Supporting Document B1

Geochemistry of Mine Wastes, Giant Mine Site, Yellowknife, NT (Golder, 2001)

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REPORT ON

GEOCHEMISTRY OF MINE WASTES
GIANT MINE SITE
YELLOWKNIFE, NT

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September 2001 002-2418

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1.0 BACKGROUND

Several decades of Giant mine operations have created changes to the original conditions within the mining lease area. The following report present an overview of the conditions within the Giant minesite in 2001, and highlight aspects of the site conditions that must be addressed in the restoration plan, exclusive of soil arsenic concentrations and underground arsenic storage chambers. The most prevalent potential contaminant on the site, and the one that is likely to dictate the contaminant mitigation aspects of the restoration plan, is arsenic. Most of the other potential contaminants are associated with it, either because of common origin (such as metal leached from rock) or because of association with common mine facilities (such as fuel oils being used near the ore processing facilities). It is important to view the site conditions in the context of regional arsenic contamination. Arsenic is widely available in exposed bedrock and so provides high background levels of arsenic in soil and surface water.

1.1 Occurrence of Arsenic

Arsenic is a ubiquitous element occurring in soil, water, air, plants, and tissues of living organisms, at concentrations ranging from parts per billion to parts per million. Naturally elevated concentrations of arsenic are often associated with mineralized zones where weathering of ore-bearing rocks can increase the levels of arsenic in soil and water. Most arsenic is introduced into the environment by industrial processes that use arsenic to manufacture agricultural products, such as insecticides, herbicides, fungicides, algaecides, wood preservatives, and growth stimulants for plants and animals. Additional potential arsenic sources include mine tailing, smelter wastes, and roaster emissions. Arsenic concentrations in soil and surface waters around smelters typically are elevated as a result of arsenic trioxide (As_2O_3) fallout from stack emissions.

The Giant Minesite is located over an arsenic-rich, gold-bearing ore body. The arsenic in the mineralized rock occurs principally as arsenopyrite (FeAsS) and as a trace constituent of pyrite (FeS_2) (Lewis, 1985). Soils around the Giant Minesite not impacted by mineral extraction/processing contain relatively elevated concentrations of arsenic from weathering of the arsenic-rich ore body. A recent study by the Royal Military College of Canada (RMC, 2000) estimates the natural or background arsenic levels in the Giant Minesite area, and in the Yellowknife area, approximately 150 mg/kg.

1.2 Comparative Guidelines

For comparative purposes, the geochemical results obtained for mining wastes, soil, creek sediments, groundwater, and surface water were evaluated against the most appropriate guideline, as described in this section.

1.2.1 Acid Drainage Potential of Mining Wastes

The potential of a geologic material to generate acid rock drainage (ARD) can be described by the ratio of the amount of neutralizing minerals expressed as neutralization potential (NP, expressed as equivalent kilograms of calcium carbonate rock per tonne of rock) to the amount of sulphide minerals expressed as acid potential (AP, same unit as NP) present in the rock. This ratio is referred to as the Neutralization Potential Ratio (NPR). The evaluation of ARD potential of mine waste material at Giant followed the procedure described in *Guidelines for Acid Rock Drainage Prediction in the North* (SRK/BC Research, 1992). The suggested guidelines are as follows:

NPR	ARD Potential
Greater than 3	Acid Neutralizing
1 – 3	Uncertain ARD Potential
Less than 1	Acid Generating

ARD potential can also be evaluated by calculating the Net Neutralization Potential, or NNP, which is the difference between AP and NP values (NNP = NP - AP). Negative NNP values suggest that the rock has insufficient neutralizing capacity for a given acid potential, indicating that the rock might have a potential to generate acidic drainage. A positive NNP suggests that the rock has a capacity to neutralize the acidity generated.

NPR is considered a more appropriate tool and was used in this study to evaluate the propensity of rock to generate acidic drainage.

1.2.2 Metal Leaching Potential of Mining Wastes

The potential of mining materials (open pit walls, waste rock, water treatment sludges, etc.) to leach metals to the environment is evaluated to determine the potential effects of leaching on surface water quality. Metal concentrations in leachate were compared to both Canadian Council of Ministers of the Environment (CCME) recommended guidelines for freshwater aquatic life and to allowable concentrations outlined in Giant Minewater License Permit N1L2-0043. These criteria were used for a qualitative comparison only. “True” runoff concentrations generated by exposure of mine wastes to water (through rain or flooding) depend on a number of factors that are difficult to simulate in static laboratory tests (e.g., grain size distribution, solution to solid ratio, sulphide oxidation, etc.).

1.2.3 Sediment Arsenic and Metal Concentrations

In 2001, the Northwest Territories has not established guidelines for concentrations of metals in soils. The recommended soil quality guidelines outlined in the CCME (2000) are typically used as a reference. The CCME guidelines are intended for general guidance only.

The Yellowknife area, including Giant Mine, is located over a mineralized zone characterized by arsenic-rich ores. Studies performed by Ollson (2000) and the Environmental Science Group of RMC (2000) on background soil arsenic levels in the Yellowknife area estimate these levels to be 100 mg/kg to 150 mg/kg, respectively. In this document, sediment arsenic concentrations below 100 mg/kg have been considered equivalent to background conditions. The Yellowknife Soil Arsenic Remediation Committee (YSARC) is also reviewing the natural or background levels of arsenic in soil in the Yellowknife area.

In 1997, Golder Associates (Golder) conducted a study for Miramar Con Mine that indicated that soil arsenic concentrations lower than 372 ppm (mg/kg) represented a minimal risk for human health, based on worker exposure at an industrial site (Golder, 1998). Because of the similarity of site use, geology, and the nature of the mining wastes generated by Con and Giant Mines, the results of the Con Mine Risk Assessment were applied to the Giant Minesite. In this document, a total arsenic concentration of 350 ppm was used as a guideline below which the potential risk to human health at the Giant Minesite is considered minimal.

1.2.4 Water Quality

No criteria exist for evaluation of groundwater quality at the Giant Minesite. For illustrative purposes only, surface water quality for samples collected at or close to the Surveillance Network Program (SNP) monitoring stations was compared to the criteria specified in Giant Minewater Use and Waste Disposal Permit N1L2-0043. The water quality of the other surface water collection sites was compared to CCME guidelines for freshwater aquatic life. Similar to the CCME guidelines for soils, the freshwater aquatic life CCME guidelines are intended for general guidance only and do not constitute legally binding criteria. For arsenic, the criterion is 5 μg/L, applicable to total arsenic concentration. The criteria for individual trace metal concentrations in water are tabulated together with results of the laboratory analyses.

2.0 OPEN PITS

2.1 Objectives

The objective of the open pits investigation was to verify and refine the chemical characterization of open pit wall rock previously reported by others. The chemical characterization focused on the potential for ARD generation and leaching of arsenic and metals.

The objective of the open pit sediment investigation was to determine whether the sediments present at the base of open pits A1, B1, and B2 consisted of tailings.

2.2 Investigations/Sampling

2.2.1 Open Pit Wall Rock Sampling

On July 21st and 22nd, 2000, a total of 43 wall rock samples (including duplicates) were collected from the walls of 8 different open pits throughout the Giant Minesite. Access permitting, representative, equidistant grab samples of wall rock were collected within each pit, or whenever a lithological change was encountered. Samples were collected using a geologist pick, bagged, and identified by writing a sample number on both the plastic bag and the sample itself. In addition, sample locations were photographed, and their positions noted on a field map. The following table lists the open pits included in the sampling effort and the number of samples collected.

Location	Rock Types	Number of Samples Collected	Number of Samples Analyzed
Open Pit A1	Andesite/Schist	6 Samples	3 Samples
Open Pit A2	Schist	5 Samples	3 Samples
Open Pit B1	Andesite/Schist	8 Samples	4 Samples
Open Pit B2	Andesite/Schist	7 Samples	3 Samples
Open Pit B3	Schist	3 Samples	2 Samples
Open Pit B4	Andesite	4 Samples	3 Samples
Brock Pit	Andesite	4 Samples	2 Samples
Open Pit C1	Andesite / Schist	6 Samples	3 Samples

Selected rock samples were subsequently packed in plastic boxes, and shipped by air freight to CEMI Laboratory in Vancouver for chemical analysis. Four pit wall samples were sent to Dr. John Jambor, of Leslie Investment in Tsawwassen, BC, for mineralogical analysis. Chain-of-Custody forms were attached to each shipment of samples.

2.2.2 Open Pit Sediment Sampling

The presence of sediments was observed at the base of open pits A1, B1, B2, and C1. Sediment samples were collected in pits A1, B1, and B2 to determine the nature of the sediments, in particular whether the sediment consisted of natural soil or tailing. Sediment in pit C1 was previously documented to consist of tailings (Deton'Cho Environmental Alliance, 1999). The three sediment samples were collected using a clean shovel and put in a plastic bag. The following table presents sample information.

Location	Number of Samples Collected	Number of Samples Analyzed
Open Pit A1	1	1
Open Pit B1	1	1
Open Pit B2	1	1

Since the analysis of open pit sediments was intended to provide information on the origin of the sediment, no duplicates were obtained. The procedures described for pit wall rock sample identification, documentation, packaging, and shipping were followed for open pit sediment samples. The sediment samples were shipped to Enviro-Test Laboratories in Edmonton for analysis.

2.3 Analytical

2.3.1 Open Pit Wall Rock

During sample collection, rock types were identified and the presence of sulphide minerals was noted. A representative selection of 23 rock samples was analyzed by CEMI Laboratory for:

1. major and trace element chemistry through triple-acid digestion and ICP scan (with the exception of arsenic and antimony, which were determined by hydride extraction);

2. ARD potential through the modified Sobek method of acid-base accounting (ABA);

3. paste pH analysis; and

4. carbonate neutralization potential.

Twelve of the 23 samples were selected for Shake Flask Extraction (SFE) analysis to determine water-soluble constituents of the rock samples. The SFE analysis consisted of 24-hour agitated leaching with de-ionized water in a 2:1 liquid to solid ratio. Sample selection for SFE analysis was based on metal scan and ABA results.

Two of the 23 open pit rock samples analyzed were submitted as blind duplicates, and an additional two replicate analyses were performed by CEMI Laboratory for ICP and ABA analyses.

Mineralogical analysis consisted of transmitted and reflected light optical microscopy and X-ray diffractometry. Sample selection for mineralogical analysis was based on the representation of the various types of rock present in the pits, as well as ABA and ICP metal scan results. The study focused on the identification and characterization of neutralizing minerals, sulphides, arsenic-bearing minerals, and secondary precipitates.

2.3.2 Open Pit Sediments

All three open pit sediment samples collected were analyzed for metals, paste pH, sulphates, and acid volatile sulphides (AVS) at Enviro-Test Laboratories. Total metal content was determined by ICP scan following a triple-acid digestion. Arsenic and antimony were analyzed by hydride extraction.

2.4 Results – Open Pit Wall Rocks

Analytical reports on ABA analysis, rock chemistry, and leachate extraction for open pit samples are presented in Appendix I and summarized in Tables 1 to 3 respectively. The mineralogical assessment report is provided in Appendix II.

2.4.1 Acid Rock Drainage Potential

Twenty of the 23 samples analyzed had an NPR greater than 3 (ranging from 6.4 to 377), indicating that most open pit wall rocks are acid consuming. As shown in the following table, analytical results indicate an NPR < 3 for three open pit wall rock samples.

Sample ID	Location	Rock Type	NPR	ARD Potential
OPA1-01-2100	Open Pit A1	Schist	1.2	Uncertain
OPA1-05-2100	Open Pit A1	Andesite	2.5	Uncertain
OPA2-03-2100	Open Pit A2	Schist	2.3	Uncertain

It should be noted that the AP was calculated using the total sulphur content. This likely represents an overestimation of the AP, since not all sulphur may react to form ARD. Although sulphate sulphur appears to be essentially non-existent, if the total sulphur fraction contains a non-reactive component, the AP would be reduced proportionally. Furthermore, a significant number of samples (13 of 23) contained less than 0.3 wt% total sulphur. According to Price (1997), a sulphide sulphur content < 0.3 wt% combined with a paste pH > 5.5 indicates that a material is not acid generating. All values for paste pH demonstrated alkaline conditions, with paste pH ranging from 8.9 to 9.8. These values are in agreement with the abrasion pH for dolomite (9-10) provided in Price (1997).

Figure 1 shows the relationship between carbonate NP and modified Sobek NP. Also included on the graph is a line denoting a 1:1 ratio. As demonstrated by this figure, the neutralization potential of the rock is almost entirely provided by carbonate minerals. Optical mineralogy identified the carbonates as being an iron-rich dolomite. Although the iron component of the Fe-dolomite does not generate any net alkalinity, the values for carbonate and Sobek NP are sufficiently large that an excess NP is considered available. Therefore, since more than 85% of the samples are acid consuming, with neutralization provided by a large supply of reactive carbonate minerals, and only three samples are characterized by an uncertain potential to generate acidic drainage, the overall potential for ARD generation by open pit rocks is considered minor. This conclusion is corroborated by a study previously conducted by Royal Oak Mines (1994), in which all rock samples collected from open pit walls were determined to be net acid consuming.

2.4.2 Whole Rock Chemistry

Arsenic concentrations varied widely, ranging from 15 to 40,200 mg/kg (i.e., three orders of magnitude). Wall rock samples in pits B2, B3, B4, and Brock had arsenic concentrations around or below 100 mg/kg. One sample each from pits A1 and C1 had significantly elevated arsenic (40,200 and 7,700 mg/kg, respectively); the other samples from these pits had relatively low arsenic concentrations (below 179 mg/kg). Most samples from pits A2 and B1 had slightly higher average arsenic concentration (ranging from 102 to 6,330 mg/kg). Concentration ranges for other metals were not as variable ranging generally over no more than one order of magnitude: copper (6 to 203 mg/kg);

chromium (52 to 262 mg/kg); nickel (39 to 117 mg/kg); lead (2 to 32 mg/kg); zinc (40 to 156 mg/kg); and antimony (4 to 49 mg/kg).

Correlation analysis shows that arsenic is weakly correlated with cadmium, lead, and antimony ($R \approx 0.6$). These correlations likely reflect a common origin and/or geochemical similarities. Based on the mineralogical investigations, likely mineral candidates for element substitution are pyrite and arsenopyrite. Stronger correlations ($R > 0.7$) are found between barium and potassium, cobalt and copper, and iron and vanadium. Once again, the geochemical similarity between these element pairs may lead to substitution in the silicates, sulphides, and/or carbonates identified in open pit rock.

2.4.3 Metal Leaching Potential

Trace metal concentrations of arsenic and manganese were present above detection limits in leachates from all open pit wall rock samples analyzed. Other trace metals were not encountered at levels above their respective detection limits. Leachable arsenic concentrations ranged from 0.0031 to 0.19 mg/L, with the lower leachable arsenic concentrations in pits B2, B3, B4, and Brock, and higher concentrations in samples from pits A1 and A2. This trend is consistent with the concentration of arsenic in the rock samples, as evidenced by a weak correlation ($R \approx 0.6$) between total and leached arsenic. The proportion of water-soluble arsenic in open pit wall rocks ranged from 0.001% by weight to 0.3%, with an average of approximately 0.08%.

Leachable manganese concentrations were also detected, ranging from 0.007 to 0.083 mg/L. Sulphate concentrations in leachates ranged from 5 mg/L to 82 mg/L, indicating dissolution of primary sulphates or secondary sulphates formed by limited oxidation of sulphides. Calcium to sulphate ratios in the leachate of approximately 1 suggest that gypsum was likely present in samples containing the most elevated sulphate concentrations from pits A2, B2, and C1. Leachate concentrations of antimony, chromium, copper, lead, and zinc were all below detection limits.

A qualitative comparison with CCME guidelines shows that leachable arsenic concentrations are above CCME guideline values for seven samples collected in most open pits (A1, A2, B1, B2, B3, and C1). Concentrations above CCME guidelines for manganese occur for two of these seven samples, in open pits A1 and A2. Leachate metal concentrations were consistently below Giant Mine effluent discharge permit requirements.

Based on the static leach testing, it appears that the open pit wall rocks have a limited ability to release dissolved metals to surface water. However, for arsenic and manganese, wall rock should be considered a potential source. The limited leachability of arsenic is likely related to the fact that this trace element primarily occurs in the form of insoluble sulphides.

The potential for metals to dissolve and exceed water quality criteria likely varies over time. Flushing episodes, such as rainfall after a period of drought or snowmelt runoff, probably represent the events of most concern, as these may cause metals concentrations to increase in water that accumulates at the base of the pit and/or is diverted to Baker Creek.

2.4.4 Quality Assurance/Quality Control

Two duplicate open pit wall rock samples were submitted for chemical analysis (ICP metal scan). Analytical results are presented in Table 4. For the two samples, 1 and 6 analytes, respectively, (out of 20) had relative percent differences (RPDs) above 35%, which is the threshold accepted by the U.S. EPA for duplicate soil analyses (EPA, 1994). In both cases, arsenic analyses were reproduced with sufficient precision (13 and 9% RPD). The ICP analyses are considered precise for the trace metals of concern and most other analytes. The apparent lack of analytical precision for some parameters is most likely related to material heterogeneity rather than analytical deficiency.

Two field duplicate samples of open pit wall rock were submitted for ABA analyses. Analytical results are presented in Table 5. The laboratory analyzed an additional two replicate samples. RPD values for field duplicates all were less than 35%, with the exception of the NP determination in one of the two duplicate sets (RPD = 50%). All laboratory replicate analyses were well below 35% RPD. Since ABA results are generally accepted to suffer from relatively poor reproducibility (as compared to "traditional" techniques such as metal analysis), all ABA results are considered to be sufficiently precise for decision-making purposes.

2.5 Discussion - Open Pit Wall Rocks

The analytical results indicate that open pit wall rocks can be a limited source of dissolved metals to water coming in contact with the rock. Should CCME guidelines become applicable to surface water on site, arsenic and manganese concentrations in pit water may exceed this guideline if the open pits become flooded. Pit wall rock generally is not considered acid generating.

2.6 Results – Open Pit Sediments

Analytical reports are presented in Appendix III and summarized in Table 6.

The sample collected in open pit A1 returned an arsenic concentration of 101 mg/kg and antimony below the detection limit of 0.1 mg/kg (antimony is used to help establish a tailing signature). Although the arsenic concentration is above CCME guidelines for industrial land use, such a concentration is within background levels for the Yellowknife area. Concentrations of other elements for this sample are all below CCME guidelines. The analytical results suggest that the sample collected in pit A1 is representative of a native clayey soil for the Yellowknife area, and there is no reason to assume that tailing is present in these sediments.

The sample collected in open pit B1 returned an arsenic concentration of 1,200 mg/kg. No other metals were above CCME guidelines for industrial land use. The elevated arsenic concentration, combined with a relatively high value for antimony (2.4 mg/kg), is consistent with the chemistry of tailing (Section 5.0), suggesting that this sediment sample may contain a tailing component.

The sample collected in open pit B2 showed an arsenic concentration of 2,070 mg/kg and a relatively elevated concentration of antimony (11.2 mg/kg). The nickel concentration (58 mg/kg) for this sample is above CCME guidelines for industrial land use. Similar to the sediment sample in B1 pit, the analytical results for the B2 pit sample suggest that tailing may be present in this sample.

Since the sediment characterization consisted of evaluation of single samples from open pits A1, B1, and B2, collection and analysis of additional samples from each of these three pits is required to confirm the characteristics and origin(s) of the bulk sediment.

3.0 WASTE ROCK

3.1 Objectives

The primary objective of the waste rock piles investigation was to verify and refine the preliminary ARD potential reported by others and to characterize the metal leaching potential of the waste rock. Results of the investigations will be used in identifying and evaluating closure options.

3.2 Investigations/Sampling

On July 22nd and 23rd, 2000, a total of 24 waste rock samples were collected from 13 different waste rock piles throughout the Giant Minesite. The following table summarizes the location and the number of samples collected and analyzed from each pile.

Location		Number of Samples Collected	Number of Samples Analyzed
Open Pit A2	North end of pit, from access ramp to pit floor	2 Samples	2 Samples
	Northwest corner of pit, from top of pit to access ramp	3 Samples	3 Samples
Open Pit B1	Northeast corner	1 Sample	1 Sample
	Northwest corner	1 Sample	1 Sample
	South end of pit, from top of pit to access ramp	1 Sample	1 Sample
Open Pit B3	South Wall	2 Samples	2 Samples
Open Pit B4	Base of pit	2 Samples	2 Samples
Brock Pit	Along south and west edges of pit	2 Samples	2 Samples
Open Pit C1	South Wall	3 Samples	3 Samples
Along B2 Pit Access Road (approximately 300 m before B2 Pit access ramp)	Northeast Pile	3 Samples	2 Samples
	Northwest Pile	2 Samples	1 Samples
	Southwest Pile	2 Samples	2 Samples

When only one waste rock sample was collected from a pile, the sample was a composite from various locations within the pile. When several samples were collected within a pile, each composite sample was gathered along equidistant points across the pile. Procedures followed for sample identification, documentation, packaging, and shipping were identical to those reported for open pit rock samples. All waste rock samples were shipped by air freight to CEMI Laboratory for chemical analyses (Appendix I). Four waste rock samples were sent to Dr. John Jambor for mineralogical analysis (Appendix II).

3.3 Analytical

During sample collection, rock types were identified and the presence of sulphide minerals was noted. A representative selection of 22 rock samples was analyzed by CEMI Laboratory for major and trace elements chemistry, ARD potential (modified Sobek method), paste pH, and carbonate neutralization potential. Eight of the 22 samples were subjected to a Shake Flask Extraction test for determination of water-soluble constituents. Similar to open pit samples, selection was based rock chemistry and ABA results.

Two of the 22 samples were submitted as laboratory blind duplicates for ABA and ICP metal scan analyses. CEMI Laboratory replicated one other sample for ABA assessment.

Mineralogical analyses performed on the waste rock samples were identical to those for the open pit rock samples.

3.4 Results

Analytical reports on ABA analysis, rock chemistry, and leachate extraction for waste rock samples are presented in Appendix I and summarized in Tables 1 to 3, respectively. The mineralogical assessment report is provided in Appendix II.

3.4.1 Acid Rock Drainage Potential

Nineteen of the 22 samples analyzed had an NPR greater than 3 (ranging from 3.7 to 38.9), thus indicating that the waste rock is generally acid consuming. Three samples showed an NPR between 1 and 3, falling in the “uncertain ARD potential” range. As with open pit rock, the NPR was calculated using total sulphur values, thereby potentially overestimating the AP. The three samples with an NPR < 3 are presented in the following table.

Sample ID	Location	Rock Type	NPR	ARD Potential
WR-OPA2-01-2300	Waste Pile near A2 Pit	Andesite	2.7	Uncertain
WR-OPC1-01-2300	Waste Pile near C1 Pit	Andesite	2.4	Uncertain
WR-OPC1-02-2300		Andesite	2.2	Uncertain

Similar to open pit rocks, the neutralization potential of the rock is almost entirely provided by carbonate minerals (Figure 1), identified by optical mineralogy as consisting primarily of an iron-rich dolomite. A significant number of samples (13 of 22) contained less than 0.3 wt% total sulphur. According to Price (1997), a sulphide-sulphur content < 0.3 wt% combined with a paste pH > 5.5 indicates that a material is not acid generating. All values for paste pH are alkaline, with paste pH ranging from 8.8 to 9.5. These values are in agreement with the abrasion pH for dolomite (9-10) provided in Price (1997).

The overall potential for ARD generation by the waste rock tested is considered minor. This conclusion is corroborated by a study previously conducted by Royal Oak Mines (1994, 1995), in which all waste rock samples were determined to be net acid consuming.

3.4.2 Whole Rock Chemistry

Similar to open pit rock samples, arsenic concentration in waste rock samples varied widely, ranging from 11 to 8,960 mg/kg, with an average of 1,119 mg/kg. More than half the samples had an arsenic concentration below 100 mg/kg; most of the other samples had an arsenic concentration above 1,000 mg/kg. The high-level arsenic samples were found in each of the waste rock piles sampled, with the exception of waste rock from Open Pit B4. Concentration ranges for other metals were less variable than for arsenic, but slightly greater than for the open pit wall samples: copper (54 to 276 mg/kg); chromium (105 to 494 mg/kg); nickel (54 to 117 mg/kg); lead (2 to 82 mg/kg); zinc (66 to 238 mg/kg); and antimony (4 to 74 mg/kg).

Correlation analysis shows that arsenic is weakly correlated with lead and zinc ($R \approx 0.6$-0.7). This is likely related to the presence of sulphides in which these trace elements coexist. Strong correlation is found between arsenic and cadmium. Correlations also exist between barium and potassium, calcium and strontium, cobalt and nickel, and lead and zinc. Geochemical similarity between these element pairs may lead to substitution in a number of mineral phases, including the silicates, sulphides, and carbonates identified by mineralogical analysis.

3.4.3 Metal Leaching Potential

Water-soluble arsenic and manganese concentrations above detection limits were present in leachates from all waste rock samples analyzed. In addition, two results for copper (0.01 mg/L) and one for zinc (0.013 mg/L) were also above detection limits. Leachable arsenic concentrations ranged from 0.0077 to 0.105 mg/L, and leachable manganese concentrations ranged from 0.010 to 0.039 mg/L. Leachate concentrations of antimony, chromium, nickel, and lead were all below their respective detection limits. The proportion of water-soluble arsenic in waste rock is somewhat lower than that of open pit wall rock, ranging from 0.001% by weight to 0.09%, with an average of 0.02% as compared to an average of 0.08% for open pit rocks. Correlation between arsenic content and arsenic leachability is excellent, with a correlation coefficient of 0.9.

Leach extraction results were compared to both CCME guidelines for freshwater aquatic life and standards from the Giant Minewater license effluent discharge criteria. Leachable arsenic concentrations exceeded CCME guidelines for a total of four waste rock samples collected at A2, B1, B3, and Brock open pits. No leachable metal concentrations were above Giant Minewater license requirements for effluent discharge.

As with the open pit rock, the leach testing demonstrates that the waste rock has a limited ability to act as a source of arsenic and other trace metals to receiving waters. The strong correlation between total arsenic content and arsenic concentration in the leachate suggests that a small fraction of the arsenic is readily available, and that leaching of this arsenic is not significantly affected by kinetic impediments. However, the bulk of the arsenic is considered not available for leaching since arsenic is largely present in insoluble form as arsenopyrite and possibly in pyrite.

3.4.4 Quality Assurance/Quality Control

Two duplicate waste rock samples were submitted for chemical analysis. Analytical results are presented in Table 4. For each sample, 7 and 10 of the analytes, respectively, (out of 20) had an RPD above 35%. Arsenic RPDs were 52 and 192%, respectively. The high RPD values for arsenic most likely reflect the heterogeneous nature of the arsenic distribution within the samples rather than analytical imprecision.

Two field duplicate samples were submitted for ABA analysis and an additional sample was replicated by the laboratory. Analytical results are presented in Table 5. All results for the field duplicates had RPD values well over 35%. This is consistent with the high RPD values for the duplicate chemical analysis, suggesting that the field duplicates may not have been representative of the same material. The replicate laboratory analysis shows a maximum RPD of 6%, indicating that laboratory precision in homogenized samples was excellent.

3.5 Discussion

Waste rock is a potential source of dissolved metals to surface water, particularly of arsenic and manganese, and possibly zinc and copper. Should CCME guidelines become applicable to surface water on site, arsenic concentrations in waste rock runoff and/or seepage may exceed this guideline. Waste rock generally is not considered acid generating.

4.0 MINESITE BUILDINGS

4.1 Objectives

Buildings and other structures on the Giant Minesite will be dismantled progressively upon closure of the mine. The minesite structures were inspected for the presence of asbestos-containing material and arsenic to develop and incorporate appropriate work procedures and material disposal options upon dismantling. In addition, minesite structures were evaluated for the presence of gold to determine if any of the materials might hold residual value.

4.2 Investigations/Sampling

Representative samples of a variety of suspected asbestos-containing materials were collected. By far the most common asbestos-containing material noted was asbestos-cement siding and insulation board. However, significant quantities of compact and loose asbestos insulation and pipe coatings were also noted. The materials examined for arsenic and gold content consisted of concrete surfaces, wood beams, and surface residues.

4.3 Analytical

Suspect asbestos-containing material was shipped to Enviro-Test Laboratories for asbestos characterization. Chip samples from concrete surfaces, shavings from wooden beams, and floor residues were collected and also shipped to Enviro-Test Laboratories for analysis of arsenite, arsenate, and gold.

4.4 Results

Analytical results from the asbestos and arsenic-gold investigations are presented in Tables 7 and 8, respectively. The total arsenic values reported consist of the sum of arsenite and arsenate, as reported by the laboratory.

Four of the five samples analyzed were reported to contain 75-100% chrysotile (serpentine) asbestos fibres and the remaining sample, which consisted of insulation from the north wall of the Roaster building, contained 75-100% amosite (amphibole) asbestos fibres. Serpentine fibres are flexible and curvy, while amphibole fibres are straight and needle-like. Amphibole fibres tend to become airborne more easily and therefore require more care during handling and exposure.

As demonstrated by the analytical results in Table 8, certain materials within the Giant Mine ore processing facilities are contaminated with arsenic residues and will likely require special handling during demolition and disposal. Some materials also have residual gold values that may be recoverable, depending on the overall quantities.

4.5 Discussion

The sampling conducted for gold and arsenic content of building materials was not exhaustive, and only represents an indication of the extent of arsenic contamination and residual gold values. However, the results do indicate that a more methodical sampling and analysis program needs to be devised prior to dismantling of the buildings.

4.6 Environment, Health and Safety Implications

Minesite structures can contain asbestos and other materials that may be contaminated by arsenic.

The handling of asbestos and arsenic-contaminated materials will require workers to wear appropriate protective equipment. Depending on the type and level of contact, this could range from simple protective clothing, dust respirators, safety glasses, and gloves to full positive pressure suits with supplied air. It may also require the workers to report to decontamination areas prior to leaving the work area. Working with arsenic-contaminated materials may require workers to undergo medical surveillance that may include monitoring of blood, urine, and hair samples.

The transportation and disposal of asbestos and arsenic-contaminated material would require special consideration, especially if disposal is off-site. The materials may be subject to the *Transportation of Dangerous Goods Act* and would require disposal in a licensed facility. The proposed disposal option for the mine building is the north side of the Northwest pond.

5.0 TAILING AND WATER TREATMENT PLANT SLUDGE

5.1 Objectives

The objective of the tailing investigation was to verify and refine the chemical characterization previously reported by others. The chemical characterization focused on metal leaching potential of arsenic and other metals in order to help define closure options.

The initial scope of work for finalizing the Giant Mine Abandonment and Restoration Plan (A&R Plan) did not include investigation of the water treatment plant sludges. A preliminary evaluation of the solubility of the sludge was carried out to provide some information on its leachability upon exposure to ambient environmental conditions, should this closure option be considered in the final A&R Plan.

Deton'Cho (1999) and Riveros and Dutrizac (2000) describe the process of arsenic elimination from minewater at Giant. In 1981, a wastewater treatment plant was installed to reduce cyanide levels in the effluent using alkaline chlorination, which was replaced in 1988 by hydrogen peroxide oxidation. Both oxidation processes also oxidize arsenite species (As^{3+}) to arsenates (As^{5+}). Ferric sulphate is added at a lime-adjusted pH of approximately 8.5 and an iron to arsenic molar ratio of 10:1. This process is reported to precipitate 98% of the arsenic, likely as a poorly crystalline, ferric oxyhydroxide phase containing adsorbed/co-precipitated arsenate. This phase is also referred to as arsenical ferrihydrite of the form $AsO_4^{3-} \bullet FeO(OH)(H_2O)x$. The chemical stability or leachability of these sludges is of concern at Giant because of the potential impact on receiving waters should arsenic be released from the sludge to the environment.

5.2 Investigations/Sampling

5.2.1 Tailing

On July 22nd and 26th, 2000, a total of 16 tailing samples were collected by Golder at several shallow locations throughout the South, Central, and North impoundments (original tailing area), and from a borehole drilled into the Northwest impoundment. Three samples* were collected from the South impoundment, 3 from the Central impoundment, 5* from the North impoundment, and 5 within borehole MW00-01, in the Northwest impoundment.

In the South, Central, and North impoundments, grab samples were collected using a shovel. Sample depths ranged from surface to approximately 0.5 m below ground surface. In borehole MW00-01, samples were collected using a split spoon lowered

* (including 1 field duplicate)

through HQ drill rods. A total of five depth ranges were sampled from the surface to a depth of 4 m. Although the borehole extended to a depth of 10 m, sample collection was not possible below a depth of 4 m. Additional tailing samples, collected in winter 2000 by Miramar staff in the South, Central, and North impoundments, were made available to Golder for further analyses. These samples were obtained from boreholes drilled through the entire thickness of the tailing in the impoundments. A description of the samples collected for analysis by Golder is presented below.

Tailing Impoundment	Number of Samples Collected by Golder	Number of Samples Obtained from Miramar	Number of Samples Analyzed
South Impoundment	3	5	8
Central Impoundment	3	5	8
North Impoundment	5	8	13
Northwest Impoundment	5	-	5

Procedures for sample identification, documentation, packaging, and shipping were similar to those described for open pit and waste rock samples. Samples were shipped by air freight to CEMI Laboratory for chemical analysis, with the exception of tail samples collected by Miramar staff, which were analyzed by Eco-Tech Laboratory of Kamloops. Nine tailing samples were selected from the Central, North, and Northwest impoundments and sent to Dr. John Jambor for mineralogical analyses.

5.2.2 Water Treatment Plant Sludge

On July 24th, 2000, two sludge samples were collected from the settling pond adjacent to the water treatment plant. One grab sample was collected at the mouth of the effluent discharge; the second sample was collected downstream from the first, along the south shore of the pond. The samples were collected with a shovel and stored in a 10-litre plastic pail fitted with a hermetically closing lid. Settling pond water was added to each sample to minimize chemical transformation during transport. Procedures described above for sample identification, documentation, packaging, and shipping were followed. Both samples were sent to CEMI Laboratory for whole rock analysis by ICP and for sequential leach extraction (at 2:1 liquid to solid ratio) using de-ionized water.

5.3 Analytical

5.3.1 Tailing

All 16 tailing samples collected by Golder field staff were analyzed for major and trace elements chemistry, ARD potential (modified Sobek method), paste pH, and carbonate neutralization potential. Eight of the 16 samples were analyzed for soluble constituents using Shake Flask Extraction, selected based on their ABA results and rock chemistry. The selected samples had a relatively low NPR or elevated concentrations of arsenic or other metals.

Two of the 16 samples were submitted as laboratory blind duplicates for ABA and rock chemistry. CEMI Laboratory performed three additional replicate analyses for ABA assessment.

Mineralogical analyses performed on the tailing samples were the same as those performed on open pit and waste rock samples.

In March 2000, Miramar staff obtained tailing samples from the South, Central, and North impoundments as part of a pilot project to reprocess and treat arsenic residues. A total of 280 samples were collected from 14 boreholes drilled into the old impoundments. The location of these boreholes is shown on Figure 2. The samples were analyzed for gold, arsenic, and iron by fire assay at Eco-Tech Laboratory. Of these samples, 63 composites were prepared and analyzed for major and trace element chemistry by ICP scan. The analytical results and remaining dried and ground samples were made available to Golder for further analyses. A total of 18 samples from 4 boreholes were retained: 5 samples at different depths from borehole 2000-04 in the South impoundment; 5 samples from borehole 2000-14 in the Central impoundment, and 4 samples each from borehole 2000-24 and 2000-26 in the North impoundment. These samples were analyzed at Eco-Tech Laboratory for their potential to generate acidity (modified Sobek method), paste pH, and carbonate neutralization potential. 12 samples were selected for water-soluble constituent analysis. The selection criteria were the same as for the tailing samples collected by Golder.

5.3.2 Water Treatment Plant Sludge

Two sludge samples were analyzed by CEMI Laboratory for major and trace elements, and sequential leach analysis to evaluate the solubility and chemical stability of the material. The sequential leach test consisted of three sequential extractions of the sludge sample using de-ionized water at a 2:1 liquid to solid ratio, each extraction using fresh de-ionized water. Each leachate was then analyzed for dissolved metals and low-level dissolved arsenic. Fire assays of each sample was also performed to obtain more accurate As:Fe molar ratios.

5.4 Results – Tailing

Analytical reports on ABA analysis, rock chemistry, and leachate extraction for tailing and water treatment sludge samples, as well as fire assay results for sludges, are presented in Appendix I and summarized in Tables 9 to 11. The mineralogical assessment report is provided in Appendix II.

5.4.1 Acid Rock Drainage Potential

NPR values, calculated using total sulphur, range from 5.1 to 69.5 for all tailing samples, indicating that the tailing samples are net acid consuming. The potential for the tailing to generate ARD is considered minor for each impoundment. The paste pH values, ranging between 7.2 and 9.0, further confirm the lack of ARD generation potential.

Samples obtained from different depths within the same borehole in each of the old impoundments showed a decreasing NPR with depth. Figures 3 and 4 show that the decrease in NPR with depth generally is related to a lower acid potential in surficial tailing. Relative enrichment in sulphate concentration in surface tailing samples was also observed. Although tailing are net acid consuming, oxidation in the near-surface environments in the old tailing impoundments is occurring, as evidenced by the enrichment in sulphate together with the decreasing acid potential with depth. However, any acidity generated under near-surface conditions is readily counteracted by the large reservoir of neutralizing components. This trend was not observed in samples from the Northwest impoundment, where oxidation in the area sampled is largely prevented by the presence of a water-cover through most of the year. Oxidation may be occurring in areas of this impoundment where tailing are generally exposed for most of the year.

5.4.2 Mineralogy

The mineralogical investigation indicated that tailing grain size in the Central, North, and Northwest impoundments is generally less than 50 μm, with a small portion of relatively coarse material of up to 150 μm observed in some samples. The bulk of the tailing consists of quartz [SiO_2] and carbonate minerals (calcite [$CaCO_3$] and dolomite [$CaMg(CO_3)_2$]), with some muscovite [$KAl_3Si_3O_{10}(OH)_2$] and chlorite [$(Mg,Fe)_6(AlSi_3)O_{10}(OH)_8$]). Sulphides form a relatively small proportion of the tailing, represented mainly by pyrite [FeS_2], with some chalcopyrite [$CuFeS_2$], pyrrhotite [$Fe_{1-x}S$], and arsenopyrite [FeAsS]. Zoned hematite [Fe_2O_3] is also common, either as single grains or as replacement rims around pyrite grains. This form of alteration of pyrite is typical of sulphide roasting products, or calcine, which was identified in all tailing samples from the Central, North, and Northwest impoundments. No sulphide minerals were found to have alteration rims consisting of goethite [α-FeOOH] or iron sulphates, characteristic of weathering under ambient environmental conditions, although gypsum was observed in some of the surficial tailing samples.

5.4.3 Tailing Chemistry

Arsenic concentrations were less variable than for rock samples, typically ranging from 1,325 to 4,990 mg/kg, with the exception of Northwest pond samples taken from between 1 and 2 m depth (arsenic concentrations of 338 to 543 mg/kg). Antimony generally showed much higher concentrations than in rock samples, ranging from 14 to 745 mg/kg, with an average of 261 mg/kg. Concentration ranges for other metals were copper (40 to 2,767 mg/kg), chromium (58 to 235 mg/kg), nickel (27 to 99 mg/kg), lead (12 to 404 mg/kg), and zinc (72 to 738 mg/kg).

Correlation analysis shows that arsenic correlates with zinc ($R \approx 0.7$). Significant correlation for other trace metals is almost non-existent. Strong correlation is observed between major elements (e.g., Al, Ca, Na, K, Mg).

5.4.4 Metal Leaching Potential

Figure 5 shows that, in general, arsenic is slightly more water-soluble in tailing than in open pit wall or waste rocks. The proportion of water-soluble arsenic in tailing ranges from 0.001% by weight to 1.2%, with an average of 0.2% as compared to an average of 0.08% and 0.02% for open pit wall rocks and waste rocks, respectively.

Arsenic and manganese concentrations in tailing leachates were above laboratory detection limits for all tailing samples tested, with the exception of the deepest sample in the Northwest pond. Manganese concentrations ranged from 0.015 to 0.17 mg/L, slightly higher than rock leachates. Arsenic concentrations ranged from < 0.2 to 10.3 mg/L, with the highest concentration originating from surficial tailing in the South and North impoundments. Figure 6 shows the proportion of water-soluble arsenic in tailing with depth. Although secondary arsenic phases were not identified by the mineralogical analysis, the higher solubility of arsenic in surficial tailing may be caused by the fact that arsenic-bearing weathering products generally are more soluble than primary arsenic-bearing phases. In addition, arsenic may be sorbed onto the hematite known to be present in the calcines. This arsenic would also represent a reservoir of labile arsenic. Weak correlation ($R \approx 0.5$) is found between total arsenic in the tailing and the arsenic concentration in the leachates. Antimony, copper, and iron concentrations were above detection limits in most samples; antimony ranged from < 0.2 to 6.6 mg/L; copper from < 0.01 to 0.18 mg/L; and iron from < 0.03 to 0.62 mg/L. Zinc concentrations were above the detection limit in about half the samples, ranging from 0.005 to 0.11 mg/L. Chromium, lead, and nickel were below detection limits in all leachates.

A qualitative comparison with Giant Minewater license effluent discharge criteria and CCME guidelines shows that arsenic concentrations are above both the maximum average concentration and maximum allowable arsenic concentration for 11 of the 20 samples tested, and are above CCME guidelines for 19 of the 20 samples. Antimony concentrations are above CCME guidelines for 18 of the 20 samples; manganese and iron are above CCME guidelines for 8 and 4 of the 20 samples, respectively. Antimony, manganese, and iron concentrations are not regulated in the Giant Minewater license.

5.4.5 Quality Assurance/Quality Control

The two tailing samples submitted as blind duplicates for rock chemistry have RPD values below 35% for all analytes, indicative of precise analyses. The same duplicate tailing samples were analyzed, along with three additional laboratory replicates, for ABA. All ABA samples have RPD values below 35%. The ABA analyses are therefore also considered precise. QAQC results are presented in Tables 4 and 5.

5.5 Discussion – Tailing

All tailing investigated in each of the impoundments are net acid consuming. A general decrease of NPR with depth and the presence of sulphates in surficial tailing indicate that oxidation is occurring superficially. Surficial oxidation was not observed in areas where tailing is typically water-covered throughout most of the year, such as in the central part of the Northwest tailing impoundment.

The typical arsenic concentration of tailing is approximately 2,000 to 4,000 ppm, with a few samples in the 5,000 ppm range. Although only a small proportion of arsenic in the tailing (average of 0.2% by weight) is water-soluble, a much smaller proportion than arsenic in mill soils, leaching of tailing may generate arsenic concentrations that exceed Giant Mine discharge permit levels. Should the surface of the tailing impoundments be left uncovered, water infiltrating through the tailing and discharging through seeps will likely continue to be captured and treated prior to release to the environment.

Tailing principally consist of quartz and carbonate minerals, with a small proportion of sulphides, including arsenopyrite, which are generally not altered or oxidized. Roaster products, or calcine, are also abundant in most tailing samples. The soluble arsenic is most likely associated with the calcine, in which arsenic likely occurs adsorbed onto hematite particles. Arsenic is more readily amenable to be released to the environment through desorption from hematite than as arsenic generated by oxidation/dissolution of arsenopyrite or arsenic-bearing pyrite tailing grains.

5.6 Results - Water Treatment Plant Sludges

Analytical reports on sludge chemistry, both from ICP analysis and fire assay, along with sequential leach extraction are presented in Appendix I and summarized in Tables 10 and 11.

5.6.1 Sludge Chemistry and Assay Results

The arsenic content of the two water treatment plant sludge samples was 1 and 4.2 wt%, respectively, and the iron content 6 and 30 wt%, respectively, with the sample obtained at the mouth of the treatment plant outlet containing the higher concentration of arsenic and iron. These concentrations yield a molar ratio of iron to arsenic of approximately 8 and 9, respectively. The sludges also contained an elevated calcium content (4 wt% and 21 wt%), copper (more than 1 wt% in both samples), antimony (5,300 and 758 mg/kg), nickel (2,286 and 566 mg/kg), some zinc (340 and 184 mg/kg), and a relatively small concentration of lead (86 mg/kg for both samples).

5.6.2 Metal Leaching Potential

The evolution of arsenic concentration with leaching cycles is presented in Figure 7. For sample SL-SE-01, arsenic concentrations rose from 0.04 mg/L in the first leach cycle to 0.106 mg/L in the third cycle. Released arsenic was higher in sample SL-SE-02; from 0.6 mg/L in the first leach cycle to 0.3 mg/L in the third cycle. It is not known why the second cycle for this sample returned such a low arsenic concentration of 0.0063 mg/L, however, based on the other five data points, this value appears to be an outlier. The average arsenic extraction from sludge samples 1 (containing 4.2% arsenic) and 2 (containing 1% arsenic) was 0.0004 wt% and 0.006 wt%, respectively.

A qualitative comparison of sludge leachate results with the CCME guidelines for freshwater aquatic life and Giant Minewater licence effluent discharge criteria shows that leachate arsenic is generally above the CCME guidelines for freshwater aquatic life. In addition, the first leaching cycle from sample SL-SE-02 generated an arsenic concentration above the permitted effluent discharge limit (for maximum average concentration only).

For sample SL-SE-01, leachable concentrations of antimony, copper, iron, manganese, and zinc above laboratory detection limits were observed. Concentration ranges were antimony (0.6 mg/L), copper (0.08 to 0.29 mg/L), iron (0.18 to 1.74 mg/L), manganese (0.056 to 0.159 mg/L), and zinc (0.109 to 0.273 mg/L). Concentrations of chromium and lead were below detection limits. For sample SL-SE-02, leachable concentrations of copper and zinc above detection limits were observed. Copper concentrations ranged from 0.29 to 1.22 mg/L, and zinc concentrations from 0.013 to 0.045 mg/L. Antimony, chromium, iron, lead, and manganese concentrations were generally below detection limits.

Leachate pH values ranged from 7.75 to 11.90. The upper values are higher than the CCME aesthetic objective range and Giant Minewater licence effluent discharge criteria value of 6.0 to 9.0 and 9.5, respectively.

5.7 Discussion – Water Treatment Sludge

Assay results indicate that the iron:arsenic ratio in the sludge is approximately 8-9:1. Many factors can affect the solubility of arsenic in the water treatment sludge, one of which is the chemical composition of the material. Various studies presented by Riveros and Dutrizac (2000) indicate that iron to arsenic ratios greater than 3:1 decrease the solubility of the sludge and increase its chemical stability in the pH range of 4 to 7. The presence of trace elements, such as copper and zinc, further increases the stability range of the arsenical ferrihydrite up to a pH of about 10 (Harris and Monette, 1988; Godbehere and others, 1995). It has been demonstrated that the presence of trace amounts of calcium and magnesium in the precipitate may result in reaction with atmospheric CO_2 to produce a carbonate phase and release arsenate in solution (Robins and Tozawa, 1982).

The stability of the arsenic and sludge produced at Giant can best be measured through leaching tests under conditions that would represent the final disposal environment. The sequential leach tests, meant to simulate exposure of the sludge to ambient conditions, indicate that a very small proportion of the arsenic in the sludge is water-soluble (up to 0.006% by weight), along with other elements present in the sludge. Leachate water quality indicates that, should the sludge be exposed to freshwater precipitation, concentrations of antimony, copper, iron, and manganese in the drainage may exceed CCME guidelines for freshwater aquatic life. The proportion of water-soluble arsenic and the aqueous arsenic concentration generated by water leaching of the sludge are nonetheless much lower than that for tailing or soils. Should the sludge be dredged and disposed of in one of the tailing ponds, the effects of sludge disposal on tailing water quality may not be significant, provided conditions within the sludge pile remain approximately constant.

6.0 GROUNDWATER

6.1 Objectives

The principal objective of the limited groundwater investigation carried out for the Abandonment and Restoration Plan was to assess groundwater quality at and around the tailing impoundments to verify the effects, if any, of tailing on groundwater quality and on the transport of aqueous species in the subsurface. This characterization was not intended to provide detailed information on the hydrogeology and groundwater flow regime throughout the minesite.

6.2 Investigations/Sampling

6.2.1 Borehole Drilling

During the period of July 26th to July 31st, 2000, a total of six boreholes were drilled. A J.T. Thomas diamond drill rig with HQ size diamond bit and rods was used. Borehole MW00-01 was drilled into the Northwest tailing impoundment. MW00-02 was drilled immediately south of Dam 21B, east of a tank farm. MW00-3A and MW00-3B were drilled along the east side of Vee Lake Road, between Dam 22A and Trapper Lake. Finally, MW-4A and MW00-4B were drilled to the southeast of Dam 3C, just below Dam 3. The locations of the six boreholes (well locations) are presented on Figure 9. With the exception of borehole MW00-01, which was drilled entirely into unconsolidated material, HW size casing was set into sound bedrock at each borehole. At MW00-01, a 1.5-m length of HW size casing was left in the hole, about 0.4 m of which protrudes above the ground surface. Following completion, each borehole was flushed with clean water for at least 30 minutes or until clean water return was achieved. Following piezometer installation, HW steel casings were topped with bright yellow steel caps. Consequently, HW size steel casings act as protective casings for the monitoring wells. Well completion schematics are presented in Appendix IV and include GPS coordinates for each borehole.

6.2.2 Piezometer Installation

Piezometers were installed within each borehole drilled. Each piezometer consisted of a blank PVC pipe string with a screened section at its base. The blank pipe used was schedule 80, 1.25 inch ID, PVC pipe. The screened sections were schedule 80, 1.25 inch ID, #10 slot size PVC pipe. The annular space around the screened portion of the piezometer was backfilled with 10-20 size silica sand, up to a height of about 1 to 2 m above the top of the screen. Upon completion of the sand pack, a bentonite grout seal was set on top of the sand. Both the sand and bentonite grout were conveyed to the desired depth through the use of a 1.0-inch, schedule 80 tremie pipe. Exceptions to the above procedure include installation at MW00-01 and MW00-4B. Because MW00-01 was drilled through tailing, it was impractical to construct a sand pack around its screen. Consequently, tailing was allowed to collapse around the screen and a grout seal was subsequently put in place. In order to prevent fine-grained material from entering the screen at MW00-01, a geotextile membrane was attached to the outside of the screened interval. At MW00-4B, a grout seal was not installed since this piezometer was aimed at providing information on water table elevation.

6.2.3 Groundwater Sampling

The monitoring wells were developed and purged using a Waterra™ pump and sampled using a peristaltic pump, with the exception of well MW00-02, which was purged and sampled using a Waterra™ pump because the depth to water was beyond the reach of a peristaltic pump. During development, the wellhead chemistry, including pH, electrical conductivity, and temperature was measured at regular intervals. Once the wellhead chemistry had stabilized over several consecutive readings, and at least six standing volumes of water had been removed from the well, it was considered developed.

After well development, unfiltered samples were collected for measurement of field parameters (pH, redox potential (Eh), electrical conductivity, and temperature) by passing groundwater directly into a flow-through cell from which readings were taken. At MW00-02, where groundwater could not be pumped directly into a flow-through cell, the groundwater was collected into a clean bucket and then fed by a peristaltic pump into the flow-through cell. The flow-through cell and/or the collection container were rinsed at least three times with sample water before collecting the sample for measurement and three times with de-ionized water after sampling.

When taking measurements for pH and Eh, the flow rate was kept low (i.e., < 10 mL/min) to prevent streaming-potential errors. The flow-through cell was then disconnected and a volume of 25 mL of unfiltered water was collected directly into the sample cup provided in the CHEMet® Dissolved Oxygen Test Kit using ampoules for colourimetric determination dissolved oxygen (DO). Field alkalinity was measured on filtered water. Following the measurements of the field parameters, water samples were collected for laboratory analyses. Groundwater samples were collected from all wells except MW00-4B, which remained dry after purging. The peristaltic pump was used to fill the sample bottles directly from the well, with the exception of well MW00-02.

Sample containers were rinsed at least three times with the sample water before filling the container. The exceptions were water samples collected in pre-preserved containers, which were not rinsed before filling. Sample bottles were filled completely, and the cap was placed on snugly. For pre-preserved bottles, care was taken not to overfill the bottles. Details of the sampling of each well are presented on the water sampling sheets in Appendix V. Samples analyzed for dissolved constituents were field-filtred and preserved, whereas samples analyzed for total constituents were not filtred but preserved only. Following collection, samples for chemical analysis were immediately placed in a cooler at the sampling site and kept cool (2ºC to 4ºC) and dark.

An in-line filtre was connected to the sample collection tubing of the peristaltic pump. Approximately 1 L of sample fluid was pumped through the filtre prior to sampling. The filtre and tubing were disposed of after use.

Samples were shipped by air to the laboratory to meet the recommended holding times. Samples were kept cool at 2ºC to 4ºC during shipment, using ice packs. The coolers were sealed with tape in such a way that it was necessary to break the seal to open the cooler. The sampler's initials were written on the seal in such a way that seal removal destroyed the signature. Analytical request forms (Chains-of-Custody) accompanied all samples submitted for analysis.

To prevent cross-contamination between samples, the equipment was decontaminated by rinsing with de-ionized water. Sampling and pump tubing were always replaced after each sample was taken. Silicon tubing and filtres were disposed of after each use.

Quality assurance and quality control (QA/QC) was provided through the collection and analysis of one duplicate sample and the calculation of charge balances for all analyses.

6.3 Analytical

The groundwater samples were analyzed by Enviro-Test Laboratories. Analytical parameters included alkalinity, conductivity, dissolved oxygen, hardness, pH, TDS, TSS, cyanide, dissolved and total metals, anions, nutrients, and oil and grease.

6.4 Results

Groundwater analytical results are presented in Appendix VI, along with the analytical request forms. Groundwater chemistry is summarized in Table 12 and 13. The geochemical analysis code AquaChem™ (WHI-version 3.7) was used to characterize and compare the water chemistry of all groundwater and surface water samples. Water types determined for each sample are presented in Table 14.

The tailing pore water in the Northwest impoundment (at MW00-01) is characterized by elevated sulphate, chloride, and total dissolved solids (TDS) and low dissolved oxygen levels (less than 0.5 mg/L). It is of the sulphate-chloride type, with calcium and sodium as the major cations. Arsenic concentration in the duplicate pair of MW00-01 is around 4.4 mg/L, with the arsenic present mostly as arsenate. The tailing pore water is also characterized by higher concentrations of trace metals (1.8 mg/L antimony, 0.5 mg/L boron, and 0.011 mg/L nickel) than groundwater samples obtained outside the impoundment. This water type is typical of tailing pond water, although with a lower arsenic concentration, as discussed in Section 7.0.

Groundwater in wells located near the Northwest (MW00-02 and MW00-03A, B) and North (MW00-04A) impoundments has a signature typical of tailing water mixed with surface water. These samples are characterized by slightly lower TDS and chloride levels than tailing pore water or pond water, but similar sulphate concentrations. Alkalinity and dissolved oxygen levels are higher in these wells, typical of mixing with surface water. Dissolved arsenic concentrations are lower in these wells, ranging from 0.04 to 0.28 mg/L, generally as arsenate, except for well MW00-02 where most of the arsenic is present as arsenite. The following dissolved metal concentrations were also recorded: antimony (0.0056 to 0.124 mg/L), copper (0.002 to 0.015 mg/L), manganese (0.118 to 0.494 mg/L), nickel (0.004 to 0.007 mg/L), and zinc (0.003 to 0.011 mg/L). Dissolved cadmium, chromium, and lead were below detection limit at all wells.

6.4.1 Quality Assurance/Quality Control

QA/QC results of all water analyses are presented in Table 15. The duplicate pair of sample MW00-01 returned RPDs of less than 20% for most elements of concern. Some analyses returned RPD values over 20%: nitrate (22%) and dissolved aluminum and mercury (67% and 150%, respectively), as well as total aluminum, iron, titanium, and vanadium (55%, 21%, 32%, and 22%, respectively). Dissolved speciated arsenic values had RPDs less than 20%, whereas total and dissolved arsenic concentrations had RPD values of less than 1%. The groundwater analyses for the parameters of concern are considered sufficiently precise to assist in decision-making.

6.5 Discussion

The effects of mining wastes on groundwater quality are discussed along with surface water in Section 7.5 of this report.

7.0 SURFACE WATER

7.1 Objectives

The objectives of the surface water investigation were to assess the water quality in surficial water throughout the property and to verify the effects, if any, of mine wastes and mining activities on surface water quality. Water quality was evaluated for tailing supernatant water, seeps, and ponds throughout the Giant Mine property, as well as in Baker and Trapper Creeks. The Baker Creek investigation had the additional objective of providing information to identify options for rehabilitation based on current mine activities and plans for eventual closure of the mine.

7.2 Investigations/Sampling

On September 19th, 20th, 21st, and October 16th, 2000, a total of 32 surface water samples were collected throughout the Giant Minesite. Of these 32 samples, four were duplicates, three were inter-laboratory duplicates, and one was collected as a field blank. Sampling locations are listed in the table below. All samples collected were analyzed.

Location		Number of Samples Collected and Analyzed
Baker Creek	Upstream and Downstream of Effluent Discharge	5
Trapper Creek	South of ICG Tank Farm	1
Effluent Discharge	West of B3 Pit before entering Baker Creek	1
Tailing Impoundment Supernatant	South, Central, North, and Northwest Ponds	3
Seeps	Dam 3, 3C, 7, 9, 11, 21B, 22B	18
Open Pits	Ponds in Open Pit B2 and C1	3
Gar Lake	Pond Downstream of Gar Lake	1

Whenever a seep was present, the water sample was collected from the upstream side of the impoundment. Supernatant water from the Northwest impoundment was collected at the north end of the pond, opposite the tailing outfall pipe. At each sampling location, a description of the sample site was made and GPS coordinates recorded. Sample locations were also marked on a field map and are shown on Figure 10.

Whenever possible, surface water samples were collected from at least 2.5 cm below the surface and care was taken not to disturb the underlying substrate. Sample bottles and equipment were rinsed three times with sample water before sampling each site. Preservatives were added to the bottles as required. All surface water samples collected were kept cool and shipped to the laboratory for analysis, with the Chain-of-Custody forms attached to each shipment.

7.3 Analytical

At the time of sampling, field physical parameters were recorded for all samples collected. These parameters included pH, electrical conductivity, redox potential, temperature, and dissolved oxygen. The surface water samples were analyzed by Enviro-Test Laboratories. Analyses performed include alkalinity, conductivity, dissolved oxygen, hardness, pH, TDS, TSS, dissolved and total metals, anions, and nutrients. Selected samples were also analyzed for arsenic speciation and total cyanide.

7.4 Results

Analytical results of surface chemistry are presented in Appendix VI along with the analytical request forms. Surface water chemistry is summarized in Table 16. The geochemical analysis code AquaChem™ (WHI-version 3.7) was used to characterize and compare the water chemistry of groundwater and surface water samples. Water types determined for each sample are presented in Table 14. A trilinear diagram (Piper plot) of water chemistry for all water samples was created using AquaChem, as shown in Figure 11. Piper plots are graphical representations of water quality, generated using the relative proportion of major cations (calcium, magnesium, potassium, and sodium) and anions (chloride, sulphate, bicarbonate) in a water sample. Results from each area investigated are discussed below.

7.4.1 Tailing Impoundment Area

The supernatant water collected by Golder from the North, South, and Northwest impoundments is characterized by elevated sulphate, chloride, and TDS. It is of the sulphate-chloride type, with calcium and sodium as the dominant cations, similar to the pore water in the Northwest pond. Arsenic concentrations in tailing pond supernatant range from 9.9 to 13.2 mg/L, which is higher than tailing pore water. Arsenic is mostly present as arsenate. These arsenic concentrations are similar to those obtained previously by others (INAC database, 2000). The tailing supernatant contains the highest concentration of trace metals of all surface and groundwater samples collected: antimony (1.3 to 2.6 mg/L), boron (0.43 to 0.65 mg/L), copper (0.016 to 0.044 mg/L), manganese (0.2 to 0.34 mg/L), nickel (0.05 to 0.1 mg/L), and zinc (0.009 to 0.026 mg/L). The water quality data from tailing supernatant corroborate water quality results obtained by others (INAC, 2000; SRK, 2001).

7.4.2 Water Ponds and Seepage from Impoundments

Surface water samples were collected at four sampling points downstream of Dam 11. These points are, with increasing distance from Dam 11 TLG-11, TLG-7A, TLG-7B, and TLG-7C. Samples were also obtained from surface water ponds east of the Central impoundment (TLG-9) and downstream of Dams 3 and 3C. In the Northwest impoundment area, water samples were collected downstream of Dams 22B and 21B. Sampling location TLG-22B is a seep that flows year-round, located upstream of the collection pond below Dam 22B. TLG-22CP is a wet area downstream of the collection pond located below Dam 22B.

Seep water from Dam 22 (TLG-22B and -22CP) is characterized by elevated chloride, sulphate, and TDS, similar to tailing water, but with higher alkalinity and a higher proportion of magnesium. This water represents a mixture of tailing water and surface (fresh) water infiltration. The higher proportion of chloride in these seeps compared to the seep at the south end of the Northwest impoundment, and around the old impoundment area, confirms the more direct hydraulic connection of these ponds with tailing water relative to other seeps. The geochemical data corroborate field observations of Dam 22B seepage flowing practically year-round.

Seeps and ponds located south of the Northwest impoundment, and around the old impoundment area, have a similar geochemical signature. They are generally characterized by low to moderate chloride concentrations, but with sulphate levels and TDS similar to those of tailing water. They are of the sulphate type, with calcium and magnesium being the dominant cations.

The concentrations of dissolved arsenic and trace metals of concern around the Northwest impoundment were of the same order of magnitude as those recorded around the old tailing area. Dissolved arsenic concentrations for all seeps and ponds ranged from 0.282 to 4.2 mg/L, with arsenic being mostly present as arsenate. Arsenic concentrations generally decreased with distance from the impoundment. Trace metal concentrations for parameters of concern ranged as follows: antimony (0.008 to 1.38 mg/L), copper (0.005 to 0.246 mg/L), nickel (0.005 to 0.039 mg/L), and zinc (0.002 to 0.1 mg/L). Chromium, mercury and lead were below detection limits in surface water samples. Similar to arsenic, a decrease in trace metal concentration could generally be observed with distance from the impoundments.

There is no evidence to indicate whether the arsenic and metal concentrations in pond water downstream of Dams 11 and 7 are a result of chemical interaction with historic tailing on which these ponds are located, or if they originate from migration of tailing water seeping through the dams. Similar order-of-magnitude concentrations of dissolved arsenic and trace metals were found in other areas downstream of impoundments in which underlying tailing deposits were absent. This suggests that chemical interaction with tailing may not be the dominant control on water quality in the historic tailing deposit area.

7.4.3 Open Pit Water

Water samples were collected from water ponded in open pits B2 and C1, both of which contain tailing material at their bases. Water in these open pits is characterized by low chloride, moderate alkalinity, and TDS and sulphate concentrations similar to those of tailing water. Calcium and magnesium are the dominant cations. B2 pit water is a sulphate-type water; C1 pit water is a sulphate-bicarbonate type.

Dissolved arsenic and trace metal concentrations are generally higher in water from B2 pit than C1 pit. Duplicate pair analysis of B2 pit water returned dissolved arsenic concentrations of 4.11 and 4.15 mg/L, mainly as arsenate, which is similar to that of tailing pore water. Other trace metal ranges were antimony (0.388 to 0.391 mg/L), copper (0.004 mg/L), nickel (0.076 to 0.078 mg/L), and zinc (0.014 to 0.018 mg/L). C12 pit water was characterized by a dissolved arsenic concentration of 0.171 mg/L, along with antimony (0.0586 mg/L), copper (0.005 mg/L), nickel (0.012 mg/L), and zinc (0.011 mg/L). Lead and chromium were below their respective detection limits in both open pit waters.

7.4.4 Trapper Lake and Trapper Creek

TLG-TL is located at the inflow of Dam 22B seepage into Trapper Lake and represents a mixture of mine seepage and lake water. Sample TLG-TC was collected in Trapper Creek, immediately south of the propane tank farm. These waters are generally more diluted than other minesite surface waters, with relatively low alkalinity and sulphate and chloride concentrations. They are of the sulphate-bicarbonate type, with calcium and magnesium as the dominant cations. Concentrations of dissolved arsenic and trace metals are also low compared to minesite waters. Dissolved arsenic at the inflow to Trapper Lake was 0.3 mg/L as compared to 0.08 mg/L downstream of Trapper Lake in Trapper Creek. The antimony concentration also showed a decrease between these two sampling locations, from 0.008 to 0.02 mg/L. Zinc at Trapper Creek was slightly higher than at the Trapper Lake inflow (0.009 and 0.006 mg/L, respectively). Copper (0.002 mg/L) and nickel (0.003 and < 0.002 mg/L) had similar concentrations at both sites, whereas chromium, lead, and mercury were below their detection limits.

7.4.5 Gar Lake Area

Sample TLG-GL was collected in a shallow pond south of Gar Lake. Similar to Trapper Lake water, it is characterized by diluted concentrations of arsenic and metals, and low TDS. The dominant anions are bicarbonate and sulphate, and the dominant cations are calcium and magnesium. It is of the bicarbonate-sulphate type. The dissolved arsenic concentration is also low at 0.2 mg/L, along with that of copper (0.002 mg/L), nickel (0.003 mg/L), and zinc (0.019 mg/L). Chromium and lead levels were below detection limits.

7.4.6 Effluent Discharge

The effluent discharge sample TLG-EFF was collected within 3 m of the effluent discharge pipe outlet on the east side of Ingraham Trail. This sampling location is comparable to Miramar Giant SNP station 43-1 outlined in the effluent discharge permit. Effluent water has similar characteristics to that of tailing water, albeit arsenic and antimony are lower since these are partially removed by the water treatment plant. It contains elevated sulphate and chloride, with calcium and sodium as the dominant cations. Samples collected on September 20th, 2000 returned a dissolved arsenic concentration of 0.48 mg/L. This concentration is higher than database records dating since 1995 from Royal Oak Mines, Miramar Giant, and INAC, which show arsenic levels fluctuating between 0.2 and 0.4 mg/L. Trace metal concentrations measured in September 2000 included antimony (0.721 mg/L), chromium (0.006 mg/L), copper (0.031 mg/L), nickel (0.118 mg/L), and zinc (0.021 mg/L). Lead and mercury were below their detection limits. Dissolved arsenic and trace metals were within the range of values obtained from pond and seep samples around the site, whereas the nickel concentration was approximately one order of magnitude higher.

7.4.7 Baker Creek

Three samples were collected from Baker Creek, one upstream from the mine effluent discharge and two downstream. The upstream sample (BC-US) can be correlated to the SNP water monitoring station 43-11, also located upstream of the effluent discharge, although at a different location than BC-US. The upstream sample collected on September 20th, 2000 is characterized by the lowest concentrations of arsenic and metals of all surface water samples collected. It is dominated by bicarbonate, calcium, and magnesium ions and is a bicarbonate-type water, typical of immature freshwater. Similarly, dissolved arsenic concentrations are low (0.014 mg/L), as well as antimony (0.0016 mg/L), and zinc (0.021 mg/L). Chromium, copper, lead, nickel, and mercury levels were below detection limits. Results obtained by Golder corroborate those of the Giant Mine database.

Sampling station BC-DS1 was located downstream of the effluent discharge point, between open pits B1 and B2, on the west side of Ingraham Trail. Sampling station BC-DS2 was located about 10 m upstream of Baker Creek inflow into Back Bay. Water from both sampling points downstream of effluent discharge is very similar to the discharge itself. Both DS1 and DS2 have similar sulphate and chloride levels as the effluent, with calcium and sodium as the dominant cations. The effluent discharge has a slightly greater proportion of magnesium than the downstream samples. Similar to effluent discharge, both downstream samples are of the sulphate-chloride type. Dissolved arsenic concentrations at both locations are between 0.32 mg/L and 0.35 mg/L, within the range of database values for effluent discharge, indicating that arsenic attenuation along Baker Creek was minimal at the time of sampling. Similar trace metal concentrations were also recorded at both downstream locations for antimony (0.67 mg/L at both locations), copper (0.021 and 0.026 mg/L), nickel (0.101 and 0.103 mg/L), and zinc (0.001 and 0.023 mg/L). Chromium levels were at or below its detection limit and lead was not detected.

7.4.8 Comparison with CCME Guidelines

Surface water quality for samples collected at or close to the Surveillance Network Program (SNP) monitoring stations were compared to the criteria specified in Giant Minewater Use and Waste Disposal Permit N1L2-0043. These samples included the effluent discharge (close to SNP43-1), Baker Creek upstream (SNP43-11), and Trapper Creek (SNP43-16). Other surface water samples were compared to CCME guidelines for freshwater aquatic life. Both sets of criteria apply to total parameter concentration rather than the dissolved fraction. The comparison is provided for qualitative assessment purposes only.

The total arsenic concentration in the grab sample of effluent discharge (0.55 mg/L) was slightly above the maximum allowable average concentration for arsenic (0.5 mg/L), but below that for a grab sample (1 mg/L). The water quality in Baker Creek upstream and Trapper Creek samples met all permit levels.

Samples downstream of the effluent discharge contained total aluminum, antimony, copper, nickel, and cyanide levels above CCME guidelines. Antimony was also above guidelines in the Baker Creek upstream sample, suggesting that background concentrations may be higher than the guideline level for this parameter. Total aluminum was above CCME guidelines in the field filtre blank sample and the Baker Creek upstream sample. Aluminum may have been introduced during filtring. This will need to be verified during future monitoring events.

The open pit water quality in pit C1 showed exceedances of CCME guidelines for aluminum, arsenic, and copper. B2 pit water showed additional exceedances of iron, nickel, and zinc.

Seep water quality exceeded CCME guidelines for freshwater aquatic life at all sampling points for aluminum, arsenic, and copper, and at the majority of monitored sites for total cyanide. Arsenic levels also exceeded maximum average and grab concentrations downstream of Dams 3, 3C, 7, 11, and 22B. Other sporadic CCME exceedances include total iron downstream of Dams 3, 3C, 9, 11, 21B, and 22B, and total zinc downstream of Dams 3C, 9, and 11.

7.4.9 Quality Assurance/Quality Control

A total of four field duplicate pairs were submitted as blind duplicates for analysis of the full suite of parameters, and three samples were submitted to a second laboratory (referred to as inter-laboratory duplicates) for the analysis of a selected suite of parameters. RPD calculations are presented in Table 15. The field duplicate pairs returned values with RPDs less than 20% for most dissolved parameters, with the exception of dissolved zinc, where the RPD ranged from 25% to 100% for each of the duplicate pairs. One of the four duplicate pairs showed an RPD greater than 20% for dissolved manganese, chromium, nitrate, and ammonia (on different sample pairs). Inter-laboratory duplicates also returned good RPD values, with only nitrate having RPDs > 20% in two pairs and cobalt in one pair.

Duplicate analyses of total metals more frequently resulted in RPD values above 20%. The table below lists the parameters and number of duplicate pairs for which RPD values exceeded 20% for total metals analyses.

Parameter	**Number of duplicate pairs where RPD > 20%**
cyanide	4 of 4
zinc, titanium, aluminum	3 of 4
copper	2 of 4
barium, manganese, phosphorus, nickel, sodium, vanadium	1 of 4

The above table indicates that duplicate total metal analyses and cyanide analyses were not as consistently precise as the dissolved metals. Disparities between cyanide analyses are likely related to the short preservation period and the distance of Giant Minesite to the laboratory. The analytical precision is considered adequate for the majority of parameters of concern for most duplicate pair analyses (arsenic, antimony, copper, nickel, lead).

7.5 Discussion

The following range of arsenic concentrations was recorded during the 2000 sampling season carried out by Golder:

Surface Water Samples	**Permit Level[1]/ *CCME guideline*[2] (mg/L)**	**Total As (mg/L)**	**Dissolved As (mg/L)**
Supernatant	-	9.0 - 12.3	9.9 – 13.2
Seeps and Ponds	**0.005**	**0.009 - 3.8**	**0.3 – 4.2**
Baker Creek Upstream	**0.005**	**0.01**	**0.01***
Effluent Discharge	**0.5** (average) **1.0** (grab)	**0.55**	0.48*
Baker Creek Downstream	**0.005**	**0.34 - 0.37**	**0.32 – 0.35**
Open Pit Water	**0.005**	**0.2 - 4.4**	**0.2 – 4.2**

[1] Total arsenic

[2] CCME guideline for aquatic life

* Only one data point in Golder 2000 database

The concentrations in the table are in general agreement with the results from the 1995 - 2000 Giant minewater quality database (INAC, Royal Oak Mines, and Miramar Giant). One exception is the effluent discharge, for which the historic concentrations are generally lower (0.2 to 0.4 mg/L) than the Golder value obtained in September 2000.

The trilinear plot presented on Figure 11 shows that the tailing pore water and tailing pond water plot in the same area, demonstrating the close relationship between the two waters. Some attenuation of arsenic appears to occur as pond water migrates downward to the base of the impoundment. The mechanisms of arsenic attenuation are not known at this time. Water obtained from ponds located downgradient of Dams 22 (Northwest impoundment), Dam 9 (Central impoundment), and Dam 7 (South impoundment) also plot in the area of tailing water, indicating that these waters likely originate principally from seeps through the dams, with further attenuation of arsenic along the flow path. Baker Creek water samples obtained downgradient of the effluent discharge point also plot in this grouping. Baker Creek water downstream of the discharge point consists of treated effluent discharge with little influence from upstream water chemistry (at the time of sampling, upstream flow in the creek was observed to be minimal). Freshet sampling of effluent and upstream/downstream water will help to verify if this relationship is maintained when upstream flows are larger.

Water from monitoring wells MW00-2, -3A, -3B, and -4A located downgradient from tailing impoundments shows an intermediate composition between that of tailing pond water and fresh water (i.e., Baker Creek upstream of effluent discharge). This grouping also includes the surface water samples obtained from the inflow of tailing water seepage into Trapper Lake, from Trapper Creek, and from a pond adjacent to Gar Lake. These waters have low levels of chloride and sulphate, but higher alkalinity than tailing water, likely indicative of impacts, to varying degrees, by mining activity.

Ponded water downstream of Dams 3 and 3C, as well as from open pits B2 and C1, is distinguished by its higher proportion of sulphate than the other samples, with sulphate concentrations similar to those present in tailing water and effluent discharge. In the case of B2 and C1 pit water, the mixed signature of surface water and elevated sulphate concentrations may be indicative of active sulphide oxidation (and subsequent neutralization) of wall rock, waste rock, and/or tailing present at the base of these pits.

8.0 BAKER CREEK SEDIMENT

8.1 Objectives

The objectives of the sediment investigation in Baker Creek were to verify the chemical characteristics of these sediments and to identify rehabilitation options for Baker Creek to be included in the closure plan.

8.2 Investigations/Sampling

Baker Creek sediment samples were collected on September 9th, 2000. Recognizing that fine sediment is sparsely present in Baker Creek, four sampling locations were selected from presumed areas of deposition within the creek (Figure 12). Sediment sampling locations coincided with water quality sampling locations in Baker Creek. In addition, sediment samples were collected in the marsh area behind the dyke in Yellowknife Bay and on the eastside of the dyke. A description of each sampling location is provided in Table 17. Two grab samples were collected from each of the six sampling locations for a total of 12 sediment samples. Each grab sample was analyzed individually. Sediments were put into glass jars that were labeled with an individual sample number. Chain-of-Custody forms were filled out with required analyses and sent with the sediment samples to Enviro-Test Laboratories for chemical analyses.

8.3 Analytical

All sediment samples were analyzed for the following parameters:

- Organic carbon (%);
- Inorganic carbon (%);
- Arsenic speciation:
    - Trivalent arsenic (As^{3+});
    - Pentavalent arsenic (As^{5+});
    - Water-soluble arsenic;
    - Total arsenic;
- Total metals (full suite); and
- Water-soluble metals (full suite).

Metals, specifically arsenic, are the principal elements of concern at the Giant Minesite, and consequently chemical analyses were focussed on these parameters. No hydrocarbons or other organic contaminants were anticipated to be present in high concentrations at the minesite and thus, these were not measured in sediment samples. Water-soluble metals were measured in selected sediment samples to determine availability/mobility of these metals under normal weathering conditions. Trivalent and pentavalent arsenic were measured to determine whether arsenic originated from an oxidized phase, such as oxidized sulphide tailing.

Total metal concentrations were measured following triple-acid digestion. Arsenic speciation analysis was carried out on all 12 sediment samples. The extraction method used for this determination is still under development by Enviro-Test Laboratories and therefore, the data presented on solid-phase arsenic species are considered qualitative. Water-soluble arsenic was determined using a 24-hour shake extraction, with de-ionized water at a liquid to solid ratio of 4:1.

Concentrations of metals in Baker Creek sediments were compared to CCME Interim Freshwater Sediment Quality Guidelines for the protection of aquatic life (CCME 1999). Concentrations were compared to the Interim Sediment Quality Guideline (ISQG) and the Probable Effects Level (PEL); above which adverse effects are predicted to frequently occur.

8.4 Results

Concentrations of metals measured in Baker Creek sediments are provided in Table 18. Raw data are provided in Appendix III. Arsenic concentrations exceeded the CCME interim freshwater sediment quality criteria at all sampling locations. Total arsenic concentrations ranged from 47 mg/kg in the marsh area of Yellowknife Bay, near the mouth of Baker Creek, to 5,030 mg/kg just upstream of the mouth of Baker Creek. In general, concentrations of arsenic were an order of magnitude higher at sampling locations downstream of the effluent discharge, but no trend in arsenic concentrations with distance from the effluent discharge was observed (Figure 13). Concentrations of arsenic in sediments collected from Baker Creek, upstream of the effluent discharge, also exceeded CCME criteria (171-205 mg/kg), but were lower than downstream sediments. Arsenic concentrations in sediment from the marsh area in Yellowknife Bay were lowest of all locations sampled.

In general, concentrations of water-soluble (leachable) arsenic were low compared to total arsenic concentrations, and ranged from 1.9 mg/kg in sediment collected from the east side of the dyke in Yellowknife Bay to 9.29 mg/kg in sediments collected just upstream of the mouth of Baker Creek (Table 19). An increase in water-soluble arsenic concentrations was observed from the effluent discharge sampling location downstream to the mouth of Baker Creek, but lower water-soluble arsenic concentrations were observed at the east side of the dyke in Yellowknife Bay (Figure 14). The percent water-soluble arsenic to total arsenic concentration was highly variable between sampling locations and ranged from 0.12 to 0.25% (Table 19). These proportions are similar to proportions found in tailing (Section 5.0), and higher than those measured in mine waste rock (Section 3.0). The concentration of water-soluble arsenic in Baker Creek sediments was lower than those reported by Mace (1998) (Table 19).

8.4.1 Other Metal Concentrations in Baker Creek Sediment

Concentrations of cadmium, chromium, copper, lead, nickel, and zinc exceeded CCME criteria at the effluent discharge point and at sampling locations further downstream. The exceptions were concentrations of these metals upstream of the effluent discharge, and concentrations of lead, nickel, and zinc in the marsh area in Yellowknife Bay, which were below CCME guidelines (Table 18). No trend was observed in concentrations of these metals with distance from the effluent discharge point (Figures 15-20). In general, water-soluble concentrations of most metals in selected sediments were below detection limits. Elevated concentrations of water-soluble metals were observed for zinc and ranged from 0.002 to 0.01% of total zinc concentrations.

8.4.2 Quality Assurance/Quality Control

Relative percent difference (RPD) values were calculated between samples to determine the degree of variability in sediments. RPD values were calculated for the two sediment samples collected at each of the six sampling locations, and for each metal that exceeded CCME guidelines. RPD values <50% were commonly observed at the upstream site, effluent discharge site and downstream near the mill shaft (DS1) (Table 20). RPD values for lead at the upstream point, organic carbon and pentavalent arsenic at the effluent discharge location, and pentavalent arsenic at the mill shaft (DS1) exceeded 50%. Just downstream of the mouth of Baker Creek most RPD values exceeded 50%, which included all RPDs for arsenic speciation, cadmium, and lead. Lower RPD values were calculated for chemical parameters in Yellowknife Bay near the marsh and east of the dyke. Consequently, RPD values show that sediments are heterogeneous as would be expected.

8.5 Discussion

8.5.1 Total Metal Concentrations

Elevated metal concentrations in Baker Creek sediments are indicative of anthropogenic sources. The elevated concentrations of arsenic in Baker Creek sediments downstream of the effluent discharge (with the exception of the marsh area in Yellowknife Bay) ranged from 1,940 mg/kg to 5,030 mg/kg. These concentrations fall within the range of arsenic concentrations measured in sediments at other impacted sites globally and within those reported in previous studies conducted in the Yellowknife area (Table 21). More specifically, arsenic concentrations in Baker Creek sediments fall within the range of arsenic concentrations reported by Mace at the Giant Mine (1998), and within those reported by Ollson (1999) at the nearby Con Mine.

These levels of arsenic concentrations measured in Baker Creek sediments have the potential to adversely affect aquatic life. Although information in the literature is limited, several studies have shown adverse effects on aquatic organisms from sediment arsenic concentrations ranging from approximately 40 mg/kg to approximately 700 mg/kg (CEPA, 1993). Effects within this range have included chronic toxicity in freshwater benthos at concentrations <100 mg/kg, and acute effects in bacteria at concentrations between 100 and 700 mg/kg.

Arsenic concentrations in sediments collected downstream of the effluent discharge point in Baker Creek were higher than arsenic concentrations in sediment collected upstream of the effluent discharge. This observation indicates a source, or sources, of anthropogenic arsenic. Concentrations of arsenic in Baker Creek sediment upstream of the effluent discharge also fall within the range of background concentrations reported in the literature (Table 21). However, arsenic concentrations in Baker Creek sediments measured in this study (171-205 mg/kg) were higher than background concentrations of arsenic reported by Ollson for the Yellowknife Bay area, and by Mace for a Northwest Territories creek. The slightly elevated concentrations of arsenic observed in Baker Creek sediments upstream of the effluent discharge may be reflective of the weathering of rocks naturally high in arsenic and from the dispersion of arsenic via air emissions from the stacks during mining operations. However, concentrations are not sufficiently high to suspect input from tailing or runoff from contaminated soil. Nevertheless, comparisons of arsenic concentrations in sediments upstream of the effluent discharge to concentrations in sediments downstream of the effluent discharge indicate an introduction of arsenic above natural background levels, and the possibility of adverse effects to the aquatic environment.

Concentrations of arsenic in sediments collected from the marsh area in Yellowknife Bay, near the mouth of Baker Creek, were lower than arsenic concentrations measured upstream of the effluent discharge in Baker Creek. Mace also reported lower arsenic concentrations in this area (*i.e.*, 278 mg/kg). Mace suggested that deposition of contaminated sediments from Baker Creek did not occur in this area, and that contaminated sediments were transported and distributed to areas further away from the mouth of Baker Creek. Alternatively, it may be that a significant amount of arsenic is removed from the sediments by the high density of macrophytes growing in this area (Mace 1998).

Concentrations of arsenic measured in sediments collected from the east side of the dyke are 75-fold higher than the CCME PEL for the protection of aquatic life. Mace also reported higher concentrations of arsenic in sediments in this area of Yellowknife Bay. It is likely that the source of arsenic contamination in this area is predominantly arsenic-contaminated soil from the adjacent land (***i.e.***, old town site), which was introduced into the bay via runoff rather than from Baker Creek. High concentrations of arsenic are reported in soil samples collected from the shoreline near the dyke.

8.5.2 Water-Soluble Arsenic Concentrations

Water-soluble arsenic and other metals concentrations were measured to determine the degree of mobility of arsenic present in Baker Creek sediments. This is important as sediments often can act as a source of contaminants long after the anthropogenic source has ceased. Concentrations of water-soluble arsenic measured in this study were low compared to concentrations of total arsenic in Baker Creek sediments. However, it is unclear whether these low concentrations of water-soluble arsenic can have an impact on aquatic life. Mace reported that most of the arsenic in Baker Creek sediments was a result of the effluent discharge and that it had co-precipitated with iron and manganese oxides. The author also states that the release of this bound arsenic may occur during anoxic conditions, which is unlikely due to the continuous water flows in Baker Creek. However, bulk transport of arsenic-bound sediment may occur (***e.g.***, strong freshet) resulting in the re-distribution of arsenic and the potential release of leachable arsenic in other areas of Baker Creek or Yellowknife Bay.

Concentrations of water-soluble arsenic concentrations reported in this study were lower than those previously reported by Mace (Table 19). However, comparison of leachable arsenic concentrations between the two studies does not necessary indicate a reduction in these concentrations between 1997 and 2000. Not only were sampling locations different, but analytical methods also differed. Mace extracted leachable arsenic using acetic acid in addition to water. Acetic acid removes organic-bound arsenic, resulting in more arsenic per quantity of leachate. Consequently, the amount of leachable arsenic determined by using acetic acid would be greater. The use of water in the extraction process, as applied in the current study, is thought to reflect natural weathering conditions and thus, the amount of leachable arsenic that would be present under natural conditions in Baker Creek.

In a further attempt to assess the mobility of arsenic, Mace and Ollson conducted studies to determine the flux of arsenic from the sediment into the water column in Yellowknife Bay, near the Giant Mine, and in the Meg-Keg-Peg Lake watershed, near the Con Mine, respectively. Based on pore water arsenic concentrations, Mace reported a high flux of arsenic from sediments into the water column of Yellowknife Bay, Back Bay, and in the vicinity of the Beach Tailing. Ollson also reported arsenic mobility from the sediment into the water column of the Meg-Keg-Peg Lake watershed, which was primarily attributed to the remobilization of arsenic from historically contaminated sediment, rather than to current mining practices. Ollson also observed that arsenic remobilization was lower in areas of less contamination. Arsenic flux studies conducted by Mace and Ollson may not be directly applicable to conditions in Baker Creek due to differences in the physical/chemical environment in the sediments, and to differences in arsenic speciation from various inputs (*e.g.*, tailing, runoff, atmospheric deposition). However, the possibility of remobilization and flux from the sediments into the water column of Baker Creek, and subsequent potential adverse effects to aquatic life, should not be disregarded, and requires further investigation.

8.6 Discussion

The high concentrations of arsenic and other metals in Baker Creek sediments are the result of inputs from mine operations that may have included a combination of arsenic trioxide dust from air emissions, runoff from contaminated soil, tailing, and effluent discharge. Although these sources of contamination will be minimized or eliminated following mine closure, Baker Creek sediments may continue to be a source of metal contamination to the surrounding aquatic environment for an extended period following closure. Concentrations of arsenic measured in this study in Baker Creek sediments and Yellowknife Bay exceed CCME interim sediment quality guidelines for the protection of aquatic life. There is insufficient information in the following areas to confidently predict the potential risk to aquatic life due to post-closure arsenic concentrations in sediments in Baker Creek:

- the flux of arsenic from the sediments into the water column;
- the hydrological regime of Baker Creek under natural conditions (i.e., when effluent flows cease);
- the bulk transport of arsenic-bound sediment in Baker Creek; and
- information relating arsenic concentrations in sediments and their potential adverse effects to aquatic life.

8.7 Recommendations

Natural flow conditions of Baker Creek need to be estimated before a final closure plan can be developed. From historical records and field observations during the habitat mapping study (Supporting Document A4), natural flows in Baker Creek will be highest in spring, during the freshet, followed by a rapid decrease to low levels for the remainder of the year. The habitat provided by Baker Creek under natural conditions is most likely limited to spring spawning.

Given the anticipated drastic decrease in flows following mine closure, the potential for the flux of arsenic from the sediments into the water column and the bulk transport of arsenic-bound sediments in Baker Creek will decrease. The degree to which these events will decrease needs to be determined before recommendations for remediation (*e.g.*, dredging) can be considered.

Sediment and water toxicity testing (both chronic and acute) should be implemented to determine present and future risks to aquatic life in Baker Creek.

Once the hydrological and toxicity data have been obtained, a risk-based approach could be used to examine a variety of scenarios concerning closure, including:

- the risk to aquatic life in Baker Creek and Yellowknife Bay if sediments in Baker Creek are dredged;

- the risk to aquatic life in Baker Creek and Yellowknife Bay if sediments in Baker Creek are not dredged; and

- the risk to aquatic life in Baker Creek and Yellowknife Bay if sediments in Baker Creek are dredged and habitat improvements are made in Baker Creek to create or improve spawning habitat for spring spawning species (*e.g.*, northern pike, longnose suckers).

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TABLES

Table 1
Acid-Base Accounting Results for
Open Pit and Waste Rock
Miramar Giant Mine

CLIENT : GOLDER ASSOCIATES
PROJECT : MIRAMAR GIANT MINE YELLOWKNIFE
PROJECT # : 0033
TEST : MODIFIED SOBEK METHOD ACID-BASE ACCOUNTING

SAMPLE	ROCK TYPE	VISIBLE SULPHIDE	PASTE pH	S(T) %	S(SO4) %	AP	NP	NET NP	NP/AP	CARBONATE NP*
Open Pit A1										
OPA1-01-2100	schist	Yes	9.3	6.47	0.01	201.9	246.3	44.4	**1.2**	270.9
OPA1-05-2100	andesite	Yes	9.8	0.90	<0.01	28.1	70.3	42.2	**2.5**	55.8
OPA1-06-2100	schist	Not Observed	9.0	0.18	<0.01	5.6	149.1	143.4	26.5	147.5
OPA1-06-2100 RE	schist	Not Observed	8.9	0.18	<0.01	5.6	141.6	135.9	25.2	148.3
Open Pit A2										
OPA2-01-2100	schist	Not Observed	9.1	0.05	<0.01	1.6	143.1	141.6	91.6	145.8
OPA2-03-2100	schist	Yes	9.2	4.01	0.01	125.0	287.5	162.5	**2.3**	313.4
OPA2-04-2100	schist	Yes	9.1	0.64	<0.01	20.0	224.7	204.7	11.2	227.5
Open Pit B1										
OPB1-03-2200	andesite	Not Observed	9.0	0.41	<0.01	12.8	95.6	82.8	7.5	107.5
OPB1-04-2200	schist	Not Observed	9.0	0.66	<0.01	20.6	166.3	145.6	8.1	171.7
OPB1-04-A	schist	Not Observed	8.9	0.92	<0.01	28.8	272.5	243.8	9.5	301.7
OPB1-06-2200	schist	Yes	9.0	0.39	<0.01	12.2	77.5	65.3	6.4	91.7
Open Pit B2										
OPB2-03-2100	schist	Not Observed	9.1	0.18	<0.01	5.6	196.9	191.3	35.0	221.7
OPB2-05-2100	schist	Yes	9.0	0.32	<0.01	10.0	159.4	149.4	15.9	179.2
OPB2-06-2100	andesite	Not Observed	8.9	0.05	<0.01	1.6	153.1	151.6	98.0	150.8
Open Pit B3										
OPB3-02-2200	schist	-	8.9	0.01	<0.01	0.3	117.8	117.5	377.0	121.7
OPB3-02-2200 RE	schist	-	8.9	0.01	<0.01	0.3	117.5	117.2	376.0	120.8
OPB3-03-2200	schist	-	9.4	0.25	<0.01	7.8	202.5	194.7	25.9	241.7
Open Pit B4										
OPB4-01-2200	andesite	Not Observed	9.1	0.08	<0.01	2.5	176.3	173.8	70.5	167.5
OPB4-01-A	andesite	Not Observed	9.0	0.10	<0.01	3.1	131.9	128.8	42.2	125.8
OPB4-02-2200	andesite	-	9.0	0.13	<0.01	4.1	220.0	215.9	54.2	220.0
Brock Pit										
OPBR-01-2100	andesite	Not Observed	9.2	0.22	<0.01	6.9	118.1	111.3	17.2	111.7
OPBR-02-2100	andesite	Not Observed	9.3	<0.01	<0.01	0.0	92.5	92.5	-	83.3
Open Pit C1										
OPC1-01-2100	schist	Not Observed	9.1	1.52	<0.01	47.5	646.9	599.4	13.6	707.5
OPC1-03-2100	andesite	Not Observed	9.0	0.05	<0.01	1.6	191.3	189.7	122.4	186.7
OPC1-05-2100	schist	Not Observed	9.2	0.07	<0.01	2.2	152.2	150.0	69.6	150.0
Waste Rock Open Pit A2										
WR-OPA2-01-2300	andesite	Yes	9.2	0.99	<0.01	30.9	84.4	53.4	**2.7**	79.2
WR-OPA2-02-2300	andesite	Yes	9.4	0.16	<0.01	5.0	56.6	51.6	11.3	54.2
WR-OPA2-03-2300	andesite	-	9.1	0.17	<0.01	5.3	157.2	151.9	29.6	155.0
WR-OPA2-03-A	andesite	-	9.5	0.06	<0.01	1.9	30.0	28.1	16.0	25.0
WR-OPA2-04-2300	andesite	Yes	9.1	0.62	<0.01	19.4	168.4	149.1	8.7	165.8
Waste Rock Open Pit B1										
WR-OPB1-01-2300	schist/andesite	-	9.0	1.94	<0.01	60.6	223.8	163.1	3.7	237.5
WR-OPB1-02-2300	schist/andesite	-	8.8	0.56	<0.01	17.5	211.3	193.8	12.1	220.0
WR-OPB1-03-2300	schist/andesite	-	8.8	0.32	<0.01	10.0	181.3	171.3	18.1	191.7
Waste Rock Open Pit B3										
WR-OPB3-01-2300	-	-	8.8	1.13	<0.01	35.3	195.6	160.3	5.5	200.8
WR-OPB3-02-2300	-	-	9.1	1.02	<0.01	31.9	175.0	143.1	5.5	192.5
Waste Rock Open Pit B4										
WR-OPB4-01-2200	-	-	9.0	0.24	<0.01	7.5	131.9	124.4	17.6	137.5
WR-OPB4-02-2200	-	-	9.0	0.21	<0.01	6.6	130.3	123.8	19.9	138.3
Waste Rock Brock Pit										
WR-OPBR-01-2300	andesite	Yes	9.4	0.09	<0.01	2.8	40.3	37.4	14.3	33.3
WR-OPBR-02-2300	andesite	Yes	9.1	0.56	<0.01	17.5	150.6	133.1	8.6	156.7
Waste Rock Open Pit C1										
WR-OPC1-01-2300	andesite	-	9.3	0.58	<0.01	18.1	42.0	23.9	**2.3**	33.3
WR-OPC1-01-2300 RE	andesite	-	9.2	0.58	<0.01	18.1	43.5	25.4	**2.4**	34.2
WR-OPC1-01-A	andesite	-	9.1	0.10	<0.01	3.1	65.3	62.1	20.9	56.7
WR-OPC1-02-2300	andesite	-	9.3	0.68	<0.01	21.3	45.8	24.5	**2.2**	40.0
Waste Rock Pile										
WR1-01-2300	andesite	Yes	9.2	0.22	<0.01	6.9	75.3	68.4	11.0	66.7
WR1-02-2300	andesite	Yes	9.1	0.10	<0.01	3.1	50.3	47.1	16.1	42.5
WR2-01-2300	andesite	Yes	9.2	0.11	<0.01	3.4	71.1	67.7	20.7	74.2
WR2-03-2300	-	-	9.3	0.13	<0.01	4.1	30.9	26.8	7.6	48.3
WR3-01-2300	andesite	Yes	9.3	0.05	<0.01	1.6	60.8	59.2	38.9	53.3
WR3-02-2300	andesite	Yes	9.2	0.11	<0.01	3.4	39.0	35.6	11.3	32.5

AP = ACID POTENTIAL IN TONNES CaCO3 EQUIVALENT PER 1000 TONNES OF MATERIAL.
NP = NEUTRALIZATION POTENTIAL IN TONNES CaCO3 EQUIVALENT PER 1000 TONNES OF MATERIAL.
NET NP = NET NEUTRALIZATION POTENTIAL = TONNES CaCO3 EQUIVALENT PER 1000 TONNES OF MATERIAL.
NOTE: WHEN S(T) AND/OR S(SO4) IS REPORTED AS <0.01, IT IS ASSUMED TO BE ZERO FOR THE AP CALCULATION.
* CARBONATE NP CALCULATED FROM TOTAL INORGANIC CARBON (TIC) ASSAY.
RE = REPLICATE.

Table 2
Rock Chemical Analysis
Miramar Giant Mine

	ROCK TYPE	VISIBLE	Ag	Al	As	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe	K	Mg	Mn	Mo	Na	Ni	P	Pb	Sb	Sr	Ti	V	W	Zn
SAMPLE ID		**SULPHIDE**	ppm	%	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%	%	%	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm
Open Pit A1																												
OPA1-01-2100	schist	Yes	3	5.73	40200	170	<0.5	<5	5.06	>100	40	138	134	9.11	2.59	2.82	1320	<2	0.36	80	470	22	49	55	0.04	237	<10	48
OPA1-05-2100	andesite	Yes	<1	4.59	179	20	<0.5	<5	3.42	4	54	118	6	10.95	0.15	2.65	2670	<2	1.48	41	1480	<2	8	32	0.89	224	<10	108
OPA1-06-2100	schist	Not Observed	<1	6.71	94	170	<0.5	<5	2.83	3	41	94	203	9.11	0.99	4.68	970	2	0.51	73	530	4	6	27	0.05	281	<10	120
Open Pit A2																												
OPA2-01-2100	schist	Not Observed	<1	6.80	133	150	<0.5	<5	2.73	4	42	252	97	7.71	0.90	5.59	600	<2	0.57	117	320	<2	8	21	0.05	208	<10	120
OPA2-03-2100	schist	Yes	<1	4.79	6330	180	<0.5	<5	5.66	>100	28	166	68	5.71	2.03	3.04	1260	4	0.58	56	240	32	8	55	0.03	160	<10	40
OPA2-04-2100	schist	Yes	<1	5.78	3610	120	<0.5	<5	4.22	98	29	76	59	7.36	0.85	5.06	735	<2	0.64	52	370	4	5	38	0.05	209	<10	108
Open Pit B1																												
OPB1-03-2200	andesite	Not Observed	<1	6.61	322	40	<0.5	<5	4.69	9	50	95	165	9.76	0.28	3.90	1330	<2	1.08	79	450	2	13	108	0.57	323	<10	110
OPB1-04-2200	schist	Not Observed	1	6.42	404	70	<0.5	<5	3.93	12	33	94	123	9.48	0.71	4.72	1100	<2	0.50	77	530	10	23	46	0.20	277	<10	156
OPB1-04-A	schist	Not Observed	1	5.90	461	110	<0.5	<5	5.79	13	36	147	99	8.65	1.08	5.33	1335	<2	0.44	74	340	8	29	38	0.03	227	<10	146
OPB1-06-2200	schist	Yes	1	6.70	102	140	0.5	<5	1.82	3	32	194	77	7.37	1.07	4.03	615	<2	0.46	87	300	4	17	30	0.03	224	<10	126
Open Pit B2																												
OPB2-03-2100	schist	Not Observed	<1	6.97	80	80	<0.5	<5	4.23	3	38	262	124	8.93	0.92	4.91	1220	<2	0.86	93	420	4	42	71	0.04	243	<10	98
OPB2-05-2100	schist	Yes	<1	6.92	69	110	0.5	<5	3.43	2	33	198	70	9.16	1.09	4.35	1385	<2	0.64	89	430	6	6	42	0.03	292	<10	104
OPB2-06-2100	andesite	Not Observed	<1	6.47	15	50	<0.5	<5	6.38	1	39	204	13	8.57	0.24	4.07	1610	<2	1.37	95	420	<2	9	68	0.48	249	<10	102
Open Pit B3																												
OPB3-02-2200	schist	-	<1	5.89	76	50	<0.5	<5	2.23	2	34	189	18	7.99	0.27	7.19	950	<2	0.56	100	320	8	6	39	0.02	214	<10	86
OPB3-03-2200	schist	-	<1	6.33	119	160	0.5	<5	4.53	3	34	73	70	7.14	1.83	3.45	1105	<2	0.53	49	340	4	22	60	0.04	196	<10	96
Open Pit B4																												
OPB4-01-2200	andesite	Not Observed	<1	6.55	47	60	<0.5	<5	6.98	1	37	102	111	8.21	0.32	3.16	1400	<2	1.84	61	400	<2	8	181	0.43	223	<10	86
OPB4-01-A	andesite	Not Observed	<1	6.81	43	50	<0.5	<5	5.39	2	47	91	126	9.52	0.23	3.70	1405	<2	1.83	74	480	<2	8	135	0.56	270	<10	96
OPB4-02-2200	andesite	-	<1	5.05	40	100	<0.5	<5	7.96	2	27	61	174	6.48	0.44	2.27	1245	<2	1.31	43	450	<2	14	126	0.06	207	<10	54
Brock Pit																												
OPBR-01-2100	andesite	Not Observed	<1	6.99	53	50	<0.5	<5	4.53	1	39	192	21	7.06	0.27	3.27	800	<2	2.71	80	570	<2	10	103	0.36	212	<10	68
OPBR-02-2100	andesite	Not Observed	<1	6.69	16	80	<0.5	<5	2.81	1	20	187	10	5.57	0.34	3.18	750	2	2.83	69	810	2	4	72	0.21	137	<10	64
Open Pit C1																												
OPC1-01-2100	schist	Not Observed	1	1.82	7700	60	<0.5	<5	12.50	>100	17	74	23	6.09	0.65	6.16	2620	2	0.33	39	120	14	12	68	0.02	82	<10	84
OPC1-03-2100	andesite	Not Observed	<1	5.38	71	50	<0.5	<5	6.72	2	37	88	105	8.18	0.31	3.36	1265	2	1.00	55	340	4	4	66	0.28	193	<10	66
OPC1-05-2100	schist	Not Observed	<1	6.30	40	50	<0.5	<5	5.91	1	45	52	100	7.64	0.27	3.56	1195	<2	1.84	53	360	<2	7	77	0.45	223	<10	80
Waste Rock Open Pit A2																												
WR-OPA2-01-2300	andesite	Yes	<1	5.98	1370	90	<0.5	<5	5.67	35	46	343	62	9.33	0.51	4.71	1985	<2	1.48	106	330	16	16	62	0.30	224	<10	110
WR-OPA2-02-2300	andesite	Yes	<1	5.82	21	50	<0.5	<5	5.02	1	43	402	85	8.21	0.31	3.90	2115	<2	2.42	91	300	4	6	49	0.37	221	<10	78
WR-OPA2-03-2300	andesite	-	<1	5.93	41	110	<0.5	<5	5.77	1	38	190	245	7.45	0.55	3.96	1490	<2	1.39	69	390	<2	4	67	0.17	228	<10	88
WR-OPA2-03-A	andesite	-	<1	5.71	24	70	<0.5	<5	4.48	1	41	404	54	8.27	0.46	4.05	2185	<2	1.76	75	410	<2	8	60	0.39	198	<10	78
WR-OPA2-04-2300	andesite	Yes	1	5.07	2930	100	<0.5	<5	5.82	74	37	204	73	8.38	0.56	4.70	1995	<2	1.40	55	510	8	6	69	0.50	215	<10	108
Waste Rock Open Pit B1																												
WR-OPB1-01-2300	schist/andesite	-	2	5.66	8960	180	<0.5	<5	5.89	>100	34	161	136	6.80	1.39	3.60	1015	<2	0.94	69	360	82	32	77	0.13	179	<10	234
WR-OPB1-02-2300	schist/andesite	-	3	6.35	1880	130	<0.5	<5	3.98	50	37	197	170	7.40	1.48	4.52	1260	2	0.51	89	370	46	35	38	0.03	227	<10	238
WR-OPB1-03-2300	schist/andesite	-	<1	5.79	89	90	<0.5	<5	4.29	2	35	239	216	6.91	2.07	4.34	1250	4	0.83	78	330	4	12	33	0.04	206	<10	106
Waste Rock Open Pit B3																												
WR-OPB3-01-2300	-	-	<1	6.39	3980	150	<0.5	<5	6.84	>100	28	105	151	7.27	1.32	2.69	1045	<2	0.93	54	560	14	20	108	0.09	199	<10	112
WR-OPB3-02-2300	-	-	2	6.89	1110	150	<0.5	<5	4.61	31	38	144	184	7.39	1.61	3.45	1105	<2	1.12	80	440	40	74	75	0.16	220	<10	118
Waste Rock Open Pit B4																												
WR-OPB4-01-2200	-	-	1	6.45	80	80	<0.5	<5	3.92	3	38	141	128	8.77	0.61	3.95	1325	<2	1.37	75	430	32	18	77	0.24	257	<10	98
WR-OPB4-02-2200	-	-	<1	6.91	42	120	<0.5	<5	5.03	1	44	108	98	8.78	1.02	3.47	1285	<2	0.99	80	470	16	9	95	0.23	271	<10	92
Waste Rock Brock Pit																												
WR-OPBR-01-2300	andesite	Yes	<1	6.88	31	40	<0.5	<5	5.44	1	48	216	87	8.13	0.12	4.42	1265	<2	2.06	117	400	<2	9	81	0.57	239	<10	88
WR-OPBR-02-2300	andesite	Yes	1	6.10	2360	60	<0.5	<5	6.87	61	34	211	92	6.53	0.48	3.39	1250	<2	1.67	78	510	10	19	153	0.42	172	<10	66
Waste Rock Open Pit C1																												
WR-OPC1-01-2300	andesite	-	<1	6.06	2310	130	<0.5	<5	5.17	59	46	438	91	10.22	0.81	4.19	2405	<2	1.12	80	450	2	13	101	0.52	248	<10	102
WR-OPC1-01-A	andesite	-	<1	6.36	46	70	<0.5	<5	5.35	2	42	494	107	8.54	0.37	5.30	2090	<2	1.63	115	310	38	9	93	0.37	217	<10	162
WR-OPC1-02-2300	andesite	-	<1	6.19	73	90	<0.5	<5	4.94	2	45	385	276	9.46	0.62	4.46	2070	<2	1.43	95	300	4	6	56	0.31	224	<10	112
Waste Rock Pile																												
WR1-01-2300	andesite	Yes	<1	6.79	271	40	<0.5	<5	7.75	8	42	253	251	8.30	0.27	3.75	1250	<2	1.14	102	410	<2	8	205	0.68	285	<10	70
WR1-02-2300	andesite	Yes	<1	7.15	21	40	<0.5	<5	4.73	<1	50	207	173	8.80	0.16	5.51	1235	<2	1.36	114	400	<2	12	93	0.61	266	<10	90
WR2-01-2300	andesite	Yes	<1	7.06	39	50	<0.5	<5	5.29	1	38	173	117	6.60	0.28	3.84	990	<2	2.02	100	290	<2	9	105	0.36	196	<10	68
WR2-03-2300	-	-	<1	6.93	11	100	<0.5	<5	5.35	1	48	159	150	8.05	0.34	4.14	1150	<2	1.89	100	330	<2	9	106	0.53	244	<10	74
WR3-01-2300	andesite	Yes	<1	7.07	33	90	<0.5	<5	6.10	1	46	174	94	7.56	0.26	4.10	1210	<2	1.67	107	360	8	9	100	0.47	222	<10	92
WR3-02-2300	andesite	Yes	<1	6.96	14	50	<0.5	<5	5.89	1	46	168	83	7.99	0.28	4.19	1180	<2	1.65	100	380	<2	11	130	0.56	245	<10	74

Table 3
Rock Leachate Extraction Chemical Analysis
Miramar Giant Mine

LEACHATE ANALYSIS BY ICP

SAMPLE ID	Rock Type	Visible Sulphide	D.I. Water Volume (ml)	Sample Weight (g)	pH	Cond. (uS/cm)	Alkalinity (mg CaCO3/L)	Acidity (pH 4.5)	Acidity (pH 8.3)	SO4 mg/L	Ag mg/L	Al mg/L	As mg/L	B mg/L	Ba mg/L	Be mg/L	Bi mg/L	Ca mg/L	Cd mg/L	Co mg/L	Cr mg/L	Cu mg/L	Fe mg/L
CCME Guidelines for Surface Water										**-**	**-**	**-**	**0.025**	**5**	**1**	**-**	**-**	**-**	**0.005**	**-**	**0.05**	**1**	**0.3**
Permit Maximum Average Concentration										**-**	**-**	**-**	**0.50**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**0.30**	**-**
Permit Maximum Concentration of any Grab Sample										**-**	**-**	**-**	**1.00**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**0.60**	**-**
Open Pit A1																							
OPA1-01-2100	schist	Yes	400	200	7.97	104	40.0	0.0	1.3	13	<0.01	<0.2	**0.19**	<0.1	<0.01	<0.005	<0.1	13.8	<0.01	<0.01	<0.01	<0.01	<0.03
Open Pit A2																							
OPA2-01-2100	schist	Not Observed	400	200	7.93	118	42.0	0.0	1.0	17	<0.01	<0.2	**0.19**	<0.1	<0.01	<0.005	<0.1	15.9	<0.01	<0.01	<0.01	<0.01	<0.03
OPA2-03-2100	schist	Yes	400	200	7.95	231	44.0	0.0	1.3	79	<0.01	<0.2	**0.05**	<0.1	<0.01	<0.005	<0.1	33.1	<0.01	<0.01	<0.01	<0.01	<0.03
Open Pit B1																							
OPB1-03-2200	andesite	Not Observed	400	200	8.10	129	66.0	0.0	2.0	5	<0.01	<0.2	0.02	<0.1	<0.01	<0.005	<0.1	23.3	<0.01	<0.01	<0.01	<0.01	<0.03
OPB1-06-2200	schist	Yes	400	200	7.92	98	37.5	0.0	2.5	10	<0.01	<0.2	**0.09**	<0.1	<0.01	<0.005	<0.1	13.4	<0.01	<0.01	<0.01	<0.01	<0.03
Open Pit B2																							
OPB2-05-2100	schist	Yes	400	200	7.99	132	44.0	0.0	1.0	28	<0.01	<0.2	**0.04**	<0.1	<0.01	<0.005	<0.1	18	<0.01	<0.01	<0.01	<0.01	<0.03
Open Pit B3																							
OPB3-03-2200	schist	-	400	200	8.05	108	57.0	0.0	3.5	5	<0.01	<0.2	**0.03**	<0.1	<0.01	<0.005	<0.1	15.5	<0.01	<0.01	<0.01	<0.01	<0.03
Open Pit B4																							
OPB4-01-2200	andesite	Not Observed	400	200	8.11	148	64.5	0.0	1.5	19	<0.01	<0.2	0.004	<0.1	<0.01	<0.005	<0.1	31.4	<0.01	<0.01	<0.01	<0.01	<0.03
OPB4-01-A	andesite	Not Observed	400	200	8.14	139	65.0	0.0	1.5	13	<0.01	<0.2	0.003	<0.1	<0.01	<0.005	<0.1	29.1	<0.01	<0.01	<0.01	<0.01	<0.03
Brock Pit																							
OPBR-02-2100	andesite	Not Observed	400	200	8.17	115	63.0	0.0	1.0	5	<0.01	<0.2	0.01	<0.1	<0.01	<0.005	<0.1	23	<0.01	<0.01	<0.01	0.01	<0.03
Open Pit C1																							
OPC1-01-2100	schist	Not Observed	400	200	8.18	259	67.0	0.0	1.0	82	<0.01	<0.2	**0.06**	<0.1	<0.01	<0.005	<0.1	44.7	<0.01	<0.01	<0.01	<0.01	<0.03
OPC1-05-2100	schist	Not Observed	400	200	8.20	130	63.0	0.0	1.0	9	<0.01	<0.2	0.01	<0.1	<0.01	<0.005	<0.1	25.3	<0.01	<0.01	<0.01	<0.01	<0.03
Waste Rock Open Pit A2																							
WR-OPA2-04-2300	andesite	Yes	400	200	8.01	126	67.5	0.0	1.8	7	<0.01	<0.2	**0.07**	<0.1	<0.01	<0.005	<0.1	19.4	<0.01	<0.01	<0.01	<0.01	<0.03
Waste Rock Open Pit B1																							
WR-OPB1-01-2300	schist/andesite	-	400	200	8.24	149	66.5	0.0	1.0	10	<0.01	<0.2	**0.11**	<0.1	<0.01	<0.005	<0.1	24.5	<0.01	<0.01	<0.01	<0.01	<0.03
Waste Rock Open Pit B3																							
WR-OPB3-01-2300	-	-	400	200	8.03	288	58.5	0.0	3.0	67	<0.01	<0.2	**0.03**	<0.1	<0.01	<0.005	<0.1	40.1	<0.01	<0.01	<0.01	0.01	<0.03
Waste Rock Brock Pit																							
WR-OPBR-02-2300	andesite	Yes	400	200	8.07	141	70.5	0.0	3.5	7	<0.01	<0.2	**0.04**	<0.1	<0.01	<0.005	<0.1	22.7	<0.01	<0.01	<0.01	0.01	<0.03
Waste Rock Open Pit C1																							
WR-OPC1-01-2300	andesite	-	400	200	8.07	115	63.5	0.0	2.0	5	<0.01	<0.2	0.03	<0.1	<0.01	<0.005	<0.1	19.3	<0.01	<0.01	<0.01	<0.01	<0.03
WR-OPC1-02-2300	andesite	-	400	200	8.10	120	65.5	0.0	2.5	5	<0.01	<0.2	0.011	<0.1	<0.01	<0.005	<0.1	21.9	<0.01	<0.01	<0.01	<0.01	<0.03
Waste Rock Pile																							
WR1-01-2300	andesite	Yes	400	200	8.20	118	67.0	0.0	0.5	4	<0.01	<0.2	0.0077	<0.1	<0.01	<0.005	<0.1	21.4	<0.01	<0.01	<0.01	<0.01	<0.03
WR3-01-2300	andesite	Yes	400	200	8.16	126	61.0	0.0	1.0	4	<0.01	<0.2	0.016	<0.1	0.11	<0.005	<0.1	23.3	<0.01	<0.01	<0.01	<0.01	<0.03

Table 3
Rock Leachate Extraction Chemical Analysis
Miramar Giant Mine

LEACHATE ANALYSIS BY ICP

SAMPLE ID	Rock Type	K mg/L	Li mg/L	Mg mg/L	Mn mg/L	Mo mg/L	Na mg/L	Ni mg/L	P mg/L	Pb mg/L	Sb mg/L	Se mg/L	Si mg/L	Sn mg/L	Sr mg/L	Ti mg/L	Tl mg/L	V mg/L	Zn mg/L
CCME Guidelines for Surface Water		-	-	-	**0.05**	-	-	-	-	**0.01**	**0.006**	-	-	-	-	-	-	-	**5**
Permit Maximum Average Concentration		-	-	-	-	-	-	**0.50**	-	**0.20**	-	-	-	-	-	-	-	-	**0.20**
Permit Maximum Concentration of any Grab Sample		-	-	-	-	-	-	**1.00**	-	**0.40**	-	-	-	-	-	-	-	-	**0.40**
Open Pit A1																			
OPA1-01-2100	schist	2	<0.01	5.0	**0.055**	<0.03	<2	<0.05	<0.3	<0.05	<0.2	<0.2	0.38	<0.03	0.021	<0.01	<0.2	<0.03	<0.005
Open Pit A2																			
OPA2-01-2100	schist	<2	<0.01	5.9	0.007	<0.03	<2	<0.05	<0.3	<0.05	<0.2	<0.2	0.71	<0.03	0.039	<0.01	<0.2	<0.03	<0.005
OPA2-03-2100	schist	4	<0.01	11.6	**0.083**	<0.03	<2	<0.05	<0.3	<0.05	<0.2	<0.2	0.64	<0.03	0.047	<0.01	<0.2	<0.03	<0.005
Open Pit B1																			
OPB1-03-2200	andesite	<2	<0.01	3.2	0.012	<0.03	<2	<0.05	<0.3	<0.05	<0.2	<0.2	0.71	<0.03	0.080	<0.01	<0.2	<0.03	<0.005
OPB1-06-2200	schist	2	<0.01	4.6	0.016	<0.03	<2	<0.05	<0.3	<0.05	<0.2	<0.2	0.52	<0.03	0.023	<0.01	<0.2	<0.03	<0.005
Open Pit B2																			
OPB2-05-2100	schist	2	<0.01	6.7	0.025	<0.03	<2	<0.05	<0.3	<0.05	<0.2	<0.2	0.66	<0.03	0.026	<0.01	<0.2	<0.03	<0.005
Open Pit B3																			
OPB3-03-2200	schist	3	<0.01	5.2	0.032	<0.03	<2	<0.05	<0.3	<0.05	<0.2	<0.2	0.45	<0.03	0.032	<0.01	<0.2	<0.03	<0.005
Open Pit B4																			
OPB4-01-2200	andesite	<2	<0.01	1.6	0.027	<0.03	<2	<0.05	<0.3	<0.05	<0.2	<0.2	0.52	<0.03	0.053	<0.01	<0.2	<0.03	<0.005
OPB4-01-A	andesite	<2	<0.01	1.8	0.022	<0.03	<2	<0.05	<0.3	<0.05	<0.2	<0.2	0.64	<0.03	0.048	<0.01	<0.2	<0.03	<0.005
Brock Pit																			
OPBR-02-2100	andesite	<2	<0.01	2.3	0.016	<0.03	2	<0.05	<0.3	<0.05	<0.2	<0.2	0.80	<0.03	0.039	<0.01	<0.2	<0.03	<0.005
Open Pit C1																			
OPC1-01-2100	schist	<2	<0.01	10	0.036	<0.03	<2	<0.05	<0.3	<0.05	<0.2	<0.2	0.49	<0.03	0.06	<0.01	<0.2	<0.03	<0.005
OPC1-05-2100	schist	<2	<0.01	2.2	0.013	<0.03	<2	<0.05	<0.3	<0.05	<0.2	<0.2	0.56	<0.03	0.034	<0.01	<0.2	<0.03	<0.005
Waste Rock Open Pit A2																			
WR-OPA2-04-2300	andesite	<2	<0.01	4.6	0.014	<0.03	5	<0.05	<0.3	<0.05	<0.2	<0.2	1.09	<0.03	0.064	<0.01	<0.2	<0.03	<0.005
Waste Rock Open Pit B1																			
WR-OPB1-01-2300	schist/andesite	2	<0.01	4.9	0.028	<0.03	<2	<0.05	<0.3	<0.05	<0.2	<0.2	0.72	<0.03	0.041	<0.01	<0.2	<0.03	<0.005
Waste Rock Open Pit B3																			
WR-OPB3-01-2300	-	4	<0.01	10.1	0.039	<0.03	7	<0.05	<0.3	<0.05	<0.2	<0.2	0.61	<0.03	0.121	<0.01	<0.2	<0.03	0.013
Waste Rock Brock Pit																			
WR-OPBR-02-2300	andesite	<2	<0.01	4.2	0.017	<0.03	3	<0.05	<0.3	<0.05	<0.2	<0.2	0.89	<0.03	0.103	<0.01	<0.2	<0.03	<0.005
Waste Rock Open Pit C1																			
WR-OPC1-01-2300	andesite	<2	<0.01	3.2	0.018	<0.03	3	<0.05	<0.3	<0.05	<0.2	<0.2	0.97	<0.03	0.048	<0.01	<0.2	<0.03	<0.005
WR-OPC1-02-2300	andesite	<2	<0.01	2.5	0.012	<0.03	3	<0.05	<0.3	<0.05	<0.2	<0.2	0.98	<0.03	0.044	<0.01	<0.2	<0.03	<0.005
Waste Rock Pile																			
WR1-01-2300	andesite	<2	<0.01	2.5	0.010	<0.03	3	<0.05	<0.3	<0.05	<0.2	<0.2	1.13	<0.03	0.096	<0.01	<0.2	<0.03	<0.005
WR3-01-2300	andesite	<2	<0.01	2.0	0.020	<0.03	3	<0.05	<0.3	<0.05	<0.2	<0.2	0.93	<0.03	0.077	<0.01	<0.2	<0.03	<0.005

Table 4
QA/QC - Chemical Analysis
Miramar Giant Mine

	SAMPLE ID	ROCK TYPE	Ag ppm	Al %	As ppm	Ba ppm	Be ppm	Bi ppm	Ca %	Cd ppm	Co ppm	Cr ppm	Cu ppm	Fe %	K %	Mg %	Mn ppm	Mo ppm	Na %	Ni ppm	P ppm	Pb ppm	Sb ppm	Sr ppm	Ti %	V ppm	W ppm	Zn ppm
Open Pit Rocks	OPB1-04-2200	schist	1	6.42	404	70	<0.5	<5	3.93	12	33	94	123	9.48	0.71	4.72	1100	<2	0.50	77	530	10	23	46	0.20	277	<10	156
	OPB1-04-A	schist	1	5.90	461	110	<0.5	<5	5.79	13	36	147	99	8.65	1.08	5.33	1335	<2	0.44	74	340	8	29	38	0.03	227	<10	146
	RPD (%)		0	6	9	28	-	-	24	5	6	27	15	6	26	8	12	-	9	3	31	15	15	13	131	14	-	4
	OPB4-01-2200	andesite	<1	6.55	47	60	<0.5	<5	6.98	1	37	102	111	8.21	0.32	3.16	1400	<2	1.84	61	400	<2	8	181	0.43	223	<10	86
	OPB4-01-A	andesite	<1	6.81	43	50	<0.5	<5	5.39	2	47	91	126	9.52	0.23	3.70	1405	<2	1.83	74	480	<2	8	135	0.56	270	<10	96
	RPD (%)		-	3	6	13	-	-	18	40	15	8	8	10	23	10	0	-	0	12	12	-	0	20	17	12	-	7
Waste Rocks	WR-OPA2-03-2300	andesite	<1	5.93	41	110	<0.5	<5	5.77	1	38	190	245	7.45	0.55	3.96	1490	<2	1.39	69	390	<2	4	67	0.17	228	<10	88
	WR-OPA2-03-A	andesite	<1	5.71	24	70	<0.5	<5	4.48	1	41	404	54	8.27	0.46	4.05	2185	<2	1.76	75	410	<2	8	60	0.39	198	<10	78
	RPD (%)		-	3	38	32	-	-	18	0	5	43	108	7	12	1	24	-	15	5	3	-	40	7	46	10	-	8
	WR-OPC1-01-2300	andesite	<1	6.06	2310	130	<0.5	<5	5.17	59	46	438	91	10.22	0.81	4.19	2405	<2	1.12	80	450	2	13	101	0.52	248	<10	102
	WR-OPC1-01-A	andesite	<1	6.36	46	70	<0.5	<5	5.35	2	42	494	107	8.54	0.37	5.30	2090	<2	1.63	115	310	38	9	93	0.37	217	<10	162
	RPD (%)		-	3	189	44	-	-	2	181	6	8	10	12	57	15	10	-	23	23	26	92	26	6	24	9	-	28
Tailings	TSPO2-2300	-	1	5.39	1890	150	<0.5	10	5.38	49	21	134	51	6.24	1.40	2.80	1050	<2	0.61	57	480	150	181	66	0.06	178	<10	214
	TSPO2-2300A	-	1	5.98	1760	170	<0.5	<5	5.40	45	20	148	56	6.36	1.59	2.89	1060	2	0.83	52	480	148	157	72	0.07	194	<10	222
	RPD (%)		0	7	5	8	-	-	0.2	6	3	7	6	1	8	2	1	-	19	6	0	1	10	6	10	6	-	2
	TNPO1-2300	-	1	4.81	4740	170	<0.5	<5	4.71	>100	28	140	2547	5.73	1.45	3.10	870	2	0.71	92	360	150	107	87	0.06	151	<10	674
	TNPO1-2300A	-	1	4.87	4990	170	<0.5	<5	4.31	>100	27	132	2767	5.54	1.46	2.97	840	2	0.70	91	340	156	114	82	0.06	150	<10	738
	RPD (%)		0	1	3	0	-	-	6	-	2	4	5	2	0	3	2	0	1	1	4	3	4	4	0	0	-	6

RPD = Relative percent difference
RE = Laboratory replicate analysis

Table 5
QA/QC Table - ABA Analyses
Miramar Giant Mine

QAQC

	SAMPLE	ROCK TYPE	PASTE pH	S(T) %	S(SO4) %	AP	NP	NET NP	NP/AP	CARBONATE NP
Open Pit Rocks	OPB1-04-2200	schist	9.0	0.66	<0.01	20.6	166.3	145.6	8.1	171.7
	OPB1-04-A	schist	8.9	0.92	<0.01	28.8	272.5	243.8	9.5	301.7
	RPD (%)		*1*	*33*	-	*33*	*48*	***50***	*16*	***55***
	OPB4-01-2200	andesite	9.1	0.08	<0.01	2.5	176.3	173.8	70.5	167.5
	OPB4-01-A	andesite	9.0	0.10	<0.01	3.1	131.9	128.8	42.2	125.8
	RPD (%)		*1*	*22*	-	*22*	*29*	*30*	***50***	*28*
	OPA1-06-2100	schist	9.0	0.18	<0.01	5.6	149.1	143.4	26.5	147.5
	OPA1-06-2100 RE	schist	8.9	0.18	<0.01	5.6	141.6	135.9	25.2	148.3
	RPD (%)		*1*	*0*	-	*0*	*5*	*5*	*5*	*1*
	OPB3-02-2200	schist	8.9	0.01	<0.01	0.3	117.8	117.5	377.0	121.7
	OPB3-02-2200 RE	schist	8.9	0.01	<0.01	0.3	117.5	117.2	376.0	120.8
	RPD (%)		*0*	*0*	-	*0*	*0*	*0*	*0*	*1*
Waste Rock	WR-OPA2-03-2300	andesite	9.1	0.17	<0.01	5.3	157.2	151.9	29.6	155.0
	WR-OPA2-03-A	andesite	9.5	0.06	<0.01	1.9	30.0	28.1	16.0	25.0
	RPD (%)		*4*	***96***	-	***96***	***136***	***138***	***60***	***144***
	WR-OPC1-01-2300	andesite	9.3	0.58	<0.01	18.1	42.0	23.9	**2.3**	33.3
	WR-OPC1-01-A	andesite	9.1	0.10	<0.01	3.1	65.3	62.1	20.9	56.7
	RPD (%)		*2*	***141***	-	***141***	*43*	***89***	***160***	***52***
	WR-OPC1-01-2300	andesite	9.3	0.58	<0.01	18.1	42.0	23.9	**2.3**	33.3
	WR-OPC1-01-2300 RE	andesite	9.2	0.58	<0.01	18.1	43.5	25.4	**2.4**	34.2
	RPD (%)		*1*	*0*	-	*0*	*4*	*6*	*4*	*2*
Tailings	TSPO2-2300	-	8.8	0.21	0.02	5.9	208.1	202.2	35.1	226.7
	TSPO2-2300A	-	8.7	0.19	0.02	5.3	202.5	197.2	38.1	223.3
	RPD (%)		*1*	*10*	-	*11*	*3*	*3*	*8*	*1*
	TNPO1-2300	-	8.3	1.41	1.14	8.4	170.9	162.5	20.3	184.2
	TNPO1-2300A	-	8.3	1.26	0.98	8.8	170.0	161.3	19.4	180.8
	RPD (%)		*0*	*11*	-	*4*	*1*	*1*	*4*	*2*
	TSPO1-2300	-	8.2	0.51	0.06	14.1	213.8	199.7	15.2	237.5
	TSPO1-2300 RE	-	8.4	0.54	0.06	15.0	218.1	203.1	14.5	236.7
	RPD (%)		*2*	*6*	-	*6*	*2*	*2*	*4*	*0*
	TSPO2-2300A	-	8.7	0.19	0.02	5.3	202.5	197.2	38.1	223.3
	TSPO2-2300A RE	-	8.6	0.19	0.02	5.3	202.5	197.2	38.1	224.2
	RPD (%)		*1*	*0*	-	*0*	*0*	*0*	*0*	*0*
	T-NW-01-2600-01	-	8.5	0.33	0.02	9.7	218.1	208.4	22.5	240.0
	T-NW-01-2600-01 RE	-	8.4	0.34	0.02	10.0	218.4	208.4	21.8	240.8
	RPD (%)		*1*	*3*	-	*3*	*0*	*0*	*3*	*0*

RPD = Relative percent difference
RE = Laboratory replicate analysis

Table 6
Chemical Results for Open Pit Sediments Miramar Giant Mine

Open Pit Location			A-1	B-1	B-2
Lab ID	**CCME Guidelines for Res/Park Land Use**	**CCME Guidelines for Industrial Land Use**	L14671-39	L14671-40	L14671-41
Sample ID			OP-A1-SE-2100	OP-B1-SE-01-2200	SE-OPB2-01-2300
Depth (m)			0.1	0.1	0.1
Date Sampled			21-Jul-00	22-Jul-00	23-Jul-00
QA/QC					
Water Soluble Arsenic					
Total Soluble Arsenic (mg/L)			-	-	-
Total Soluble Arsenic (mg/kg)			-	-	-
Ammonia-N			<1	<1	<1
Antimony			<0.1	2.4	11.2
Mercury	**6.6**	**50**	0.05	0.05	0.05
Oil - Gravimetric			200	100	<100
Sulphate (SO4)			258	269	1900
pH			7.1	7.5	7.7
Metals (Strong Acid Rec.)					
Silver			<1	<1	<1
Aluminum			6970	5230	4990
Arsenic (Total)	**12**	**12**	**101**	**1200**	**2070**
Barium	**500**	**2000**	228	22.9	16.6
Beryllium			<1	<1	<1
Calcium			5900	38800	40800
Cadmium	**10**	**22**	<0.5	<0.5	1.9
Cobalt			13	9	24
Chromium	**64**	**87**	56.7	33	39.3
Copper	**63**	**91**	31	28	**85**
Iron			25300	25800	38300
Potassium			3920	900	1010
Magnesium			10100	16700	17500
Manganese			330	800	790
Molybdenum			<1	<1	<1
Sodium			700	200	200
Nickel	**50**	**50**	36	27	**58**
Phosphorus			440	280	240
Lead	**140**	**600**	12	59	**240**
Tin			<5	<5	<5
Strontium			44	28	23
Titanium			715	120	193
Thallium	**1**	**1**	<1	<1	<1
Vanadium	**130**	**130**	50	39	43
Zinc	**200**	**360**	63.2	80	**337**

Notes:
1. Results are expressed in milligrams per kilograms (mg/kg), except for soluble arsenic concentration expressed in mg/L.
2. Chromium guidelines are for total chromium. Cr(VI) guidelines are 0.4 mg/kg for Res/Park land use, and 1.4 mg/kg for industrial land use. No Cr(III) guidelines exist.

TABLE 7
ASBESTOS CHARACTERIZATION RESULTS

SAMPLE DESCRIPTION	MATERIAL TESTED	ASBESTOS CONTENT (%)	ASBESTOS TYPE
P110-CS-01-07/00-AB	SIDING	75-100	CHRYSOTILE
P110-CS-04-07/00-AB	INSULATION	75-100	CHRYSOTILE
P142-CS-06-07/00-AB	INSULATION	75-100	AMOSITE
P134-CS-08-07/00-AB	INSULATION	75-100	CHRYSOTILE
P134-CS-10-07/00-AB	SIDING	25-50	CHRYSOTILE

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TABLE 8
ARSENIC AND RESIDUAL GOLD VALUES

SAMPLE DESCRIPTION	TOTAL ARSENIC (MG/KG)	GOLD (MG/KG)	MATERIAL TESTED
P110-CC-02-07/00-AS,AU	80	6	CONCRETE
P110-CS-03-07/00-AS,AU	766	15	WOOD
P142-CC-05-07/00-AS,AU	20	4	CONCRETE
P142-CS-07-07/00-AS,AU	6	24	WOOD
P134-CC-09-07/00-AS,AU	15	34	CONCRETE
P106-CS-11-07/00-AS,AU	158	195	WOOD
P106-CC-12-07/00-AS,AU	9	4	CONCRETE
P106-SD-13-07/00-AS,AU	606	47	RESIDUE
P106-CS-14-07/00-AS,AU	3	<1	WOOD
P101-CS-15-07/00-AS,AU	4	<1	WOOD
P101-CC-16-07/00-AS,AU	0.1	18	CONCRETE

Table 9
Acid Base Accounting Results - Tailings
Miramar Giant Mine

CLIENT : GOLDER ASSOCIATES
PROJECT : GIANT YELLOWKNIFE
PROJECT # : 0033
TEST : MODIFIED SOBEK METHOD ACID-BASE ACCOUNTING

SAMPLE	SAMPLE DEPTH (m)	PASTE pH	S(T) %	S(SO4) %	AP	NP	NET NP	NP/AP	CARBONATE NP*
South Tailings Pond									
TSPO1-2300	0.5	8.2	0.51	0.06	14.1	213.8	199.7	15.2	237.5
TSPO1-2300 RE	0.5	8.4	0.54	0.06	15.0	218.1	203.1	14.5	236.7
TSPO2-2300	0.5	8.8	0.21	0.02	5.9	208.1	202.2	35.1	226.7
TSPO2-2300A	0.5	8.7	0.19	0.02	5.3	202.5	197.2	38.1	223.3
TSPO2-2300A RE	0.5	8.6	0.19	0.02	5.3	202.5	197.2	38.1	224.2
32711	1.4	8.2	0.30	0.02	9.4	211.1	201.7	22.5	insuf.
32713	3.5	8.1	0.35	0.02	10.9	208.3	197.4	19.1	insuf.
32719	8.5	8.2	0.67	0.02	20.9	228.1	207.1	10.9	insuf.
32724	12.8	8.2	0.39	0.02	12.2	217.7	205.5	17.8	insuf.
32730	16.8	8.2	0.43	0.02	13.4	216.1	202.7	16.1	insuf.
Central Tailings Pond									
TCPO1-2300	0.1	8.6	0.51	0.02	15.3	226.9	211.6	14.8	248.3
TCPO2-2300-02	0.1	8.4	0.27	0.04	7.2	212.5	205.3	29.6	233.3
TCPO3-2300	0.1	8.3	0.95	0.74	6.6	218.1	211.6	33.2	246.7
32761	1.1	8.0	0.46	0.02	14.4	221.1	206.8	15.4	insuf.
32763	3.0	8.0	0.32	0.08	10.0	213.7	203.7	21.4	insuf.
32769	7.9	8.1	0.64	0.02	20.0	225.3	205.3	11.3	insuf.
32777	14.0	8.2	0.69	0.02	21.6	168.3	146.7	7.8	insuf.
32787	19.5	7.2	0.23	0.02	7.2	234.1	226.9	32.5	insuf.
North Tailings Pond									
TNPO1-2300	0.05	8.3	1.41	1.14	8.4	170.9	162.5	20.3	184.2
TNPO1-2300A	0.05	8.3	1.26	0.98	8.8	170.0	161.3	19.4	180.8
TNPO2-2300	0.5	8.4	0.24	0.14	3.1	197.5	194.4	63.2	211.7
TNPO3-2300	0.5	8.4	0.22	0.14	2.5	173.8	171.3	69.5	180.8
TNPO4-2300	0.5	8.4	0.34	0.12	6.9	192.5	185.6	28.0	220.0
1st hole									
32951	0.8	8.1	0.60	0.02	18.8	208.9	190.2	11.1	insuf.
32953	2.3	8.2	0.52	0.02	16.3	211.3	195.1	13.0	insuf.
32957	5.3	8.1	0.38	0.02	11.9	196.4	184.5	16.5	insuf.
32964	9.8	8.1	0.61	0.02	19.1	191.6	172.5	10.0	insuf.
2nd hole									
33001	0.6	7.9	0.46	0.04	14.4	206.0	191.6	14.3	insuf.
33003	2.4	8.0	0.57	0.02	17.8	207.7	189.9	11.7	insuf.
33006	4.6	7.9	0.69	0.02	21.6	189.8	168.2	8.8	insuf.
33011	8.0	8.0	0.70	0.02	21.9	193.4	171.6	8.8	insuf.
Northwest Tailings Pond									
T-NW-01-2600-01	0.1 - 0.5	8.5	0.33	0.02	9.7	218.1	208.4	22.5	240.0
T-NW-01-2600-01 RE	0.1 - 0.5	8.4	0.34	0.02	10.0	218.4	208.4	21.8	240.8
T-NW-01-2600-02	0.6 - 1.0	8.5	0.30	0.04	8.1	165.0	156.9	20.3	177.5
T-NW-01-2600-03	1.1 - 1.5	8.8	0.19	<0.01	5.9	124.1	118.1	20.9	120.8
T-NW-01-2600-04	1.6 - 2.0	8.8	0.36	<0.01	11.3	111.6	100.3	9.9	119.2
T-NW-01-2600-05	3.6 - 4.0	9.0	1.05	<0.01	32.8	166.6	133.8	5.1	169.2

AP = ACID POTENTIAL IN TONNES CaCO3 EQUIVALENT PER 1000 TONNES OF MATERIAL.
NP = NEUTRALIZATION POTENTIAL IN TONNES CaCO3 EQUIVALENT PER 1000 TONNES OF MATERIAL.
NET NP = NET NEUTRALIZATION POTENTIAL = TONNES CaCO3 EQUIVALENT PER 1000 TONNES OF MATERIAL.
NOTE: WHEN S(T) AND/OR S(SO4) IS REPORTED AS <0.01, IT IS ASSUMED TO BE ZERO FOR THE AP CALCULATION.
* CARBONATE NP CALCULATED FROM TOTAL INORGANIC CARBON (TIC) ASSAY.
RE = REPLICATE; Insuf. = INSUFFFICIENT SAMPLE.

Table 10
Tailings and Water Treatment Sludge
Chemical Analysis
Miramar Giant Mine

TEST : METAL SCAN BY ICP (MULTI-ACID DIGESTION) PLUS ARSENIC AND ANTIMONY ASSAYS

SAMPLE ID	Sample Depth (m)	Ag ppm	Al %	As ppm	Ba ppm	Be ppm	Bi ppm	Ca %	Cd ppm	Co ppm	Cr ppm	Cu ppm	Fe %	K %	Mg %	Mn ppm	Mo ppm	Na %	Ni ppm	P ppm	Pb ppm	Sb ppm	Sr ppm	Ti %	V ppm	W ppm	Zn ppm
South TCA																											
TSPO1-2300	0.5	2	3.90	2610	140	<0.5	25	4.83	63	32	87	50	6.53	1.17	2.45	1010	2	0.87	67	300	170	129	57	0.04	132	<10	196
TSPO2-2300	0.5	1	5.39	1890	150	<0.5	10	5.38	49	21	134	51	6.24	1.40	2.80	1050	<2	0.61	57	480	150	181	66	0.06	178	<10	214
TSPO2-2300A	0.5	1	5.98	1760	170	<0.5	<5	5.40	45	20	148	56	6.36	1.59	2.89	1060	2	0.83	52	480	148	157	72	0.07	194	<10	222
32711	1.4	2.3	1.65	2485	75	-	10	3.00	<1	35	109	69	5.80	0.69	0.46	1177	3	0.03	63	430	304	590	37	0.05	176	<10	267
32711	1.4	2.3	1.56	2440	60	-	15	3.06	<1	36	104	71	5.84	0.68	0.35	1226	3	0.02	67	430	322	635	31	0.05	170	<10	277
32713	3.5	2.2	1.87	2285	70	-	15	2.37	<1	34	105	78	5.55	0.71	0.51	1109	4	<0.01	63	350	260	285	28	0.03	173	<10	358
32719	8.5	12.2	0.61	2990	60	-	25	3.01	<1	51	58	71	6.42	0.53	0.72	1108	3	<0.01	73	240	198	270	27	0.04	106	<10	378
32724	12.8	1.5	2.35	2700	70	-	15	2.43	<1	26	105	53	4.64	0.79	0.57	1066	3	<0.01	51	280	214	390	30	0.03	182	<10	214
32730	16.8	3.8	1.39	2295	60	-	20	2.34	3	35	102	73	5.49	0.67	0.44	1080	3	<0.01	57	330	204	245	24	0.04	152	<10	341
Central TCA																											
TCPO1-2300	0.1	1	4.35	3850	130	<0.5	10	5.29	96	36	104	63	6.54	1.11	2.60	1040	<2	0.60	71	400	318	309	61	0.05	139	<10	342
TCPO2-2300-02	0.1	1	5.99	3280	190	<0.5	5	5.28	83	24	133	70	6.41	1.73	2.93	1075	<2	0.78	62	430	332	274	72	0.06	191	<10	340
TCPO3-2300	0.1	1	4.76	2720	120	<0.5	<5	5.12	65	23	112	45	5.33	1.40	3.22	995	2	0.74	51	310	152	123	63	0.04	159	<10	232
32761	1.07	2.1	2.02	2635	70	-	15	2.65	<1	28	96	54	4.90	0.74	0.59	1054	3	<0.01	51	260	252	305	27	0.03	170	<10	307
32763	3.0	1.3	1.47	1995	60	-	20	2.42	<1	30	102	49	5.01	0.64	0.43	1078	3	<0.01	54	280	166	205	25	0.03	160	<10	346
32769	7.9	2.1	0.93	2550	55	-	10	2.89	<1	44	86	58	5.63	0.56	0.58	1105	4	<0.01	73	260	218	215	23	0.03	132	<10	312
32777	14.0	1.9	1.15	2665	50	-	15	2.41	<1	35	71	47	5.14	0.61	0.37	874	4	0.02	62	240	278	745	27	0.02	111	<10	351
32787	19.5	4.0	0.45	1325	55	-	10	3.03	<1	14	105	42	2.97	0.67	0.58	1121	4	0.02	27	240	94	120	26	0.03	106	<10	127
North TCA																											
TNPO1-2300	0.05	1	4.81	4740	170	<0.5	<5	4.71	>100	28	140	2547	5.73	1.45	3.10	870	2	0.71	92	360	150	107	87	0.06	151	<10	674
TNPO1-2300A	0.05	1	4.87	4990	170	<0.5	<5	4.31	>100	27	132	2767	5.54	1.46	2.97	840	2	0.70	91	340	156	114	82	0.06	150	<10	738
TNPO2-2300	0.5	1	6.41	2430	160	<0.5	<5	4.47	61	20	186	103	5.56	1.88	3.49	905	<2	0.54	56	380	162	66	55	0.05	220	<10	224
TNPO3-2300	0.5	<1	7.29	2550	200	<0.5	<5	4.34	65	21	201	93	6.41	1.93	3.59	930	<2	0.68	71	380	170	46	60	0.07	247	<10	388
TNPO4-2300	0.5	1	5.01	3130	130	<0.5	<5	4.95	81	30	126	114	6.34	1.34	3.02	985	<2	0.54	72	350	222	99	52	0.04	171	<10	416
32951	0.8	1.6	1.83	3410	95	-	15	3.68	<1	40	125	61	6.01	0.70	0.83	1209	5	0.01	66	360	194	295	39	0.04	161	<10	283
32953	2.3	1.7	1.66	2945	80	-	15	3.49	<1	41	113	84	6.03	0.67	0.69	1192	5	0.01	74	360	200	320	35	0.04	155	<10	323
32957	5.3	2.1	3.24	2095	120	-	15	3.75	<1	29	127	40	4.94	0.74	0.93	1015	3	<0.01	54	340	326	295	39	0.03	191	<10	497
32964	9.8	6.5	1.92	2615	90	-	20	3.44	<1	41	102	60	5.83	0.68	0.85	1026	3	0.01	74	300	268	370	33	0.05	156	<10	348
33001	0.6	1.3	1.84	2460	85	-	15	3.67	<1	40	108	55	5.84	0.66	0.71	1107	4	0.01	66	320	188	270	42	0.04	159	<10	301
33003	2.4	1.7	2.01	2690	90	-	10	3.58	<1	43	111	84	6.14	0.66	0.74	1044	4	<0.01	81	310	240	260	33	0.04	158	<10	397
33006	4.6	2.4	1.42	3545	85	-	20	2.81	<1	56	101	68	7.48	0.60	0.75	977	5	<0.01	95	240	368	560	25	0.03	142	<10	416
33011	8.0	2.6	1.27	3505	90	-	25	2.87	<1	59	97	67	7.66	0.62	0.71	1032	6	<0.01	99	260	404	600	30	0.03	138	<10	454
Northwest TCA																											
T-NW-01-2600-01	0.1 - 0.5	1	4.60	3340	120	<0.5	<5	5.91	93	32	109	72	6.66	1.14	2.92	1115	<2	0.73	70	340	274	351	69	0.07	154	<10	272
T-NW-01-2600-02	0.6 - 1.0	1	5.42	2110	120	<0.5	<5	5.11	57	29	165	88	6.69	0.87	2.88	1105	<2	0.98	70	520	146	150	104	0.19	159	<10	196
T-NW-01-2600-03	1.1 - 1.5	<1	6.22	338	110	<0.5	<5	4.35	10	38	131	144	8.47	0.52	3.68	1165	<2	0.92	75	580	26	29	109	0.31	220	<10	122
T-NW-01-2600-04	1.6 - 2.0	<1	6.71	543	170	<0.5	<5	4.28	16	37	146	159	8.44	0.87	3.67	1115	<2	1.14	78	620	44	27	105	0.27	221	<10	126
T-NW-01-2600-05	3.6 - 4.0	<1	7.16	3220	190	<0.5	<5	3.89	86	32	235	180	6.66	2.04	3.86	850	<2	0.50	80	540	12	14	59	0.10	237	<10	72

Sludge																											
SL-SE-01-2300	0.1	26	0.68	42300	60	<0.5	10	10.35	>100	61	23	>10000	>15.00	0.20	0.50	1990	28	0.14	2286	550	86	5300	566	0.06	44	<10	340
SL-SE-02-2300	0.1	5	2.21	10500	150	<0.5	<5	>15.00	>100	21	47	>10000	5.44	0.55	2.62	765	6	0.47	566	350	86	758	235	0.05	67	<10	184

Fire Assay Results		SiO2 %	Al2O3 %	Fe2O3 %	CaO %	MgO %	Na2O %	K2O %	TiO2 %	MnO %	P2O5 %	Ba ppm	Sr ppm	Zr ppm	Y ppm	Sc ppm	LOI %	Total %
SL-SE-01-2300	-	13.69	1.55	41.79	5.68	1.56	0.05	0.38	0.02	0.98	3.58	2880	90	40	40	2	30.05	99.62
SL-SE-02-2300	-	20.83	4.62	8.55	29.84	4.70	0.68	0.69	0.30	0.12	0.23	120	270	40	10	10	27.80	98.40

Table 11
Tailings Leachate Extraction Chemical Analysis
Miramar Giant Mine

LEACHATE ANALYSIS BY ICP

SAMPLE ID	Sample Depth (m)	D.I. Water Volume (ml)	Sample Weight (g)	pH	Cond. (uS/cm)	Alkalinity (mg CaCO3/L)	Acidity (pH 4.5) (mg CaCO3/L)	Acidity (pH 8.3)	SO4 mg/L	Ag mg/L	Al mg/L	As mg/L	B mg/L	Ba mg/L	Be mg/L	Bi mg/L	Ca mg/L	Cd mg/L	Co mg/L	Cr mg/L	Cu mg/L	Fe mg/L
CCME Guidelines for Surface Water									-	-	-	**0.025**	**5**	**1**	-	-	-	**0.005**	-	**0.05**	**1**	**0.3**
Permit Maximum Average Concentration									-	-	-	**0.50**	-	-	-	-	-	-	-	-	**0.30**	-
Permit Maximum Concentration of any Grab Sample									-	-	-	**1.00**	-	-	-	-	-	-	-	-	**0.60**	-
South TCA																						
TSPO2-2300	0.5	400	200	7.96	361	63.0	0.0	1.5	114	<0.01	<0.2	**1.4**	<0.1	<0.01	<0.005	<0.1	50.7	<0.01	0.01	<0.01	<0.01	0.14
32711	1.4	123	41	8.13	710	n/a	n/a	n/a	213	<0.01	<0.2	**10.3**	0.1	<0.01	<0.005	<0.1	94.6	<0.02	0.04	<0.01	0.02	0.20
32713	3.5	186	62	7.98	815	79.0	n/a	n/a	335	<0.01	<0.2	**1.6**	<0.1	<0.01	<0.005	<0.1	128	<0.01	0.03	<0.01	0.03	0.26
32724	12.8	156	52	8.07	729	81.0	n/a	n/a	248	<0.01	<0.2	**2.6**	<0.1	<0.01	<0.005	<0.1	86.5	<0.01	0.02	<0.01	0.02	**0.40**
Central TCA																						
TCPO1-2300	0.1	400	200	8.00	307	59.0	0.0	1.5	100	<0.01	<0.2	**0.6**	<0.1	<0.01	<0.005	<0.1	49.3	<0.01	0.02	<0.01	0.01	0.05
32761	1.1	196	98	7.83	2150	61.0	n/a	n/a	2170	<0.01	<0.2	**2.5**	<0.1	0.01	<0.005	<0.2	619	<0.01	0.05	<0.01	0.03	0.23
32763	3.0	83	41.3	7.76	1400	n/a	n/a	n/a	n/a	<0.01	<0.2	**0.61**	<0.1	0.01	<0.005	<0.1	424	<0.01	0.05	<0.01	0.03	**0.62**
32777	14.0	182	91	8.20	544	86.0	n/a	n/a	196	<0.01	<0.2	**1.5**	<0.1	<0.01	<0.005	<0.1	67.0	<0.01	<0.01	<0.01	0.03	0.18
North TCA																						
TNPO1-2300	0.05	400	200	7.95	4200	62.0	0.0	4.5	5220	<0.02	<0.4	**9.5**	<0.2	0.04	<0.01	<3	446	<0.02	0.11	<0.02	0.14	0.1
TNPO1-2300A	0.05	400	200	7.87	4720	61.5	0.0	5.0	6370	<0.02	<0.4	**10**	<0.2	0.03	<0.01	<3	368	<0.02	0.14	<0.02	0.18	0.09
TNPO3-2300	0.50	400	200	7.93	1055	43.5	0.0	2.0	667	<0.01	<0.2	**0.3**	<0.1	<0.01	<0.005	<0.1	171	<0.01	0.01	<0.01	0.01	0.05
32951	0.8	152	76	8.20	749	90.0	n/a	n/a	230	<0.01	<0.2	**0.9**	<0.1	<0.01	<0.005	<0.1	78.9	<0.01	0.05	<0.01	0.03	**0.39**
32953	2.3	180	90	8.27	536	99.0	n/a	n/a	134	<0.01	<0.2	**0.9**	0.1	<0.01	<0.005	<0.1	51.6	<0.01	0.05	<0.01	0.03	**0.43**
32964	9.8	210	105	8.20	607	92.0	n/a	n/a	212	<0.01	<0.2	**1.2**	<0.1	<0.01	<0.005	<0.1	73.2	<0.01	0.02	<0.01	0.04	0.14
33001	0.6	184	92	7.93	1590	58.0	n/a	n/a	1300	<0.01	<0.2	**1.0**	0.2	0.01	<0.005	<0.1	405	<0.01	0.06	<0.01	0.04	0.14
33003	2.4	130	65	8.10	915	74.0	n/a	n/a	411	<0.01	<0.2	**0.56**	<0.1	<0.01	<0.005	<0.1	135	<0.01	0.04	<0.01	0.07	0.22
33011	8.0	130	65	8.09	784	76.0	n/a	n/a	331	<0.01	<0.2	**0.55**	<0.1	<0.01	<0.005	<0.1	106	<0.01	0.02	<0.01	0.02	0.08
Northwest TCA																						
T-NW-01-2600-01	0.1 - 0.5	400	200	8.03	486	60.0	0.0	2.0	130	<0.01	<0.2	**1.3**	<0.1	<0.01	<0.005	<0.1	58.3	<0.01	0.03	<0.01	0.01	0.04
T-NW-01-2600-03	1.1 - 1.5	365	183	8.07	280	58.0	0.0	2.0	70	<0.01	<0.2	**0.3**	<0.1	<0.01	<0.005	<0.1	45.2	<0.01	<0.01	<0.01	0.01	<0.03
T-NW-01-2600-05	3.6 - 4.0	125	62	8.20	254	75.0	n/a	n/a	57	<0.01	<0.2	<0.2	0.2	<0.01	<0.005	<0.1	42.7	<0.01	<0.01	<0.01	0.01	<0.03
Sludges																						
SL-SE-01, L1	0.10	2000	1000	7.75	1200	43.5	0.0	4.0	503	0.01	<0.2	**0.04**	0.7	0.12	<0.005	<0.1	171	<0.01	0.65	<0.01	0.29	**1.74**
SL-SE-01, L2				7.90	820	50.5	0.0	3.0	412	<0.01	<0.2	**0.088**	0.7	0.05	<0.005	<0.1	129	<0.01	0.50	<0.01	0.09	**0.64**
SL-SE-01, L3				7.78	564	53.0	0.0	3.3	282	<0.01	<0.2	**0.106**	0.6	0.03	<0.005	<0.1	88.8	<0.01	0.29	<0.01	0.08	0.18
SL-SE-02, L1	0.10	2000	1000	11.90	5740	1135.0	0.0	0.0	1100	0.01	0.4	**0.6**	0.2	0.10	<0.005	<0.1	912	<0.01	0.47	0.02	**1.22**	<0.03
SL-SE-02, L2				11.85	4730	932.0	0.0	0.0	282	<0.01	0.4	0.0063	<0.1	0.09	<0.005	<0.1	481	<0.01	0.09	<0.01	0.37	<0.03
SL-SE-02, L3				11.70	3450	818.0	0.0	0.0	176	<0.01	0.5	**0.3**	<0.1	0.10	<0.005	<0.1	430	<0.01	0.05	<0.01	0.29	<0.03

Table 11
Tailings Leachate Extraction Chemical Analysis
Miramar Giant Mine

LEACHATE ANALYSIS BY ICP

SAMPLE ID	Sample Depth (m)	K mg/L	Li mg/L	Mg mg/L	Mn mg/L	Mo mg/L	Na mg/L	Ni mg/L	P mg/L	Pb mg/L	Sb mg/L	Se mg/L	Si mg/L	Sn mg/L	Sr mg/L	Ti mg/L	Tl mg/L	V mg/L	Zn mg/L
CCME Guidelines for Surface Water		-	-	-	**0.05**	-	-	-	-	**0.01**	**0.006**	-	-	-	-	-	-	-	**5**
Permit Maximum Average Concentration		-	-	-	-	-	-	**0.50**	-	**0.20**	-	-	-	-	-	-	-	-	**0.20**
Permit Maximum Concentration of any Grab Sample		-	-	-	-	-	-	**1.00**	-	**0.40**	-	-	-	-	-	-	-	-	**0.40**
South TCA																			
TSPO2-2300	0.5	5	<0.01	13.0	0.026	<0.03	18	<0.05	<0.3	<0.05	**2.2**	<0.2	1.19	<0.03	0.228	<0.01	<0.2	<0.03	0.005
32711	1.4	24	0.01	23.2	0.022	0.04	32	<0.05	<0.3	<0.05	**6.6**	<0.2	2.44	<0.03	0.294	<0.01	<0.2	<0.03	0.008
32713	3.5	19	0.01	29.3	0.041	0.03	29	<0.05	<0.3	<0.05	**2.2**	<0.2	2.24	<0.03	0.404	<0.01	<0.2	<0.03	0.008
32724	12.8	20	0.01	29.7	0.023	<0.03	31	<0.05	<0.3	<0.05	**3.6**	<0.2	2.61	<0.03	0.318	<0.01	<0.2	<0.03	0.007
Central TCA																			
TCPO1-2300	0.1	3	<0.01	8.7	0.027	<0.03	13	<0.05	<0.3	<0.05	**1.1**	<0.2	0.76	<0.03	0.132	<0.01	<0.2	<0.03	<0.005
32761	1.1	47	<0.01	171	**0.137**	0.06	133	<0.05	<0.3	<0.05	**1.1**	<0.2	3.01	<0.03	1.33	<0.01	<0.2	<0.03	0.012
32763	3.0	35	<0.01	47.4	**0.081**	<0.03	35	<0.05	<0.3	<0.05	**0.8**	<0.2	2.22	<0.03	0.777	<0.01	<0.2	<0.03	0.015
32777	14.0	32	<0.01	20.6	0.015	0.06	20	<0.05	<0.3	<0.05	**5.0**	<0.2	2.31	<0.03	0.066	<0.01	<0.2	<0.03	<0.005
North TCA																			
TNPO1-2300	0.05	66	0.05	1140	**0.150**	0.20	510	<0.1	<0.6	<0.1	**0.9**	<0.4	1.40	<0.06	2.31	<0.02	<0.4	<0.06	0.060
TNPO1-2300A	0.05	80	0.05	1450	**0.17**	0.25	638	<0.1	<0.6	<0.1	**1**	<0.4	1.40	<0.06	1.98	<0.02	<0.4	<0.06	0.109
TNPO3-2300	0.50	6	<0.01	53.4	**0.055**	<0.03	19	<0.05	<0.3	<0.05	<0.2	<0.2	1.42	<0.03	0.49	<0.01	<0.2	<0.03	0.005
32951	0.8	29	<0.01	30.9	0.031	<0.03	34	<0.05	<0.3	<0.05	**1.1**	<0.2	2.08	<0.03	0.246	<0.01	<0.2	<0.03	<0.005
32953	2.3	29	<0.01	22.8	0.018	<0.03	24	<0.05	<0.3	<0.05	**1.1**	<0.2	2.05	<0.03	0.162	<0.01	<0.2	<0.03	<0.005
32964	9.8	24	<0.01	24.1	0.019	<0.03	30	<0.05	<0.3	<0.05	**1.7**	<0.2	2.37	<0.03	0.129	<0.01	<0.2	<0.03	<0.005
33001	0.6	31	<0.01	72.3	**0.101**	0.04	97	<0.05	<0.3	<0.05	**1.2**	<0.2	2.66	<0.03	1.20	<0.01	<0.2	<0.03	0.008
33003	2.4	35	<0.01	30.0	0.030	<0.03	29	<0.05	<0.3	<0.05	**0.4**	<0.2	2.01	<0.03	0.325	<0.01	<0.2	<0.03	<0.005
33011	8.0	28	<0.01	31.6	0.024	0.04	22	<0.05	<0.3	<0.05	**1.1**	<0.2	2.14	<0.03	0.228	<0.01	<0.2	<0.03	<0.005
Northwest TCA																			
T-NW-01-2600-01	0.1 - 0.5	6	<0.01	13.5	**0.060**	<0.03	31	<0.05	<0.3	<0.05	**1.6**	<0.2	0.84	<0.03	0.154	<0.01	<0.2	<0.03	<0.005
T-NW-01-2600-03	1.1 - 1.5	3	<0.01	5.7	**0.054**	<0.03	8	<0.05	<0.3	<0.05	**0.2**	<0.2	0.61	<0.03	0.194	<0.01	<0.2	<0.03	<0.005
T-NW-01-2600-05	3.6 - 4.0	3	<0.01	7.0	0.022	<0.03	6	<0.05	<0.3	<0.05	<0.2	<0.2	1.15	<0.03	0.168	<0.01	<0.2	<0.03	<0.005
Sludges																			
SL-SE-01, L1	0.10	9	0.01	34.6	**0.159**	0.12	79	0.07	<0.3	<0.05	**0.6**	<0.2	1.18	<0.03	1.90	<0.01	<0.2	<0.03	0.273
SL-SE-01, L2		7	0.01	26.3	**0.101**	0.14	41	0.06	<0.3	<0.05	**0.6**	<0.2	1.20	<0.03	1.48	<0.01	<0.2	<0.03	0.111
SL-SE-01, L3		6	<0.01	18.5	**0.056**	0.14	18	<0.05	<0.3	<0.05	**0.6**	<0.2	1.12	<0.03	1.01	<0.01	<0.2	<0.03	0.109
SL-SE-02, L1	0.10	75	0.03	<0.1	<0.005	0.07	447	<0.05	<0.3	<0.05	<0.2	<0.2	0.30	<0.03	3.51	<0.01	<0.2	<0.03	0.013
SL-SE-02, L2		32	0.02	<0.1	<0.005	<0.03	166	<0.05	<0.3	<0.05	<0.2	<0.2	0.29	<0.03	2.09	<0.01	<0.2	<0.03	0.045
SL-SE-02, L3		14	0.02	0.10	<0.005	<0.03	65	<0.05	<0.3	<0.05	<0.2	<0.2	0.35	<0.03	1.45	<0.01	<0.2	<0.03	0.017

Table 12
Groundwater Analytical Results-Dissolved Metals
Miramar Giant Mine

PARAMETERS		Easting	636191	636191	635969	636098	636098	637310
		Northing	6934689	6934689	6934326	6935537	6935537	6934220
		Lab ID	L14821-6	L14821-7	L14821-4	L14821-2	L14821-3	L14821-8
		Sample ID	MW00-01	MW00-01A	MW00-2	MW00-3A	MW00-3B	MW00-4A
		Depth (m)	8.5	8.5	22.7	8.5	16.5	8.5
		Date Sampled	1-Aug-00	1-Aug-00	1-Aug-00	1-Aug-00	1-Aug-00	1-Aug-00
		QA/QC		FD				
Routine Parameters		**UNITS**						
Alkalinity (total field)	as $CaCO_3$	mg/L	115	115	205	187.5	167.5	200
Alkalinity (bicarbonate)	HCO_3	mg/L	155	153	280	251	217	269
Alkalinity (carbonate)	CO_3	mg/L	<5	<5	<5	<5	<5	<5
Alkalinity (hydroxide)	OH	mg/L	<5	<5	<5	<5	<5	<5
Alkalinity (total as $CaCO_3$)	as $CaCO_3$	mg/L	127	126	229	206	178	220
Conductivity (field)	Cond	µS/cm	1624	1624	1170	1240	856	758
Conductivity (lab)	Cond	µS/cm	2040	2070	1530	1790	1260	972
Dissolved oxygen (field)	DO	mg/L	0.35	0.35	2.5	1.5	1.5	4.0
Hardness (as $CaCO_3$)	Hard	mg/L	760	757	698	618	526	423
pH (field)	pH	pH units	7.95	7.95	7.72	7.45	7.58	7.80
pH (lab)	pH	pH units	7.8	7.8	7.7	7.5	7.7	7.7
Redox potential (field)	Eh	mV	-79.0	-79.0	65.5	88	87.4	83.1
Temperature (field)	Temp	^oC	9.5	9.5	6.5	4.3	3.3	6.5
Total dissolved solids	TDS	mg/L	1340	1350	1090	1190	863	693
Total suspended solids	TSS	mg/L	41	35	7540	2120	1830	3470
Anions								
Chloride	Cl	mg/L	291	293	73	132	102	2
Sulphate	SO_4	mg/L	511	519	548	544	378	337
Nutrients								
Nitrate+Nitrite (N)	N	mg/L	6.5	7.8	0.1	0.3	0.1	0.5
Amonia (N)	NH_3	mg/L	3.34	3.59	3.17	1.26	0.78	0.18
Nitrate (N)	NO_3	mg/L	5.7	7.1	0.1	0.3	0.1	<0.1
Nitrite (N)	NO_2	mg/L	0.74	0.72	<0.05	<0.05	<0.05	<0.05
Hydrocarbons								
Oil & Grease		mg/L	<1	<1	<1	<1	<1	<1
Dissolved Metals								
Aluminum	Al	mg/L	0.02	0.01	0.09	0.32	0.14	0.20
Antimony	Sb	mg/L	1.80	1.81	0.124	0.0056	0.0183	0.0115
Arsenic 3+	As3+	mg/L	0.305	0.291	0.166	0.0042	<0.0002	0.093
Arsenic 5+	As5+	mg/L	2.19	2.58	0.0010	0.0318	0.0267	0.0841
Total (diss.) Arsenic	As	mg/L	4.40	4.39	0.275	0.0748	0.0465	0.169
Barium	Ba	mg/L	0.014	0.014	0.053	0.044	0.061	0.013
Beryllium	Be	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	B	mg/L	0.50	0.50	0.15	0.19	0.13	0.06
Cadmium	Cd	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Calcium	Ca	mg/L	218	217	167	156	133	88.1
Chromium	Cr	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Cobalt	Co	mg/L	0.066	0.066	0.032	0.052	0.033	0.006
Copper	Cu	mg/L	0.015	0.014	0.002	0.003	0.005	0.015
Iron	Fe	mg/L	0.054	0.061	<0.005	1.23	0.067	0.289
Lead	Pb	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Magnesium	Mg	mg/L	52.4	52.2	68.3	55.6	47.2	49.2
Manganese	Mn	mg/L	0.237	0.239	0.494	0.435	0.285	0.118
Mercury	Hg	mg/L	0.0014	0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	Mo	mg/L	0.027	0.027	0.024	0.011	0.013	0.007
Nickel	Ni	mg/L	0.011	0.011	0.007	0.006	0.004	0.004
Phosphorus	P	mg/L	<0.1	<0.1	0.9	7.5	2.5	5.9
Potassium	K	mg/L	13.3	13.3	10.9	11.5	9.1	4.3
Silver	Ag	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Sodium	Na	mg/L	148	147	83	163	86	78
Strontium	Sr	mg/L	2.04	2.09	1.43	1.63	1.42	0.357
Thallium	Tl	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Tin	Sn	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Titanium	Ti	mg/L	<0.001	<0.001	<0.001	0.010	<0.001	0.006
Vanadium	V	mg/L	0.003	0.003	0.003	0.009	0.009	0.006
Zinc	Zn	mg/L	0.010	0.008	0.003	0.003	0.004	0.011

No applicable groundwater quality criteria

Table 13
Groundwater Analytical Results-Total Metals
Miramar Giant Mine

PARAMETERS			CCME GUIDELINES WATER : COMMUNITY Maximum Allowable Concentration (mg/L)	Aesthetic Objectives (mg/L)						
		Location			MW00-01	MW00-01	MW00-2	MW00-3A	MW00-3B	MW00-4A
		Easting			636191	636191	635969	636098	636098	637310
		Northing			6934689	6934689	6934326	6935537	6935537	6934220
		Lab ID			L14821-6	L14821-7	L14821-4	L14821-2	L14821-3	L14821-8
		Sample ID			MW00-01	MW00-01A	MW00-2	MW00-3A	MW00-3B	MW00-4A
		Depth (m)			8.5	8.5	22.7	8.5	16.5	8.5
		Date Sampled			1-Aug-00	1-Aug-00	1-Aug-00	1-Aug-00	1-Aug-00	1-Aug-00
		QA/QC				FD				
Total Metals		**UNITS**								
Aluminum	Al	mg/L	-	-	1.74	0.99	204	43.5	44.9	130
Antimony	Sb	mg/L	**0.006**	-	**1.92**	**1.92**	**0.167**	0.0031	**0.0133**	**0.0127**
Arsenic	As	mg/L	**0.025**	-	**4.91**	**4.94**	**2.58**	**0.0811**	**0.0667**	**0.452**
Barium	Ba	mg/L	**1**	-	0.020	0.017	**1.10**	0.740	0.520	0.627
Beryllium	Be	mg/L	-	-	<0.002	<0.002	0.004	0.003	<0.002	0.002
Boron	B	mg/L	**5**	-	0.63	0.65	0.17	0.22	0.14	0.12
Cadmium	Cd	mg/L	**0.005**	-	<0.001	<0.001	0.002	<0.001	<0.001	<0.001
Chromium	Cr	mg/L	**0.05**	-	0.005	0.006	**1.07**	0.009	**0.052**	**0.310**
Cobalt	Co	mg/L	-	-	0.081	0.081	0.382	0.060	0.054	0.147
Copper	Cu	mg/L	-	**1**	0.028	0.027	0.745	0.021	0.092	0.437
Iron	Fe	mg/L	-	**0.3**	**2.33**	**1.89**	**348**	**22.6**	**59.5**	**160**
Lead	Pb	mg/L	**0.01**	-	**0.015**	**0.014**	**0.111**	**0.053**	**0.035**	**0.038**
Manganese	Mn	mg/L	-	**0.05**	**0.314**	**0.310**	**8.21**	**0.963**	**1.93**	**3.87**
Mercury	Hg	mg/L	**0.001**	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	Mo	mg/L	-	-	0.032	0.032	0.035	0.011	0.014	0.011
Nickel	Ni	mg/L	-	-	0.013	0.012	0.538	0.021	0.037	0.183
Phosphorus	P	mg/L	-	-	0.14	0.14	4.15	9.59	3.08	9.17
Silver	Ag	mg/L	-	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Strontium	Sr	mg/L	-	-	2.27	2.34	2.03	2.17	1.73	0.706
Thallium	Tl	mg/L	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Tin	Sn	mg/L	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Titanium	Ti	mg/L	-	-	0.018	0.013	8.29	0.204	1.85	7.13
Vanadium	V	mg/L	-	-	0.010	0.008	1.01	0.030	0.149	0.532
Zinc	Zn	mg/L	-	**5**	0.025	0.026	0.520	0.125	0.158	0.348
Cyanide										
Total Cyanide	CN	mg/L	**0.2**	-	0.183	0.172	0.160	0.022	0.014	0.010
Charge Balance										
Ion Balance		%	-	-	101	98.7	98.8	103	101	104

CCME guidelines for surface water; used for comparative purposes only.

Table 14
Groundwater and Surface Water Chemical Types
Miramar Giant Mine

Sample id	Location		Sampling date	Water type
BC-DS1	Baker Creek	downstream 1	9/19/2000	Ca-Na-SO4-Cl
BC-DS2	Baker Creek	downstream 2	9/19/2000	Ca-Na-SO4-Cl
BC-Eff	Effluent discharge		9/20/2000	Ca-Na-Mg-SO4-Cl
BC-US	Baker Creek	up stream of discharge	9/20/2000	Ca-Mg-HCO3
MW00-1	Groundwater	NWPond tails	8/1/2000	Ca-Na-SO4-Cl
MW00-2	Groundwater	propane tank farm	8/1/2000	Ca-Mg-Na-SO4-HCO3
MW00-3A	Groundwater	V Lake rd	8/1/2000	Ca-Na-Mg-SO4-HCO3
MW00-3B	Groundwater	V Lake rd, 20m	8/1/2000	Ca-Mg-Na-SO4-HCO3
MW00-4A	Groundwater	North Pond, 10m	8/1/2000	Ca-Mg-Na-SO4-HCO3
OP-B2	Giant surf water	open pit B2	9/19/2000	Ca-Mg-SO4
OP-C1	Giant surf water	open pit C1	9/19/2000	Ca-Mg-SO4-HCO3
TLG-21B	NWPtails seep	propane dam 21B	9/20/2000	Ca-Mg-SO4
TLG-22B	seep	MWPond seep	9/20/2000	Ca-Mg-Na-SO4-Cl
TLG-22CP	seep	NWPond seep	9/20/2000	Ca-Mg-Na-SO4-Cl
TLG-3	seep	north, NPond	9/20/2000	Ca-Mg-SO4
TLG-3C	seep	North pond, north	9/20/2000	Ca-Mg-SO4
TLG-7A-SW	seep	dam 7	9/20/2000	Ca-Mg-SO4
TLG-7B-SW	seep	dam7	9/20/2000	Ca-Mg-SO4-HCO3
TLG-9-SW-09/00	seep	central pond	9/20/2000	Ca-Mg-HCO3-SO4
TLG-NP-SW-09/00	pond water	north pond	9/20/2000	Ca-Na-Mg-SO4-Cl
TLG-NWP	pond water	NWpond water	9/20/2000	Ca-Na-Mg-SO4-Cl
TLG-SP-SW-09/00	pond water	south pond water	9/20/2000	Ca-Na-Mg-SO4-Cl
TLG-TC	Trapper Creek	ditch at propane tanks	9/20/2000	Ca-Mg-SO4-HCO3
TLG-TL	Trapper Lake	inflow	9/20/2000	Ca-Mg-HCO3-SO4
TLG-GL	surface water	off site	9/20/2000	Ca-Mg-HCO3-SO4

Table 15
QAQC Results for All Water Analyses

PARAMETERS	Monitoring well L14821-6 MW00-01 1-Aug-00	Monitoring well L14821-7 MW00-01A 1-Aug-00 FD of L14821-6	RPD	Open Pit B2 L17746-7 OP-B2-SW-09/00 19-Sep-00	Open Pit B2 L17746-8 OP-B2-SW-09/00-B 19-Sep-00 FD of L17746-7	RPD	Baker Creek L17746-3 BC-DS2-SW-09/00 19-Sep-00	Baker Creek L17746-5 BC-DS2-SW-09/00-C 19-Sep-00 FD of L17746-3	RPD	Baker Creek L32566-4 BC-DS2-SW-05/01 15-May-01	Baker Creek L32566-5 BC-DS2-SW-05/01-C 15-May-01 FD of L32566-4	RPD	Dam 11 L19648-3 TLG-11-SW-10/00 16-Oct-00	Dam 11 L19648-4 TLG-11A-SW-10/00 16-Oct-00 FD of L19648-3	RPD	Dam 22B L17833-10 TLG-22B-SW-09/00 20-Sep-00	Dam 22B L17833-13 TLG-22B-SW-09/00-A 20-Sep-00 FD of L17833-10	RPD	Dam 7 L19648-1 TLG-7A-SW-10/00 16-Oct-00	Dam 7 3353-2 TLG-7A-SW-10/00 16-Oct-00 ID	RPD
Standard Tests																					
Alkalinity (total as $CaCO_3$)	127	126	0.8	157	157	0.0	83	78	6.2	47	48	2.1	131	-	-	159	158	0.6	161	169	4.8
Conductivity (lab)	2040	2070	1.5	1980	1970	0.5	2220	2140	3.7	156.0	157.0	0.6	-	-	-	2040	2020	1.0	-	-	-
Hardness (as $CaCO_3$)	760	757	0.4	1210	1200	0.8	908	883	2.8	64.0	64.0	0.0	-	-	-	835	835	0.0	-	771	-
pH (lab)	7.8	7.8	0.0	7.7	7.7	0.0	7.7	7.7	0.0	7.5	7.5	0.0	-	-	-	7.6	7.6	0.0	-	-	-
Total Dissolved Solids	1340	1350	0.7	1670	1650	1.2	1570	1520	3.2	77.0	79.0	2.6	-	-	-	1410	1400	0.7	-	-	-
Dissolved Organic Carbon	-	-	-	9	9	0.0	6	6	0.0	13.0	13.0	0.0	7	6	15	6	7	15	10	9	11
Anions																					
Chloride	291	293	0.7	18	18	0.0	291	285	2.1	4.0	4.0	0.0	-	-	-	222	223	0.4	-	-	-
Sulphate	511	519	1.6	970	970	0.0	679	659	3.0	17.1	17.8	4.0	-	-	-	636	633	0.5	-	-	-
Nutrients																					
Nitrate+Nitrite (N)	6.5	7.8	18	30.2	27.7	8.6	13	12.6	3.1	<0.1	<0.1	NC	-	-	-	6.1	6.1	0.0	-	-	-
Ammonia (N)	3.34	3.59	7.2	1.27	1.28	0.8	0.28	0.49	**55**	0.2	0.2	0	<0.05	<0.05	-	1.39	1.4	0.7	-	-	-
Nitrate (N)	5.7	7.1	**22**	29.3	26.9	8.5	12.9	12.4	4.0	<0.1	<0.1	NC	3	5.2	**54**	6.1	6.1	0.0	0.7	0.86	**21**
Nitrite (N)	0.74	0.72	2.7	0.82	0.8	2.5	0.14	0.24	-	<0.05	<0.05	NC	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	0.01	-
Dissolved Metals																					
Aluminum	0.02	0.01	**67**	<0.01	<0.01	-	0.01	<0.01	-	0.03	0.03	0.0	<0.01	<0.01	-	<0.01	<0.01	-	-	<0.05	-
Antimony	1.80	1.81	0.6	0.388	0.391	0.8	0.671	0.663	1.2	0.0073	0.0074	1.4	0.511	0.521	1.9	1.38	1.35	2.2	-	0.2	-
Arsenic 3+	0.305	0.291	4.7	0.116	0.115	0.9	0.008	0.008	0.0	0.015	0.0148	1.3	0.395	0.395	0.0	0.035	0.035	0.0	0.196	-	-
Arsenic 5+	2.19	2.58	16	3.96	3.67	7.6	0.307	0.269	13	0.0798	0.0808	1	1.94	1.87	3.7	1.28	1.37	6.8	1.12	-	-
Total Dissolved Arsenic	4.40	4.39	0.2	4.11	4.15	1.0	0.35	0.316	10	0.0933	0.0927	1	2.33	2.26	3.1	1.53	1.47	4.0	1.32	1.4	5.9
Barium	0.014	0.014	0.0	0.028	0.029	3.5	0.022	0.019	15	0.011	0.011	0	0.035	0.035	0.0	0.036	0.035	2.8	-	0.04	-
Beryllium	<0.001	<0.001	-	<0.001	<0.001	-	<0.001	<0.001	-	<0.001	<0.001	NC	<0.001	<0.001	-	<0.001	<0.001	-	-	<0.005	-
Boron	0.50	0.50	0.0	0.15	0.15	0.0	0.5	0.49	2.0	<0.05	<0.05	NC	0.3	0.3	0.0	0.55	0.54	1.8	-	0.2	-
Cadmium	<0.001	<0.001	-	<0.001	<0.001	-	<0.001	<0.001	-	<0.001	<0.001	NC	<0.001	<0.001	-	<0.001	<0.001	-	-	<0.002	-
Calcium	218	217	0.5	308	307	0.3	267	260	2.7	15.3	15.3	0.0	273	275	0.7	227	227	0.0	-	203	-
Chromium	<0.005	<0.005	-	<0.005	<0.005	-	<0.005	0.005	-	<0.005	<0.005	NC	<0.005	<0.005	-	0.005	0.008	**46**	-	<0.01	-
Cobalt	0.066	0.066	0.0	0.042	0.042	0.0	0.062	0.068	9.2	<0.002	<0.002	NC	0.074	0.074	0.0	0.072	0.071	1.4	-	0.03	-
Copper	0.015	0.014	6.9	0.004	0.004	0.0	0.021	0.024	13	0.005	0.005	0.0	0.246	0.246	0.0	0.049	0.046	6.3	-	0.01	-
Iron	0.054	0.061	12	<0.005	<0.005	-	<0.005	<0.005	-	0.097	0.097	0.0	<0.005	<0.005	-	0.357	0.411	14	-	<0.03	-
Lead	<0.005	<0.005	-	<0.005	<0.005	-	<0.005	<0.005	-	<0.005	<0.005	NC	<0.005	<0.005	-	<0.005	<0.005	-	-	<0.01	-
Magnesium	52.4	52.2	0.4	106	106	0.0	58.7	56.8	3.3	4.76	4.71	1.1	96	97.4	1.4	65.1	65.2	0.2	-	64.2	-
Manganese	0.237	0.239	0.8	0.273	0.268	1.8	0.028	0.046	**49**	0.065	0.065	0.0	0.388	0.391	0.8	0.708	0.785	10	-	0.046	-
Mercury	0.0014	0.0002	**150**	-	-	-	-	-	-	<0.0002	<0.0002	NC	<0.0002	<0.0002	-	<0.0002	<0.0002	-	-	<0.00005	-
Molybdenum	0.027	0.027	0.0	0.032	0.033	3.1	0.023	0.024	4.3	<0.005	<0.005	NC	0.028	0.029	3.5	0.03	0.029	3.4	-	<0.03	-
Nickel	0.011	0.011	0.0	0.078	0.076	2.6	0.101	0.102	1.0	0.002	0.002	0.0	0.039	0.039	0.0	0.031	0.03	3.3	-	<0.05	-
Phosphorus	<0.1	<0.1	-	<0.1	<0.1	-	<0.1	<0.1	-	<0.1	<0.1	NC	<0.1	<0.1	-	<0.1	<0.1	-	-	-	-
Potassium	13.3	13.3	0.0	10.6	10.6	0.0	11.9	11.9	0.0	1.5	1.4	6.9	10	10.1	1.0	13.0	13	0.0	-	-	-
Silver	<0.005	<0.005	-	<0.005	<0.005	-	<0.005	<0.005	-	<0.005	<0.005	NC	<0.005	<0.005	-	<0.005	<0.005	-	-	<0.001	-
Sodium	148	147	0.7	26	23	12.2	155	142	8.8	4.0	4.0	0.0	99.2	100	0.8	120	121	0.8	-	81	-
Strontium	2.04	2.09	2.4	0.778	0.788	1.3	2.18	2.18		0.051	0.051	0.0									
Thallium	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	NC	<0.05	<0.05	-	<0.05	<0.05	-	-	0.002	-
Tin	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	NC	<0.05	<0.05	-	<0.05	<0.05	-	-	-	-
Titanium	<0.001	<0.001	-	<0.001	<0.001	-	<0.001	<0.001	-	<0.001	<0.001	NC	<0.001	0.003	-	0.001	0.001	0.0	-	-	-
Vanadium	0.003	0.003	0.0	0.003	0.003	0.0	0.002	0.002	0.0	<0.001	<0.001	NC	0.004	0.004	0.0	0.004	0.004	0.0	-	-	-
Zinc	0.010	0.008	**22**	0.018	0.014	**25**	0.001	0.023	**183**	0.005	0.005	0.0	0.016	0.02	**22**	0.006	0.002	**100**	-	<0.005	-
Total Metals																					
Aluminum	1.74	0.99	**55**	0.06	0.75	**170**	0.15	0.02	**153**	1.43	1.77	**21.3**	0.91	0.79	14	0.02	0.05	**86**	-	-	-
Antimony	1.92	1.92	0.0	0.389	0.425	8.8	0.685	0.78	13	0.0196	0.0206	5	0.516	0.469	9.5	1.35	1.35	0.0	-	-	-
Arsenic	4.91	4.94	0.6	4.13	4.35	5.2	0.365	0.37	1.4	0.231	0.229	0.9	2.66	2.5	6.2	1.34	1.34	0.0	-	-	-
Barium	0.020	0.017	16	0.029	0.033	13	0.025	0.024	4.1	0.033	0.034	3.0	0.042	0.034	**21**	0.035	0.035	0.0	-	-	-
Beryllium	<0.002	<0.002	-	<0.002	<0.002	-	<0.002	<0.002	-	<0.002	<0.002	NC	<0.002	<0.002	-	<0.002	<0.002	-	-	-	-
Cadmium	<0.001	<0.001	-	<0.001	<0.001	-	<0.001	<0.001	-	<0.001	<0.001	NC	<0.001	<0.001	-	<0.001	<0.001	-	-	-	-
Calcium	-	-	-	292	334	13	260	282	8.1	15.3	15.2	0.7	264	270	2.2	216	216	0.0	-	-	-
Chromium	0.005	0.006	18	<0.005	<0.005	-	0.007	0.008	13	<0.005	<0.005	NC	<0.005	0.005	-	0.006	0.006	0.0	-	-	-
Cobalt	0.081	0.081	0.0	0.047	0.054	14	0.075	0.09	18	0.005	0.005	0.0	0.068	0.065	4.5	0.067	0.067	0.0	-	-	-
Copper	0.028	0.027	3.6	0.019	0.006	**104**	0.028	0.04	**35**	0.018	0.018	0.0	0.252	0.24	4.9	0.053	0.053	0.0	-	-	-
Iron	2.33	1.89	**21**	<0.005	1.38	-	0.257	<0.005	-	0.869	1.08	**21.7**	0.916	0.997	8.5	0.402	0.415	3.2	-	-	-
Lead	0.015	0.014	6.9	<0.005	<0.005	-	<0.005	<0.005	-	0.006	0.007	15.4	<0.005	<0.005	-	<0.005	<0.005	-	-	-	-
Magnesium	0.314	0.310	1.3	83.2	91.4	9.4	49.6	53.6	7.8	5.1	5.1	0.0	91.2	65.4	**33**	58	59.1	1.9	-	-	-
Manganese	<0.0002	<0.0002	-	0.298	0.365	20	0.055	0.062	12	0.079	0.080	1.3	0.389	0.372	4.5	0.799	0.799	0.0	-	-	-
Molybdenum	0.032	0.032	0.0	0.033	0.039	17	0.027	0.031	14	<0.005	<0.005	NC	0.027	0.027	0.0	0.03	0.029	3.4	-	-	-
Nickel	0.013	0.012	8.0	0.085	0.099	15	0.122	0.14	14	0.008	0.008	0.0	0.015	0.039	**89**	0.031	0.031	0.0	-	-	-
Phosphorus	0.14	0.14	0.0	0.06	0.17	**96**	0.07	0.08	13	0.17	0.18	5.7	0.07	0.08	13	0.07	0.07	0.0	-	-	-
Potassium	-	-	-	8.9	9.7	8.6	9.4	10.1	7.2	1.8	1.8	0.0	9.6	8.9	7.6	13	13.1	0.8	-	-	-
Silver	<0.005	<0.005	-	<0.005	<0.005	-	<0.005	<0.005	-	<0.005	<0.005	NC	<0.005	<0.005	-	<0.005	<0.005	-	-	-	-
Sodium	-	-	-	17	18	5.7	199	199	0.0	4	4	0.0	97	131	**30**	118	120	1.7	-	-	-
Strontium	2.27	2.34	3.0	0.779	0.911	16	2.31	2.53	9.1	0.10	0.10	0.0	1.24	1.2	3.3	1.27	1.28	0.8	-	-	-
Thallium	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	NC	<0.05	<0.05	-	<0.05	<0.05	-	-	-	-
Tin	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	NC	<0.05	<0.05	-	<0.05	<0.05	-	-	-	-
Titanium	0.018	0.013	**32**	0.001	0.013	**171**	0.008	0.004	**67**	0.087	0.061	**35.1**	0.035	0.028	**22**	0.003	0.003	0.0	-	-	-
Vanadium	0.010	0.008	**22**	0.003	0.006	**67**	0.003	0.003	0.0	0.004	0.005	**22.2**	0.006	0.005	18	0.004	0.004	0.0	-	-	-
Zinc	0.025	0.026	3.9	0.032	0.026	21	0.009	0.059	**147**	0.024	0.034	**34.5**	0.101	0.008	**171**	0.009	0.006	**40**	-	-	-
Cyanide																					
Total Cyanide	0.183	0.172	6.2	-	-	-	0.036	0.046	**24**	<0.002	<0.002	NC	0.027	0.019	**35**	0.027	0.019	**35**	0.016	0.033	**69**

Table 15
QAQC Results for All Water Analyses

PARAMETERS	Dam 7 L19648-2 TLG-7B-SW-10/00 16-Oct-00	Dam 7 3353-3 TLG-7B-SW-10/00 16-Oct-00 ID	RPD	Dam 11 L19648-3 TLG-11-SW-10/00 16-Oct-00	Dam 11 3353-1 TLG-11-SW-10/00 16-Oct-00 ID	RPD
Standard Tests						
Alkalinity (total as $CaCO_3$)	221	252	13	131	136	3.7
Conductivity (lab)	-	-	-	-	-	-
Hardness (as $CaCO_3$)	-	588	-	-	1140	-
pH (lab)	-	-	-	-	-	-
Total Dissolved Solids	-	-	-	-	-	-
Dissolved Organic Carbon	9	8.7	3.4	7	6.1	14
Anions						
Chloride	-	-	-	-	-	-
Sulphate	-	-	-	-	-	-
Nutrients						
Nitrate+Nitrite (N)	-	-	-	-	-	-
Ammonia (N)	-	-	-	<0.05	-	-
Nitrate (N)	<0.1	0.007	-	3	6.31	**71**
Nitrite (N)	<0.05	0.001	-	<0.05	0.006	-
Dissolved Metals						
Aluminum	-	<0.05	-	<0.01	<0.05	-
Antimony	-	<0.2	-	0.511	0.5	2.2
Arsenic 3+	0.0548	-	-	0.395	-	-
Arsenic 5+	0.297	-	-	1.94	-	-
Total Dissolved Arsenic	0.352	0.3	16	2.33	2.8	18
Barium	-	0.03	-	0.035	0.03	15
Beryllium	-	<0.005	-	<0.001	<0.005	-
Boron	-	<0.1	-	0.3	0.3	0.0
Cadmium	-	<0.002	-	<0.001	<0.002	-
Calcium	-	166	-	273	296	8.1
Chromium	-	<0.01	-	<0.005	<0.01	-
Cobalt	-	0.01	-	0.074	0.06	**21**
Copper	-	<0.01	-	0.246	0.21	16
Iron	-	<0.03	-	<0.005	<0.03	-
Lead	-	<0.01	-	<0.005	<0.01	-
Magnesium	-	42.5	-	96	98.4	2.5
Manganese	-	0.055	-	0.388	0.333	15
Mercury	-	<0.00005	-	<0.0002	<0.00005	-
Molybdenum	-	<0.03	-	0.028	<0.03	-
Nickel	-	<0.05	-	0.039	<0.05	-
Phosphorus	-	-	-	<0.1	-	-
Potassium	-	-	-	10	-	-
Silver	-	<0.001	-	<0.005	<0.001	-
Sodium	-	36	-	99.2	111	11
Strontium						
Thallium	-	0.001	-	<0.05	0.002	-
Tin	-	-	-	<0.05	-	-
Titanium	-	-	-	<0.001	-	-
Vanadium	-	-	-	0.004	-	-
Zinc	-	<0.005	-	0.016	0.015	6.5
Total Metals						
Aluminum	-	-	-	0.91	-	-
Antimony	-	-	-	0.516	-	-
Arsenic	-	-	-	2.66	-	-
Barium	-	-	-	0.042	-	-
Beryllium	-	-	-	<0.002	-	-
Cadmium	-	-	-	<0.001	-	-
Calcium	-	-	-	264	-	-
Chromium	-	-	-	<0.005	-	-
Cobalt	-	-	-	0.068	-	-
Copper	-	-	-	0.252	-	-
Iron	-	-	-	0.916	-	-
Lead	-	-	-	<0.005	-	-
Magnesium	-	-	-	91.2	-	-
Manganese	-	-	-	0.389	-	-
Molybdenum	-	-	-	0.027	-	-
Nickel	-	-	-	0.015	-	-
Phosphorus	-	-	-	0.07	-	-
Potassium	-	-	-	9.6	-	-
Silver	-	-	-	<0.005	-	-
Sodium	-	-	-	97	-	-
Strontium	-	-	-	1.24	-	-
Thallium	-	-	-	<0.05	-	-
Tin	-	-	-	<0.05	-	-
Titanium	-	-	-	0.035	-	-
Vanadium	-	-	-	0.006	-	-
Zinc	-	-	-	0.101	-	-
Cyanide						-
Total Cyanide	0.005	0.018	**113**	0.027	0.053	**65**

Table 16
Surface Water Quality
Total Metals for Baker Creek (Sept. '00 May '01)
Miramar Giant Mine

PARAMETERS			Location / Northing / Easting / Lab ID / Sample ID / Sample Date / QAQC	CCME Aquatic Life	Water Quality Discharge Permit: Maximum Average Concentration	Water Quality Discharge Permit: Maximum Concentration of Any Grab Sample	Baker Creek 6932932 635938 L17746-4 BC-DS1-SW-09/00 19-Sep-00	Baker Creek 6932932 635938 L17833-3 BC-DS1-SW-09/00 -D 20-Sep-00 Filter blank	Baker Creek 6931262 635860 L17746-3 BC-DS2-SW-09/00 19-Sep-00	Baker Creek 6931262 635860 L17746-5 BC-DS2-SW-09/00-C 19-Sep-00 FD of L17746-3	Baker Creek 6933915 635720 L17833-1 BC-US-SW-09/00 20-Sep-00	Effluent Discharge 6933802 636168 L17833-2 BC-EFF-SW-09/00 20-Sep-00	Baker Creek 6933917 635727 L32566-1 BC-US-SW-05/01 15-May-01
Total Metals		UNITS	MDL										
Aluminum	Al	mg/L		0.005-0.1			**0.08**	**0.03**	**0.15**	**0.02**	**0.05**	**0.06**	**0.07**
Antimony	Sb	mg/L					0.721	0.0005	0.685	0.78	0.0015	0.872	0.0019
Arsenic	As	mg/L		0.005	0.5	1	**0.342**	<0.0004	**0.365**	**0.37**	**0.0145**	**0.549**	**0.0399**
Barium	Ba	mg/L					0.022	<0.003	0.025	0.024	0.01	0.019	0.013
Beryllium	Be	mg/L					<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cadmium	Cd	mg/L		0.000017			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Calcium	Ca	mg/L					263	<0.5	260	282	22	332	12.7
Chromium	Cr	mg/L					0.007	<0.005	0.007	0.008	<0.005	0.005	<0.005
Cobalt	Co	mg/L					0.082	<0.002	0.075	0.09	<0.002	0.095	<0.002
Copper	Cu	mg/L		0.002-0.004	0.3	0.6	**0.036**	0.001	**0.028**	**0.04**	<0.001	**0.042**	**0.003**
Iron	Fe	mg/L		0.3			<0.005	0.038	0.257	<0.005	0.166	**0.548**	0.179
Lead	Pb	mg/L		0.001-0.007	0.2	0.4	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Magnesium	Mg	mg/L					50.3	<0.1	49.6	53.6	7.4	70.6	4.4
Manganese	Mn	mg/L					0.055	0.002	0.055	0.062	0.025	0.135	0.097
Mercury				0.0001			-	<0.0002	-	-	<0.0002	<0.0002	<0.0002
Molybdenum	Mo	mg/L		0.073			0.029	<0.005	0.027	0.031	<0.005	0.034	<0.005
Nickel	Ni	mg/L		0.025-0.15	0.5	1	**0.127**	<0.002	**0.122**	**0.14**	<0.002	**0.138**	<0.002
Phosphorus	P	mg/L					0.06	0.1	0.07	0.08	0.21	0.08	0.08
Potassium	K	mg/L					9.7	0.1	9.4	10.1	1.6	16.8	1.5
Silver	Ag	mg/L		0.0001			<0.005	<0.005	<0.005	<0.005	-	<0.005	<0.005
Sodium	Na	mg/L					190	<1	199	199	5	176	3
Strontium	Sr	mg/L					2.34	<0.002	2.31	2.53	0.078	2.83	0.052
Thallium	Tl	mg/L		0.0008			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Tin	Sn	mg/L					<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Titanium	Ti	mg/L					0.002	<0.001	0.008	0.004	<0.001	0.003	0.001
Vanadium	V	mg/L					0.003	<0.001	0.003	0.003	<0.001	0.004	<0.001
Zinc	Zn	mg/L		0.03	0.2	0.4	0.013	0.018	0.009	**0.059**	0.02	0.027	0.004
Cyanide													
Total Cyanide	CN	mg/L		0.005	0.8	1.6	**0.054**	-	**0.036**	**0.046**	-	**0.048**	-
Ion Balance Calculation													
Ion Balance		%					101	-	101	99.8	107	97.7	107

Notes:
All concentrations in mg/L, unless otherwise stated.

Table 16
Surface Water Quality
Total Metals for Baker Creek (Sept. '00 May '01)
Miramar Giant Mine

PARAMETERS		UNITS	Location / Northing / Easting / Lab ID / Sample ID / Sample Date / QAQC	CCME Aquatic Life	Water Quality Discharge Permit: Maximum Average Concentration	Water Quality Discharge Permit: Maximum Concentration of Any Grab Sample	Baker Creek 6933804 636071 L32566-2 BC-EFF-SW-05/01 15-May-01	Baker Creek 6932904 635934 L32566-3 BC-DS1-SW-05/01 15-May-01	Baker Creek 6931184 6366021 L32566-4 BC-DS2-SW-05/01 15-May-01	Baker Creek 6931184 6366021 L32566-5 BC-DS2-SW-05/01-C 15-May-01 FD of L32566-4
Total Metals		**UNITS**	**MDL**							
Aluminum	Al	mg/L		**0.005-0.1**			**0.72**	**0.56**	**1.43**	**1.77**
Antimony	Sb	mg/L					0.0258	0.131	0.0196	0.0206
Arsenic	As	mg/L		**0.005**	**0.5**	**1**	**0.166**	**0.662**	**0.231**	**0.229**
Barium	Ba	mg/L					0.019	0.010	0.033	0.034
Beryllium	Be	mg/L					<0.002	<0.002	<0.002	<0.002
Cadmium	Cd	mg/L		**0.000017**			<0.001	<0.001	<0.001	<0.001
Calcium	Ca	mg/L					19.4	22.6	15.3	15.2
Chromium	Cr	mg/L					<0.005	<0.005	<0.005	<0.005
Cobalt	Co	mg/L					<0.002	<0.002	0.005	0.005
Copper	Cu	mg/L		**0.002-0.004**	**0.3**	**0.6**	**0.006**	**0.008**	**0.018**	**0.018**
Iron	Fe	mg/L		**0.3**			**0.633**	**0.874**	**0.869**	**1.08**
Lead	Pb	mg/L		**0.001-0.007**	**0.2**	**0.4**	<0.005	<0.005	**0.006**	**0.007**
Magnesium	Mg	mg/L					6.4	5.3	5.1	5.1
Manganese	Mn	mg/L					0.081	0.049	0.079	0.080
Mercury				**0.0001**			<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	Mo	mg/L		**0.073**			<0.005	<0.005	<0.005	<0.005
Nickel	Ni	mg/L		**0.025-0.15**	**0.5**	**1**	0.004	0.003	0.008	0.008
Phosphorus	P	mg/L					0.08	0.08	0.17	0.18
Potassium	K	mg/L					2.2	1.7	1.8	1.8
Silver	Ag	mg/L		**0.0001**			<0.005	<0.005	<0.005	<0.005
Sodium	Na	mg/L					5	3	4	4
Strontium	Sr	mg/L					0.064	0.054	0.10	0.10
Thallium	Tl	mg/L		**0.0008**			<0.05	<0.05	<0.05	<0.05
Tin	Sn	mg/L					<0.05	<0.05	<0.05	<0.05
Titanium	Ti	mg/L					0.087	0.013	0.087	0.061
Vanadium	V	mg/L					0.002	0.002	0.004	0.005
Zinc	Zn	mg/L		**0.03**	**0.2**	**0.4**	0.022	0.006	0.024	**0.034**
Cyanide										
Total Cyanide	CN	mg/L		**0.005**	**0.8**	**1.6**	<0.002	<0.002	<0.002	<0.002
Ion Balance Calculation										
Ion Balance		%					102	104	106	105

Notes:
All concentrations in mg/L, unless otherwise stated.

Sediment Sampling Location in Baker Creek and Yellowknife Bay Near Giant Mine

	Sample Location	Sample Site Description	Sample Code	Analysis
Baker Creek				
1	Baker Creek Upstream	Baker Creek upstream of the mine discharge	BC-US-SD-09/00-01 -02	Total Metals as Spec'n TOC
2	Baker Creek "effluent"	Upstream end of the large pond into which the effluent discharges	BC-EFF-SD-09/00-01 -02	Total Metals as Spec'n TOC
3	Baker Creek Downstream #1	Baker Creek downstream of effluent discharge point in marshy area west of the mill/shaft	BC-DS1-SD-09/00-01 -02	Total Metals as Spec'n TOC
4	Baker Creek Downstream #2	Baker Creek prior to flowing into Yellowknife Bay – approximately 10 m upstream of outlet	BC-DS2-SD-09/00-01 -02	Total Metals as Spec'n TOC
5	Yellowknife Bay near Baker Creek Outlet Marsh (Downstream #3)	Marsh area in Yellowknife Bay on the west side of the dyke	BC-DS3-SD-09/00-01 -02	Total Metals as Spec'n TOC
6	Yellowknife Bay (Downstream #4)	East side of the dyke in Yellowknife Bay	BC-DS4-SD-09/00-01 -02	Total Metals as Spec'n TOC

Table 18
Chemical Analyses of Baker Creek Sediments, Giant Mine

Location Sample Control Number Date Sampled	CCME 1999 Interim Freshwater Sediment Quality Guidelines ISQG	CCME(1999) draft Freshwater Sediment Quality Criteria PEL	BC-US-SD-09/00-01 L17890-7 21/09/00	BC-US-SD-09/00-02 L17890-8 21/09/00	BC-EFF-SD-09/00-01 L17890-9 21/09/00	BC-EFF-SD-09/00-02 L17890-10 21/09/00	BC-DS1-SD-09/00-01 L17890-11 21/09/00	BC-DS1-SD-09/00-02 L17890-12 21/09/00	BC-DS2-SD-09/00-01 L17890-13 21/09/00
Carbon									
Organic Carbon (%)			1.80	1.70	0.20	0.10	1.30	1.70	0.80
Inorganic Carbon (%)			0.08	0.11	1.83	1.77	1.24	1.37	0.68
Total Carbon (%)			1.90	1.80	2.10	1.90	2.50	3.10	1.50
Arsenic									
Arsenic +3			85.1	132	973	940	642	724	1320
Arsenic +5			30.6	40.4	544	1050	421	94.1	350
Arsenic (5+,3+)			116	172	1520	1990	1060	818	1670
Soluble Arsenic			nm	nm	3.45	3.76	3.9	5.8	9.29
Total Arsenic	5.9	**17**	**171**	**205**	**1940**	**2490**	**3380**	**3190**	**5030**
Total Metals									
Aluminum			6700	6500	21200	20900	20900	24400	19900
Ammonia			<1	<1	2	4	3	5	5
Barium			77.9	75.1	12.8	15	58.4	82.7	60.5
Beryllium			<1	<1	<1	<1	<1	<1	<1
Calcium			3400	3400	42200	39700	28600	38200	18500
Cadmium	0.6	**3.5**	<0.5	<0.5	**4.2**	**4.3**	1.3	1.1	3.1
Chromium	37.3	**90**	29.9	29.3	59.8	58.8	59.9	73.2	62.2
Cobalt			6	7	29	29	44	33	41
Copper	35.7	**197**	20	18	97	70	**328**	**211**	**295**
Iron			13600	13900	64900	62800	40900	41500	58700
Lead	35.0	**91**	10	19	**644**	**647**	**218**	**177**	**463**
Phosphorus			380	410	330	310	430	410	430
Potassium			1150	970	860	1130	2000	2650	1880
Magnesium			4930	5010	20200	19500	20400	23900	15400
Manganese			840	920	830	780	620	650	520
Molybdenum			<1	<1	1	1	1	1	1
Nickel		**49**	15	16	**71**	**66**	**105**	**84**	**99**
Silver		**2.2**	<1	<1	<1	<1	**2**	1	1
Sodium			200	100	200	200	300	300	300
Strontium			15	14	30	28	30	37	26
Thallium			<1	<1	<1	<1	<1	<1	<1
Tin			<5	<5	<5	<5	<5	<5	<5
Titanium			362	325	52	49	476	530	308
Vanadium			32	24	66	67	70	80	65
Zinc	123	**315**	53.2	67.3	**822**	**828**	**316**	281	**820**

Notes:
1) All concentrations are in micrograms per gram (mg/kg).

Table 18
Chemical Analyses of Baker Creek Sediments, Giant Mine

Location Sample Control Number Date Sampled	CCME 1999 Interim Freshwater Sediment Quality Guidelines ISQG	CCME(1999) draft Freshwater Sediment Quality Criteria PEL	BC-DS2-SD-09/00-02 L17890-14 21/09/00	BC-DS3-SD-09/00-01 L17890-15 21/09/00	BC-DS3-SD-09/00-02 L17890-16 21/09/00	BC-DS4-SD-09/00-01 L17890-17 21/09/00	BC-DS4-SD-09/00-02 L17890-18 21/09/00
Carbon							
Organic Carbon (%)			0.60	0.40	0.80	2.30	0.40
Inorganic Carbon (%)			0.52	0.09	0.09	0.38	1.09
Total Carbon (%)			1.10	0.50	0.80	2.60	1.50
Arsenic							
Arsenic +3			616	17.3	23.2	445	377
Arsenic +5			24.8	34.8	13.5	47.1	145
Arsenic (5+,3+)			640	-	36.3	492	536
Soluble Arsenic			2.86	nm	nm	2.78	1.9
Total Arsenic	5.9	**17**	**2240**	**47**	**81.2**	**1110**	**1440**
Total Metals							
Aluminum			20500	17200	17300	19800	21400
Ammonia			5	<1	<1	3	2
Barium			113	133	143	119	87.5
Beryllium			<1	<1	<1	<1	<1
Calcium			14400	3300	3700	9100	13900
Cadmium	0.6	**3.5**	1.8	<0.5	<0.5	0.5	0.6
Chromium	37.3	**90**	52.8	41.5	42.1	53	61.2
Cobalt			24	9	8	28	52
Copper	35.7	**197**	**223**	38	36	**264**	**266**
Iron			34000	25800	20800	28200	35300
Lead	35.0	**91**	**222**	10	14	64	70
Phosphorus			440	460	410	470	450
Potassium			3290	3160	3190	3330	3090
Magnesium			11900	6790	6820	10800	13100
Manganese			400	220	200	320	480
Molybdenum			<1	<1	<1	<1	1
Nickel		**49**	**65**	24	25	**72**	**90**
Silver		**2.2**	<1	<1	<1	<1	<1
Sodium			400	300	300	500	500
Strontium			39	36	35	39	37
Thallium			<1	<1	<1	<1	<1
Tin			<5	<5	<5	<5	<5
Titanium			496	554	562	583	624
Vanadium			61	46	46	59	74
Zinc	123	**315**	**544**	63.2	62.1	195	246

Notes:
1) All concentrations are in micrograms per gram (mg/kg).

Table 19
Concentration of Water-Soluble and Total Arsenic Concentrations in Baker Creek Sediments

Sampling Location	Leachable/Water-soluble arsenic concentration (mg/kg)	Total arsenic concentration (mg/kg)	Percent leachable/water-soluble arsenic (%)
Golder (2000):			
BC-EFF-SD-01	3.45	1940	0.17
BC-EFF-SD-02	3.76	2490	0.15
BC-DS1-SD-01	3.9	3380	0.12
BC-DS1-SD-02	5.8	3190	0.18
BC-DS2-SD-01	9.29	5030	0.18
BC-DS2-SD-02	2.86	2240	0.13
BC-DS4-SD-01	2.78	1110	0.25
BC-DS4-SD-02	1.9	1440	0.13
Mace (1998)			
Baker Creek - #16	11	1764	0.62
Baker Creek - #18	68	2838	2.40
Baker Creek - #20	78	1736	4.49

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Table 20
Relative Percent Difference Chemical Parameters of Baker Creek Sediments

Location	CCME 1999 Interim Freshwater Sediment Quality Guidelines	CCME(1999) draft Freshwater Sediment Quality Criteria	BC-US-SD-09/00-01	BC-US-SD-09/00-02		BC-EFF-SD-09/00-01	BC-EFF-SD-09/00-02		BC-DS1-SD-09/00-01	BC-DS1-SD-09/00-02	
Sample Control Number			L17890-7	L17890-8	**RPD**	L17890-9	L17890-10	**RPD**	L17890-11	L17890-12	**RPD**
Date Sampled	**ISQG**	**PEL**	21/09/00	21/09/00	**%**	21/09/00	21/09/00	**%**	21/09/00	21/09/00	**%**
Carbon											
Organic Carbon (%)			1.80	1.70	5.7%	0.20	0.10	**66.7%**	1.30	1.70	26.7%
Inorganic Carbon (%)			0.08	0.11	31.6%	1.83	1.77	3.3%	1.24	1.37	10.0%
Total Carbon (%)			1.90	1.80	5.4%	2.10	1.90	10.0%	2.50	3.10	21.4%
Arsenic											
Arsenic +3			85.1	132	43.2%	973	940	3.5%	642	724	12.0%
Arsenic +5			30.6	40.4	27.6%	544	1050	**63.5%**	421	94.1	**126.9%**
Arsenic (5+,3+)			116	172	38.9%	1520	1990	26.8%	1060	818	25.8%
Soluble Arsenic			nm	nm	-	3.45	3.76	8.6%	3.9	5.8	39.2%
Total Arsenic	5.9	**17**	**171**	**205**	18.1%	**1940**	**2490**	24.8%	**3380**	**3190**	5.8%
Total Metals											
Cadmium	0.6	**3.5**	<0.5	<0.5	NC	**4.2**	**4.3**	2.4%	1.3	1.1	16.7%
Chromium	37.3	**90**	29.9	29.3	2.0%	59.8	58.8	1.7%	59.9	73.2	20.0%
Copper	35.7	**197**	20	18	10.5%	97	70	32.3%	**328**	**211**	43.4%
Lead	35.0	**91**	10	19	**62.1%**	**644**	**647**	0.5%	**218**	**177**	20.8%
Nickel		**49**	15	16	6.5%	**71**	**66**	7.3%	**105**	**84**	22.2%
Zinc	123	**315**	53.2	67.3	23.4%	**822**	**828**	0.7%	**316**	281	11.7%

Notes:

1) All concentrations are in micrograms per kilogram (mg/kg).
RPD = Relative Percent Difference
NC = Not calculated (one or both of the values are below the detection limit)
RPD values greater than 50% are **bolded**

Table 20
Relative Percent Difference Chemical Parameters of Baker Creek Sediments

Location	**CCME 1999 Interim**	**CCME(1999) draft**	BC-DS2-SD-09/00-01	BC-DS2-SD-09/00-02		BC-DS3-SD-09/00-01	BC-DS3-SD-09/00-02		BC-DS4-SD-09/00-01	BC-DS4-SD-09/00-02	
Sample Control Number	**Freshwater Sediment**	**Freshwater Sediment**	L17890-13	L17890-14	**RPD**	L17890-15	L17890-16	**RPD**	L17890-17	L17890-18	**RPD**
Date Sampled	**Quality Guidelines**	**Quality Criteria**	21/09/00	21/09/00	**%**	21/09/00	21/09/00	**%**	21/09/00	21/09/00	**%**
	ISQG	**PEL**									
Carbon											
Organic Carbon (%)			0.80	0.60	28.6%	0.40	0.80	**66.7%**	2.30	0.40	**140.7%**
Inorganic Carbon (%)			0.68	0.52	26.7%	0.09	0.09	0.0%	0.38	1.09	**96.6%**
Total Carbon (%)			1.50	1.10	30.8%	0.50	0.80	46.2%	2.60	1.50	**53.7%**
Arsenic											
Arsenic +3			1320	616	**72.7%**	17.3	23.2	29.1%	445	377	16.5%
Arsenic +5			350	24.8	**173.5%**	34.8	13.5	**88.2%**	47.1	145	**101.9%**
Arsenic (5+,3+)			1670	640	**89.2%**	-	36.3	-	492	536	8.6%
Soluble Arsenic			9.29	2.86	**105.8%**	nm	nm	-	2.78	1.9	37.6%
Total Arsenic	5.9	**17**	**5030**	**2240**	**76.8%**	**47**	**81.2**	**53.4%**	**1110**	**1440**	25.9%
Total Metals											
Cadmium	0.6	**3.5**	3.1	1.8	**53.1%**	<0.5	<0.5	NC	0.5	0.6	18.2%
Chromium	37.3	**90**	62.2	52.8	16.3%	41.5	42.1	1.4%	53	61.2	14.4%
Copper	35.7	**197**	**295**	**223**	27.8%	38	36	5.4%	**264**	**266**	0.8%
Lead	35.0	**91**	**463**	**222**	**70.4%**	10	14	33.3%	64	70	9.0%
Nickel		**49**	**99**	**65**	41.5%	24	25	4.1%	**72**	**90**	22.2%
Zinc	123	**315**	**820**	**544**	40.5%	63.2	62.1	1.8%	195	246	23.1%

Notes:

1) All concentrations are in micrograms per kilogram (mg/kg).
   RPD = Relative Percent Difference
   NC = Not calculated (one or both of the values are below the detection limit)
   RPD values greater than 50% are**bolded**

Table 21
Arsenic Concentrations in Aquatic Sediments at other Mine Sites

LOCATION	AS CONCENTRATION (mg/kg)	REFERENCE
Background Concentrations:		
Canada	<20	Mace, 1998
Canada	100-5000	CEPA 1993
NWT creek	6.5	Mace 1998
Halifax Harbour	65	CEPA 1993
Nova Scotia	262	CEPA 1993
Several provinces in Canada	100-200 (average) 650 (maximum)	CEPA 1993
Yellowknife River	6	Mace, 1998
Yellowknife area, natural sediment concentration Yellowknife Bay area	6-100, median 68 7-104	Ollson, 1999
Baker Creek Background	41-114	Mace 1998
Western Coast of Washington State and British Columbia	7-37	Mace, 1998
Upper Mississippi River	0.6-6.2, mean 2.6	Eisler, 1988
Lake Michigan	5-30	Eisler, 1988
Oceanic	<0.4-455, mean 33.7	Eisler, 1988
Lacustrine	5-26.9	Eisler, 1988
Impacted Sites:		
Yellowknife, NWT Area:		
Giant Yellowknife Mine Yellowknife Bay Beach Tailings area Baker Creek Upstream of effluent discharge Downstream of effluent discharge	 1193-3140 64.6-1016 41-114 238-3821	Mace 1998
Giant Yellowknife Mine Baker Creek: Upstream of effluent discharge Downstream of effluent discharge Marsh at mouth Yellowknife Bay	 171-205 1940-5030 47-81 1110-1440	Golder, in progress
Giant Yellowknife Mine Tailings Pond effluent 1975 Yellowknife Bay Back Bay	 1.5-20.4 4-3000 6-534	Moore et al. (1978)
Giant Yellowknife Mine Back Bay Tailings	 15-3685	Back Bay TLG Investigation 2000

Table 21
Arsenic Concentrations in Aquatic Sediments at other Mine Sites

LOCATION	AS CONCENTRATION (mg/kg)	REFERENCE
Con Mine		Ollson, 1999
Kam Lake, downstream from Con Mine	130-1571, mean 1110	
Meg Lake	174-865	
Keg Lake	132-2150	
Peg Lake	79.8-5550	
Great Slave Lake Outflow	10-380	
Baker Creek (downstream of Giant discharge), Kam Lake (downstream of historical Con discharge), and Keg Lake (drainage system of Con effluent discharge)	380-3821, median 1164	
Keg Lake, Great Slave Lake outflow, Yellowknife Bay, Back Bay, and Baker Creek outflow	155-681, median 302	
Kam, Grace, Keg, Likely, and Chitty Lakes	6-3500 (total)	
Yellowknife Back Bay Area	7.68-~2500	Jackson et al. 1996
Back Bay	<0.08-0.12	Sutherland, 1989
Yellowknife Bay	79-633	
Beach Area	65-1016	Mace, 1998
Yellowknife River and Yellowknife Bay	6-3140	
Baker Creek		Mace, 1998
Baker Creek Pond	1736	
Mill Samples	2838-3821	
Downstream	1764-1946	
Baker Creek Marsh	278-1825	
Areas around Canada:		
Ontario		Mace, 1998
Moira Lake	545-1000	
Miscellaneous Areas:		
From areas contaminated by smelteries, arsenical herbicides, or mine tailings:		Eisler, 1988
Surface	198-3500	
Subsurface	12-25	
Gold mines & abandoned precious metals refinery	700-5000 18,650 (maximum)	CEPA 1993
Gold mine, S. Colombia		Grosser et al., 1994
Background	46.3-110.6	
Impacted Sites	980.8-6300.9	
Coeur d'Alene River, Idaho	10.68-209.09	Mok & Wai, 1990
Panther and Blackbird Creek, Idaho	42.1-2550.4	Mok & Wai, 1990

Table A1-21

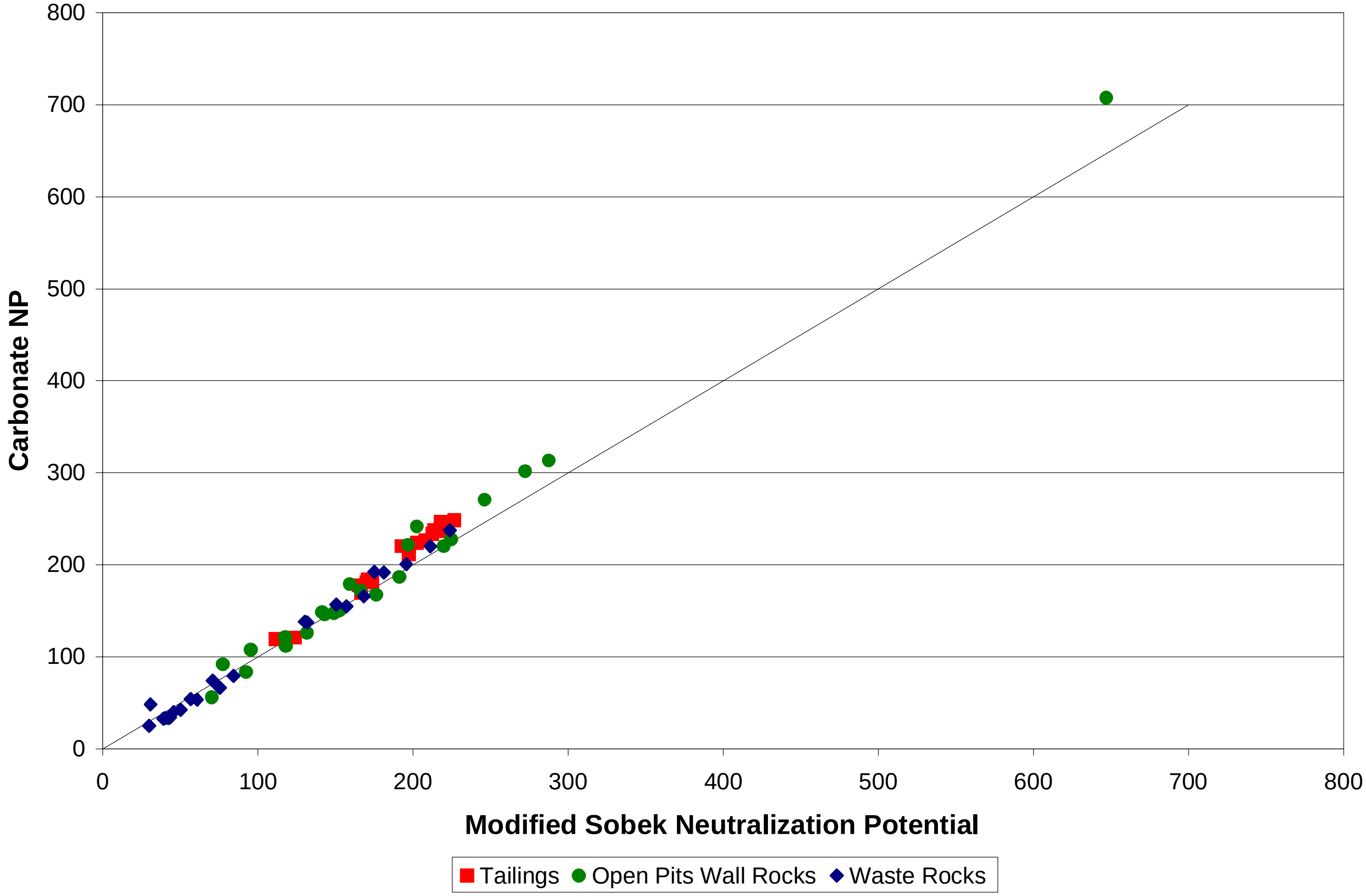
Concentration of Water-Soluble and Total Arsenic Concentrations in Baker Creek Sediments

Sampling Location	Leachable/Water-soluble arsenic concentration (mg/kg)	Total arsenic concentration (mg/kg)	Percent leachable/water-soluble arsenic (%)
Golder (2000):			
BC-EFF-SD-01	3.45	1940	0.17
BC-EFF-SD-02	3.76	2490	0.15
BC-DS1-SD-01	3.9	3380	0.12
BC-DS1-SD-02	5.8	3190	0.18
BC-DS2-SD-01	9.29	5030	0.18
BC-DS2-SD-02	2.86	2240	0.13
BC-DS4-SD-01	2.78	1110	0.25
BC-DS4-SD-02	1.9	1440	0.13
Mace (1998)			
Baker Creek - #16	11	1764	0.62
Baker Creek - #18	68	2838	2.40
Baker Creek - #20	78	1736	4.49

N:\FINAL\2000\002-2418\TBL0403 - TABLEA1-21.DOC

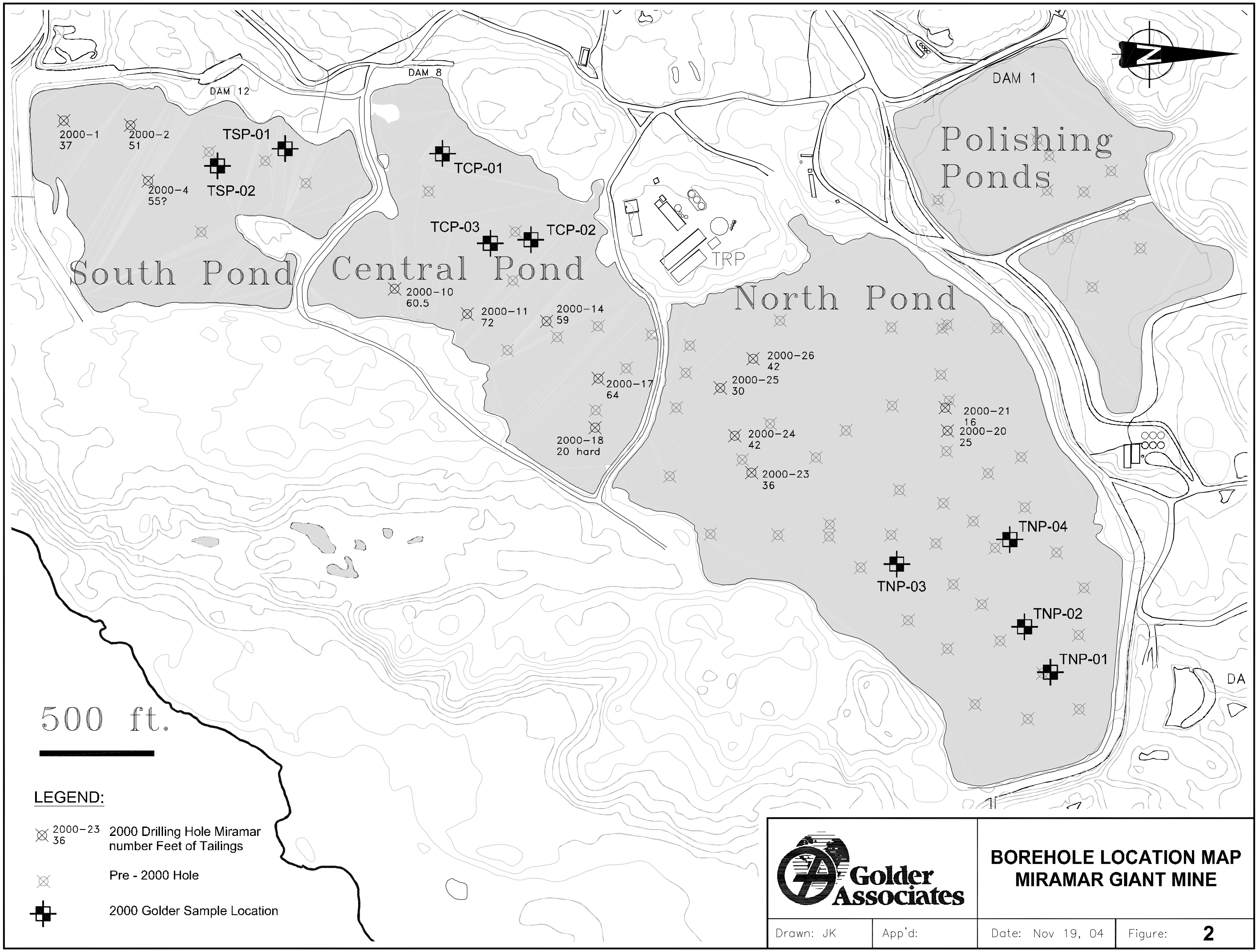
FIGURES

Figure 1
Carbonate NP vs Modified Sobek NP
Tailings, Open Pit Walls and Waste Rock Pile Samples
Miramar Giant Mine



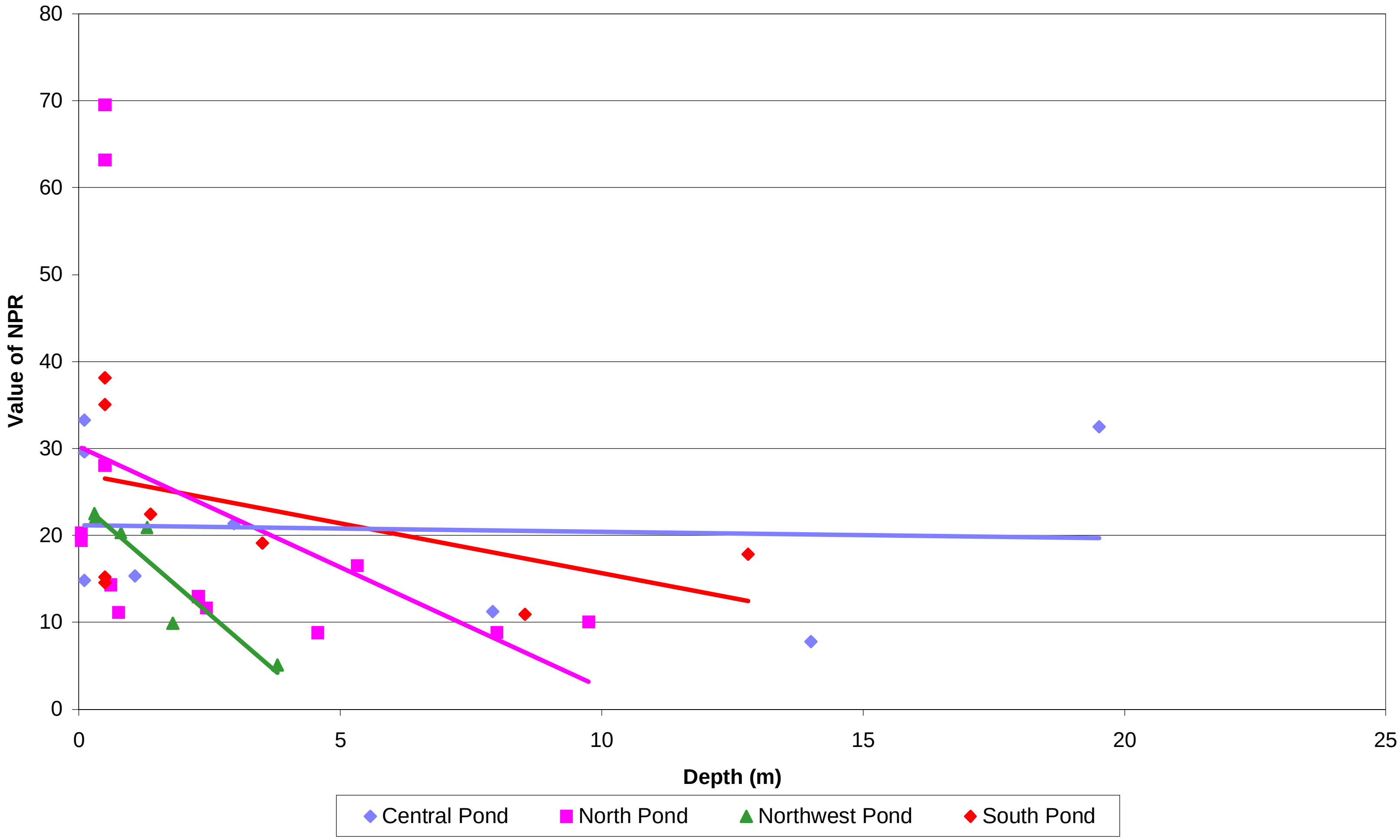
Golder Associates

Drawing: O:\Active\2000\2000\002-2418 A&R Miramar Giant\Drawings\geochem drwgs\P2418-01.dwg Plotted: Nov 19, 2004 - 8:58am By: lxiao



Project No.: 002-1418 Revision No.:

Figure 3
NPR with Depth of Tailings
Miramar Giant Mine



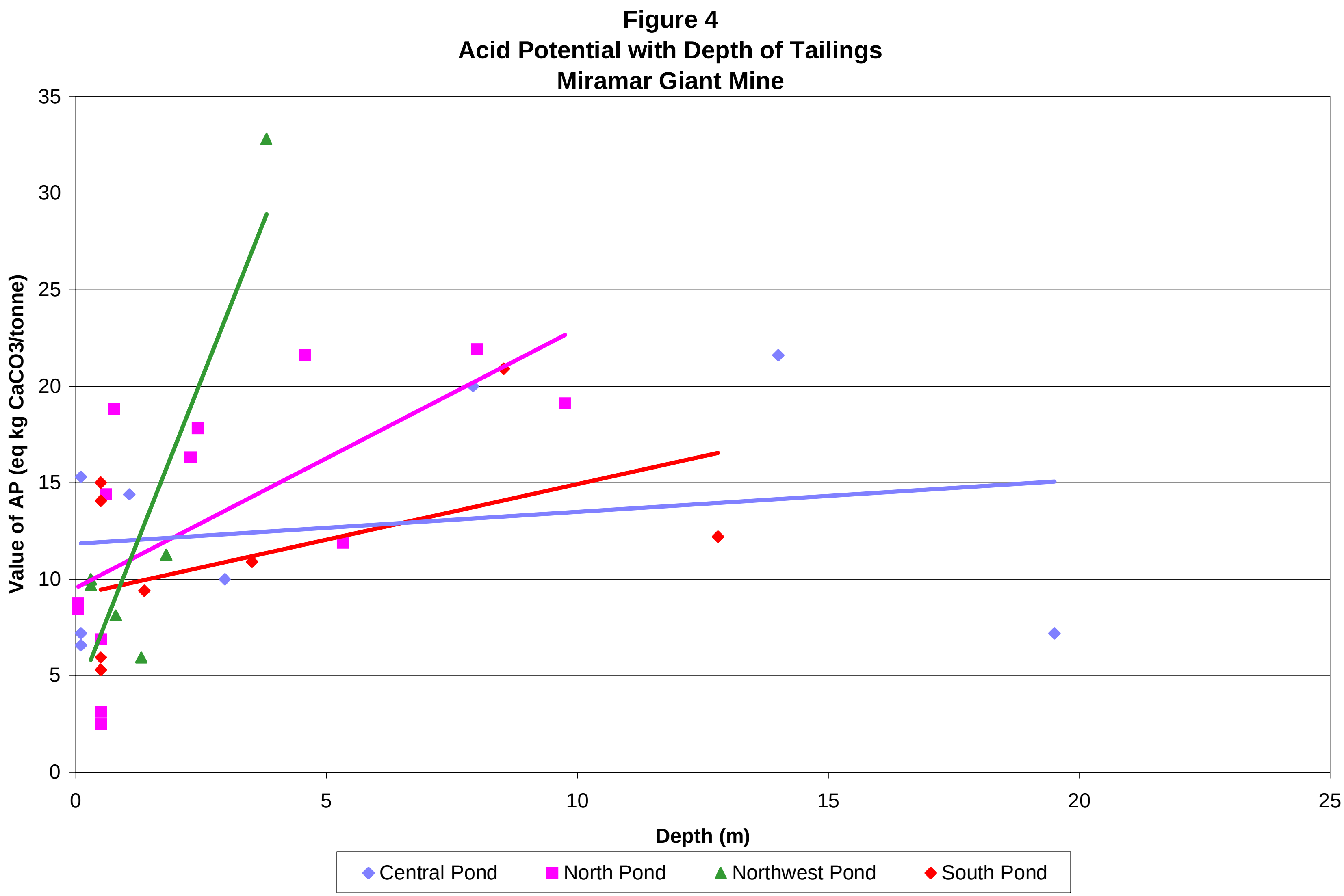


Figure 4
Acid Potential with Depth of Tailings
Miramar Giant Mine
Value of AP (eq kg CaCO3/tonne)
35
30
25
20
15
10
5
0
0
5
10
15
20
25
Depth (m)
Central Pond
North Pond
Northwest Pond
South Pond

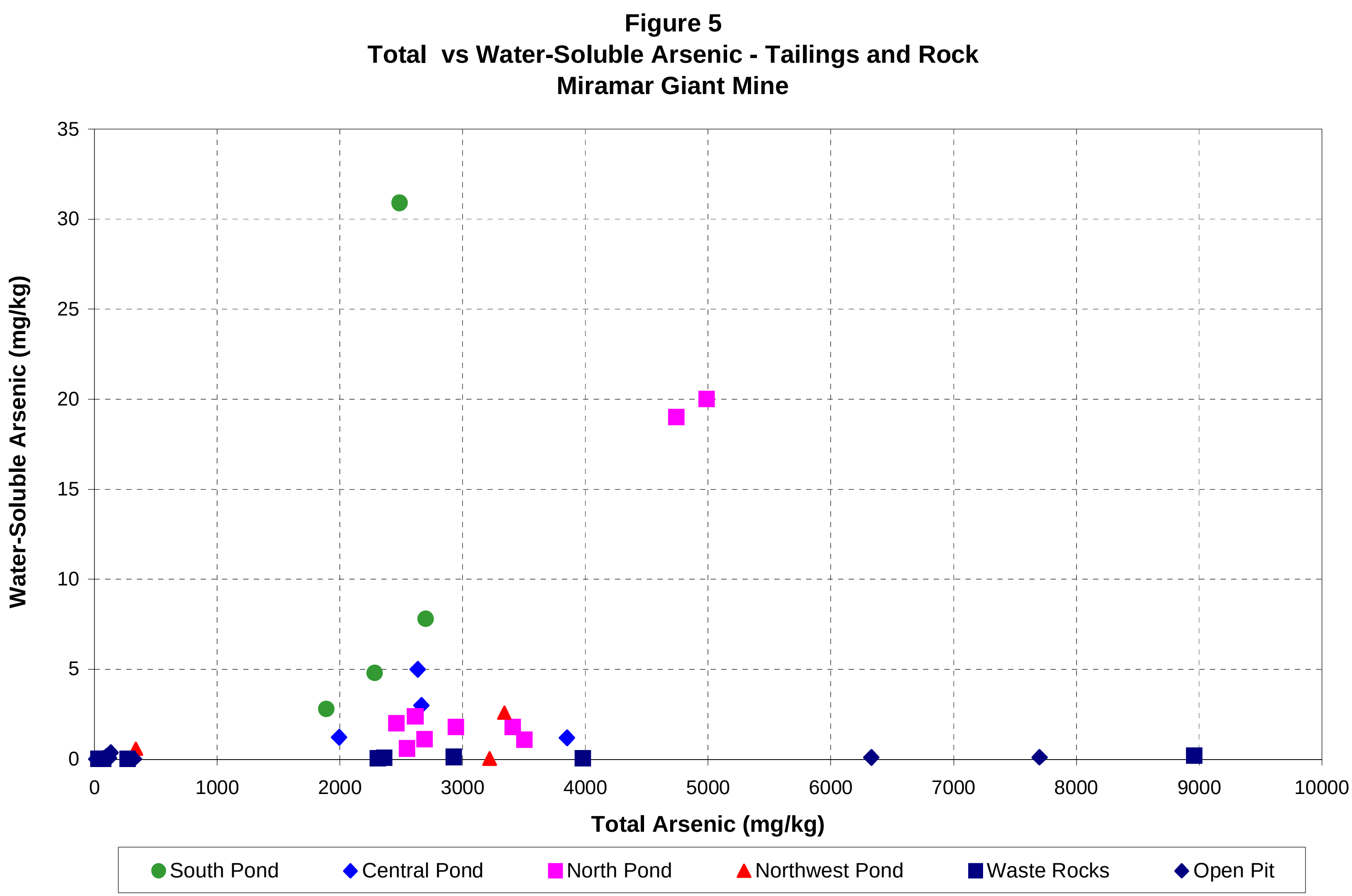


Figure 5
Total vs Water-Soluble Arsenic - Tailings and Rock
Miramar Giant Mine
35
30
25
20
15
10
5
0
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
10000
Water-Soluble Arsenic (mg/kg)
Total Arsenic (mg/kg)
South Pond
Central Pond
North Pond
Northwest Pond
Waste Rocks
Open Pit

Figure 6
Leachable Arsenic Concentration of Tailing vs Depth
Miramar Giant Mine

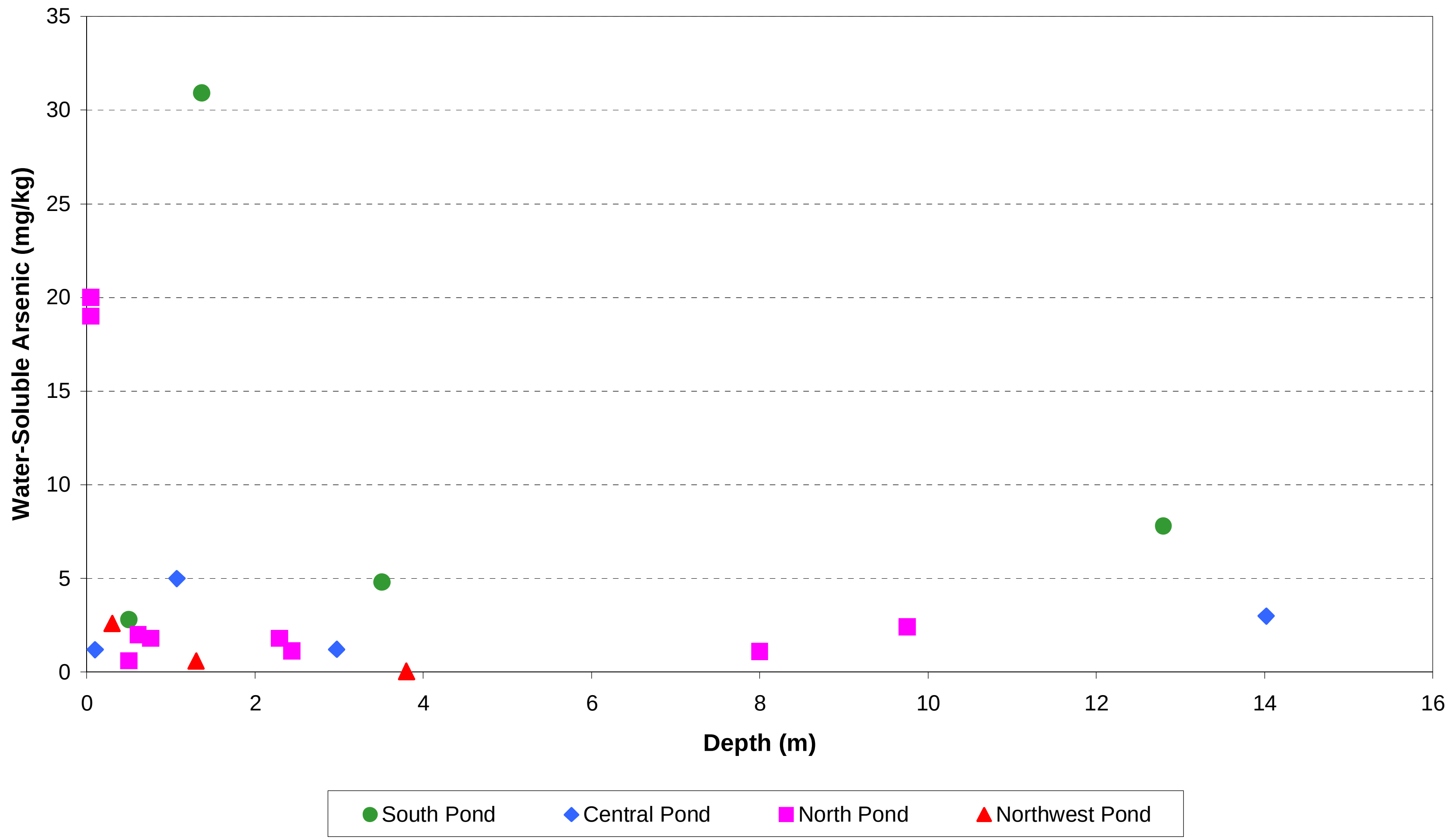


Figure 7
Sequential Leach Extraction of Water Treatment Sludge
Miramar Giant Mine

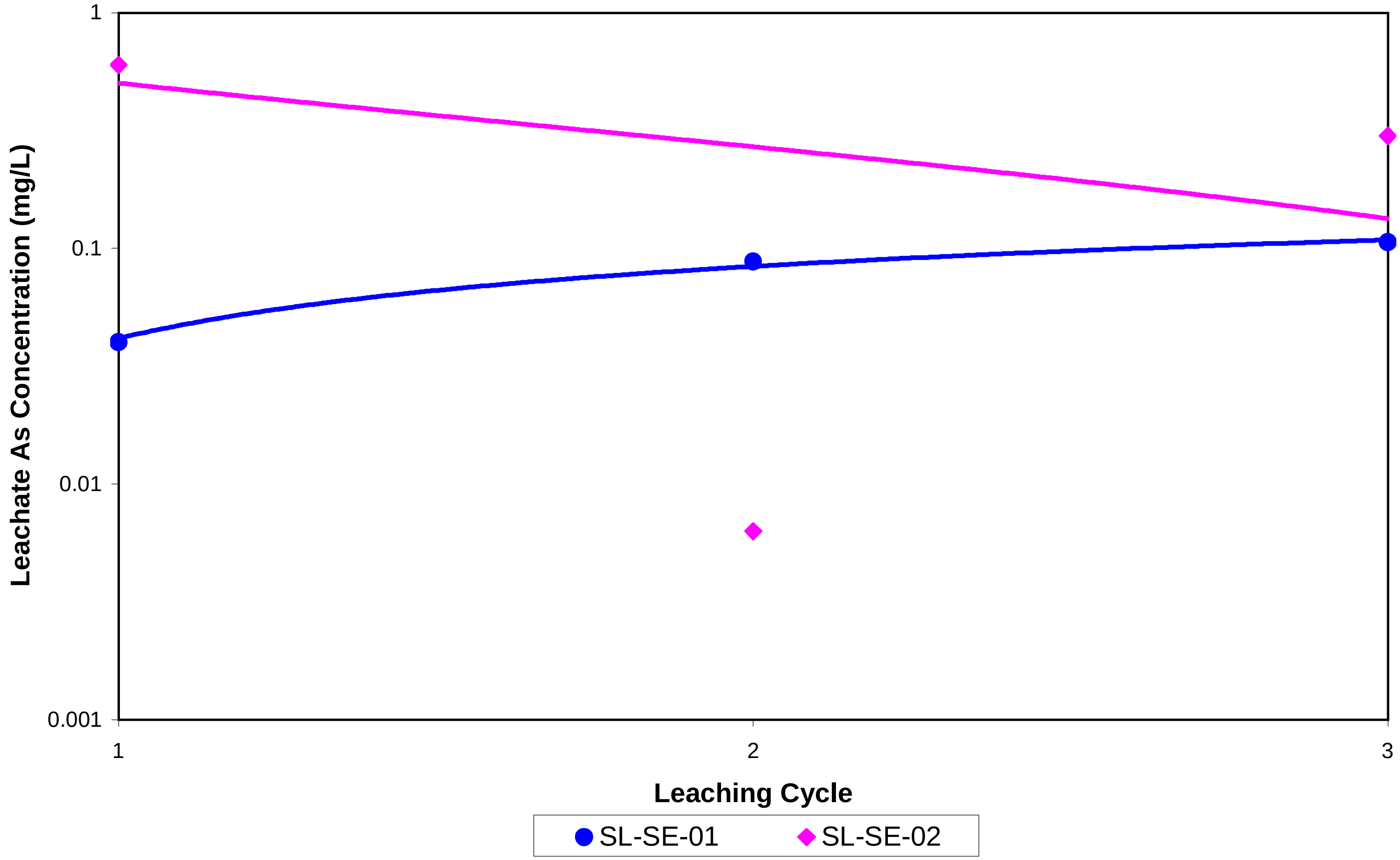
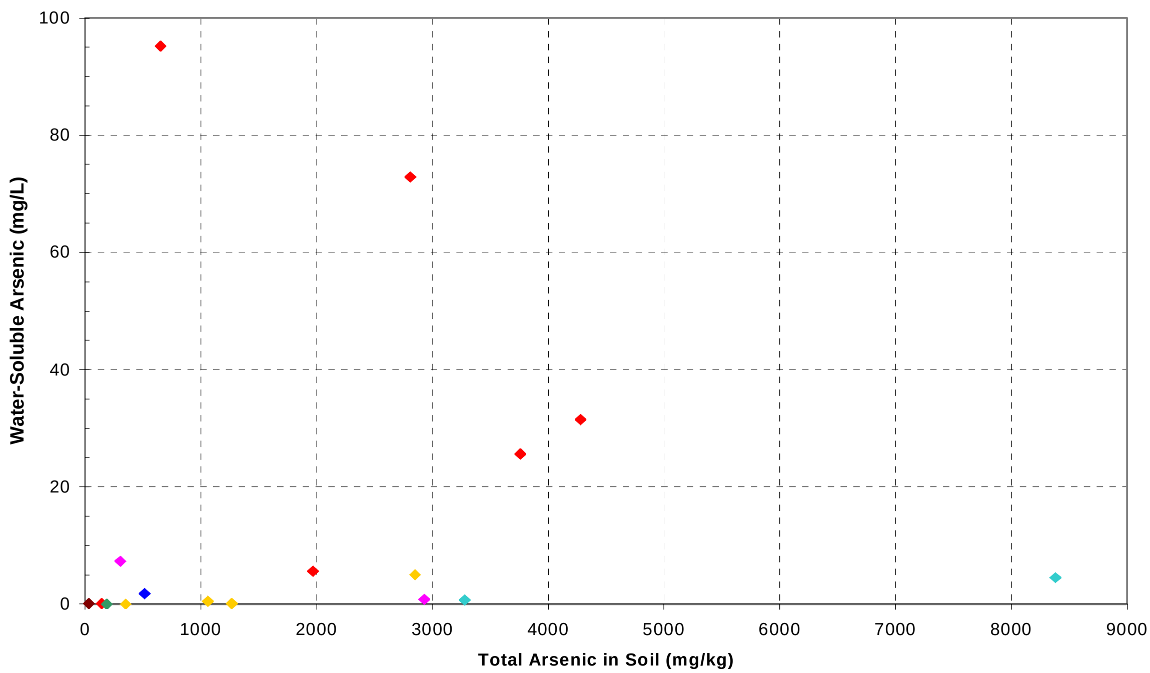
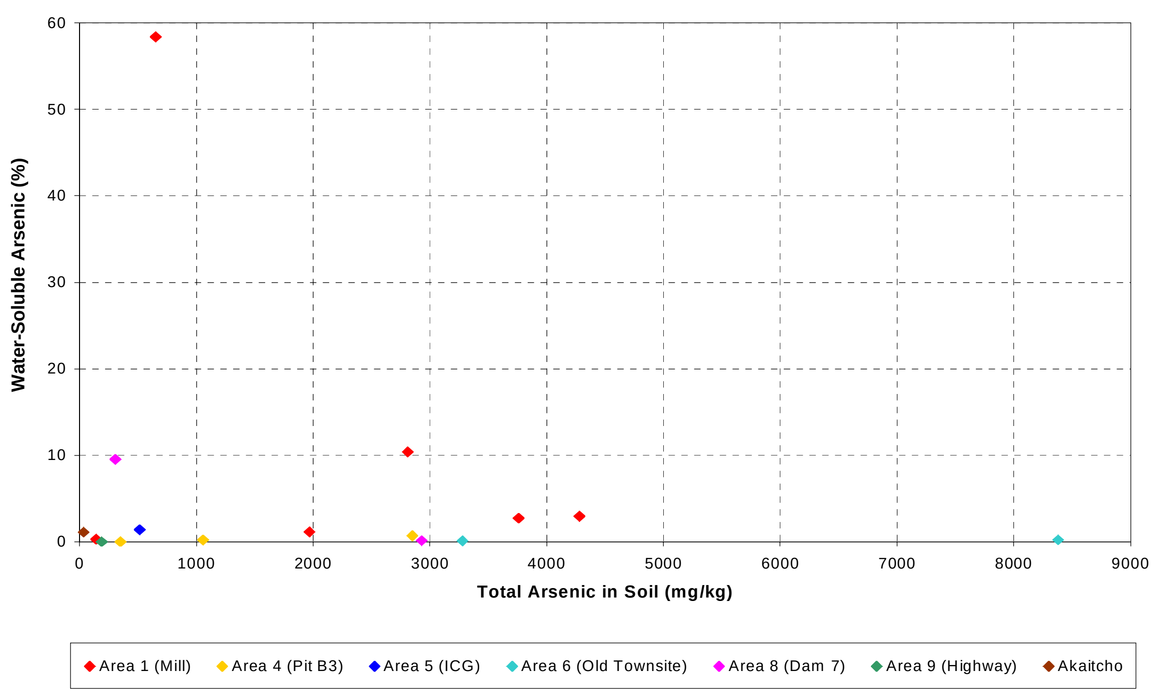
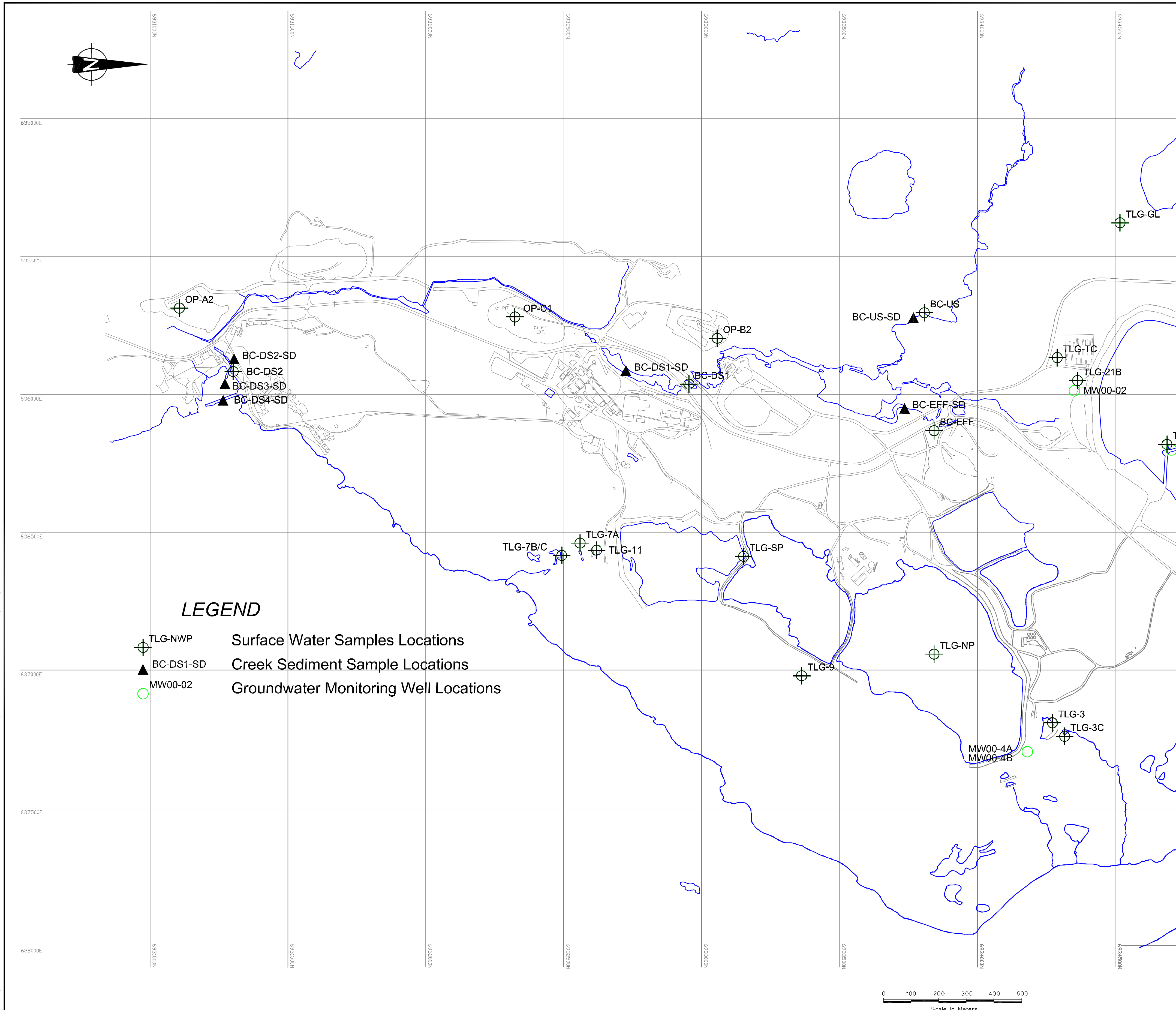


Figure 8

Total vs Water-Soluble Arsenic Concentrations
Miramar Giant Mine







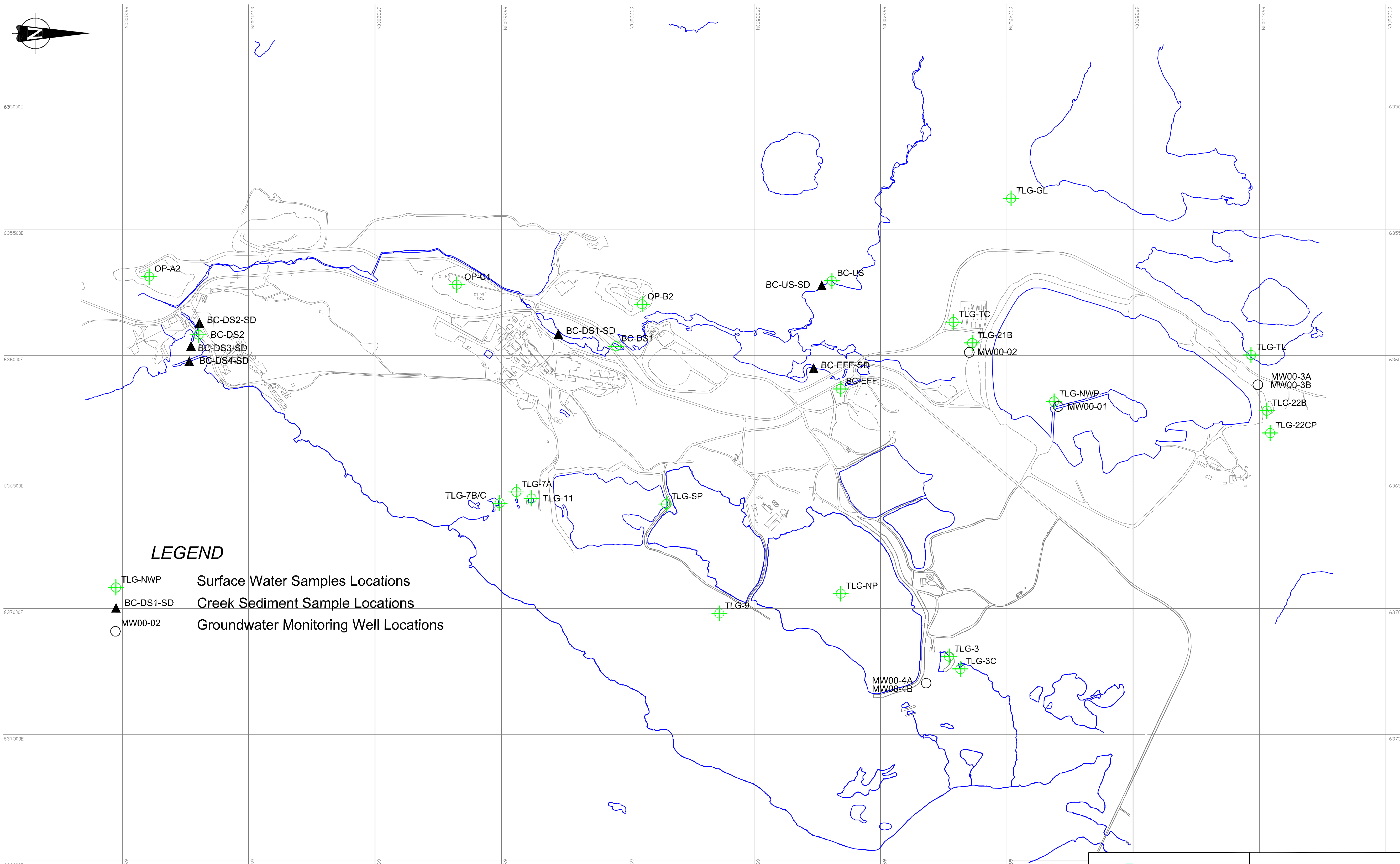
Drawing: O:\Active\2000\2000\002-2418 A&R Miramar Giant\Drawings\Geochemical-Sampling.dwg Plotted: Nov 19, 2004 - 9:00am By: lxiao

Golder Associates

Groundwater Monitoring Well Locations Miramar Giant Mine

Drawn: KC	App'd:	Date: Nov 19, 04	Figure: 9

Project No.: 982-2418 Revision No.:

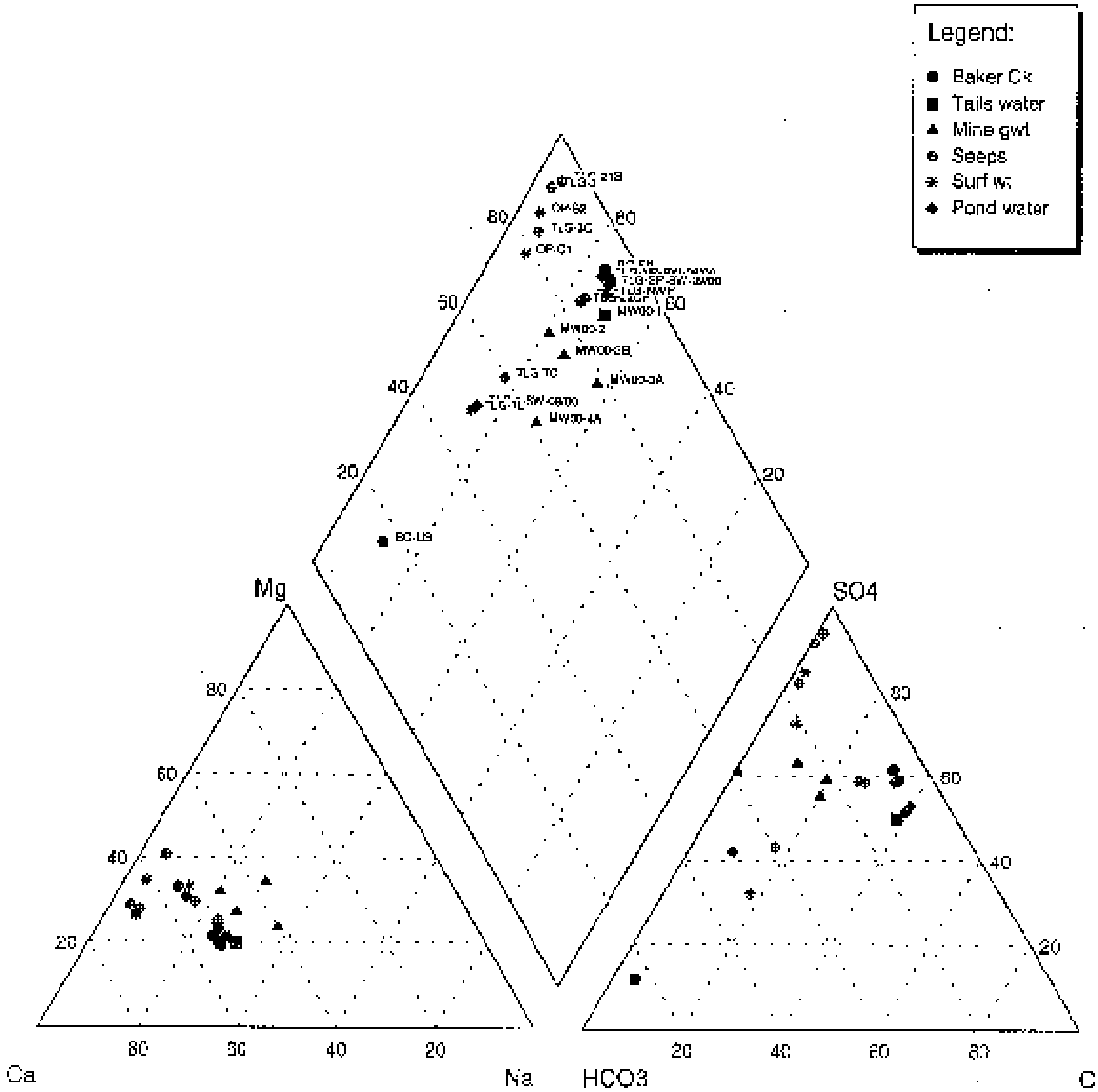


Surface Water Sample Locations Miramar Giant Mine

Drawn: KC | App'd: | Date: Nov 19, 04 | Figure: 10

Project No.: 982-2418 | Revision No.:

Drawing: O:\Active\2000\2000\002-2418 A&R Miramar Giant\Drawings\Geochemical-Sampling.dwg Plotted: Nov 19, 2004 - 9:01am By: lxiao

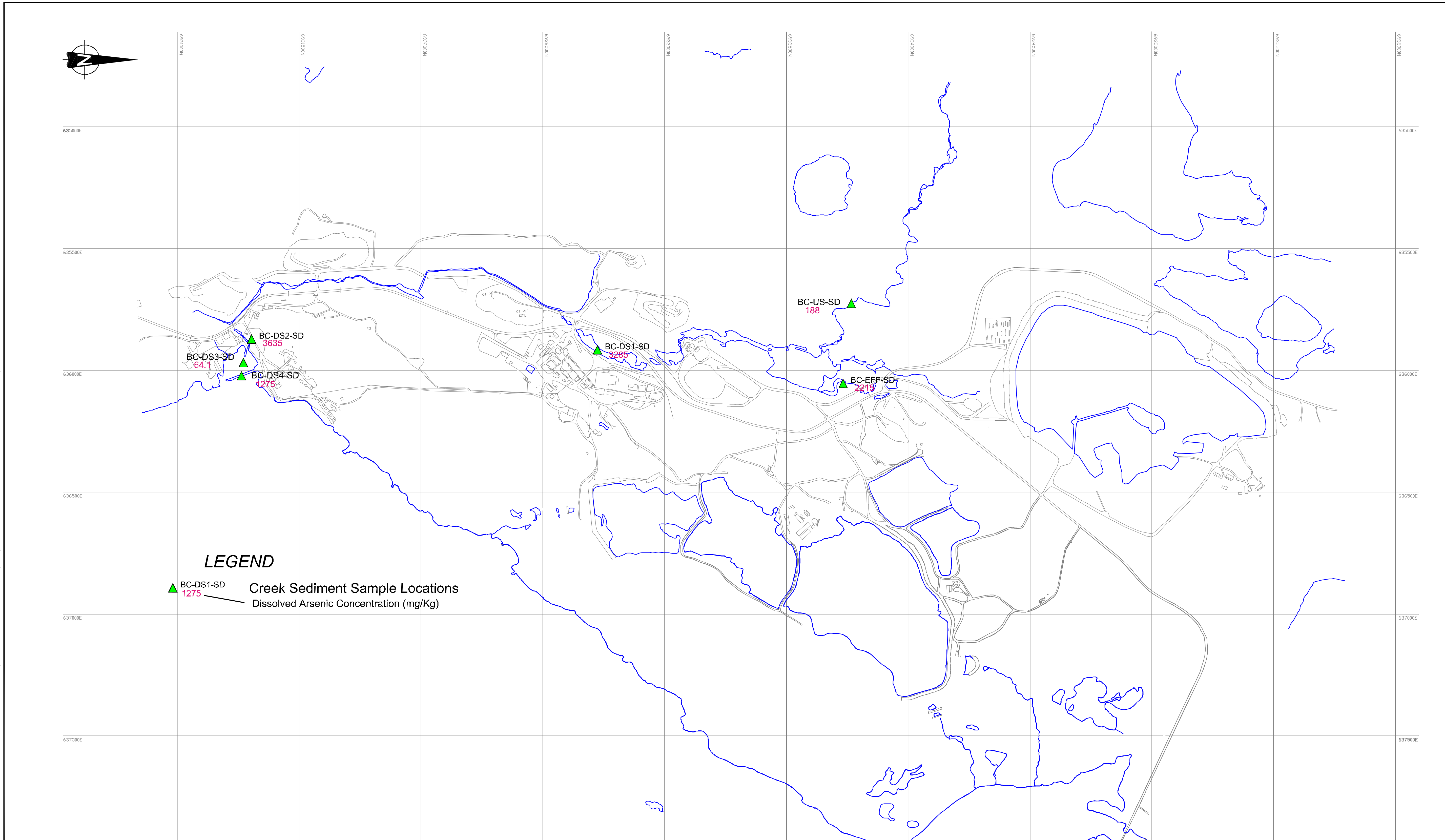


Project No. 002-2418 Drawn S.S. Reviewed Date

Golder Associates

MIRAMAR GIANT MINE WATER CHEMISTRY

Figure **11**



Golder Associates

Sediment Sampling Locations in Baker Creek Miramar Giant Mine

Drawn: KMC	App'd:	Date: Nov 19, 04	Figure: **12**

Project No.: 002-2418 Revision No.:

Drawing: O:\Active\2000\2000\002-2418 A&R Miramar Giant\Drawings\Geochemical-Sampling.dwg Plotted: Nov 19, 2004 - 9:02am By: lxiao

APPENDIX I

OPEN PIT ROCK, WASTE ROCK AND TAILINGS CEMI LABORATORY ANALYTICAL REPORTS

1636 West 75th Avenue, Vancouver, BC Canada V6P 6G2 TEL: (604) 264-5536 FAX: (604) 2[illegible]

CEM Inc.

Canadian Environmental and Metallurgical Inc.

DATA REPORT

Date: February 2, 2001

CEM Inc. File No. 0033

Report On: Giant Yellowknife Samples

Report To: Golder Associates
500-4260 Still Creek Drive
Burnaby, BC
V5C 6C6

Attention: Ms. Valerie Bertrand

Received: July 31, 2000

CLIENT : GOLDER ASSOCIATES
PROJECT : GIANT YELLOWKNIFE
PROJECT # : 9033
TEST : METAL SCAN BY ICP (MULTI-ACID DIGESTION) PLUS ARSENIC AND ANTIMONY ASSAYS

SAMPLE ID	Ag ppm	Al %	Ba ppm	Be ppm	Bi ppm	Ca %	Cd ppm	Co ppm	Cr ppm	Cu ppm	Fe %	K %	Mg %	Mn ppm	Mo ppm	Na %	Ni ppm	P ppm	Pb ppm	Sr ppm	Ti %	V ppm	W ppm	Zn ppm	As ppm	As %	Sb ppm
TSP01-2300	2	3.90	140	<0.5	25	4.63	63	32	87	50	6.63	1.17	2.45	1010	2	0.87	67	300	170	57	0.04	132	<10	196	2610	-	125
TSP02-2300	1	5.39	150	<0.5	10	5.58	49	21	134	51	6.24	1.40	2.80	1050	<2	0.61	57	480	150	66	0.06	178	<10	214	1890	-	181
TCP01-2300	1	4.05	130	<0.5	10	6.29	98	36	104	63	6.54	1.11	2.60	1040	<2	0.66	71	400	318	51	0.05	139	<10	342	3850	-	309
TCP02-2300-02	1	5.99	190	<0.5	5	5.28	83	24	133	70	6.41	1.73	2.93	1075	<2	0.76	62	490	332	72	0.06	191	<10	540	3260	-	274
TCP03-2300	1	4.70	120	<0.5	<5	5.12	65	23	112	45	5.33	1.40	3.22	995	2	0.74	51	310	152	63	0.04	159	<10	232	2720	-	123
TAP01-2300	1	4.81	170	<0.5	<5	4.71	>100	26	140	2547	5.73	1.45	3.10	870	2	0.71	92	360	150	57	0.06	151	<10	674	4740	-	107
TAP02-2300	1	6.41	100	<0.5	<5	4.47	61	20	186	103	5.56	1.88	3.45	905	<2	0.54	56	330	162	55	0.05	220	<10	224	2430		66
TAP03-2300	<1	7.29	230	<0.5	<5	4.34	65	21	201	83	6.41	1.93	3.59	930	<2	0.68	71	380	170	63	0.07	247	<10	388	2550	-	48
TAP04-2300	1	5.01	130	<0.5	<5	4.55	81	30	126	114	6.34	1.34	3.42	965	<2	0.54	77	350	222	52	0.04	171	<10	416	3130	-	98
TSP03-2300A	1	3.98	170	<0.5	<5	5.40	45	20	148	75	6.36	1.59	2.09	1060	2	0.83	62	480	148	72	0.07	194	<10	222	1760	-	157
TAP01-2300A	1	4.87	170	<0.5	<5	4.31	>100	27	132	2767	5.54	1.46	2.97	840	2	0.70	91	340	156	62	0.06	150	<10	708	4900	-	114
WR-OPB1-03-2300	<1	3.79	80	<0.5	<5	4.29	2	35	230	213	6.91	2.07	4.24	1250	4	0.63	78	330	4	33	0.04	206	<10	106	83	-	12
WR-OPB1-02-2300	3	6.35	130	<0.5	<5	3.98	50	37	197	173	7.40	1.48	4.52	1280	2	0.51	89	370	46	38	0.03	227	<10	238	1880	-	35
WR-OPB1-01-2300	2	5.66	180	<0.5	<5	5.89	>100	34	161	136	6.80	1.39	3.60	1015	<2	0.94	69	360	82	77	0.13	179	<10	234	8960	-	32
WR-OPA2-01-2300	<1	5.98	90	<0.5	<5	5.67	35	46	343	62	9.33	0.51	4.71	1985	<2	1.46	106	390	16	62	0.30	234	<10	110	1370	-	16
WR-OPA2-02-2300	<1	5.62	50	<0.5	<5	5.02	1	43	402	85	3.21	0.31	3.90	2115	<2	2.42	91	300	4	49	0.37	221	<10	73	21	-	6
WR-OPA2-03-2300	<1	5.93	110	<0.5	<5	5.77	1	38	190	245	7.48	0.55	3.98	1490	<2	1.39	69	390	<2	67	0.17	225	<10	85	41	-	4
WR-OPA2-04-2300	1	5.07	100	<0.5	<6	5.82	74	37	204	73	9.38	0.56	4.70	1995	<2	1.40	55	510	3	65	0.50	215	<10	109	2330	-	6
WR-OPA2-05-A	<1	5.71	70	<0.5	<5	4.48	1	41	404	54	3.27	0.40	4.05	2185	<2	1.76	75	410	<2	60	0.39	198	<10	78	24	-	9
OPA2-C1-2100	<1	5.80	160	<0.5	<5	2.73	4	42	252	87	7.71	0.90	5.59	600	<2	0.57	117	320	<2	71	0.05	208	<10	120	133	-	9
OPA2-C3-2100	<1	4.79	180	<0.5	<5	5.86	>100	28	186	68	5.71	2.09	3.04	1200	4	0.58	53	240	32	55	0.03	150	<10	40	5330	-	8
OPA2-C4-2100	<1	5.78	120	<0.5	<5	4.22	98	29	76	59	7.36	0.85	5.06	735	<2	0.64	52	370	4	38	0.05	209	<10	108	3610	-	5
OPA1-C1-2100	3	5.73	170	<0.5	<5	5.06	>100	40	139	134	9.11	2.59	2.82	1320	<2	0.36	80	470	22	55	0.04	237	<10	48	>10000	4.02	49
OPA1-C5-2100	<1	4.50	20	<0.6	<5	3.42	4	64	118	6	10.95	0.15	2.65	2670	<2	1.48	41	1460	<2	32	0.89	224	<10	108	179	-	8
OPA1-C8-2100	<1	0.71	170	<0.5	<5	2.85	3	41	94	203	9.11	0.99	4.00	970	2	0.51	70	530	4	27	0.05	281	<10	120	94	-	6
OPC1-01-2100	1	1.82	60	<0.5	<5	17.50	>100	17	74	25	6.09	0.65	6.16	2620	2	0.33	39	120	14	68	0.07	82	<10	84	7700	-	12
OPC1-03-2100	<1	5.38	50	<0.5	<5	6.72	2	37	88	106	8.13	0.31	3.30	1205	2	1.00	56	340	4	66	0.28	193	<10	66	71	-	4
OPC1-05-2100	<1	6.30	50	<0.5	<5	5.91	1	46	52	100	7.64	0.27	3.56	1195	<2	1.84	53	260	<2	77	0.45	223	<10	80	40	-	7
OPBR-01-2100	<1	6.99	50	<0.5	<5	4.59	1	39	192	21	7.05	0.27	3.27	905	<2	2.71	90	570	<2	103	0.36	212	<10	65	63	-	10
OPBR-02-2100	<1	6.69	80	<0.5	<5	2.81	1	20	187	10	5.57	0.34	3.18	750	2	2.83	69	610	2	72	0.21	137	<10	64	16	-	4
OPB2-03-2100	<1	6.97	80	<0.5	<5	4.23	3	38	252	124	8.03	0.02	4.01	1220	<2	0.86	93	420	4	71	0.04	243	<10	96	80	-	42
OPB2-05-2100	<1	6.32	110	0.5	<5	3.43	2	33	198	70	9.76	1.09	4.35	1385	<2	0.64	89	430	6	42	0.03	257	<10	104	69	-	8
OPB2-06-2100	<1	6.47	50	<0.5	<5	6.38	1	39	234	10	6.57	0.24	4.07	1610	<2	1.37	95	420	<2	68	0.48	249	<10	102	16	-	9
WR1-01-2300	<1	6.79	40	<0.5	<5	7.75	8	42	253	251	6.30	0.27	3.75	1250	<2	1.14	102	410	<2	205	0.65	285	<10	70	271	-	8
WR1-02-2300	<1	7.15	40	<0.5	<5	4.73	<1	50	207	173	8.90	0.10	5.51	1235	<2	1.30	114	400	<2	93	0.61	266	<10	90	21	-	12
WR2-01-2300	<1	7.06	50	<0.5	<5	5.29	1	38	173	117	6.60	0.26	3.84	990	<2	2.02	100	290	<2	105	0.36	196	<10	68	39	-	9
WR2-03-2300	<1	0.93	100	<0.5	<5	5.35	1	43	159	150	6.05	0.34	4.14	1150	<2	1.89	100	330	<2	106	0.53	244	<10	74	11	-	9
WR3-01-2300	<1	7.07	90	<0.5	<5	6.10	1	45	174	94	7.56	0.20	4.10	1210	<2	1.67	107	360	8	103	0.47	222	<10	92	33	-	9
WR3-02-2300	<1	6.96	50	<0.5	<5	5.89	1	43	168	83	7.59	0.28	4.19	1180	<2	1.65	100	300	<2	130	0.56	245	<10	74	14	-	11
WR-OPBR-02-2300	1	6.10	80	<0.5	<5	6.37	61	34	211	97	6.53	0.48	5.30	1250	<2	1.67	78	510	10	153	0.42	172	<10	65	2360	-	13
WR-OPBR-01-2300	<1	6.84	40	<0.5	<5	5.41	1	48	216	87	8.13	0.12	4.42	1265	<2	2.06	117	400	<2	81	0.57	239	<10	88	31	-	9
WR-OPB3-01-2300	<1	6.39	150	<0.5	<5	6.34	>100	28	105	151	7.27	1.32	2.60	1045	<2	0.93	54	560	14	109	0.09	190	<10	112	3960	-	20
WR-OPB3-02-2300	2	6.09	150	<0.5	<5	4.21	31	38	144	184	7.39	1.61	3.45	1105	<2	1.12	80	440	40	75	0.16	220	<10	118	1110	-	74
WR-OPC1-01-2300	<1	6.06	130	<0.5	<5	5.17	59	40	438	91	10.22	0.81	4.10	2405	<2	1.12	80	450	2	101	0.52	248	<10	102	2310	-	13
WR-OPC1-02-2300	<1	6.19	90	<0.5	<5	4.94	2	46	385	275	9.46	0.62	4.40	2070	<2	1.42	95	300	4	50	0.31	224	<10	112	73	-	6
WR-OPC1-01-A	1	6.36	70	<0.5	<5	5.35	2	42	404	107	8.54	0.37	4.30	2090	<2	1.63	115	310	38	63	0.37	217	<10	167	16	-	9

CLIENT : GOLDER ASSOCIATES
PROJECT : GIANT YELLOWKNIFE
PROJECT # : 0033
TEST : METAL SCAN BY ICP (MULTI-ACID DIGESTION) PLUS ARSENIC AND ANTIMONY ASSAYS

SAMPLE ID	Ag ppm	Al %	Ba ppm	Be ppm	Bi ppm	Ca %	Cd ppm	Co ppm	Cr ppm	Cu ppm	Fe %	K %
WR-OPB4-01-2200	1	6.45	60	<0.5	<5	3.92	3	38	141	128	8.77	0.61
WR-OPB4-02-2200	<1	6.91	120	<0.5	<5	5.03	1	44	108	98	4.78	1.02
OPB3-02-2200	<1	5.89	50	<0.5	<5	2.23	2	34	189	18	7.09	0.27
OPB3-03-2200	<1	6.33	160	0.5	<5	4.53	3	34	73	70	7.14	1.83
OPB1-03-2200	<1	3.81	40	<0.5	<5	4.80	9	50	95	165	8.76	0.28
OPB1-04-2200	1	5.42	70	<0.5	<5	3.83	12	33	94	123	9.48	0.71
OPB7-03-2200	1	3.70	140	0.5	<5	1.82	3	32	194	77	7.37	1.07
OPB4-01-2200	<1	5.55	60	<0.5	<5	6.93	1	37	102	111	8.21	0.32
OPB4-02-2200	<1	5.05	100	<0.5	<5	7.93	2	27	61	174	6.48	0.44
OPB4-01-A	<1	5.81	50	<0.5	<5	5.39	2	47	91	120	9.52	0.23
OPB1-04-A	1	5.90	110	<0.5	<5	5.73	13	38	147	99	8.65	1.08
T-NW-01-2600-01	1	4.60	120	<0.5	<5	5.91	93	32	109	72	6.68	1.14
T-NW-01-2600-02	1	5.42	120	<0.5	<5	5.11	57	29	165	88	6.69	0.87
T-NW-01-2600-03	<1	6.22	110	<0.5	<5	4.35	10	30	131	144	8.47	0.52
T-NW-01-2600-04	<1	6.71	170	<0.5	<5	4.28	16	37	146	159	8.44	0.37
T-NW-01-2600-05	<1	7.30	190	<0.5	<5	3.89	86	32	235	180	6.66	2.04
SL-SS-02-2300	5	2.21	150	<0.5	<5	>15.00	>100	21	47	>10000	5.44	0.55
SL-SS-01-2300	28	0.68	60	<0.5	10	10.05	>100	61	23	>10000	>15.00	0.20

SAMPLE ID	Mg %	Mn ppm	Mo ppm	Na %	Ni ppm	P ppm	Pb ppm	Sr ppm	Ti %	V ppm	W ppm	Zn ppm	As ppm	As %	Sb ppm
WR-OPB4-01-2200	3.35	1325	<2	1.37	75	430	32	77	0.24	257	<10	98	80	-	18
WR-OPB4-02-2200	3.47	1285	<2	0.95	80	470	16	95	0.29	271	<10	92	42	-	9
OPB3-02-2200	7.19	950	<2	0.56	100	370	8	39	0.02	234	<10	80	76	-	3
OPB3-03-2200	3.45	1105	<2	0.53	49	340	4	60	0.04	196	<10	96	119	-	22
OPB1-03-2200	3.90	1330	<2	1.08	79	450	2	108	0.57	323	<10	110	322	-	10
OPB1-04-2200	4.72	1100	<2	0.50	77	530	10	46	0.20	277	<10	156	404	-	23
OPB7-03-2200	4.05	815	<2	0.46	87	300	4	30	0.03	224	<10	126	102	-	17
OPB4-01-2200	3.16	1400	<2	1.84	61	430	<2	181	0.45	223	<10	86	47	-	8
OPB4-02-2200	2.27	1245	<2	1.31	43	450	<2	123	0.08	207	<10	54	40	-	14
OPB4-01-A	3.70	1405	<2	1.83	74	480	<2	135	0.56	273	<10	96	43	-	6
OPB1-04-A	5.33	1335	<2	0.44	74	340	8	38	0.03	222	<10	146	401	-	29
T-NW-01-2600-01	2.92	1115	<2	0.73	70	340	274	69	0.07	154	<10	272	3340	-	351
T-NW-01-2600-02	2.88	1105	<2	0.98	70	520	140	104	0.19	150	<10	106	2110	-	150
T-NW-01-2600-03	3.68	1165	<2	0.92	75	580	26	109	0.31	220	<10	122	398	-	29
T-NW-01-2600-04	3.87	1115	<2	1.14	78	520	44	105	0.27	221	<10	126	649	-	27
T-NW-01-2600-05	3.86	850	<2	0.50	80	540	12	59	0.10	237	<10	72	3220	-	14
SL-SS-02-2300	2.62	765	6	0.47	566	350	88	235	0.05	67	<10	104	>10000	1.05	758
SL-SS-01-2300	0.50	1990	28	0.14	2286	550	88	568	0.06	44	<10	340	>10000	4.23	5300

CLIENT : GOLDER ASSOCIATES
PROJECT : GIANT YELLOWKNIFE
PROJECT # : 0033
TEST : WHOLE ROCK ANALYSIS

	SiO_2	Al_2O_3	Fe_2O_3	CaO	MgO	Na_2O	K_2O	TiO_2	MnO	P_2O_5	Ba	Sr	Zr	Y	Sc	LOI	Total
	%	%	%	%	%	%	%	%	%	%	ppm	ppm	ppm	ppm	ppm	%	%
SAMPLE ID																	
SL-SE-02-2000	20.93	4.62	8.55	29.84	4.70	0.68	0.69	0.30	0.12	0.23	120	270	40	10	10	27.60	98.40
SL-SE-01-2000	13.59	1.55	41.79	5.68	1.56	0.05	0.38	0.02	0.98	3.58	2080	90	40	40	2	30.05	99.62

CLIENT : GOLDER ASSOCIATES
PROJECT : GIANT YELLOWKNIFE
PROJECT # : 0033
TEST : MODIFIED SOBEK METHOD ACID-BASE ACCOUNTING

SAMPLE	PASTE pH	S(T) %	S(SO4) %	AP	NP	NET NP	NP/AP	CARBONATE NP*
TSPO1-2300	8.2	0.51	0.06	14.1	213.8	199.7	15.2	237.5
TSPO1-2300 RE	8.4	0.54	0.06	15.0	218.1	203.1	14.5	236.7
TSPO2-2300	8.8	0.21	0.02	5.9	208.1	202.2	35.1	226.7
TCPO1-2300	8.6	0.51	0.02	15.3	226.9	211.6	14.8	248.3
TCPO2-2300-02	8.4	0.27	0.04	7.2	212.5	205.3	29.6	233.3
TCPO3-2300	8.3	0.95	0.74	6.6	218.1	211.6	33.2	246.7
TNPO1-2300	8.3	1.41	1.14	8.4	170.9	162.5	20.3	184.2
TNPO2-2300	8.4	0.24	0.14	3.1	197.5	194.4	63.2	211.7
TNPO3-2300	8.4	0.22	0.14	2.5	173.8	171.3	69.5	180.8
TNPO4-2300	8.4	0.34	0.12	6.9	192.5	185.6	28.0	220.0
TSPO2 2300A	8.7	0.19	0.02	5.3	202.5	197.2	38.1	223.3
TSPO2-2300A RE	8.6	0.19	0.02	5.3	202.5	197.2	38.1	224.2
TNPO1-2300A	8.3	1.26	0.98	8.8	170.0	161.3	19.4	180.8
WR-OPB1-03-2300	8.8	0.32	<0.01	10.0	181.3	171.3	18.1	191.7
WR-OPB1-02-2300	8.8	0.56	<0.01	17.5	211.3	193.8	12.1	220.0
WR-OPB1-01-2300	9.0	1.94	<0.01	60.6	223.8	163.1	3.7	237.5
WR-OPA2-01-2300	9.2	0.99	<0.01	30.9	84.4	53.4	2.7	79.2
WR-OPA2-02-2300	9.4	0.16	<0.01	5.0	56.6	51.6	11.3	54.2
WR-OPA2-03-2300	9.1	0.17	<0.01	5.3	157.2	151.9	29.6	155.0
WR-OPA2-04-2300	9.1	0.62	<0.01	19.4	168.4	149.1	8.7	165.8
WR-OPA2-03-A	9.5	0.06	<0.01	1.9	30.0	28.1	16.0	25.0
OPA2-01-2100	9.1	0.05	<0.01	1.6	143.1	141.6	91.6	145.8
OPA2-03-2100	9.2	4.01	0.01	125.0	287.5	162.5	2.3	313.4
OPA2-04-2100	9.1	0.64	<0.01	20.0	224.7	204.7	11.2	227.5
OPA1-01-2100	9.3	6.47	0.01	201.9	246.3	44.4	1.2	270.9
OPA1-05-2100	9.8	0.90	<0.01	28.1	70.3	42.2	2.5	55.8
OPA1-06-2100	9.0	0.18	<0.01	5.6	149.1	143.4	26.5	147.5
OPA1-06-2100 RE	8.9	0.18	<0.01	5.6	141.6	135.9	25.2	148.3
CPC1-01-2100	9.1	1.52	<0.01	47.5	646.9	599.4	13.6	707.5
CPC1-03-2100	9.0	0.05	<0.01	1.6	191.3	189.7	122.4	186.7
CPC1-05-2100	9.2	0.07	<0.01	2.2	152.2	150.0	69.6	150.0
CPBR-01-2100	9.2	0.22	<0.01	6.9	118.1	111.3	17.2	111.7
CPBR-02-2100	9.3	<0.01	<0.01	0.0	92.5	92.5	-	83.3
CPB2-03-2100	9.1	0.18	<0.01	5.6	196.9	191.3	35.0	221.7
CPB2-05-2100	9.0	0.32	<0.01	10.0	159.4	149.4	15.9	179.2

AP = ACID POTENTIAL IN TONNES $CaCO_3$ EQUIVALENT PER 1000 TONNES OF MATERIAL.
NP = NEUTRALIZATION POTENTIAL IN TONNES $CaCO_3$ EQUIVALENT PER 1000 TONNES OF MATERIAL.
NET NP = NET NEUTRALIZATION POTENTIAL IN TONNES $CaCO_3$ EQUIVALENT PER 1000 TONNES OF MATERIAL.
NOTE: WHEN S(T) AND/OR S(SO4) IS REPORTED AS <0.01, IT IS ASSUMED TO BE ZERO FOR THE AP CALCULATION.
* CARBONATE NP CALCULATED FROM TOTAL INORGANIC CARBON (TIC) ASSAY.
RE = REPLICATE.

CLIENT : GOLDER ASSOCIATES
PROJECT : GIANT YELLOWKNIFE
PROJECT # : 0033
TEST : MODIFIED SOBEK METHOD ACID-BASE ACCOUNTING

SAMPLE	PASTE pH	S(T) %	S(SO4) %	AP	NP	NET NP	NP/AP	CARBONATE NP*
OPB2-06-2100	8.9	0.05	<0.01	1.6	153.1	151.6	98.0	150.8
WR1-01-2300	9.2	0.22	<0.01	6.9	75.3	68.4	11.0	66.7
WR1-02-2300	9.1	0.10	<0.01	3.1	50.3	47.1	16.1	42.5
WR2-01-2300	9.2	0.11	<0.01	3.4	71.1	67.7	20.7	74.2
WR2-03-2300	9.3	0.13	<0.01	4.1	30.9	26.5	7.6	48.3
WR3-01-2300	9.3	0.05	<0.01	1.6	60.8	59.2	38.9	53.3
WR3-02-2300	9.2	0.11	<0.01	3.4	39.0	35.6	11.3	32.5
WR-OPBR-02-2300	9.1	0.56	<0.01	17.5	150.6	133.1	8.6	156.7
WR-OPBR-01-2300	9.4	0.09	<0.01	2.8	40.3	37.4	14.3	33.3
WR-OPB3-01-2300	8.8	1.13	<0.01	35.3	195.6	160.3	5.5	200.8
WR-OPB3-02-2300	9.1	1.02	<0.01	31.9	175.0	143.1	5.5	192.5
WR-OPC1-01-2300	9.3	0.58	<0.01	18.1	42.0	23.9	2.3	33.3
WR-OPC1-01-2300 RE	9.2	0.58	<0.01	18.1	43.5	25.4	2.4	34.2
WR-OPC1-02-2300	9.3	0.68	<0.01	21.3	45.8	24.5	2.2	40.0
WR-OPC1-01-A	9.1	0.10	<0.01	3.1	65.3	62.1	20.9	56.7
WR-OPB4-01-2200	9.0	0.24	<0.01	7.5	131.9	124.4	17.6	137.5
WR-OPB4-02-2200	9.0	0.21	<0.01	6.6	130.3	123.8	19.9	138.3
OPB3-02-2200	8.9	0.01	<0.01	0.3	117.8	117.5	377.0	121.7
OPB3-02-2200 RE	8.9	0.01	<0.01	0.3	117.5	117.2	376.0	120.8
OPB3-03-2200	9.4	0.25	<0.01	7.8	202.5	194.7	25.9	241.7
OPB1-03-2200	9.0	0.41	<0.01	12.8	95.6	82.8	7.5	107.5
OPB1-04-2200	9.0	0.66	<0.01	20.6	166.3	145.6	8.1	171.7
OPB1-06-2200	9.0	0.39	<0.01	12.2	77.5	65.3	6.4	91.7
OPB4-01-2200	9.1	0.08	<0.01	2.5	176.3	173.8	70.5	167.5
OPB4-02-2200	9.0	0.13	<0.01	4.1	220.0	215.9	54.2	220.0
OPB4-01-A	9.0	0.10	<0.01	3.1	131.9	128.8	42.2	125.8
OPB1-04-A	8.9	0.92	<0.01	28.8	272.5	243.8	9.5	301.7
T-NW-01-2600-01	8.5	0.33	0.02	9.7	218.1	208.4	22.5	240.0
T-NW-01-2600-01 RE	8.4	0.34	0.02	10.0	218.4	208.4	21.8	240.8
T-NW-01-2600-02	8.5	0.30	0.04	8.1	165.0	156.9	20.3	177.5
T-NW-01-2600-03	8.8	0.19	<0.01	5.9	124.1	118.1	20.9	120.8
T-NW-01-2600-04	8.8	0.36	<0.01	11.3	111.6	100.3	9.9	119.2
T-NW-01-2600-05	9.0	1.05	<0.01	32.8	166.6	133.8	5.1	169.2

AP = ACID POTENTIAL IN TONNES CaCO3 EQUIVALENT PER 1000 TONNES OF MATERIAL.
NP = NEUTRALIZATION POTENTIAL IN TONNES CaCO3 EQUIVALENT PER 1000 TONNES OF MATERIAL.
NET NP = NET NEUTRALIZATION POTENTIAL = TONNES CaCO3 EQUIVALENT PER 1000 TONNES OF MATERIAL.
NOTE: WHEN S(T) AND/OR S(SO4) IS REPORTED AS <0.01 IT IS ASSUMED TO BE ZERO FOR THE AP CALCULATION.
* CARBONATE NP CALCULATED FROM TOTAL INORGANIC CARBON (TIC) ASSAY.
RE = REPLICATE.

SEQUENTIAL LEACH TEST
PROJECT: Giant Yellowknife
PROJECT #: 0033

STAGE	DATE	DISTILLED WATER VOLUME (ml)	SAMPLE WEIGHT (g)	WATER RECOVERED (mL)	pH	CONDUCTIVITY (µS/cm)	ALKALINITY (mg CaCO3/L)	ACIDITY (pH 4.5) (mg CaCO3/L)	ACIDITY (pH 8.3) (mg CaCO3/L)	SULPHATE (mg/L)
SAMPLE: SL-SE-01										
1	08-Aug-00	2000	1000	1440	7.75	1200	43.5	0.0	4.0	503
2				1455	7.90	820	50.5	0.0	3.0	412
3				1520	7.78	564	53.0	0.0	3.3	282
SAMPLE: SL-SE-02										
1	08-Aug-00	2000	1000	1440	11.90	5740	1135.0	0.0	0.0	1100
2				1450	11.85	4730	932.0	0.0	0.0	282
3				1340	11.70	3450	818.0	0.0	0.0	176

SEQUENTIAL LEACH TEST
PROJECT: Giant Yellowknife
PROJECT #: 0033

LEACHATE ANALYSIS BY ICP

Sample Name:		SL-SE-01			SL-SE-02		
Stage:		1	2	3	1	2	3
CEMI#:		02891	02892	02893	02888	02889	02890
Dissolved Metals							
Al	mg/L	<0.2	<0.2	<0.2	0.4	0.4	0.5
Sb	mg/L	0.6	0.6	0.6	<0.2	<0.2	<0.2
As	mg/L	0.040	0.088	0.106	0.6	0.0063	0.3
Ba	mg/L	0.12	0.05	0.03	0.10	0.09	0.10
Be	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Bi	mg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
B	mg/L	0.7	0.7	0.6	0.2	<0.1	<0.1
Cd	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Ca	mg/L	171	129	88.8	912	451	430
Cr	mg/L	<0.01	<0.01	<0.01	0.02	<0.01	<0.01
Co	mg/L	0.65	0.50	0.29	0.47	0.09	0.05
Cu	mg/L	0.29	0.09	0.08	1.22	0.37	0.29
Fe	mg/L	1.74	0.64	0.18	<0.03	<0.03	<0.03
Pb	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Li	mg/L	0.01	0.01	<0.01	0.03	0.02	0.02
Mg	mg/L	34.6	26.3	18.5	<0.1	<0.1	0.10
Mn	mg/L	0.159	0.101	0.056	<0.005	<0.005	<0.005
Mo	mg/L	0.12	0.14	0.14	0.07	<0.03	<0.03
Ni	mg/L	0.07	0.06	<0.05	<0.05	<0.05	<0.05
P	mg/L	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
K	mg/L	9	7	6	75	32	14
Se	mg/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Si	mg/L	1.18	1.20	1.12	0.30	0.29	0.35
Ag	mg/L	0.01	<0.01	<0.01	0.01	<0.01	<0.01
Na	mg/L	79	41	18	447	166	65
Sr	mg/L	1.90	1.48	1.01	3.61	2.09	1.45
Tl	mg/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Sn	mg/L	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Ti	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
V	mg/L	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Zn	mg/L	0.273	0.111	0.109	0.013	0.045	0.017

CLIENT : GOLDER ASSOCIATES
PROJECT : GIANT YELLOWKNIFE
PROJECT # : 0033
TEST : LEACH EXTRACTION TEST

SAMPLE	DISTILLED WATER VOLUME (mL)	SAMPLE WEIGHT (g)	pH	CONDUCTIVITY (uS/cm)	ALKALINITY (mg CaCO3/L)	ACIDITY (pH 4.5) (mg CaCO3/L)	ACIDITY (pH 8.3) (mg CaCO3/L)	SULPHATE (mg/L)
TSPO2-2300	400	200	7.96	361	63.0	0.0	1.5	114
TCPO1-2300	400	200	8.00	307	59.0	0.0	1.5	100
TNPO1-2300	400	200	7.95	4200	62.0	0.0	4.5	5220
TNPO3-2300	400	200	7.93	1055	43.5	0.0	2.0	667
TNPO1-2300A	400	200	7.87	4720	61.5	0.0	5.0	6370
WR-OPB1-01-2300	400	200	8.24	149	66.5	0.0	1.0	10
WR-OPA2-04-2300	400	200	8.01	126	67.5	0.0	1.8	7
OPA2-01-2100	400	200	7.93	115	42.0	0.0	1.0	17
OPA2-03-2100	400	200	7.95	231	44.0	0.0	1.3	79
OPA1-01-2100	400	200	7.97	104	40.0	0.0	1.3	13
OPC1-01-2100	400	200	8.18	259	67.0	0.0	1.0	82
OPC1-05-2100	400	200	8.20	130	63.0	0.0	1.0	9
OPBR-02-2100	400	200	8.17	115	63.0	0.0	1.0	5
OPB2-05-2100	400	200	7.99	132	44.0	0.0	1.0	28
WR1-01-2300	400	200	8.20	118	67.0	0.0	0.5	4
WR3-01-2300	400	200	8.16	126	61.0	0.0	1.0	4
WR-OPBR-02-2300	400	200	8.07	141	70.5	0.0	3.5	7
WR-OPB3-01-2300	400	200	8.03	288	58.5	0.0	3.0	67
WR-OPC1-01-2300	400	200	8.07	115	63.5	0.0	2.0	5
WR-OPC1-02-2300	400	200	8.10	120	65.5	0.0	2.5	5
OPB3-03-2200	400	200	8.05	108	57.0	0.0	3.5	5
OPB1-03-2200	400	200	8.10	129	66.0	0.0	2.0	5
OPB1-06-2200	400	200	7.92	98	37.5	0.0	2.5	10
OPB4-01-2200	400	200	8.11	148	64.5	0.0	1.5	19
OPB4-01-A	400	200	8.14	139	65.0	0.0	1.5	13
T-NW-01-2600-01	400	200	8.03	486	60.0	0.0	2.0	130
T-NW-01-2600-03	365	183	8.07	280	58.0	0.0	2.0	70
T-NW-01-2600-05	125	62	8.20	254	75.0	n/a	n/a	57
32711	123	41	8.13	710	n/a	n/a	n/a	213
32713	186	62	7.98	815	79.0	n/a	n/a	335
32724	156	52	8.07	729	81.0	n/a	n/a	248
32761	196	98	7.83	2150	61.0	n/a	n/a	2170
32763	83	41.3	7.76	1400	n/a	n/a	n/a	n/a
32777	182	91	8.20	544	86.0	n/a	n/a	196
32951	152	76	8.20	749	90.0	n/a	n/a	230
32953	180	90	8.27	536	99.0	n/a	n/a	134
32964	210	105	8.20	607	92.0	n/a	n/a	212
33001	184	92	7.93	1590	53.0	n/a	n/a	1300
33003	130	65	8.10	915	74.0	n/a	n/a	411
33011	130	65	8.09	784	76.0	n/a	n/a	331

n/a = not available due to insufficient sample volume.

CLIENT : GOLDER ASSOCIATES
PROJECT : GIANT YELLOWKNIFE
PROJECT # : 0033
TEST : LEACH EXTRACTION TEST

LEACHATE ANALYSIS BY ICP

Sample Name:	CEM#	TSPO2-2300 03178	TCPO1-2300 03179	TNPO1-2300 03180	TNPO3-2300 03181	TNPO1-2300A 03182	WR-OPB1-01-2300 03183
Dissolved Metals (mg/L)							
Aluminum	Al	<0.2	<0.2	<0.4	<0.2	<0.4	<0.2
Antimony	Sb	2.2	1.1	0.9	<0.2	1.0	<0.2
Arsenic	As	1.4	0.6	8.5	0.3	10.0	0.105
Barium	Ba	<0.01	<0.01	0.04	<0.01	0.03	<0.01
Beryllium	Be	<0.005	<0.005	<0.01	<0.005	<0.01	<0.005
Bismuth	Bi	<0.1	<0.1	<3	<0.1	<3	<0.1
Boron	B	<0.1	<0.1	<0.2	<0.1	<0.2	<0.1
Cadmium	Cd	<0.01	<0.01	<0.02	<0.01	<0.02	<0.01
Calcium	Ca	50.7	49.3	446	171	368	24.5
Chromium	Cr	<0.01	<0.01	<0.02	<0.01	<0.02	<0.01
Cobalt	Co	0.01	0.02	0.11	0.01	0.14	<0.01
Copper	Cu	<0.01	0.01	0.14	0.01	0.18	<0.01
Iron	Fe	0.14	0.05	0.10	0.05	0.09	<0.03
Lead	Pb	<0.05	<0.05	<0.1	<0.05	<0.1	<0.05
Lithium	Li	<0.01	<0.01	0.05	<0.01	0.05	<0.01
Magnesium	Mg	13.0	8.7	1140	53.4	1450	4.9
Manganese	Mn	0.026	0.027	0.15	0.055	0.17	0.028
Molybdenum	Mo	<0.03	<0.03	0.20	<0.03	0.25	<0.03
Nickel	Ni	<0.05	<0.05	<0.1	<0.05	<0.1	<0.05
Phosphorous	P	<0.3	<0.3	<0.6	<0.3	<0.6	<0.3
Potassium	K	5	3	66	6	80	2
Selenium	Se	<0.2	<0.2	<0.4	<0.2	<0.4	<0.2
Silicon	Si	1.19	0.76	1.4	1.42	1.4	0.72
Silver	Ag	<0.01	<0.01	<0.02	<0.01	<0.02	<0.01
Sodium	Na	18	13	510	19	638	<2
Strontium	Sr	0.223	0.132	2.31	0.490	1.98	0.341
Thallium	Tl	<0.2	<0.2	<0.4	<0.2	<0.4	<0.2
Tin	Sn	<0.03	<0.03	<0.06	<0.03	<0.06	<0.03
Titanium	Ti	<0.01	<0.01	<0.02	<0.01	<0.02	<0.01
Vanadium	V	<0.03	<0.03	<0.06	<0.03	<0.06	<0.03
Zinc	Zn	0.005	<0.005	0.060	0.005	0.109	<0.005

CLIENT : GOLDER ASSOCIATES
PROJECT : GIANT YELLOWKNIFE
PROJECT # : 0033
TEST : LEACH EXTRACTION TEST

LEACHATE ANALYSIS BY ICP

Sample Name:		WR-OPA2-04-2300	OPA2-01-2100	OPA2-03-2100	OPA1-01-2100	OPC1-01-2100	OPC1-05-2100
	CEMI#	03184	03185	03186	03187	03188	03189
Dissolved Metals (mg/L)							
Aluminum	Al	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Antimony	Sb	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arsenic	As	0.065	0.191	0.053	0.190	0.055	0.0146
Barium	Ba	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Beryllium	Be	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Bismuth	Bi	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Boron	B	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Cadmium	Cd	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Calcium	Ca	19.4	15.9	33.1	13.8	44.7	25.3
Chromium	Cr	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	Co	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Copper	Cu	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Iron	Fe	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Lead	Pb	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Lithium	Li	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Magnesium	Mg	4.6	5.9	11.6	5.0	10.0	2.2
Manganese	Mn	0.014	0.007	0.083	0.055	0.036	0.013
Molybdenum	Mo	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Nickel	Ni	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Phosphorous	P	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Potassium	K	<2	<2	4	2	<2	<2
Selenium	Se	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Silicon	Si	1.09	0.71	0.64	0.38	0.49	0.56
Silver	Ag	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Sodium	Na	5	<2	<2	<2	<2	<2
Strontium	Sr	0.064	0.039	0.047	0.021	0.060	0.034
Thallium	Tl	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Tin	Sn	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Titanium	Ti	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium	V	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Zinc	Zn	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005

CLIENT : GOLDER ASSOCIATES
PROJECT : GIANT YELLOWKNIFE
PROJECT # : 0033
TEST : LEACH EXTRACTION TEST

LEACHATE ANALYSIS BY ICP

Sample Name:		OPBR-02-2100	OPB2-05-2100	WR1-01-2300	WR3-01-2300	WR-OPBR-02-2350	WR OPB3-01-2300
	CEM #	03190	03191	03192	03193	03194	03195
Dissolved Metals (mg/L)							
Aluminum	Al	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Antimony	Sb	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arsenic	As	0.0069	0.036	0.0077	0.0156	0.042	0.029
Barium	Ba	<0.01	<0.01	<0.01	0.11	<0.01	<0.01
Beryllium	Be	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Bismuth	Bi	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Boron	B	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Cadmium	Cd	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Calcium	Ca	23.0	18.0	21.4	23.3	22.7	40.1
Chromium	Cr	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	Co	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Copper	Cu	0.01	<0.01	<0.01	<0.01	0.01	0.01
Iron	Fe	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Lead	Pb	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Lithium	Li	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Magnesium	Mg	2.3	6.7	2.5	2.0	4.2	10.1
Manganese	Mn	0.016	0.025	0.010	0.020	0.017	0.039
Molybdenum	Mo	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Nickel	Ni	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Phosphorous	P	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Potassium	K	<2	2	<2	<2	<2	4
Selenium	Se	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Silicon	Si	0.83	0.66	1.13	0.93	0.89	0.61
Silver	Ag	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Sodium	Na	2	<2	3	3	3	7
Strontium	Sr	0.039	0.026	0.098	0.077	0.103	0.121
Thallium	Tl	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Tin	Sn	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Titanium	Ti	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium	V	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Zinc	Zn	<0.005	<0.005	<0.005	<0.005	<0.005	0.013

CLIENT : GOLDER ASSOCIATES
PROJECT : GIANT YELLOWKNIFE
PROJECT # : 0033
TEST : LEACH EXTRACTION TEST

LEACHATE ANALYSIS BY ICP

Sample Name:		WR-OPC1-01-2300	WR-OPC1-02-2300	OPB3-03-2200	OPB1-03-2200	OPB1-06-2200	OPB4-01-2200
	CSMI#	03196	03197	03198	03199	03200	03201
Dissolved Metals (mg/L)							
Aluminum	Al	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Antimony	Sb	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arsenic	As	0.025	0.0112	0.032	0.015	0.033	0.0037
Barium	Ba	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Beryllium	Be	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Bismuth	Bi	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Boron	B	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Cadmium	Cd	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Calcium	Ca	19.3	21.9	15.5	23.3	13.4	31.4
Chromium	Cr	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	Co	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Copper	Cu	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Iron	Fe	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Lead	Pb	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Lithium	Li	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Magnesium	Mg	3.2	2.5	5.2	3.2	4.6	1.6
Manganese	Mn	0.018	0.012	0.032	0.012	0.016	0.027
Molybdenum	Mo	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Nickel	Ni	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Phosphorous	P	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Potassium	K	<2	<2	3	<2	2	<2
Selenium	Se	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Silicon	Si	0.97	0.98	0.45	0.71	0.52	0.52
Silver	Ag	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Sodium	Na	3	3	<2	<2	<2	<2
Strontium	Sr	0.048	0.044	0.032	0.080	0.023	0.053
Thallium	Tl	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Tin	Sn	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Titanium	Ti	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium	V	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Zinc	Zn	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005

CLIENT : GOLDER ASSOCIATES
PROJECT : GIANT YELLOWKNIFE
PROJECT # : 0033
TEST : LEACH EXTRACTION TEST

LEACHATE ANALYSIS BY ICP

Sample Name:		OPB4-01 A	T-NW-01-2600 01	T-NW-01-2600 03	T-NW-01-2600 05	32711	32713
	CEMI#	03202	03203	03204	03205	03317	03318
Dissolved Metals (mg/L)							
Aluminum	Al	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Antimony	Sb	<0.2	1.6	0.2	<0.2	6.6	2.2
Arsenic	As	0.0031	1.3	0.3	0.1	10.3	1.6
Barium	Ba	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Beryllium	Be	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Bismuth	Bi	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Boron	B	<0.1	<0.1	<0.1	0.2	0.1	<0.1
Cadmium	Cd	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01
Calcium	Ca	29.1	58.3	45.2	42.7	94.6	128
Chromium	Cr	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	Co	<0.01	0.03	<0.01	<0.01	0.04	0.03
Copper	Cu	<0.01	0.01	0.01	0.01	0.02	0.03
Iron	Fe	<0.03	0.04	<0.03	<0.03	0.20	0.26
Lead	Pb	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Lithium	Li	<0.01	<0.01	<0.01	<0.01	0.01	0.01
Magnesium	Mg	1.8	13.5	5.7	7.0	23.2	29.3
Manganese	Mn	0.022	0.060	0.054	0.022	0.022	0.041
Molybdenum	Mo	<0.03	<0.03	<0.03	<0.03	0.04	0.03
Nickel	Ni	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Phosphorous	P	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Potassium	K	<2	6	3	3	24	19
Selenium	Se	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Silicon	Si	0.64	0.64	0.61	1.15	2.44	2.24
Silver	Ag	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Sodium	Na	<2	31	8	6	32	29
Strontium	Sr	0.048	0.154	0.194	0.168	0.294	0.404
Thallium	Tl	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Tin	Sn	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Titanium	T	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium	V	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Zinc	Zr	<0.005	<0.005	<0.005	<0.005	0.008	0.008

CLIENT : GOLDER ASSOCIATES
PROJECT : GIANT YELLOWKNIFE
PROJECT # : 0033
TEST : LEACH EXTRACTION TEST

<u>LEACHATE ANALYSIS BY ICP</u>

Sample Name:		32724	32761	32763	32777	32951	32953
	CEM#	03319	03320	03321	03322	03323	03324
Dissolved Metals (mg/L)							
Aluminum	Al	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Antimony	Sb	3.6	1.1	0.8	5.0	1.1	1.1
Arsenic	As	2.6	2.5	0.61	1.5	0.9	0.9
Barium	Ba	<0.01	0.01	0.01	<0.01	<0.01	<0.01
Beryllium	Be	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Bismuth	Bi	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1
Boron	B	<0.1	<0.1	<0.1	<0.1	<0.1	0.1
Cadmium	Cd	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Calcium	Ca	86.5	619	424	67.0	78.9	51.6
Chromium	Cr	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	Co	0.02	0.05	0.05	<0.01	0.06	0.05
Copper	Cu	0.02	0.03	0.03	0.03	0.03	0.03
Iron	Fe	0.40	0.23	0.62	0.18	0.39	0.43
Lead	Pb	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Lithium	Li	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Magnesium	Mg	29.7	171	47.4	20.6	30.9	22.8
Manganese	Mn	0.023	0.137	0.081	0.015	0.031	0.018
Molybdenum	Mo	<0.03	0.06	<0.03	0.06	<0.03	<0.03
Nickel	Ni	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Phosphorous	P	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Potassium	K	20	47	36	32	29	29
Selenium	Se	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Silicon	Si	2.61	3.01	2.22	2.31	2.08	2.05
Silver	Ag	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Sodium	Na	31	133	36	20	34	24
Strontium	Sr	0.318	1.33	0.777	0.066	0.246	0.162
Thallium	Tl	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Tin	Sn	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Titanium	Ti	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium	V	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Zinc	Zn	0.007	0.012	0.015	<0.005	<0.005	<0.005

CLIENT : GOLDER ASSOCIATES
PROJECT : GIANT YELLOWKNIFE
PROJECT # : 0033
TEST : LEACH EXTRACTION TEST

LEACHATE ANALYSIS BY ICP

Sample Name:		32964	33001	33003	33011
	CEMI#	03325	03326	03327	03328
Dissolved Metals (mg/L)					
Aluminum	Al	<0.2	<0.2	<0.2	<0.2
Antimony	Sb	1.7	1.2	0.4	1.1
Arsenic	As	1.2	1.0	0.56	0.55
Barium	Ba	<0.01	0.01	<0.01	<0.01
Beryllium	Be	<0.005	<0.005	<0.005	<0.005
Bismuth	Bi	<0.1	<0.1	<0.1	<0.1
Boron	B	<0.1	0.2	<0.1	<0.1
Cadmium	Cd	<0.01	<0.01	<0.01	<0.01
Calcium	Ca	73.2	405	135	106
Chromium	Cr	<0.01	<0.01	<0.01	<0.01
Cobalt	Co	0.02	0.06	0.04	0.02
Copper	Cu	0.04	0.04	0.07	0.02
Iron	Fe	0.14	0.14	0.22	0.08
Lead	Pb	<0.05	<0.05	<0.05	<0.05
Lithium	Li	<0.01	<0.01	<0.01	<0.01
Magnesium	Mg	24.1	72.3	30.0	31.6
Manganese	Mn	0.019	0.101	0.030	0.024
Molybdenum	Mo	<0.03	0.04	<0.03	0.04
Nickel	Ni	<0.05	<0.05	<0.05	<0.05
Phosphorous	P	<0.3	<0.3	<0.3	<0.3
Potassium	K	24	31	35	28
Selenium	Se	<0.2	<0.2	<0.2	<0.2
Silicon	Si	2.37	2.66	2.01	2.14
Silver	Ag	<0.01	<0.01	<0.01	<0.01
Sodium	Na	30	97	29	22
Strontium	Sr	0.129	1.20	0.325	0.228
Thallium	Tl	<0.2	<0.2	<0.2	<0.2
Tin	Sn	<0.03	<0.03	<0.03	<0.03
Titanium	Ti	<0.01	<0.01	<0.01	<0.01
Vanadium	V	<0.03	<0.03	<0.03	<0.03
Zinc	Zn	<0.005	0.008	<0.005	<0.005

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CHEMICAL ANALYSIS REPORT

Date:	October 18, 2000
ASL File No.	M1016r
Report On:	Release 826 Water Analysis
Report To:	**Canadian Environmental and** Metallurgical Inc. 1636 West 75th Avenue Vancouver, BC V6P 6G2
Attention:	**Mr. Sohan Basra**
Received:	August 16, 2000

ASL ANALYTICAL SERVICE LABORATORIES LTD.
per:

Joanne Patrick, B.Sc. - Project Chemist
Can Dang, B.Sc. - Project Chemist

RESULTS OF ANALYSIS - Water File No. M1016r

Sample ID		02889	02890	02892	02893	[redacted]
Sample Date		00 08 11	00 08 11	00 08 11	00 08 11	[redacted]
Dissolved Metals						
Aluminum	D-Al	0.4	0.5	<0.2	<0.2	[redacted]
Antimony	D-Sb	<0.2	<0.2	0.6	0.6	[redacted]
Arsenic	D-As	0.0033	0.3	0.082	0.106	[redacted]
Barium	D-Ba	0.09	0.10	0.05	0.03	[redacted]
Beryllium	D-Be	<0.005	<0.005	<0.005	<0.005	[redacted]
Bismuth	D-Bi	<0.1	<0.1	<0.1	<0.1	[redacted]
Boron	D-B	<0.1	<0.1	0.7	0.6	[redacted]
Cadmium	D-Cd	<0.01	<0.01	<0.01	<0.01	[redacted]
Calcium	D-Ca	481	430	129	88.8	[redacted]
Chromium	D-Cr	<0.01	<0.01	<0.01	<0.01	[redacted]
Cobalt	D-Co	0.09	0.05	0.50	0.29	[redacted]
Copper	D-Cu	0.37	0.29	0.09	0.08	[redacted]
Iron	D-Fe	<0.03	<0.03	0.64	0.18	[redacted]
Lead	D-Pb	<0.05	<0.05	<0.05	<0.05	[redacted]
Lithium	D-Li	0.02	0.02	0.01	<0.01	[redacted]
Magnesium	D-Mg	<0.1	0.1	26.3	18.5	[redacted]
Manganese	D-Mn	<0.005	<0.005	0.101	0.056	[redacted]
Molybdenum	D-Mo	<0.03	<0.03	0.14	0.14	[redacted]
Nickel	D-Ni	<0.05	<0.05	0.06	<0.05	[redacted]
Phosphorus	D-P	<0.3	<0.3	<0.3	<0.3	[redacted]
Potassium	D-K	32	14	7	6	[redacted]
Selenium	D-Se	<0.2	<0.2	<0.2	<0.2	[redacted]
Silicon	D-Si	0.29	0.35	1.20	1.12	[redacted]
Silver	D-Ag	<0.01	<0.01	<0.01	<0.01	[redacted]
Sodium	D-Na	166	65	41	18	[redacted]
Strontium	D-Sr	2.09	1.45	1.48	1.01	[redacted]
Thallium	D-Tl	<0.2	<0.2	<0.2	<0.2	[redacted]
Tin	D-Sn	<0.03	<0.03	<0.03	<0.03	[redacted]
Titanium	D-Ti	<0.01	<0.01	<0.01	<0.01	[redacted]
Vanadium	D-V	<0.03	<0.03	<0.03	<0.03	[redacted]
Zinc	D-Zn	0.045	0.017	0.111	0.109	[redacted]

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

Outlines of the methodologies utilized for the analysis of the samples submitted are as follows:

Metals in Water

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" 20th Edition 1998 published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotplate or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by atomic absorption/emission spectrophotometry (EPA Method 7000 series), inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B), and/or inductively coupled plasma - mass spectrometry (EPA Method 6020).

Recommended Holding Time:

Sample:	6 months
Reference:	EPA
For more detail see:	ASL 'Collection & Sampling Guide'

End of Report

8 Triumph Street, Vancouver, BC Canada V5L 1K5

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FAX: (604) 253-6700 TEL: (604) 253-4188

CHEMICAL ANALYSIS REPORT

Date: October 19, 2000

ASL File No. L9877r

Report On: Release No. 825 Water Analysis

Report To: **Canadian Environmental and**
Metallurgical Inc.
1636 West 75th Avenue
Vancouver, BC
V6P 6G2

Attention: **Mr. Sohan Basra**

Received: August 11, 2000

ASL ANALYTICAL SERVICE LABORATORIES LTD.
per:

Joanne Patrick, B.Sc. - Project Chemist
Can Dang, B.Sc. - Project Chemist

![ALS logo]

RESULTS OF ANALYSIS - Water

File No. L9877r

Sample ID		[redacted]	[redacted]	[redacted]	02888	02891
Dissolved Metals						
Aluminum	D-Al	[redacted]	[redacted]	[redacted]	0.4	<0.2
Antimony	D-Sb	[redacted]	[redacted]	[redacted]	<0.2	0.6
Arsenic	D-As	[redacted]	[redacted]	[redacted]	0.6	0.040
Barium	D-Ba	[redacted]	[redacted]	[redacted]	0.10	0.12
Beryllium	D-Be	[redacted]	[redacted]	[redacted]	<0.005	<0.005
Bismuth	D-Bi	[redacted]	[redacted]	[redacted]	<0.1	<0.1
Boron	D-B	[redacted]	[redacted]	[redacted]	0.2	0.7
Cadmium	D-Cd	[redacted]	[redacted]	[redacted]	<0.01	<0.01
Calcium	D-Ca	[redacted]	[redacted]	[redacted]	912	171
Chromium	D-Cr	[redacted]	[redacted]	[redacted]	0.02	<0.01
Cobalt	D-Co	[redacted]	[redacted]	[redacted]	0.47	0.65
Copper	D-Cu	[redacted]	[redacted]	[redacted]	1.22	0.29
Iron	D-Fe	[redacted]	[redacted]	[redacted]	<0.03	1.74
Lead	D-Pb	[redacted]	[redacted]	[redacted]	<0.05	<0.05
Lithium	D-Li	[redacted]	[redacted]	[redacted]	0.03	0.01
Magnesium	D-Mg	[redacted]	[redacted]	[redacted]	<0.1	34.6
Manganese	D-Mn	[redacted]	[redacted]	[redacted]	<0.005	0.159
Molybdenum	D-Mo	[redacted]	[redacted]	[redacted]	0.07	0.12
Nickel	D-Ni	[redacted]	[redacted]	[redacted]	<0.05	0.07
Phosphorus	D-P	[redacted]	[redacted]	[redacted]	<0.3	<0.3
Potassium	D-K	[redacted]	[redacted]	[redacted]	75	9
Selenium	D-Se	[redacted]	[redacted]	[redacted]	<0.2	<0.2
Silicon	D-Si	[redacted]	[redacted]	[redacted]	0.30	1.18
Silver	D-Ag	[redacted]	[redacted]	[redacted]	0.01	0.01
Sodium	D-Na	[redacted]	[redacted]	[redacted]	447	79
Strontium	D-Sr	[redacted]	[redacted]	[redacted]	8.51	1.90
Thallium	D-Tl	[redacted]	[redacted]	[redacted]	<0.2	<0.2
Tin	D-Sn	[redacted]	[redacted]	[redacted]	<0.03	<0.03
Titanium	D-Ti	[redacted]	[redacted]	[redacted]	<0.01	<0.01
Vanadium	D-V	[redacted]	[redacted]	[redacted]	<0.03	<0.03
Zinc	D-Zn	[redacted]	[redacted]	[redacted]	0.013	0.273

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

Outlines of the methodologies utilized for the analysis of the samples submitted are as follows:

Metals in Water

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" 20th Edition 1998 published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotplate or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by atomic absorption/emission spectrophotometry (EPA Method 7000 series), inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B), and/or inductively coupled plasma - mass spectrometry (EPA Method 6020).

Recommended Holding Time:

Sample:	6 months
Reference:	EPA
For more detail see:	ASL "Collection & Sampling Guide"

End of Report

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CHEMICAL ANALYSIS REPORT

Date: November 27, 2000 11/42

ASL File No. M2564r

Report On: Release 839 Water Analysis

Report To: **Canadian Environmental and**
Metallurgical Inc.
1636 West 75th Avenue
Vancouver, BC
V6P 6G2

Attention: **Mr. Sohan Basra**

Received: September 26, 2000

ASL ANALYTICAL SERVICE LABORATORIES LTD.
per:

Joanne Patrick, B.Sc. - Project Chemist
Can Dang, B.Sc. - Project Chemist

RESULTS OF ANALYSIS - Water File No. M2564r

Sample ID		03194	03195	03196	03197	03198
Dissolved Metals						
Aluminum	D-Al	<0.2	<0.2	<0.2	<0.2	<0.2
Antimony	D-Sb	<0.2	<0.2	<0.2	<0.2	<0.2
Arsenic	D-As	0.042	0.029	0.025	0.0112	0.032
Barium	D-Ba	<0.01	<0.01	<0.01	<0.01	<0.01
Beryllium	D-Be	<0.005	<0.005	<0.005	<0.005	<0.005
Bismuth	D-Bi	<0.1	<0.1	<0.1	<0.1	<0.1
Boron	D-B	<0.1	<0.1	<0.1	<0.1	<0.1
Cadmium	D-Cd	<0.01	<0.01	<0.01	<0.01	<0.01
Calcium	D-Ca	22.7	40.1	19.3	21.9	15.5
Chromium	D-Cr	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	D-Co	<0.01	<0.01	<0.01	<0.01	<0.01
Copper	D-Cu	0.01	0.01	<0.01	<0.01	<0.01
Iron	D-Fe	<0.03	<0.03	<0.03	<0.03	<0.03
Lead	D-Pb	<0.05	<0.05	<0.05	<0.05	<0.05
Lithium	D-Li	<0.01	<0.01	<0.01	<0.01	<0.01
Magnesium	D-Mg	4.2	10.1	3.2	2.5	5.2
Manganese	D-Mn	0.017	0.039	0.018	0.012	0.032
Molybdenum	D-Mo	<0.03	<0.03	<0.03	<0.03	<0.03
Nickel	D-Ni	<0.05	<0.05	<0.05	<0.05	<0.05
Phosphorus	D-P	<0.3	<0.3	<0.3	<0.3	<0.3
Potassium	D-K	<2	4	<2	<2	3
Selenium	D-Se	<0.2	<0.2	<0.2	<0.2	<0.2
Silicon	D-Si	0.89	0.61	0.97	0.98	0.45
Silver	D-Ag	<0.01	<0.01	<0.01	<0.01	<0.01
Sodium	D-Na	3	7	3	3	<2
Strontium	D-Sr	0.105	0.121	0.048	0.044	0.032
Thallium	D-Tl	<0.2	<0.2	<0.2	<0.2	<0.2
Tin	D-Sn	<0.03	<0.03	<0.03	<0.03	<0.03
Titanium	D-Ti	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium	D-V	<0.03	<0.03	<0.03	<0.03	<0.03
Zinc	D-Zn	<0.005	0.013	<0.005	<0.005	<0.005

Results are expressed as milligrams per litre except where noted.
< = Less than the detection limit indicated.

RESULTS OF ANALYSIS - Water

File No. M2564r

Sample ID		03199	03200	03201	03202	03203
Dissolved Metals						
Aluminum	D-Al	<0.2	<0.2	<0.2	<0.2	<0.2
Antimony	D-Sb	<0.2	<0.2	<0.2	<0.2	1.6
Arsenic	D-As	0.015	0.093	0.0037	0.0031	1.3
Barium	D-Ba	<0.01	<0.01	<0.01	<0.01	<0.01
Beryllium	D-Be	<0.005	<0.005	<0.005	<0.005	<0.005
Bismuth	D-Bi	<0.1	<0.1	<0.1	<0.1	<0.1
Boron	D-B	<0.1	<0.1	<0.1	<0.1	<0.1
Cadmium	D-Cd	<0.01	<0.01	<0.01	<0.01	<0.01
Calcium	D-Ca	23.3	13.4	31.4	29.1	58.3
Chromium	D-Cr	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	D-Co	<0.01	<0.01	<0.01	<0.01	0.03
Copper	D-Cu	<0.01	<0.01	<0.01	<0.01	0.01
Iron	D-Fe	<0.03	<0.03	<0.03	<0.03	0.04
Lead	D-Pb	<0.05	<0.05	<0.05	<0.05	<0.05
Lithium	D-Li	<0.01	<0.01	<0.01	<0.01	<0.01
Magnesium	D-Mg	3.2	4.6	1.6	1.8	13.5
Manganese	D-Mn	0.012	0.016	0.027	0.022	0.060
Molybdenum	D-Mo	<0.03	<0.03	<0.03	<0.03	<0.03
Nickel	D-Ni	<0.05	<0.05	<0.05	<0.05	<0.05
Phosphorus	D-P	<0.3	<0.3	<0.3	<0.3	<0.3
Potassium	D-K	<2	2	<2	<2	6
Selenium	D-Se	<0.2	<0.2	<0.2	<0.2	<0.2
Silicon	D-Si	0.71	0.52	0.52	0.64	0.84
Silver	D-Ag	<0.01	<0.01	<0.01	<0.01	<0.01
Sodium	D-Na	<2	<2	<2	<2	31
Strontium	D-Sr	0.080	0.023	0.053	0.048	0.154
Thallium	D-Tl	<0.2	<0.2	<0.2	<0.2	<0.2
Tin	D-Sn	<0.03	<0.03	<0.03	<0.03	<0.03
Titanium	D-Ti	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium	D-V	<0.03	<0.03	<0.03	<0.03	<0.03
Zinc	D-Zn	<0.005	<0.005	<0.005	<0.005	<0.005

Results are expressed as milligrams per litre except where noted.
< = Less than the detection limit indicated.

RESULTS OF ANALYSIS - Water

File No. M2564r

Sample ID		03204	03205
Dissolved Metals			
Aluminum	D-Al	<0.2	<0.2
Antimony	D-Sb	0.2	<0.2
Arsenic	D-As	0.3	0.100
Barium	D-Ba	<0.01	<0.01
Beryllium	D-Be	<0.005	<0.005
Bismuth	D-Bi	<0.1	<0.1
Boron	D-B	<0.1	0.2
Cadmium	D-Cd	<0.01	<0.01
Calcium	D-Ca	45.2	42.7
Chromium	D-Cr	<0.01	<0.01
Cobalt	D-Co	<0.01	<0.01
Copper	D-Cu	0.01	0.01
Iron	D-Fe	<0.03	<0.03
Lead	D-Pb	<0.05	<0.05
Lithium	D-Li	<0.01	<0.01
Magnesium	D-Mg	5.7	7.0
Manganese	D-Mn	0.054	0.022
Molybdenum	D-Mo	<0.03	<0.03
Nickel	D-Ni	<0.05	<0.05
Phosphorus	D-P	<0.3	<0.3
Potassium	D-K	3	3
Selenium	D-Se	<0.2	<0.2
Silicon	D-Si	0.61	1.15
Silver	D-Ag	<0.01	<0.01
Sodium	D-Na	8	6
Strontium	D-Sr	0.194	0.168
Thallium	D-Tl	<0.2	<0.2
Tin	D-Sn	<0.03	<0.03
Titanium	D-Ti	<0.01	<0.01
Vanadium	D-V	<0.03	<0.03
Zinc	D-Zn	<0.005	<0.005

Results are expressed as milligrams per litre except where noted.
< = Less than the detection limit indicated.

Appendix 1 - QUALITY CONTROL - Replicates

File No. M2564r

Water		03198	03198 QC # 213855
Dissolved Metals			
Aluminum	D-Al	<0.2	<0.2
Antimony	D-Sb	<0.2	<0.2
Arsenic	D-As	0.032	0.031
Barium	D-Ba	<0.01	<0.01
Beryllium	D-Be	<0.005	<0.005
Bismuth	D-Bi	<0.1	<0.1
Boron	D-B	<0.1	<0.1
Cadmium	D-Cd	<0.01	<0.01
Calcium	D-Ca	15.5	15.5
Chromium	D-Cr	<0.01	<0.01
Cobalt	D-Co	<0.01	<0.01
Copper	D-Cu	<0.01	<0.01
Iron	D-Fe	<0.03	<0.03
Lead	D-Pb	<0.05	<0.05
Lithium	D-Li	<0.01	<0.01
Magnesium	D-Mg	5.2	5.3
Manganese	D-Mn	0.032	0.032
Molybdenum	D-Mo	<0.03	<0.03
Nickel	D-Ni	<0.05	<0.05
Phosphorus	D-P	<0.3	<0.3
Potassium	D-K	3	3
Selenium	D-Se	<0.2	<0.2
Silicon	D-Si	0.45	0.45
Silver	D-Ag	<0.01	<0.01
Sodium	D-Na	<2	<2
Strontium	D-Sr	0.032	0.032
Thallium	D-Tl	<0.2	<0.2
Tin	D-Sn	<0.03	<0.03
Titanium	D-Ti	<0.01	<0.01
Vanadium	D-V	<0.03	<0.03
Zinc	D-Zn	<0.005	<0.005

Results are expressed as milligrams per litre except where noted.
< = Less than the detection limit indicated.

Outlines of the methodologies utilized for the analysis of the samples submitted are as follows:

Metals in Water

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Recommended Holding Time:

Sample:	6 months
Reference:	EPA
For more detail see:	ASL "Collection & Sampling Guide"

End of Report

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CHEMICAL ANALYSIS REPORT

Date:	October 17, 2000
ASL File No.	M8012
Report On:	Release 842 Water Analysis
Report To:	**Canadian Environmental and** Metallurgical Inc. 1636 West 75th Avenue Vancouver, BC V6P 6G2
Attention:	**Mr. Sohan Basra**
Received:	October 6, 2000

ASL ANALYTICAL SERVICE LABORATORIES LTD.
per:

Joanne Patrick, B.Sc. - Project Chemist
Can Dang, B.Sc. - Project Chemist

RESULTS OF ANALYSIS - Water File No. M3012

Sample ID		[redacted]	[redacted]	03317	03318	03319
Sample Date		00 10 03	00 10 03	00 10 03	00 10 03	00 10 03
Dissolved Metals						
Aluminum	D-Al	[redacted]	[redacted]	<0.2	<0.2	<0.2
Antimony	D-Sb	[redacted]	[redacted]	6.6	2.2	3.6
Arsenic	D As	[redacted]	[redacted]	10.3	1.6	2.6
Barium	D-Ba	[redacted]	[redacted]	<0.01	<0.01	<0.01
Beryllium	D-Be	[redacted]	[redacted]	<0.005	<0.005	<0.005
Bismuth	D-Bi	[redacted]	[redacted]	<0.1	<0.1	<0.1
Boron	D-B	[redacted]	[redacted]	0.1	<0.1	<0.1
Cadmium	D-Cd	[redacted]	[redacted]	<0.02	<0.01	<0.01
Calcium	D-Ca	[redacted]	[redacted]	94.6	128	86.5
Chromium	D-Cr	[redacted]	[redacted]	<0.01	<0.01	<0.01
Cobalt	D-Co	[redacted]	[redacted]	0.04	0.03	0.02
Copper	D-Cu	[redacted]	[redacted]	0.02	0.03	0.02
Iron	D-Fe	[redacted]	[redacted]	0.20	0.26	0.40
Lead	D-Pb	[redacted]	[redacted]	<0.05	<0.05	<0.05
Lithium	D-Li	[redacted]	[redacted]	0.01	0.01	0.01
Magnesium	D-Mg	[redacted]	[redacted]	23.2	29.3	29.7
Manganese	D-Mn	[redacted]	[redacted]	0.022	0.041	0.023
Molybdenum	D-Mo	[redacted]	[redacted]	0.04	0.03	<0.03
Nickel	D-Ni	[redacted]	[redacted]	<0.05	<0.05	<0.05
Phosphorus	D-P	[redacted]	[redacted]	<0.3	<0.3	<0.3
Potassium	D-K	[redacted]	[redacted]	24	19	20
Selenium	D-Se	[redacted]	[redacted]	<0.2	<0.2	<0.2
Silicon	D-Si	[redacted]	[redacted]	2.44	2.24	2.51
Silver	D-Ag	[redacted]	[redacted]	<0.01	<0.01	<0.01
Sodium	D-Na	[redacted]	[redacted]	32	29	31
Strontium	D-Sr	[redacted]	[redacted]	0.294	0.404	0.518
Thallium	D-Tl	[redacted]	[redacted]	<0.2	<0.2	<0.2
Tin	D-Sn	[redacted]	[redacted]	<0.03	<0.03	<0.03
Titanium	D-Ti	[redacted]	[redacted]	<0.01	<0.01	<0.01
Vanadium	D-V	[redacted]	[redacted]	<0.03	<0.03	<0.03
Zinc	D-Zn	[redacted]	[redacted]	0.008	0.008	0.007

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

RESULTS OF ANALYSIS - Water File No. M3012

Sample ID		03320	03321	03322	03323	03324
Sample Date		00 10 03	00 10 03	00 10 03	00 10 03	00 10 03
Dissolved Metals						
Aluminum	D-Al	<0.2	<0.2	<0.2	<0.2	<0.2
Antimony	D-Sb	1.1	0.8	5.0	1.1	1.1
Arsenic	D-As	2.5	0.61	1.5	0.9	0.9
Barium	D-Ba	0.01	0.01	<0.01	<0.01	<0.01
Beryllium	D-Be	<0.005	<0.005	<0.005	<0.005	<0.005
Bismuth	D-Bi	<0.2	<0.1	<0.1	<0.1	<0.1
Boron	D-B	<0.1	<0.1	<0.1	<0.1	0.1
Cadmium	D-Cd	<0.01	<0.01	<0.01	<0.01	<0.01
Calcium	D-Ca	619	424	67.0	78.9	51.6
Chromium	D-Cr	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	D-Co	0.05	0.05	<0.01	0.05	0.05
Copper	D-Cu	0.03	0.03	0.03	0.03	0.03
Iron	D-Fe	0.23	0.62	0.18	0.39	0.43
Lead	D-Pb	<0.05	<0.05	<0.05	<0.05	<0.05
Lithium	D-Li	<0.01	<0.01	<0.01	<0.01	<0.01
Magnesium	D-Mg	171	47.4	20.6	30.9	22.8
Manganese	D-Mn	0.137	0.081	0.015	0.031	0.018
Molybdenum	D-Mo	0.06	<0.03	0.06	<0.03	<0.03
Nickel	D-Ni	<0.05	<0.05	<0.05	<0.05	<0.05
Phosphorus	D-P	<0.3	<0.3	<0.3	<0.3	<0.3
Potassium	D-K	47	35	32	29	29
Selenium	D-Se	<0.2	<0.2	<0.2	<0.2	<0.2
Silicon	D-Si	3.01	2.22	2.31	2.08	2.05
Silver	D-Ag	<0.01	<0.01	<0.01	<0.01	<0.01
Sodium	D-Na	153	35	30	34	24
Strontium	D-Sr	1.33	0.777	0.066	0.243	0.162
Thallium	D-Tl	<0.2	<0.2	<0.2	<0.2	<0.2
Tin	D-Sn	<0.03	<0.03	<0.03	<0.03	<0.03
Titanium	D-Ti	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium	D-V	<0.03	<0.03	<0.03	<0.03	<0.03
Zinc	D-Zn	0.012	0.015	<0.005	<0.005	<0.005

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

RESULTS OF ANALYSIS - Water File No. M3012

Sample ID		03325	03326	03327	03328	[redacted]
Sample Date		00 10 03	00 10 03	00 10 03	00 10 03	00 10 03
Dissolved Metals						
Aluminum	D-Al	<0.2	<0.2	<0.2	<0.2	[redacted]
Antimony	D-Sb	1.7	1.2	0.4	1.1	[redacted]
Arsenic	D-As	1.2	1.0	0.56	0.55	[redacted]
Barium	D-Ba	<0.01	0.01	<0.01	<0.01	[redacted]
Beryllium	D-Be	<0.005	<0.005	<0.005	<0.005	[redacted]
Bismuth	D-Bi	<0.1	<0.1	<0.1	<0.1	[redacted]
Boron	D-B	<0.1	0.2	<0.1	<0.1	[redacted]
Cadmium	D-Cd	<0.01	<0.01	<0.01	<0.01	[redacted]
Calcium	D-Ca	73.2	405	135	106	[redacted]
Chromium	D-Cr	<0.01	<0.01	<0.01	<0.01	[redacted]
Cobalt	D-Co	0.02	0.06	0.04	0.02	[redacted]
Copper	D-Cu	0.04	0.04	0.07	0.02	[redacted]
Iron	D-Fe	0.14	0.14	0.22	0.08	[redacted]
Lead	D-Pb	<0.05	<0.05	<0.05	<0.05	[redacted]
Lithium	D-Li	<0.01	<0.01	<0.01	<0.01	[redacted]
Magnesium	D-Mg	24.1	72.3	30.0	31.6	[redacted]
Manganese	D-Mn	0.019	0.101	0.030	0.024	[redacted]
Molybdenum	D-Mo	<0.03	0.04	<0.03	0.04	[redacted]
Nickel	D-Ni	<0.05	<0.05	<0.05	<0.05	[redacted]
Phosphorus	D-P	<0.3	<0.3	<0.3	<0.3	[redacted]
Potassium	D-K	24	31	35	28	[redacted]
Selenium	D-Se	<0.2	<0.2	<0.2	<0.2	[redacted]
Silicon	D-Si	2.37	2.66	2.01	2.14	[redacted]
Silver	D-Ag	<0.01	<0.01	<0.01	<0.01	[redacted]
Sodium	D-Na	30	97	29	22	[redacted]
Strontium	D-Sr	0.129	1.20	0.325	0.228	[redacted]
Thallium	D-Tl	<0.2	<0.2	<0.2	<0.2	[redacted]
Tin	D-Sn	<0.03	<0.03	<0.03	<0.03	[redacted]
Titanium	D-Ti	<0.01	<0.01	<0.01	<0.01	[redacted]
Vanadium	D-V	<0.03	<0.03	<0.03	<0.03	[redacted]
Zinc	D-Zn	<0.005	0.008	<0.005	<0.005	[redacted]

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

Appendix 1 - QUALITY CONTROL - Replicates File No. M3012

Water		03320	03320
		00 10 03	QC # 215558
Dissolved Metals			
Aluminum	D-Al	<0.2	<0.2
Antimony	D-Sb	1.1	1.0
Arsenic	D-As	2.5	2.1
Barium	D-Ba	0.01	0.01
Beryllium	D-Be	<0.005	<0.005
Bismuth	D-Bi	<0.2	<0.2
Boron	D-B	<0.1	<0.1
Cadmium	D-Cd	<0.01	<0.01
Calcium	D-Ca	619	574
Chromium	D-Cr	<0.01	<0.01
Cobalt	D-Co	0.05	0.06
Copper	D-Cu	0.03	0.03
Iron	D-Fe	0.23	0.21
Lead	D-Pb	<0.05	<0.05
Lithium	D-Li	<0.01	0.01
Magnesium	D-Mg	171	158
Manganese	D-Mn	0.137	0.127
Molybdenum	D-Mo	0.06	0.06
Nickel	D-Ni	<0.05	<0.05
Phosphorus	D-P	<0.3	<0.3
Potassium	D-K	47	43
Selenium	D-Se	<0.2	<0.2
Silicon	D-Si	3.01	2.81
Silver	D-Ag	<0.01	<0.01
Sodium	D-Na	133	122
Strontium	D-Sr	1.33	1.22
Thallium	D-Tl	<0.2	<0.2
Tin	D-Sn	<0.03	<0.03
Titanium	D-Ti	<0.01	<0.01
Vanadium	D-V	<0.03	<0.03
Zinc	D-Zn	0.012	0.011

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

Outlines of the methodologies utilized for the analysis of the samples submitted are as follows:

Chloride in Water

This analysis is carried out using procedures adapted from APHA Method 4500 "Chloride". Chloride is determined using the ferricyanide colourimetric method.

Recommended Holding Time:
Sample: 28 days
Reference: APHA
For more detail see ASL "Collection & Sampling Guide"

Metals in Water

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" 20th Edition 1998 published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotplate or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by atomic absorption/emission spectrophotometry (EPA Method 7000 series), inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B), and/or inductively coupled plasma - mass spectrometry (EPA Method 6020).

Recommended Holding Time:

Sample:	6 months
Reference:	EPA
For more detail see:	ASL "Collection & Sampling Guide"

End of Report

analytical
service
laboratories
ltd.

CHEMICAL ANALYSIS REPORT

Date:	November 27, 2000
ASL File No.	M2452r
Report On:	Release 838 Water Analysis
Report To:	**Canadian Environmental and** Metallurgical Inc. 1636 West 75th Avenue Vancouver, BC V6P 6G2
Attention:	**Mr. Sohan Basra**
Received:	September 22, 2000

ASL ANALYTICAL SERVICE LABORATORIES LTD.
per:

Joanne Patrick, B.Sc. - Project Chemist
Can Dang, B.Sc. - Project Chemist

REMARKS

File No. M2452r

The detection limits were increased for the metals for the samples "O3163", "O3180", and "O3182" due to sample matrix interferences.

RESULTS OF ANALYSIS - Water File No. M2432r

Sample ID		[redacted]	[redacted]	[redacted]	[redacted]	03178
Sample Date		00 09 19	00 09 19	00 09 19	00 09 19	00 09 19
Dissolved Metals						
Aluminum	D-Al	[redacted]	[redacted]	[redacted]	[redacted]	<0.2
Antimony	D-Sb	[redacted]	[redacted]	[redacted]	[redacted]	2.2
Arsenic	D-As	[redacted]	[redacted]	[redacted]	[redacted]	1.4
Barium	D-Ba	[redacted]	[redacted]	[redacted]	[redacted]	<0.01
Beryllium	D-Be	[redacted]	[redacted]	[redacted]	[redacted]	<0.005
Bismuth	D-Bi	[redacted]	[redacted]	[redacted]	[redacted]	<0.1
Boron	D-B	[redacted]	[redacted]	[redacted]	[redacted]	<0.1
Cadmium	D-Cd	[redacted]	[redacted]	[redacted]	[redacted]	<0.01
Calcium	D-Ca	[redacted]	[redacted]	[redacted]	[redacted]	50.7
Chromium	D-Cr	[redacted]	[redacted]	[redacted]	[redacted]	<0.01
Cobalt	D-Co	[redacted]	[redacted]	[redacted]	[redacted]	0.01
Copper	D-Cu	[redacted]	[redacted]	[redacted]	[redacted]	<0.01
Iron	D-Fe	[redacted]	[redacted]	[redacted]	[redacted]	0.14
Lead	D-Pb	[redacted]	[redacted]	[redacted]	[redacted]	<0.05
Lithium	D-Li	[redacted]	[redacted]	[redacted]	[redacted]	<0.01
Magnesium	D-Mg	[redacted]	[redacted]	[redacted]	[redacted]	13.0
Manganese	D-Mn	[redacted]	[redacted]	[redacted]	[redacted]	0.026
Molybdenum	D-Mo	[redacted]	[redacted]	[redacted]	[redacted]	<0.03
Nickel	D-Ni	[redacted]	[redacted]	[redacted]	[redacted]	<0.05
Phosphorus	D-P	[redacted]	[redacted]	[redacted]	[redacted]	<0.3
Potassium	D-K	[redacted]	[redacted]	[redacted]	[redacted]	5
Selenium	D-Se	[redacted]	[redacted]	[redacted]	[redacted]	<0.2
Silicon	D-Si	[redacted]	[redacted]	[redacted]	[redacted]	1.19
Silver	D-Ag	[redacted]	[redacted]	[redacted]	[redacted]	<0.01
Sodium	D-Na	[redacted]	[redacted]	[redacted]	[redacted]	18
Strontium	D-Sr	[redacted]	[redacted]	[redacted]	[redacted]	0.228
Thallium	D-Tl	[redacted]	[redacted]	[redacted]	[redacted]	<0.2
Tin	D-Sn	[redacted]	[redacted]	[redacted]	[redacted]	<0.03
Titanium	D-Ti	[redacted]	[redacted]	[redacted]	[redacted]	<0.01
Vanadium	D-V	[redacted]	[redacted]	[redacted]	[redacted]	<0.03
Zinc	D-Zn	[redacted]	[redacted]	[redacted]	[redacted]	0.005

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

RESULTS OF ANALYSIS - Water

File No. M2452r

Sample ID		03179	03180	03181	03182	03183
Sample Date		00 09 19	00 09 19	00 09 19	00 09 19	00 09 19
Dissolved Metals						
Aluminum	D-Al	<0.2	<0.4	<0.2	<0.4	<0.2
Antimony	D-Sb	1.1	0.9	<0.2	1.0	<0.2
Arsenic	D-As	0.6	9.5	0.3	10.0	0.105
Barium	D-Ba	<0.01	0.04	<0.01	0.03	<0.01
Beryllium	D-Be	<0.005	<0.01	<0.005	<0.01	<0.005
Bismuth	D-Bi	<0.1	<3	<0.1	<3	<0.1
Boron	D-B	<0.1	<0.2	<0.1	<0.2	<0.1
Cadmium	D-Cd	<0.01	<0.02	<0.01	<0.02	<0.01
Calcium	D-Ca	49.3	446	171	358	24.5
Chromium	D-Cr	<0.01	<0.02	<0.01	<0.02	<0.01
Cobalt	D-Co	0.02	0.11	0.01	0.14	<0.01
Copper	D-Cu	0.01	0.14	0.01	0.18	<0.01
Iron	D-Fe	0.05	0.10	0.05	0.09	<0.03
Lead	D-Pb	<0.05	<0.1	<0.05	<0.1	<0.05
Lithium	D-Li	<0.01	0.05	<0.01	0.05	<0.01
Magnesium	D-Mg	8.7	1140	53.4	1450	4.9
Manganese	D-Mn	0.027	0.15	0.055	0.17	0.028
Molybdenum	D-Mo	<0.03	0.20	<0.03	0.25	<0.03
Nickel	D-Ni	<0.05	<0.1	<0.05	<0.1	<0.05
Phosphorus	D-P	<0.3	<0.6	<0.3	<0.6	<0.3
Potassium	D-K	3	66	6	80	2
Selenium	D-Se	<0.2	<0.4	<0.2	<0.4	<0.2
Silicon	D-Si	0.76	1.4	1.42	1.4	0.72
Silver	D-Ag	<0.01	<0.02	<0.01	<0.02	<0.01
Sodium	D-Na	13	510	19	633	<2
Strontium	D-Sr	0.132	2.31	0.490	1.98	0.041
Thallium	D-Tl	<0.2	<0.4	<0.2	<0.4	<0.2
Tin	D-Sn	<0.03	<0.06	<0.03	<0.06	<0.03
Titanium	D-Ti	<0.01	<0.02	<0.01	<0.02	<0.01
Vanadium	D-V	<0.03	<0.05	<0.03	<0.06	<0.03
Zinc	D-Zn	<0.005	0.060	0.005	0.109	<0.005

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

RESULTS OF ANALYSIS - Water File No. M2452r

Sample ID		03184	03155	03156	03187	03188
Sample Date		00 09 19	00 09 19	00 09 19	00 09 19	00 09 19
Dissolved Metals						
Aluminum	D-Al	<0.2	<0.2	<0.2	<0.2	<0.2
Antimony	D-Sb	<0.2	<0.2	<0.2	<0.2	<0.2
Arsenic	D-As	0.065	0.191	0.053	0.190	0.055
Barium	D-Ba	<0.01	<0.01	<0.01	<0.01	<0.01
Beryllium	D-Be	<0.005	<0.005	<0.005	<0.005	<0.005
Bismuth	D-Bi	<0.1	<0.1	<0.1	<0.1	<0.1
Boron	D-B	<0.1	<0.1	<0.1	<0.1	<0.1
Cadmium	D-Cd	<0.01	<0.01	<0.01	<0.01	<0.01
Calcium	D-Ca	19.4	15.9	33.1	13.8	44.7
Chromium	D-Cr	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	D-Co	<0.01	<0.01	<0.01	<0.01	<0.01
Copper	D-Cu	<0.01	<0.01	<0.01	<0.01	<0.01
Iron	D-Fe	<0.03	<0.03	<0.03	<0.03	<0.03
Lead	D-Pb	<0.05	<0.05	<0.05	<0.05	<0.05
Lithium	D-Li	<0.01	<0.01	<0.01	<0.01	<0.01
Magnesium	D-Mg	4.6	5.9	11.6	5.0	10.0
Manganese	D-Mn	0.014	0.007	0.083	0.055	0.036
Molybdenum	D-Mo	<0.03	<0.03	<0.03	<0.03	<0.03
Nickel	D-Ni	<0.05	<0.05	<0.05	<0.05	<0.05
Phosphorus	D-P	<0.3	<0.3	<0.3	<0.3	<0.3
Potassium	D-K	<2	<2	4	2	<2
Selenium	D-Se	<0.2	<0.2	<0.2	<0.2	<0.2
Silicon	D-Si	1.09	0.71	0.64	0.38	0.49
Silver	D-Ag	<0.01	<0.01	<0.01	<0.01	<0.01
Sodium	D-Na	5	<2	<2	<2	<3
Strontium	D-Sr	0.064	0.039	0.047	0.021	0.060
Thallium	D-Tl	<0.2	<0.2	<0.2	<0.2	<0.2
Tin	D-Sn	<0.03	<0.03	<0.03	<0.03	<0.03
Titanium	D-Ti	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium	D-V	<0.03	<0.03	<0.03	<0.03	<0.03
Zinc	D-Zn	<0.005	<0.005	<0.005	<0.005	<0.005

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

RESULTS OF ANALYSIS - Water

File No. M2452r

Sample ID		03189	03190	03191	03192	03193
Sample Date		00 09 19	00 09 19	00 09 19	00 09 19	00 09 19
Dissolved Metals						
Aluminum	D-Al	<0.2	<0.2	<0.2	<0.2	<0.2
Antimony	D-Sb	<0.2	<0.2	<0.2	<0.2	<0.2
Arsenic	D-As	0.0146	0.0069	0.036	0.0077	0.0156
Barium	D-Ba	<0.01	<0.01	<0.01	<0.01	0.11
Beryllium	D-Be	<0.005	<0.005	<0.005	<0.005	<0.005
Bismuth	D-Bi	<0.1	<0.1	<0.1	<0.1	<0.1
Boron	D-B	<0.1	<0.1	<0.1	<0.1	<0.1
Cadmium	D-Cd	<0.01	<0.01	<0.01	<0.01	<0.01
Calcium	D-Ca	25.3	23.0	18.0	21.4	23.3
Chromium	D-Cr	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	D-Co	<0.01	<0.01	<0.01	<0.01	<0.01
Copper	D-Cu	<0.01	0.01	<0.01	<0.01	<0.01
Iron	D-Fe	<0.03	<0.03	<0.03	<0.03	<0.03
Lead	D-Pb	<0.05	<0.05	<0.05	<0.05	<0.05
Lithium	D-Li	<0.01	<0.01	<0.01	<0.01	<0.01
Magnesium	D-Mg	2.2	2.3	6.7	2.5	2.0
Manganese	D-Mn	0.013	0.016	0.025	0.010	0.020
Molybdenum	D-Mo	<0.03	<0.03	<0.03	<0.03	<0.03
Nickel	D-Ni	<0.05	<0.05	<0.05	<0.05	<0.05
Phosphorus	D-P	<0.3	<0.3	<0.3	<0.3	<0.3
Potassium	D-K	<2	<2	2	<2	<2
Selenium	D-Se	<0.2	<0.2	<0.2	<0.2	<0.2
Silicon	D-Si	0.56	0.80	0.66	1.13	0.93
Silver	D-Ag	<0.01	<0.01	<0.01	<0.01	<0.01
Sodium	D-Na	<2	2	<2	3	3
Strontium	D-Sr	0.034	0.039	0.028	0.096	0.077
Thallium	D-Tl	<0.2	<0.2	<0.2	<0.2	<0.2
Tin	D-Sn	<0.03	<0.03	<0.03	<0.03	<0.03
Titanium	D-Ti	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium	D-V	<0.03	<0.03	<0.03	<0.03	<0.03
Zinc	D-Zn	<0.005	<0.005	<0.005	<0.005	<0.005

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

ASL

Appendix 1 - QUALITY CONTROL - Replicates

File No. M2452r

Water		03163	03163
		00 09 19	QC # 213399
Dissolved Metals			
Aluminum	D-Al	<0.4	<0.4
Antimony	D-Sb	<0.4	<0.4
Arsenic	D-As	<0.4	<0.4
Barium	D-Ba	<0.02	<0.02
Beryllium	D-Be	<0.01	<0.01
Bismuth	D-Bi	<0.2	<0.2
Boron	D-B	<0.2	<0.2
Cadmium	D-Cd	5.76	5.79
Calcium	D-Ca	2.3	2.3
Chromium	D-Cr	<0.02	<0.02
Cobalt	D-Co	0.32	0.32
Copper	D-Cu	18.4	18.4
Iron	D-Fe	13.9	14.0
Lead	D-Pb	4.3	4.3
Lithium	D-Li	<0.02	<0.02
Magnesium	D-Mg	<0.2	<0.2
Manganese	D-Mn	0.15	0.15
Molybdenum	D-Mo	<0.06	<0.06
Nickel	D-Ni	0.1	0.2
Phosphorus	D-P	<0.6	<0.6
Potassium	D-K	<4	<4
Selenium	D-Se	<0.4	<0.4
Silicon	D-Si	3.4	3.4
Silver	D-Ag	<0.02	<0.02
Sodium	D-Na	<4	<4
Strontium	D-Sr	0.81	0.81
Thallium	D-Tl	<0.4	<0.4
Tin	D-Sn	<0.06	<0.06
Titanium	D-Ti	<0.02	<0.02
Vanadium	D-V	<0.06	<0.06
Zinc	D-Zn	314	312

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

Appendix 1 - QUALITY CONTROL - Replicates

File No. M2452r

Water		03171	03171
		00 09 19	QC # 213400
Dissolved Metals			
Aluminum	D-Al	<0.2	<0.2
Antimony	D-Sb	<0.2	<0.2
Arsenic	D-As	<0.2	<0.2
Barium	D-Ba	<0.01	<0.01
Beryllium	D-Be	<0.005	<0.005
Bismuth	D-Bi	<0.1	<0.1
Boron	D-B	0.2	0.2
Cadmium	D-Cd	<0.01	<0.01
Calcium	D-Ca	7.42	7.57
Chromium	D-Cr	<0.01	<0.01
Cobalt	D-Co	0.60	0.61
Copper	D-Cu	0.30	0.31
Iron	D-Fe	<0.03	<0.03
Lead	D-Pb	<0.05	<0.05
Lithium	D-Li	0.01	0.02
Magnesium	D-Mg	5.0	5.0
Manganese	D-Mn	0.152	0.155
Molybdenum	D-Mo	<0.03	<0.03
Nickel	D-Ni	<0.05	<0.05
Phosphorus	D-P	<0.3	<0.3
Potassium	D-K	12	13
Selenium	D-Se	<0.2	<0.2
Silicon	D-Si	12.1	12.2
Silver	D-Ag	<0.01	<0.01
Sodium	D-Na	12	12
Strontium	D-Sr	<0.005	<0.005
Thallium	D-Tl	<0.2	<0.2
Tin	D-Sn	<0.03	<0.03
Titanium	D-Ti	<0.01	<0.01
Vanadium	D-V	<0.03	<0.03
Zinc	D-Zn	0.230	0.233

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

Appendix 1 - QUALITY CONTROL - Replicates

File No. M2452r

Water		03182	03182
		00 09 19	QC # 213401
Dissolved Metals			
Aluminum	D-Al	<0.4	<0.4
Antimony	D-Sb	1.0	1.1
Arsenic	D-As	10.0	10.3
Barium	D-Ba	0.03	0.03
Beryllium	D-Be	<0.01	<0.01
Bismuth	D-Bi	<3	<3
Boron	D-B	<0.2	<0.2
Cadmium	D-Cd	<0.02	<0.02
Calcium	D-Ca	368	376
Chromium	D-Cr	<0.02	<0.02
Cobalt	D-Co	0.14	0.14
Copper	D-Cu	0.18	0.18
Iron	D-Fe	0.09	0.09
Lead	D-Pb	<0.1	<0.1
Lithium	D-Li	0.05	0.05
Magnesium	D-Mg	1450	1470
Manganese	D-Mn	0.17	0.17
Molybdenum	D-Mo	0.25	0.25
Nickel	D-Ni	<0.1	<0.1
Phosphorus	D-P	<0.6	<0.6
Potassium	D-K	80	80
Selenium	D-Se	<0.4	<0.4
Silicon	D-Si	1.4	1.4
Silver	D-Ag	<0.02	<0.02
Sodium	D-Na	638	644
Strontium	D-Sr	1.98	2.02
Thallium	D-Tl	<0.4	<0.4
Tin	D-Sn	<0.06	<0.06
Titanium	D-Ti	<0.02	<0.02
Vanadium	D-V	<0.06	<0.06
Zinc	D-Zn	0.109	0.109

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

Appendix 1 - QUALITY CONTROL - Replicates

File No. M2452r

Water		03191	03191
		00 09 19	QC # 213402
Dissolved Metals			
Aluminum	D-Al	<0.2	<0.2
Antimony	D-Sb	<0.2	<0.2
Arsenic	D-As	0.036	0.035
Barium	D-Ba	<0.01	<0.01
Beryllium	D-Be	<0.005	<0.005
Bismuth	D-Bi	<0.1	<0.1
Boron	D-B	<0.1	<0.1
Cadmium	D-Cd	<0.01	<0.01
Calcium	D-Ca	18.0	17.7
Chromium	D-Cr	<0.01	<0.01
Cobalt	D-Co	<0.01	<0.01
Copper	D-Cu	<0.01	<0.01
Iron	D-Fe	<0.03	<0.03
Lead	D-Pb	<0.05	<0.05
Lithium	D-Li	<0.01	<0.01
Magnesium	D-Mg	6.7	6.6
Manganese	D-Mn	0.025	0.023
Molybdenum	D-Mo	<0.03	<0.03
Nickel	D-Ni	<0.05	<0.05
Phosphorus	D-P	<0.3	<0.3
Potassium	D-K	2	2
Selenium	D-Se	<0.2	<0.2
Silicon	D-Si	0.66	0.65
Silver	D-Ag	<0.01	<0.01
Sodium	D-Na	<2	<2
Strontium	D-Sr	0.026	0.026
Thallium	D-Tl	<0.2	<0.2
Tin	D-Sn	<0.03	<0.03
Titanium	D-Ti	<0.01	<0.01
Vanadium	D-V	<0.03	<0.03
Zinc	D-Zn	<0.005	<0.005

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

Outlines of the methodologies utilized for the analysis of the samples submitted are as follows:

Metals in Water

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" 20th Edition 1998 published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotplate or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by atomic absorption/emission spectrophotometry (EPA Method 7000 series), inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B), and/or inductively coupled plasma - mass spectrometry (EPA Method 6020).

Recommended Holding Time:

Sample:	6 months
Reference:	EPA
For more detail see:	ASL "Collection & Sampling Guide"

End of Report

WK P-ed

CHAIN OF CUSTODY RECORD/ANALYSIS REQUEST

No. 1937 page 1 of 2

Golder Associates

500 - 4260 Still Creek Drive
Burnaby, British Columbia, Canada V5C 6C6
Telephone (604) 298-6623 Fax (604) 298-5253

Project Number: 002-2418T4100	Laboratory Name: CEMI
Short Title: Giant /A&R Plan /Yellowknife	Address:
Golder Contact: Valerie Bertrand	Telephone/Fax: — Contact: Sohan Basra

Sample Control Number (SCN)	Sample Location	Staff	Sample Depth (m)	Sample Matrix (over)	Date Sampled (D/M/Y)	Time Sampled (HH:MM)	Sample Type (over)	QAQC Code (over)	Related SCN (over)	Number of Containers	ABA (Solid)	ICP Scan	CN NT					RUSH	Remarks (over)
WR1-01-2300 - 01	Waste Rock Pile			Rock	23/7/00						X	X	X						do As using hydride
WR1-02-2300 - 02											X	X	X						
WR2-01-2300 - 03											X	X	X						
WR2-03-2300 - 04											X	X	X						
WR3-01-2300 - 05											X	X	X						
WR3-02-2300 - 06											X	X	X						
WR-OPBR-02-2300 - 07	Waste Rock Brock Pit										X	X	X						
WR-OPBR-01-2300 - 08											X	X	X						
WR-OPB3-01-2300 - 09	Waste Rock B3 Pit										X	X	X						
WR-OPB3-02-2300 - 10											X	X	X						
WR-OPC1-01-2300 - 11	Waste Rock C1 Pit										X	X	X						
WR-OPC1-02-2300 - 12											X	X	X						
WR-OPC1-01-A - 13								FD			X	X	X						
WR-OPB4-01-2200 - 14	Waste Rock B4 Pit				22/7/00						X	X	X						
WR-OPB4-02-2200 - 15											X	X	X						

Sampler's Signature: V. Bertrand	Relinquished by: Signature	Company	Date	Time	Received by: Signature	Company
Sample Storage (°C) —	Relinquished by: Signature	Company	Date	Time	Received by: Signature	Company
Comments: Crush samples and keep unused portions for possible further analysis	Method of Shipment:	Waybill No:	Received for Lab by:		Date	Time
	Shipped by:	Shipment Condition: Seal Intact:	Temp (°C)	Cooler opened by:	Date	Time

WHITE: Golder Copy YELLOW: Lab Copy PINK: Lab Returns with Final Report

WK Pi[illegible]

CHAIN OF CUSTODY REC[illegible]RD/ANALYSIS REQUEST

No. 02 page 2 of 2

Golder Associates

500 - 4260 Still Creek Drive
Burnaby, British Columbia, Canada V5C 6C6
Telephone (604) 298-6623 Fax (604) 298-5253

Project Number: ~~[illegible]~~ 002-2418 T 4100	Laboratory Name: CEMI
Short Title: Giant / A.E.R. Plan / Yellowknife	Address:
Golder Contact: Valerie Bertrand	Telephone/Fax: / Contact: Sohan Basta

Sample Control Number (SCN)	Sample Location	Site	Sample Depth (m)	Sample Matrix (over)	Date Sampled (D/M/Y)	Time Sampled (HH:MM)	Sample Type (over)	QA/QC Code (over)	Related SCN (over)	Number of Containers	ABA (Gelex)	ICP Scan	CO3 NP					RUSH	Remarks (over)
WR-OPB1-03-2300 - ~~01~~	Waste Rock B1 PIT				23/7/00						X	X	X						do As using hybride
WR-OPB1-02-2300 - ~~02~~	↓				↓						X	X	X						↓
WR-OPB1-01-2300 - ~~03~~	↓				↓						X	X	X						↓
WR-OPA2-01-2300 - ~~04~~	Waste Rock A2 PIT				↓						X	X	X						↓
WR-OPA2-02-2300 - ~~05~~	↓				↓						X	X	X						↓
WR-OPA2-03-2300 - ~~06~~	↓				↓						X	X	X						↓
WR-OPA2-04-2340 - ~~07~~	↓				↓						X	X	X						↓
WR-OPA2-03-A - ~~08~~	↓				↓			FD			X	X	X						↓
- 09																			
- 10																			
- 11																			
- 12																			
- 13																			
- 14																			
- 15																			

Sampler's Signature: V. Bertrand	Relinquished by: Signature	Company	Date	Time	Received by: Signature	Company	
Sample Storage (°C)	Relinquished by: Signature	Company	Date	Time	Received by: Signature	Company	
Comments: Crush Samples & Keep unused portions for possible further analysis	Method of Shipment:	Waybill No.:		Received for Lab by:		Date	Time
	Shipped by:	Shipment Condition: Seal Intact:		Temp (°C)	Cooler opened by	Date	Time

water
rock

CHAIN OF CUSTODY RECORD/ANALYSIS REQUEST

No. 5839 page 2 of 2

Golder Associates

500 - 4260 Still Creek Drive
Burnaby, British Columbia, Canada V5C 6C6
Telephone (604) 298-6623 Fax (604) 298-5253

Project Number: 002-2418-4100		Laboratory Name: CEMI	
Short Title: Giant Mirama / A&R Plan		Address: 1635 West 75th ave Van BC	
Golder Contact: Valérie Bertrand		Telephone/Fax: 261-2364	Contact: Sohan Basra

Analyses Required

Sample Control Number (SCN)	Sample Location	Sa.#	Sample Depth (m)	Sample Matrix (over)	Date Sampled (D/M/Y)	Time Sampled (HH.MM)	Sample Type (over)	QAQC Code (over)	Related SCN (over)	Number of Containers	Shake flask extraction								PUSH	Remarks (over)
WROPBR-02-2300				rock	23/7		grab			1	X									Lab already
WROPB3-01-2300				↓	↓		↓			1	X									has samples
WROPC1-01-2300				↓	↓		↓			1	X									
WR-OPC1-02-2300				↓	↓		↓			1	X									
OPB4-01-A				↓	↓		↓	FD	OPB4-01-2300	1	X									
-06																				
-07																				
-08																				
-09																				
-10																				
-11																				
-12																				
-13																				
-14																				
-15																				

Sampler's Signature: V. Bertrand	Relinquished by: Signature V. Bertrand	Company GAL	Date Sept. 14, 00	Time	Received by: Signature	Company
Sample Storage (°C) —	Relinquished by: Signature	Company	Date	Time	Received by: Signature	Company
Comments: keep unused portion for further analyses.	Method of Shipment:	Waybill No.:		Received for Lab by:	Date	Time
	Shipped by	Shipment Condition: Seal Intact		Temp (°C)	Cooler opened by	Date / Time

WHITE: Golder Copy YELLOW: Lab Copy PINK: Lab Returns with Final Report

yp water colum...

CHAIN OF CUSTODY RECORD/ANALYSIS REQUEST

No. 5838 page 1 of 2

Golder Associates
500 - 4260 Still Creek Drive
Burnaby, British Columbia, Canada V5C 6C6
Telephone (604) 298-6623 Fax (604) 298-5253

Project Number: 002-2418-4800.	Laboratory Name: CEMI
Short Title: Giant Miramar /RAPlan/Yk.	Address: 1635 West 75th ave. Vanc.
Golder Contact: Valerie Bertrand.	Telephone/Fax: 267-2364
	Contact: Sohan Basra

Sample Control Number (SCN)	Sample Location	Sa.#	Sample Depth (m)	Sample Matrix (over)	Date Sampled (D/M/Y)	Time Sampled (HH:MM)	Sample Type (over)	QAQC Code (over)	Related SCN (over)	Number of Containers	Shake flask extraction	RUSH	Remarks (over)
OPA1-01-2100-01				rock	21/7		grab			1	X		Lab already
OPA2-01-2100-02				↓	"		↓			1	X		has samples
OPA2-03-2100-03					"					1	X		
OPB1-03-2200-04					22/7					1	X		
OPB1-06-2200-05					"					1	X		
OPB2-05-2100-06					21/7.					1	X		
OPB3-03-2200-07					22/7					1	X		
OPB4-01-2200-08					22/7					1	X		
ORC1-01-2100-09					21/7					1	X		
ORC1-05-2100-10					"					1	X		
OPBR-02-2100-11					"					1	X		
WR OPB1-01-2300-12					23/7					1	X		
WR-OPA2-04-2300-13					"					1	X		
WR1-01-2300-14					"					1	X		
WR3-01-2300-15				↓	"		↓			1	X		

Sampler's Signature: V Bertrand	Relinquished by: Signature V Bertrand	Company GAL	Date Sept. 14, 2000	Time	Received by: Signature	Company
Sample Storage (°C) –	Relinquished by: Signature	Company	Date	Time	Received by: Signature	Company
Comments: Keep unused portion for further analyses	Method of Shipment:	Waybill No.:	Received for Lab by:	Date	Time
	Shipped by:	Shipment Condition: Seal Intact:	Temp (°C)	Cooler opened by	Date	Time

WHITE: Golder Copy YELLOW: Lab Copy PINK: Lab Returns with Final Report

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CHAIN OF CUSTODY RECORD/ANALYSIS REQUEST

No. 1196 page 1 of 2

Golder Associates

500 - 4260 Still Creek Drive
Burnaby, British Columbia, Canada V5C 6C6
Telephone (604) 298-6623 Fax (604) 298-5253

Project Number: 002-7418 T4100	Laboratory Name: CEMI
Short Title: Giant / AER Plan / Yellowknife	Address:
Golder Contact: Valerie Bertrand	Telephone/Fax: / Contact: Sohan Basra

Analyses Required

Sample Control Number (SCN)	Sample Location	SA#	Sample Depth (m)	Sample Matrix (over)	Date Sampled (D/M/Y)	Time Sampled (HH:MM)	Sample Type (over)	QA/QC Code (over)	Related SCN (over)	Number of Containers	ABA	ICP Scan	CO3 NP					RUSH	Remarks (over)
OPA2-01-2100 ~~01~~	A2 Pit	OPA2-01-2100		Rock	21/7/00		Rock				X	X	X						do AS using hydride method
OPA2-03-2100 ~~02~~	A2 Pit	OPA2-03-2100		↓	21/7/00		Rock				X	X	X						↓
OPA2-04-2100 ~~03~~	A2 Pit	OPA2-04-2100			21/7/00		Rock				X	X	X						
OPA1-01-2100 ~~04~~	A1 Pit	OPA1-01-2100			21/7/00		Rock				X	X	X						
OPA1-05-2100 ~~05~~	A1 Pit	OPA1-05-2100			21/7/00		Rock				X	X	X						
OPA1-06-2100 ~~06~~	A1 Pit	OPA1-06-2100			21/7/00		Rock				X	X	X						
OPC1-01-2100 ~~07~~	C1 Pit	OPC1-01-2100			21/7/00		Rock				X	X	X						
OPC1-03-2100 ~~08~~	C1 Pit	OPC1-03-2100			21/7/00		Rock				X	X	X						
OPC1-05-2100 ~~09~~	C1 Pit	OPC1-05-2100			21/7/00		Rock				X	X	X						
OPBR-01-2100 ~~10~~	Brock Pit	OPBR-01-2100			21/7/00		Rock				X	X	X						
OPBR-02-2100 ~~11~~	Brock Pit	OPBR-02-2100			21/7/00		Rock				X	X	X						
OPB2-03-2100 ~~12~~	B2 Pit	OPB2-03-2100			21/7/00		Rock				X	X	X						
OPB2-05-2100 ~~13~~	B2 Pit	OPB2-05-2100			21/7/00		Rock				X	X	X						
OPB2-06-2100 ~~14~~	B2 Pit	OPB2-06-2100		↓	21/7/00		Rock				X	X	X						↓
- ~~15~~																			

Sampler's Signature: [signature]	Relinquished by: Signature	Company	Date	Time	Received by: Signature	Company
Sample Storage (°C)	Relinquished by: Signature	Company	Date	Time	Received by: Signature	Company
Comments: Crush samples & keep unused portions for possible further analysis	Method of Shipment:	Waybill No.:	Received for Lab by:		Date	Time
	Shipped by:	Shipment Condition: Seal Intact:	Temp (°C)	Cooler opened by	Date	Time

WHITE: Golder Copy YELLOW: Lab Copy PINK: Lab Returns with Final Report

open

CHAIN OF CUSTODY REC...D/ANALYSIS REQUEST

No. 194... page 2 of 2

Golder Associates

503 - 4260 Still Creek Drive
Burnaby, British Columbia, Canada V5C 6C6
Telephone (604) 298-6623 Fax (604) 298-5253

Project Number: 002-2418 T 4100	Laboratory Name: CEMI
Short Title: Giant / A&R Plan / Yellowknife	Address:
Golder Contact: Valerie Bertrand	Telephone/Fax:
	Contact: Sohan Basra

Sample Control Number (SCN)	Sample Location	Sa.#	Sample Depth (m)	Sample Matrix (over)	Date Sampled (D/M/Y)	Time Sampled (HH:MM)	Sample Type (over)	QA/QC Code (over)	Related SCN (over)	Number of Containers	ABA (Sobek)	ICP Scan	CO3					RUSH	Remarks (over)
OPB3-02 -2200 -01	B3 Pit	OPB3-02 -2200		Rock	22/7/00		Rock				X	X	X						dn As using hydride.
OPB3-03 -2200 -02	B3 Pit	OPB3-03 -2200			22/7/00		Rock				X	X	X						
OPB1-03 -2200 -03	B1 Pit	OPB1-03 -2200			22/7/00		Rock				X	X	X						
OPB1-04 -2200 -04	B1 Pit	OPB1-04 -2200			22/7/00		Rock				X	X	X						
OPB1-06 -2200 -05	B1 Pit	OPB1-06 -2200			22/7/00		Rock				X	X	X						
OPB4-01 -2200 -06	B4 Pit	OPB4-01 -2200			22/7/00		Rock				X	X	X						
OPB4-02 -2200 -07	B4 Pit	OPB4-02 -2200			22/7/00		Rock				X	X	X						
OPB4-1 -A -08	B4 Pit	OPB4-1 -A			22/7/00		Rock	FD			X	X	X						
OPB1-4 -A -09	B1 Pit	OPB1-4 -A			22/7/00		Rock	FD			X	X	X						
-10																			
-11																			
-12																			
-13																			
-14																			
-15																			

Sampler's Signature: V. Bertrand	Relinquished by: Signature	Company	Date	Time	Received by: Signature	Company
Sample Storage (°C)	Relinquished by: Signature	Company	Date	Time	Received by: Signature	Company
Comments: Crush samples and keep unused portions for possible further analysis	Method of Shipment:	Waybill No.:		Received for Lab by:	Date	Time
	Shipped by:	Shipment Condition: Seal Intact:		Temp (°C)	Cooler opened by:	Date	Time

WHITE: Golder Copy YELLOW: Lab Copy PINK: Lab Returns with Final Report

Yellowknife

CHAIN OF CUSTODY RECORD/ANALYSIS REQUEST

No. 5840 page 1 of 1

Golder Associates

503 - 4260 Still Creek Drive
Burnaby, British Columbia, Canada V5C 6C6
Telephone (604) 298-6623 Fax (604) 298 5253

Project Number: 002-2418-4300	Laboratory Name: CEMI
Short Title: Giant Miramar/A&R Plan	Address: 1635 West 75th ave. Van BC
Golder Contact: Valerie Bertrand	Telephone/Fax: 261-2364 / Contact: Sohan Basra

Sample Control Number (SCN)	Sample Location	Se.#	Sample Depth (m)	Sample Matrix (over)	Date Sampled (D/M/Y)	Time Sampled (HH:MM)	Sample Type (over)	QA/QC Code (over)	Related SCN (over)	Number of Containers	Shake Flask Extraction							RUSH	Remarks (over)
TNW01-2600-01				tails	26/07		grab			1	X								Lab already
TNW01-2600-03				↓	↓		↓			1	X								has all
TNW01-2600-05										1	X								samples.
TSP02-2300										1	X								
TCP01-2300										1	X								
TNP01-2300									TNP01-2300A	1	X								
TNP01-2300A								FD	TNP01-2300	1	X								
TNP03-2300										1	X								
-09																			
-10																			
-11																			
-12																			
-13																			
-14																			
-15																			

Sampler's Signature: V. Bertrand	Relinquished by: Signature V. Bertrand	Company: GAL	Date: Sept. 14,00	Time	Received by: Signature	Company
Sample Storage (°C)	Relinquished by: Signature	Company	Date	Time	Received by: Signature	Company
Comments: Keep unused portion for further analyses.	Method of Shipment:	Waybill No.:	Received for Lab by:		Date	Time
	Shipped by:	Shipment Condition: Seal Intact:	Temp (°C)	Cooler opened by:	Date	Time

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Golder Associates
500 - 4260 Still Creek Drive
Burnaby, British Columbia, Canada V5C 6C6
Telephone (604) 298-6623 Fax (604) 298-5253

CHAIN OF CUSTODY RECORD/ANALYSIS REQUEST

No. 5843 page 1 of 1

Project Number: 002-2418-4300	Laboratory Name: CEMI
Short Title: Miramar Giant - AIR Plan	Address:
Golder Contact: Valerie Bertrand	Telephone/Fax: Contact: Sohan Basra

Sample Control Number (SCN)	Sample Location	No.	Sample Depth (m)	Sample Matrix (over)	Date Sampled (D/M/Y)	Time Sampled (HH:MM)	Sample Type (over)	QA/QC Code (over)	Related SCN (over)	Number of Containers	Shake flask extraction	RUSH	Remarks (over)
32711 - 01				Tails	1999					1	X		d/o As + S
32713 - 02				Tails						1	X		low-level
32724 - 03				Tails						1	X		analysis of
~~32730 - 04~~													leachate
32761 - 05				Tails	1999					1	X		regular As
32763 - 06										1	X		and below
32777 - 07										1	X		detection li
32951 - 08										1	X		
32953 - 09										1	X		
32964 - 10										1	X		
33001 - 11										1	X		
33003 - 12										1	X		
33011 - 13										1	X		
- 14													
- 15													

Analyses Required

Sampler's Signature: BOB HAUSER (Miramar)	Relinquished by: Signature V. Bertrand	Company: G	Date: Sept 22/00	Time	Received by: Signature	Company
Sample Storage (°C)	Relinquished by: Signature	Company	Date	Time	Received by: Signature	Company
Comments:	Method of Shipment:	Waybill No.:	Received for Lab by:		Date	Time
Keep unused portion	Shipped by:	Shipment Condition: Seal Intact:	Temp (°C)	Cooler opened by:	Date	Time

PINK: Lab Returns with Final Report

CHAIN OF CUSTODY REC :D/ANALYSIS REQUEST

No. 02(Page 1 of 1

Golder Associates
500 - 4260 Still Creek Drive
Burnaby, British Columbia, Canada V5C 6C6
Telephone (604) 298-6623 Fax (604) 298-5253

Project Number: 002-2418-4300	Laboratory Name: CEMI
Short Title: GIANT MIRAMAR / REA Plan / Yellowknife	Address: 1635 West 75th Ave Vanc
Golder Contact: Valérie Bertrand	Telephone/Fax: (604) 267-2314 · Contact: Johan Basia

Sample Control Number (SCN)	Sample Location	Sa.4	Sample Depth (m)	Sample Matrix (over)	Date Sampled (D/M/Y)	Time Sampled (HH:MM)	Sample Type (over)	QAQC Code (over)	Related SCN (over)	Number of Containers	ABA (Static)	ICP metals	CO_3^{2-} NP				RUSH	Remarks (over)
TSP01-2300 - 01	South Pond		0.5	tails	23/07					1	X	X	X					As analysis
TSP02-2300 - 02	"		0.5							1	X	X	X					using
TCP01-2300 - 03	Central Pond		0.5							1	X	X	X					hydride
TCP02-2300-02 - 04	"		3.5							1	X	X	X					method
TCP-03-2300 - 05	"		0.05							1	X	X	X					
TNP01-2300 - 06	North Pond		0.05								X	X	X					
TNP02-2300 - 07	"		0.5							1	X	X	X					
TNP03-2300 - 08	"		0.5							1	X	X	X					
TNP04-2300 - 09	"		5.5							1	X	X	X					
- 10																		
- 11																		
TSP02-2300A - 12	South Pond		0.5	tails	23/07			FD		1	X	X	X					
TNP04-2300A - 13	North Pond		0.05	tails	23/07			FD		1	X	X	X					
- 14																		
- 15																		

Sampler's Signature: Bertrand	Relinquished by: Signature	Company	Date July '00	Time	Received by: Signature	Company
Sample Storage (°C)	Relinquished by: Signature	Company	Date	Time	Received by: Signature	Company
Comments: Keep unused portion of each sample for further analyses.	Method of Shipment:	Waybill No.:	Received for Lab by:		Date	Time
	Shipped by:	Shipment Condition: Seal Intact:	Temp (°C)	Cooler opened by:	Date	Time

WHITE: Golder Copy YELLOW: Lab C PINK: Lab Returns with Final Report

CHAIN OF CUSTODY RECORD/ANALYSIS REQUEST

No. 4862 page 1 of 1

Golder Associates
500 - 4260 Still Creek Drive
Burnaby, British Columbia, Canada V5C 6C6
Telephone (604) 298-6623 Fax (604) 298-5253

Project Number: 007-2418	Laboratory Name: CCMI
Short Title: Giant /R.E.A. Plan/Yellowknife	Address: 1635 West 75th ave Vancouver
Golder Contact: Valérie Bertrand	Telephone/Fax: 604-767-2364 / Contact: Sohan Basra

Sample Control Number (SCN)	Sample Location	Stn#	Sample Depth (m)	Sample Matrix (over)	Date Sampled (D/M/Y)	Time Sampled (HH.MM)	Sample Type (over)	QA/QC Code (over)	Related SCN (over)	Number of Containers	ABA(Sobek)	ICP Metal Scan	032-NP					RUSH	Remarks (over)
T-NW-01-2600-01	NW Pond		0.1–0.5m	tails	26/7/00					1	X	X	X						As analysis
T-NW-01-2600-02	↓		0.6–1.0m	↓	↓					1	X	X	X						using hydrid
T-NW-01-2600-03	↓		1.1–1.5m	↓	↓					1	X	X	X						method
T-NW-01-2600-04	↓		1.6–2.0m	↓	↓					1	X	X	X						
T-NW-01-2600-05	↓		3.6–4.0m	↓	↓					1	X	X	X						
-06																			
-07																			
-08																			
-09																			
-10																			
-11																			
-12																			
-13																			
-14																			
-15																			

Sampler's Signature: [signature]	Relinquished by: Signature	Company	Date July 00	Time	Received by: Signature	Company
Sample Storage (°C)	Relinquished by: Signature	Company	Date	Time	Received by: Signature	Company
Comments: Keep unused portion of each sample for further Analysis	Method of Shipment:	Waybill No.:	Received for Lab by:		Date	Time
	Shipped by:	Shipment Condition: Seal Intact:	Temp (°C)	Cooler opened by:	Date	Time

WHITE: Golder Copy YELLOW: Lab Copy PINK: Lab Returns with Final Report

APPENDIX II

MINERALOGICAL ASSESSMENT REPORT
LESLIE INVESTMENTS LTD.

MINERALOGY OF WASTE-ROCK AND TAILINGS SAMPLES FROM THE GIANT MINE, YELLOWKNIFE, NORTHWEST TERRITORIES

Prepared for: **GOLDER ASSOCIATES LTD.**
Burnaby, British Columbia

December 2000

LRC

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EXECUTIVE SUMMARY

Seven samples of waste rock and nine samples of tailings from the Giant mine at Yellowknife, N.W.T., were examined by transmitted- and reflected-light microscopy, and by X-ray diffractograms of bulk samples. All but one of the waste-rock samples contain a quartz-dolomite assemblage in which the proportion of dolomite far exceeds that of sulfide minerals. The sole different waste-rock sample is mainly a dark greenish rock, interpreted to be a chloritized volcanic flow, which contains minor to accessory amounts of calcite and is almost barren of sulfides. The principal sulfides in the waste rocks are pyrite and arsenopyrite, neither of which has been affected by surficial oxidation.

The tailings samples are variably rich in dolomite and calcite, and are sulfide-poor. In none of the tailings samples are there indications that the sulfide minerals have been altered by weathering, but in all except possibly one sample there are zoned iron oxides that are interpreted to be the waste residues from the roasting of sulfide concentrates. Thus, the roaster wastes were apparently combined with flotation tailings and the two were co-disposed to the tailings impoundments. The possible exception to this scenario is the deepest sample (3.6-4.0 m) from the NW Pond, which contains only a trace of roaster-type iron oxide, but also has the highest sulfide content of the tailings samples. In this sample the main source of arsenic content is arsenopyrite ± pyrite, but in all other tailings samples the principal identified host for arsenic is incompletely roasted sulfide-mineral residues; it is likely, however, that additional arsenic resides with the zoned iron oxides even where these lack sulfide remnants.

INTRODUCTION

Sixteen samples from the Giant mine at Yellowknife, N.W.T., were received from Golder Associates via Canadian Environmental and Metallurgical Inc. on November 21, 2000. The request was for a general mineralogical examination, especially whether mineralogical variations are evident among tailings samples that had been collected at different depths from the same borehole. The following summarizes the chain-of-custody record for 17 samples, of which 16 were received.

Sample Number	Sample Location	Comments
OPA1-01	Pit Al	crushed grab sample
OPA2-01	Pit A2	no sample received
OPA2-03	Pit A2	crushed grab sample
OPC1-01	Pit C1	crushed grab sample
WR3-1	WR Pile	crushed grab sample
WR-OPA2-04	WR A2	crushed grab sample
WR-OPB1-01	WR B1	crushed grab sample
WR-OPC1-01	WR C1	crushed grab sample
TCP01	Central Pond	tailings, depth 0.5 m
TCP-02	Central Pond	tailings, 3.5 m
TNP01	North Pond	tailings, 0.05 m
TNP02	North Pond	tailings, 0.5-0.6 m
TNP03	North Pond	tailings, 0.5 m
TNP04	North Pond	tailings, 5.5 m
TNW-01-01	NW Pond	tailings, 0.1-0.5 m
TNW-01-03	NW Pond	tailings, 1.1-1.5 m; pulverized
TNW-01-05	NW Pond	tailings, 3.6-4.0 m; pulverized

All of the received samples were examined by X-ray diffractometry and by transmitted- and reflected-light optical microscopy of polished thin sections; all sections are 26 × 46 mm. All of the as-received rock samples consisted of crushed material rather than intact, single hand specimens. A brief note on the as-received material and the corresponding chips that were used for the preparation of the polished thin section is given in the description for each sample.

RESULTS

Sample OPA1-01

The sample, which is from pit A1, consists of coarse chips of light greenish grey rock, with the two largest chips about 1 × 1.5 × 5 cm. The rock is poorly foliated (possibly sheared?), and the colour and appearance suggest a quartz-sericite (muscovite) -chlorite assemblage. Sulfides megascopically appear only as disseminated, pinprick-size grains.

Rather than selecting one of the two largest chips for the polished thin section, it was thought that a more representative sample would be obtained by randomly choosing several smaller chips. Thus, the resulting polished thin section contains about 15 chips, the largest of which is approximately 0.4 × 1 cm. In marked contrast to the impression obtained from the as-received rock, the section megascopically shows that nearly all of the chips are rich in sulfide minerals.

Examination of the section in transmitted light shows that all of the chips except one are grossly similar insofar as they have muscovite, quartz, and carbonate as the major minerals. The sole exception is a small chip, 1 × 5 mm, that consists almost wholly of carbonate minerals (Fig. 1) whose grain sizes are in the range 5 – 100 µm across; these sizes are in the same general range as for carbonate minerals in the quartz- and muscovite-bearing rock chips, although locally a few carbonate grains are up to 500 µm across. The proportions of muscovite, quartz, and carbonates vary from chip to chip, but the aforementioned three minerals are consistently the major constituents. Chlorite is a minor mineral and generally has a habit similar to that of muscovite. Small amounts of a turbid, semi-opaque mineral, thought to be aggregates of rutile, are present. Prismatic apatite occurs as an accessory mineral.

Reflected-light microscopy shows that the principal sulfide mineral is pyrite. Nearly all of the pyrite is in subhedral to anhedral grains, the coarsest ~600 µm along an edge, and only a few aggregates of grains are larger. Fractures and brecciation of the pyrite are common (Fig. 2). The infill is mainly by carbonate, with quartz and muscovite occurring only locally and sparsely.

Arsenopyrite is widespread but is less abundant than pyrite. Arsenopyrite grain sizes are the smaller, typically <75 µm, and some grains occur as inclusions in pyrite. Other sulfides are quantitatively insignificant; traces of tetrahedrite occur as veinlets in fractured pyrite and arsenopyrite, and traces of chalcopyrite are present as minute, isolated grains, or rarely as a companion to tetrahedrite.

An order-of-magnitude estimation is that total sulfide abundance is about 5 vol%. The ratio of pyrite to arsenopyrite is highly variable from chip to chip. However, most chips have pyrite >> arsenopyrite, and overall magnitude is of the order pyrite: arsenopyrite = 50:1.

An X-ray diffractogram of the bulk sample is shown in Figure 3. The diffractogram

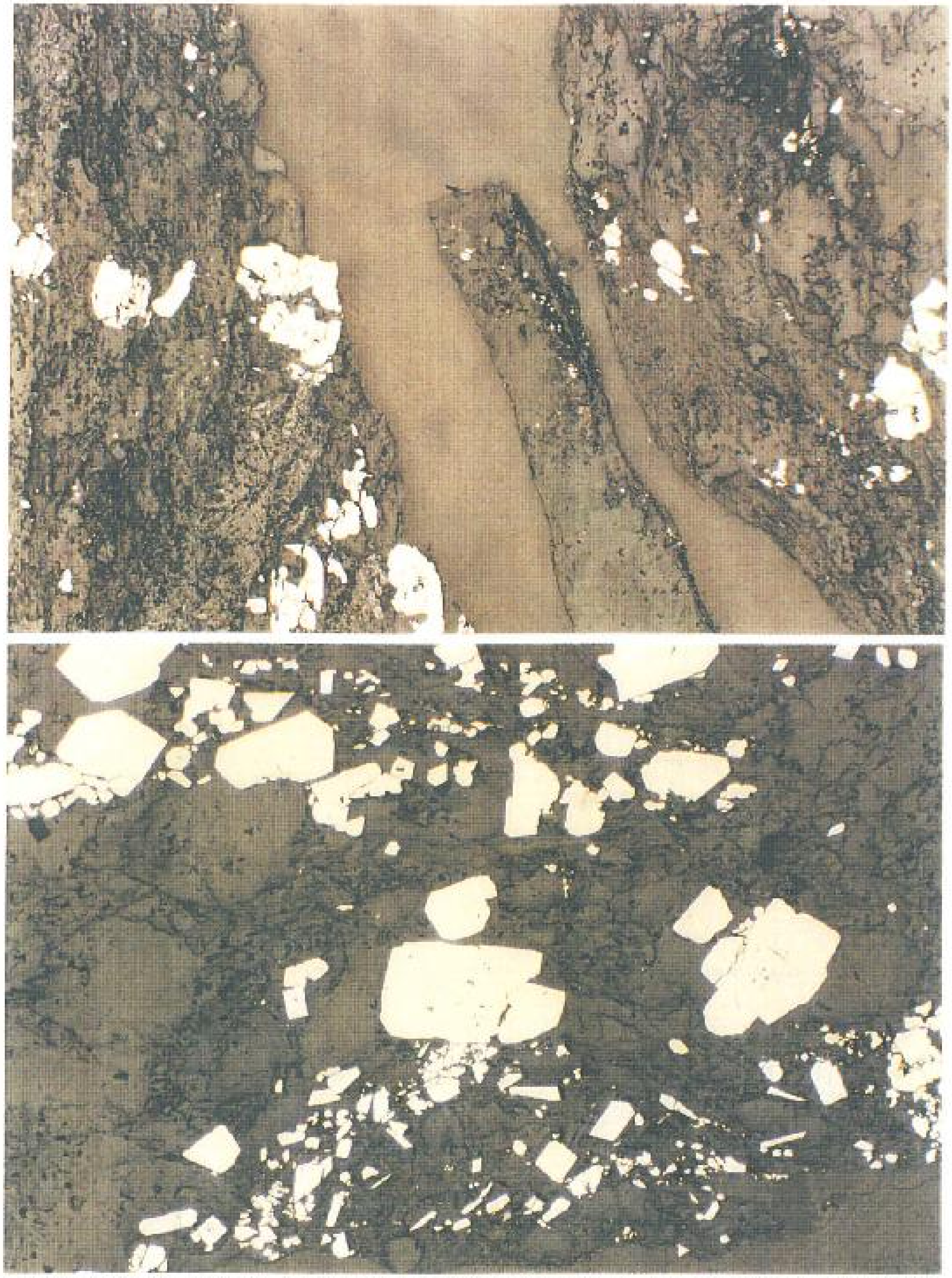


Figure 1. Sample OPA1-01 in plain reflected light. Upper photo, width of field 5.1 mm, shows disseminated pyrite (white) in quartzose chips (i.e., rock fragments) that form the left and right sides of the photo. Between them is an elongate, sulfide-poor chip that consists almost wholly of polycrystalline dolomite. Lower photo, width of field 2.6 mm, shows coarse grains of pyrite that, along the bottom of the photo, are accompanied by abundant smaller, elongate to rectangular grains of arsenopyrite.

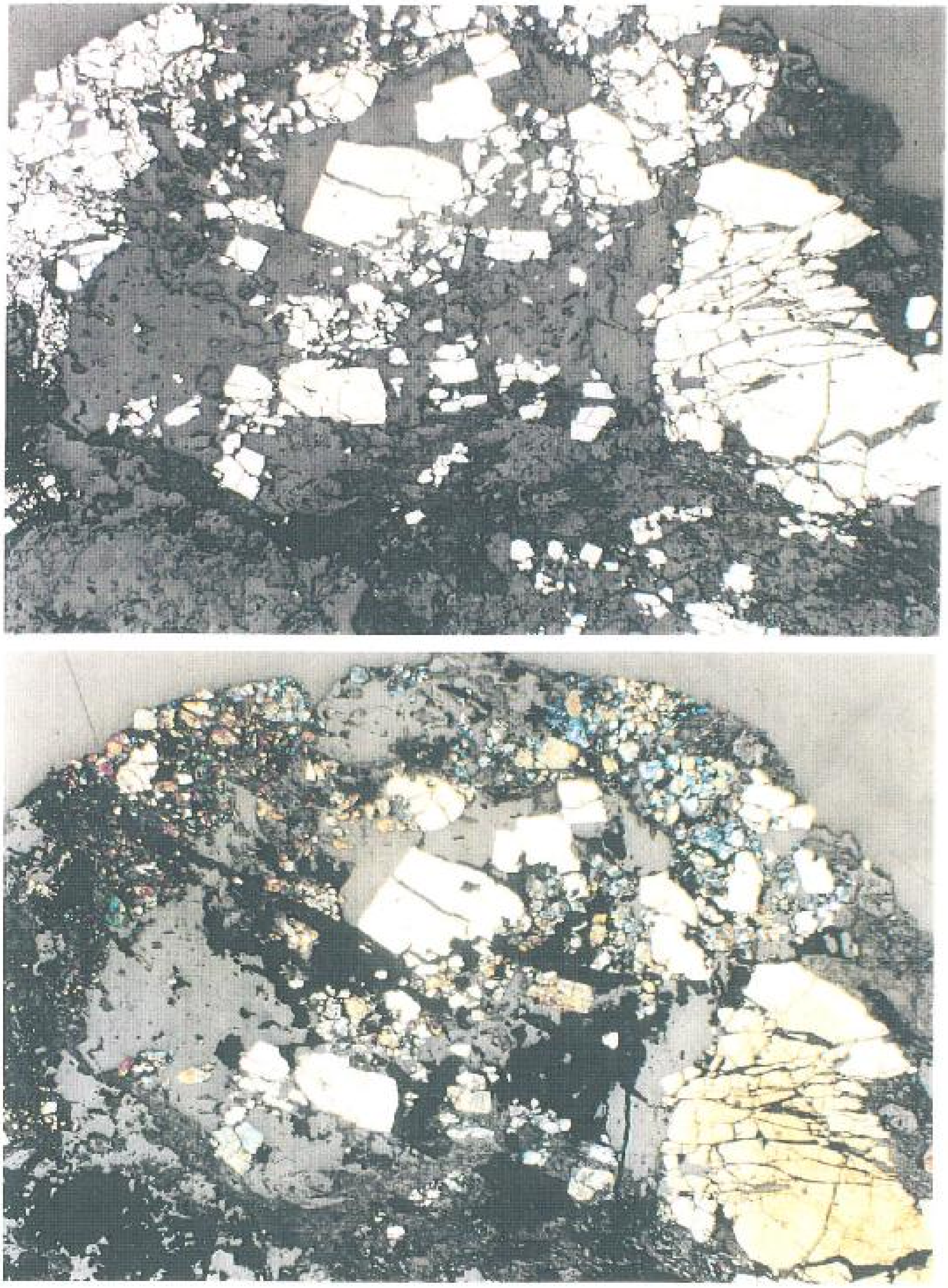


Figure 2. Sample OPA-01 in plain reflected light, width of field 5.1 mm, showing coarse grains of brecciated pyrite accompanied by finer grained arsenopyrite. Lower photo is the same field, after etching with 1:7 HNO_3. Etching has left the pyrite unaffected except for minor local yellowing, whereas arsenopyrite has taken on a multicoloured stain.

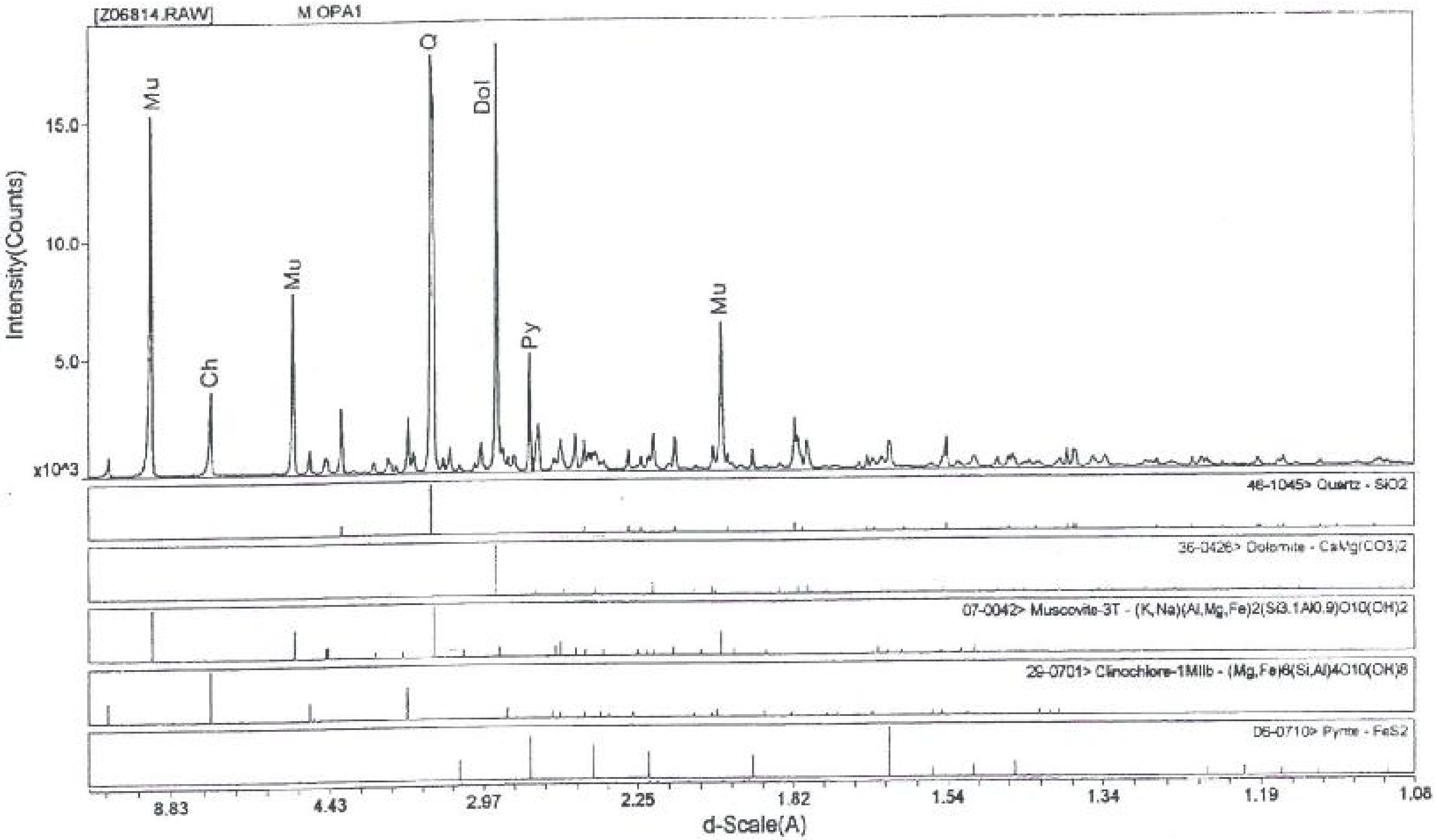


Figure 3. X-ray diffractogram of sample OPA-01. Labelled peaks are **Mu** muscovite, **Ch** chlorite, **Q** quartz, **Dol** dolomite, and Py pyrite.

confirms the major-mineral abundances observed microscopically and shows that all, or nearly all, of the carbonate mineral is dolomite. Calcite and siderite, if present, are <1% of the total carbonates.

Sample OPA2-03

The sample, which is from pit A2, is slightly lighter grey but otherwise appears megascopically to be similar to preceding sample OPA1-01. The as-received material varies from fine sand to coarse chips, the largest of which is about 1 × 3 × 5 cm. As for OPA1-01, a group of smaller chips was selected for the preparation of the polished thin section. The resulting section contains slightly fewer than 20 chips, the largest of which is about 0.3 × 1.1 cm. The sulfide content of the chips can be seen megascopically to vary from sparsely disseminated to percentage amounts.

Transmitted-light microscopy shows the sample to be similar to OPA1-01 in overall texture and in the predominance of the quartz-muscovite-carbonate assemblage. A few grains and aggregates of quartz are coarser and more monomineralic than in OPA1-01, but the difference between the two samples is not appreciable.

The principal sulfide observed in reflected light is pyrite. Content of the pyrite in individual chips varies from nil to about 20 vol%, and the average is of the order of 3–4%. The pyrite varies from euhedral to anhedral; euhedral grains are common, in part reflecting the absence of extensive fracturing or brecciation in this sample. Even where aggregates of pyrite are present, they are typically simple composites of only a few grains rather than complex, polycrystalline intergrowths. Arsenopyrite is widespread, commonly euhedral, and like in the preceding sample, is typically in grains smaller than those of pyrite. The ratio of pyrite to arsenopyrite is highly variable from chip to chip, but the average is probably not different from that of the preceding sample. Traces of chalcopyrite, but no tetrahedrite, were observed.

The X-ray diffractogram of a bulk sample of OPA2-03 is shown in Figure 4. The predominance of the muscovite-quartz-dolomite assemblage is evident. No calcite is detectable; siderite, if present, is negligible relative to dolomite.

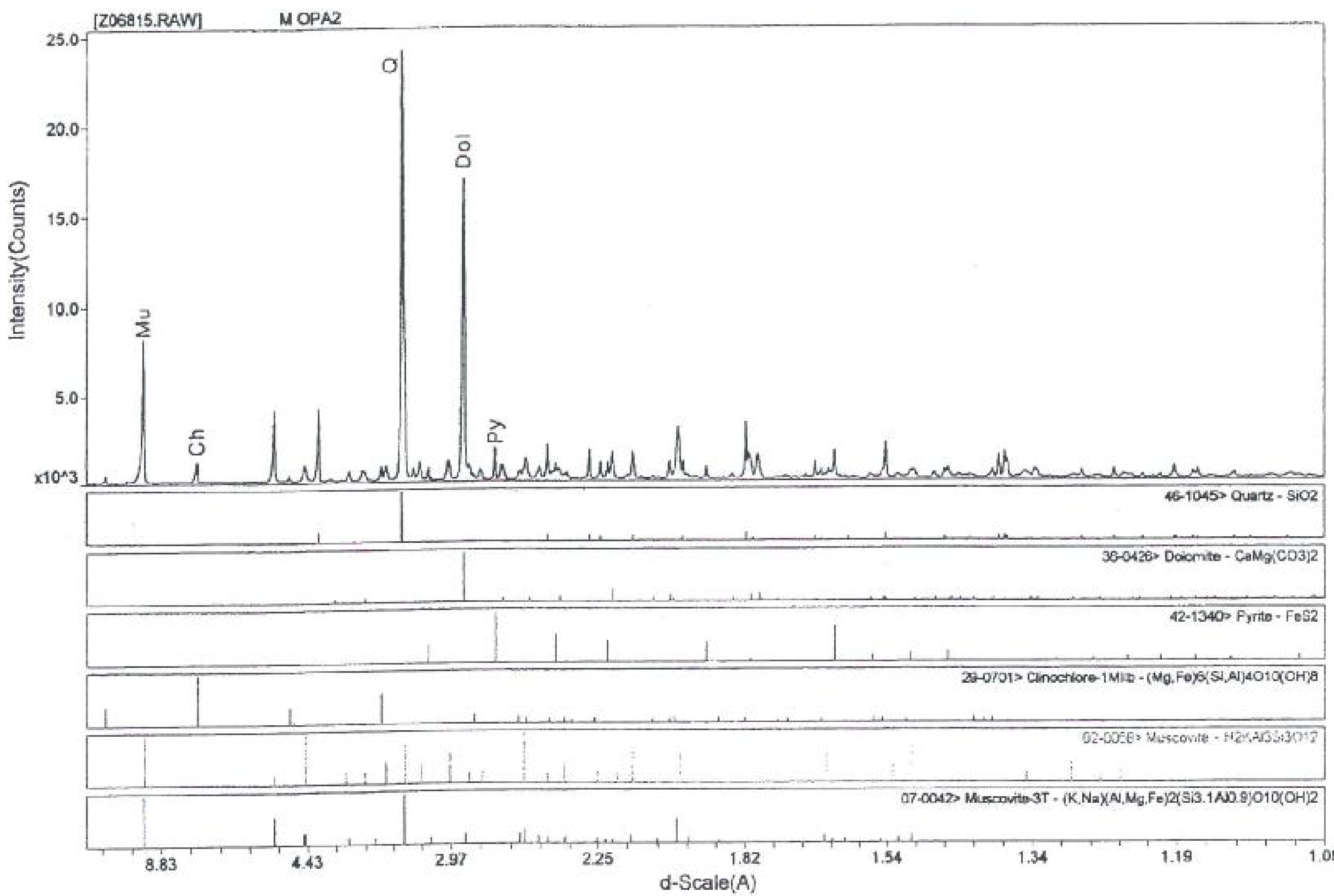


Figure 4. X-ray diffractogram of sample OPA2-03. Labelled peaks are **Mu** muscovite, **Ch** chlorite, **Q** quartz, **Dol** dolomite, and **Py** pyrite.

Sample OPC1-01

The sample, from pit C1, consists of dark greenish grey, massive, irregular fragments up to 1 × 2 × 2 cm. One chip, 0.5 × 1.5 × 2 cm, is schistose, as are a few of the smaller chips. Fine-grained, disseminated pyrite appears to be sparse and is confined mainly to the schistose chips.

The polished thin section contains about 10 chips averaging 3–4 mm across, and a few smaller ones. Microscopy shows that the rock is non-foliated and consists almost wholly of quartz and carbonate. A few chips also contain abundant muscovite and chlorite, but in these too the silicates and quartz are quantitatively minor relative to carbonate.

Reflected-light microscopy shows that the main sulfide is pyrite, which varies from almost nil to several percent in individual chips. Arsenopyrite is common, but is subordinate to pyrite, and the ratio of the two roughly approximates that of the preceding samples. The sulfides vary from concentrations in layers (Fig. 5), to irregular 'trains' of grains (Fig. 6); no veinlets of continuous sulfide are present. Almost all pyrite is in grains <150 μm across, and arsenopyrite is typically slightly finer grained. Overall abundance of the carbonates far exceeds that of the sulfides.

The X-ray diffractogram of a bulk sample is illustrated as Figure 7. The results confirm

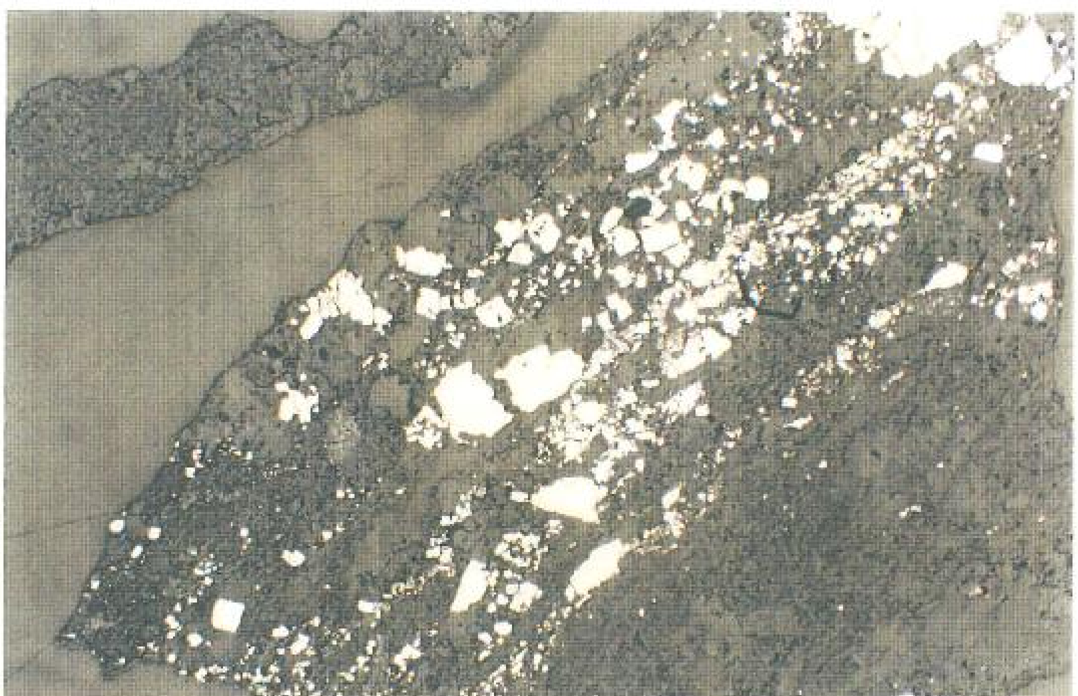
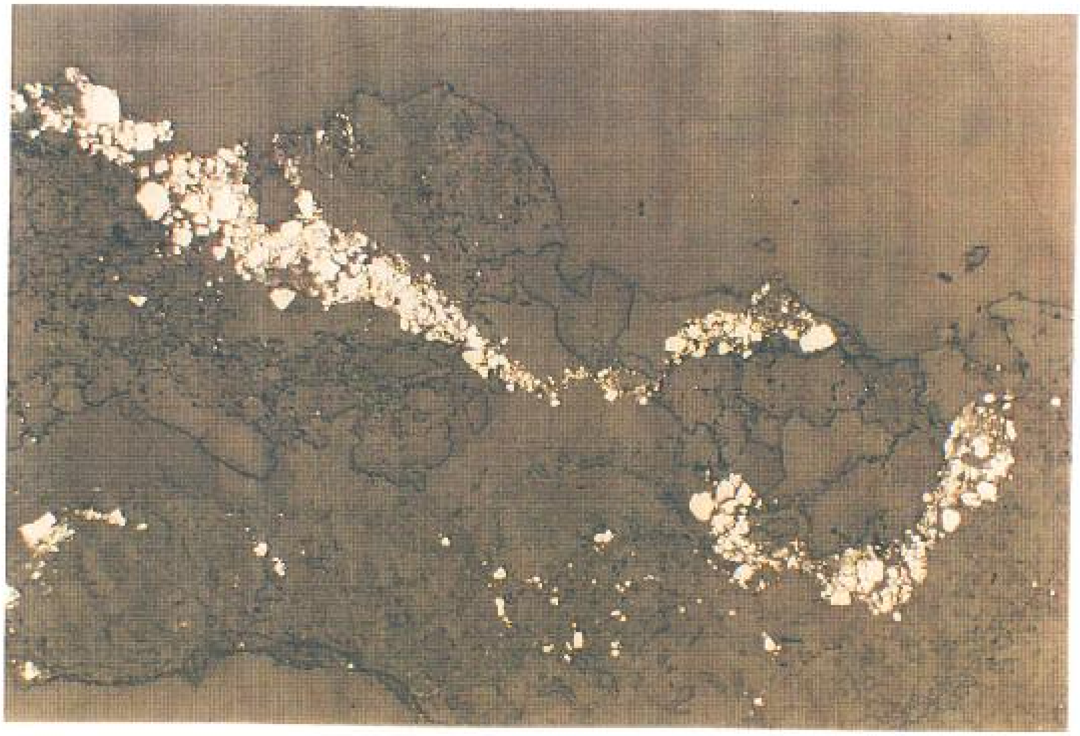


Figure 5. OPC1-01 in reflected light, width of field 5.1 mm, showing concentration of sulfides in layers. Coarse grains are pyrite, and many of the fine grains are arsenopyrite, in a carbonate-rich matrix containing quartz and abundant chlorite. Barren chip at upper left consists almost wholly of dolomite.



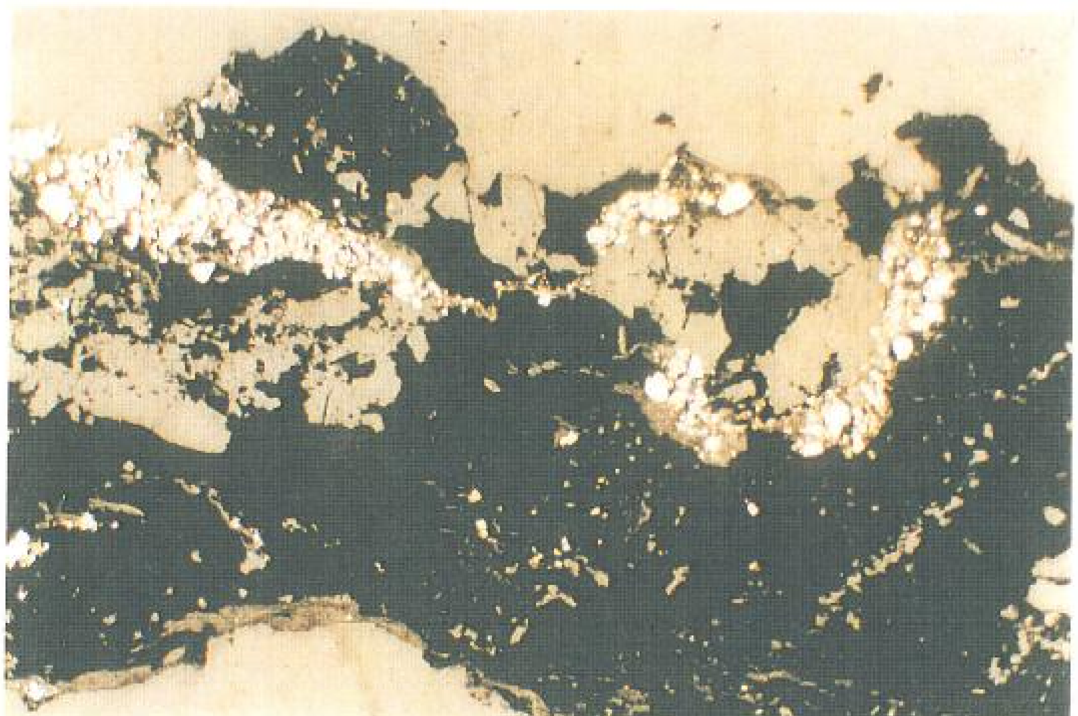


Figure 6. Sample OPC1-01, width of field 5.1 mm. Upper photo, in plain reflected light, shows a 'train' of sulfides, mainly pyrite but with arsenopyrite among the finer grains. Lower photo of the same area in plain transmitted light shows the distribution of dolomite, here stained black by acid treatment; unaffected areas are mainly quartz.

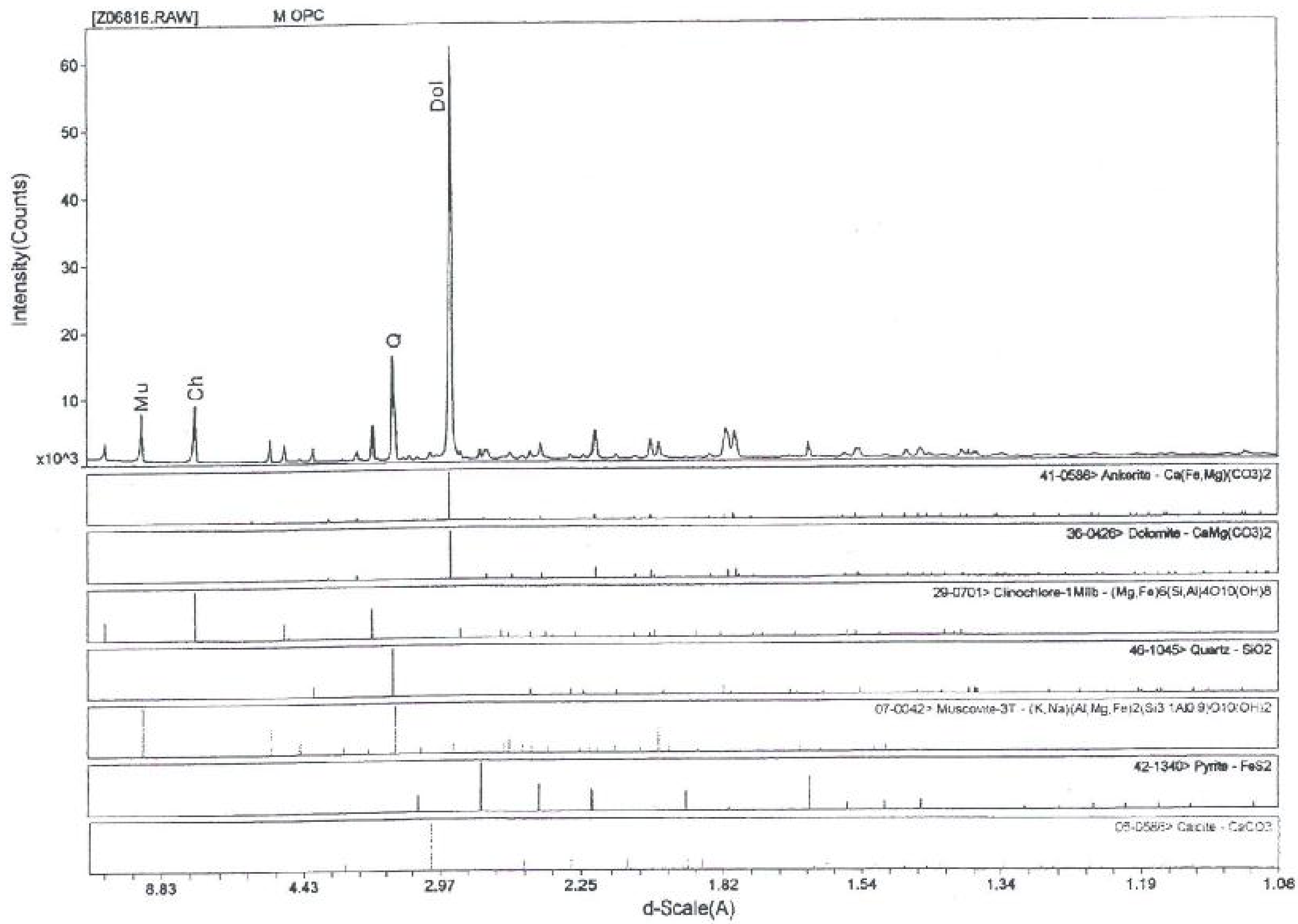


Figure 7. X-ray diffractogram of sample OPC1-01. Labelled peaks are **Mu** muscovite, **Ch** chlorite, **Q** quartz, and **Dol** dolomite.

the optical observations and indicate that the carbonate mineral is dolomite. Siderite and calcite, if present, are negligible relative to dolomite.

Sample WR3-1

The as-received sample consists of crushed rock in which the largest piece is 1 × 2.5 × 2.5 cm. About half of the sample consists of fragments that are less than 1 cm across. The fragments have sharp edges, are of irregular shape, and their distinctly greenish colour suggests a chloritic character. Sparsely disseminated sulfides are evident.

The polished thin section contains about eight chips (fragments) that are 3–4 mm, and several small (1–2 mm) ones. Megascopically visible sulfides are sparse and are mainly in one chip.

Microscopic examination shows the principal rock type to consist of a fine-grained chlorite-amphibole-plagioclase assemblage that is interpreted to be a highly chlorite-altered volcanic flow (Fig. 8). Replacement by carbonate is also common, and one chip has abundant epidote as a polycrystalline mass. Two of the chips are coarser grained, containing plagioclase laths to 300 μm in length and amphibole grains of a similar size; these chips may represent an intrusive phase, perhaps a dyke. The two chips, although less altered than the extrusive rock, also contain abundant chlorite and have traces of carbonates in veinlets and patches.

Most of the chips are barren of sulfides or contain only a few disseminated grains of pyrite. The pyrite occurs as subhedral to anhedral grains to 120 μm across. Commonly spatially associated with pyrite, but not intergrown with it, are anhedral grains of chalcopyrite whose maximum size is 30–40 μm. One chip contains several blebs of chalcopyrite, but no pyrite. No arsenopyrite was observed, and average sulfide content is probably less than 0.1%. Carbonate content is far in excess of that of the sulfides.

The X-ray diffractogram of WR3-1, given as Figure 9, shows that the predominant mineral is chlorite. Albite and amphibole are other major aluminosilicates, mica is present in minor amounts, and quartz is abundant. The peak for calcite indicates that several percent of the mineral is present. A small amount of dolomite seems to be indicated, and the presence of siderite cannot be discounted. Nevertheless, dolomite and siderite combined are no more than minor relative to the abundance of calcite.

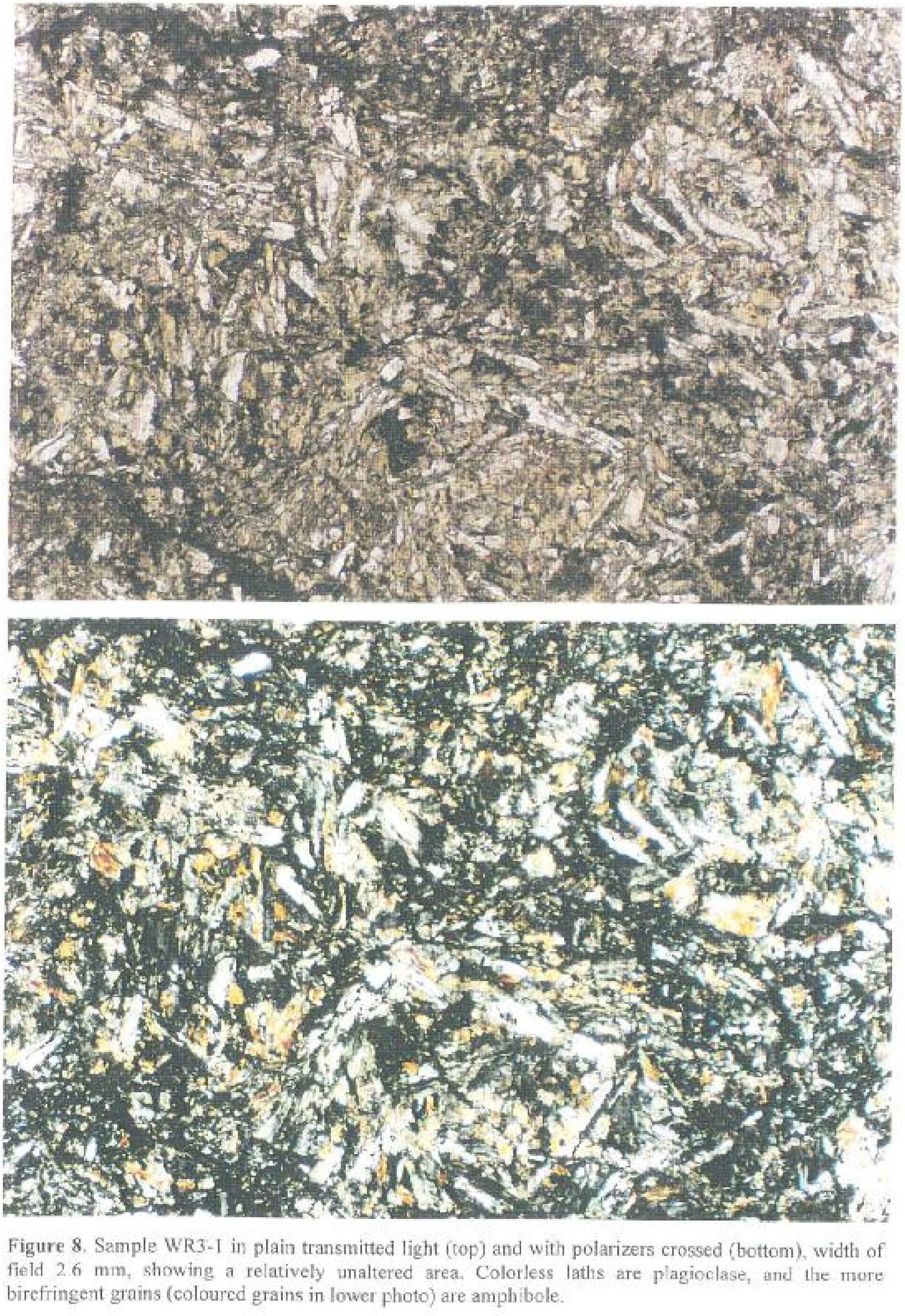


Figure 8. Sample WR3-1 in plain transmitted light (top) and with polarizers crossed (bottom), width of field 2.6 mm, showing a relatively unaltered area. Colorless laths are plagioclase, and the more birefringent grains (coloured grains in lower photo) are amphibole.

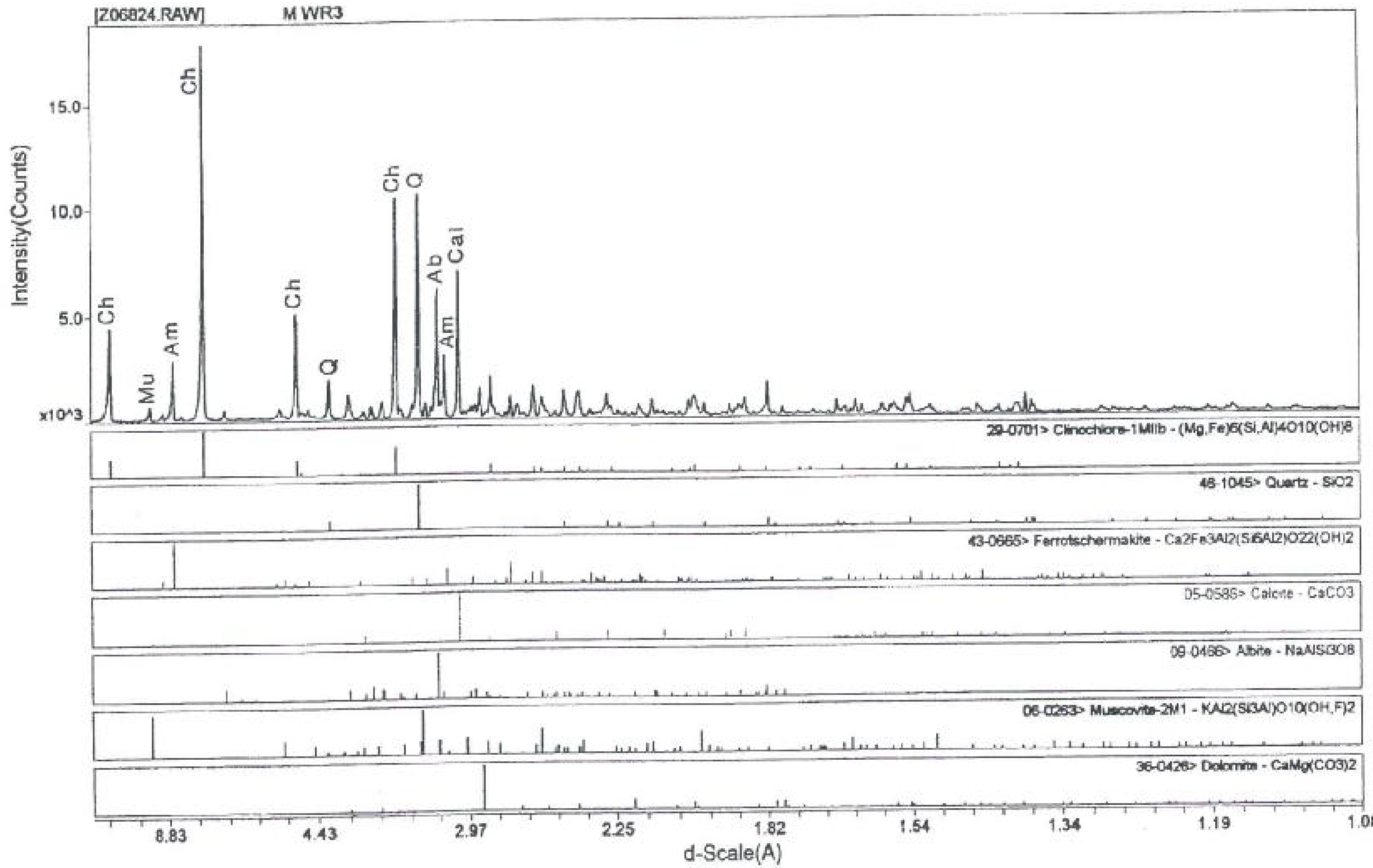


Figure 9. X-ray diffractogram of sample WR3-1. Labelled peaks are **Ch** chlorite, **Mu** muscovite, **Am** amphibole, Q quartz, **Ab** albite plagioclase, and **Cal** calcite.

Sample WR-OPA2-04

The as-received sample is megascopically medium greyish green and quartzose, but the quartz is not present as distinct veinlets. The maximum size of the rock fragments is about 1 × 2 × 3 cm. A few disseminated grains of sulfide are visible. The minus ¼ inch (6 mm) fraction was used for the polished thin section and X-ray diffractometry.

The polished thin section contains 40-50 chips, the largest 3 × 4 mm and nearly all of them >2 mm across. Many of the chips appear megascopically to be sulfide-barren, with about eight chips accounting for >90% of the sulfide. Except for one particle that approaches 1 mm along an edge, the sulfides are fine-grained and disseminated.

Transmitted-light microscopy shows the chips to be predominantly a blend of chloritized effusive volcanics, of the type observed in WR3-1, and the quartz-carbonate-chlorite-muscovite assemblage of the type observed for the OP pit samples. Two of the chips consist of relatively coarse, clean, strained quartz accompanied by undeformed carbonate-mineral grains. Carbonate is present in all of the rocks types but is most abundant in the quartz-carbonate-chlorite-muscovite assemblage.

Pyrite, arsenopyrite, and chalcopyrite occur in all rock types but are mostly in the quartz-carbonate type, and also in a fine-grained, layered, quartz-carbonate-chlorite rock that resembles a quartzose metasediment (Figs. 10, 11). Sulfides, however, are almost absent in the chloritic volcanics, wherein the principal opaque mineral is ilmenite. Some chips contain more arsenopyrite than pyrite, and the overall proportion of arsenopyrite to pyrite, possibly about 5:1, is much higher than in other samples. Chalcopyrite is also more common but is nevertheless sparse relative to pyrite and arsenopyrite. The carbonate-mineral content far exceeds that of total sulfides.

The X-ray diffractogram of the bulk sample is shown in Figure 12. The diffractogram indicates that the principal carbonate is dolomite. Siderite, if present, is quantitatively insignificant, but a minor amount of calcite is present. The dolomite, as is suggested from previously noted associations, probably originates with the quartz-carbonate-chlorite-muscovite rock whereas the calcite occurs in the altered volcanics.

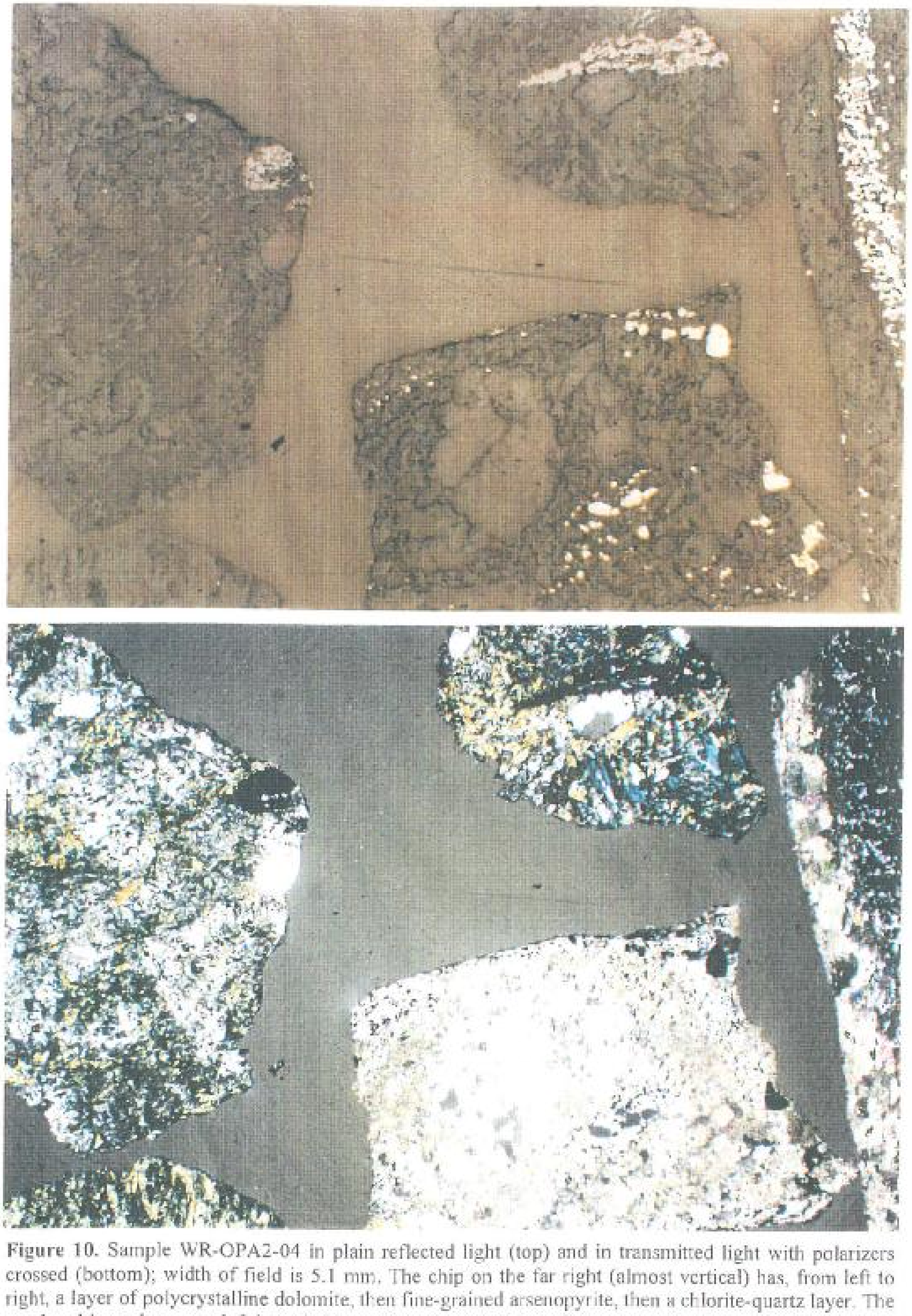


Figure 10. Sample WR-OPA2-04 in plain reflected light (top) and in transmitted light with polarizers crossed (bottom); width of field is 5.1 mm. The chip on the far right (almost vertical) has, from left to right, a layer of polycrystalline dolomite, then fine-grained arsenopyrite, then a chlorite-quartz layer. The nearby chip at the upper left is probably an altered volcanic; the light grey mineral in the upper photo is ilmenite, and in the lower photo the bluish mineral is chlorite. The chip below consists of a pyritiferous quartz-carbonate assemblage; in the lower photo the quartz shows as white to grey, and the associated, more coloured grains are dolomite. See also Figure 11.

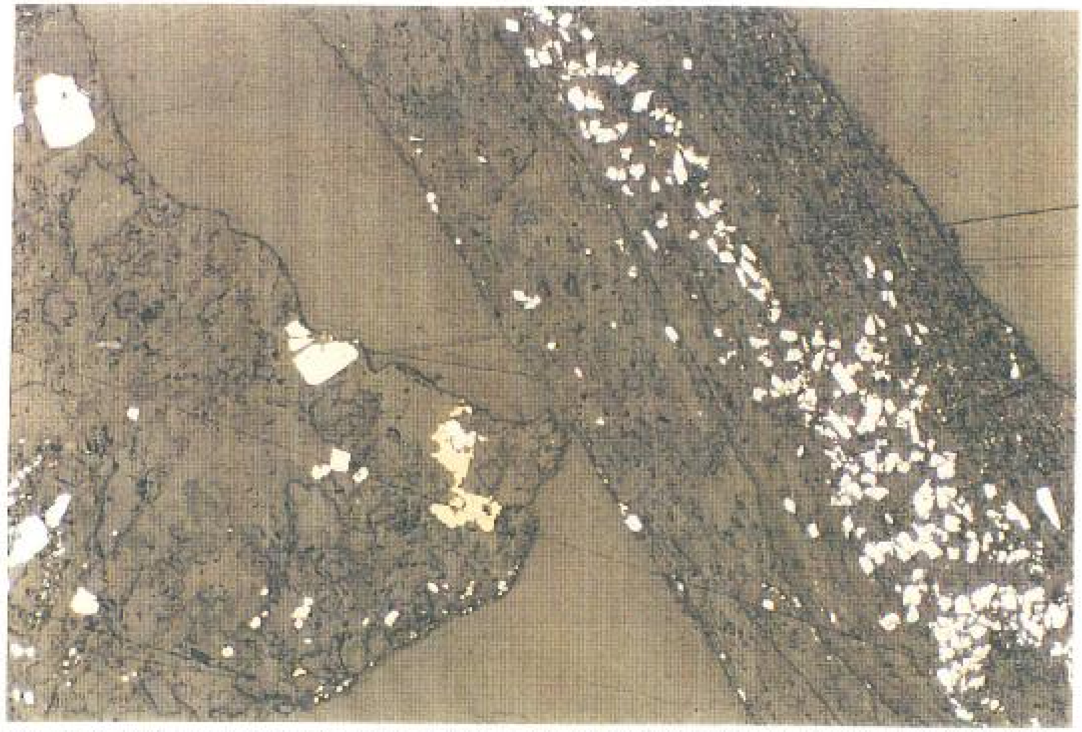


Figure 11. Enlargement of the right side of Figure 10, width of field 2.6 mm, showing WR-OPA2-04 in plain reflected light. In the chip on the right, the abundant white grains are arsenopyrite. In the chip on the left, the white grains are pyrite, and an irregular, yellow grain of chalcopyrite is at the far right of the chip.

Sample WR-OPB1-01

The as-received sample is light grey and quartzose; the largest fragments have an irregular shape and are up to 3 cm long and 1.5 cm across. A few small, blackish, presumably chloritic fragments are also present. Sparse, fine-grained sulfides are visible, and traces of ochreous staining occur along fracture surfaces.

The polished thin section contains approximately 40 chips, the largest of which is about 4 mm across, and almost all of the chips are larger than 1.5 mm across. The sulfide content of individual chips varies from nil to percentage amounts.

Transmitted-light microscopy shows that three of the chips are of the coarser grained, amphibole-bearing, dyke-type rock, and all other chips are of the quartz-carbonate-muscovite-chlorite type. In reflected light the dyke-type rock is seen to be barren of sulfides, whereas the quartz-carbonate chips vary from barren to sulfide-rich (Figs. 13, 14). In one chip the pyrite grains are euhedral and up to 0.5 mm along an edge; the grains are clustered, and most have been

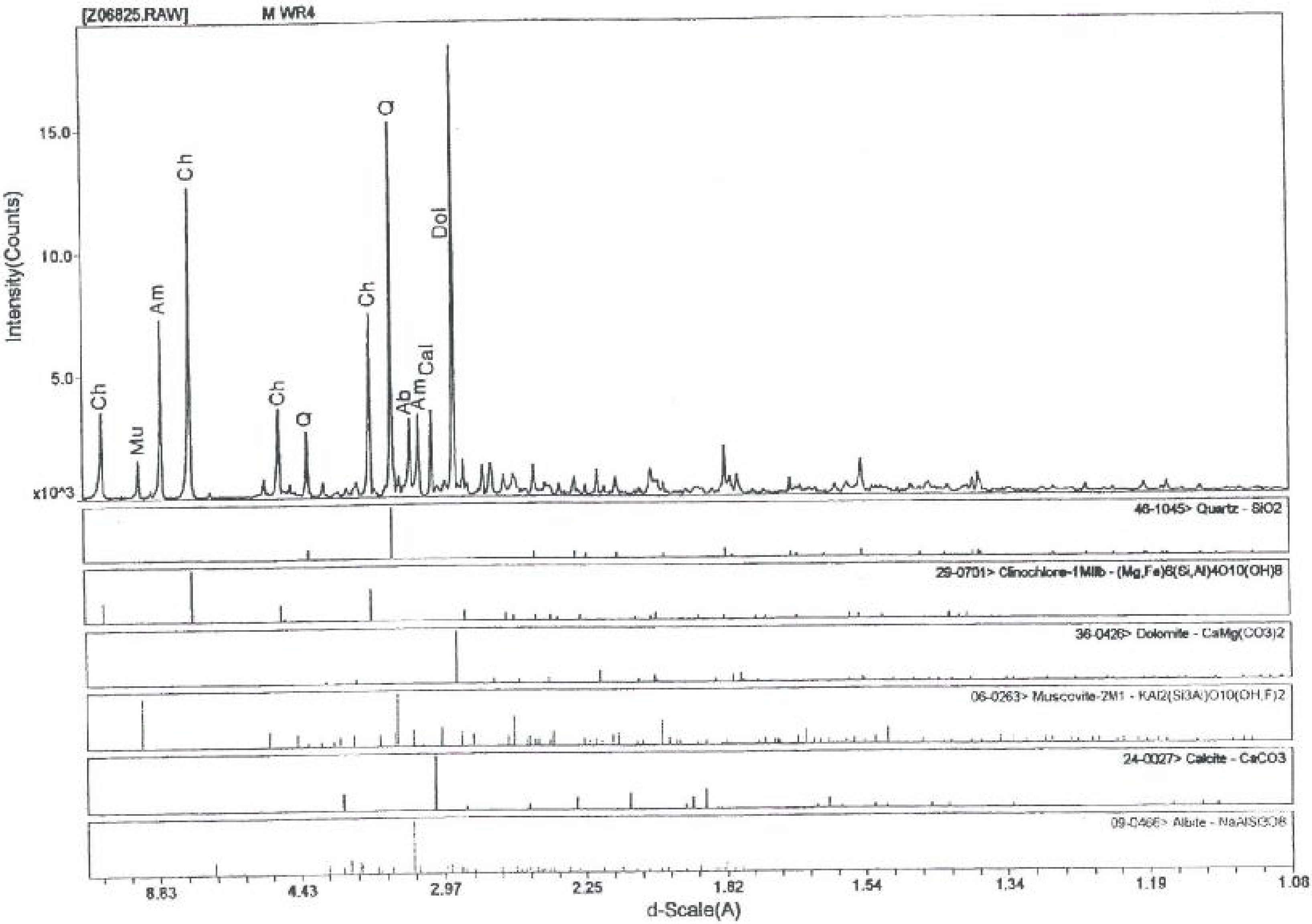
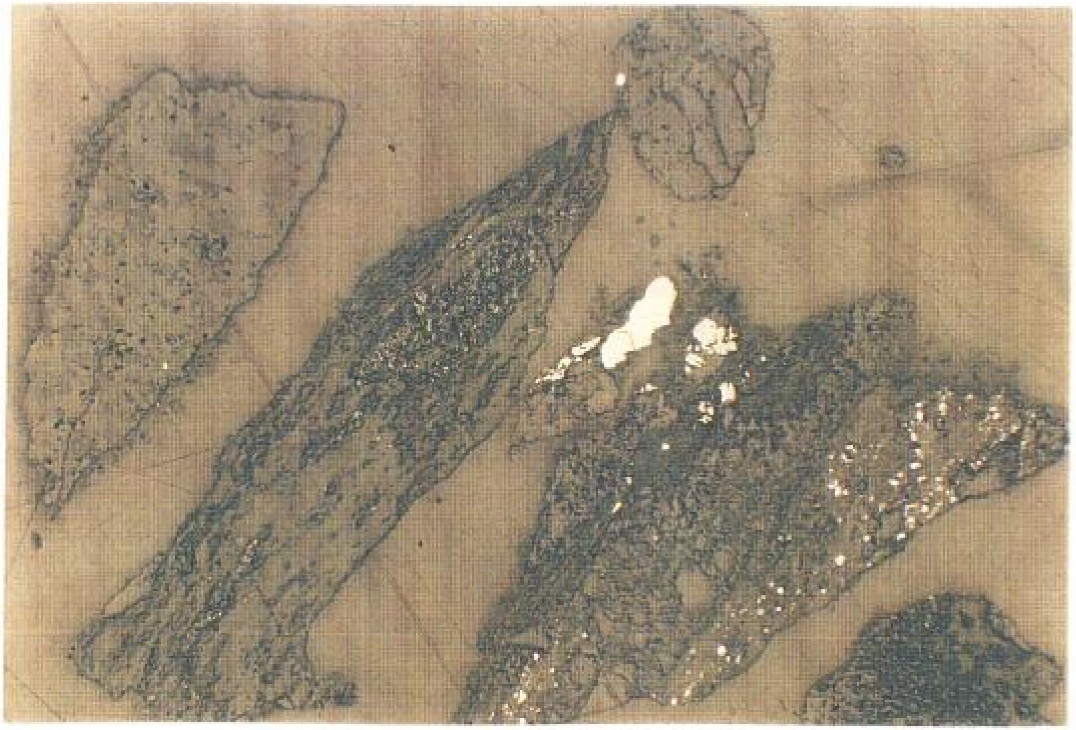


Figure 12. X-ray diffractogram of WR-OPA2-04. Labelled peaks are **Ch** chlorite, **Mu** muscovite, **Am** amphibole, **Q** quartz, **Ab** albite plagioclase, **Cal** calcite, and **Dol** dolomite.

Figure 13. Sample WR-OPB1-01 in plain reflected light, width of field 5.1 mm, showing the general variation and distribution of the sulfide minerals. Most of the white grains are pyrite, but in the chip at the bottom left the main sulfide is arsenopyrite. In the chip at the top centre, most of the sulfide grains are pyrite, but the accompanying minute grains are arsenopyrite and chalcopyrite.

brecciated and healed by carbonate. One of the grains has a 20 × 50 μm inclusion of tetrahedrite, which also occurs elsewhere in the section in minute amounts. Arsenopyrite is widespread in the section and is more abundant than pyrite in some chips. Nevertheless, pyrite is by far predominant overall, and the ratio of pyrite to arsenopyrite is probably not significantly different from that described for the preceding quartz-carbonate rock samples. One quartz-carbonate chip contains no pyrite or arsenopyrite, but has a grain of pyrrhotite, 200 μm across, with an attached smaller grain of chalcopyrite.

The X-ray diffractogram of a bulk sample is shown in Figure 15. The aluminosilicate assemblage is as was observed microscopically; the principal carbonate mineral is dolomite, but an appreciable amount of calcite is present. Pyrite is detectable, but the carbonate-mineral content far exceeds that of the sulfides.



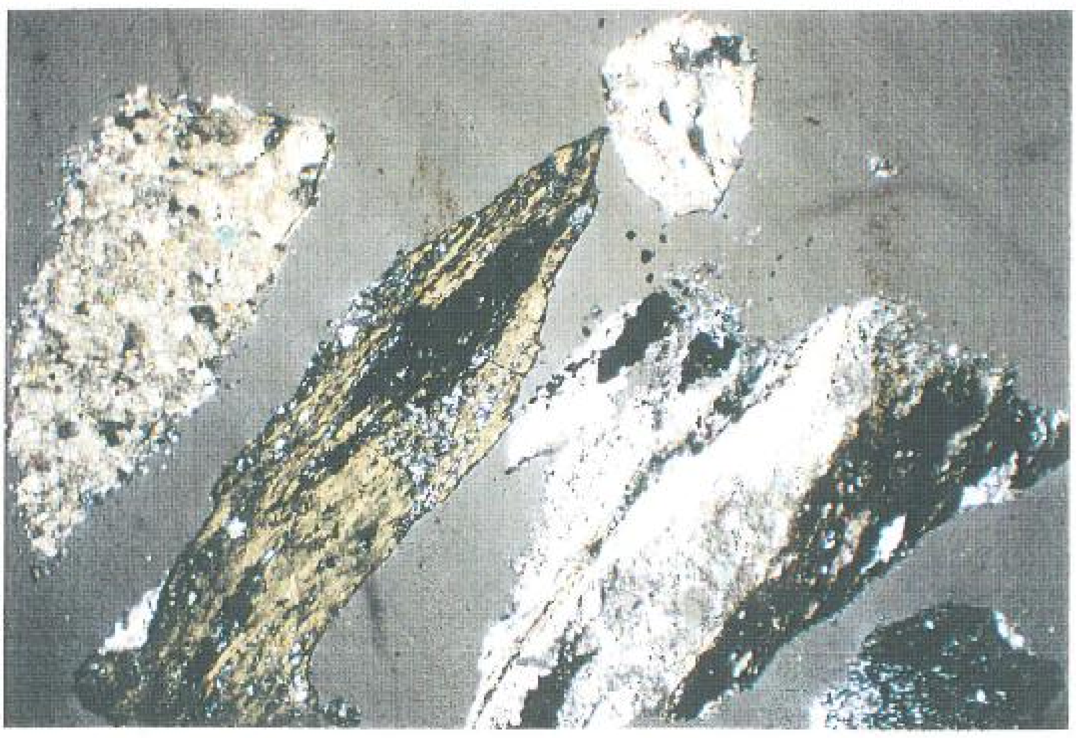


Figure 14. Sample WR-OPB1-01 in plain reflected light (top) and in transmitted light with polarizers crossed (bottom); width of field is 5.1 mm. The sulfide-barren chip on the far left consists almost wholly of polycrystalline dolomite. To its right is an elongate chip consisting largely of chlorite (greenish), and above it is round to elliptical small chip of quartz and dolomite. The pyritiferous chip on the right contains a quartz-carbonate-chlorite-muscovite assemblage.

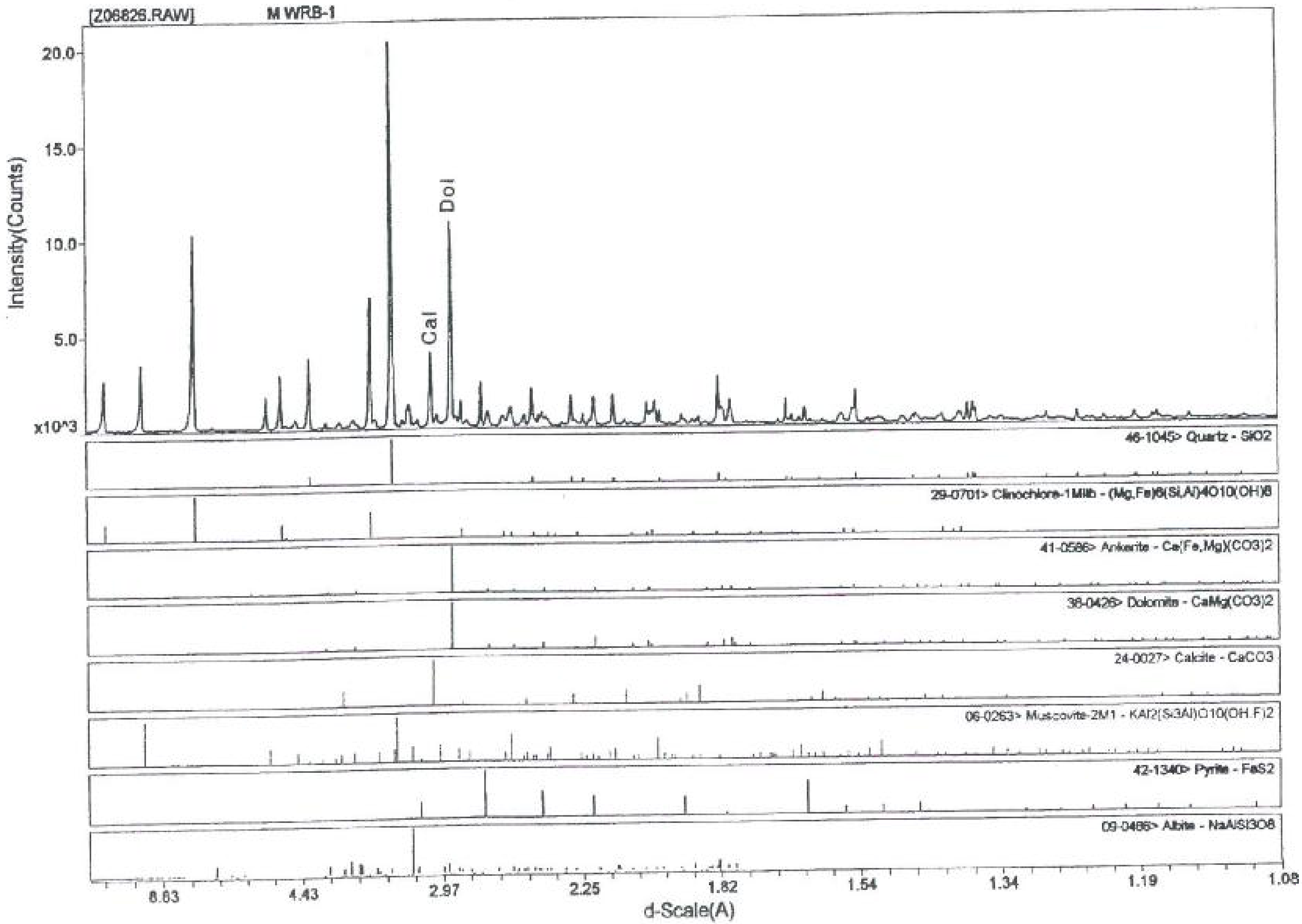


Figure 15. X-ray diffractogram of sample WR-OPB1-01. Labelled peaks are **Cal** calcite, and **Dol** dolomite.

Sample WR-OPC1-01

The as-received sample is a dark greenish grey crushed rock for which the fragments are irregular, massive, and up to 1 × 2 × 2 cm. One fragment, 0.5 × 1.5 × 2 cm, and a few smaller ones, appear to be slightly schistose and contains abundant, fine-grained, disseminated pyrite that is concentrated in micaceous or chloritic layers. The polished thin section of the sample contains about 35 chips, the largest of which is 4 × 7 mm, and most are >3 mm. Most of the sulfides, other than a few disseminated grains, are concentrated in six of the chips.

Transmitted-light microscopy shows that the majority of the chips are amphibole- and chlorite-rich rocks, interpreted to be altered extrusive volcanics, and three of the chips are coarser grained, dyke-type rock (Fig. 16). About a third of the chips is of the quartz-carbonate rock type. Some of amphibole-bearing chips contain small amounts of carbonate, presumably calcite, but the chief alteration is extensive chloritization. The quartzose rocks are highly calcareous (presumably dolomite) and also host nearly all of the sulfides.

The altered volcanics are seen in reflected light to contain only a few blebs of chalcopyrite and pyrite, and most of the chips of this rock type are devoid of sulfides. One of the chips of dyke rock contains two adjacent particles of sulfide mineral, each particle about 100 μm across; one of the particles consists of a polycrystalline aggregate of marcasite, and the other consists of roughly equal amounts of pyrite and marcasite. Blebs of chalcopyrite and additional pyrite were also observed, but all are <5 μm across and are quantitatively insignificant. The bulk of the sulfides occurs in the quartz-carbonate rock type. Pyrite and arsenopyrite are predominant, a trace of chalcopyrite is present, and the textures, proportions, and associations are similar to those already described for other quartz-carbonate waste-rock samples.

The X-ray diffractogram of a bulk sample of WR-OPC1-01 is illustrated in Figure 17. The high content of amphibole and chlorite largely reflects the presence of the altered volcanics. Both calcite and dolomite are abundant, with the latter predominant. The carbonate content far exceeds the sulfide content.

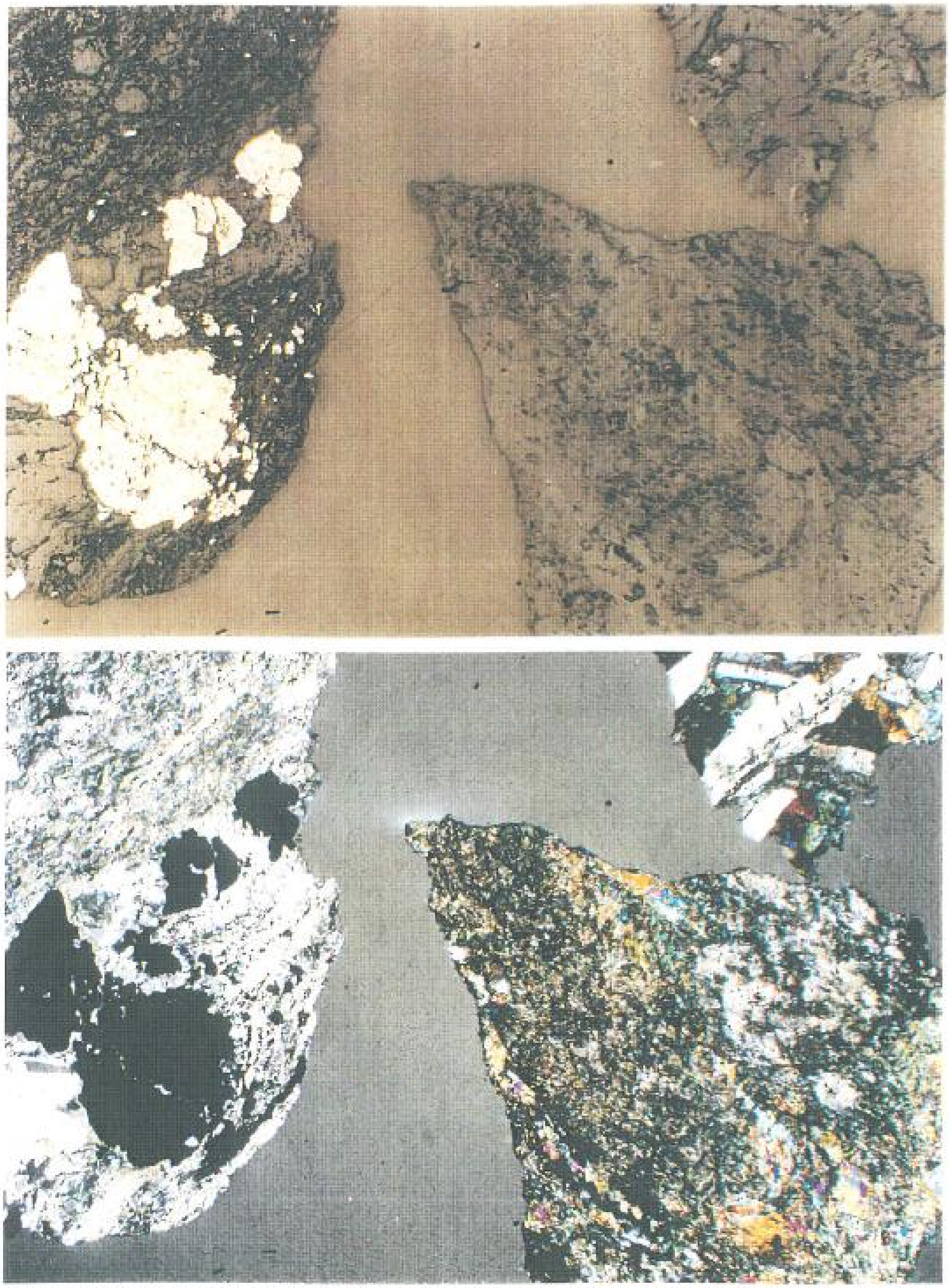


Figure 16. Sample WR-OPC1-01 in plain reflected light (top) and in transmitted light with polarizers crossed (bottom), width of field 5.1 mm. Upper photo shows the variation in sulfide content; white grains on the left are mainly pyrite, but an isolated diamond-shape crystal of arsenopyrite is evident at the extreme bottom-left corner. Lower photo shows relatively coarse plagioclase laths in the dyke-type rock at the top right. Below it is a calcite-bearing chip of altered volcanic rock in which the bright colours are from amphibole. At the far left is a chlorite-rich chip containing the quartz-carbonate-muscovite assemblage.

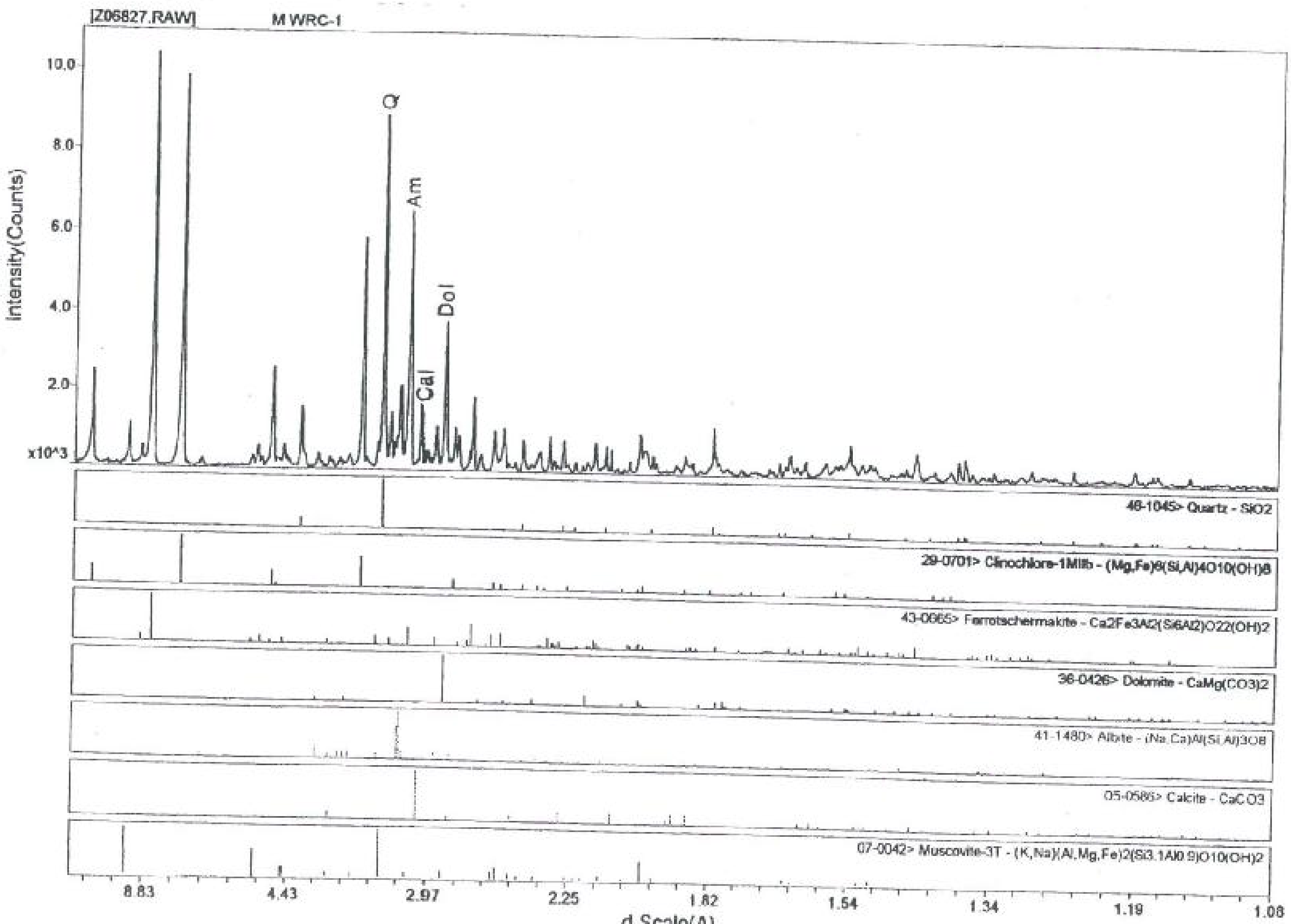


Figure 17. X-ray diffractogram of sample WR-OPC1-01. Labelled peaks are **Q** quartz, **Am** amphibole, **Cal** calcite, and **Dol** dolomite.

Samples TCP01 and TCP-02

Samples TCP01 and TCP-02 are fine-grained tailings from 0.5 m and 3.5 m, respectively, in the Central Pond. As-received material of TCP01 is medium greenish grey, finely silty, with numerous slightly cohesive lumps, most <0.4 cm in diameter, that are easily disintegrated by only slight pressure. Sample TCP-02 is similar, but the colour is slightly brownish rather than greenish.

Microscopic examination of TCP01 is in accord with a tailings origin. Maximum grain size is of the order of 150 μm, but most grains are <50 μm. Almost all of the coarser grains are quartz and carbonate, and the finer portion consists predominantly of these two minerals and shreds or laths of muscovite and chlorite.

Opaque minerals are common but form only a small proportion of the assemblage (Fig. 18). Pyrite and hematite predominate, and the latter is almost invariably finely zoned. A few grains of pyrrhotite, arsenopyrite, and a trace of chalcopyrite are present. None of these sulfide minerals has rims or replacements that are characteristic of alteration that occurs by oxidation

Figure 18. Overview of sample TCP-01 in plain reflected light, width of field 2.6 mm. Greyish grains, including the well-zoned one below and right of centre, are Fe oxide that is interpreted to be roaster waste. White grains are sulfides, some of which are rimmed by Fe oxide (see Fig. 19).

Figure 19. Sample TCP-01 in plain reflected light, width of field 0.625 mm, showing a zoned grain of roaster-type Fe oxide. To its left is a grain of pyrite that is rimmed by Fe oxide, indicating that roasting did not consume some of the sulfide grains. Whitish grains to the left and far right are unoxidized pyrite, presumably from the flotation tailings.

during weathering; in such a setting the most common oxidation products are goethite (α – FeOOH) and Fe^{2+} sulfates. However, numerous sulfide grains show partial, zoned replacement by an iron oxide with the optical properties of hematite (Figs. 19, 20). The textures and associations are typical of incompletely roasted sulfides, and the conclusion is that sample TCP01 represents a combination of co-disposed flotation tailings and wastes from roaster processing.

Sample TCP-02 is noticeably finer grained than TCP01. In TCP-02, more than 90% of the grains are finer than 40 µm . The non-opaque minerals are chiefly quartz and carbonate, and the opaque minerals are mainly zoned hematite and subordinate amounts of incompletely roasted pyrite. The most noticeable difference between these two Central Pond tailings samples is the finer grain size of the deeper sample.

The X-ray diffractograms of the two TCP samples are given in Figure 21. Both patterns show the prevalence of chlorite, muscovite, quartz and carbonates, the latter consisting of dolomite and calcite. The most conspicuous mineralogical difference between the two samples is the higher proportion of calcite in TCP-02.

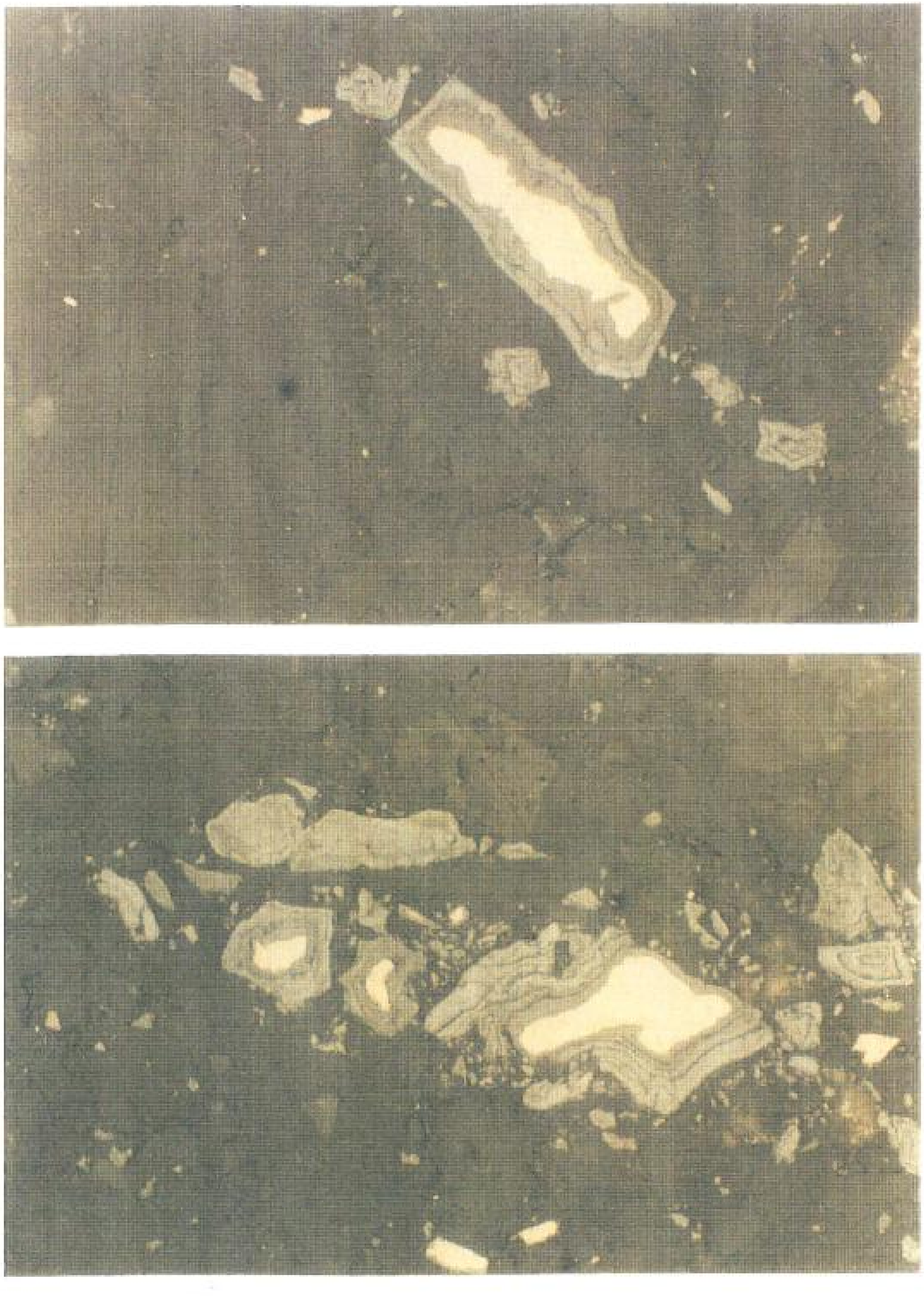


Figure 20. Sample TCP-01 in plain reflected light, width of field 0.3 mm, showing roaster-type oxides, some with unoxidized cores of pyrite.

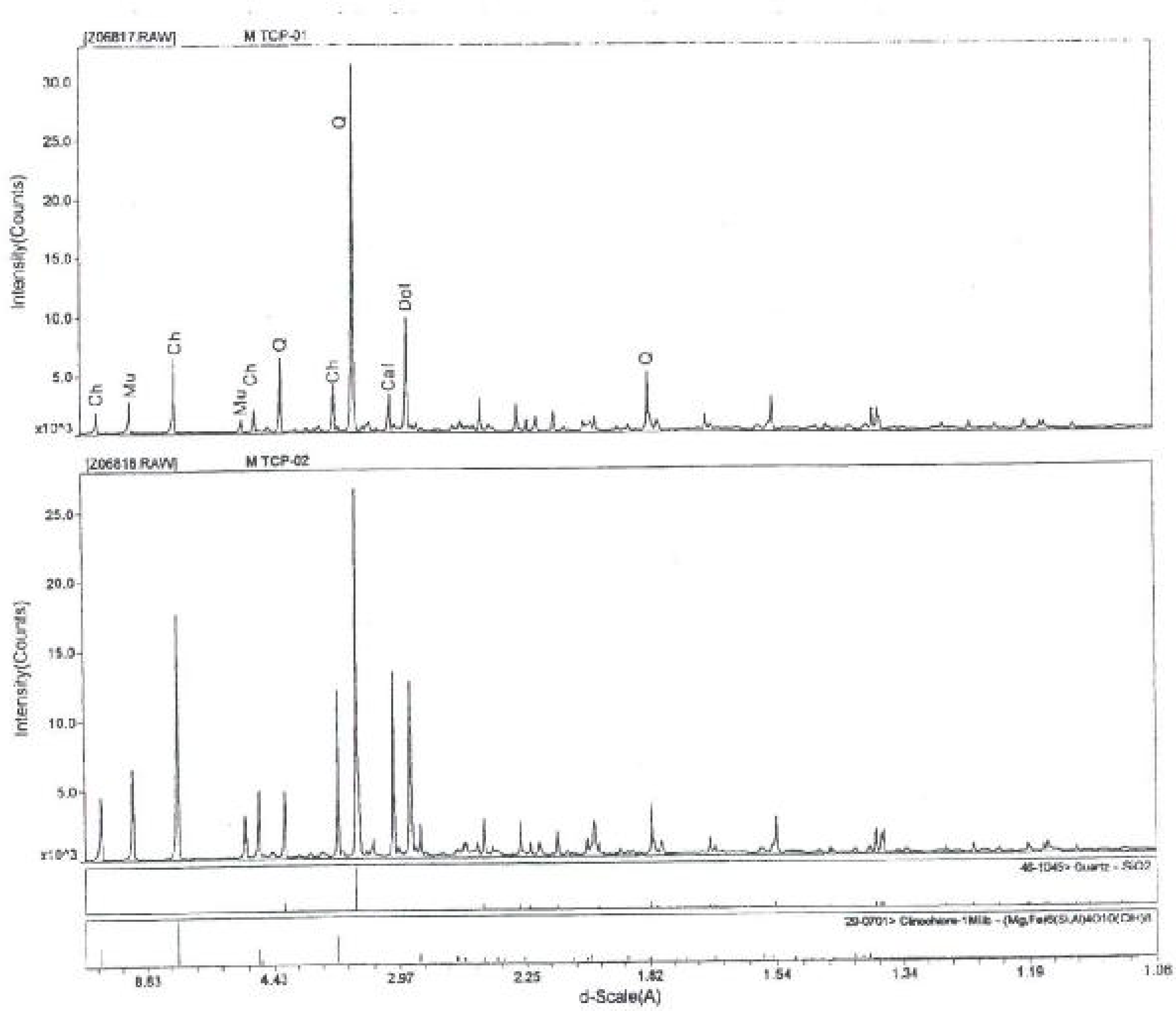


Figure 21. X-ray diffractograms of sample TCP-01 and TCP-02. Labelled peaks are **Ch** chlorrite, **Mu** muscovite, **Q** quartz, **Cal** calcite, and **Dol** dolomite.

Sample TNP01

Sample TNP01, collected at a depth of 0.05 m, is the shallowest of a downward succession of four samples from the North Pond tailings. The as-received material of TNP01 is pulverulent and light brownish. Lumpy portions are poorly cohesive and are easily disintegrated by finger pressure.

Optical microscopy indicates that the tailings are a blend of relatively coarse (~150 μm) and finer particles. The principal minerals are quartz and carbonates, with minor chlorite and muscovite. The chief opaque mineral as observed in reflected light is sparse hematite that is zoned and is optically identical to the roaster-type hematite from the Central Pond (Fig. 22). Pyrite is also common, occurring both as fresh grains and as cores rimmed by hematite. Traces of liberated pyrrhotite are present, and the grains are unaltered. As for the Central Pond, this shallow sample from the North Pond is interpreted to be a mixture of flotation tailings and roaster wastes.

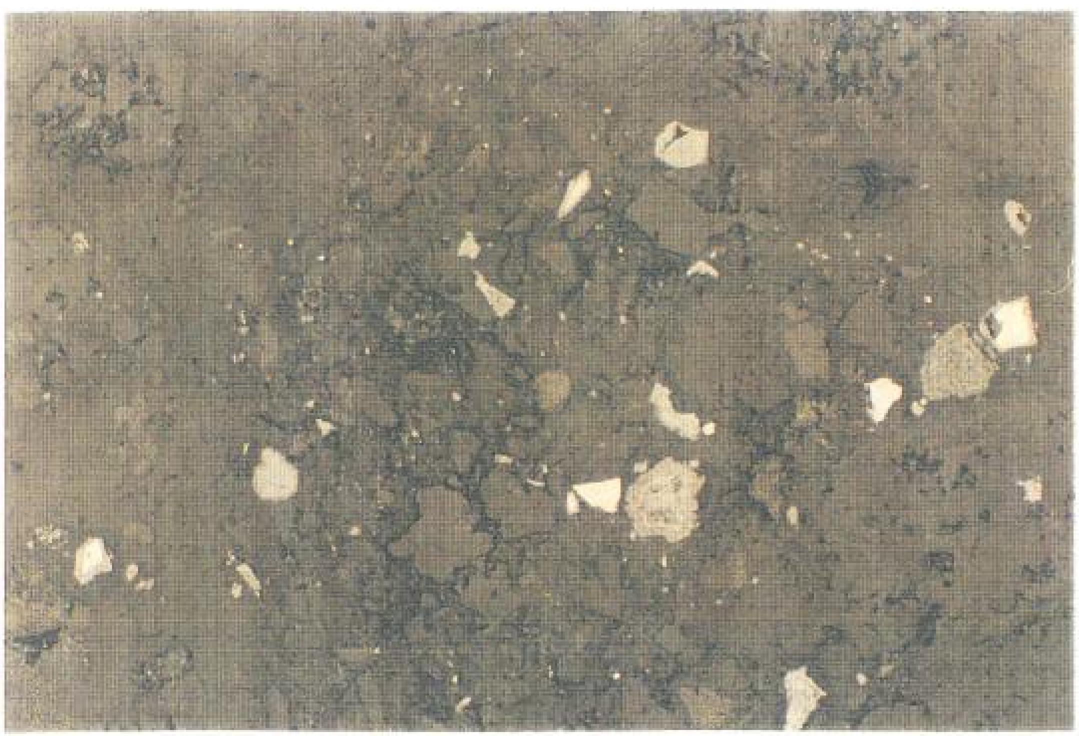


Figure 22. Sample TNP01 in plain reflected light, width of field 0.625 mm, showing roaster-type oxides, some with unconsumed sulfide cores.

Sample TNP02

The sample is from the North Pond tailings at a depth of 0.5–0.6 m, i.e., approximately half a metre below TNP01. The deeper sample as received is light tan and is predominantly lumpy rather than a free-flowing powder.

Optical microscopy of the polished thin section shows the material to be extremely fine-grained; the coarser grains are only about 30 μm across, and most grains are <20 μm. The non-opaque portion is rich in quartz, carbonates, muscovite, and chlorite.

The opaque fraction is relatively sparse, as in TNP01, and the fine grain size is at the limit for optical identifications. Nevertheless, fresh, liberated grains of pyrite and arsenopyrite are evident, as are particles of zoned hematite and apparently incompletely roasted sulfides. Thus, both the opaque and non-opaque assemblage seems to be the same as in TNP01, with the principal difference being the much finer grain size of TNP02.

X-ray diffractograms of TNP01 and TNP02 are shown as Figure 23. The former contains a trace of gypsum and almost all of the carbonate mineral is dolomite. Sample TNP02 differs in that gypsum is not detectable, the proportion of muscovite is higher, and calcite, although minor relative to dolomite, is slightly more abundant than in TNP01.

Sample TNP03

Sample TNP03 is from the North Pond tailings at a depth of 0.5 m, i.e., approximately the same depth as TNP02. Sample TNP03 is the finest grained of the North Pond tailings samples, with more than 90% of the particles <20 μm across. The non-opaque assemblage consists predominantly of quartz, chlorite, muscovite, and carbonates. The principal opaque mineral is pyrite. Zoned grains of hematite are observable, as are a few zoned grains of sulfides that are interpreted to be the products of incomplete roaster processing. The proportion of pristine, unreacted sulfides seems to be higher than in other samples, suggesting that more tailings and fewer roaster wastes are represented.

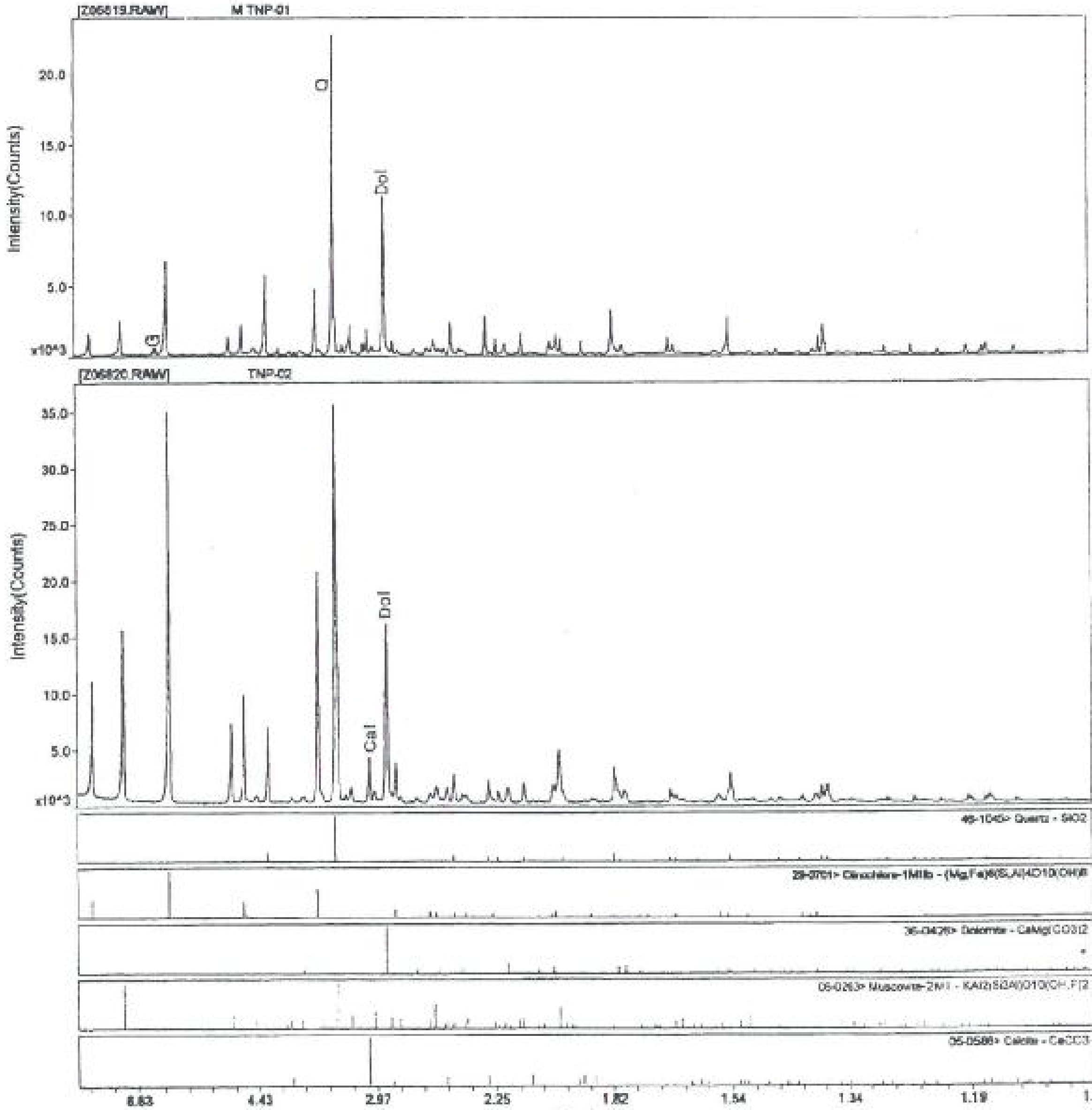


Figure 23. X-ray diffractograms of sample TNP-01 and TNP-02. Labelled peaks are **G** gypsum, **Q** quartz, **Cal** calcite, and **Dol** dolomite.

Sample TNPO4

Sample TNP04 is coarser than TNP03, with much of the material in TNP04 in the 50-100 μm range. The non-opaque assemblage in both samples appears to be mineralogically similar. Zoned, roaster-type hematite is more abundant in TNP04 than in TNP03, and some unaltered sulfides, mainly pyrite but with traces of arsenopyrite, were also observed. Thus, the proportion of roaster versus flotation wastes may have varied among the TNP samples, but all of these samples apparently consist of a combination of flotation and roaster products.

The X-ray diffractograms of TNP03 and TNP04 are shown in Figure 24. The X-ray patterns indicate that there is little mineralogical difference between the two samples; both contain abundant dolomite with subordinate amounts of calcite

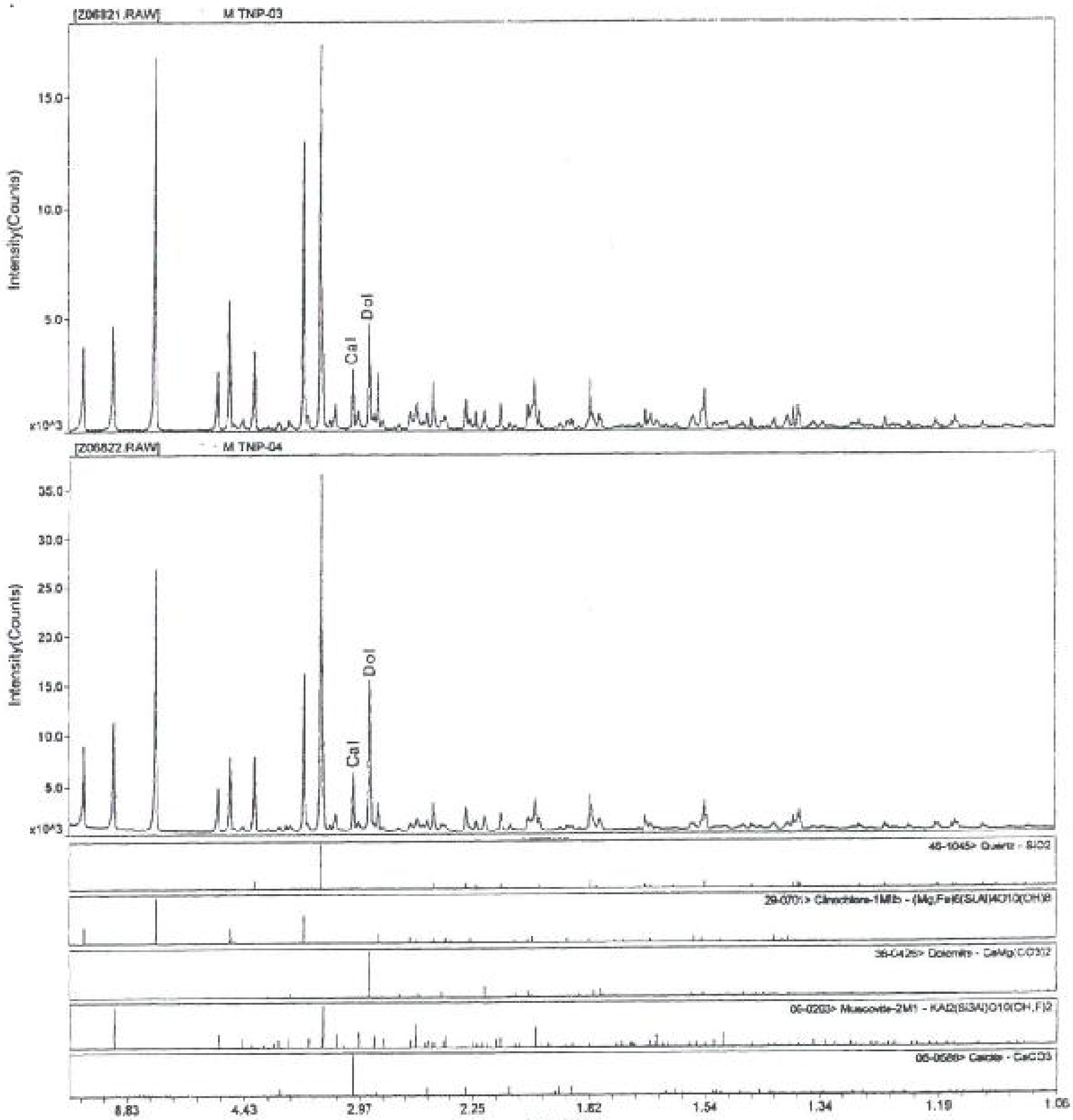


Figure 24. X-ray diffractograms of sample TNP03 and TNP04. Labelled peaks are **Cal** calcite, and **Dol** dolomite.

Sample TNW-01-01

The sample is from the NW tailings pond at a depth of 0.1–0.5 m. The as-received material is grey, pulverulent and partly lumpy, and lacks the brownish cast that is evident in the tailings samples from the North Pond.

The polished thin section shows that a major proportion of the grains is in the size range 50–100 μm. The principal non-opaque minerals are quartz and carbonates, which are accompanied by abundant muscovite and chlorite. Reflected-light microscopy shows that zoned, roaster-type hematite is common and does not appear to be different from that in the North Pond tailings. Also present are liberated, unaltered grains of pyrite, several grains of unaltered pyrrhotite, and traces of unaltered arsenopyrite, all of which are characteristic of flotation tailings. As well, a few zoned grains typical of incompletely roasted sulfides are present.

The X-ray diffractogram of the sample is given in Figure 25. Quartz, chlorite, and muscovite are abundant, and both calcite and dolomite, the former the predominant mineral, are major constituents. Traces of amphibole and albite are detectable, suggesting that a small amount of altered volcanics (wallrock?) was processed.

Sample TNW-01-03 (CEM sample 02853)

Sample TNW-01-02 is from the NW tailings pond at a depth of 1.1–1.5 m, that is, about 1 m deeper than TNW-01-1. The as-received powder is distinctly greenish, and the sample is reported to have been pulverized.

The material in the polished thin section has a few grains up to 100 μm across, and although nearly all of the grains are smaller than 100 μm, the effects of pulverizing are not apparent insofar as the material is coarser than that of some of the tailings samples from the Central Pond. The non-opaque assemblage is mainly quartz-carbonate, with abundant chlorite, minor muscovite, and accessory epidote.

The principal opaque mineral is unaltered pyrite, almost all (>99%) of which is in grains <50 μm, and most is <20 μm across. Several grains of chalcopyrite and traces of unaltered pyrrhotite are present. Only a few grains of roaster-type hematite, much fewer than those of the sulfides, were observed.

The X-ray diffractogram of the sample is shown in Figure 26. The large proportion of chlorite in combination with abundant albite suggests that the source rocks (mill feed) included

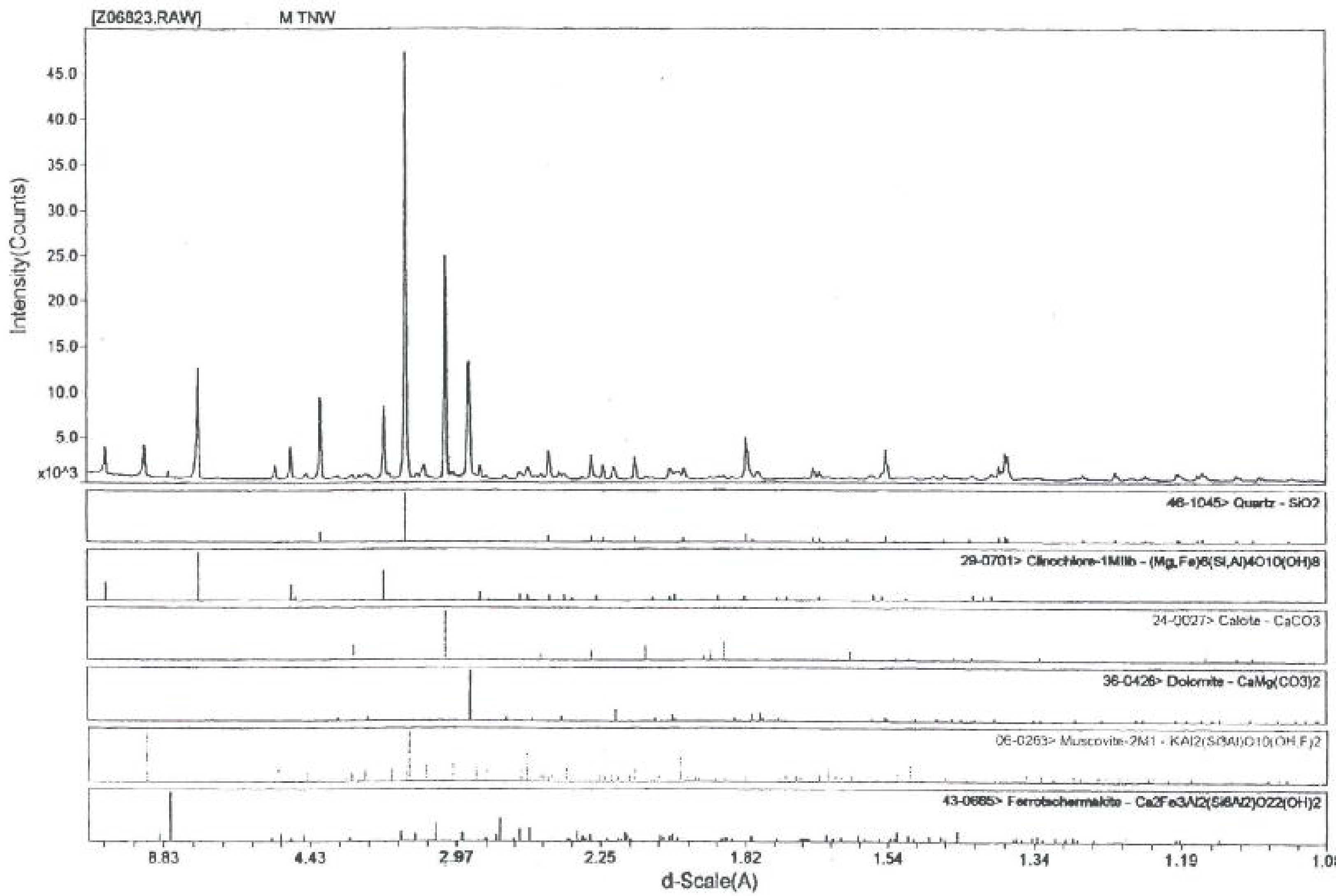


Figure 25. X-ray diffractogram of sample TNW-01-01.

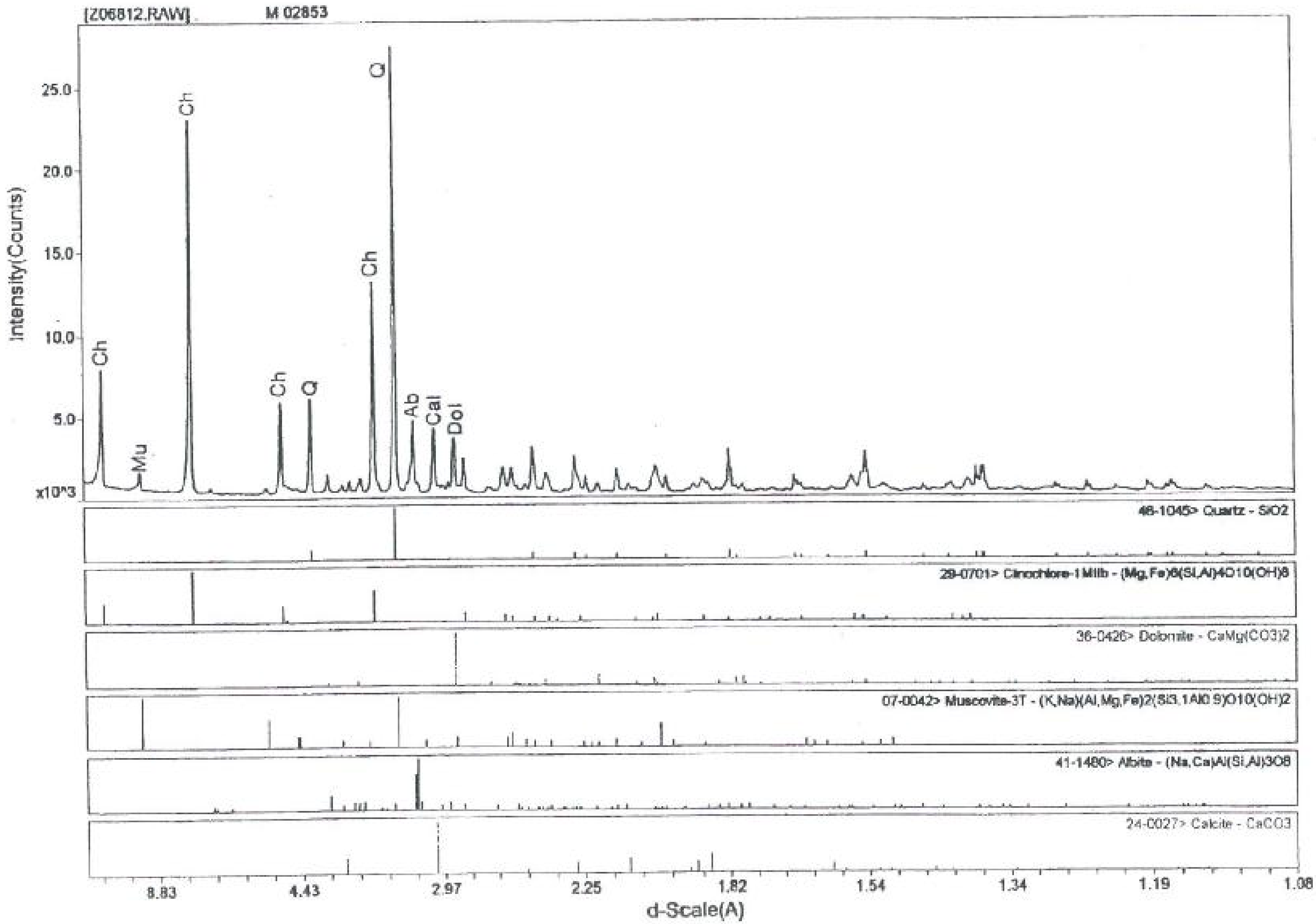


Figure 26. X-ray diffractogram of sample TNW-01-03. Labelled peaks are **Ch** chlorite, **Mu** muscovite, **Q** quartz, **Ab** albite plagioclase, **Cal** calcite, and **Dol** dolomite.

strongly chloritized volcanics. Both calcite and dolomite occur in subequal, major or high minor amounts; thus, the assemblage is primarily chlorite-quartz-albite-calcite-dolomite. The opaque constituents indicate that these are chiefly flotation tailings, which are accompanied by a small amount of roaster wastes.

Sample TNW-01-5 (CEM sample 02855)

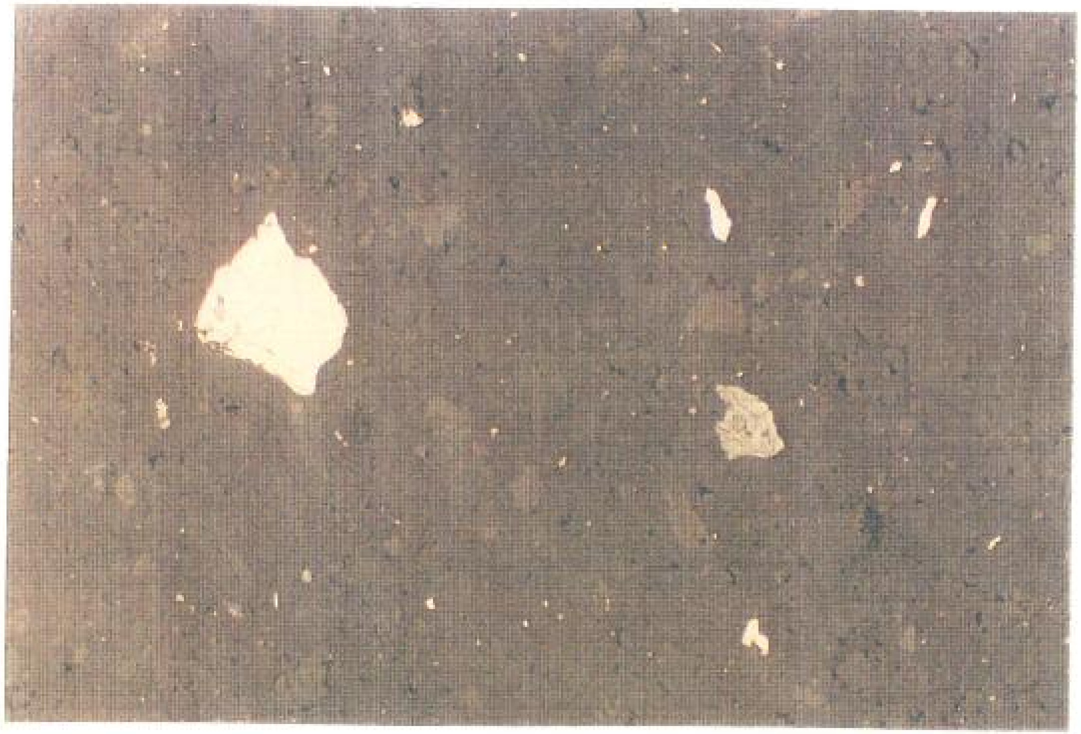
The sample is from the NW tailings pond at a depth of 3.6–4.0 m, about 2½ – 3 m deeper than TNW-01-03. Both the –03 and the –05 samples have the same greenish colour, and both are indicated as having been pulverized.

Optical microscopy of TNW-01-05 indicates a predominant quartz-carbonate-chlorite assemblage, with less chlorite and more muscovite than in TNW-01-03, and with negligible epidote. Grain sizes are mainly <50 μm, and grains as large as 100 μm are rare.

Reflected-light microscopy shows this to be the most sulfide-rich of all of the tailings samples. Grains of arsenopyrite are common, and the proportion of arsenopyrite to pyrite is at least as high as that observed in the waste-rock samples. Only two or three particles of roaster-type hematite were observed in the section; as well, a few apparently hematitic particles that have a spongy rather than a zoned texture are present, but these are of uncertain origin. At the highest optical magnifications available (20 × 40 X), some of the sulfide grains appear to have reaction rims, but this observation is somewhat indefinite (Fig. 27).

The X-ray diffractogram of the sample is shown in Figure 28. The principal mineralogy is in accord with the microscopic observations, except that low-minor albite is also present. The X-ray pattern indicates that the carbonate minerals are dolomite and very minor calcite.

The derivation of the opaque minerals in the sample is debatable. The occurrence of roaster-type hematite in the sample is rare enough that the contamination from up-hole material cannot be discounted. However, the amount of sulfides in the sample could be deemed as higher than normal, and there are tenuous indications of foetal reaction rims (Fig. 27). Thus, the sample may be a combination of flotation tails and roaster wastes, with the latter having been almost unaffected by the roast processing. Regardless, the bulk of the sulfur and arsenic currently reside in the sulfides rather than in oxidized roaster-derived products.



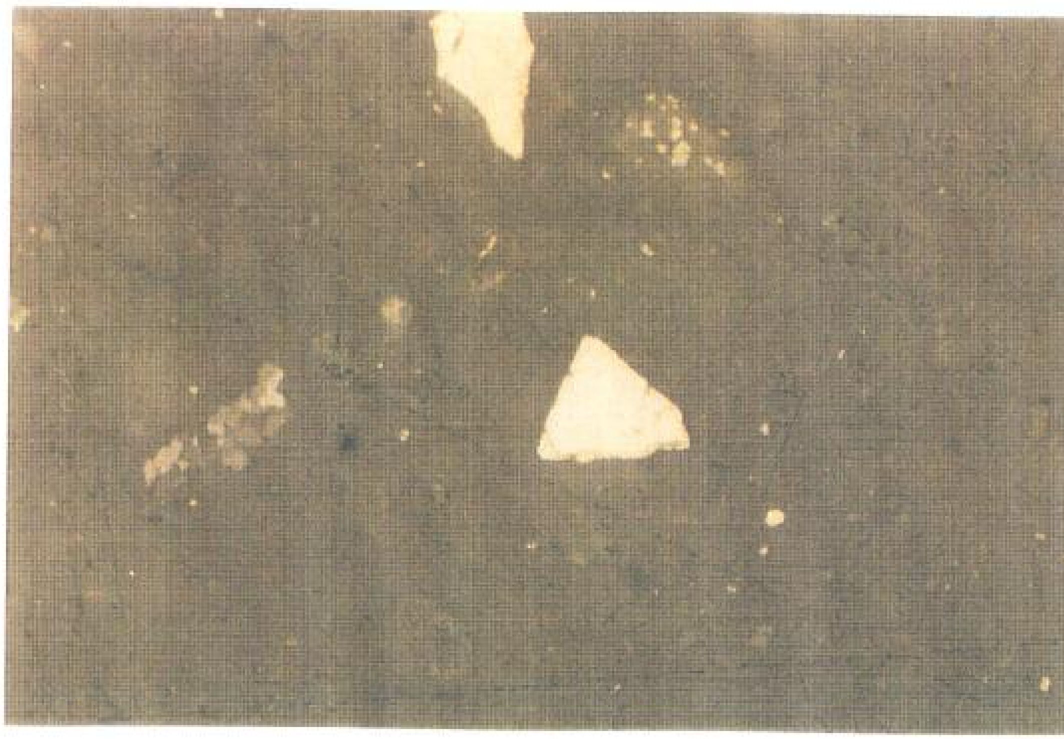


Figure 27. Sample TNW-01-05 in plain reflected light. Upper photo (width of field 0.625 mm) shows one of the few particles of zoned Fe oxide (right of centre) in the sample. The large, whitish sulfide grain on the left is pyrrhotite. Lower photo, width of field 0.3 mm, shows a triangular grain of pyrite, apparently with a narrow, barely visible reaction rim.

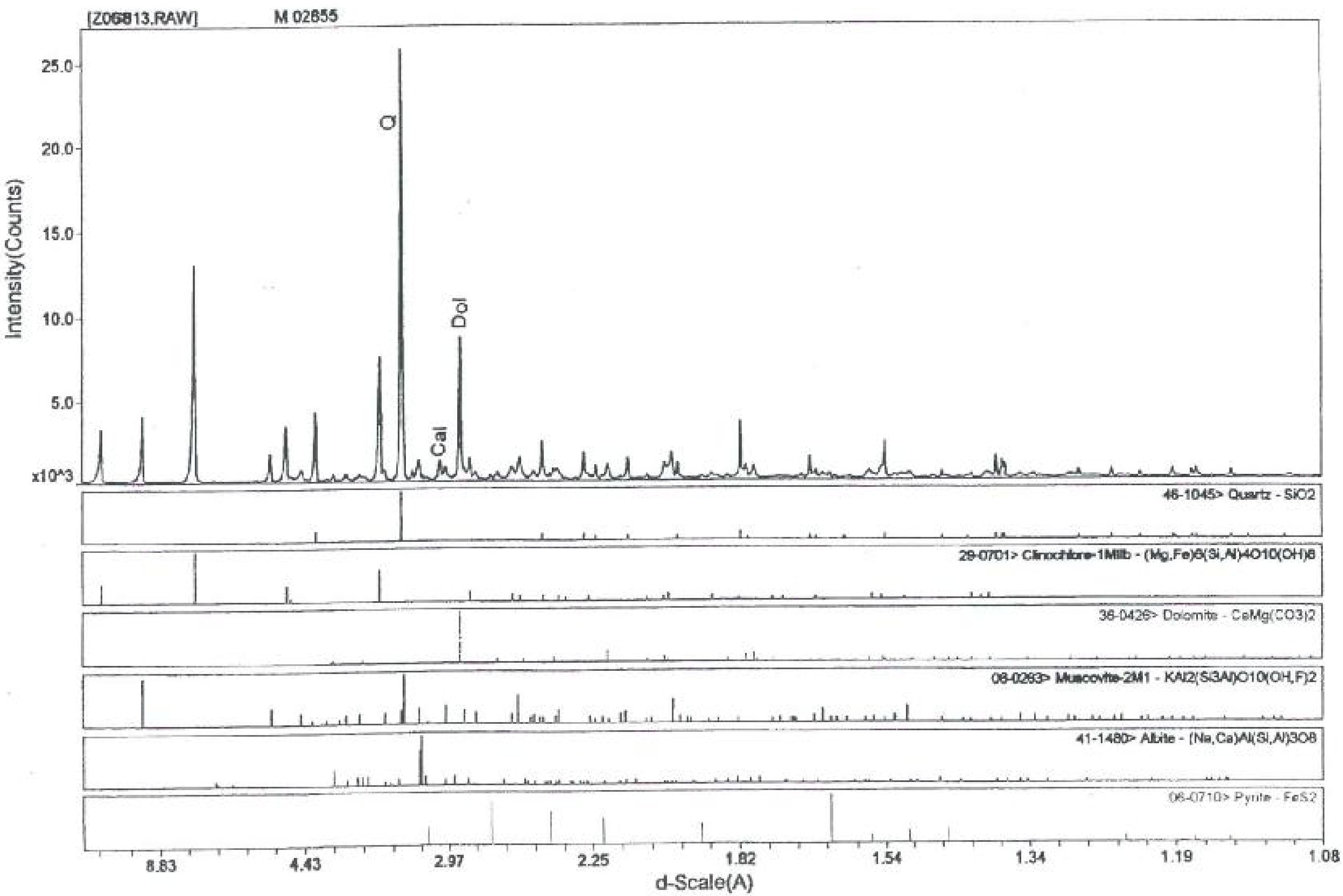


Figure 28. X-ray diffractogram of sample TNW-01-05. Labelled peaks are **Cal** calcite, and **Dol** dolomite.

SUMMARY AND CONCLUSIONS

All of the samples examined, both of the waste rock and tailings, are rich in carbonate minerals. The least calcareous rocks are the altered volcanics and dyke-rock, which nevertheless contain at least accessory amounts of calcite and are almost devoid of sulfides. All other waste-rock samples are characterized by the presence of a quartz and carbonate-mineral assemblage that hosts nearly all of the sulfides. The prevalent carbonate mineral in the quartz-carbonate rocks is $Ca(Mg,Fe)(CO_3)_2$, which throughout this report has been referred to as dolomite because the amount of Fe^{2+} substitution for Mg, and hence the progression to ankerite (mol Fe > Mg), is not known. There is a good correlation between rock type and carbonate mineralogy; the presence of appreciable amounts of calcite in bulk samples of waste rock invariably signalled the presence of altered volcanic and dyke rocks.

The principal sulfide minerals in the waste rocks are pyrite and arsenopyrite, with the former predominant. Both minerals are potential generators of acidity, but in all of the samples of waste rock and tailings, the carbonate minerals are far in excess of those required to neutralize any potential acidity generated by sulfide oxidation. No indication of sulfide-mineral oxidation attributable to weathering was observed in any of the samples.

All of the tailings samples are carbonate-rich, and are sulfide-poor relative to the abundance of carbonates. All of the tailings samples except TNW-01-05 contain numerous grains of zoned iron oxide that are interpreted to have been derived by the roasting of sulfide concentrates. In the Central Pond, North Pond, and NW pond, the roaster wastes, which also include incompletely consumed sulfides, were apparently co-disposed with the flotation tailings. The deepest sample in the NW Pond, sample TNW-01-05, is the most sulfide-rich and contains only traces of roaster-type products.

Potential sources of arsenic in the waste rocks are arsenopyrite and possibly pyrite if the latter is arsenian. As was mentioned, however, the waste rocks are carbonate-rich and no signs of oxidation of sulfides were observed in any of the samples examined in this study. In the tailings samples, all of which are also carbonate-rich, sulfides are sparse and liberated arsenopyrite is rare. The principal hosts for arsenic in these samples are incompletely roasted sulfides, especially arsenopyrite, and probably the iron oxide that was formed by the roaster processing. Electron-microbeam studies, which were not included within the scope of this investigation, would be necessary to determine whether arsenic is specifically associated with the iron-oxide residues.

Other than in possible trace amounts, arsenic cannot be accommodated in the structure of an iron oxide such as hematite; however, appreciable (percentage) amounts of arsenic can be sorbed to such material and would therefore be amenable to potential release in solution.

FAXED Nov 20/00

CHAIN OF CUSTODY RECORD/ANALYSIS REQUEST

No. 6130 page 1 of 2

Golder Associates
500 - 4260 Still Creek Drive
Burnaby, British Columbia, Canada V5C 6C6
Telephone (604) 298-6623 Fax (604) 298-5253

Project Number: 002-2418-4100	Laboratory Name: John Jambor
Short Title: Giant / A&R Plan / Yknife	Address: 316 Rosehill Way, TSAWWASSEN
Golder Contact: Valérie Bertrand .	Telephone/Fax: 948-1368 — Contact: J. Jambor

Sample Control Number (SCN)	Sample Location	Sa.#	Sample Depth (m)	Sample Matrix (over)	Date Sampled (D/M/Y)	Time Sampled (HH:MM)	Sample Type (over)	QAQC Code (over)	Related SCN (over)	Number of Containers	XRD	Optical mineralogy	Analyses Required	PUSH	Remarks (over)
OPA1-01-~~01~~	Pit A1			rock	July/00		grab			1	X	X			incl. report.
OPA2-03 ~~02~~	Pit A2			"						1	X	X			
OPC1-01-~~03~~	Pit C1			"						1	X	X			watch for
OPA2-01-~~04~~	Pit A2			"						1	X	X			As-bearing
WR3-1-~~05~~	WR Pile			"						1	X	X			phase +
WR-OPA2-04 ~~06~~	WR A2			"						1	X	X			sulfides espec.
WR-OPB1-01 ~~07~~	WR B1			"						1	X	X			Re: metal
WR-OPC1-01 ~~08~~	WR C1			"						1	X	X			leaching potential.
TCP01-~~09~~	Central Pond		0.5	tails						1	X	X			
TNP01-~~10~~	North Pond		0.05	"						1	X	X			
TNP03-~~11~~	North Pond		0.5	"						1	X	X			
TNW-01-01 ~~12~~	NW Pond		0.1-0.5	"				(core)		1	X	X			
TNW-01-03 ~~13~~	NW Pond		1.1-1.5	"				"		1	X	X	pulverized sample		
TNW-01-05 ~~14~~	NW Pond		3.6-4.0	"	↓		↓	"		1	X	X	-pulverized sample.		
TNP-04-~~15~~	North Pond		5.5	"				"		1	X	X			

Sampler's Signature: V Bertrand	Relinquished by: Signature: Sohan Basra	Company: CEMI Lab.	Date: Nov 20, 2000	Time: —	Received by: Signature	Company
Sample Storage (°C): —	Relinquished by: Signature	Company	Date	Time	Received by: Signature	Company
Comments: —	Method of Shipment: Courrier	Waybill No.:	Received for Lab by:		Date	Time
	Shipped by:	Shipment Condition: Seal Intact:	Temp (°C)	Cooler opened by:	Date	Time

WHITE: Golder Copy YELLOW: Lab Copy PINK: Lab Returns with Final Report

FAXED NOV 20/00

CHAIN OF CUSTODY RECORD/ANALYSIS REQUEST

No. 6151 page 2 of 2

Golder Associates
500 - 4260 Still Creek Drive
Burnaby, British Columbia, Canada V5C 6C6
Telephone (604) 298-6623 Fax (604) 298-5253

Project Number: 002-2418-400	Laboratory Name: John Jambor
Short Title: Giant / A & R Plan / Yellowknife	Address: 316 Rosehill Way, Tsawwassen
Golder Contact: V Berthond	Telephone/Fax: 948-1368 / Contact: John Jambor

Sample Control Number (SCN)	Sample Location	Sa.#	Sample Depth (m)	Sample Matrix (over)	Date Sampled (D / M / Y)	Time Sampled (HH:MM)	Sample Type (over)	QAQC Code (over)	Related SCN (over)	Number of Containers	XRD	optical mineralogy	RUSH	Remarks (over)
TNP02-~~01~~	North Pond		0.5-0.6	tails	23/07		–	grab			X	X		
~~TNP03~~-02														see sheet
TCP-02 ~~03~~	Central Pond		3.5	tails	23/07		–	grab			X	X		1
~~-04~~														
- 05														
- 06														
- 07														
- 08														
- 09														
- 10														
- 11														
- 12														
- 13														
- 14														
- 15														

Sampler's Signature: V Berthond	Relinquished by: Signature Sohan Basra	Company CEMI Lab	Date Nov 20, 2000	Time –	Received by: Signature	Company
Sample Storage (°C) –	Relinquished by: Signature	Company	Date	Time	Received by: Signature	Company
Comments: –	Method of Shipment: Courier	Waybill No.:		Received for Lab by:	Date	Time
	Shipped by:	Shipment Condition: Seal Intact:		Temp (°C) / Cooler opened by:	Date	Time

WHITE: Golder Copy YELLOW: Lab Copy PINK: Lab Returns with Final Report

APPENDIX III

OPEN PIT AND BAKER CREEK SEDIMENTS ANALYTICAL REPORTS AND CHAIN-OF-CUSTODY RECORDS

ECO-TECH LABORATORIES LTD.

ASSAYING
GEOCHEMISTRY
ANALYTICAL CHEMISTRY
ENVIRONMENTAL TESTING

10041 Dallas Drive, Kamloops, B.C. V2C 6T4
Phone (250) 573-5700 Fax (250) 573-4557
email: ecotech@direct.ca

CHEMICAL ANALYSIS REPORT

Date:	22-Aug-00
Et. File No.	AK 2000-26
Report On:	**Acid / Base Accounting** *No. of samples received:* **18** *Sample type: Tailings* *Project #: Miramar Con Mine* *Samples submitted by: B. Hauser*
Report To:	GOLDER ASSOCIATES LTD. 500 - 4260 Still Creek Road BURNABY, BC V5C 6C6
Attention:	*Valerie Bertrand*

ECO-TECH LABORATORIES LTD.
per:

Frank J. Pezzotti, A.Sc.T.
B.C. Certified Assayer

POTENTIAL ACID PRODUCTION / NEUTRALIZATION

			Sulfur % (as S)			Tonnes $CaCO_3$ Equivalent per 1000 Tonnes		
Et. #	Tag #	Paste pH	S(SO4) Sulfate	Sulfide	S(T) Sulfur	AP Production	NP Neutralization	Net Neutralization NET NP Potential
32	32711	8.17	0.02	0.28	0.30	9.4	211.1	201.7
34	32713	8.08	0.02	0.33	0.35	10.9	208.3	197.4
40	32719	8.21	0.02	0.65	0.67	20.9	228.1	207.1
45	32724	8.20	0.02	0.37	0.39	12.2	217.7	205.5
51	32730	8.15	0.02	0.41	0.43	13.4	216.1	202.7
76	32761	7.89	0.02	0.44	0.46	14.4	221.1	206.8
80	32763	7.99	0.08	0.24	0.32	10.0	213.7	203.7
86	32769	8.08	0.02	0.62	0.64	20.0	225.3	205.3
94	32777	8.19	0.02	0.67	0.69	21.6	168.3	146.7
104	32787	7.24	0.02	0.21	0.23	7.2	234.1	226.9
215	32951	8.07	0.02	0.58	0.60	18.8	208.9	190.2
217	32953	8.17	0.02	0.50	0.52	16.3	211.3	195.1
221	32957	8.05	0.02	0.36	0.38	11.9	196.4	184.5
228	32964	8.12	0.02	0.59	0.61	19.1	191.6	172.5
250	33001	7.92	0.04	0.42	0.46	14.4	206.0	191.6
252	33003	7.98	0.02	0.55	0.57	17.8	207.7	189.9
255	33006	7.86	0.02	0.67	0.69	21.6	189.8	168.2
260	33011	7.98	0.02	0.68	0.70	21.9	193.4	171.6

QC/DATA

Repeat:

32	32711	8.15	0.02	0.26	0.28	8.8	211.3	202.6
260	33011	8.00	0.02	0.68	0.70	21.9	192.2	170.3

Standard:

NBM-1		-	-	-	0.31	9.7	40.5	30.8
NBM-1		-	-	-	0.31	9.7	40.9	31.3

XLS/00

End of Report

Golder Associates Ltd.
Miramar Con Mine Project
Acid Base Accounting

METHOD OF TESTING

Acid Base Accounting

A modified Sobek procedure was requested and performed for these determinations. The modification required that samples not be boiled after addition of HCl but rather be allowed to remain in contact with the acid for 24 hours at 25-35° C. Additionally the titration end point pH was changed to 8.30 from the usual 7.00.

ICP Metal Determination

A cold multi acid attack was requested and used for sample dissolution. The dissolution entailed the addition of HNO_3, HCl, HF and HCl04 in sequence and at room temperature and allowing each acid to react for 10 minutes prior to the addition of the next acid. Half gram samples were used for the analyses which were made up to 10 ml volume with water prior to the ICP scan.

24-Aug-00

ECO-TECH LABORATORIES LTD.
10041 Dallas Drive
KAMLOOPS, B.C.
V2C 6T4

Phone: 604-573-5700
Fax : 604-573-4557

ICP CERTIFICATE OF ANALYSIS AK 2000-026a

RECEIVED SEP - 5 2000

GOLDER ASSOCIATES LTD.
500 - 4260 Still Creek Road
BURNABY, BC
V5C 6C6

ATTENTION: Valerie Bertrand

No. of samples reviewed: 18 of 260
Sample type: Tailings
Project #: None Given
Shipment #: None Given
Samples submitted by: G. Hauser

Values in ppm unless otherwise reported

Et #.	Tag #	Ag	Al %	As	Ba	Bi	Ca %	Cd	Co	Cr	Cu	Fe %	K %	La	Mg %	Mn	Mo	Na %	Ni	P	Pb	Sb	Sn	Sr	Ti %	U	V	W	Y	Zn
32	32711	2.3	1.05	2485	75	10	3.00	<1	35	109	69	5.80	0.69	<10	0.40	1177	3	0.03	63	430	304	560	<20	37	0.05	<10	176	<10	<1	267
34	32713	2.2	1.87	2285	70	15	2.37	<1	34	105	78	5.55	0.71	<10	0.51	1109	4	<0.01	63	350	280	205	<20	20	0.03	<10	173	<10	<1	250
40	32719	12.2	0.61	2890	60	25	3.01	<1	51	58	71	6.42	0.53	<10	0.72	1108	3	<0.01	73	240	198	270	<20	27	0.04	<10	186	<10	<1	378
45	32724	1.5	2.35	2700	70	15	2.43	<1	28	105	53	4.61	0.79	<10	0.57	1066	3	<0.01	51	280	214	350	<20	30	0.09	<10	182	<10	<1	214
51	32730	3.8	1.39	2205	80	20	2.34	3	35	102	73	5.49	0.67	<10	0.44	1060	3	<0.01	57	300	204	245	<20	24	0.04	<10	152	<10	<1	341
70	32761	2.1	2.03	2635	70	15	2.65	<1	28	98	57	4.50	0.74	<10	0.69	1054	3	<0.01	61	260	252	305	<20	27	0.03	<10	170	<10	<1	307
80	32783	1.3	1.47	1885	80	20	2.42	<1	30	102	49	5.01	0.64	<10	0.43	1076	3	<0.01	54	200	166	205	<20	25	0.03	<10	160	<10	<1	346
80	32789	2.1	0.93	2550	55	10	2.89	<1	44	86	58	5.63	0.56	<10	0.58	1105	4	<0.01	73	260	216	215	<20	23	0.03	<10	182	<10	<1	312
94	32777	1.9	1.15	2665	50	15	2.41	<1	35	71	47	5.14	0.61	<10	0.37	1074	4	0.02	62	240	270	745	<20	27	0.02	<10	111	<10	<1	351
104	32787	4.0	0.45	1525	55	10	3.03	<1	14	105	42	2.97	0.07	<10	0.58	1121	4	0.02	27	240	94	120	<20	25	0.03	<10	106	<10	<1	127
215	32951	1.0	1.43	2410	95	15	3.00	<1	40	125	61	6.01	0.70	<10	0.83	1209	5	0.01	66	360	184	295	<20	34	0.04	<10	161	<10	<1	283
217	32953	1.7	1.88	2945	80	15	3.49	<1	41	113	84	6.03	0.67	<10	0.89	1192	5	0.01	74	360	200	320	<20	35	0.04	<10	165	<10	<1	323
221	32957	2.1	3.24	2095	120	15	3.75	<1	29	127	40	4.84	0.74	<10	0.93	1015	3	<0.01	54	340	320	205	<20	30	0.03	<10	191	<10	<1	497
228	32964	8.5	1.92	2615	90	20	3.44	<1	41	102	60	5.83	0.69	<10	0.85	1028	3	0.01	74	300	268	370	<20	33	0.05	<10	156	<10	<1	348
250	33001	1.3	1.64	2460	80	10	3.67	<1	40	106	55	5.84	0.66	<10	0.71	1107	4	0.01	68	320	188	270	<20	42	0.04	<10	159	<10	<1	301
252	33003	1.7	2.01	2090	50	10	3.58	<1	43	111	84	6.14	0.66	<10	0.74	1044	4	<0.01	81	310	240	260	<20	33	0.04	<10	158	<10	<1	397
256	33006	7.4	1.42	3545	85	20	2.81	<1	56	101	68	7.48	0.60	<10	0.75	977	5	<0.01	35	740	368	580	<20	25	0.03	<10	142	<10	<1	416
260	33011	2.6	1.27	3605	50	25	2.87	<1	59	97	67	7.66	0.62	<10	0.71	1032	6	<0.01	39	260	404	800	<20	30	0.03	<10	133	<10	<1	454

24-Aug-00

ICP CERTIFICATE OF ANALYSIS AK 2000-026a

GOLDER ASSOCIATES LTD.
500 - 4260 Still Creek Road
BURNABY, BC
V5C 6C6

Et #.	Tag #	Ag	Al %	As	Ba	Bi	Ca %	Cd	Co	Cr	Cu	Fe %	K %	La	Mg %	Mn	Mo	Na %	Ni	P	Pb	Sb	Sn	Sr	Ti %	U	V	W	Y	Zn
QC DATA:																														
Repeat:																														
32	32742[1]	2.0	1.55	2440	60	15	3.08	<1	38	104	71	5.84	0.86	<10	0.05	1226	3	0.02	67	400	322	835	<20	31	0.05	<10	170	<10	<1	277

ECO-TECH LABORATORIES LTD.
Frank J. Pezzotti, A.Sc.T.
B.C. Certified Assayer

df/miramar
XLS/00
FAX 867-920 7050

tailings

CHAIN OF CUSTODY RECORD/ANALYSIS REQUEST

No. 5842 page 2 of 2

Golder Associates

500 - 4260 Still Creek Drive,
Burnaby, British Columbia, Canada V5C 6C6
Telephone (604) 298 6623 Fax (604) 298-5253

Project Number: 002-2418 / 4300	Laboratory Name: ECO Tech Lab.
Short Title:	Address: 1004 Dallas dr. Kamloops BC
Golder Contact: Valerie Bertrand.	Telephone/Fax: 250 573-5700 — Contact: Frank Pezzotti

Sample Control Number (SCN)	Sample Location	Stn#	Sample Depth (m)	Sample Matrix (over)	Date Sampled (D/M/Y)	Time Sampled (HH:MM)	Sample Type (over)	QAQC Code (over)	Related SCN (over)	Number of Containers	ABA and static	ICP metals scan	Colony leach					RUSH	Remarks (over)
32953-01	North Pond		7.5	tailings			grab				X	X							samples
32957-02	"		17.5	↓			↓				X	X							already at
32964-03	"		32.0	↓			↓				X	X							lab.
-04																			
-05																			
-06																			
-07																			
-08																			
-09																			
-10																			
-11																			
-12																			
-13																			
-14																			
-15																			

Sampler's Signature: Mirjaman Con	Relinquished by: Signature Valerie Bertrand	Company GAL	Date Aug 8, 2000	Time —	Received by: Signature (request sent by fax)	Company
Sample Storage (°C) Bob Hauser	Relinquished by: Signature (fax to lab only)	Company	Date	Time	Received by: Signature	Company
Comments:	Method of Shipment:	Waybill No.:	Received for Lab by:		Date	Time
	Shipped by:	Shipment Condition: Seal Intact:	Temp (°C)	Cooler opened by:	Date	Time

tailings

CHAIN OF CUSTODY RECORD/ANALYSIS REQUEST

No. 5841 page 1 of 2

Golder Associates

500 - 4260 Still Creek Drive
Burnaby, British Columbia, Canada V5C 6C6
Telephone (604) 298-6623 Fax (604) 298-5253

Project Number: 002 - 2418	Laboratory Name: Eco Tech Lab.
Short Title: Giant Miramar / A R Pan.	Address: 10041 Dallas dr, Kamloops BC
Golder Contact: Valerie Bertrand	Telephone/fax: 250-573-5700 ; Contact: Frank Pezzotti

Sample Control Number (SCN)	Sample Location	Sa #	Sample Depth (m)	Sample Matrix (over)	Date Sampled (D/M/Y)	Time Sampled (HH:MM)	Sample Type (over)	QAQC Code (over)	Related SCN (over)	Number of Containers	ABA (incl. S)	ICP metal scan	[illegible]					HOLD	Remarks (over)
32711 - 01	South Pond		4.5	tailing			grab				X	X							samples
32713 - 02	"		11.5								X	X							already
32719 - 03	"		28								X	X							at Lab.
32724 - 04	"		42								X	X							
32730 - 05	"		55								X	X							
32761 - 06	Central Pond		3.5								X	X							
32763 - 07	"		9.75								X	X							
32769 - 08	"		26								X	X							
32777 - 09	"		46								X	X							
32787 - 10	"		64								X	X							
33001 - 11	North Pond		2.0								X	X							
33003 - 12	"		8.								X	X							
33006 - 13	"		15.								X	X							
33011 - 14	"		26.25								X	X							
32951 - 15	"		2.5								X	X							

Sampler's Signature: (Miramar Con)	Relinquished by: Signature: V Bertrand (Fax to Lab only)	Company: GAL	Date: Aug 8, 00	Time	Received by: Signature: (Sent by Fax)	Company
Sample Storage (°C): Rob Hauser	Relinquished by: Signature	Company	Date	Time	Received by: Signature	Company
Comments:	Method of Shipment:	Waybill No.:		Received for Lab by:	Date	Time
	Shipped by:	Shipment Condition: Seal Intact:		Temp (°C)	Cooler opened by:	Date	Time

WHITE: Golder Copy YELLOW: Lab Copy PINK: Lab Returns with Final Report

1988 Triumph Street, Vancouver, BC Canada V5L 1K5

analytical
service
laboratories
ltd.

FAX: (604) 253-6700 TEL: (604) 253-4188

RECEIVED NOV 27 2000

CHEMICAL ANALYSIS REPORT

Date: November 17, 2000

ASL File No. M4159

Report On: 002-2418 Soil Analysis

Report To: **Golder Associates Ltd.**
500 - 4260 Still Creek Drive
Burnaby, BC
V5C 6C6

Attention: **Ms. Valerie Bertrand**

Received: November 8, 2000

ASL ANALYTICAL SERVICE LABORATORIES LTD.
per:

Brent C. Mack, B.Sc. - Project Chemist
Heather A. Ross, B.Sc. - Project Chemist

RESULTS OF ANALYSIS - Sediment/Soil

File No. M4159

Sample ID		PSO-14-2200-01	PSO-14-2200-02	PSO-15-2200-02	PSO-15-2200-03	PSO-12-2200-02
ASL ID		1	2	3	4	5
Total Metals						
Arsenic	T-As	9880	4890	782	1320	14200

Results are expressed as milligrams per dry kilogram except where noted.

RESULTS OF ANALYSIS - Sediment/Soil File No. M4159

Sample ID		PSO-12-2200-03	PSO-14-2200-03	PSO-18-2200-02	PSO 18-2200-03	PSO-18-2200-04
ASL ID		*6*	*7*	*8*	*9*	*10*
Total Metals						
Arsenic	T-As	679	1630	1990	1330	1740

Results are expressed as milligrams per dry kilogram except where noted.

RESULTS OF ANALYSIS - Sediment/Soil File No. M4159

Sample ID		PSO-97-2300-02
ASL ID		11
Total Metals		
Arsenic	T-As	8560

Results are expressed as milligrams per dry kilogram except where noted.

Appendix 1 - QUALITY CONTROL - Replicates File No. M4159

Sediment/Soil		PSO-15-2200-03	PSO-15-2200-03 QC # 220036
Total Metals			
Arsenic	T-As	1320	1240

Results are expressed as milligrams per dry kilogram except where noted.

Outlines of the methodologies utilized for the analysis of the samples submitted are as follows:

Metals in Sediment/Soil

This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 Method 3050B or Method 3051, published by the United States Environmental Protection Agency (EPA). The sample is manually homogenized and a representative subsample of the wet material is weighed. The sample is then digested by either hotplate or microwave oven using a 1:1 ratio of nitric acid and hydrochloric acid. Instrumental analysis is by atomic absorption spectrophotometry (EPA Method 7000 series) and/or inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

Method Limitation: This method is not a total digestion technique for most samples. It is a very strong acid digestion that will dissolve almost all elements that could become "environmentally available." By design, elements bound in silicate structures are not normally dissolved by this procedure as they are not usually mobile in the environment.

Recommended Holding Time:

Sample/Extract:	6 months (Mercury = 28 days)
Reference:	EPA
For more detail see:	ASL "Collection & Sampling Guide"

End of Report

Appendix

CHAIN OF CUSTODY FORMS

CHAIN OF CUSTODY RECORD/ANALYSIS REQUEST

No. [illegible] page 1 of 1

Golder Associates
500 - 4260 Still Creek Drive
Burnaby, British Columbia, Canada V5G 6C6
Telephone (604) 298 6623 Fax (604) 298-5253

Project Number: [illegible] 2418		Laboratory Name: ASL	
Short Title: [illegible]		Address: Vancouver	
Golder Contact: [illegible]		Telephone/Fax: [illegible]	Contact: [illegible]

Sample Control Number (SCN)	[redacted]	Sample Matrix (over)	Date Sampled (D / M / Y)	[redacted]	Number of Containers	Analyses Required							RUSH	Remarks (over)
[illegible] -01		[illegible]	[illegible]		1	✓								
[illegible] -02		"	"		1	✓								
[illegible] -03		"	"		2	✓								
[illegible] -04		"	"		2	✓								
[illegible] -05		"	"		2	✓								
[illegible] -06		"	"		2	✓								
[illegible] -07		"	"		1	✓								
[illegible] -08		"	"		1	✓								[illegible]
[illegible] -09		"	"		1	✓								[illegible]
[illegible] -10		"	"		2	✓								
[illegible] -11		"	"		1	✓								
-12														
-13														
-14														
-15														

Sampler's Signature: [illegible]	Relinquished by: Signature [illegible]	Company [illegible]	Date [illegible]	Time [illegible]	Received by: Signature [illegible]	Company
Sample Storage (°C)	Relinquished by: Signature [illegible]	Company [illegible] ASL	Date: [illegible] 2000	Time	Received by: Signature	Company
Comments [illegible]	Method of Shipment: [illegible]	Waybill No:	Received for Lab by:		Date	Time
	Shipped by:	Shipment Condition: Seal Intact:	Temp (°C)	Cooler opened by:	Date	Time

[illegible]

WHITE: Golder Copy YELLOW: Lab Copy PINK: Lab Returns with Final Report

EnL Enviro-Test

CHEMICAL ANALYSIS REPORT

GOLDER ASSOCIATES LTD
ATTN: VALERIE BERTRAND
500 4260 STILL CREEK DRIVE
BURNABY BC V5C 6C6

DATE: January 31, 2001

Lab Work Order #: L14071 Soil

Sampled By: DAMIAN PANAYI

Date Received: 01-AUG-00

Project P.O. #: 002-2418

Project Reference: 4500

Comments: ADDITIONAL 14-NOV-00 15:56 ADDITIONAL 30-OCT-00 14:52
The Liquid:soil ratio for the water soluble arsenic is 4:1.

APPROVED BY:

ROY JONES
Project Manager

ACCREDITATIONS: STANDARDS COUNCIL OF CANADA (SCC), IN COOPERATION WITH THE CANADIAN ASSOCIATION FOR ENVIRONMENTAL ANALYTICAL LABORATORIES (CAEAL) FOR SPECIFIC TESTS AS REGISTERED BY THE COUNCIL (EDMONTON, CALGARY, SASKATOON, WINNIPEG, THUNDER BAY)
AMERICAN INDUSTRIAL HYGIENE ASSOCIATION (AIHA) FOR INDUSTRIAL HYGIENE ANALYSIS (EDMONTON)
W. STANDARDS COUNCIL OF CANADA IN COOPERATION WITH THE CANADIAN FOOD INSPECTION AGENCY (CFIA) FOR FERTILIZER AND FEED TESTING (SASKATOON)

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L14671-1	PSO-01-2200-01							
Sample Date	22-JUL-00							
Matrix:	SOIL							
		Antimony (Sb)	1.6	0.1	mg/kg		15-AUG-00	CC5
		Arsenic (As)	641	0.1	mg/kg		15-AUG-00	CC5
		Mercury (Hg)	0.09	0.01	mg/kg		15-AUG-00	CC5
		Oil-Gravimetric	2900	100	mg/kg	04-AUG-00	08-AUG-00	ZW
		Metals (Strong Acid Rec.)						
		Silver (Ag)	<1	1	mg/kg		15-AUG-00	CC5
		Aluminum (Al)	7430	10	mg/kg		15-AUG-00	CC5
		Barium (Ba)	86.2	0.5	mg/kg		15-AUG-00	CC5
		Beryllium (Be)	<1	1	mg/kg		15-AUG-00	CC5
		Calcium (Ca)	46000	100	mg/kg		15-AUG-00	CC5
		Cadmium (Cd)	<0.5	0.5	mg/kg		15-AUG-00	CC5
		Cobalt (Co)	12	1	mg/kg		15-AUG-00	CC5
		Chromium (Cr)	131	0.5	mg/kg		15-AUG-00	CC5
		Copper (Cu)	64	1	mg/kg		15-AUG-00	CC5
		Iron (Fe)	28200	100	mg/kg		15-AUG-00	CC5
		Potassium (K)	1160	20	mg/kg		15-AUG-00	CC5
		Magnesium (Mg)	12400	10	mg/kg		15-AUG-00	CC5
		Manganese (Mn)	480	20	mg/kg		15-AUG-00	CC5
		Molybdenum (Mo)	5	1	mg/kg		15-AUG-00	CC5
		Sodium (Na)	200	100	mg/kg		15-AUG-00	CC5
		Nickel (Ni)	89	2	mg/kg		15-AUG-00	CC5
		Phosphorus (P)	440	10	mg/kg		15-AUG-00	CC5
		Lead (Pb)	20	5	mg/kg		15-AUG-00	CC5
		Tin (Sn)	<5	5	mg/kg		15-AUG-00	CC5
		Strontium (Sr)	45	1	mg/kg		15-AUG-00	CC5
		Titanium (Ti)	300	5	mg/kg		15-AUG-00	CC5
		Thallium (Tl)	<1	1	mg/kg		15-AUG-00	CC5
		Vanadium (V)	58	1	mg/kg		15-AUG-00	CC5
		Zinc (Zn)	75.4	0.5	mg/kg		15-AUG-00	CC5
L14671-2	PSO-02-2200-01							
Sample Date	22-JUL-00							
Matrix:	SOIL							
		Ammonia-N	<1	1	mg/kg		09-AUG-00	EK
		Antimony (Sb)	0.2	0.1	mg/kg		15-AUG-00	CC5
		Arsenic (As)	392	0.1	mg/kg		15-AUG-00	CC5
		Mercury (Hg)	0.04	0.01	mg/kg		15-AUG-00	CC5
		Oil-Gravimetric	<100	100	mg/kg	04-AUG-00	08-AUG-00	ZW
		Sulphate (SO4)	120	2.5	mg/kg		23-AUG-00	JZ
		pH	7.4	0.1	pH		08-AUG-00	RT
		Metals (Strong Acid Rec.)						
		Silver (Ag)	<1	1	mg/kg		15-AUG-00	CC5
		Aluminum (Al)	22000	10	mg/kg		16-AUG-00	CC5
		Barium (Ba)	142	0.5	mg/kg		15-AUG-00	CC5
		Beryllium (Be)	<1	1	mg/kg		15-AUG-00	CC5
		Calcium (Ca)	4800	100	mg/kg		15-AUG-00	CC5
		Cadmium (Cd)	<0.5	0.5	mg/kg		15-AUG-00	CC5
		Cobalt (Co)	19	1	mg/kg		15-AUG-00	CC5

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L14671-2	PSO-02-2200-01							
Sample Date 22-JUL-00								
Matrix: SOIL								
		Metals (Strong Acid Rec.)						
		Chromium (Cr)	71.8	0.5	mg/kg		15-AUG-00	CC5
		Copper (Cu)	31	1	mg/kg		15-AUG-00	CC5
		Iron (Fe)	27800	100	mg/kg		15-AUG-00	CC5
		Potassium (K)	1520	20	mg/kg		15-AUG-00	CC5
		Magnesium (Mg)	9320	10	mg/kg		15-AUG-00	CC5
		Manganese (Mn)	380	20	mg/kg		15-AUG-00	CC5
		Molybdenum (Mo)	<1	1	mg/kg		15-AUG-00	CC5
		Sodium (Na)	200	100	mg/kg		15-AUG-00	CC5
		Nickel (Ni)	42	2	mg/kg		15-AUG-00	CC5
		Phosphorus (P)	140	10	mg/kg		15-AUG-00	CC5
		Lead (Pb)	12	5	mg/kg		15-AUG-00	CC5
		Tin (Sn)	<5	5	mg/kg		15-AUG-00	CC5
		Strontium (Sr)	17	1	mg/kg		15-AUG-00	CC5
		Titanium (Ti)	508	5	mg/kg		15-AUG-00	CC5
		Thallium (Tl)	<1	1	mg/kg		15-AUG-00	CC5
		Vanadium (V)	48	1	mg/kg		15-AUG-00	CC5
		Zinc (Zn)	60.3	0.5	mg/kg		15-AUG-00	CC5
L14671-3	PSO-11-2200-01							
Sample Date 22-JUL-00								
Matrix: SOIL								
		Ammonia-N	<1	1	mg/kg		09-AUG-00	EK
		Antimony (Sb)	1.5	0.1	mg/kg		15-AUG-00	CC5
		Arsenic (As)	2440	0.1	mg/kg		15-AUG-00	CC5
		Mercury (Hg)	0.10	0.01	mg/kg		15-AUG-00	CC5
		Oil-Gravimetric	200	100	mg/kg	04-AUG-00	08-AUG-00	ZW
		Sulphate (SO4)	1720	2.5	mg/kg		23-AUG-00	JZ
		pH	7.3	0.1	pH		08-AUG-00	RT
		Metals (Strong Acid Rec.)						
		Silver (Ag)	<1	1	mg/kg		15-AUG-00	CC5
		Aluminum (Al)	31600	10	mg/kg		15-AUG-00	CC5
		Barium (Ba)	42.0	0.5	mg/kg		15-AUG-00	CC5
		Beryllium (Be)	<1	1	mg/kg		15-AUG-00	CC5
		Calcium (Ca)	47500	100	mg/kg		15-AUG-00	CC5
		Cadmium (Cd)	0.8	0.5	mg/kg		15-AUG-00	CC5
		Cobalt (Co)	40	1	mg/kg		15-AUG-00	CC5
		Chromium (Cr)	122	0.5	mg/kg		15-AUG-00	CC5
		Copper (Cu)	68	1	mg/kg		15-AUG-00	CC5
		Iron (Fe)	73700	100	mg/kg		15-AUG-00	CC5
		Potassium (K)	800	20	mg/kg		15-AUG-00	CC5
		Manganese (Mn)	520	20	mg/kg		15-AUG-00	CC5
		Molybdenum (Mo)	2	1	mg/kg		15-AUG-00	CC5
		Sodium (Na)	200	100	mg/kg		15-AUG-00	CC5
		Nickel (Ni)	104	2	mg/kg		15-AUG-00	CC5
		Phosphorus (P)	340	10	mg/kg		15-AUG-00	CC5
		Lead (Pb)	43	5	mg/kg		15-AUG-00	CC5
		Tin (Sn)	<5	5	mg/kg		15-AUG-00	CC5
		Strontium (Sr)	43	1	mg/kg		15-AUG-00	CC5

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L14671-3	PSO-11-2200-01							
Sample Date	22-JUL-00							
Matrix:	SOIL							
		Metals (Strong Acid Rec.)						
		Titanium (Ti)	243	5	mg/kg		15-AUG-00	CC5
		Thallium (Tl)	<1	1	mg/kg		15-AUG-00	CC5
		Vanadium (V)	104	1	mg/kg		15-AUG-00	CC5
		Zinc (Zn)	159	0.5	mg/kg		15-AUG-00	CC5
L14671-4	PSO-12-2200-01							
Sample Date	22-JUL-00							
Matrix:	SOIL							
		Water-Soluble Arsenic Species						
		Arsenic (As)	25.5	0.1	mg/L		22-SEP-00	JJ
		Ammonia-N	<1	1	mg/kg		09-AUG-00	EK
		Antimony (Sb)	2.5	0.1	mg/kg		15-AUG-00	CC5
		Arsenic (As) 3+	698	0.1	mg/kg		22-SEP-00	JJ
		Arsenic (As) 5+	1590	0.1	mg/kg		22-SEP-00	JJ
		Mercury (Hg)	0.26	0.01	mg/kg		15-AUG-00	CC5
		Oil-Gravimetric	300	100	mg/kg	04-AUG-00	08-AUG-00	ZW
		Sulphate (SO4)	210	2.5	mg/kg		23-AUG-00	JZ
		pH	8.3	0.1	pH		08-AUG-00	RY
		Metals (Strong Acid Rec.)						
		Silver (Ag)	<1	1	mg/kg		15-AUG-00	CC5
		Aluminum (Al)	21400	10	mg/kg		15-AUG-00	CC5
		Barium (Ba)	78.4	0.5	mg/kg		15-AUG-00	CC5
		Beryllium (Be)	<1	1	mg/kg		15-AUG-00	CC5
		Calcium (Ca)	33600	100	mg/kg		15-AUG-00	CC5
		Cadmium (Cd)	0.6	0.5	mg/kg		15-AUG-00	CC5
		Cobalt (Co)	40	1	mg/kg		15-AUG-00	CC5
		Chromium (Cr)	96.4	0.5	mg/kg		15-AUG-00	CC5
		Copper (Cu)	89	1	mg/kg		15-AUG-00	CC5
		Iron (Fe)	45500	100	mg/kg		15-AUG-00	CC5
		Potassium (K)	1100	20	mg/kg		15-AUG-00	CC5
		Magnesium (Mg)	19500	10	mg/kg		15-AUG-00	CC5
		Manganese (Mn)	750	20	mg/kg		15-AUG-00	CC5
		Molybdenum (Mo)	2	1	mg/kg		15-AUG-00	CC5
		Sodium (Na)	200	100	mg/kg		15-AUG-00	CC5
		Nickel (Ni)	85	2	mg/kg		15-AUG-00	CC5
		Phosphorus (P)	420	10	mg/kg		15-AUG-00	CC5
		Lead (Pb)	74	5	mg/kg		15-AUG-00	CC5
		Tin (Sn)	<5	5	mg/kg		15-AUG-00	CC5
		Strontium (Sr)	27	1	mg/kg		15-AUG-00	CC5
		Titanium (Ti)	331	5	mg/kg		15-AUG-00	CC5
		Thallium (Tl)	<1	1	mg/kg		15-AUG-00	CC5
		Vanadium (V)	88	1	mg/kg		15-AUG-00	CC5
		Zinc (Zn)	147	0.5	mg/kg		15-AUG-00	CC5
		Arsenic (As)						
		Arsenic (As)	2290	0.1	mg/kg		22-SEP-00	JJ
		Arsenic (As)	3760	0.1	mg/kg		15-AUG-00	CC5

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L14671-5	PSO-14-2200-01							
Sample Date	22-JUL-00							
Matrix:	SOIL							
		Ammonia-N	<1	1	mg/kg		08-AUG-00	EK
		Antimony (Sb)	27.7	0.1	mg/kg		15-AUG-00	CC5
		Arsenic (As)	8100	0.1	mg/kg		15-AUG-00	CC5
		Mercury (Hg)	0.48	0.01	mg/kg		15-AUG-00	CC5
		Oil-Gravimetric	1100	100	mg/kg	04-AUG-00	08-AUG-00	ZW
		Sulphate (SO4)	698	2.5	mg/kg		23-AUG-00	JZ
		pH	7.7	0.1	pH		08-AUG-00	RT
		Metals (Strong Acid Rec.)						
		Silver (Ag)	<1	1	mg/kg		15-AUG-00	CC5
		Aluminum (Al)	22000	10	mg/kg		15-AUG-00	CC5
		Barium (Ba)	30.0	0.5	mg/kg		15-AUG-00	CC5
		Beryllium (Be)	<1	1	mg/kg		15-AUG-00	CC5
		Calcium (Ca)	44100	100	mg/kg		15-AUG-00	CC5
		Cadmium (Cd)	1.5	0.5	mg/kg		15-AUG-00	CC5
		Cobalt (Co)	37	1	mg/kg		15-AUG-00	CC5
		Chromium (Cr)	102	0.5	mg/kg		15-AUG-00	CC5
		Copper (Cu)	138	1	mg/kg		15-AUG-00	CC5
		Iron (Fe)	64000	100	mg/kg		15-AUG-00	CC5
		Potassium (K)	790	20	mg/kg		15-AUG-00	CC5
		Magnesium (Mg)	21200	10	mg/kg		15-AUG-00	CC5
		Manganese (Mn)	850	20	mg/kg		15-AUG-00	CC5
		Molybdenum (Mo)	2	1	mg/kg		15-AUG-00	CC5
		Sodium (Na)	300	100	mg/kg		15-AUG-00	CC5
		Nickel (Ni)	95	2	mg/kg		15-AUG-00	CC5
		Phosphorus (P)	320	10	mg/kg		15-AUG-00	CC5
		Lead (Pb)	239	5	mg/kg		15-AUG-00	CC5
		Tin (Sn)	<5	5	mg/kg		15-AUG-00	CC5
		Strontium (Sr)	35	1	mg/kg		15-AUG-00	CC5
		Titanium (Ti)	262	5	mg/kg		15-AUG-00	CC5
		Thallium (Tl)	<1	1	mg/kg		15-AUG-00	CC5
		Vanadium (V)	78	1	mg/kg		15-AUG-00	CC5
		Zinc (Zn)	262	0.5	mg/kg		15-AUG-00	CC5
L14671-6	PSO-14-2200-02							
Sample Date	22-JUL-00							
Matrix:	SOIL							
		Ammonia-N	<1	1	mg/kg		08-AUG-00	EK
		Antimony (Sb)	1.7	0.1	mg/kg		15-AUG-00	CC5
		Arsenic (As)	943	0.1	mg/kg		15-AUG-00	CC5
		Mercury (Hg)	0.09	0.01	mg/kg		15-AUG-00	CC5
		Oil-Gravimetric	400	100	mg/kg	04-AUG-00	08-AUG-00	ZW
		Sulphate (SO4)	755	2.5	mg/kg		23-AUG-00	JZ
		pH	7.8	0.1	pH		08-AUG-00	RT
		Metals (Strong Acid Rec.)						
		Silver (Ag)	<1	1	mg/kg		15-AUG-00	CC5
		Aluminum (Al)	26300	10	mg/kg		15-AUG-00	CC5
		Barium (Ba)	34.5	0.5	mg/kg		15-AUG-00	CC5
		Beryllium (Be)	<1	1	mg/kg		15-AUG-00	CC5

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L14671-6	PSO 14-2200-02							
Sample Date	22-JUL-00							
Matrix:	SOIL							
		Metals (Strong Acid Rec.)						
		Calcium (Ca)	44000	100	mg/kg		15-AUG-00	CC5
		Cadmium (Cd)	<0.5	0.5	mg/kg		15-AUG-00	CC5
		Cobalt (Co)	35	1	mg/kg		15-AUG-00	CC5
		Chromium (Cr)	122	0.5	mg/kg		15-AUG-00	CC5
		Copper (Cu)	89	1	mg/kg		15-AUG-00	CC5
		Iron (Fe)	64800	100	mg/kg		15-AUG-00	CC5
		Potassium (K)	840	20	mg/kg		15-AUG-00	CC5
		Magnesium (Mg)	21900	10	mg/kg		15-AUG-00	CC5
		Manganese (Mn)	930	20	mg/kg		15-AUG-00	CC5
		Molybdenum (Mo)	3	1	mg/kg		15-AUG-00	CC5
		Sodium (Na)	200	100	mg/kg		15-AUG-00	CC5
		Nickel (Ni)	80	2	mg/kg		15-AUG-00	CC5
		Phosphorus (P)	300	10	mg/kg		15-AUG-00	CC5
		Lead (Pb)	35	5	mg/kg		15-AUG-00	CC5
		Tin (Sn)	<5	5	mg/kg		15-AUG-00	CC5
		Strontium (Sr)	54	1	mg/kg		15-AUG-00	CC5
		Titanium (Ti)	869	5	mg/kg		15-AUG-00	CC5
		Thallium (Tl)	<1	1	mg/kg		15-AUG-00	CC5
		Vanadium (V)	113	1	mg/kg		15-AUG-00	CC5
		Zinc (Zn)	94.4	0.5	mg/kg		15-AUG-00	CC5
L14671-7	PSO-15-2200-01							
Sample Date	22-JUL-00							
Matrix:	SOIL							
		Ammonia N	<1	1	mg/kg		09-AUG-00	EK
		Antimony (Sb)	0.9	0.1	mg/kg		15-AUG-00	CC5
		Arsenic (As)	1830	0.1	mg/kg		15-AUG-00	CC5
		Mercury (Hg)	0.09	0.01	mg/kg		15-AUG-00	CC5
		Oil Gravimetric	500	100	mg/kg	04-AUG-00	08-AUG-00	ZW
		Sulphate (SO4)	64	2.5	mg/kg		23-AUG-00	JZ
		pH	8.0	0.1	pH		05-AUG-00	RT
		Metals (Strong Acid Rec.)						
		Silver (Ag)	<1	1	mg/kg		15-AUG-00	CC5
		Aluminum (Al)	20100	10	mg/kg		15-AUG-00	CC5
		Barium (Ba)	16.3	0.5	mg/kg		15-AUG-00	CC5
		Beryllium (Be)	<1	1	mg/kg		15-AUG-00	CC5
		Calcium (Ca)	42800	100	mg/kg		15-AUG-00	CC5
		Cadmium (Cd)	<0.5	0.5	mg/kg		15-AUG-00	CC5
		Cobalt (Co)	46	1	mg/kg		15-AUG-00	CC5
		Chromium (Cr)	103	0.5	mg/kg		15-AUG-00	CC5
		Copper (Cu)	111	1	mg/kg		15-AUG-00	CC5
		Iron (Fe)	68700	100	mg/kg		15-AUG-00	CC5
		Potassium (K)	520	20	mg/kg		15-AUG-00	CC5
		Magnesium (Mg)	21300	10	mg/kg		15-AUG-00	CC5
		Manganese (Mn)	930	20	mg/kg		15-AUG-00	CC5
		Molybdenum (Mo)	2	1	mg/kg		15-AUG-00	CC5
		Sodium (Na)	200	100	mg/kg		15-AUG-00	CC5
		Nickel (Ni)	85	2	mg/kg		15-AUG-00	CC5

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L14671-7	PSO-15-2200-01							
Sample Date: 22-JUL-00								
Matrix: SOIL								
		Metals (Strong Acid Rec.)						
		Phosphorus (P)	280	10	mg/kg		15-AUG-00	CC5
		Lead (Pb)	42	5	mg/kg		15-AUG-00	CC5
		Tin (Sn)	<5	5	mg/kg		15-AUG-00	CC5
		Strontium (Sr)	34	1	mg/kg		15-AUG-00	CC5
		Titanium (Ti)	1440	5	mg/kg		15-AUG-00	CC5
		Thallium (Tl)	<1	1	mg/kg		15-AUG-00	CC5
		Vanadium (V)	128	1	mg/kg		15-AUG-00	CC5
		Zinc (Zn)	125	0.5	mg/kg		15-AUG-00	CC5
L14671-8	PSO-16-2200-01							
Sample Date: 22-JUL-00								
Matrix: SOIL								
		Ammonia-N	<1	1	mg/kg		09-AUG-00	EK
		Antimony (Sb)	0.5	0.1	mg/kg		15-AUG-00	CC5
		Arsenic (As)	753	0.1	mg/kg		15-AUG-00	CC5
		Mercury (Hg)	0.06	0.01	mg/kg		15-AUG-00	CC5
		Oil-Gravimetric	200	100	mg/kg	04-AUG-00	08-AUG-00	ZV
		Sulphate (SO4)	1160	2.5	mg/kg		23-AUG-00	JZ
		pH	7.8	0.1	pH		08-AUG-00	RT
		Metals (Strong Acid Rec.)						
		Silver (Ag)	<1	1	mg/kg		15-AUG-00	CC5
		Aluminum (Al)	27100	10	mg/kg		15-AUG-00	CC5
		Barium (Ba)	15.7	0.5	mg/kg		15-AUG-00	CC5
		Beryllium (Be)	<1	1	mg/kg		15-AUG-00	CC5
		Calcium (Ca)	40000	100	mg/kg		15-AUG-00	CC5
		Cadmium (Cd)	<0.5	0.5	mg/kg		15-AUG-00	CC5
		Cobalt (Co)	43	1	mg/kg		15-AUG-00	CC5
		Chromium (Cr)	75.6	0.3	mg/kg		15-AUG-00	CC5
		Copper (Cu)	56	1	mg/kg		15-AUG-00	CC5
		Iron (Fe)	67500	100	mg/kg		15-AUG-00	CC5
		Potassium (K)	450	20	mg/kg		15-AUG-00	CC5
		Magnesium (Mg)	21800	10	mg/kg		15-AUG-00	CC5
		Manganese (Mn)	980	20	mg/kg		15-AUG-00	CC5
		Molybdenum (Mo)	2	1	mg/kg		15-AUG-00	CC5
		Sodium (Na)	200	100	mg/kg		15-AUG-00	CC5
		Nickel (Ni)	76	2	mg/kg		15-AUG-00	CC5
		Phosphorus (P)	280	10	mg/kg		15-AUG-00	CC5
		Lead (Pb)	12	5	mg/kg		15-AUG-00	CC5
		Tin (Sn)	<5	5	mg/kg		15-AUG-00	CC5
		Strontium (Sr)	30	1	mg/kg		15-AUG-00	CC5
		Titanium (Ti)	3070	5	mg/kg		15-AUG-00	CC5
		Thallium (Tl)	<1	1	mg/kg		15-AUG-00	CC5
		Vanadium (V)	151	1	mg/kg		15-AUG-00	CC5
		Zinc (Zn)	85.8	0.5	mg/kg		15-AUG-00	CC5
L14671-9	PSO-17-2200-01							
Sample Date: 22-JUL-00								
Matrix: SOIL								

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L14671-9	PSC-17-2200-01							
Sample Date	22-JUL-00							
Matrix:	SOIL							
		Antimony (Sb)	3.4	0.1	mg/kg		15-AUG-00	CC5
		Arsenic (As)	1600	0.1	mg/kg		15-AUG-00	CC5
		Mercury (Hg)	0.27	0.01	mg/kg		15-AUG-00	CC5
		Oil-Gravimetric	3700	100	mg/kg	04-AUG-00	08-AUG-00	ZW
		pH	8.0	0.1	pH		08-AUG-00	RT
		Metals (Strong Acid Rec.)						
		Silver (Ag)	<1	1	mg/kg		15-AUG-00	CC5
		Aluminum (Al)	6520	10	mg/kg		15-AUG-00	CC5
		Barium (Ba)	183	0.5	mg/kg		15-AUG-00	CC5
		Beryllium (Be)	<1	1	mg/kg		15-AUG-00	CC5
		Calcium (Ca)	32100	100	mg/kg		15-AUG-00	CC5
		Cadmium (Cd)	<0.5	0.5	mg/kg		15-AUG-00	CC5
		Cobalt (Co)	8	1	mg/kg		15-AUG-00	CC5
		Chromium (Cr)	108	0.5	mg/kg		15-AUG-00	CC5
		Copper (Cu)	40	1	mg/kg		15-AUG-00	CC5
		Iron (Fe)	14400	100	mg/kg		15-AUG-00	CC5
		Potassium (K)	2520	20	mg/kg		15-AUG-00	CC5
		Magnesium (Mg)	8950	10	mg/kg		15-AUG-00	CC5
		Manganese (Mn)	170	20	mg/kg		15-AUG-00	CC5
		Molybdenum (Mo)	5	1	mg/kg		15-AUG-00	CC5
		Sodium (Na)	500	100	mg/kg		15-AUG-00	CC5
		Nickel (Ni)	67	2	mg/kg		15-AUG-00	CC5
		Phosphorus (P)	630	10	mg/kg		15-AUG-00	CC5
		Lead (Pb)	27	5	mg/kg		15-AUG-00	CC5
		Tin (Sn)	<5	5	mg/kg		15-AUG-00	CC5
		Strontium (Sr)	73	1	mg/kg		15-AUG-00	CC5
		Titanium (Ti)	304	5	mg/kg		15-AUG-00	CC5
		Thallium (Tl)	<1	1	mg/kg		15-AUG-00	CC5
		Vanadium (V)	3	1	mg/kg		15-AUG-00	CC5
		Zinc (Zn)	82.0	0.5	mg/kg		15-AUG-00	CC5
L14671-10	PSO-18-2200-02							
Sample Date	22-JUL-00							
Matrix:	SOIL							
		Ammonia-N	<1	1	mg/kg		09-AUG-00	EK
		Antimony (Sb)	1.7	0.1	mg/kg		09-AUG-00	MD
		Arsenic (As)	1390	0.1	mg/kg		09-AUG-00	MD
		Mercury (Hg)	0.12	0.01	mg/kg		09-AUG-00	MD
		Oil-Gravimetric	12500	100	mg/kg	04-AUG-00	08-AUG-00	ZW
		Sulphate (SO4)	312	2.5	mg/kg		23-AUG-00	JZ
		pH	8.0	0.1	pH		09-AUG-00	RT
		Metals (Strong Acid Rec.)						
		Silver (Ag)	<1	1	mg/kg		09-AUG-00	MD
		Aluminum (Al)	29400	10	mg/kg		09-AUG-00	MD
		Barium (Ba)	46.8	0.5	mg/kg		09-AUG-00	MD
		Beryllium (Be)	<1	1	mg/kg		09-AUG-00	MD
		Calcium (Ca)	37400	100	mg/kg		09-AUG-00	MD
		Cadmium (Cd)	<0.5	0.5	mg/kg		09-AUG-00	MD

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L14671-10	PSO-16-2200-02							
Sample Date	22-JUL-00							
Matrix:	SOIL							
		Metals (Strong Acid Rec.)						
		Cobalt (Co)	46	1	mg/kg		09-AUG-00	MD
		Chromium (Cr)	186	0.5	mg/kg		09-AUG-00	MD
		Copper (Cu)	96	1	mg/kg		09-AUG-00	MD
		Iron (Fe)	60300	100	mg/kg		09-AUG-00	MD
		Potassium (K)	940	20	mg/kg		09-AUG-00	MD
		Magnesium (Mg)	25700	10	mg/kg		09-AUG-00	MD
		Manganese (Mn)	1030	20	mg/kg		09-AUG-00	MD
		Molybdenum (Mo)	5	1	mg/kg		09-AUG-00	MD
		Sodium (Na)	200	100	mg/kg		09-AUG-00	MD
		Nickel (Ni)	132	2	mg/kg		09-AUG-00	MD
		Phosphorus (P)	380	10	mg/kg		09-AUG-00	MD
		Lead (Pb)	63	5	mg/kg		09-AUG-00	MD
		Tin (Sn)	<5	5	mg/kg		09-AUG-00	MD
		Strontium (Sr)	34	1	mg/kg		09-AUG-00	MD
		Titanium (Ti)	1550	5	mg/kg		09-AUG-00	MD
		Thallium (Tl)	<1	1	mg/kg		09-AUG-00	MD
		Vanadium (V)	137	1	mg/kg		09-AUG-00	MD
		Zinc (Zn)	142	0.5	mg/kg		09-AUG-00	MD
L14671-11	PSO-18-2200-03							
Sample Date	22-JUL-00							
Matrix:	SOIL							
		Ammonia-N	2	1	mg/kg		09-AUG-00	EK
		Antimony (Sb)	0.9	0.1	mg/kg		09-AUG-00	MD
		Arsenic (As)	910	0.1	mg/kg		09-AUG-00	MD
		Mercury (Hg)	0.10	0.01	mg/kg		09-AUG-00	MD
		Oil-Gravimetric	4300	100	mg/kg	04-AUG-00	08-AUG-00	ZW
		Sulphate (SO4)	124	2.5	mg/kg		23-AUG-00	JZ
		pH	7.3	0.1	pH		08-AUG-00	RT
		Metals (Strong Acid Rec.)						
		Silver (Ag)	<1	1	mg/kg		09-AUG-00	MD
		Aluminum (Al)	26700	10	mg/kg		09-AUG-00	MD
		Barium (Ba)	80.9	0.5	mg/kg		09-AUG-00	MD
		Beryllium (Be)	<1	1	mg/kg		09-AUG-00	MD
		Calcium (Ca)	36800	100	mg/kg		09-AUG-00	MD
		Cadmium (Cd)	<0.5	0.5	mg/kg		09-AUG-00	MD
		Cobalt (Co)	34	1	mg/kg		09-AUG-00	MD
		Chromium (Cr)	175	0.5	mg/kg		09-AUG-00	MD
		Copper (Cu)	70	1	mg/kg		09-AUG-00	MD
		Iron (Fe)	48500	100	mg/kg		09-AUG-00	MD
		Potassium (K)	1210	20	mg/kg		09-AUG-00	MD
		Magnesium (Mg)	19200	10	mg/kg		09-AUG-00	MD
		Manganese (Mn)	890	20	mg/kg		09-AUG-00	MD
		Molybdenum (Mo)	4	1	mg/kg		09-AUG-00	MD
		Sodium (Na)	300	100	mg/kg		09-AUG-00	MD
		Nickel (Ni)	119	2	mg/kg		09-AUG-00	MD
		Phosphorus (P)	350	10	mg/kg		09-AUG-00	MD
		Lead (Pb)	37	5	mg/kg		09-AUG-00	MD

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ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L14671-11	PSO-18-2200-03							
Sample Date 22-JUL-00								
Matrix: SOIL								
		Metals (Strong Acid Rec.)						
		Tin (Sn)	<5	5	mg/kg		09-AUG-00	MD
		Strontium (Sr)	60	1	mg/kg		09-AUG-00	MD
		Titanium (Ti)	860	5	mg/kg		09-AUG-00	MD
		Thallium (Tl)	<1	1	mg/kg		09-AUG-00	MD
		Vanadium (V)	104	1	mg/kg		09-AUG-00	MD
		Zinc (Zn)	145	0.5	mg/kg		09-AUG-00	MD
L14671-12	PSO-19-2200-01							
Sample Date 22-JUL-00								
Matrix: SOIL								
		Ammonia-N	<1	1	mg/kg		09-AUG-00	EK
		Antimony (Sb)	0.6	0.1	mg/kg		09-AUG-00	MD
		Arsenic (As)	1720	0.1	mg/kg		09-AUG-00	MD
		Mercury (Hg)	0.08	0.01	mg/kg		09-AUG-00	MD
		Oil-Gravimetric	500	100	mg/kg	04-AUG-00	08-AUG-00	ZW
		Sulphate (SO4)	1620	2.5	mg/kg		23-AUG-00	JZ
		pH	7.7	0.1	pH		08-AUG-00	RT
		Metals (Strong Acid Rec.)						
		Silver (Ag)	<1	1	mg/kg		09-AUG-00	MD
		Aluminum (Al)	35300	10	mg/kg		09-AUG-00	MD
		Barium (Ba)	31.4	0.5	mg/kg		09-AUG-00	MD
		Beryllium (Be)	<1	1	mg/kg		09-AUG-00	MD
		Calcium (Ca)	56400	100	mg/kg		09-AUG-00	MD
		Cadmium (Cd)	<0.5	0.5	mg/kg		09-AUG-00	MD
		Cobalt (Co)	45	1	mg/kg		09-AUG-00	MD
		Chromium (Cr)	169	0.5	mg/kg		09-AUG-00	MD
		Copper (Cu)	82	1	mg/kg		09-AUG-00	MD
		Iron (Fe)	60200	100	mg/kg		09-AUG-00	MD
		Potassium (K)	1100	20	mg/kg		09-AUG-00	MD
		Magnesium (Mg)	30400	10	mg/kg		09-AUG-00	MD
		Manganese (Mn)	1020	20	mg/kg		09-AUG-00	MD
		Molybdenum (Mo)	6	1	mg/kg		09-AUG-00	MD
		Sodium (Na)	300	100	mg/kg		09-AUG-00	MD
		Nickel (Ni)	131	2	mg/kg		09-AUG-00	MD
		Phosphorus (P)	400	10	mg/kg		09-AUG-00	MD
		Lead (Pb)	17	5	mg/kg		09-AUG-00	MD
		Tin (Sn)	<5	5	mg/kg		09-AUG-00	MD
		Strontium (Sr)	31	1	mg/kg		09-AUG-00	MD
		Titanium (Ti)	823	5	mg/kg		09-AUG-00	MD
		Thallium (Tl)	<1	1	mg/kg		09-AUG-00	MD
		Vanadium (V)	150	1	mg/kg		09-AUG-00	MD
		Zinc (Zn)	116	0.5	mg/kg		09-AUG-00	MD
L14671-13	PSO-20-2200-01							
Sample Date 22-JUL-00								
Matrix: SOIL								
		Ammonia-N	<1	1	mg/kg		09-AUG-00	EK

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L14671-13	PSO-20-2200-01							
Sample Date	22-JUL-00							
Matrix:	SOIL							
		Antimony (Sb)	0.2	0.1	mg/kg		09-AUG-00	MD
		Arsenic (As)	199	0.1	mg/kg		09-AUG-00	MD
		Mercury (Hg)	0.11	0.01	mg/kg		09-AUG-00	MD
		Oil-Gravimetric	200	100	mg/kg	04-AUG-00	08-AUG-00	ZW
		Sulphate (SO4)	378	2.5	mg/kg		23-AUG-00	JZ
		pH	7.4	0.1	pH		08-AUG-00	RT
		Metals (Strong Acid Rec.)						
		Silver (Ag)	<1	1	mg/kg		09-AUG-00	MD
		Aluminum (Al)	26100	10	mg/kg		09-AUG-00	MD
		Barium (Ba)	227	0.5	mg/kg		09-AUG-00	MD
		Beryllium (Be)	<1	1	mg/kg		09-AUG-00	MD
		Calcium (Ca)	8900	100	mg/kg		09-AUG-00	MD
		Cadmium (Cd)	<0.5	0.5	mg/kg		09-AUG-00	MD
		Cobalt (Co)	15	1	mg/kg		09-AUG-00	MD
		Chromium (Cr)	70.6	0.5	mg/kg		09-AUG-00	MD
		Copper (Cu)	38	1	mg/kg		09-AUG-00	MD
		Iron (Fe)	31000	100	mg/kg		09-AUG-00	MD
		Potassium (K)	6100	20	mg/kg		09-AUG-00	MD
		Magnesium (Mg)	11600	10	mg/kg		09-AUG-00	MD
		Manganese (Mn)	470	20	mg/kg		09-AUG-00	MD
		Molybdenum (Mo)	<1	1	mg/kg		09-AUG-00	MD
		Sodium (Na)	600	100	mg/kg		09-AUG-00	MD
		Nickel (Ni)	44	2	mg/kg		09-AUG-00	MD
		Phosphorus (P)	480	10	mg/kg		09-AUG-00	MD
		Lead (Pb)	20	5	mg/kg		09-AUG-00	MD
		Tin (Sn)	<5	5	mg/kg		09-AUG-00	MD
		Strontium (Sr)	53	1	mg/kg		09-AUG-00	MD
		Titanium (Ti)	642	5	mg/kg		09-AUG-00	MD
		Thallium (Tl)	<1	1	mg/kg		09-AUG-00	MD
		Vanadium (V)	58	1	mg/kg		09-AUG-00	MD
		Zinc (Zn)	76.3	0.5	mg/kg		09-AUG-00	MD
L14671-15	PSO-13-2500-01A							
Sample Date	22-JUL-00							
Matrix:	SOIL							
		Ammonia-N	<1	1	mg/kg		09-AUG-00	EK
		Antimony (Sb)	10.5	0.1	mg/kg		09-AUG-00	MD
		Arsenic (As)	2370	0.1	mg/kg		09-AUG-00	MD
		Mercury (Hg)	0.40	0.01	mg/kg		09-AUG-00	MD
		Oil-Gravimetric	1100	100	mg/kg	04-AUG-00	08-AUG-00	ZW
		Sulphate (SO4)	1110	2.5	mg/kg		23-AUG-00	JZ
		pH	7.6	0.1	pH		08-AUG-00	RT
		Metals (Strong Acid Rec.)						
		Silver (Ag)	<1	1	mg/kg		09-AUG-00	MD
		Aluminum (Al)	27700	10	mg/kg		09-AUG-00	MD
		Barium (Ba)	43.6	0.5	mg/kg		09-AUG-00	MD
		Beryllium (Be)	<1	1	mg/kg		09-AUG-00	MD
		Calcium (Ca)	29900	100	mg/kg		09-AUG-00	MD

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L14671-15	PSC 15 2500 01A							
Sample Date	22-JUL-00							
Matrix:	SOIL							
		Metals (Strong Acid Rec.)						
		Cadmium (Cd)	0.8	0.5	mg/kg		09-AUG-00	MD
		Cobalt (Co)	40	1	mg/kg		09-AUG-00	MD
		Chromium (Cr)	86.2	0.5	mg/kg		09-AUG-00	MD
		Copper (Cu)	137	1	mg/kg		09-AUG-00	MD
		Iron (Fe)	55300	100	mg/kg		09-AUG-00	MD
		Potassium (K)	1600	20	mg/kg		09-AUG-00	MD
		Magnesium (Mg)	23900	10	mg/kg		09-AUG-00	MD
		Manganese (Mn)	850	20	mg/kg		09-AUG-00	MD
		Molybdenum (Mo)	1	1	mg/kg		09-AUG-00	MD
		Sodium (Na)	200	100	mg/kg		09-AUG-00	MD
		Nickel (Ni)	82	2	mg/kg		09-AUG-00	MD
		Phosphorus (P)	400	10	mg/kg		09-AUG-00	MD
		Lead (Pb)	148	5	mg/kg		09-AUG-00	MD
		Tin (Sn)	<5	5	mg/kg		09-AUG-00	MD
		Strontium (Sr)	29	1	mg/kg		09-AUG-00	MD
		Titanium (Ti)	458	5	mg/kg		09-AUG-00	MD
		Thallium (Tl)	<1	1	mg/kg		09-AUG-00	MD
		Vanadium (V)	105	1	mg/kg		09-AUG-00	MD
		Zinc (Zn)	175	0.5	mg/kg		09-AUG-00	MD
L14671-16	PSC-23-2500-01							
Sample Date	22-JUL-00							
Matrix:	SOIL							
		Water-Soluble Arsenic Species						
		Arsenic (As)	31.5	0.1	mg/L		22-SEP-00	JJ
		Ammonia-N	<1	1	mg/kg		09-AUG-00	EK
		Antimony (Sb)	2.3	0.1	mg/kg		09-AUG-00	MD
		Arsenic (As) 3+	765	0.1	mg/kg		22-SEP-00	JJ
		Arsenic (As) 5+	1630	0.1	mg/kg		22-SEP-00	JJ
		Mercury (Hg)	0.36	0.01	mg/kg		09-AUG-00	MD
		Oil-Gravimetric	200	100	mg/kg	04-AUG-00	08-AUG-00	ZW
		Sulphate (SO4)	300	2.5	mg/kg		23-AUG-00	JZ
		pH	7.9	0.1	pH		08-AUG-00	RT
		Metals (Strong Acid Rec.)						
		Silver (Ag)	2	1	mg/kg		09-AUG-00	MD
		Aluminum (Al)	32200	10	mg/kg		09-AUG-00	MD
		Barium (Ba)	32.2	0.5	mg/kg		09-AUG-00	MD
		Beryllium (Be)	<1	1	mg/kg		09-AUG-00	MD
		Calcium (Ca)	43600	100	mg/kg		09-AUG-00	MD
		Cadmium (Cd)	3.8	0.5	mg/kg		09-AUG-00	MD
		Cobalt (Co)	71	1	mg/kg		09-AUG-00	MD
		Chromium (Cr)	92.4	0.5	mg/kg		09-AUG-00	MD
		Copper (Cu)	181	1	mg/kg		09-AUG-00	MD
		Iron (Fe)	79400	100	mg/kg		09-AUG-00	MD
		Potassium (K)	950	20	mg/kg		09-AUG-00	MD
		Magnesium (Mg)	25300	10	mg/kg		09-AUG-00	MD
		Manganese (Mn)	1130	20	mg/kg		09-AUG-00	MD
		Molybdenum (Mo)	2	1	mg/kg		09-AUG-00	MD

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L14671-16	PSO-21-2500-01							
Sample Date	22-JUL-00							
Matrix:	SOIL							
		Metals (Strong Acid Rec.)						
		Sodium (Na)	200	100	mg/kg		09-AUG-00	MD
		Nickel (Ni)	116	2	mg/kg		09-AUG-00	MD
		Phosphorus (P)	260	10	mg/kg		09-AUG-00	MD
		Lead (Pb)	475	5	mg/kg		09-AUG-00	MD
		Tin (Sn)	<5	5	mg/kg		09-AUG-00	MD
		Strontium (Sr)	45	1	mg/kg		09-AUG-00	MD
		Titanium (Ti)	1320	5	mg/kg		09-AUG-00	MD
		Thallium (Tl)	<1	1	mg/kg		09-AUG-00	MD
		Vanadium (V)	151	1	mg/kg		09-AUG-00	MD
		Zinc (Zn)	515	0.5	mg/kg		09-AUG-00	MD
		Arsenic (As)						
		Arsenic (As)	2820	0.1	mg/kg		22-SEP-00	JJ
		Arsenic (As)	4200	0.1	mg/kg		09-AUG-00	MD
L14671-17	PSO-21-2500-02							
Sample Date	22-JUL-00							
Matrix:	SOIL							
		Water-Soluble Arsenic Species						
		Arsenic (As)	73.0	0.1	mg/L		22-SEP-00	JJ
		Ammonia-N	<1	1	mg/kg		09-AUG-00	EK
		Antimony (Sb)	1.1	0.1	mg/kg		09-AUG-00	MD
		Arsenic (As) 3+	2250	0.1	mg/kg		22-SEP-00	JJ
		Arsenic (As) 5+	874	0.1	mg/kg		22-SEP-00	JJ
		Mercury (Hg)	0.10	0.01	mg/kg		09-AUG-00	MD
		Oil-Gravimetric	800	100	mg/kg	04-AUG-00	08-AUG-00	ZW
		Sulphate (SO4)	236	2.5	mg/kg		20-AUG-00	JZ
		pH	7.2	0.1	pH		08-AUG-00	RT
		Metals (Strong Acid Rec.)						
		Silver (Ag)	<1	1	mg/kg		09-AUG-00	MD
		Aluminum (Al)	15500	10	mg/kg		09-AUG-00	MD
		Barium (Ba)	91.6	0.5	mg/kg		09-AUG-00	MD
		Beryllium (Be)	<1	1	mg/kg		09-AUG-00	MD
		Calcium (Ca)	11100	100	mg/kg		09-AUG-00	MD
		Cadmium (Cd)	<0.5	0.5	mg/kg		09-AUG-00	MD
		Cobalt (Co)	16	1	mg/kg		09-AUG-00	MD
		Chromium (Cr)	59.5	0.5	mg/kg		09-AUG-00	MD
		Copper (Cu)	38	1	mg/kg		09-AUG-00	MD
		Iron (Fe)	23400	100	mg/kg		09-AUG-00	MD
		Potassium (K)	2320	20	mg/kg		09-AUG-00	MD
		Magnesium (Mg)	5460	10	mg/kg		09-AUG-00	MD
		Manganese (Mn)	380	20	mg/kg		09-AUG-00	MD
		Molybdenum (Mo)	1	1	mg/kg		09-AUG-00	MD
		Sodium (Na)	200	100	mg/kg		09-AUG-00	MD
		Nickel (Ni)	39	2	mg/kg		09-AUG-00	MD
		Phosphorus (P)	360	10	mg/kg		09-AUG-00	MD
		Lead (Pb)	33	5	mg/kg		09-AUG-00	MD
		Tin (Sn)	<5	5	mg/kg		09-AUG-00	MD
		Strontium (Sr)	34	1	mg/kg		09-AUG-00	MD

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L14671-17	PSO-21-2500-02							
Sample Date	22-JUL-00							
Matrix:	SOIL							
		Metals (Strong Acid Rec.)						
		Titanium (Ti)	690	5	mg/kg		09-AUG-00	MD
		Thallium (Tl)	<1	1	mg/kg		09-AUG-00	MD
		Vanadium (V)	49	1	mg/kg		09-AUG-00	MD
		Zinc (Zn)	78.6	0.5	mg/kg		09-AUG-00	MD
		Arsenic (As)						
		Arsenic (As)	2910	0.1	mg/kg		09-AUG-00	MD
		Arsenic (As)	3140	0.1	mg/kg		22-SEP-00	JJ
L14671-18	PSO-21-2500-01A							
Sample Date	22-JUL-00							
Matrix:	SOIL							
		Ammonia-N	<1	1	mg/kg		09-AUG-00	EK
		Antimony (Sb)	0.7	0.1	mg/kg		15-AUG-00	CC5
		Arsenic (As)	3650	0.1	mg/kg		15-AUG-00	CC5
		Mercury (Hg)	0.29	0.01	mg/kg		15-AUG-00	CC5
		Oil-Gravimetric	200	100	mg/kg	04-AUG-00	08-AUG-00	ZW
		Sulphate (SO4)	433	2.5	mg/kg		23-AUG-00	JZ
		pH	7.6	0.1	pH		09-AUG-00	RT
		Metals (Strong Acid Rec.)						
		Silver (Ag)	1	1	mg/kg		15-AUG-00	CC5
		Aluminum (Al)	13600	10	mg/kg		15-AUG-00	CC5
		Barium (Ba)	21.0	0.5	mg/kg		15-AUG-00	CC5
		Beryllium (Be)	<1	1	mg/kg		15-AUG-00	CC5
		Calcium (Ca)	44200	100	mg/kg		15-AUG-00	CC5
		Cadmium (Cd)	4.0	0.5	mg/kg		15-AUG-00	CC5
		Cobalt (Co)	68	1	mg/kg		15-AUG-00	CC5
		Chromium (Cr)	50.4	0.5	mg/kg		15-AUG-00	CC5
		Copper (Cu)	191	1	mg/kg		15-AUG-00	CC5
		Potassium (K)	750	20	mg/kg		15-AUG-00	CC5
		Magnesium (Mg)	22000	10	mg/kg		15-AUG-00	CC5
		Manganese (Mn)	943	20	mg/kg		15-AUG-00	CC5
		Molybdenum (Mo)	3	1	mg/kg		15-AUG-00	CC5
		Sodium (Na)	300	100	mg/kg		15-AUG-00	CC5
		Nickel (Ni)	117	2	mg/kg		15-AUG-00	CC5
		Phosphorus (P)	230	10	mg/kg		15-AUG-00	CC5
		Lead (Pb)	427	5	mg/kg		15-AUG-00	CC5
		Tin (Sn)	<5	5	mg/kg		15-AUG-00	CC5
		Strontium (Sr)	39	1	mg/kg		15-AUG-00	CC5
		Titanium (Ti)	1530	5	mg/kg		15-AUG-00	CC5
		Thallium (Tl)	<1	1	mg/kg		15-AUG-00	CC5
		Vanadium (V)	138	1	mg/kg		15-AUG-00	CC5
		Zinc (Zn)	535	0.5	mg/kg		15-AUG-00	CC5
L14671-19	PSO-13-2500-02							
Sample Date	22-JUL-00							
Matrix:	SOIL							
		Water-Soluble Arsenic Species						
		Arsenic (As)	95.3	0.1	mg/L		22-SEP-00	JJ

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L14671-19	PSO 13 3500 02							
Sample Date	22-JUL-00							
Matrix:	SOIL							
		Ammonia-N	<1	1	mg/kg		08-AUG-00	EK
		Antimony (Sb)	0.8	0.1	mg/kg		15-AUG-00	CC5
		Arsenic (As) 3+	58.1	0.1	mg/kg		22-SEP-00	JJ
		Arsenic (As) 5+	300	0.1	mg/kg		22-SEP-00	JJ
		Mercury (Hg)	0.11	0.01	mg/kg		15-AUG-00	CC5
		Oil-Gravimetric	500	100	mg/kg	04-AUG-00	08-AUG-00	ZW
		Sulphate (SO4)	199	2.5	mg/kg		23-AUG-00	JZ
		pH	8.1	0.1	pH		03-AUG-00	RT
		Metals (Strong Acid Rec.)						
		Silver (Ag)	<1	1	mg/kg		15-AUG-00	CC5
		Aluminum (Al)	8500	10	mg/kg		15-AUG-00	CC5
		Barium (Ba)	17.8	0.5	mg/kg		15-AUG-00	CC5
		Beryllium (Be)	<1	1	mg/kg		15-AUG-00	CC5
		Calcium (Ca)	42200	100	mg/kg		15-AUG-00	CC5
		Cadmium (Cd)	<0.5	0.5	mg/kg		15-AUG-00	CC5
		Cobalt (Co)	59	1	mg/kg		15-AUG-00	CC5
		Chromium (Cr)	165	0.5	mg/kg		15-AUG-00	CC
		Copper (Cu)	37	1	mg/kg		15-AUG-00	C
		Iron (Fe)	50400	100	mg/kg		15-AUG-00	CC5
		Potassium (K)	870	20	mg/kg		15-AUG-00	CC5
		Magnesium (Mg)	29100	10	mg/kg		15-AUG-00	CC5
		Manganese (Mn)	950	20	mg/kg		15-AUG-00	CC5
		Molybdenum (Mo)	<1	1	mg/kg		15-AUG-00	CC5
		Sodium (Na)	100	100	mg/kg		15-AUG-00	CC5
		Nickel (Ni)	112	2	mg/kg		15-AUG-00	CC5
		Phosphorus (P)	260	10	mg/kg		15-AUG-00	CC5
		Lead (Pb)	22	5	mg/kg		15-AUG-00	CC5
		Tin (Sn)	<5	5	mg/kg		15-AUG-00	CC5
		Strontium (Sr)	26	1	mg/kg		15-AUG-00	CC5
		Titanium (Ti)	171	5	mg/kg		15-AUG-00	CC5
		Thallium (Tl)	<1	1	mg/kg		15-AUG-00	CC5
		Vanadium (V)	170	1	mg/kg		15-AUG-00	CC5
		Zinc (Zn)	96.1	0.5	mg/kg		15-AUG-00	CC5
		Arsenic (As)						
		Arsenic (As)	358	0.1	mg/kg		22-SEP-00	JJ
		Arsenic (As)	652	0.1	mg/kg		15-AUG-00	CC5
L14671-20	PSO 35 2300 07							
Sample Date	22-JUL-00							
Matrix:	SOIL							
		Ammonia-N	<1	1	mg/kg		09-AUG-00	EK
		Antimony (Sb)	0.1	0.1	mg/kg		15-AUG-00	CC5
		Arsenic (As)	113	0.1	mg/kg		15-AUG-00	CC5
		Mercury (Hg)	0.04	0.01	mg/kg		15-AUG-00	[illegible]
		Oil-Gravimetric	100	100	mg/kg	04-AUG-00	08-AUG-00	ZW
		Sulphate (SO4)	37	2.5	mg/kg		23-AUG-00	JZ
		pH	8.1	0.1	pH		06-AUG-00	RT
		Metals (Strong Acid Rec.)						

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L14671-20	PSO-35-2300-01							
Sample Date	22-JUL-00							
Matrix:	SOIL							
		Metals (Strong Acid Rec.)						
		Silver (Ag)	<1	1	mg/kg		15-AUG-00	CC5
		Aluminum (Al)	7270	10	mg/kg		15-AUG-00	CC5
		Barium (Ba)	239	0.5	mg/kg		15-AUG-00	CC5
		Beryllium (Be)	<1	1	mg/kg		15-AUG-00	CC5
		Calcium (Ca)	8600	100	mg/kg		15-AUG-00	CC5
		Cadmium (Cd)	<0.5	0.5	mg/kg		15-AUG-00	CC5
		Cobalt (Co)	15	1	mg/kg		15-AUG-00	CC5
		Chromium (Cr)	88.9	0.5	mg/kg		15-AUG-00	CC5
		Copper (Cu)	37	1	mg/kg		15-AUG-00	CC5
		Iron (Fe)	29400	100	mg/kg		15-AUG-00	CC5
		Magnesium (Mg)	11500	10	mg/kg		15-AUG-00	CC5
		Manganese (Mn)	430	20	mg/kg		15-AUG-00	CC5
		Molybdenum (Mo)	2	1	mg/kg		15-AUG-00	CC5
		Sodium (Na)	750	100	mg/kg		15-AUG-00	CC5
		Nickel (Ni)	57	2	mg/kg		15-AUG-00	CC5
		Phosphorus (P)	440	10	mg/kg		15-AUG-00	CC5
		Lead (Pb)	14	5	mg/kg		15-AUG-00	CC5
		Tin (Sn)	<5	5	mg/kg		15-AUG-00	CC5
		Strontium (Sr)	55	1	mg/kg		15-AUG-00	CC5
		Titanium (Ti)	771	5	mg/kg		15-AUG-00	CC5
		Thallium (Tl)	<1	1	mg/kg		15-AUG-00	CC5
		Vanadium (V)	44	1	mg/kg		15-AUG-00	CC5
		Zinc (Zn)	66.8	0.5	mg/kg		15-AUG-00	CC5
L14671-21	PSO-35-2300-01							
Sample Date	22-JUL-00							
Matrix:	SOIL							
		Ammonia-N	<1	1	mg/kg		09-AUG-00	EK
		Antimony (Sb)	0.3	0.1	mg/kg		15-AUG-00	CC5
		Arsenic (As)	313	0.1	mg/kg		15-AUG-00	CC5
		Mercury (Hg)	0.05	0.01	mg/kg		15-AUG-00	CC5
		Oil-Gravimetric	500	100	mg/kg	04-AUG-00	08-AUG-00	ZW
		Sulphate (SO4)	297	2.5	mg/kg		23-AUG-00	JZ
		pH	7.0	0.1	pH		08-AUG-00	RT
		Metals (Strong Acid Rec.)						
		Silver (Ag)	<1	1	mg/kg		15-AUG-00	CC5
		Aluminum (Al)	6950	10	mg/kg		15-AUG-00	CC5
		Barium (Ba)	202	0.5	mg/kg		15-AUG-00	CC5
		Beryllium (Be)	<1	1	mg/kg		15-AUG-00	CC5
		Calcium (Ca)	8500	100	mg/kg		15-AUG-00	CC5
		Cadmium (Cd)	<0.5	0.5	mg/kg		15-AUG-00	CC5
		Cobalt (Co)	12	1	mg/kg		15-AUG-00	CC5
		Chromium (Cr)	57.1	0.5	mg/kg		15-AUG-00	CC5
		Copper (Cu)	36	1	mg/kg		15-AUG-00	CC5
		Iron (Fe)	24100	100	mg/kg		15-AUG-00	CC5
		Potassium (K)	3590	20	mg/kg		15-AUG-00	CC5
		Magnesium (Mg)	8960	10	mg/kg		15-AUG-00	CC5
		Manganese (Mn)	350	20	mg/kg		15-AUG-00	CC5

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L14671-21	PSO-36-2300-01							
Sample Date	22-JUL-00							
Matrix:	SOIL							
		Metals (Strong Acid Rec.)						
		Molybdenum (Mo)	<1	1	mg/kg		15-AUG-00	CC5
		Sodium (Na)	600	100	mg/kg		15-AUG-00	CC5
		Nickel (Ni)	38	2	mg/kg		15-AUG-00	CC5
		Phosphorus (P)	420	10	mg/kg		15-AUG-00	CC5
		Lead (Pb)	13	5	mg/kg		15-AUG-00	CC5
		Tin (Sn)	<5	5	mg/kg		15-AUG-00	CC5
		Strontium (Sr)	54	1	mg/kg		15-AUG-00	CC5
		Titanium (Ti)	662	5	mg/kg		15-AUG-00	CC5
		Thallium (Tl)	<1	1	mg/kg		15-AUG-00	CC5
		Vanadium (V)	44	1	mg/kg		15-AUG-00	CC5
		Zinc (Zn)	59.0	0.5	mg/kg		15-AUG-00	CC5
L14671-22	PSO-37-2300-01							
Sample Date	22-JUL-00							
Matrix:	SOIL							
		Water-Soluble Arsenic Species						
		Arsenic (As)	7.3	0.1	mg/L		22-SEP-00	JJ
		Ammonia-N	<1	1	mg/kg		09-AUG-00	EK
		Antimony (Sb)	0.5	0.1	mg/kg		15-AUG-00	CC5
		Arsenic (As)	307	0.1	mg/kg		15-AUG-00	CC5
		Mercury (Hg)	0.06	0.01	mg/kg		15-AUG-00	CC5
		Oil-Gravimetric	400	100	mg/kg	04-AUG-00	08-AUG-00	ZW
		Sulphate (SO4)	485	2.5	mg/kg		23-AUG-00	JZ
		pH	7.5	0.1	pH		08-AUG-00	RT
		Metals (Strong Acid Rec.)						
		Silver (Ag)	<1	1	mg/kg		15-AUG-00	CC5
		Aluminum (Al)	6080	10	mg/kg		15-AUG-00	CC5
		Barium (Ba)	100	0.5	mg/kg		15-AUG-00	CC5
		Beryllium (Be)	<1	1	mg/kg		15-AUG-00	CC5
		Calcium (Ca)	9500	100	mg/kg		15-AUG-00	CC5
		Cadmium (Cd)	<0.5	0.5	mg/kg		15-AUG-00	CC5
		Cobalt (Co)	11	1	mg/kg		15-AUG-00	CC5
		Chromium (Cr)	53.3	0.5	mg/kg		15-AUG-00	CC5
		Copper (Cu)	35	1	mg/kg		15-AUG-00	CC5
		Iron (Fe)	22800	100	mg/kg		15-AUG-00	CC5
		Potassium (K)	3560	20	mg/kg		15-AUG-00	CC5
		Magnesium (Mg)	8360	10	mg/kg		15-AUG-00	CC5
		Manganese (Mn)	280	20	mg/kg		15-AUG-00	CC5
		Molybdenum (Mo)	1	1	mg/kg		15-AUG-00	CC5
		Sodium (Na)	500	100	mg/kg		15-AUG-00	CC5
		Nickel (Ni)	42	2	mg/kg		15-AUG-00	CC5
		Phosphorus (P)	420	10	mg/kg		15-AUG-00	CC5
		Lead (Pb)	12	5	mg/kg		15-AUG-00	CC[illegible]
		Tin (Sn)	<5	5	mg/kg		15-AUG-00	C[illegible]
		Strontium (Sr)	56	1	mg/kg		15-AUG-00	CC5
		Titanium (Ti)	627	5	mg/kg		15-AUG-00	CC5
		Thallium (Tl)	<1	1	mg/kg		15-AUG-00	CC5
		Vanadium (V)	37	1	mg/kg		15-AUG-00	CC5

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L14671-22	PSO-37-2200-01							
Sample Date	22-JUL-00							
Matrix:	SOIL							
		Metals (Strong Acid Rec.)						
		Zinc (Zn)	61.7	0.5	mg/kg		15-AUG-00	CC5
L14671-23	PSO-03-2200-01							
Sample Date	22-JUL-00							
Matrix:	SOIL							
		Water-Soluble Arsenic Species						
		Arsenic (As)	6.0	0.1	mg/L		22-SEP-00	JJ
		Ammonia-N	<1	1	mg/kg		09-AUG-00	EK
		Antimony (Sb)	14.7	0.1	mg/kg		15-AUG-00	CC5
		Arsenic (As) 3+	1200	0.1	mg/kg		22-SEP-00	JJ
		Arsenic (As) 5+	978	0.1	mg/kg		22-SEP-00	JJ
		Mercury (Hg)	0.13	0.01	mg/kg		15-AUG-00	CC5
		Oil-Gravimetric	<100	100	mg/kg	04-AUG-00	08-AUG-00	ZW
		Sulphate (SO4)	854	2.5	mg/kg		23-AUG-00	JZ
		pH	7.8	0.1	pH		08-AUG-00	RT
		Metals (Strong Acid Rec.)						
		Silver (Ag)	<1	1	mg/kg		15-AUG-00	CC5
		Aluminum (Al)	6580	10	mg/kg		15-AUG-00	CC5
		Barium (Ba)	7.9	0.5	mg/kg		15-AUG-00	CC5
		Beryllium (Be)	<1	1	mg/kg		15-AUG-00	CC5
		Calcium (Ca)	44300	100	mg/kg		15-AUG-00	CC5
		Cadmium (Cd)	1.1	0.5	mg/kg		15-AUG-00	CC5
		Cobalt (Co)	37	1	mg/kg		15-AUG-00	CC5
		Chromium (Cr)	50.9	0.5	mg/kg		15-AUG-00	CC5
		Copper (Cu)	59	1	mg/kg		15-AUG-00	CC5
		Iron (Fe)	50000	100	mg/kg		15-AUG-00	CC5
		Potassium (K)	570	20	mg/kg		15-AUG-00	CC5
		Magnesium (Mg)	17200	10	mg/kg		15-AUG-00	CC5
		Manganese (Mn)	840	20	mg/kg		15-AUG-00	CC5
		Molybdenum (Mo)	<1	1	mg/kg		15-AUG-00	CC5
		Sodium (Na)	<100	100	mg/kg		15-AUG-00	CC5
		Nickel (Ni)	75	2	mg/kg		15-AUG-00	CC5
		Phosphorus (P)	210	10	mg/kg		15-AUG-00	CC5
		Lead (Pb)	190	5	mg/kg		15-AUG-00	CC5
		Tin (Sn)	<5	5	mg/kg		15-AUG-00	CC5
		Strontium (Sr)	30	1	mg/kg		15-AUG-00	CC5
		Titanium (Ti)	137	5	mg/kg		15-AUG-00	CC5
		Thallium (Tl)	<1	1	mg/kg		15-AUG-00	CC5
		Vanadium (V)	56	1	mg/kg		15-AUG-00	CC5
		Zinc (Zn)	213	0.5	mg/kg		15-AUG-00	CC5
		Arsenic (As)						
		Arsenic (As)	2150	0.1	mg/kg		22-SEP-00	JJ
		Arsenic (As)	2860	0.1	mg/kg		15-AUG-00	CC5
L14671-24	PSO-05-2200-01							
Sample Date	22-JUL-00							
Matrix:	SOIL							

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L14671-24	PSO-05-2200-01							
Sample Date	23-JUL-00							
Matrix:	SOIL							
		Ammonia-N	<1	1	mg/kg		09-AUG-00	EK
		Antimony (Sb)	0.1	0.1	mg/kg		15-AUG-00	CC5
		Arsenic (As)	81.6	0.1	mg/kg		15-AUG-00	CC5
		Mercury (Hg)	0.08	0.01	mg/kg		15-AUG-00	CC5
		Oil-Gravimetric	300	100	mg/kg	04-AUG-00	08-AUG-00	ZW
		Sulphate (SO4)	203	2.5	mg/kg		25-AUG-00	JZ
		pH	8.1	0.1	pH		08-AUG-00	RT
		Metals (Strong Acid Rec.)						
		Silver (Ag)	<1	1	mg/kg		15-AUG-00	CC5
		Aluminum (Al)	7500	10	mg/kg		15-AUG-00	CC5
		Barium (Ba)	276	0.5	mg/kg		15-AUG-00	CC5
		Beryllium (Be)	1	1	mg/kg		15-AUG-00	CC5
		Calcium (Ca)	7400	100	mg/kg		15-AUG-00	CC5
		Cadmium (Cd)	<0.5	0.5	mg/kg		15-AUG-00	CC5
		Cobalt (Co)	10	1	mg/kg		15-AUG-00	CC5
		Chromium (Cr)	80.6	0.5	mg/kg		15-AUG-00	CC5
		Copper (Cu)	44	1	mg/kg		15-AUG-00	CC5
		Iron (Fe)	32000	100	mg/kg		15-AUG-00	C[illegible]
		Magnesium (Mg)	12800	10	mg/kg		15-AUG-00	CC5
		Manganese (Mn)	500	20	mg/kg		15-AUG-00	CC5
		Molybdenum (Mo)	1	1	mg/kg		15 AUG 00	CC5
		Sodium (Na)	900	100	mg/kg		15 AUG 00	CC5
		Nickel (Ni)	53	2	mg/kg		15-AUG-00	CC5
		Phosphorus (P)	450	10	mg/kg		15-AUG-00	CC5
		Lead (Pb)	13	5	mg/kg		15-AUG-00	CC5
		Tin (Sn)	<5	5	mg/kg		15-AUG-00	CC5
		Strontium (Sr)	47	1	mg/kg		15-AUG-00	CC5
		Titanium (Ti)	305	5	mg/kg		15-AUG-00	CC5
		Thallium (Tl)	<1	1	mg/kg		15-AUG-00	CC5
		Vanadium (V)	50	1	mg/kg		15-AUG-00	CC5
		Zinc (Zn)	70.7	0.5	mg/kg		15-AUG-00	CC5
L14671-25	PSO-05-2200-01							
Sample Date	22-JUL-00							
Matrix:	SOIL							
		Water-Soluble Arsenic Species						
		Arsenic (As)	<0.1	0.1	mg/L		22-SEP-00	JJ
		Ammonia-N	<1	1	mg/kg		09-AUG-00	EK
		Antimony (Sb)	0.7	0.1	mg/kg		15-AUG-00	CC5
		Arsenic (As) 3+	25.5	0.1	mg/kg		22-SEP-00	JJ
		Arsenic (As) 5+	42.0	0.1	mg/kg		22-SEP-00	JJ
		Mercury (Hg)	0.07	0.01	mg/kg		15-AUG-00	CC5
		Oil-Gravimetric	200	100	mg/kg	04-AUG-00	08-AUG-00	ZW
		Sulphate (SO4)	90	2.5	mg/kg		23-AUG-00	JZ
		pH	7.7	0.1	pH		08-AUG-00	RT
		Metals (Strong Acid Rec.)						
		Silver (Ag)	<1	1	mg/kg		15 AUG 00	CC5
		Aluminum (Al)	8020	10	mg/kg		15 AUG-00	CC5

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L14671-25	PSO-06-2200-01							
Sample Date	22-JUL-00							
Matrix	SOIL							
		Metals (Strong Acid Rec.)						
		Barium (Ba)	73.1	0.5	mg/kg		15-AUG-00	CC5
		Beryllium (Be)	<1	1	mg/kg		15-AUG-00	CC5
		Calcium (Ca)	4200	100	mg/kg		15-AUG-00	CC5
		Cadmium (Cd)	<0.5	0.5	mg/kg		15-AUG-00	CC5
		Cobalt (Co)	14	1	mg/kg		15-AUG-00	CC5
		Chromium (Cr)	81.8	0.5	mg/kg		15-AUG-00	CC5
		Copper (Cu)	46	1	mg/kg		15-AUG-00	CC5
		Iron (Fe)	20900	100	mg/kg		15-AUG-00	CC5
		Potassium (K)	1830	20	mg/kg		15-AUG-00	CC5
		Magnesium (Mg)	7790	10	mg/kg		15-AUG-00	CC5
		Manganese (Mn)	240	20	mg/kg		15-AUG-00	CC5
		Molybdenum (Mo)	[illegible]	1	mg/kg		15-AUG-00	CC5
		Sodium (Na)	200	100	mg/kg		15-AUG-00	CC5
		Nickel (Ni)	45	2	mg/kg		15-AUG-00	CC5
		Phosphorus (P)	320	10	mg/kg		15-AUG-00	CC5
		Lead (Pb)	16	5	mg/kg		15-AUG-00	CC5
		Tin (Sn)	<5	5	mg/kg		15-AUG-00	CC5
		Strontium (Sr)	40	1	mg/kg		15-AUG-00	CC5
		Titanium (Ti)	532	5	mg/kg		15-AUG-00	CC5
		Thallium (Tl)	<1	1	mg/kg		15-AUG-00	CC5
		Vanadium (V)	32	1	mg/kg		15-AUG-00	CC5
		Zinc (Zn)	48.2	0.5	mg/kg		15-AUG-00	CC5
		Arsenic (As)						
		Arsenic (As)	67.5	0.1	mg/kg		14-OCT-00	JJ
		Arsenic (As)	361	0.1	mg/kg		15-AUG-00	CC5
L14671-26	PSO-06-2200-01							
Sample Date	22-JUL-00							
Matrix	SOIL							
		Water-Soluble Arsenic Species						
		Arsenic (As)	0.5	0.1	mg/L		22-SEP-00	JJ
		Ammonia-N	<1	1	mg/kg		09-AUG-00	EK
		Antimony (Sb)	2.2	0.1	mg/kg		15-AUG-00	CC5
		Arsenic (As)	1060	0.1	mg/kg		15-AUG-00	CC5
		Mercury (Hg)	0.06	0.01	mg/kg		15-AUG-00	CC5
		Oil-Gravimetric	800	100	mg/kg	04-AUG-00	06-AUG-00	ZW
		Sulphate (SO4)	1300	2.5	mg/kg		23-AUG-00	JZ
		pH	7.7	0.1	pH		08-AUG-00	RT
		Metals (Strong Acid Rec.)						
		Silver (Ag)	<1	1	mg/kg		15-AUG-00	CC5
		Aluminum (Al)	8240	10	mg/kg		15-AUG-00	CC5
		Barium (Ba)	84.3	0.5	mg/kg		15-AUG-00	CC5
		Beryllium (Be)	<1	1	mg/kg		15-AUG-00	CC5
		Calcium (Ca)	34600	100	mg/kg		15-AUG-00	CC5
		Cadmium (Cd)	<0.5	0.5	mg/kg		15-AUG-00	CC5
		Cobalt (Co)	37	1	mg/kg		15-AUG-00	CC5
		Chromium (Cr)	104	0.5	mg/kg		15-AUG-00	CC5
		Copper (Cu)	57	1	mg/kg		15-AUG-00	CC5

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L14671-26	PSO-08-2200-01							
Sample Date	22-JUL-00							
Matrix:	SOIL							
		Metals (Strong Acid Rec.)						
		Iron (Fe)	50200	100	mg/kg		15-AUG-00	CC5
		Potassium (K)	1870	20	mg/kg		15-AUG-00	CC5
		Magnesium (Mg)	21500	10	mg/kg		15-AUG-00	CC5
		Manganese (Mn)	820	20	mg/kg		15-AUG-00	CC5
		Molybdenum (Mo)	2	1	mg/kg		15-AUG-00	CC5
		Sodium (Na)	300	100	mg/kg		15-AUG-00	CC5
		Nickel (Ni)	86	2	mg/kg		15-AUG-00	CC5
		Phosphorus (P)	420	10	mg/kg		15-AUG-00	CC5
		Lead (Pb)	46	5	mg/kg		15-AUG-00	CC5
		Tin (Sn)	<5	5	mg/kg		15-AUG-00	CC5
		Strontium (Sr)	43	1	mg/kg		15-AUG-00	CC5
		Titanium (Ti)	965	5	mg/kg		15-AUG-00	CC5
		Thallium (Tl)	<1	1	mg/kg		15-AUG-00	CC5
		Vanadium (V)	114	1	mg/kg		15-AUG-00	CC5
		Zinc (Zn)	106	0.5	mg/kg		15-AUG-00	CC5
L14671-27	PSO-09-2200-01							
Sample Date	22-JUL-00							
Matrix:	SOIL							
		Ammonia-N	<1	1	mg/kg		09-AUG-00	EK
		Antimony (Sb)	2.1	0.1	mg/kg		15-AUG-00	CC5
		Arsenic (As)	624	0.1	mg/kg		15-AUG-00	CC5
		Mercury (Hg)	0.07	0.01	mg/kg		15-AUG-00	CC5
		Oil-Gravimetric	100	100	mg/kg	04-AUG-00	08-AUG-00	ZW
		Sulphate (SO4)	879	2.5	mg/kg		23-AUG-00	JZ
		pH	7.9	0.1	pH		08-AUG-00	RT
		Metals (Strong Acid Rec.)						
		Silver (Ag)	<1	1	mg/kg		15-AUG-00	CC5
		Aluminum (Al)	6430	10	mg/kg		15-AUG-00	CC5
		Barium (Ba)	41.5	0.5	mg/kg		15-AUG-00	CC5
		Beryllium (Be)	<1	1	mg/kg		15-AUG-00	CC5
		Calcium (Ca)	44700	100	mg/kg		15-AUG-00	CC5
		Cadmium (Cd)	0.5	0.5	mg/kg		15-AUG-00	CC5
		Cobalt (Co)	22	1	mg/kg		15-AUG-00	CC5
		Chromium (Cr)	95.1	0.5	mg/kg		15-AUG-00	CC5
		Copper (Cu)	58	1	mg/kg		15-AUG-00	CC5
		Iron (Fe)	30200	100	mg/kg		15-AUG-00	CC5
		Potassium (K)	2150	20	mg/kg		15-AUG-00	CC5
		Magnesium (Mg)	11300	10	mg/kg		15-AUG-00	CC5
		Manganese (Mn)	430	20	mg/kg		15-AUG-00	CC5
		Molybdenum (Mo)	3	1	mg/kg		15-AUG-00	CC5
		Sodium (Na)	400	100	mg/kg		15-AUG-00	CC5
		Nickel (Ni)	77	2	mg/kg		15-AUG-00	CC5
		Phosphorus (P)	440	10	mg/kg		15-AUG-00	[illegible]
		Lead (Pb)	66	5	mg/kg		15-AUG-00	CC5
		Tin (Sn)	<5	5	mg/kg		15-AUG-00	CC5
		Strontium (Sr)	24	1	mg/kg		15-AUG-00	CC5
		Titanium (Ti)	840	5	mg/kg		15-AUG-00	CC5

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L14671-27	PSC-09-2200-01							
Sample Date	22-JUL-00							
Matrix	SOIL							
		Metals (Strong Acid Rec.)						
		Thallium (Tl)	<1	1	mg/kg		15-AUG-00	CC5
		Vanadium (V)	42	1	mg/kg		15-AUG-00	CC5
		Zinc (Zn)	135	0.5	mg/kg		15-AUG-00	CC5
L14671-28	PSC-10-2200-01							
Sample Date	22-JUL-00							
Matrix	SOIL							
		Ammonia-N	<1	1	mg/kg		09-AUG-00	FK
		Antimony (Sb)	0.1	0.1	mg/kg		15-AUG-00	CC5
		Arsenic (As)	[illegible]	0.1	mg/kg		15-AUG-00	CC5
		Mercury (Hg)	0.05	0.01	mg/kg		15-AUG-00	CC5
		Oil-Gravimetric	<100	100	mg/kg	04-AUG-00	08-AUG-00	ZW
		Sulphate (SO4)	82	2.5	mg/kg		23-AUG-00	JZ
		pH	6.9	0.1	pH		08-AUG-00	RT
		Metals (Strong Acid Rec.)						
		Silver (Ag)	<1	1	mg/kg		15-AUG-00	CC5
		Aluminum (Al)	7270	10	mg/kg		15-AUG-00	CC5
		Barium (Ba)	247	0.5	mg/kg		15-AUG-00	CC5
		Beryllium (Be)	1	1	mg/kg		15-AUG-00	CC5
		Calcium (Ca)	5300	100	mg/kg		15-AUG-00	CC5
		Cadmium (Cd)	<0.5	0.5	mg/kg		15-AUG-00	CC5
		Cobalt (Co)	12	1	mg/kg		15-AUG-00	CC5
		Chromium (Cr)	52.4	0.5	mg/kg		15-AUG-00	CC5
		Copper (Cu)	30	1	mg/kg		15-AUG-00	CC5
		Iron (Fe)	27200	100	mg/kg		15-AUG-00	CC5
		Potassium (K)	3640	20	mg/kg		15-AUG-00	CC5
		Magnesium (Mg)	9380	10	mg/kg		15-AUG-00	CC5
		Manganese (Mn)	390	20	mg/kg		15-AUG-00	CC5
		Molybdenum (Mo)	<1	1	mg/kg		15-AUG-00	CC5
		Sodium (Na)	700	100	mg/kg		15-AUG-00	CC5
		Nickel (Ni)	37	2	mg/kg		15-AUG-00	CC5
		Phosphorus (P)	430	10	mg/kg		15-AUG-00	CC5
		Lead (Pb)	15	5	mg/kg		15-AUG-00	CC5
		Tin (Sn)	<5	5	mg/kg		15-AUG-00	CC5
		Strontium (Sr)	73	1	mg/kg		15-AUG-00	CC5
		Titanium (Ti)	535	5	mg/kg		15-AUG-00	CC5
		Thallium (Tl)	<1	1	mg/kg		15-AUG-00	CC5
		Vanadium (V)	45	1	mg/kg		15-AUG-00	CC5
		Zinc (Zn)	60.5	0.5	mg/kg		15-AUG-00	CC5
L14671-29	PSC-30-2300-01							
Sample Date	22-JUL-00							
Matrix	SOIL							
		Ammonia-N	<1	1	mg/kg		09-AUG-00	FK
		Antimony (Sb)	0.4	0.1	mg/kg		15-AUG-00	CC5
		Arsenic (As)	146	0.1	mg/kg		15-AUG-00	CC5
		Mercury (Hg)	0.05	0.01	mg/kg		15-AUG-00	CC5

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L14671-29	PSO-30-2300-01							
Sample Date	22-JUL-00							
Matrix:	SOIL							
		Oil-Gravimetric	100	100	mg/kg	04-AUG-00	08-AUG-00	ZW
		Sulphate (SO4)	235	2.5	mg/kg		23-AUG-00	JZ
		pH	7.8	0.1	pH		08-AUG-00	RT
		Metals (Strong Acid Rec.)						
		Silver (Ag)	<1	1	mg/kg		15-AUG-00	CC5
		Aluminum (Al)	6940	10	mg/kg		15-AUG-00	CC5
		Barium (Ba)	204	0.5	mg/kg		15-AUG-00	CC5
		Beryllium (Be)	<1	1	mg/kg		15-AUG-00	CC5
		Calcium (Ca)	7700	100	mg/kg		15-AUG-00	CC5
		Cadmium (Cd)	<0.5	0.5	mg/kg		15-AUG-00	CC5
		Cobalt (Co)	15	1	mg/kg		15-AUG-00	CC5
		Chromium (Cr)	78.3	0.5	mg/kg		15-AUG-00	CC5
		Copper (Cu)	37	1	mg/kg		15-AUG-00	CC5
		Iron (Fe)	27800	100	mg/kg		15-AUG-00	CC5
		Potassium (K)	3510	20	mg/kg		15-AUG-00	CC5
		Magnesium (Mg)	10400	10	mg/kg		15-AUG-00	CC5
		Manganese (Mn)	450	20	mg/kg		15-AUG-00	CC5
		Molybdenum (Mo)	2	1	mg/kg		15-AUG-00	CC5
		Sodium (Na)	600	100	mg/kg		15-AUG-00	C
		Nickel (Ni)	53	2	mg/kg		15-AUG-00	CC5
		Phosphorus (P)	400	10	mg/kg		15-AUG-00	CC5
		Lead (Pb)	23	5	mg/kg		15-AUG-00	CC5
		Tin (Sn)	<5	5	mg/kg		15-AUG-00	CC5
		Strontium (Sr)	52	1	mg/kg		15-AUG-00	CC5
		Titanium (Ti)	840	5	mg/kg		15-AUG-00	CC5
		Thallium (Tl)	<1	1	mg/kg		15-AUG-00	CC5
		Vanadium (V)	41	1	mg/kg		15-AUG-00	CC5
		Zinc (Zn)	38.5	0.5	mg/kg		15-AUG-00	CC5
L14671-30	PSO-31-2300-01							
Sample Date	22-JUL-00							
Matrix:	SOIL							
		Water-Soluble Arsenic Species						
		Arsenic (As)	1.8	0.1	mg/L		22 SEP 00	[illegible]
		Ammonia-N	<1	1	mg/kg		08-AUG-00	EK
		Antimony (Sb)	1.2	0.1	mg/kg		15-AUG-00	CC5
		Arsenic (As)	516	0.1	mg/kg		15-AUG-00	CC5
		Mercury (Hg)	0.08	0.01	mg/kg		15-AUG-00	CC5
		Oil-Gravimetric	400	100	mg/kg	04-AUG-00	08-AUG-00	ZW
		Sulphate (SO4)	419	2.5	mg/kg		23-AUG-00	JZ
		pH	7.5	0.1	pH		08-AUG-00	RT
		Metals (Strong Acid Rec.)						
		Silver (Ag)	<1	1	mg/kg		15-AUG-00	CC5
		Aluminum (Al)	6640	10	mg/kg		15-AUG-00	C
		Barium (Ba)	151	0.5	mg/kg		15-AUG-00	CC5
		Beryllium (Be)	<1	1	mg/kg		15-AUG-00	CC5
		Calcium (Ca)	10700	100	mg/kg		15-AUG-00	CC5
		Cadmium (Cd)	<0.5	0.5	mg/kg		15-AUG-00	CC5

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L14671-30	PSD-31-2300-01							
Sample Date	22-JUL-00							
Matrix:	SOIL							
		Metals (Strong Acid Rec.)						
		Cobalt (Co)	15	1	mg/kg		15-AUG-00	CC5
		Chromium (Cr)	72.2	0.5	mg/kg		15-AUG-00	CC5
		Copper (Cu)	43	1	mg/kg		15-AUG-00	CC5
		Iron (Fe)	23600	100	mg/kg		15-AUG-00	CC5
		Potassium (K)	3020	20	mg/kg		15-AUG-00	CC5
		Magnesium (Mg)	9290	10	mg/kg		15-AUG-00	CC5
		Manganese (Mn)	400	20	mg/kg		15-AUG-00	CC5
		Molybdenum (Mo)	2	1	mg/kg		15-AUG-00	CC5
		Sodium (Na)	500	100	mg/kg		15-AUG-00	CC5
		Nickel (Ni)	49	2	mg/kg		15-AUG-00	CC5
		Phosphorus (P)	430	10	mg/kg		15-AUG-00	CC5
		Lead (Pb)	35	5	mg/kg		15-AUG-00	CC5
		Tin (Sn)	<5	5	mg/kg		15-AUG-00	CC5
		Strontium (Sr)	44	1	mg/kg		15-AUG-00	CC5
		Titanium (Ti)	645	5	mg/kg		15-AUG-00	CC5
		Thallium (Tl)	<1	1	mg/kg		15-AUG-00	CC5
		Vanadium (V)	39	1	mg/kg		15-AUG-00	CC5
		Zinc (Zn)	74.5	0.5	mg/kg		15-AUG-00	CC5
L14671-31	PSD-32-2300-01							
Sample Date	22-JUL-00							
Matrix:	SOIL							
		Ammonia-N	<1	1	mg/kg		09-AUG-00	EK
		Antimony (Sb)	0.2	0.1	mg/kg		15-AUG-00	CC5
		Arsenic (As)	437	0.1	mg/kg		15-AUG-00	CC5
		Mercury (Hg)	0.08	0.01	mg/kg		15-AUG-00	CC5
		Oil-Gravimetric	<100	100	mg/kg	04-AUG-00	08-AUG-00	ZW
		Sulphate (SO4)	488	2.5	mg/kg		23-AUG-00	JZ
		pH	7.8	0.1	pH		08-AUG-00	RT
		Metals (Strong Acid Rec.)						
		Silver (Ag)	<1	1	mg/kg		15-AUG-00	CC5
		Aluminum (Al)	9180	10	mg/kg		15-AUG-00	CC5
		Barium (Ba)	27.2	0.5	mg/kg		15-AUG-00	CC5
		Beryllium (Be)	<1	1	mg/kg		15-AUG-00	CC5
		Calcium (Ca)	25900	100	mg/kg		15-AUG-00	CC5
		Cadmium (Cd)	<0.5	0.5	mg/kg		15-AUG-00	CC5
		Cobalt (Co)	51	1	mg/kg		15-AUG-00	CC5
		Chromium (Cr)	149	0.5	mg/kg		15-AUG-00	CC5
		Copper (Cu)	137	1	mg/kg		15-AUG-00	CC5
		Iron (Fe)	50900	100	mg/kg		15-AUG-00	CC5
		Potassium (K)	1210	20	mg/kg		15-AUG-00	CC5
		Magnesium (Mg)	34600	10	mg/kg		15-AUG-00	CC5
		Manganese (Mn)	1250	20	mg/kg		15-AUG-00	CC5
		Molybdenum (Mo)	4	1	mg/kg		15-AUG-00	CC5
		Sodium (Na)	100	100	mg/kg		15-AUG-00	CC5
		Nickel (Ni)	119	2	mg/kg		15-AUG-00	CC5
		Phosphorus (P)	290	10	mg/kg		15-AUG-00	CC5
		Lead (Pb)	14	5	mg/kg		15-AUG-00	CC5

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L14671-31	PSO-32-2300-01							
Sample Date	22-JUL-00							
Matrix:	SOIL							
		Metals (Strong Acid Rec.)						
		Tin (Sn)	<5	5	mg/kg		15-AUG-00	CC5
		Strontium (Sr)	19	1	mg/kg		15-AUG-00	CC5
		Titanium (Ti)	199	5	mg/kg		15-AUG-00	CC5
		Thallium (Tl)	<1	1	mg/kg		15-AUG-00	CC5
		Vanadium (V)	190	1	mg/kg		15-AUG-00	CC5
		Zinc (Zn)	102	0.5	mg/kg		15-AUG-00	CC5
L14671-32	PSO-35-2500-01							
Sample Date	22-JUL-00							
Matrix:	SOIL							
		Ammonia-N	<1	1	mg/kg		09-AUG-00	EK
		Antimony (Sb)	<0.1	0.1	mg/kg		15-AUG-00	CC5
		Arsenic (As)	41.7	0.1	mg/kg		15-AUG-00	CC5
		Mercury (Hg)	0.06	0.01	mg/kg		15-AUG-00	CC5
		Oil-Gravimetric	1700	100	mg/kg	04-AUG-00	08-AUG-00	ZW
		Sulphate (SO4)	386	2.5	mg/kg		23-AUG-00	JT
		pH	8.6	0.1	pH		08-AUG-00	RV
		Metals (Strong Acid Rec.)						
		Silver (Ag)	<1	1	mg/kg		15-AUG-00	CC5
		Aluminum (Al)	7480	10	mg/kg		15-AUG-00	CC5
		Barium (Ba)	261	0.5	mg/kg		15-AUG-00	CC5
		Beryllium (Be)	1	1	mg/kg		15-AUG-00	CC5
		Calcium (Ca)	17000	100	mg/kg		15-AUG-00	CC5
		Cadmium (Cd)	<0.5	0.5	mg/kg		15-AUG-00	CC5
		Cobalt (Co)	10	1	mg/kg		15-AUG-00	CC5
		Chromium (Cr)	49.8	0.5	mg/kg		15-AUG-00	CC5
		Copper (Cu)	39	1	mg/kg		15-AUG-00	CC5
		Iron (Fe)	22700	100	mg/kg		15-AUG-00	CC5
		Potassium (K)	3860	20	mg/kg		15-AUG-00	CC5
		Magnesium (Mg)	10500	10	mg/kg		15-AUG-00	CC5
		Manganese (Mn)	340	20	mg/kg		15-AUG-00	CC5
		Molybdenum (Mo)	<1	1	mg/kg		15-AUG-00	CC5
		Sodium (Na)	500	100	mg/kg		15-AUG-00	CC5
		Nickel (Ni)	32	2	mg/kg		15-AUG-00	CC5
		Phosphorus (P)	420	10	mg/kg		15-AUG-00	CC5
		Lead (Pb)	9	5	mg/kg		15-AUG-00	CC5
		Tin (Sn)	<5	5	mg/kg		15-AUG-00	CC5
		Strontium (Sr)	73	1	mg/kg		15-AUG-00	CC5
		Titanium (Ti)	508	5	mg/kg		15-AUG-00	CC5
		Thallium (Tl)	<1	1	mg/kg		15-AUG-00	CC5
		Vanadium (V)	47	1	mg/kg		15-AUG-00	CC5
		Zinc (Zn)	47.0	0.5	mg/kg		15-AUG-00	CC5
L14671-33	PSO-40-2500-01							
Sample Date	22-JUL-00							
Matrix:	SOIL							
		Water-Soluble Arsenic Species						
		Arsenic (As)	0.1	0.1	mg/L		22-SEP-00	JJ

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L14671-33	FSO-40-2500-01							
Sample Date	22-JUL-00							
Matrix:	SOIL							
		Ammonia-N	<1	1	mg/kg		09-AUG-00	EK
		Antimony (Sb)	<0.1	0.1	mg/kg		15-AUG-00	CC5
		Arsenic (As) 3+	4.5	0.1	mg/kg		22-SEP-00	JJ
		Arsenic (As) 5+	19.0	0.1	mg/kg		22-SEP-00	JJ
		Mercury (Hg)	0.04	0.01	mg/kg		15-AUG-00	CC5
		Oil-Gravimetric	<100	100	mg/kg	04-AUG-00	06-AUG-00	ZW
		Sulphate (SO4)	12	2.5	mg/kg		23-AUG-00	JZ
		pH	7.5	0.1	pH		08-AUG-00	RT
		Metals (Strong Acid Rec.)						
		Silver (Ag)	<1	1	mg/kg		15-AUG-00	CC5
		Aluminum (Al)	6530	10	mg/kg		15-AUG-00	CC5
		Barium (Ba)	111	0.5	mg/kg		15-AUG-00	CC5
		Beryllium (Be)	<1	1	mg/kg		15-AUG-00	CC5
		Calcium (Ca)	3300	100	mg/kg		15-AUG-00	CC5
		Cadmium (Cd)	<0.5	0.5	mg/kg		15-AUG-00	CC5
		Cobalt (Co)	13	1	mg/kg		15-AUG-00	CC5
		Chromium (Cr)	77.0	0.5	mg/kg		15-AUG-00	CC5
		Copper (Cu)	35	1	mg/kg		15-AUG-00	CC5
		Iron (Fe)	26000	100	mg/kg		15-AUG-00	CC5
		Potassium (K)	3430	20	mg/kg		15-AUG-00	CC5
		Magnesium (Mg)	10500	10	mg/kg		15-AUG-00	CC5
		Manganese (Mn)	230	20	mg/kg		15-AUG-00	CC5
		Molybdenum (Mo)	<1	1	mg/kg		15-AUG-00	CC5
		Sodium (Na)	300	100	mg/kg		15-AUG-00	CC5
		Nickel (Ni)	46	2	mg/kg		15-AUG-00	CC5
		Phosphorus (P)	430	10	mg/kg		15-AUG-00	CC5
		Lead (Pb)	7	5	mg/kg		15-AUG-00	CC5
		Tin (Sn)	<5	5	mg/kg		15-AUG-00	CC5
		Strontium (Sr)	17	1	mg/kg		15-AUG-00	CC5
		Titanium (Ti)	722	5	mg/kg		15-AUG-00	CC5
		Thallium (Tl)	<1	1	mg/kg		15-AUG-00	CC5
		Vanadium (V)	45	1	mg/kg		15-AUG-00	CC5
		Zinc (Zn)	56.4	0.5	mg/kg		15-AUG-00	CC5
		Arsenic (As)						
		Arsenic (As)	23.5	0.1	mg/kg		14-OCT-00	JJ
		Arsenic (As)	35.9	0.1	mg/kg		15-AUG-00	CC5
L14671-34	FSO-41-2500-01							
Sample Date	22-JUL-00							
Matrix:	SOIL							
		Ammonia-N	<1	1	mg/kg		09-AUG-00	EK
		Antimony (Sb)	0.2	0.1	mg/kg		15-AUG-00	CC5
		Arsenic (As)	71.7	0.1	mg/kg		15-AUG-00	CC5
		Mercury (Hg)	0.03	0.01	mg/kg		15-AUG-00	CC5
		Oil-Gravimetric	200	100	mg/kg	04-AUG-00	06-AUG-00	ZW
		Sulphate (SO4)	47	2.5	mg/kg		23-AUG-00	JZ
		pH	7.6	0.1	pH		08-AUG-00	RT
		Metals (Strong Acid Rec.)						

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L14871-34	PSO-41-2500-01							
Sample Date	22-JUL-00							
Matrix:	SOIL							
		Metals (Strong Acid Rec.)						
		Silver (Ag)	<1	1	mg/kg		15-AUG-00	CC5
		Aluminum (Al)	6970	10	mg/kg		15-AUG-00	CC5
		Barium (Ba)	123	0.5	mg/kg		15-AUG-00	CC5
		Beryllium (Be)	<1	1	mg/kg		15-AUG-00	CC5
		Calcium (Ca)	9800	100	mg/kg		15-AUG-00	CC5
		Cadmium (Cd)	<0.5	0.5	mg/kg		15-AUG-00	CC5
		Cobalt (Co)	21	1	mg/kg		15-AUG-00	CC5
		Chromium (Cr)	33.2	0.5	mg/kg		15-AUG-00	CC5
		Copper (Cu)	72	1	mg/kg		15-AUG-00	CC5
		Iron (Fe)	30100	100	mg/kg		15-AUG-00	CC5
		Potassium (K)	1860	20	mg/kg		15-AUG-00	CC5
		Magnesium (Mg)	10500	10	mg/kg		15-AUG-00	CC5
		Manganese (Mn)	390	20	mg/kg		15-AUG-00	CC5
		Molybdenum (Mo)	<1	1	mg/kg		15-AUG-00	CC5
		Sodium (Na)	400	100	mg/kg		15-AUG-00	CC5
		Nickel (Ni)	53	2	mg/kg		15-AUG-00	CC5
		Phosphorus (P)	350	10	mg/kg		15-AUG-00	CC5
		Lead (Pb)	13	5	mg/kg		15-AUG-00	C
		Tin (Sn)	<5	5	mg/kg		15-AUG-00	CC5
		Strontium (Sr)	15	[illegible]	mg/kg		15-AUG-00	CC5
		Titanium (Ti)	1080	5	mg/kg		15-AUG-00	CC5
		Thallium (Tl)	<1	[illegible]	mg/kg		15-AUG-00	CC5
		Vanadium (V)	67	[illegible]	mg/kg		15-AUG-00	CC5
		Zinc (Zn)	50.2	0.5	mg/kg		15-AUG-00	CC5
L14871-35	PSO-33-2500-01							
Sample Date	22-JUL-00							
Matrix:	SOIL							
		Ammonia-N	<1	1	mg/kg		09-AUG-00	FK
		Antimony (Sb)	<0.1	0.1	mg/kg		15-AUG-00	CC5
		Arsenic (As)	50.9	0.1	mg/kg		15-AUG-00	CC5
		Mercury (Hg)	0.03	0.01	mg/kg		15-AUG-00	CC5
		Cl-Gravimetric	300	100	mg/kg	04-AUG-00	08-AUG-00	ZW
		Sulphate (SO4)	121	2.5	mg/kg		23-AUG-00	JZ
		pH	5.8	0.1	pH		08-AUG-00	RT
		Metals (Strong Acid Rec.)						
		Silver (Ag)	<1	1	mg/kg		15-AUG-00	CC5
		Aluminum (Al)	5710	10	mg/kg		15-AUG-00	CC5
		Barium (Ba)	80.3	0.5	mg/kg		15-AUG-00	CC5
		Beryllium (Be)	<1	1	mg/kg		15-AUG-00	CC5
		Calcium (Ca)	2500	100	mg/kg		15-AUG-00	CC5
		Cadmium (Cd)	<0.5	0.5	mg/kg		15-AUG-00	CC5
		Cobalt (Co)	[illegible]	1	mg/kg		15-AUG-00	CC5
		Chromium (Cr)	38.4	0.5	mg/kg		15-AUG-00	C
		Copper (Cu)	16	1	mg/kg		15-AUG-00	CC5
		Iron (Fe)	14100	100	mg/kg		15-AUG-00	CC5
		Potassium (K)	1000	20	mg/kg		15-AUG-00	CC5
		Magnesium (Mg)	5210	10	mg/kg		15-AUG-00	CC5

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L14671-35	PSO-33-2500-01							
Sample Date	22-JUL-00							
Matrix:	SOIL							
		Metals (Strong Acid Rec.)						
		Manganese (Mn)	140	20	mg/kg		15-AUG-00	CC5
		Molybdenum (Mo)	<1	1	mg/kg		15-AUG-00	CC5
		Sodium (Na)	300	100	mg/kg		15-AUG-00	CC5
		Nickel (Ni)	22	2	mg/kg		15-AUG-00	CC5
		Phosphorus (P)	340	10	mg/kg		15-AUG-00	CC5
		Lead (Pb)	7	5	mg/kg		15-AUG-00	CC5
		Tin (Sn)	<5	5	mg/kg		15-AUG-00	CC5
		Strontium (Sr)	23	1	mg/kg		15-AUG-00	CC5
		Titanium (Ti)	593	5	mg/kg		15-AUG-00	CC5
		Thallium (Tl)	<1	1	mg/kg		15-AUG-00	CC5
		Vanadium (V)	30	1	mg/kg		15-AUG-00	CC5
		Zinc (Zn)	32.2	0.5	mg/kg		15-AUG-00	CC5
L14677-36	PSO-34-2500-01							
Sample Date	22-JUL-00							
Matrix:	SOIL							
		Ammonia-N	<1	1	mg/kg		09-AUG-00	EK
		Antimony (Sb)	0.2	0.1	mg/kg		15-AUG-00	CC5
		Arsenic (As)	71.6	0.1	mg/kg		15-AUG-00	CC5
		Mercury (Hg)	0.05	0.01	mg/kg		15-AUG-00	CC5
		Oil-Gravimetric	400	100	mg/kg	04-AUG-00	08-AUG-00	ZW
		Sulphate (SO4)	230	2.5	mg/kg		25-AUG-00	JZ
		pH	6.2	0.1	pH		08-AUG-00	RT
		Metals (Strong Acid Rec.)						
		Silver (Ag)	<1	1	mg/kg		15-AUG-00	CC5
		Aluminum (Al)	6570	10	mg/kg		15-AUG-00	CC5
		Barium (Ba)	134	0.5	mg/kg		15-AUG-00	CC5
		Beryllium (Be)	<1	1	mg/kg		15-AUG-00	CC5
		Calcium (Ca)	4100	100	mg/kg		15-AUG-00	CC5
		Cadmium (Cd)	<0.5	0.5	mg/kg		15-AUG-00	CC5
		Cobalt (Co)	9	1	mg/kg		15-AUG-00	CC5
		Chromium (Cr)	48.4	0.5	mg/kg		15-AUG-00	CC5
		Copper (Cu)	24	1	mg/kg		15-AUG-00	CC5
		Iron (Fe)	20100	100	mg/kg		15-AUG-00	CC5
		Potassium (K)	2940	20	mg/kg		15-AUG-00	CC5
		Magnesium (Mg)	6870	10	mg/kg		15-AUG-00	CC5
		Manganese (Mn)	270	20	mg/kg		15-AUG-00	CC5
		Molybdenum (Mo)	<1	1	mg/kg		15-AUG-00	CC5
		Sodium (Na)	400	100	mg/kg		15-AUG-00	CC5
		Nickel (Ni)	31	2	mg/kg		15-AUG-00	CC5
		Phosphorus (P)	470	10	mg/kg		15-AUG-00	CC5
		Lead (Pb)	12	5	mg/kg		15-AUG-00	CC5
		Tin (Sn)	<5	5	mg/kg		15-AUG-00	CC5
		Strontium (Sr)	33	1	mg/kg		15-AUG-00	CC5
		Titanium (Ti)	673	5	mg/kg		15-AUG-00	CC5
		Thallium (Tl)	<1	1	mg/kg		15-AUG-00	CC5
		Vanadium (V)	34	1	mg/kg		15-AUG-00	CC5
		Zinc (Zn)	50.4	0.5	mg/kg		15-AUG-00	CC5

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extraction	Analyzed	By
L14671-37	PSC-38-2500-01							
Sample Date	22-JUL-00							
Matrix:	SOIL							
		Water-Soluble Arsenic Species						
		Arsenic (As)	<0.1	0.1	mg/L		22-SEP-00	JJ
		Ammonia-N	<1	1	mg/kg		09-AUG-00	EK
		Antimony (Sb)	0.2	0.1	mg/kg		15-AUG-00	CC5
		Arsenic (As) 3+	26.7	0.1	mg/kg		22-SEP-00	JJ
		Arsenic (As) 5+	72.7	0.1	mg/kg		22-SEP-00	JJ
		Mercury (Hg)	0.09	0.01	mg/kg		15-AUG-00	CC5
		Oil Gravimetric	1100	100	mg/kg	04-AUG-00	08-AUG-00	ZW
		Sulphate (SO4)	400	2.5	mg/kg		23-AUG-00	JZ
		pH	6.9	0.1	pH		08-AUG-00	RT
		Metals (Strong Acid Rec.)						
		Silver (Ag)	<1	1	mg/kg		15-AUG-00	CC5
		Aluminum (Al)	6640	10	mg/kg		15-AUG-00	CC5
		Barium (Ba)	153	0.5	mg/kg		15-AUG-00	CC5
		Beryllium (Be)	<1	1	mg/kg		15-AUG-00	CC5
		Calcium (Ca)	6100	100	mg/kg		15-AUG-00	CC5
		Cadmium (Cd)	<0.5	0.5	mg/kg		15-AUG-00	CC5
		Cobalt (Co)	11	1	mg/kg		15-AUG-00	CC5
		Chromium (Cr)	53.9	0.5	mg/kg		15-AUG-00	CC5
		Copper (Cu)	28	1	mg/kg		15-AUG-00	CC5
		Iron (Fe)	21400	100	mg/kg		15-AUG-00	CC5
		Potassium (K)	3400	20	mg/kg		15-AUG-00	CC5
		Magnesium (Mg)	8040	10	mg/kg		15-AUG-00	CC5
		Manganese (Mn)	300	20	mg/kg		15-AUG-00	CC5
		Molybdenum (Mo)	<1	1	mg/kg		15-AUG-00	CC5
		Sodium (Na)	400	100	mg/kg		15-AUG-00	CC5
		Nickel (Ni)	36	2	mg/kg		15-AUG-00	CC5
		Phosphorus (P)	430	10	mg/kg		15-AUG-00	CC5
		Lead (Pb)	14	5	mg/kg		15-AUG-00	CC5
		Tin (Sn)	<5	5	mg/kg		15-AUG-00	CC5
		Strontium (Sr)	35	1	mg/kg		15-AUG-00	CC5
		Titanium (Ti)	639	5	mg/kg		15-AUG-00	CC5
		Thallium (Tl)	<1	1	mg/kg		15-AUG-00	CC5
		Vanadium (V)	42	1	mg/kg		15-AUG-00	CC5
		Zinc (Zn)	51.1	0.5	mg/kg		15-AUG-00	CC5
		Arsenic (As)						
		Arsenic (As)	99.4	0.1	mg/kg		14-OCT-00	JJ
		Arsenic (As)	189	0.1	mg/kg		15-AUG-00	CC5
L14671-38	PSC-34-2500-05A							
Sample Date	22-JUL-00							
Matrix	SOIL							
		Ammonia-N	<1	1	mg/kg		09-AUG-00	EK
		Antimony (Sb)	<0.1	0.1	mg/kg		15-AUG-00	CC5
		Arsenic (As)	35.4	0.1	mg/kg		15-AUG-00	CC5
		Mercury (Hg)	0.06	0.01	mg/kg		15-AUG-00	CC5
		Oil Gravimetric	500	100	mg/kg	04-AUG-00	08-AUG-00	ZW
		Sulphate (SO4)	252	2.5	mg/kg		25-AUG-00	JZ

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L14671-38	PSO-34-2500-01A							
Sample Date	22-JUL-00							
Matrix:	SOIL							
		pH	6.2	0.1	pH		03 AUG 00	RT
		Metals (Strong Acid Rec.)						
		Silver (Ag)	<1	1	mg/kg		15-AUG-00	CC5
		Aluminum (Al)	6390	10	mg/kg		15-AUG-00	CC5
		Barium (Ba)	131	0.5	mg/kg		15-AUG-00	CC5
		Beryllium (Be)	<1	1	mg/kg		15-AUG-00	CC5
		Calcium (Ca)	3700	100	mg/kg		15-AUG-00	CC5
		Cadmium (Cd)	<0.5	0.5	mg/kg		15-AUG-00	CC5
		Cobalt (Co)	8	1	mg/kg		15-AUG-00	CC5
		Chromium (Cr)	47.3	0.5	mg/kg		15-AUG-00	CC5
		Copper (Cu)	23	1	mg/kg		15-AUG-00	CC5
		Iron (Fe)	18500	100	mg/kg		15-AUG-00	CC5
		Potassium (K)	3140	20	mg/kg		15-AUG-00	CC5
		Magnesium (Mg)	5540	10	mg/kg		15-AUG-00	CC5
		Manganese (Mn)	240	20	mg/kg		15-AUG-00	CC5
		Molybdenum (Mo)	<1	1	mg/kg		15-AUG-00	CC5
		Sodium (Na)	400	100	mg/kg		15-AUG-00	CC5
		Nickel (Ni)	26	2	mg/kg		15-AUG-00	CC5
		Phosphorus (P)	440	10	mg/kg		15-AUG-00	CC5
		Lead (Pb)	8	5	mg/kg		15-AUG-00	CC5
		Tin (Sn)	<5	5	mg/kg		15-AUG-00	CC5
		Strontium (Sr)	34	1	mg/kg		15-AUG-00	CC5
		Titanium (Ti)	674	5	mg/kg		15-AUG-00	CC5
		Thallium (Tl)	<1	1	mg/kg		15-AUG-00	CC5
		Vanadium (V)	40	1	mg/kg		15-AUG-00	CC5
		Zinc (Zn)	42.1	0.5	mg/kg		15-AUG-00	CC5
L14671-39	OP-A1-SE-2100							
Sample Date	22-JUL-00							
Matrix:	SEDIMENT							
		Ammonia-N	<1	1	mg/kg		09-AUG-00	SK
		Antimony (Sb)	<0.1	0.1	mg/kg		15-AUG-00	CC5
		Arsenic (As)	101	0.1	mg/kg		15-AUG-00	CC5
		Mercury (Hg)	0.05	0.01	mg/kg		15-AUG-00	CC5
		Oil Gravimetric	200	100	mg/kg	04-AUG-00	05-AUG-00	ZW
		Sulphate (SO4)	258	2.5	mg/kg		23-AUG-00	JZ
		pH	7.1	0.1	pH		05-AUG-00	RT
		Metals (Strong Acid Rec.)						
		Silver (Ag)	<1	1	mg/kg		15-AUG-00	CC5
		Aluminum (Al)	6970	10	mg/kg		15-AUG-00	CC5
		Barium (Ba)	225	0.5	mg/kg		15-AUG-00	CC5
		Beryllium (Be)	<1	1	mg/kg		15-AUG-00	CC5
		Calcium (Ca)	5900	100	mg/kg		15-AUG-00	CC5
		Cadmium (Cd)	<0.5	0.5	mg/kg		15-AUG-00	CC5
		Cobalt (Co)	13	1	mg/kg		15-AUG-00	CC5
		Chromium (Cr)	56.7	0.5	mg/kg		15-AUG-00	CC5
		Copper (Cu)	31	1	mg/kg		15-AUG-00	CC5
		Iron (Fe)	25300	100	mg/kg		15-AUG-00	CC5
		Potassium (K)	3920	20	mg/kg		15-AUG-00	CC5

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L14671-39	OP-A1-SE-2100							
Sample Date	22-JUL-00							
Matrix:	SEDIMENT							
		Metals (Strong Acid Rec.)						
		Magnesium (Mg)	10100	10	mg/kg		15-AUG-00	CC5
		Manganese (Mn)	330	20	mg/kg		15-AUG-00	CC5
		Molybdenum (Mo)	<1	1	mg/kg		15-AUG-00	CC5
		Sodium (Na)	700	100	mg/kg		15-AUG-00	CC5
		Nickel (Ni)	38	2	mg/kg		15-AUG-00	CC5
		Phosphorus (P)	440	10	mg/kg		15-AUG-00	CC5
		Lead (Pb)	12	5	mg/kg		15-AUG-00	CC5
		Tin (Sn)	<5	5	mg/kg		15-AUG-00	CC5
		Strontium (Sr)	44	1	mg/kg		15-AUG-00	CC5
		Titanium (Ti)	715	5	mg/kg		15-AUG-00	CC5
		Thallium (Tl)	<1	1	mg/kg		15-AUG-00	CC5
		Vanadium (V)	50	1	mg/kg		15-AUG-00	CC5
		Zinc (Zn)	63.2	0.5	mg/kg		15-AUG-00	CC5
L14671-40	OP-B1-SE-01-2200							
Sample Date	22-JUL-00							
Matrix:	SEDIMENT							
		Ammonia-N	<1	1	mg/kg		09-AUG-00	EH
		Antimony (Sb)	2.4	0.1	mg/kg		15-AUG-00	CC5
		Arsenic (As)	1200	0.1	mg/kg		15-AUG-00	CC5
		Mercury (Hg)	0.05	0.01	mg/kg		15-AUG-00	CC5
		Oil-Gravimetric	100	100	mg/kg	04-AUG-00	08-AUG-00	ZW
		Sulphate (SO4)	239	2.5	mg/kg		23-AUG-00	JZ
		pH	7.5	0.1	pH		08-AUG-00	RT
		Metals (Strong Acid Rec.)						
		Silver (Ag)	<1	1	mg/kg		15-AUG-00	CC5
		Aluminum (Al)	5230	10	mg/kg		15-AUG-00	CC5
		Barium (Ba)	22.5	0.5	mg/kg		15-AUG-00	CC5
		Beryllium (Be)	<1	1	mg/kg		15-AUG-00	CC5
		Calcium (Ca)	33800	100	mg/kg		15-AUG-00	CC5
		Cadmium (Cd)	<0.5	0.5	mg/kg		15-AUG-00	CC5
		Cobalt (Co)	9	1	mg/kg		15-AUG-00	CC5
		Chromium (Cr)	33.0	0.5	mg/kg		15-AUG-00	CC5
		Copper (Cu)	28	1	mg/kg		15-AUG-00	CC5
		Iron (Fe)	25800	100	mg/kg		15-AUG-00	CC5
		Potassium (K)	900	20	mg/kg		15-AUG-00	CC5
		Magnesium (Mg)	16700	10	mg/kg		15-AUG-00	CC5
		Manganese (Mn)	800	20	mg/kg		15-AUG-00	CC5
		Molybdenum (Mo)	<1	1	mg/kg		15-AUG-00	CC5
		Sodium (Na)	200	100	mg/kg		15-AUG-00	CC5
		Nickel (Ni)	27	2	mg/kg		15-AUG-00	CC5
		Phosphorus (P)	280	10	mg/kg		15-AUG-00	CC5
		Lead (Pb)	59	5	mg/kg		15-AUG-00	CC5
		Tin (Sn)	<5	5	mg/kg		15-AUG-00	CC5
		Strontium (Sr)	26	1	mg/kg		15-AUG-00	CC5
		Titanium (Ti)	120	5	mg/kg		15-AUG-00	CC5
		Thallium (Tl)	<1	1	mg/kg		15-AUG-00	CC5
		Vanadium (V)	35	1	mg/kg		15-AUG-00	CC5

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L14671-40	OP B1-SE 01 2200							
Sample Date	22-JUL-00							
Matrix:	SEDIMENT							
		Metals (Strong Acid Rec.)						
		Zinc (Zn)	80.0	0.5	mg/kg		15-AUG-00	CC5
L14671-41	SE-OPB2-01-2300							
Sample Date	22-JUL-00							
Matrix:	SEDIMENT							
		Ammonia-N	<1	1	mg/kg		09-AUG-00	EK
		Antimony (Sb)	11.2	0.1	mg/kg		15-AUG-00	CC5
		Arsenic (As)	2070	0.1	mg/kg		15-AUG-00	CC5
		Mercury (Hg)	0.05	0.01	mg/kg		15-AUG-00	CC5
		Oil-Gravimetric	<100	100	mg/kg	09-AUG-00	09-AUG-00	ZW
		Sulphate (SO4)	1900	2.5	mg/kg		23-AUG-00	JZ
		pH	7.7	0.1	pH		08-AUG-00	RT
		Metals (Strong Acid Rec.)						
		Silver (Ag)	<1	1	mg/kg		15-AUG-00	CC5
		Aluminum (Al)	4890	10	mg/kg		15-AUG-00	CC5
		Barium (Ba)	16.8	0.5	mg/kg		15-AUG-00	CC5
		Beryllium (Be)	<1	1	mg/kg		15-AUG-00	CC5
		Calcium (Ca)	40800	100	mg/kg		15-AUG-00	CC5
		Cadmium (Cd)	1.9	0.5	mg/kg		15-AUG-00	CC5
		Cobalt (Co)	24	1	mg/kg		15-AUG-00	CC5
		Chromium (Cr)	39.3	0.5	mg/kg		15-AUG-00	CC5
		Copper (Cu)	85	1	mg/kg		15-AUG-00	CC5
		Iron (Fe)	35300	100	mg/kg		15-AUG-00	CC5
		Potassium (K)	1510	20	mg/kg		15-AUG-00	CC5
		Magnesium (Mg)	17500	10	mg/kg		15-AUG-00	CC5
		Manganese (Mn)	790	20	mg/kg		15-AUG-00	CC5
		Molybdenum (Mo)	<1	1	mg/kg		15-AUG-00	CC5
		Sodium (Na)	200	100	mg/kg		15-AUG-00	CC5
		Nickel (Ni)	56	2	mg/kg		15-AUG-00	CC5
		Phosphorus (P)	240	10	mg/kg		15-AUG-00	CC5
		Lead (Pb)	240	5	mg/kg		15-AUG-00	CC5
		Tin (Sn)	<5	5	mg/kg		15-AUG-00	CC5
		Strontium (Sr)	23	1	mg/kg		15-AUG-00	CC5
		Titanium (Ti)	135	5	mg/kg		15-AUG-00	CC5
		Thallium (Tl)	<1	1	mg/kg		15-AUG-00	CC5
		Vanadium (V)	43	1	mg/kg		15-AUG-00	CC5
		Zinc (Zn)	337	0.5	mg/kg		15-AUG-00	CC5
L14671-44	P-SO-13-2000-07							
Sample Date	22-JUL-00							
Matrix:	SEDIMENT							
		Water-Soluble Arsenic Species						
		Arsenic (As)	5.5	0.1	mg/L		22-SEP-00	[illegible]
		Ammonia-N	<1	1	mg/kg		09-AUG-00	EK
		Antimony (Sb)	13.0	0.1	mg/kg		15-AUG-00	CC5
		Arsenic (As) 3+	233	0.1	mg/kg		22-SEP-00	[illegible]
		Arsenic (As) 5+	370	0.1	mg/kg		22-SEP-00	[illegible]

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L14871-44	P-SO-13-2500-01							
Sample Date	22-JUL-00							
Matrix	SEDIMENT							
		Mercury (Hg)	0.16	0.01	mg/kg		15-AUG-00	CC5
		Oil-Gravimetric	800	100	mg/kg	04-AUG-00	08-AUG-00	ZW
		Sulphate (SO4)	888	2.5	mg/kg		23-AUG-00	JZ
		pH	7.8	0.1	pH		08-AUG-00	RT
		Metals (Strong Acid Rec.)						
		Silver (Ag)	<1	1	mg/kg		15-AUG-00	CC5
		Aluminum (Al)	6920	10	mg/kg		15-AUG-00	CC5
		Barium (Ba)	49.3	0.5	mg/kg		15-AUG-00	CC5
		Beryllium (Be)	<1	1	mg/kg		15-AUG-00	CC5
		Calcium (Ca)	28800	100	mg/kg		15-AUG-00	CC5
		Cadmium (Cd)	3.9	0.5	mg/kg		15-AUG-00	CC5
		Cobalt (Co)	42	1	mg/kg		15-AUG-00	CC5
		Chromium (Cr)	79.0	0.5	mg/kg		15-AUG-00	CC5
		Copper (Cu)	115	1	mg/kg		15-AUG-00	CC5
		Iron (Fe)	44800	100	mg/kg		15-AUG-00	CC5
		Potassium (K)	1560	20	mg/kg		15-AUG-00	CC5
		Magnesium (Mg)	19100	10	mg/kg		15-AUG-00	CC5
		Manganese (Mn)	710	20	mg/kg		15-AUG-00	CC5
		Molybdenum (Mo)	2	1	mg/kg		15-AUG-00	CC5
		Sodium (Na)	300	100	mg/kg		15-AUG-00	CC5
		Nickel (Ni)	78	2	mg/kg		15-AUG-00	CC5
		Phosphorus (P)	360	10	mg/kg		15-AUG-00	CC5
		Lead (Pb)	110	5	mg/kg		15-AUG-00	CC5
		Tin (Sn)	<5	5	mg/kg		15-AUG-00	CC5
		Strontium (Sr)	24	1	mg/kg		15-AUG-00	CC5
		Titanium (Ti)	457	5	mg/kg		15-AUG-00	CC5
		Thallium (Tl)	<1	1	mg/kg		15-AUG-00	CC5
		Vanadium (V)	80	1	mg/kg		15-AUG-00	CC5
		Zinc (Zn)	155	0.5	mg/kg		15-AUG-00	CC5
		Arsenic (As)						
		Arsenic (As)	803	0.1	mg/kg		22-SEP-00	JJ
		Arsenic (As)	1970	0.1	mg/kg		15-AUG-00	CC5
L14871-45	HWD-01-2507							
Sample Date	22-JUL-00							
Matrix	SEDIMENT							
		Metals (Strong Acid Rec.)						
		Silver (Ag)	2	1	mg/kg		09-AUG-00	MD
		Aluminum (Al)	12400	10	mg/kg		09-AUG-00	MD
		Barium (Ba)	13.4	0.5	mg/kg		09-AUG-00	MD
		Beryllium (Be)	1	1	mg/kg		09-AUG-00	MD
		Calcium (Ca)	84900	100	mg/kg		09-AUG-00	MD
		Cadmium (Cd)	8.1	0.5	mg/kg		09-AUG-00	MD
		Cobalt (Co)	109	1	mg/kg		09-AUG-00	MD
		Chromium (Cr)	51.4	0.5	mg/kg		09-AUG-00	MD
		Copper (Cu)	392	1	mg/kg		09-AUG-00	MD
		Iron (Fe)	53400	100	mg/kg		09-AUG-00	MD
		Potassium (K)	1950	20	mg/kg		09-AUG-00	MD
		Magnesium (Mg)	12200	10	mg/kg		09-AUG-00	MD
		Manganese (Mn)	1180	20	mg/kg		09-AUG-00	MD

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L14671-46	HWD-01-2507							
Sample Date	22-JUL-00							
Matrix:	SEDIMENT							
		Metals (Strong Acid Rec.)						
		Molybdenum (Mo)	4	1	mg/kg		09-AUG-00	MD
		Sodium (Na)	3300	100	mg/kg		09-AUG-00	MD
		Nickel (Ni)	252	2	mg/kg		09-AUG-00	MD
		Phosphorus (P)	30	10	mg/kg		09-AUG-00	MD
		Lead (Pb)	1050	5	mg/kg		09-AUG-00	MD
		Tin (Sn)	<5	5	mg/kg		09-AUG-00	MD
		Strontium (Sr)	134	1	mg/kg		09-AUG-00	MD
		Titanium (Ti)	12	5	mg/kg		09-AUG-00	MD
		Thallium (Tl)	<1	1	mg/kg		09-AUG-00	MD
		Vanadium (V)	28	1	mg/kg		09-AUG-00	MD
		Zinc (Zn)	1240	0.5	mg/kg		09-AUG-00	MD
		Bulk Asbestos Content						
		Chrysotile		1	%		09-AUG-00	ALK
		Amosite		1	%		09-AUG-00	ALK
		Tremolite		1	%		09-AUG-00	ALK
		Crocidolite		1	%		09-AUG-00	ALK
		Anthophyllite		1	%		09-AUG-00	ALK
		Actinolite		1	%		09-AUG-00	ALK
		N.D.	<1@MMVF, ORG	1	%		09-AUG-00	ALK
L14671-47	HWD-02-2507							
Sample Date	22-JUL-00							
Matrix:	SEDIMENT							
		Metals (Strong Acid Rec.)						
		Silver (Ag)	<1	1	mg/kg		09-AUG-00	MD
		Aluminum (Al)	890	10	mg/kg		09-AUG-00	MD
		Barium (Ba)	60.1	0.5	mg/kg		09-AUG-00	MD
		Beryllium (Be)	<1	1	mg/kg		09-AUG-00	MD
		Calcium (Ca)	407000	100	mg/kg		09-AUG-00	MD
		Cadmium (Cd)	<0.5	0.5	mg/kg		09-AUG-00	MD
		Cobalt (Co)	3	1	mg/kg		09-AUG-00	MD
		Chromium (Cr)	6.9	0.5	mg/kg		09-AUG-00	MD
		Copper (Cu)	63	1	mg/kg		09-AUG-00	MD
		Iron (Fe)	1000	100	mg/kg		10-AUG-00	MD
		Potassium (K)	550	20	mg/kg		09-AUG-00	MD
		Magnesium (Mg)	4970	10	mg/kg		09-AUG-00	MD
		Manganese (Mn)	40	20	mg/kg		09-AUG-00	MD
		Molybdenum (Mo)	<1	1	mg/kg		09-AUG-00	MD
		Nickel (Ni)	12	2	mg/kg		09-AUG-00	MD
		Phosphorus (P)	90	10	mg/kg		09-AUG-00	MD
		Lead (Pb)	<5	5	mg/kg		09-AUG-00	MD
		Tin (Sn)	<5	5	mg/kg		09-AUG-00	MD
		Strontium (Sr)	96	1	mg/kg		09-AUG-00	MD
		Titanium (Ti)	36	5	mg/kg		09-AUG-00	MD
		Thallium (Tl)	<1	1	mg/kg		09-AUG-00	MD
		Vanadium (V)	4	1	mg/kg		09-AUG-00	MD
		Zinc (Zn)	34.8	0.5	mg/kg		09-AUG-00	MD

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L14671-46	HWD-03-2507							
Sample Date	22-JUL-00							
Matrix:	SEDIMENT							
		Arsenic (As)	1730	0.1	mg/kg		09-AUG-00	MD
		Metals (Strong Acid Rec.)						
		Silver (Ag)	<1	1	mg/kg		09-AUG-00	MD
		Aluminum (Al)	110	10	mg/kg		09-AUG-00	MD
		Barium (Ba)	1.6	0.5	mg/kg		09-AUG-00	MD
		Beryllium (Be)	<1	1	mg/kg		09-AUG-00	MD
		Calcium (Ca)	230	100	mg/kg		10-AUG-00	MD
		Cadmium (Cd)	<0.5	0.5	mg/kg		09-AUG-00	MD
		Cobalt (Co)	2	1	mg/kg		09-AUG-00	MD
		Chromium (Cr)	1.2	0.5	mg/kg		09-AUG-00	MD
		Copper (Cu)	487	1	mg/kg		09-AUG-00	MD
		Iron (Fe)	5100	100	mg/kg		09-AUG-00	MD
		Potassium (K)	400	20	mg/kg		09-AUG-00	MD
		Magnesium (Mg)	370	10	mg/kg		09-AUG-00	MD
		Manganese (Mn)	30	20	mg/kg		09-AUG-00	MD
		Molybdenum (Mo)	1	1	mg/kg		09-AUG-00	MD
		Sodium (Na)	362000	100	mg/kg		10-AUG-00	MD
		Nickel (Ni)	4	2	mg/kg		09-AUG-00	MD
		Phosphorus (P)	40	10	mg/kg		09-AUG-00	MD
		Lead (Pb)	6	5	mg/kg		09-AUG-00	MD
		Tin (Sn)	<5	5	mg/kg		09-AUG-00	MD
		Strontium (Sr)	2	1	mg/kg		09-AUG-00	MD
		Titanium (Ti)	10	5	mg/kg		09-AUG-00	MD
		Thallium (Tl)	<1	1	mg/kg		09-AUG-00	MD
		Vanadium (V)	3	1	mg/kg		09-AUG-00	MD
		Zinc (Zn)	15.9	0.5	mg/kg		09-AUG-00	MD
L14671-49	PS022-02							
Sample Date	22-JUL-00							
Matrix:	SEDIMENT							
		Antimony (Sb)	0.2	0.1	mg/kg		17-SEP-00	CC5
		Sulphate (SO4)	56	3	mg/kg		18-SEP-00	JZ
		Sulphide	40	20	mg/kg		22-SEP-00	TBL
		pH	[illegible]	0.1	pH		16-SEP-00	RT
		Metals (Strong Acid Rec.)						
		Silver (Ag)	<1	1	mg/kg		17-SEP-00	CC5
		Aluminum (Al)	24200	10	mg/kg		17-SEP-00	CC5
		Barium (Ba)	184	0.5	mg/kg		17-SEP-00	CC5
		Beryllium (Be)	<1	1	mg/kg		17-SEP-00	CC5
		Calcium (Ca)	5600	100	mg/kg		17-SEP-00	CC5
		Cadmium (Cd)	<0.5	0.5	mg/kg		17-SEP-00	CC5
		Cobalt (Co)	10	1	mg/kg		17-SEP-00	CC5
		Chromium (Cr)	49.6	0.5	mg/kg		17-SEP-00	CC5
		Copper (Cu)	27	1	mg/kg		17-SEP-00	CC5
		Iron (Fe)	26200	100	mg/kg		17-SEP-00	[illegible]
		Potassium (K)	5250	20	mg/kg		17-SEP-00	CC5
		Magnesium (Mg)	8320	10	mg/kg		17-SEP-00	CC5
		Manganese (Mn)	250	20	mg/kg		17-SEP-00	CC5
		Molybdenum (Mo)	<1	1	mg/kg		17-SEP-00	CC5
		Sodium (Na)	400	100	mg/kg		17-SEP-00	CC5

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L14671-49	PS022-02							
Sample Date	22-JUL-00							
Matrix:	SEDIMENT							
		Metals (Strong Acid Rec.)						
		Nickel (Ni)	23	2	mg/kg		17-SEP-00	CC5
		Phosphorus (P)	350	10	mg/kg		17-SEP-00	CC5
		Lead (Pb)	13	5	mg/kg		17-SEP-00	CC5
		Tin (Sn)	<5	5	mg/kg		17-SEP-00	CC5
		Strontium (Sr)	54	1	mg/kg		17-SEP-00	CC5
		Titanium (Ti)	749	5	mg/kg		17-SEP-00	CC5
		Thallium (Tl)	<1	1	mg/kg		17-SEP-00	CC5
		Vanadium (V)	53	1	mg/kg		17-SEP-00	CC5
		Zinc (Zn)	43.1	0.5	mg/kg		17-SEP-00	CC5
		Arsenic (As)						
		Arsenic (As)	110	0.1	mg/kg		17-SEP-00	CC5
L14671-50	PS023-01							
Sample Date	22-JUL-00							
Matrix:	SEDIMENT							
		Antimony (Sb)	<0.1	0.1	mg/kg		17-SEP-00	CC5
		Sulphate (SO4)	31	3	mg/kg		18-SEP-00	JZ
		Sulphide	30	20	mg/kg		22-SEP-00	TBL
		pH	8.3	0.1	pH		18-SEP-00	KI
		Metals (Strong Acid Rec.)						
		Silver (Ag)	<1	1	mg/kg		17-SEP-00	CC5
		Aluminum (Al)	28600	10	mg/kg		17-SEP-00	CC5
		Barium (Ba)	258	0.5	mg/kg		17-SEP-00	CC5
		Beryllium (Be)	<1	1	mg/kg		17-SEP-00	CC5
		Calcium (Ca)	6800	100	mg/kg		17-SEP-00	CC5
		Cadmium (Cd)	<0.5	0.5	mg/kg		17-SEP-00	CC5
		Cobalt (Co)	14	1	mg/kg		17-SEP-00	CC5
		Chromium (Cr)	50.0	0.5	mg/kg		17-SEP-00	CC5
		Copper (Cu)	36	1	mg/kg		17-SEP-00	CC5
		Iron (Fe)	30400	100	mg/kg		17-SEP-00	CC5
		Potassium (K)	5110	20	mg/kg		17-SEP-00	CC5
		Magnesium (Mg)	12500	10	mg/kg		17-SEP-00	CC5
		Manganese (Mn)	440	20	mg/kg		17-SEP-00	CC5
		Molybdenum (Mo)	<1	1	mg/kg		17-SEP-00	CC5
		Sodium (Na)	800	100	mg/kg		17-SEP-00	CC5
		Nickel (Ni)	37	2	mg/kg		17-SEP-00	CC5
		Phosphorus (P)	480	10	mg/kg		17-SEP-00	CC5
		Lead (Pb)	10	5	mg/kg		17-SEP-00	CC5
		Tin (Sn)	<5	5	mg/kg		17-SEP-00	CC5
		Strontium (Sr)	46	1	mg/kg		17-SEP-00	CC5
		Titanium (Ti)	763	5	mg/kg		17-SEP-00	CC5
		Thallium (Tl)	<1	1	mg/kg		17-SEP-00	CC5
		Vanadium (V)	59	1	mg/kg		17-SEP-00	CC5
		Zinc (Zn)	57.0	0.5	mg/kg		17-SEP-00	CC5
		Arsenic (As)						
		Arsenic (As)	36.1	0.1	mg/kg		17-SEP-00	CC5

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L14671-51	PS024-01							
Sample Date	22-JUL-00							
Matrix:	SEDIMENT							
		Water-Soluble Arsenic Species						
		Arsenic (As)	0.7	0.1	mg/L		30-OCT-00	JJ
		Antimony (Sb)	1.5	0.1	mg/kg		17-SEP-00	CC5
		Sulphate (SO4)	533	3	mg/kg		18-SEP-00	JZ
		Sulphide	<20	20	mg/kg		22-SEP-00	TBL
		pH	8.1	0.1	pH		19-SEP-00	RT
		Metals (Strong Acid Rec.)						
		Silver (Ag)	<1	1	mg/kg		17-SEP-00	CC5
		Aluminum (Al)	35700	10	mg/kg		17-SEP-00	CC5
		Barium (Ba)	23.6	0.5	mg/kg		17-SEP-00	CC5
		Beryllium (Be)	<1	1	mg/kg		17-SEP-00	CC5
		Calcium (Ca)	63200	100	mg/kg		17-SEP-00	CC5
		Cadmium (Cd)	1.5	0.5	mg/kg		17-SEP-00	CC5
		Cobalt (Co)	56	1	mg/kg		17-SEP-00	CC5
		Chromium (Cr)	76.1	0.5	mg/kg		17-SEP-00	CC5
		Copper (Cu)	84	1	mg/kg		17-SEP-00	CC5
		Iron (Fe)	74200	100	mg/kg		17-SEP-00	CC5
		Potassium (K)	900	20	mg/kg		17-SEP-00	CC5
		Magnesium (Mg)	25100	10	mg/kg		17-SEP-00	CC5
		Manganese (Mn)	1310	20	mg/kg		17-SEP-00	CC5
		Molybdenum (Mo)	<1	1	mg/kg		17-SEP-00	CC5
		Sodium (Na)	900	100	mg/kg		17-SEP-00	CC5
		Nickel (Ni)	92	2	mg/kg		17-SEP-00	CC5
		Phosphorus (P)	330	10	mg/kg		17-SEP-00	CC5
		Lead (Pb)	138	5	mg/kg		17-SEP-00	CC5
		Tin (Sn)	<5	5	mg/kg		17-SEP-00	CC5
		Strontium (Sr)	48	1	mg/kg		17-SEP-00	CC5
		Titanium (Ti)	101	1	mg/kg		17-SEP-00	CC5
		Thallium (Tl)	<1	1	mg/kg		17-SEP-00	CC5
		Vanadium (V)	107	1	mg/kg		17-SEP-00	CC5
		Zinc (Zn)	200	0.5	mg/kg		17-SEP-00	CC5
		Arsenic (As)						
		Arsenic (As)	3200	0.3	mg/kg		17-SEP-00	CC5
L14671-52	PS025-01							
Sample Date	22-JUL-00							
Matrix:	SEDIMENT							
		Antimony (Sb)	17.7	0.1	mg/kg		17-SEP-00	CC5
		Sulphate (SO4)	1520	3	mg/kg		18-SEP-00	JZ
		Sulphide	40	20	mg/kg		22-SEP-00	TBL
		pH	7.5	0.1	pH		19-SEP-00	RT
		Metals (Strong Acid Rec.)						
		Silver (Ag)	<1	1	mg/kg		17-SEP-00	CC5
		Aluminum (Al)	24700	10	mg/kg		17-SEP-00	CC5
		Barium (Ba)	26.6	0.5	mg/kg		17-SEP-00	CC5
		Beryllium (Be)	<1	1	mg/kg		17-SEP-00	CC5
		Calcium (Ca)	36800	100	mg/kg		17-SEP-00	CC5
		Cadmium (Cd)	1.2	0.5	mg/kg		17-SEP-00	CC5
		Cobalt (Co)	49	1	mg/kg		17-SEP-00	CC5

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L14671-52	PS025-01							
Sample Date: 22-JUL-00								
Matrix:	SEDIMENT							
		Metals (Strong Acid Rec.)						
		Chromium (Cr)	58.7	0.5	mg/kg		17-SEP-00	CC5
		Copper (Cu)	98	1	mg/kg		17-SEP-00	CC5
		Iron (Fe)	61400	100	mg/kg		17-SEP-00	CC5
		Potassium (K)	1450	20	mg/kg		17-SEP-00	CC5
		Magnesium (Mg)	19100	10	mg/kg		17-SEP-00	CC5
		Manganese (Mn)	800	20	mg/kg		17-SEP-00	CC5
		Molybdenum (Mo)	1	1	mg/kg		17-SEP-00	CC5
		Sodium (Na)	200	100	mg/kg		17-SEP-00	CC5
		Nickel (Ni)	77	2	mg/kg		17-SEP-00	CC5
		Phosphorus (P)	850	10	mg/kg		17-SEP-00	CC5
		Lead (Pb)	171	5	mg/kg		17-SEP-00	CC5
		Tin (Sn)	<5	5	mg/kg		17-SEP-00	CC5
		Strontium (Sr)	34	1	mg/kg		17-SEP-00	CC5
		Titanium (Ti)	258	5	mg/kg		17-SEP-00	CC5
		Thallium (Tl)	<1	1	mg/kg		17-SEP-00	CC5
		Vanadium (V)	90	1	mg/kg		17-SEP-00	CC5
		Zinc (Zn)	227	0.5	mg/kg		17-SEP-00	CC5
		Arsenic (As)						
		Arsenic (As)	3700	0.1	mg/kg		17-SEP-00	CC5
L14671-53	PS026-01							
Sample Date: 22-JUL-00								
Matrix:	SEDIMENT							
		Antimony (Sb)	3.7	0.1	mg/kg		17-SEP-00	CC5
		Sulphate (SO4)	61	3	mg/kg		15-SEP-00	JZ
		Sulphide	50	20	mg/kg		22-SEP-00	TBL
		pH	7.5	0.1	pH		18-SEP-00	RT
		Metals (Strong Acid Rec.)						
		Silver (Ag)	<1	1	mg/kg		17-SEP-00	CC5
		Aluminum (Al)	10700	10	mg/kg		17-SEP-00	CC5
		Barium (Ba)	123	0.5	mg/kg		17-SEP-00	CC5
		Beryllium (Be)	<1	1	mg/kg		17-SEP-00	CC5
		Calcium (Ca)	35600	100	mg/kg		17-SEP-00	CC5
		Cadmium (Cd)	<0.5	0.5	mg/kg		17-SEP-00	CC5
		Cobalt (Co)	14	1	mg/kg		17-SEP-00	CC5
		Chromium (Cr)	32.6	0.5	mg/kg		17-SEP-00	CC5
		Copper (Cu)	41	1	mg/kg		17-SEP-00	CC5
		Iron (Fe)	18200	100	mg/kg		17-SEP-00	CC5
		Potassium (K)	1460	20	mg/kg		17-SEP-00	CC5
		Magnesium (Mg)	7370	10	mg/kg		17-SEP-00	CC5
		Manganese (Mn)	340	20	mg/kg		17-SEP-00	CC5
		Molybdenum (Mo)	2	1	mg/kg		17-SEP-00	CC5
		Sodium (Na)	500	100	mg/kg		17-SEP-00	CC5
		Nickel (Ni)	30	2	mg/kg		17-SEP-00	CC5
		Phosphorus (P)	710	10	mg/kg		17-SEP-00	CC5
		Lead (Pb)	30	5	mg/kg		17-SEP-00	CC5
		Tin (Sn)	<5	5	mg/kg		17-SEP-00	CC5
		Strontium (Sr)	69	1	mg/kg		17-SEP-00	CC5
		Titanium (Ti)	215	5	mg/kg		17-SEP-00	CC5

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L14671-53	PS026-01							
Sample Date	22-JUL-00							
Matrix:	SEDIMENT							
		Metals (Strong Acid Rec.)						
		Thallium (Tl)	<1	1	mg/kg		17-SEP-00	CC5
		Vanadium (V)	29	1	mg/kg		17-SEP-00	CC5
		Zinc (Zn)	62.7	0.5	mg/kg		17-SEP-00	CC5
		Arsenic (As)						
		Arsenic (As)	573	0.1	mg/kg		17-SEP-00	CC5
L14671-54	PS027-01							
Sample Date	22-JUL-00							
Matrix:	SEDIMENT							
		Water-Soluble Arsenic Species						
		Arsenic (As)	4.5	0.1	mg/L		30-OCT-00	JJ
		Antimony (Sb)	25.3	0.1	mg/kg		17-SEP-00	CC5
		Sulphate (SO4)	108	5	mg/kg		18-SEP-00	JZ
		Sulphide	30	20	mg/kg		22-SEP-00	TBL
		pH	8.1	0.1	pH		18-SEP-00	RT
		Metals (Strong Acid Rec.)						
		Silver (Ag)	<1	1	mg/kg		17-SEP-00	C
		Aluminum (Al)	29500	10	mg/kg		17-SEP-00	CC5
		Barium (Ba)	11.4	0.5	mg/kg		17-SEP-00	CC5
		Beryllium (Be)	<1	1	mg/kg		17-SEP-00	CC5
		Calcium (Ca)	48700	100	mg/kg		17-SEP-00	CC5
		Cadmium (Cd)	1.8	0.5	mg/kg		17-SEP-00	CC5
		Cobalt (Co)	32	1	mg/kg		17-SEP-00	CC5
		Chromium (Cr)	78.4	0.5	mg/kg		17-SEP-00	CC5
		Copper (Cu)	116	1	mg/kg		17-SEP-00	CC5
		Iron (Fe)	79400	100	mg/kg		17-SEP-00	CC5
		Potassium (K)	450	20	mg/kg		17-SEP-00	CC5
		Magnesium (Mg)	24100	10	mg/kg		17-SEP-00	CC5
		Manganese (Mn)	1030	20	mg/kg		17-SEP-00	CC5
		Molybdenum (Mo)	1	1	mg/kg		17-SEP-00	CC5
		Sodium (Na)	280	100	mg/kg		17-SEP-00	CC5
		Nickel (Ni)	101	2	mg/kg		17-SEP-00	CC5
		Phosphorus (P)	250	10	mg/kg		17-SEP-00	CC5
		Lead (Pb)	341	5	mg/kg		17-SEP-00	CC5
		Tin (Sn)	<5	5	mg/kg		17-SEP-00	CC5
		Strontium (Sr)	40	1	mg/kg		17-SEP-00	CC5
		Titanium (Ti)	144	5	mg/kg		17-SEP-00	CC5
		Thallium (Tl)	<1	1	mg/kg		17-SEP-00	CC5
		Vanadium (V)	120	1	mg/kg		17-SEP-00	CC5
		Zinc (Zn)	365	0.5	mg/kg		17-SEP-00	CC5
		Arsenic (As)						
		Arsenic (As)	6380	0.1	mg/kg		17-SEP-00	CC5

Methodology Reference

ETL Test Code	Test Description	Methodology Reference (Based On)
AS-AS3-ED	Arsenic (As) 3+	APHA 3114 C-AAS - Hydride
AS-AS3-SOL-ED	Water-Soluble Arsenic(III)	Birkholz et al + APHA 3114 C-(HGAAS)
AS-AS5-ED	Arsenic (As) 5+	APHA 3114 C-AAS - Hydride
AS-AS5-SOL-ED	Water-Soluble Arsenic(V)	Birkholz et al + APHA 3114 C-(HGAAS)
AS-HYD-ED	Arsenic (As)	APHA 3114 C-AAS - Hydride
AS-SOL-ED	Total Water-Soluble Arsenic	Birkholz et al + APHA 3114 C-(HGAAS)
ASBESTOS-ED	Bulk Asbestos Content	NIOSH 9002-Polarized Microscopy
HG-HYD-ED	Mercury (Hg)	APHA 3112 B-AAS Cold Vapor
METAL-EXD-ED	Metals (Strong Acid Rec.)	SW 846 - 3051/6010-ICP-OES
NH4-ED	Ammonia-N	APHA 4500 NH3F-Colorimetry
OGG-ED	Oil and Grease-Gravimetric	APHA 5520 D-Soxhlet Extr. Gravimetri
PH-1:1-ED	pH	C. CSSS 16.3-Electrode on 1:1 extr.
SB-HYD-ED	Antimony (Sb)	APHA 3114 C-AAS-Hydride
SO4-ED	Sulfate (SO4)	APHA 4110 B-Ion Chromatography
SPECIAL-REQ-IN-ED	Special Request Inorganics EDM	----
SULPHIDE-AP	Sulphide	Alb. Env.
SULPHIDE-TB	Sulphide	EPA 9030B

ENVIRO-TEST QC REPORT

Workorder: L14671

QC Type: BLANK

Lab QC Number:		Result	Qualifier	Units	Limit	Analyzed
WG16136-1						
METAL-EXD-ED	Silver (Ag)	<1		mg/kg	5	15-AUG-00
	Aluminum (Al)	20		mg/kg	50	15-AUG-00
	Barium (Ba)	<0.5		mg/kg	2.5	15-AUG-00
	Beryllium (Be)	<1		mg/kg	5	15-AUG-00
	Calcium (Ca)	<100		mg/kg	500	15-AUG-00
	Cadmium (Cd)	<0.5		mg/kg	2.5	15-AUG-00
	Cobalt (Co)	<1		mg/kg	5	15-AUG-00
	Chromium (Cr)	<0.5		mg/kg	2.5	15-AUG-00
	Copper (Cu)	3		mg/kg	5	15-AUG-00
	Iron (Fe)	<100		mg/kg	500	15-AUG-00
	Potassium (K)	<20		mg/kg	100	15-AUG-00
	Magnesium (Mg)	<10		mg/kg	50	15-AUG-00
	Magnesium (Mg)	<10		mg/kg	50	15-AUG-00
	Manganese (Mn)	<20		mg/kg	100	15-AUG-00
	Molybdenum (Mo)	<1		mg/kg	5	15-AUG-00
	Sodium (Na)	<100		mg/kg	500	15-AUG-00
	Nickel (Ni)	<2		mg/kg	10	15-AUG-00
	Phosphorus (P)	20		mg/kg	50	15-AUG-00
	Lead (Pb)	<5		mg/kg	25	15-AUG-00
	Tin (Sn)	<5		mg/kg	25	15-AUG-00
	Strontium (Sr)	<1		mg/kg	5	15-AUG-00
	Titanium (Ti)	<5		mg/kg	25	15-AUG-00
	Thallium (Tl)	<1		mg/kg	5	15-AUG-00
	Vanadium (V)	<1		mg/kg	5	15-AUG-00
	Zinc (Zn)	4.3	^	mg/kg	2.5	15-AUG-00
WG16154-1						
METAL-EXD-ED	Silver (Ag)	<1		mg/kg	5	09-AUG-00
	Aluminum (Al)	50		mg/kg	50	09-AUG-00
	Barium (Ba)	<0.5		mg/kg	2.5	09-AUG-00
	Beryllium (Be)	<1		mg/kg	5	09-AUG-00
	Calcium (Ca)	<100		mg/kg	500	09-AUG-00
	Cadmium (Cd)	<0.5		mg/kg	2.5	09-AUG-00
	Cobalt (Co)	<1		mg/kg	5	09-AUG-00
	Chromium (Cr)	<0.5		mg/kg	2.5	09-AUG-00
	Copper (Cu)	3		mg/kg	5	09-AUG-00
	Iron (Fe)	<100		mg/kg	500	09-AUG-00
	Potassium (K)	<20		mg/kg	100	09-AUG-00
	Magnesium (Mg)	<10		mg/kg	50	09-AUG-00
	Manganese (Mn)	<20		mg/kg	100	09-AUG-00
	Molybdenum (Mo)	<1		mg/kg	5	09-AUG-00
	Sodium (Na)	<100		mg/kg	500	09-AUG-00
	Nickel (Ni)	<2		mg/kg	10	09-AUG-00
	Phosphorus (P)	<10		mg/kg	50	09-AUG-00
	Lead (Pb)	<5		mg/kg	25	09-AUG-00
	Tin (Sn)	<5		mg/kg	25	09-AUG-00
	Strontium (Sr)	<1		mg/kg	5	09-AUG-00
	Titanium (Ti)	<5		mg/kg	25	09-AUG-00
	Thallium (Tl)	<1		mg/kg	5	09-AUG-00
	Vanadium (V)	<1		mg/kg	5	09-AUG-00

ENVIRO-TEST QC REPORT

Workorder L14671

	Zinc (Zn)	5.8	A	mg/kg	2.5	09-AUG-00
WG16161-1						
METAL-EXD-ED	Silver (Ag)	<1		mg/kg	5	15-AUG-00
	Aluminum (Al)	30		mg/kg	50	15-AUG-00
	Barium (Ba)	0.5		mg/kg	2.5	15-AUG-00
	Beryllium (Be)	<1		mg/kg	5	15-AUG-00
	Calcium (Ca)	<100		mg/kg	500	15-AUG-00
	Cadmium (Cd)	<0.5		mg/kg	2.5	15-AUG-00
	Cobalt (Co)	<1		mg/kg	5	15-AUG-00
	Chromium (Cr)	<0.5		mg/kg	2.5	15-AUG-00
	Copper (Cu)	3		mg/kg	5	15-AUG-00
	Iron (Fe)	<100		mg/kg	500	15-AUG-00
	Potassium (K)	20		mg/kg	100	15-AUG-00
	Magnesium (Mg)	<10		mg/kg	50	15-AUG-00
	Manganese (Mn)	<20		mg/kg	100	15-AUG-00
	Molybdenum (Mo)	<1		mg/kg	5	15-AUG-00
	Sodium (Na)	<100		mg/kg	500	15-AUG-00
	Nickel (Ni)	<2		mg/kg	10	15-AUG-00
	Phosphorus (P)	<10		mg/kg	50	15-AUG-00
	Lead (Pb)	<5		mg/kg	25	15-AUG-00
	Tin (Sn)	<5		mg/kg	25	15-AUG-00
	Strontium (Sr)	<1		mg/kg	5	15-AUG-00
	Titanium (Ti)	<5		mg/kg	25	15-AUG-00
	Thallium (Tl)	<1		mg/kg	5	15-AUG-00
	Vanadium (V)	<1		mg/kg	5	15-AUG-00
	Zinc (Zn)	2.6	A	mg/kg	2.5	15-AUG-00
WG16170-1						
METAL-EXD-ED	Silver (Ag)	<1		mg/kg	5	15-AUG-00
	Aluminum (Al)	90		mg/kg	50	15-AUG-00
	Barium (Ba)	<0.5		mg/kg	2.5	15-AUG-00
	Beryllium (Be)	<1		mg/kg	5	15-AUG-00
	Calcium (Ca)	<100		mg/kg	500	15-AUG-00
	Cadmium (Cd)	<0.5		mg/kg	2.5	15-AUG-00
	Cobalt (Co)	<1		mg/kg	5	15-AUG-00
	Chromium (Cr)	<0.5		mg/kg	2.5	15-AUG-00
	Copper (Cu)	3		mg/kg	5	15-AUG-00
	Iron (Fe)	<100		mg/kg	500	15-AUG-00
	Potassium (K)	<20		mg/kg	100	15-AUG-00
	Magnesium (Mg)	<10		mg/kg	50	15-AUG-00
	Manganese (Mn)	<20		mg/kg	100	15-AUG-00
	Molybdenum (Mo)	<1		mg/kg	5	15-AUG-00
	Sodium (Na)	<100		mg/kg	500	15-AUG-00
	Nickel (Ni)	<2		mg/kg	10	15-AUG-00
	Phosphorus (P)	<10		mg/kg	50	15-AUG-00
	Lead (Pb)	<5		mg/kg	25	15-AUG-00
	Tin (Sn)	<5		mg/kg	25	15-AUG-00
	Strontium (Sr)	<1		mg/kg	5	15-AUG-00
	Titanium (Ti)	<5		mg/kg	25	15-AUG-00

ENVIRO-TEST QC REPORT

Workorder L14671

	Thallium (Tl)	<1	mg/kg	5	15-AUG-00
	Vanadium (V)	<1	mg/kg	5	15-AUG-00
	Zinc (Zn)	1.3	mg/kg	2.5	15-AUG-00
WG16179-1					
METAL-EXD-ED	Silver (Ag)	<1	mg/kg	5	15-AUG-00
	Aluminum (Al)	10	mg/kg	50	15-AUG-00
	Barium (Ba)	<0.5	mg/kg	2.5	15-AUG-00
	Beryllium (Be)	<1	mg/kg	5	15-AUG-00
	Calcium (Ca)	<100	mg/kg	500	15-AUG-00
	Cadmium (Cd)	<0.5	mg/kg	2.5	15-AUG-00
	Cobalt (Co)	<1	mg/kg	5	15-AUG-00
	Chromium (Cr)	<0.5	mg/kg	2.5	15-AUG-00
	Copper (Cu)	2	mg/kg	5	15-AUG-00
	Iron (Fe)	<100	mg/kg	500	15-AUG-00
	Potassium (K)	<20	mg/kg	100	15-AUG-00
	Magnesium (Mg)	<10	mg/kg	50	15-AUG-00
	Manganese (Mn)	<20	mg/kg	100	15-AUG-00
	Molybdenum (Mo)	<1	mg/kg	5	15-AUG-00
	Sodium (Na)	<100	mg/kg	500	15-AUG-00
	Nickel (Ni)	<2	mg/kg	10	15-AUG-00
	Phosphorus (P)	<10	mg/kg	50	15-AUG-00
	Lead (Pb)	<5	mg/kg	25	15-AUG-00
	Tin (Sn)	<5	mg/kg	25	15-AUG-00
	Strontium (Sr)	<1	mg/kg	5	15-AUG-00
	Titanium (Ti)	<5	mg/kg	25	15-AUG-00
	Thallium (Tl)	<1	mg/kg	5	15-AUG-00
	Vanadium (V)	<1	mg/kg	5	15-AUG-00
	Zinc (Zn)	<0.5	mg/kg	2.5	15-AUG-00
WG16276-1					
METAL-EXD-ED	Silver (Ag)	<1	mg/kg	5	09-AUG-00
	Aluminum (Al)	40	mg/kg	50	09-AUG-00
	Barium (Ba)	<0.5	mg/kg	2.5	09-AUG-00
	Beryllium (Be)	<1	mg/kg	5	09-AUG-00
	Calcium (Ca)	<100	mg/kg	500	09-AUG-00
	Cadmium (Cd)	<0.5	mg/kg	2.5	09-AUG-00
	Cobalt (Co)	<1	mg/kg	5	09-AUG-00
	Chromium (Cr)	<0.5	mg/kg	2.5	09-AUG-00
	Copper (Cu)	3	mg/kg	5	09-AUG-00
	Iron (Fe)	<100	mg/kg	500	09-AUG-00
	Potassium (K)	<20	mg/kg	100	09-AUG-00
	Magnesium (Mg)	<10	mg/kg	50	09-AUG-00
	Manganese (Mn)	<20	mg/kg	100	09-AUG-00
	Molybdenum (Mo)	<1	mg/kg	5	09-AUG-00
	Sodium (Na)	<100	mg/kg	500	09-AUG-00
	Nickel (Ni)	<2	mg/kg	10	09-AUG-00
	Phosphorus (P)	<10	mg/kg	50	09-AUG-00
	Lead (Pb)	<5	mg/kg	25	09-AUG-00
	Tin (Sn)	<5	mg/kg	25	09-AUG-00

ENVIRO-TEST QC REPORT

Workorder L14671

		Strontium (Sr)	<1		mg/kg	5	09-AUG-00
		Titanium (Ti)	<5		mg/kg	25	09-AUG-00
		Thallium (Tl)	<1		mg/kg	5	09-AUG-00
		Vanadium (V)	<1		mg/kg	5	09-AUG-00
		Zinc (Zn)	11.4	A	mg/kg	2.5	09-AUG-00
WG16298-1							
	OGG-ED	Oil-Gravimetric	<100		mg	100	08-AUG-00
WG16323-1							
	OGG-ED	Oil-Gravimetric	<100		mg	100	08-AUG-00
WG16395-1							
	NH4-ED	Ammonia-N	<0.05		mg/L	0.05	09-AUG-00
	NH4-ED	Ammonia-N	<1		mg/kg	1	09-AUG-00
WG16426-1							
	OGG-ED	Oil-Gravimetric	<100		mg	100	09-AUG-00
WG17418-1							
	SO4-ED	Sulphate (SO4)	<3		mg/kg	2.5	23-AUG-00
WG18873-1							
	METAL-EXD-ED	Silver (Ag)	<1		mg/kg	5	17-SEP-00
		Aluminum (Al)	10		mg/kg	50	17-SEP-00
		Barium (Ba)	<0.5		mg/kg	2.5	17-SEP-00
		Beryllium (Be)	<1		mg/kg	5	17-SEP-00
		Calcium (Ca)	<100		mg/kg	500	17-SEP-00
		Cadmium (Cd)	<0.5		mg/kg	2.5	17-SEP-00
		Cobalt (Co)	<1		mg/kg	5	17-SEP-00
		Chromium (Cr)	5.5	A	mg/kg	2.5	17-SEP-00
		Copper (Cu)	<1		mg/kg	5	17-SEP-00
		Iron (Fe)	<100		mg/kg	500	17-SEP-00
		Potassium (K)	<20		mg/kg	100	17-SEP-00
		Magnesium (Mg)	<10		mg/kg	50	17-SEP-00
		Manganese (Mn)	<20		mg/kg	100	17-SEP-00
		Molybdenum (Mo)	<1		mg/kg	5	17-SEP-00
		Sodium (Na)	<100		mg/kg	500	17-SEP-00
		Nickel (Ni)	3		mg/kg	10	17-SEP-00
		Phosphorus (P)	<10		mg/kg	50	17-SEP-00
		Lead (Pb)	<5		mg/kg	25	17-SEP-00
		Tin (Sn)	<5		mg/kg	25	17-SEP-00
		Strontium (Sr)	<1		mg/kg	5	17-SEP-00
		Titanium (Ti)	<5		mg/kg	25	17-SEP-00
		Thallium (Tl)	<1		mg/kg	5	17-SEP-00
		Vanadium (V)	<1		mg/kg	5	17-SEP-00
G18876-1							
	METAL-EXD-ED	Silver (Ag)	<1		mg/kg	5	17-SEP-00
		Aluminum (Al)	20		mg/kg	50	17-SEP-00
		Barium (Ba)	<0.5		mg/kg	2.5	17-SEP-00
		Beryllium (Be)	<1		mg/kg	5	17-SEP-00
		Calcium (Ca)	<100		mg/kg	500	17-SEP-00

ENVIRO-TEST QC REPORT

Workorder L14671

	Cadmium (Cd)	<0.5		mg/kg	2.5	17-SEP-00
	Cobalt (Co)	<1		mg/kg	5	17-SEP-00
	Chromium (Cr)	<0.5		mg/kg	2.5	17-SEP-00
	Copper (Cu)	1		mg/kg	5	17-SEP-00
	Iron (Fe)	<100		mg/kg	500	17-SEP-00
	Potassium (K)	<20		mg/kg	100	17-SEP-00
	Magnesium (Mg)	<10		mg/kg	50	17-SEP-00
	Manganese (Mn)	<20		mg/kg	100	17-SEP-00
	Molybdenum (Mo)	<1		mg/kg	5	17-SEP-00
	Sodium (Na)	<100		mg/kg	500	17-SEP-00
	Nickel (Ni)	<2		mg/kg	10	17-SEP-00
	Phosphorus (P)	<10		mg/kg	50	17-SEP-00
	Lead (Pb)	<5		mg/kg	25	17-SEP-00
	Tin (Sn)	<5		mg/kg	25	17-SEP-00
	Strontium (Sr)	<1		mg/kg	5	17-SEP-00
	Titanium (Ti)	<5		mg/kg	25	17-SEP-00
	Thallium (Tl)	<1		mg/kg	5	17-SEP-00
	Vanadium (V)	<1		mg/kg	5	17-SEP-00
	Zinc (Zn)	10.7	A	mg/kg	2.5	17-SEP-00

QC Type: MB

Lab QC Number:		Result	Qualifier	Units	Limit	Analyzed
WG20905-1						
AS-AS3-SOL-ED	Arsenic (As) 3+	<0.1		mg/kg	0.5	22-SEP-00
AS-AS5-SOL-ED	Arsenic (As) 5+	<0.1		mg/kg	0.5	22-SEP-00
WG23165-1						
SULPHIDE-TB	Sulphide	<20		mg/kg	20	25-SEP-00

QC Type: MBLK

Lab QC Number:		Result	Qualifier	Units	Limit	Analyzed
WG16600-1						
AS-HYD-ED	Arsenic (As)	<0.1		mg/kg	0.1	15-AUG-00
WG20885-1						
AS-AS3-ED	Arsenic (As) 3+	<0.1		mg/kg	0.1	14-OCT-00
WG20924-1						
AS-HYD-ED	Arsenic (As)	<0.1		mg/kg	0.5	22-SEP-00

QC Type: DUP

Lab QC Number:		RPD	Qualifier	Limit %	Analyzed
WG16136-3					
METAL-EXD-ED	Silver (Ag)	N/A	RPD-NA	20	15-AUG-00
	Aluminum (Al)	1.0		20	15-AUG-00
	Barium (Ba)	0.50		20	15-AUG-00
	Beryllium (Be)	N/A	RPD-NA	20	15-AUG-00

		Calcium (Ca)	0.88		20	15-AUG-00
		Cadmium (Cd)	N/A	RPD-NA	20	15-AUG-00
		Cobalt (Co)	1.9		20	15-AUG-00
		Chromium (Cr)	0.52		20	15-AUG-00
		Copper (Cu)	0.47		20	15-AUG-00
		Iron (Fe)	1.6		20	15-AUG-00
		Potassium (K)	1.9		20	15-AUG-00
		Magnesium (Mg)	0.56		20	15-AUG-00
		Manganese (Mn)	1.8		20	15-AUG-00
		Molybdenum (Mo)	N/A	RPD-NA	20	15-AUG-00
		Sodium (Na)	1.6		20	15-AUG-00
		Nickel (Ni)	3.2		20	15-AUG-00
		Phosphorus (P)	6.2		20	15-AUG-00
		Lead (Pb)	16		20	15-AUG-00
		Tin (Sn)	N/A	RPD-NA	20	15-AUG-00
		Strontium (Sr)	2.5		20	15-AUG-00
		Titanium (Ti)	0.14		20	15-AUG-00
		Thallium (Tl)	N/A	RPD-NA	20	15-AUG-00
		Vanadium (V)	0.67		20	15-AUG-00
		Zinc (Zn)	12		20	15-AUG-00
WG16154-3						
	METAL-EXD-ED	Silver (Ag)	N/A	RPD-NA	20	09-AUG-00
		Aluminum (Al)	13		20	09-AUG-00
		Barium (Ba)	14		20	09-AUG-00
		Beryllium (Be)	N/A	RPD-NA	20	09-AUG-00
		Calcium (Ca)	8.5		20	09-AUG-00
		Cadmium (Cd)	N/A	RPD-NA	20	09-AUG-00
		Cobalt (Co)	6.0		20	09-AUG-00
		Chromium (Cr)	17		20	09-AUG-00
		Copper (Cu)	3.7		20	09-AUG-00
		Iron (Fe)	7.9		20	09-AUG-00
		Potassium (K)	23		20	09-AUG-00
		Magnesium (Mg)	6.3		20	09-AUG-00
		Manganese (Mn)	7.3		20	09-AUG-00
		Molybdenum (Mo)	21		20	09-AUG-00
		Sodium (Na)	14		20	09-AUG-00
		Nickel (Ni)	13		20	09-AUG-00
		Phosphorus (P)	8.9		20	09-AUG-00
		Lead (Pb)	3.4		20	09-AUG-00
		Tin (Sn)	N/A	RPD-NA	20	09-AUG-00
		Strontium (Sr)	16		20	09-AUG-00
		Titanium (Ti)	19		20	09-AUG-00
		Thallium (Tl)	N/A	RPD-NA	20	09-AUG-00
		Vanadium (V)	13		20	09-AUG-00
		Zinc (Zn)	3.5		20	09-AUG-00
WG16161-3						
	METAL-EXD-ED					

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	Silver (Ag)	N/A	RPD-NA	20	15-AUG-00
	Aluminum (Al)	1.1		20	15-AUG-00
	Barium (Ba)	1.6		20	15-AUG-00
	Beryllium (Be)	N/A	RPD-NA	20	15-AUG-00
	Calcium (Ca)	1.4		20	15-AUG-00
	Cadmium (Cd)	N/A	RPD-NA	20	15-AUG-00
	Cobalt (Co)	0.88		20	15-AUG-00
	Chromium (Cr)	2.3		20	15-AUG-00
	Copper (Cu)	0.34		20	15-AUG-00
	Iron (Fe)	0.12		20	15-AUG-00
	Potassium (K)	2.4		20	15-AUG-00
	Magnesium (Mg)	0.069		20	15-AUG-00
	Manganese (Mn)	1.5		20	15-AUG-00
	Molybdenum (Mo)	7.2		20	15-AUG-00
	Sodium (Na)	2.0		20	15-AUG-00
	Nickel (Ni)	1.1		20	15-AUG-00
	Phosphorus (P)	2.1		20	15-AUG-00
	Lead (Pb)	0.26		20	15-AUG-00
	Tin (Sn)	N/A	RPD-NA	20	15-AUG-00
	Strontium (Sr)	2.5		20	15-AUG-00
	Titanium (Ti)	1.8		20	15-AUG-00
	Thallium (Tl)	N/A	RPD-NA	20	15-AUG-00
	Vanadium (V)	0.46		20	15-AUG-00
	Zinc (Zn)	2.3		20	15-AUG-00
WG16170-3					
METAL-EXD-ED	Silver (Ag)	N/A	RPD-NA	20	15-AUG-00
	Aluminum (Al)	1.7		20	15-AUG-00
	Barium (Ba)	5.1		20	15-AUG-00
	Beryllium (Be)	N/A	RPD-NA	20	15-AUG-00
	Calcium (Ca)	1.4		20	15-AUG-00
	Cadmium (Cd)	N/A	RPD-NA	20	15-AUG-00
	Cobalt (Co)	0.16		20	15-AUG-00
	Chromium (Cr)	2.2		20	15-AUG-00
	Copper (Cu)	1.5		20	15-AUG-00
	Iron (Fe)	0.55		20	15-AUG-00
	Potassium (K)	5.5		20	15-AUG-00
	Magnesium (Mg)	0.73		20	15-AUG-00
	Manganese (Mn)	2.5		20	15-AUG-00
	Molybdenum (Mo)	N/A	RPD-NA	20	15-AUG-00
	Sodium (Na)	3.2		20	15-AUG-00
	Nickel (Ni)	3.1		20	15-AUG-00
	Phosphorus (P)	1.0		20	15-AUG-00
	Lead (Pb)	0.86		20	15-AUG-00
	Tin (Sn)	N/A	RPD-NA	20	15-AUG-00
	Strontium (Sr)	6.1		20	15-AUG-00
	Titanium (Ti)	3.7		20	15-AUG-00
	Thallium (Tl)	N/A	RPD-NA	20	15-AUG-00

	Vanadium (V)	2.8		20	15-AUG-00
	Zinc (Zn)	2.0		20	15-AUG-00
WG16179-3					
METAL-EXD-ED	Silver (Ag)	N/A	RPD-NA	20	15-AUG-00
	Aluminum (Al)	0.91		20	15-AUG-00
	Barium (Ba)	3.2		20	15-AUG-00
	Beryllium (Be)	N/A	RPD-NA	20	15-AUG-00
	Calcium (Ca)	1.4		20	15-AUG-00
	Cadmium (Cd)	22		20	15-AUG-00
	Cobalt (Co)	1.6		20	15-AUG-00
	Chromium (Cr)	1.3		20	15-AUG-00
	Copper (Cu)	6.5		20	15-AUG-00
	Iron (Fe)	1.8		20	15-AUG-00
	Potassium (K)	9.7		20	15-AUG-00
	Magnesium (Mg)	0.55		20	15-AUG-00
	Manganese (Mn)	2.1		20	15-AUG-00
	Molybdenum (Mo)	22		20	15-AUG-00
	Sodium (Na)	6.6		20	15-AUG-00
	Nickel (Ni)	2.4		20	15-AUG-00
	Phosphorus (P)	3.0		20	15-AUG-00
	Lead (Pb)	14		20	15-AUG-00
	Tin (Sn)	N/A	RPD-NA	20	15-AUG-00
	Strontium (Sr)	2.1		20	15-AUG-00
	Titanium (Ti)	0.82		20	15-AUG-00
	Thallium (Tl)	N/A	RPD-NA	20	15-AUG-00
	Vanadium (V)	1.5		20	15-AUG-00
	Zinc (Zn)	12		20	15-AUG-00
WG16298-3					
OGG-ED	Oil-Gravimetric	10		11.6	08-AUG-00
WG16299-2					
PH-1:1-ED	pH	0.38		1.1	08-AUG-00
WG16299-3					
PH-1:1-ED	pH	0.26		1.1	08-AUG-00
WG16323-3					
OGG-ED	Oil-Gravimetric	0.39		11.6	08-AUG-00
WG16399-3					
NH4-ED	Ammonia-N	4.0		4.33	09-AUG-00
WG16399-4					
NH4-ED	Ammonia-N	2.7		4.33	09-AUG-00
WG16426-3					
OGG-ED	Oil-Gravimetric	N/A	RPD-NA	11.6	09-AUG-00
WG17418-3					
SO4-ED	Sulphate (SO4)	2.5		20	23-AUG-00

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WG17418-5					
SO4-ED	Sulphate (SO4)	1.5		20	23-AUG-00
WG18873-3					
METAL-EXD-ED	Silver (Ag)	N/A	RPD-NA	20	17-SEP-00
	Barium (Ba)	6.3		20	17-SEP-00
	Beryllium (Be)	N/A	RPD-NA	20	17-SEP-00
	Calcium (Ca)	1.4		20	17-SEP-00
	Cadmium (Cd)	1.6		20	17-SEP-00
	Cobalt (Co)	3.1		20	17-SEP-00
	Chromium (Cr)	0.30		20	17-SEP-00
	Copper (Cu)	8.2		20	17-SEP-00
	Potassium (K)	2.1		20	17-SEP-00
	Magnesium (Mg)	1.9		20	17-SEP-00
	Manganese (Mn)	2.0		20	17-SEP-00
	Molybdenum (Mo)	2.9		20	17-SEP-00
	Sodium (Na)	1.2		20	17-SEP-00
	Nickel (Ni)	2.3		20	17-SEP-00
	Phosphorus (P)	2.1		20	17-SEP-00
	Lead (Pb)	1.2		20	17-SEP-00
	Tin (Sn)	N/A	RPD-NA	20	17-SEP-00
	Strontium (Sr)	2.3		20	17-SEP-00
	Titanium (Ti)	0.20		20	17-SEP-00
	Thallium (Tl)	N/A	RPD-NA	20	17-SEP-00
	Vanadium (V)	1.2		20	17-SEP-00
	Zinc (Zn)	2.4		20	17-SEP-00
WG18960-2					
PH-1:1-ED	pH	0.12		1.1	13-SEP-00
WG20905-2					
AS-AS3-SOL-ED	Arsenic (As) 3+	N/A	RPD-NA	12.5	22-SEP-00
AS-AS5-SOL-ED	Arsenic (As) 5+	N/A	RPD-NA	12.5	22-SEP-00
WG20905-3					
AS-AS3-SOL-ED	Arsenic (As) 3+	13	H	12.5	22-SEP-00
AS-AS5-SOL-ED	Arsenic (As) 5+	2.1		12.5	22-SEP-00
WG20924-2					
AS-HYD-ED	Arsenic (As)	N/A	RPD-NA	20	14-SEP-00

QC Type: **LCS**

Lab QC Number:		% Recovery	Qualifier	Limit %	Analyzed
WG16298-2					
OGG-ED	Oil-Gravimetric	104		93-107.5	08-AUG-00
WG16299-4					
PH-1:1-ED	pH	101		98.7-104	08-AUG-00
WG16299-5					
PH-1:1-ED	pH	101		98.7-104	08-AUG-00

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WG16299-6					
PH-1:1-ED	pH	101		98.7-104	08-AUG-00
WG16323-2					
OGG-ED	Oil-Gravimetric	104		93-107.5	09-AUG-00
WG16399-2					
NH4-ED	Ammonia-N	100		93.5-108.6	09-AUG-00
NH4-ED	Ammonia-N	100		90-110	09-AUG-00
WG16425-2					
OGG-ED	Oil-Gravimetric	99		93-107.5	09-AUG-00
WG18960-3					
PH-1:1-ED	pH	100		98.7-104	18-SEP-00
WG18960-4					
PH-1:1-ED	pH	101		98.7-104	18-SEP-00
WG18960-5					
PH-1:1-ED	pH	100		98.7-104	18-SEP-00

QC Type: MS

Lab QC Number:		% Recovery	Qualifier	Limit %	Analyzed
WG16136-4					
METAL-EXD-ED	Silver (Ag)	43	F	75-125	15-AUG-00
	Aluminum (Al)	57	E	75-125	15-AUG-00
	Barium (Ba)	97		75-125	15-AUG-00
	Beryllium (Be)	104		75-125	15-AUG-00
	Calcium (Ca)	104		75-125	15-AUG-00
	Cadmium (Cd)	106		75-125	15-AUG-00
	Cobalt (Co)	99		75-125	15-AUG-00
	Chromium (Cr)	106		75-125	15-AUG-00
	Copper (Cu)	97		75-125	15-AUG-00
	Iron (Fe)	108		75-125	15-AUG-00
	Potassium (K)	83		75-125	15-AUG-00
	Magnesium (Mg)	92		75-125	15-AUG-00
	Manganese (Mn)	99		75-125	15-AUG-00
	Molybdenum (Mo)	108		75-125	15-AUG-00
	Sodium (Na)	102		75-125	15-AUG-00
	Nickel (Ni)	99		75-125	15-AUG-00
	Phosphorus (P)	91		75-125	15-AUG-00
	Lead (Pb)	101		75-125	15-AUG-00
	Tin (Sn)	111		75-125	15-AUG-00
	Strontium (Sr)	105		75-125	15-AUG-00
	Titanium (Ti)	124		75-125	15-AUG-00
	Thallium (Tl)	102		75-125	15-AUG-00
	Vanadium (V)	122		75-125	15-AUG-00
	Zinc (Zn)	110		75-125	15-AUG-00
WG16154-4					
METAL-EXD-ED	Silver (Ag)	49	F	75-125	09-AUG-00

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	Barium (Ba)	118		75-125	09-AUG-00
	Beryllium (Be)	113		75-125	09-AUG-00
	Calcium (Ca)	126		75-125	09-AUG-00
	Cadmium (Cd)	110		75-125	09-AUG-00
	Cobalt (Co)	109		75-125	09-AUG-00
	Chromium (Cr)	118		75-125	09-AUG-00
	Copper (Cu)	107		75-125	09-AUG-00
	Iron (Fe)	151	G	75-125	09-AUG-00
	Potassium (K)	114		75-125	09-AUG-00
	Magnesium (Mg)	120		75-125	09-AUG-00
	Manganese (Mn)	150	E	75-125	09-AUG-00
	Molybdenum (Mo)	106		75-125	09-AUG-00
	Sodium (Na)	104		75-125	09-AUG-00
	Nickel (Ni)	109		75-125	09-AUG-00
	Phosphorus (P)	11[illegible]		75-125	09-AUG-00
	Lead (Pb)	118		75-125	09-AUG-00
	Tin (Sn)	110		75-125	09-AUG-00
	Strontium (Sr)	118		75-125	09-AUG-00
	Thallium (Tl)	118		75-125	09-AUG-00
	Vanadium (V)	117		75-125	09-AUG-00
	Zinc (Zn)	121		75-125	09-AUG-00
WG16161-4					
METAL-EXD-ED	Aluminum (Al)	53	G	75-125	15-AUG-00
	Barium (Ba)	98		75-125	15-AUG-00
	Beryllium (Be)	114		75-125	15-AUG-00
	Calcium (Ca)	102		75-125	15-AUG-00
	Cadmium (Cd)	107		75-125	15-AUG-00
	Cobalt (Co)	102		75-125	15-AUG-00
	Chromium (Cr)	95		75-125	15-AUG-00
	Copper (Cu)	99		75-125	15-AUG-00
	Iron (Fe)	83		75-125	15-AUG-00
	Magnesium (Mg)	87		75-125	15-AUG-00
	Manganese (Mn)	91		75-125	15-AUG-00
	Molybdenum (Mo)	108		75-125	15-AUG-00
	Sodium (Na)	98		75-125	15-AUG-00
	Nickel (Ni)	100		75-125	15-AUG-00
	Phosphorus (P)	92		75-125	15-AUG-00
	Lead (Pb)	95		75-125	15-AUG-00
	Tin (Sn)	110		75-125	15-AUG-00
	Strontium (Sr)	104		75-125	15-AUG-00
	Titanium (Ti)	102		75-125	15-AUG-00
	Thallium (Tl)	97		75-125	15-AUG-00
	Vanadium (V)	103		75-125	15-AUG-00
	Zinc (Zn)	107		75-125	15-AUG-00
WG16170-4					
METAL-EXD-ED	Barium (Ba)	106		75-125	15-AUG-00
	Beryllium (Be)	120		75-125	15-AUG-00

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	Calcium (Ca)	107		75-125	15-AUG-00
	Cadmium (Cd)	105		75-125	15-AUG-00
	Cobalt (Co)	102		75-125	15-AUG-00
	Chromium (Cr)	103		75-125	15-AUG-00
	Copper (Cu)	101		75-125	15-AUG-00
	Iron (Fe)	94		75-125	15-AUG-00
	Potassium (K)	70		75-125	15-AUG-00
	Magnesium (Mg)	99		75-125	15-AUG-00
	Manganese (Mn)	104		75-125	15-AUG-00
	Molybdenum (Mo)	107		75-125	15-AUG-00
	Sodium (Na)	108		75-125	15-AUG-00
	Nickel (Ni)	104		75-125	15-AUG-00
	Phosphorus (P)	96		75-125	15-AUG-00
	Lead (Pb)	95		75-125	15-AUG-00
	Tin (Sn)	107		75-125	15-AUG-00
	Strontium (Sr)	103		75-125	15-AUG-00
	Titanium (Ti)	100		75-125	15-AUG-00
	Thallium (Tl)	96		75-125	15-AUG-00
	Vanadium (V)	101		75-125	15-AUG-00
	Zinc (Zn)	111		75-125	15-AUG-00
WG16179-4					
METAL-EXD-ED	Silver (Ag)	41	F	75-125	15-AUG-00
	Aluminum (Al)	86		75-125	15-AUG-00
	Barium (Ba)	105		75-125	15-AUG-00
	Beryllium (Be)	102		75-125	15-AUG-00
	Calcium (Ca)	89		75-125	15-AUG-00
	Cadmium (Cd)	100		75-125	15-AUG-00
	Cobalt (Co)	94		75-125	15-AUG-00
	Chromium (Cr)	89		75-125	15-AUG-00
	Copper (Cu)	94		75-125	15-AUG-00
	Iron (Fe)	80		75-125	15-AUG-00
	Potassium (K)	64	E	75-125	15-AUG-00
	Magnesium (Mg)	68		75-125	15-AUG-00
	Manganese (Mn)	93		75-125	15-AUG-00
	Molybdenum (Mo)	107		75-125	15-AUG-00
	Sodium (Na)	93		75-125	15-AUG-00
	Nickel (Ni)	94		75-125	15-AUG-00
	Phosphorus (P)	87		75-125	15-AUG-00
	Lead (Pb)	85		75-125	15-AUG-00
	Tin (Sn)	102		75-125	15-AUG-00
	Strontium (Sr)	93		75-125	15-AUG-00
	Titanium (Ti)	94		75-125	15-AUG-00
	Thallium (Tl)	87		75-125	15-AUG-00
	Vanadium (V)	89		75-125	15-AUG-00
	Zinc (Zn)	94		75-125	15-AUG-00
WG16399-5					
NH4 ED	Ammonia-N	100		81.3-130.2	09-AUG-00

WG16399-6					
NH4-ED	Ammonia-N	103		81.3-130.2	09-AUG-00
WG16500-4					
AS-HYD-ED	Arsenic (As)	107	H	87.3-106	15-AUG-00
WG17418-4					
SO4-ED	Sulphate (SO4)	97		75-125	23-AUG-00
WG17418-6					
SO4-ED	Sulphate (SO4)	105		75-125	23-AUG-00
WG18873-4					
METAL-EXD-ED	Silver (Ag)	23	F	75-125	17-SEP-00
	Barium (Ba)	93		75-125	17-SEP-00
	Beryllium (Be)	92		75-125	17-SEP-00
	Calcium (Ca)	97		75-125	17-SEP-00
	Cadmium (Cd)	97		75-125	17-SEP-00
	Cobalt (Co)	91		75-125	17-SEP-00
	Chromium (Cr)	93		75-125	17-SEP-00
	Copper (Cu)	85		75-125	17-SEP-00
	Potassium (K)	79		75-125	17-SEP-00
	Magnesium (Mg)	79		75-125	17-SEP-00
	Manganese (Mn)	87		75-125	17-SEP-00
	Molybdenum (Mo)	102		75-125	17-SEP-00
	Sodium (Na)	93		75-125	17-SEP-00
	Nickel (Ni)	92		75-125	17-SEP-00
	Phosphorus (P)	86		75-125	17-SEP-00
	Lead (Pb)	84		75-125	17-SEP-00
	Tin (Sn)	98		75-125	17-SEP-00
	Strontium (Sr)	101		75-125	17-SEP-00
	Titanium (Ti)	96		75-125	17-SEP-00
	Thallium (Tl)	95		75-125	17-SEP-00
	Vanadium (V)	92		75-125	17-SEP-00
	Zinc (Zn)	85		75-125	17-SEP-00

QC Type: MSD

Lab QC Number:		RPD	Qualifier	Limit %	Analyzed
WG17418-6					
SO4-ED	Sulphate (SO4)	N/A		20	23-AUG-00

ENVIRO-TEST QC REPORT

Workorder L14671

Type: SRM

Lab QC Number:		% Recovery	Qualifier	Limit %	Analyzed
WG16136-2					
METAL-EXD-ED	Silver (Ag)	73		-	15-AUG-00
	Aluminum (Al)	29	G	56.2-144	15-AUG-00
	Barium (Ba)	88		86.7-113	15-AUG-00
	Beryllium (Be)	91		-	15-AUG-00
	Calcium (Ca)	95		85-115	15-AUG-00
	Cadmium (Cd)	98		87.8-112	15-AUG-00
	Cobalt (Co)	95		85.4-115	15-AUG-00
	Chromium (Cr)	82		73.9-126	15-AUG-00
	Copper (Cu)	104		87-113	15-AUG-00
	Iron (Fe)	89		80.6-119	15-AUG-00
	Potassium (K)	74		69-131	15-AUG-00
	Magnesium (Mg)	91		79.4-121	15-AUG-00
	Manganese (Mn)	95		82.4-118	15-AUG-00
	Molybdenum (Mo)	104		-	15-AUG-00
	Sodium (Na)	95		82.2-123	15-AUG-00
	Nickel (Ni)	91		85.6-114	15-AUG-00
	Phosphorus (P)	90		84.7-115	15-AUG-00
	Lead (Pb)	68	G	81.5-118	15-AUG-00
	Tin (Sn)	99		-	15-AUG-00
	Strontium (Sr)	51	G	87.7-112	15-AUG-00
	Titanium (Ti)	82		-	15-AUG-00
	Thallium (Tl)	98		-	15-AUG-00
	Vanadium (V)	179	G	64.2-136	15-AUG-00
	Zinc (Zn)	77		84.5-115	15-AUG-00

Comments: Analytes listed without acceptance limits have concentrations approaching detection limit.

Lab QC Number:		% Recovery	Qualifier	Limit %	Analyzed
WG16154-2					
METAL-EXD-ED	Silver (Ag)	71		-	09-AUG-00
	Aluminum (Al)	76		45-155	09-AUG-00
	Barium (Ba)	82		78.7-121	09-AUG-00
	Beryllium (Be)	101		71.8-128	09-AUG-00
	Calcium (Ca)	93		85.6-114	09-AUG-00
	Cadmium (Cd)	88		85.1-115	09-AUG-00
	Cobalt (Co)	95		87.5-113	09-AUG-00
	Chromium (Cr)	91		63.9-136	09-AUG-00
	Copper (Cu)	99		85.2-115	09-AUG-00
	Iron (Fe)	92		69.9-130	09-AUG-00
	Potassium (K)	90		71-129	09-AUG-00
	Magnesium (Mg)	96		79.2-121	09-AUG-00
	Manganese (Mn)	100		76.3-124	09-AUG-00
	Molybdenum (Mo)	87		75.1-125	09-AUG-00
	Sodium (Na)	97		79.6-121	09-AUG-00
	Nickel (Ni)	98		80-120	09-AUG-00
	Phosphorus (P)	100		79.6-120	09-AUG-00
	Lead (Pb)	89		79-121	09-AUG-00
	Tin (Sn)	95		-	09-AUG-00
	Strontium (Sr)	101		85.3-115	09-AUG-00

	Titanium (Ti)	77		-	09-AUG-00
	Thallium (Tl)	86		75-125	09-AUG-00
	Vanadium (V)	77		41.4-159	09-AUG-00
	Zinc (Zn)	86		79.9-120	09-AUG-00

Comments: Analytes listed without acceptance limits have concentrations approaching detection limit.

WG16170-2					
METAL-EXD-ED	Silver (Ag)	84		-	15-AUG-00
	Aluminum (Al)	29	H	45-155	15-AUG-00
	Barium (Ba)	94		78.7-121	15-AUG-00
	Beryllium (Be)	95		71.8-120	15-AUG-00
	Calcium (Ca)	97		85.6-114	15-AUG-00
	Cadmium (Cd)	75	G	85.1-115	15-AUG-00
	Cobalt (Co)	99		87.5-113	15-AUG-00
	Chromium (Cr)	81		63.9-136	15-AUG-00
	Copper (Cu)	100		85.2-115	15-AUG-00
	Iron (Fe)	89		69.9-130	15-AUG-00
	Potassium (K)	58	H	71.1-129	15-AUG-00
	Magnesium (Mg)	90		79.2-121	15-AUG-00
	Manganese (Mn)	92		76.3-124	15-AUG-00
	Molybdenum (Mo)	97		75.1-125	15-AUG-00
	Sodium (Na)	97		78.6-121	15-AUG-00
	Nickel (Ni)	96		80-120	15-AUG-00
	Phosphorus (P)	93		79.6-120	15-AUG-00
	Lead (Pb)	81		79-121	15-AUG-00
	Strontium (Sr)	94		85.3-115	15-AUG-00
	Titanium (Ti)	90		-	15-AUG-00
	Thallium (Tl)	84		75-125	15-AUG-00
	Vanadium (V)	72		41.4-159	15-AUG-00
	Zinc (Zn)	80		79.9-120	15-AUG-00

Comments: Analytes listed without acceptance limits have concentrations approaching detection limit.

WG16179-2					
METAL-EXD-ED	Silver (Ag)	123		-	15-AUG-00
	Aluminum (Al)	39		45-155	15-AUG-00
	Barium (Ba)	107		78.7-121	15-AUG-00
	Beryllium (Be)	122		73-128	15-AUG-00
	Calcium (Ca)	94		85.6-114	15-AUG-00
	Cadmium (Cd)	88		85.1-115	15-AUG-00
	Cobalt (Co)	97		87.5-113	15-AUG-00
	Chromium (Cr)	110		63.9-136	15-AUG-00
	Copper (Cu)	96		85.2-115	15-AUG-00
	Iron (Fe)	100		69.9-130	15-AUG-00
	Magnesium (Mg)	96		79.2-121	15-AUG-00
	Manganese (Mn)	90		76.3-124	15-AUG-00
	Molybdenum (Mo)	116		75.1-125	15-AUG-00
	Sodium (Na)	100		78.6-121	15-AUG-00
	Nickel (Ni)	99		80-120	15-AUG-00

	Phosphorus (P)	89		79.6-120	15-AUG-00
	Lead (Pb)	81		79-121	15-AUG-00
	Strontium (Sr)	100		85.3-115	15-AUG-00
	Thallium (Tl)	89		75-126	15-AUG-00
	Vanadium (V)	135		41.4-159	15-AUG-00
	Zinc (Zn)	79	H	79.9-120	15-AUG-00

Comments: . Analytes listed without acceptance limits have concentrations approaching detection limit.

WG16275-2					
METAL-EXD-ED	Silver (Ag)	92		-	09-AUG-00
	Aluminum (Al)	102		56.2-144	09-AUG-00
	Barium (Ba)	96		86.7-113	09-AUG-00
	Beryllium (Be)	110		-	09-AUG-00
	Calcium (Ca)	96		85-115	09-AUG-00
	Cadmium (Cd)	97		87.8-112	09-AUG-00
	Cobalt (Co)	101		85.4-115	09-AUG-00
	Chromium (Cr)	105		73.9-126	09-AUG-00
	Copper (Cu)	104		87-113	09-AUG-00
	Iron (Fe)	103		80.6-119	09-AUG-00
	Potassium (K)	103		69-131	09-AUG-00
	Magnesium (Mg)	102		79.4-121	09-AUG-00
	Manganese (Mn)	102		82.4-118	09-AUG-00
	Molybdenum (Mo)	104		-	09-AUG-00
	Sodium (Na)	100		82.6-123	09-AUG-00
	Nickel (Ni)	100		85.6-114	09-AUG-00
	Phosphorus (P)	102		84.7-115	09-AUG-00
	Lead (Pb)	94		81.5-118	09-AUG-00
	Tin (Sn)	75		-	09-AUG-00
	Strontium (Sr)	107		87.7-112	09-AUG-00
	Titanium (Ti)	119		-	09-AUG-00
	Thallium (Tl)	103		-	09-AUG-00
	Vanadium (V)	107		64.2-136	09-AUG-00
	Zinc (Zn)	97		84.5-115	09-AUG-00

Comments: Analytes listed without acceptance limits have concentrations approaching detection limit.

WG15299-1					
PH-1:1-ED	pH	100		98.7-101	02-AUG-00
WG16600-2					
AS-HYD-ED	Arsenic (As)	93		86.5-112	15-AUG-00
WG18873-2					
METAL-EXD-ED	Silver (Ag)	110		-	17-SEP-00
	Barium (Ba)	93		78.7-121	17-SEP-00
	Beryllium (Be)	94		71.6-120	17-SEP-00
	Calcium (Ca)	101		85.6-114	17-SEP-00
	Cadmium (Cd)	94		85.1-115	17-SEP-00
	Cobalt (Co)	102		87.5-113	17-SEP-00
	Chromium (Cr)	95		63.0-130	17-SEP-00

Workorder L14671

	Copper (Cu)	96	85.2-115	17-SEP-00
	Iron (Fe)	100	69.9-130	17-SEP-00
	Magnesium (Mg)	97	79.2-121	17-SEP-00
	Manganese (Mn)	103	76.3-124	17-SEP-00
	Molybdenum (Mo)	98	75.1-125	17-SEP-00
	Sodium (Na)	98	79.6-121	17-SEP-00
	Nickel (Ni)	106	80-120	17-SEP-00
	Phosphorus (P)	102	79.6-120	17-SEP-00
	Lead (Pb)	86	79-121	17-SEP-00
	Strontium (Sr)	104	85.3-115	17-SEP-00
	Titanium (Ti)	62	-	17-SEP-00
	Thallium (Tl)	93	75-125	17-SEP-00
	Vanadium (V)	93	41.4-159	17-SEP-00
	Zinc (Zn)	114	79.9-120	17-SEP-00

Comments: Analytes listed without acceptance limits have concentrations approaching detection limit.

WG18960-1				
PH-1:1-ED	pH	100	98.7-101	19-SEP-00

ENVIRO-TEST QC REPORT

Workorder L14671

Legend:

Limit	95% Confidence Interval (Laboratory Warning Limits)
DUP	Duplicate
RPD	Relative Percent Difference ((higher result-lower result)/Average, expressed as %)
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Materials
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material

Qualifier:

RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.
A	Method blank exceeds detection limit. Blank correction applied, where appropriate.
B	Method blank result exceeds detection limit, however, it is less than 5% of sample concentration. Blank correction not applied.
C	Method blank result exceeds detection limit, however, it is less than 5% of the regulatory limit for the analyte of interest. Blank correction not applied.
D	Duplicate result exceeds limit due to increased variability for low level samples.
E	Matrix spike limit exceeded due to high sample background.
F	Silver recovery low, likely due to elevated choride levels in sample.
G	Outlier - No assignable cause for nonconformity has been determined.
H	Result fall within the 99% Confidence Interval (Laboratory Control Limits)

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Analytical and Consulting Services

17225 - 109 Avenue
Edmonton, Alberta T5S 1H7
Phone: (780) 489-9100 Fax: (780) 489-9700

TECHNICAL REPORT

To: **Enviro-Test/Eco Laboratories**
9936 67 Avenue
Edmonton AB T6E 0P5

File: **15798**
Date: **August 21, 2000**
Client PO: **BPO9509**
Attention: **Roy Jones**

Project: L14671

	Sample ID:	L14671-1 198139 PSO-01-2200-01	L14671-2 198141 PSO-02-2200-01		
	Date Sampled:	Not Supplied	Not Supplied		
Parameter	Unit			Date Analyzed	Analyst Initials
Sulphide	µg/g	0.54	<0.10	Aug. 11/00	G.M.

	Sample ID:	L14671-3 198143 PSO-11-2200-01	L14671-4 198145 PSO-12-2200-01		
	Date Sampled:	Not Supplied	Not Supplied		
Parameter	Unit			Date Analyzed	Analyst Initials
Sulphide	µg/g	0.20	<0.10	Aug. 11/00	G.M.

	Sample ID:	L14671-5 198147 PSO-14-2200-01	L14671-6 198149 PSO-14-2200-02		
	Date Sampled:	Not Supplied	Not Supplied		
Parameter	Unit			Date Analyzed	Analyst Initials
Sulphide	µg/g	5.8	0.95	Aug. 11/00	G.M.

	Sample ID:	L14671-7 198151 PSO-15-2200-01	L14671-8 198153 PSO-16-2200-01		
	Date Sampled:	Not Supplied	Not Supplied		
Parameter	Unit			Date Analyzed	Analyst Initials
Sulphide	µg/g	4.0	0.26	Aug. 11/00	G.M.

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TECHNICAL REPORT

To Enviro-Test/Eco Laboratories File: 15798

Project: L14671

	Sample ID:	L14671-9 198155 PSO-17-2200-01	L14671-10 198157 PSO-18-2200-02		
	Date Sampled:	Not Supplied	Not Supplied		
Parameter	Unit			Date Analyzed	Analyst Initials
Sulphide	µg/g	2.2	<0.10	Aug. 11/00	G.M.

	Sample ID:	L14671-11 198159 PSO-18-2200-03	L14671-12 198161 PSO-19-2200-01		
	Date Sampled:	Not Supplied	Not Supplied		
Parameter	Unit			Date Analyzed	Analyst Initials
Sulphide	µg/g	0.39	0.32	Aug. 11/00	G.M.

	Sample ID:	L14671-13 198163 PSO-20-2200-01	L14671-15 198167 PSO-13-2500-01A		
	Date Sampled:	Not Supplied	Not Supplied		
Parameter	Unit			Date Analyzed	Analyst Initials
Sulphide	µg/g	0.24	0.22	Aug. 11/00	G.M.

	Sample ID:	L14671-16 198169 PSO-21-2500-01	L14671-17 198171 PSO-21-2500-02		
	Date Sampled:	Not Supplied	Not Supplied		
Parameter	Unit			Date Analyzed	Analyst Initials
Sulphide	µg/g	0.63	<0.10	Aug. 11/00	G.M.

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TECHNICAL REPORT

To: **Enviro-Test/Eco Laboratories** File: **15798**

Project: **L14671**

	Sample ID:	L14671-18 198173 PSO-21-2500-01A	L14671-19 198175 PSO-13-2500-02		
	Date Sampled:	Not Supplied	Not Supplied		
Parameter	Unit			Date Analyzed	Analyst Initials
Sulphide	µg/g	<0.10	<0.10	Aug. 11/00	G.M.

	Sample ID:	L14671-20 198177 PSO-35-2300-01	L14671-21 198179 PSO-36-2300-01		
	Date Sampled:	Not Supplied	Not Supplied		
Parameter	Unit			Date Analyzed	Analyst Initials
Sulphide	µg/g	<0.10	0.30	Aug. 11/00	G.M.

	Sample ID:	L14671-22 198181 PSO-37-2300-01	L14671-23 198183 PSO-03-2200-01		
	Date Sampled:	Not Supplied	Not Supplied		
Parameter	Unit			Date Analyzed	Analyst Initials
Sulphide	µg/g	0.55	<0.10	Aug. 18/00	G.M.

	Sample ID:	L14671-24 198185 PSO-05-2200-01	L14671-25 198187 PSO-06-2200-01		
	Date Sampled:	Not Supplied	Not Supplied		
Parameter	Unit			Date Analyzed	Analyst Initials
Sulphide	µg/g	0.14	<0.10	Aug. 18/00	G.M.

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TECHNICAL REPORT

To: **Enviro-Test/Eco Laboratories** File: **15798**

Project: L14671

	Sample ID:	L14671-26 198189 PSO-08-2200-01	L14671-27 198191 PSO-09-2200-01		
	Date Sampled:	Not Supplied	Not Supplied		
Parameter	Unit			Date Analyzed	Analyst Initials
Sulphide	µg/g	0.23	0.16	Aug. 18/00	G.M.

	Sample ID:	L14671-28 198193 PSO-10-2200-01	L14671-29 198195 PSO-30-2300-01		
	Date Sampled:	Not Supplied	Not Supplied		
Parameter	Unit			Date Analyzed	Analyst Initials
Sulphide	µg/g	<0.10	<0.10	Aug. 18/00	G.M.

	Sample ID:	L14671-30 198197 PSO-31-2300-01	L14671-31 198199 PSO-32-2300-01		
	Date Sampled:	Not Supplied	Not Supplied		
Parameter	Unit			Date Analyzed	Analyst Initials
Sulphide	µg/g	0.44	<0.10	Aug. 18/00	G.M.

	Sample ID:	L14671-32 198201 PSO-39-2500-01	L14671-33 198203 PSO-40-2500-01		
	Date Sampled:	Not Supplied	Not Supplied		
Parameter	Unit			Date Analyzed	Analyst Initials
Sulphide	µg/g	0.63	<0.10	Aug. 18/00	G.M.

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TECHNICAL REPORT

To: **Enviro-Test/Eco Laboratories** File: **15798**

Project: **L14671**

	Sample ID:	L14671-34 198205 PSO-41-2500-01	L14671-35 198207 PSO-33-2500-01		
	Date Sampled:	Not Supplied	Not Supplied		
Parameter	Unit			Date Analyzed	Analyst Initials
Sulphide	µg/g	0.19	0.14	Aug. 18/00	G.M.

	Sample ID:	L14671-36 198209 PSO-34-2500-01	L14671-37 198129 PSO-36-2500-01		
	Date Sampled:	Not Supplied	Not Supplied		
Parameter	Unit			Date Analyzed	Analyst Initials
Sulphide	µg/g	0.18	0.15	Aug. 18/00	G.M.

	Sample ID:	L14671-38 198131 PSO-34-2500-01A	L14671-39 198133 OP-A1-SE-2100		
	Date Sampled:	Not Supplied	Not Supplied		
Parameter	Unit			Date Analyzed	Analyst Initials
Sulphide	µg/g	<0.10	0.15	Aug. 18/00	G.M.

	Sample ID:	L14671-40 198135 OP-B1-SE-01-2100	L14671-41 198137 SE-OPB2-01-2300		
	Date Sampled:	Not Supplied	Not Supplied		
Parameter	Unit			Date Analyzed	Analyst Initials
Sulphide	µg/g	<0.10	0.11	Aug. 18/00	G.M.

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Analytical and Consulting Services

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Edmonton, Alberta T5S 1-I7
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TECHNICAL REPORT

To: **Enviro-Test/Eco Laboratories**   File: **15798**

Project: L14671

	Sample ID:	L14671-44		
	Date Sampled:	Not Supplied		
Parameter	Unit		Date Analyzed	Analyst Initials
Sulphide	μg/g	0.15	Aug. 18/00	G.M.

Analysis Verified by:

Lisa Reinbolt
Supervisor

Report Authorized by:

Bob Lickacz, B Sc., P.Biol
President

Note: All samples will be disposed of 30 days after analysis. Please advise the laboratory if you require additional sample storage time.

ALPHA LABORATORY SERVICES LTD.

QUALITY ASSURANCE REPORT

CLIENT: ETL/Eco

ATTENTION: Rey Jones

PROJECT: L14671

DATE: 8/21/00

FILE NUMBER: 15793

VERIFIED BY: L Reinbolt

Lisa Reinbolt
Supervisor

PARAMETER - METHOD	DATE ANALYZED	CONTROL STANDARD			DUPLICATE SAMPLE			SPIKED SAMPLE			
		RESULT	MEAN	95% CONFIDENCE LIMITS	A	B	Diff 95% C.L.	% RECOV	MEAN	95% CONFIDENCE LIMITS	
Sulphide - Spec	8/11/00		QC Check	Not Applicable	0.23	0.22	0.01	106.92	100.98	82.84	119.12
Sulphide - Spec.	8/18/00		QC Check	Not Applicable	0.03	0.09	0.01	102.76	100.33	82.03	118.04

Golder Associates
300 - 4260 Still Creek Drive
Burnaby, British Columbia, Canada V5C 6C6
Telephone (604) 298-6623 Fax (604) 298-5253

CHAIN OF CUSTODY RECORD/ANALYSIS REQUEST

No. 4861 page 1 of 1

Project Number: 002-2418-4500	Laboratory Name: ENVIRO-TEST
Short Title: Giant/A&R Plan/Yellowknife	Address: EDMONTON, ALTA.
Golder Contact: Valérie Bertrand	Telephone/Fax: / Contact: Rick Z.

Sample Control Number (SCN)	Sample Location	Sa.#	Sample Depth (m)	Sample Matrix (over)	Date Sampled (D/M/Y)	Time Sampled (HH:MM)	Sample Type (over)	QA/QC Code (over)	Related SCN (over)	Number of Containers	Metal Scan (ICP)		Product ID					RUSH	Remarks (over)
HWD-01 2507-01	Haz Waste		–	waste	25/07					1	X		X			-46	-43		Asbestos waste
HWD-02 2507-02	Dump		–	waste	25/07					1	X					-47	-45		Lime
HWD-03 2507-03	"		–	waste	25/07					1	X		X			-48	-44		Arsenic trioxide
-04																			
-05																			
-06																			
-07																			
-08																			
-09																			
-10																			
-11																			
-12																			
-13																			
-14																			
-15																			

Sampled by: V. Bertrand	Relinquished by: Signature	Company	Date	Time	Received by: Signature	Company
Sample Storage (°C)	Relinquished by: Signature	Company	Date	Time	Received by: Signature	Company
Comments:	Method of Shipment:	WayBill No:	Received for Lab by:		Date	Time
	Shipped by:	Shipment Condition: Seal Intact:	Temp (°C)	Cooler opened by:	Date	Time

WHITE: Golder Copy YELLOW: Lab Copy PINK: Lab Returns with Final Report

** TOTAL PAGE.05 **

CHAIN OF CUSTODY RECORD/ANALYSIS REQUEST

No 3885 page 1 of 3

Golder Associates

500 - 4260 Still Creek Drive
Burnaby, British Columbia, Canada V5C 6C6
Telephone (604) 298-6623 Fax (604) 298-5253

Project Number: GIANT MIRAMAR/AirPlan/Yellowknife		Laboratory Name: ENVIROTEST	
Short Title: 002-2418-4500		Address: 9936-67 ave, Edmonton	
Golder Contact: Valerie Bertrand		Telephone/Fax: 780-413-5280	Contact: Rick Z.

Sample Control Number (SCN)	Sample Location	Sub	Sample Depth (m)	Sample Matrix (over)	Date Sampled (D/M/Y)	Time Sampled (HH:MM)	Sample Type (over)	QA/QC Code (over)	Related SCN (over)	Number of Containers	SAG Plus extraction		[illegible]	Complete [illegible]			RUSH	Remarks (over)
PSO-01-2200-01-01				Soil	22/07								[illegible]		X		-1		
PSO-02-2200-01-02				Soil	22/07								X		X		-2		Quote
PSO-11-2200-01-03				Soil	22/07								X		X		-3		#
PSO-12-2200-01-04				Soil									X		X		-4		Q5463
PSO-14-2200-01-05				Soil											X		-5		(Soil analysis)
PSO-14-2200-02-06				Soil							X				X		-6		
PSO-15-2200-01-07				Soil											X		-7		L467
PSO-16-2200-01-08				Soil									X		X		-8		
PSO-17-2200-01-09				Soil									X		X		-9		
PSO-18-2200-02-10				Soil											X		-10		
PSO-18-2200-03-11				Soil									X		X		-11		
PSO-19-2200-01-12				Soil											X		-12		
PSO-20-2200-01-13				Soil									X		X		-13		
PSO-13-2200-01-14				Soil	25/07						X				X		14		-41
PSO-13-2200-01A-15				Soil	25/07								X		X		-15		

Sampler's Signature: Damian Panayi	Relinquished by: Signature	Company	Date	Time	Received by: Signature	Company
Sample Storage (°C)	Relinquished by: Signature	Company	Date	Time	Received by: Signature	Company
Comments: keep sample for further analysis	Method of Shipment:	Waybill No.:	Received for Lab by:		Date	Time
	Shipped by:	Shipment Condition: Seal Intact:	Temp (°C)	Cooler opened by:	Date	Time

WHITE: Golder Copy YELLOW: Lab Co PINK: Lab Returns with Final Report

Golder Associates
500 - 4260 Still Creek Drive
Burnaby, British Columbia, Canada V5C 6C6
Telephone (604) 298-6623 Fax (604) 298-5253

CHAIN OF CUSTODY REC...D/ANALYSIS REQUEST

No. 3886 page 2 of 3

Project Number: 002-2418-4500	Laboratory Name: ENVIROTEST
Short Title: Giant / Air Bay /	Address: 9936 - 67 ave. Edmonton
Golder Contact: Bertrand	Telephone/Fax: 780 413 5280 · Contact: Rick Z.

Sample Control Number (SCN)	Sample Location	Sub	Sample Depth (m)	Sample Matrix (over)	Date Sampled (D/M/Y)	Time Sampled (HH:MM)	Sample Type (over)	QA/QC Code (over)	Related SCN (over)	Number of Container	Shake Flask Extraction	Detailed salt scan	Complete metals		RUSH	Remarks (over)
PSO-21-2500-01				Soil	25/07					X			X	.16		
PSO-21-2500-02				Soil	25/07								X	.17		Quote # Q5463
PSO-21-2500-03				Soil	25/07						X		X	.18		
PSO-13-2500-01				Soil	25/07					X			X	.19		
~~PSO-19-2500-01~~								~~FD~~								
PSO-35-2300-01				Soil	23/07						X		X	.20		
PSO-36-2300-01				Soil	23/07								X	.21		
PSO-37-2300-01				Soil	23/07								X	.22		
PSO-03-2200-01				Soil	22/07						X		X	.23		
PSO-05-2200-01				Soil	22/07								X	.24		
PSO-06-2200-01				Soil	22/07						X		X	.25		
PSO-08-2200-01				Soil	22/07								X	.26		
PSO-09-2200-01				Soil	22/07								X	.27		
PSO-10-2200-01				Soil	22/07						X		X	.28		
-15																

Sampler's Signature: Damian Panayi	Relinquished by: Signature	Company	Date	Time	Received by: Signature	Company
Sample Storage (°C)	Relinquished by: Signature	Company	Date	Time	Received by: Signature	Company
Special Instructions: Keep remaining sample for further analysis	Method of Shipment:	Waybill No.	Received for Lab by:		Date	Time
	Shipped by:	Shipment Condition: Seal Intact:	Temp (°C)	Cooler opened by:	Date	Time

WHITE: Golder Copy YELLOW: Lab Copy PINK: Lab Returns with Final Report

CHAIN OF CUSTODY RECORD/ANALYSIS REQUEST

No. 062 page 3 of 3

Golder Associates
500 - 4260 Still Creek Drive
Burnaby, British Columbia, Canada V5C 6C6
Telephone (604) 298-6623 Fax (604) 298-5253

Project Number: 002-2418-4500	Laboratory Name: ENVIROTEST		
Short Title: Giant/A&R/Yellowknife	Address: 9936-67 ave Edmonton		
Golder Contact: Valerie Bertrand	Telephone/Fax: 780 413-5280	Contact: Rick Z.	

Sample Control Number (SCN)	Sample Location ✓	Stn.# ✓	Sample Depth (m) ✓	Sample Matrix (over)	Date Sampled (D/M/Y)	Time Sampled (HH:MM) ✓	Sample Type (over) ✓	QAQC Code (over) ✓	Related SCN (over) ✓	Number of Containers	Shake flask extraction	Partial ss suite	Complete metals suite		RUSH	Remarks (over)
P-50-30-2300-01				Soil	23/07								X	-29		Quote # Q5463
P-50-31 2300-01				Soil	23/07								X	-30		
P-50-32 2300-01				Soil	23/07						X		X	-31		
P-50-39 2500-01				Soil	25/07								X	-32		
P-50-40 2500-01				Soil	25/07								X	-33		
P-50-41 2500-01				Soil	25/07						X		X	-34		
P-50-33 2500-01				Soil	25/07						X		X	-35		
P-50-34 2500-01				Soil	25/07								X	-36		
P-50-38 2500-01				Soil	25/07						X		X	-37		
P-50-34 2500-01-Z				Soil	25/07						X		X	-38		
01-A1-Se 2100				Sed.	21/07								X	-39		
02-B1-Se 01-2200				Sed.	22/07								X	-40		
Se-OFB2-01-2300				Sed.	23/07								X	-41		
-14																
-15																

Samplers Signature: Nicolas Vachon	Relinquished by: Signature	Company	Date	Time	Received by: Signature	Company
Sample Storage (°C)	Relinquished by: Signature	Company	Date	Time	Received by: Signature	Company
Comments: keep unused sample for further analysis	Method of Shipment:	Waybill No.:	Received for Lab by:	Date	Time
	Shipped by:	Shipment Condition: Seal Intact:	Temp (°C)	Cooler opened by:	Date	Time

ETL Enviro-Test

Edmonton (Main)
9936 - 67 Avenue
Edmonton AB
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Phone: (780) 413-5227
Fax: (780) 437-2311

Edmonton (Downtown)
Industrial Hygiene
3rd Flr. 10158 - 103 Street
Edmonton AB
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Calgary
Bay 3, 1313 - 44th Ave. N.E.
Calgary AB
T2E 6L5
Phone: (403) 291-9897
Fax: (403) 291-0298

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9505 - 111 Street
Grande Prairie AB
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124 Veterinary Road
Saskatoon, SK
S7N 5E5
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Fax: (306) 668-8383
1-800-667-7645

Winnipeg
745 Logan Avenue
Winnipeg, MB
R3E 3L5
Phone: (204) 945-3705
Fax: (204) 945-0763

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1081 Barton Street
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Ottawa, ON
K1G 4J8
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Fax: (613) 730-1157

Wyoming
420 West First Street
Casper, Wyoming 82601
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Fax: (307) 235-1075
1-800-666-7006

Canada Wide Phone:
1-800-668-9878

Western Canada Fax:
1-800-386-7018

www.envirotest.com

CHEMICAL ANALYSIS REPORT

GOLDER ASSOCIATES LTD

ATTN: VALERIE DURTRAND

500 4260 STILL CREEK DRIVE

BURNABY BC V5C 6C6

DATE: November 30, 2000

Lab Work Order #: L17438, REVISED

Project P.O. #: Soils

Project Reference: 002-2418

Sampled By: DP

Date Received: 09/15/00

Comments: ADDITIONAL 30-OCT-00 14:53

APPROVED BY:

RON JONES

Project Manager

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L17438-1	YELLOWKNIFE-PS0-12-2200-02							
Sample Date								
Matrix:	SOIL							
		Arsenic (As)	8380	0.1	mg/kg		27-SEP-00	JJ
		Sulphate (SO4)	210	10	mg/kg		20-SEP-00	JZ
		Acid Volatile Sulphides	40	10	mg/kg	20-SEP-00	22-SEP-00	BA
		pH	7.9	0.1	pH		20-SEP-00	RT
L17438-3	YELLOWKNIFE-PS0-12-2200-03							
Sample Date								
Matrix:	SOIL							
		Arsenic (As)	1120	0.1	mg/kg		27-SEP-00	JJ
		Sulphate (SO4)	270	10	mg/kg		20-SEP-00	JZ
		Acid Volatile Sulphides	50	10	mg/kg	20-SEP-00	22-SEP-00	BA
		pH	8.0	0.1	pH		20-SEP-00	RT
L17438-4	YELLOWKNIFE-PS0-28-2300-01							
Sample Date								
Matrix:	SOIL							
		Arsenic (As)	861	0.1	mg/kg		27-SEP-00	JJ
		Sulphate (SO4)	390	10	mg/kg		20-SEP-00	JZ
		Acid Volatile Sulphides	20	10	mg/kg	25-SEP-00	27-SEP-00	BA
		pH	7.7	0.1	pH		20-SEP-00	RT
L17438-5	YELLOWKNIFE-PS0-34-2200-03							
Sample Date								
Matrix:	SOIL							
		Arsenic (As)	2240	0.1	mg/kg		27-SEP-00	JJ
		Sulphate (SO4)	310	10	mg/kg		20-SEP-00	JZ
		Acid Volatile Sulphides	20	10	mg/kg	25-SEP-00	27-SEP-00	BA
		pH	8.2	0.1	pH		20-SEP-00	RT
L17438-6	YELLOWKNIFE-PS0-17-2200-02							
Sample Date								
Matrix:	SOIL							
		Arsenic (As)	165	0.1	mg/kg		27-SEP-00	JJ
		Sulphate (SO4)	50	10	mg/kg		20-SEP-00	JZ
		Acid Volatile Sulphides	30	10	mg/kg	25-SEP-00	27-SEP-00	BA
		pH	7.5	0.1	pH		20-SEP-00	RT
L17438-7	YELLOWKNIFE-PS0-07-2200-01							
Sample Date								
Matrix:	SOIL							
		Arsenic (As)	2920	0.1	mg/kg		27-SEP-00	JJ
		Sulphate (SO4)	5510	10	mg/kg		20-SEP-00	JZ
		Acid Volatile Sulphides	30	10	mg/kg	25-SEP-00	27-SEP-00	BA
		pH	7.0	0.1	pH		20-SEP-00	RT

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L17438-8	YELLOWKNIFE-PS0-04-2200-01							
Sample Date								
Matrix:	SOIL							
		Arsenic (As)	873	0.1	mg/kg		27-SEP-00	JJ
		Sulphate (SO4)	130	10	mg/kg		20-SEP-00	JZ
		Acid Volatile Sulphides	20	10	mg/kg	25-SEP-00	27-SEP-00	BA
		pH	6.9	0.1	pH		20-SEP-00	RT
L17438-9	YELLOWKNIFE-PS0-06-2200-02							
Sample Date								
Matrix:	SOIL							
		Arsenic (As)	50.2	0.1	mg/kg		27-SEP-00	JJ
		Sulphate (SO4)	130	10	mg/kg		20-SEP-00	JZ
		Acid Volatile Sulphides	20	10	mg/kg	25-SEP-00	27-SEP-00	BA
		pH	8.1	0.1	pH		20-SEP-00	RT
L17438-10	YELLOWKNIFE-PS0-04-2200-02							
Sample Date								
Matrix:	SOIL							
		Arsenic (As)	130	0.1	mg/kg		27-SEP-00	JJ
		Sulphate (SO4)	270	10	mg/kg		20-SEP-00	JZ
		Acid Volatile Sulphides	20	10	mg/kg	25-SEP-00	27-SEP-00	BA
		pH	7.2	0.1	pH		20-SEP-00	RT
L17438-11	YELLOWKNIFE-PS0-15-2200-02							
Sample Date								
Matrix:	SOIL							
		Arsenic (As)	802	0.1	mg/kg		27-SEP-00	JJ
		Sulphate (SO4)	300	10	mg/kg		20-SEP-00	JZ
		Acid Volatile Sulphides	30	10	mg/kg	25-SEP-00	27-SEP-00	BA
		pH	8.3	0.1	pH		20-SEP-00	RT
L17438-12	YELLOWKNIFE-PS0-15-2200-03							
Sample Date								
Matrix:	SOIL							
		Arsenic (As)	2280	0.1	mg/kg		27-SEP-00	JJ
		Sulphate (SO4)	500	10	mg/kg		20-SEP-00	JZ
		Acid Volatile Sulphides	10	10	mg/kg	25-SEP-00	27-SEP-00	BA
		pH	7.9	0.1	pH		20-SEP-00	RT
L17438-13	YELLOWKNIFE-PS0-21-2200-03							
Sample Date								
Matrix:	SOIL							
		Arsenic (As)	247	0.1	mg/kg		27-SEP-00	JJ
		Sulphate (SO4)	120	10	mg/kg		20-SEP-00	JZ
		Acid Volatile Sulphides	30	10	mg/kg	25-SEP-00	27-SEP-00	BA
		pH	7.2	0.1	pH		20-SEP-00	RT

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L17438-14	YELLOWKNIFE-PS0-38-2300-02							
Sample Date								
Matrix:	SOIL							
		Arsenic (As)	14.4	0.1	mg/kg		27-SEP-00	JJ
		Sulphate (SO4)	280	10	mg/kg		20-SEP-00	JZ
		Acid Volatile Sulphides	50	10	mg/kg	25-SEP-00	27-SEP-00	BA
		pH	6.3	0.1	pH		20-SEP-00	RT
L17438-15	YELLOWKNIFE-PS0-21-2300-04							
Sample Date								
Matrix:	SOIL							
		Water-Soluble Arsenic Species						
		Arsenic (As)	0.1	0.1	mg/L		30-OCT-00	JJ
		Arsenic (As)	143	0.1	mg/kg		27-SEP-00	JJ
		Sulphate (SO4)	130	10	mg/kg		20-SEP-00	JZ
		Acid Volatile Sulphides	40	10	mg/kg	25-SEP-00	27-SEP-00	BA
		pH	7.1	0.1	pH		20-SEP-00	RT
L17438-16	YELLOWKNIFE-PS0-35-2300-02							
Sample Date								
Matrix:	SOIL							
		Arsenic (As)	22.4	0.1	mg/kg		27-SEP-00	JJ
		Sulphate (SO4)	110	10	mg/kg		20-SEP-00	JZ
		Acid Volatile Sulphides	40	10	mg/kg	29-SEP-00	05-OCT-00	BA
		pH	8.0	0.1	pH		20-SEP-00	RT
L17438-17	YELLOWKNIFE-PS0-37-2300-02							
Sample Date								
Matrix:	SOIL							
		Water-Soluble Arsenic Species						
		Arsenic (As)	6.8	0.1	mg/L		30-OCT-00	JJ
		Arsenic (As)	2930	0.1	mg/kg		27-SEP-00	JJ
		Sulphate (SO4)	400	10	mg/kg		20-SEP-00	JZ
		Acid Volatile Sulphides	20	10	mg/kg	29-SEP-00	05-OCT-00	BA
		pH	7.7	0.1	pH		20-SEP-00	RT
L17438-18	YELLOWKNIFE-PS0-31-2200-02							
Sample Date								
Matrix:	SOIL							
		Arsenic (As)	221	0.1	mg/kg		27-SEP-00	JJ
		Sulphate (SO4)	200	10	mg/kg		20-SEP-00	JZ
		Acid Volatile Sulphides	30	10	mg/kg	29-SEP-00	05-OCT-00	BA
		pH	8.0	0.1	pH		20-SEP-00	RT
L17438-19	YELLOWKNIFE-PS0-32-2300-02							
Sample Date								
Matrix:	SOIL							

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L17438-19	YELLOWKNIFE-PS0-32-2300-02							
Sample Date								
Matrix:	SOIL							
		Arsenic (As)	50.3	0.1	mg/kg		27-SEP-00	JJ
		Sulphate (SO4)	250	10	mg/kg		20-SEP-00	JZ
		Acid Volatile Sulphides	20	10	mg/kg	28-SEP-00	05-OCT-00	BA
		pH	8.1	0.1	pH		20-SEP-00	RT
L17438-20	YELLOWKNIFE-PS0-17-2200-03							
Sample Date								
Matrix:	SOIL							
		Arsenic (As)	110	0.1	mg/kg		27-SEP-00	JJ
		Sulphate (SO4)	90	10	mg/kg		20-SEP-00	JZ
		Acid Volatile Sulphides	20	10	mg/kg	28-SEP-00	05-OCT-00	BA
		pH	7.5	0.1	pH		20-SEP-00	RT
L17438-21	YELLOWKNIFE-PS0-15-2200-04							
Sample Date								
Matrix:	SOIL							
		Arsenic (As)	2540	0.1	mg/kg		27-SEP-00	JJ
		Sulphate (SO4)	210	10	mg/kg		20-SEP-00	JZ
		Acid Volatile Sulphides	<10	10	mg/kg	10-OCT-00	16-OCT-00	BA
		pH	8.1	0.1	pH		20-SEP-00	RT
L17438-22	YELLOWKNIFE-PS0-02-2200-02							
Sample Date								
Matrix:	SOIL							
		Water-Soluble Arsenic Species						
		Arsenic (As)	0.1	0.1	mg/L		30-OCT-00	JJ
		Arsenic (As)	1270	0.1	mg/kg		27-SEP-00	JJ
		Sulphate (SO4)	210	10	mg/kg		20-SEP-00	JZ
		Acid Volatile Sulphides	<10	10	mg/kg	10-OCT-00	16-OCT-00	BA
		pH	8.0	0.1	pH		20-SEP-00	RT
L17438-23	YELLOWKNIFE-PS0-11-2200-02							
Sample Date								
Matrix:	SOIL							
		Arsenic (As)	2520	0.1	mg/kg		27-SEP-00	JJ
		Sulphate (SO4)	1790	10	mg/kg		20-SEP-00	JZ
		Acid Volatile Sulphides	20	10	mg/kg	10-OCT-00	16-OCT-00	BA
		pH	7.8	0.1	pH		20-SEP-00	RT
L17438-24	YELLOWKNIFE-PS0-09-2200-02							
Sample Date								
Matrix:	SOIL							
		Arsenic (As)	249	0.1	mg/kg		27-SEP-00	JJ
		Sulphate (SO4)	1240	10	mg/kg		20-SEP-00	JZ

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L17436-24	YELLOWKNIFE-PS0-09-2200-02							
Sample Date								
Matrix	SOIL							
		Acid Volatile Sulphides	20	10	mg/kg	10-OCT-00	18-OCT-00	BA
		pH	7.7	0.1	pH		20-SEP-00	RT

Methodology Reference

ETL Test Code	Test Description	Methodology Reference (Based On)
AS-HYD-ED	Arsenic (As)	APHA 3114 C-AAS - Hydride
AS-SOL-ED	Total Water-Soluble Arsenic	Birkholz et al + APHA 3114 C-(HGAAS)
PH-1:1-ED	pH	C. CSSS 16.3-Electrode on 1:1 extr.
SO4-ED	Sulfate (SO4)	APHA 4110 B-Ion Chromatography
SULPHIDE-ACIDVOL-TB	Sulphide	EPA 9030B

ENVIRO-TEST QC REPORT

Workorder L17438

QC Type: BLANK

Lab QC Number:		Result	Qualifier	Units	Limit	Analyzed
WG19202-1						
SO4-ED	Sulphate (SO4)	<10		mg/kg	10	20-SEP-00

QC Type: MBLK

Lab QC Number:		Result	Qualifier	Units	Limit	Analyzed
WG19627-1						
AS-HYD-ED	Arsenic (As)	0.4		mg/kg	0.5	27-SEP-00

QC Type: DUP

Lab QC Number:		RPD	Qualifier	Limit %	Analyzed
WG19158-2					
PH-1:1-ED	pH	0.14		1.1	20-SEP-00
WG19158-3					
PH-1:1-ED	pH	0.41		1.1	20-SEP-00
WG19202-5					
SO4-ED	Sulphate (SO4)	9.0		20	20-SEP-00
WG19202-9					
SO4-ED	Sulphate (SO4)	6.0		20	20-SEP-00
WG19627-5					
AS-HYD-ED	Arsenic (As)	2.5		12.5	27-SEP-00
WG19627-7					
AS-HYD-ED	Arsenic (As)	5.5		12.5	27-SEP-00

QC Type: LCS

Lab QC Number:		% Recovery	Qualifier	Limit %	Analyzed
WG19158-4					
PH-1:1-ED	pH	100		98.8-102	20-SEP-00
WG19158-5					
PH-1:1-ED	pH	101		98.7-102	20-SEP-00
WG19158-6					
PH-1:1-ED	pH	100		100-104	20-SEP-00
WG19627-2					
AS-HYD-ED	Arsenic (As)	102		85.5-114	27-SEP-00
WG19627-3					
AS-HYD-ED	Arsenic (As)	95		85.5-114	27-SEP-00

QC Type: MS

Lab QC Number:	% Recovery	Qualifier	Limit %	Analyzed

ENVIRO-TEST QC REPORT

Workorder L17438

WG19202-6					
SO4-ED	Sulphate (SO4)	98		75-125	20-SEP-00
WG19627-4					
AS-HYD-ED	Arsenic (As)	102		79.6-120	27-SEP-00
WG19627-6					
AS-HYD-ED	Arsenic (As)	98		79.6-120	27-SEP-00

QC Type: SRM

Lab QC Number:		% Recovery	Qualifier	Limit %	Analyzed
WG19156-1					
PH-1:1-ED	pH	101		98.7-101	20-SEP-00

ENVIRO-TEST QC REPORT

Workorder L17438

Legend

DUP Duplicate
RPD Relative Percent Difference ((higher result-lower result)/Average, expressed as %)
N/A Not Available
LCS Laboratory Control Sample
SRM Standard Reference Materials
MS Matrix Spike
MSD Matrix Spike Duplicate
ADE Average Desorption Efficiency

Qualifier

RPD-NA Relative Percent Difference Not Available due to result(s) being less than detection limit.
A Method blank exceeds detection limit. Blank correction applied where appropriate.
B Method blank result exceeds detection limit, however, it is less that 5% of sample concentration. Blank correction not applied.
C Method blank result exceeds detection limit, however it is less than 5% of the regulatory limit for the analyte of interest. Blank correction not applied.
D Duplicate result exceeds limit due to increased variability for low level samples.
E Matrix spike limit exceeded due to high sample background.
F Silver recovery low, likely due to elevated choride levels in sample.
G Outlier - No assignable cause for nonconformity has been determined.

ETL EnviroTest **CHAIN OF CUSTODY / ANALYTICAL REQUEST FORM**

[illegible] Avenue, Edmonton, Alberta [illegible] — Telephone (780) 413-5227 — Fax (780) 437-2311
Edmonton Toll-Free Line — Telephone 1-800-668-9878 — Fax 1-800-[illegible]
[illegible] Avenue N.E., Calgary, Alberta [illegible] — Telephone (403) 291-9897 — Fax (403) 291-0298
[illegible] Street, Grande Prairie, Alberta [illegible] — Telephone (780) 539-5196 — Fax (780) 513-2191
[illegible] Bldg., 124 Veterinary Road, Saskatoon, Saskatchewan [illegible] — Telephone (306) 668-8370 — Fax (306) 668-8383
745 Logan Avenue, Winnipeg, Manitoba [illegible] — Telephone (204) 945-3705 — Fax (204) 945-0763
[illegible] Street, Thunder Bay, Ontario [illegible] — Telephone (807) 623-6463 — Fax (807) 623-7598

DATE: 12 Sept 00 DATE REQUIRED: ______

SERVICE REQUESTED:

☒ REGULAR ☐ PRIORITY (50% SURCHARGE) ☐ EMERGENCY (100% SURCHARGE)

SPECIAL REQUIREMENTS / REGS (CIRCLE ONE)
MISA — TIER I — CCME
BC MELP — AB MUST
OTHER ______

ANALYSIS REQUESTED: Prep dup/ligning; Prep Hyd-cd; Total Arsenic As-hyd-cd; Sulfate SO4-IEO; Sulfide Sulfide-T[illegible]; pH [illegible]; PH-18-ED

Q5-463

L17438

SAMPLE ID	SAMPLED BY / DATE / TIME	LOCATION OF SAMPLING	SAMPLING METHOD	SAMPLE TYPE	Analysis 1	Analysis 2	Analysis 3	Analysis 4	LAB SAMPLE NO.
PSO-12-2200-03	DP 22/00	Yellowknife			✓	✓	✓	✓	-1
PSO-17-2200-02	DP 22/00				✓	✓	✓	✓	3
PSO-22-2200-01					✓	✓	✓	✓	-4
PSO-14-2200-07 (3 DP)					✓	✓	✓	✓	-5
PSO-17-2200-03					✓	✓	✓		-6
PSO-07-2200-01					✓	✓	✓	✓	-7
PSO-07-2200-01					✓	✓	✓	✓	-8
PSO-01-2200-02					✓	✓	✓	✓	9
PSO-01-2200-03					✓	✓	✓	✓	-10
PSO-15-2200-02					✓	✓	✓	✓	-11
PSO-15-2200-03					✓	✓	✓	✓	-12

PRESERVED / FILTERED

NOTES & CONDITIONS
1. Quote number must be provided to ensure proper pricing.
2. Turnaround times will vary dependant on complexity of analysis & lab workload at time of submission. Please contact the lab to confirm turnaround times.
3. All hazardous samples submitted must be labeled to comply with WHMIS regulations. This must include the nature of the hazard, as well as a contact name & phone number that the lab can contact for further information.

NOTE: Failure to properly complete all portions of this form may delay analysis.

NOTE: Shaded areas **MUST** be completed in full by client for sample processing to occur.

CLIENT: Golder Associates NO. BOTTLES SUBMITTED: 23
CONTACT: Valerie Bertrand PHONE: (604) 298-6623
REPORT ADDRESS: #500, 4260 Still Creek Dr. (604) 298-5253
Burnaby BC V5C 6C6 QUOTE NO: ______
INVOICE TO: As above PO NO: ______

RELINQUISHED BY:	DATE:	RECEIVED BY:	DATE:
Norman Powers	13 Sept 00	KJH	Sept 14
	TIME:	ETL LAB:	TIME: 11:00
RELINQUISHED BY:	DATE:	RECEIVED BY:	DATE:
	TIME:	ETL LAB:	TIME:

SAMPLE CONDITION UPON RECEIPT:
FROZEN: ______ COLD: X AMBIENT: ______
OTHER (BREAKAGE, LEAKAGE, ETC): ______

WHITE - Report Copy
PINK - File Copy
YELLOW - Customer Copy

0972-4118

E&L EnviroTest **CHAIN OF CUSTODY / ANALYTICAL REQUEST FORM**

Page 2 of 3

DATE: 13 Sept 00 DATE REQUIRED: ________

SERVICE REQUESTED:

☒ REGULAR ☐ PRIORITY (50% SURCHARGE) ☐ EMERGENCY (100% SURCHARGE)

SPECIAL REQUIREMENTS / REGS (CIRCLE ONE)

VISA	TIER 1	CCME
BC MELP	AB MUST	
OTHER		

ANALYSIS REQUESTED: Total Arsenic, Sulfate, Sulfide, pH

SAMPLE ID	SAMPLED BY / DATE / TIME		LOCATION OF SAMPLING	SAMPLING METHOD	SAMPLE TYPE	Total Arsenic	Sulfate	Sulfide	pH	LAB SAMPLE NO
BSO-21-2500-03	DP	25/00	Yellowknife			✓	✓	✓	✓	-13
BSO-28-2500-02	DP	25/00				✓	✓	✓	✓	-14
BSO-21-2500-04	DP	25/00				✓	✓	✓	✓	-15
BSO-30-2300-02	DP	23/00				✓	✓	✓	✓	-16
BSO-37-2300-02	DP	23/00				✓	✓	✓	✓	-17
BSO-31-2200-02	DP	22/00				✓	✓	✓	✓	-18
BSO-32-2300-02	DP	23/00				✓	✓	✓	✓	-19
BSO-17-2200-03	DP	22/00				✓	✓	✓	✓	-20
BSO-18-2200-04	DP	22/00				✓	✓	✓	✓	-21
BSO-08-2200-02	DP	22/00				✓	✓	✓	✓	-22
BSO-11-2200-02	DP	22/00	↓			✓	✓	✓	✓	-23

PRESERVED / FILTERED

NOTES & CONDITIONS
1. Quote number must be provided to ensure proper pricing.
2. Turnaround times will vary dependent on complexity of analysis & lab workload at time of submission. Please contact the lab to confirm turnaround times.
3. All hazardous samples submitted must be labeled to comply with WHMIS regulations. This must include the nature of the hazard, as well as a contact name & phone number that the lab can contact for further information.

NOTE: Failure to properly complete all portions of this form may delay analysis.

NOTE: Shaded areas MUST be completed in full by client for sample processing to occur.

CLIENT: Golder Associates NO. OF SAMPLES SUBMITTED: 23

CONTACT: Valerie Bertrand PHONE: (604) 298-6623

REPORT ADDRESS: #500, 4260 Still Creek Dr. FAX: (604) 298-5253

Burnaby, BC V5C 6C6 QUOTE NO.: ________

INVOICE ADDRESS: as above PO NO.: ________

RELINQUISHED BY:	DATE: 13 Sept 00	RECEIVED BY: KJH	DATE:
	TIME:	ETL LAB:	TIME:
RELINQUISHED BY:	DATE:	RECEIVED BY:	DATE:
	TIME:	ETL LAB:	TIME:

SAMPLE CONDITION UPON RECEIPT

FROZEN: ______ COLD: ______ AMBIENT: ______

OTHER (BREAKAGE, LEAKAGE ETC): ______

WHITE - Report Copy
PINK - File Copy
YELLOW - Customer Copy

EnL Env Test **CHAIN OF CUSTODY / ANALYTICAL REQUEST FORM**

9505 - 6th Avenue, Edmonton, Alberta T6E 0P5 Telephone: (780) 413-5220 Fax: (780) 437-2311
Canadian Toll Free Line Telephone: 1-800-668-9878 Fax: 1-800-280-7312
1319 - 17 Avenue N.E. Calgary, Alberta T2E 6 5 Telephone: (403) 291-9897 Fax: (403) 291-0298
9505 - 111 Street, Grande Prairie, Alberta T8V 5W1 Telephone: (780) 539-5196 Fax: (780) 513-2191
General Purpose Bldg., 124 Veterinary Rd., Saskatoon, Saskatchewan S7N 5E3 Telephone: (306) 668-8370 Fax: (306) 668-8383
745 Logan Avenue, Winnipeg, Manitoba R3E 3L5 Telephone: (204) 945-3705 Fax: (204) 945-0763
1081 Barton Street, Thunder Bay, Ontario P7B 5N3 Telephone: (807) 623-6463 Fax: (807) 623-7598

DATE: 13 Sept 00 DATE REQUIRED: ______

SERVICE REQUESTED:

☒ REGULAR ☐ PRIORITY (50% SURCHARGE) ☐ EMERGENCY (100% SURCHARGE)

SPECIAL REQUIREMENTS / REGS (CIRCLE ONE)
MISA TIER I CCME
BC MELP AB MUST
OTHER ______

ANALYSIS REQUESTED: Total Arsenic, Sulfate, Sulfide, pH

Page 3 of 3

SAMPLE ID	SAMPLED BY / DATE / TIME	LOCATION OF SAMPLING	SAMPLING METHOD	SAMPLE TYPE	Total Arsenic	Sulfate	Sulfide	pH	LAB SAMPLE NO.
P50-97-2800-02	DP / 22/00	Yellowknife			✓	✓	✓	✓	-24
			PRESERVED / FILTERED						

NOTES & CONDITIONS
1. Quote number must be provided to ensure proper pricing.
2. Turnaround times will vary dependant on complexity of analysis & Lab workload at time of submission. Please contact the Lab to confirm turnaround times.
3. All hazardous samples submitted must be labeled to comply with WHMIS regulations. This must include the nature of the hazard, as well as a contact name & phone number for the Lab to contact for further information.

NOTE: Failure to properly complete all portions of this form may delay analysis.

NOTE: Shaded areas MUST be completed in full by client for sample processing to occur.

CLIENT: Golder Associates NO. BOTTLES SUBMITTED: 23
CONTACT: Valerie Bertrand PHONE: (604) 298-6623
REPORT ADDRESS: 4260 Still Creek Dr FAX: (604) 298-5253
Burnaby BC V5C 6C6 QUOTE NO.: ______
INVOICE ADDRESS: As above P.O. NO.: ______

RELINQUISHED BY: Aurora Aunna DATE: 13 Sept 00 TIME: RECEIVED BY: ETL LAB: DATE: TIME:
RELINQUISHED BY: DATE: TIME: RECEIVED BY: ETL LAB: DATE: TIME:

SAMPLE CONDITION UPON RECEIPT:
FROZEN: ______ COLD: ______ AMBIENT: ______
OTHER (BOTTLE BREAKAGE / DAMAGE / ETC): ______

WHITE - Report Copy
PINK - ETL Copy
YELLOW - Customer Copy

ENVIRO-TEST QC REPORT

Workorder L17436

QC Type: BLANK

Lab QC Number:		Result	Qualifier	Units	Limit	Analyzed
WG20965-1						
SULPHIDE-ACIDVOL-T	Acid Volatile Sulphides	<10		mg/kg	10	27-SEP-00

QC Type: MB

Lab QC Number:		Result	Qualifier	Units	Limit	Analyzed
WG20965-3						
SULPHIDE-ACIDVOL-T	Acid Volatile Sulphides	<10		mg/kg	10	05-OCT-00

QC Type: MBLK

Lab QC Number:		Result	Qualifier	Units	Limit	Analyzed
WG19627-1						
AS-HYD-ED	Arsenic (As)	0.4		mg/kg	0.5	27-SEP-00

QC Type: DUP

Lab QC Number:		RPD	Qualifier	Limit %	Analyzed
WG19158-2					
PH-1:1-ED	pH	0.14		1.1	20-SEP-00
WG19158-3					
PH-1:1-ED	pH	0.41		1.1	20-SEP-00
WG19627-5					
AS-HYD-ED	Arsenic (As)	2.5		12.5	27-SEP-00
WG19627-7					
AS-HYD-ED	Arsenic (As)	5.5		12.5	27-SEP-00
WG20965-2					
SULPHIDE-ACIDVOL-T	Acid Volatile Sulphides	1.8		20	22-SEP-00
WG20965-4					
SULPHIDE-ACIDVOL-T	Acid Volatile Sulphides	0.48		20	05-OCT-00

QC Type: LCS

Lab QC Number:		% Recovery	Qualifier	Limit %	Analyzed
WG19158-4					
PH-1:1-ED	pH	100		98.8-103	20-SEP-00
WG19158-5					
PH-1:1-ED	pH	101		98.7-102	20-SEP-00
WG19158-6					
PH-1:1-ED	pH	100		100-104	20-SEP-00
WG19627-2					

ENVIRO-TEST QC REPORT

Workorder L17436

AS-HYD-ED	Arsenic (As)	102		85.5-114	27-SEP-00
WG19627-3					
AS-HYD-ED	Arsenic (As)	95		85.5-114	27-SEP-00

QC Type: **MS**

Lab QC Number:		% Recovery	Qualifier	Limit %	Analyzed
WG19627-4					
AS-HYD-ED	Arsenic (As)	102		79.6-120	27-SEP-00
WG19627-6					
AS-HYD-ED	Arsenic (As)	96		79.6-120	27-SEP-00

QC Type: **SRM**

Lab QC Number:		% Recovery	Qualifier	Limit %	Analyzed
WG19158-1					
PH-1:1-ED	pH	101		95.7-101	20-SEP-00

ENVIRO-TEST QC REPORT

Workorder L17438

Legend:

Limit	95% Confidence Interval (Laboratory Warning Limits)
DUP	Duplicate
RPD	Relative Percent Difference ((higher result-lower result)/Average, expressed as %)
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Materials
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material

Qualifier:

RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.
A	Method blank exceeds detection limit. Blank correction applied, where appropriate.
B	Method blank result exceeds detection limit, however, it is less than 5% of sample concentration. Blank correction not applied.
C	Method blank result exceeds detection limit, however, it is less than 5% of the regulatory limit for the analyte of interest. Blank correction not applied.
D	Duplicate result exceeds limit due to increased variability for low level samples.
E	Matrix spike limit exceeded due to high sample background.
F	Silver recovery low, likely due to elevated choride levels in sample.
G	Outlier - No assignable cause for nonconformity has been determined.
H	Result fall within the 99% Confidence Interval (Laboratory Control Limits)

Edmonton (Main)
Phone (780) 413-5227
Fax (780) 437-2311

Edmonton (Downtown)
Industrial Hygiene
Phone (780) 413-5265
Fax (780) 424-4602

Calgary
Phone (403) 291-9897
Fax (403) 291-0298

Grande Prairie
Phone (780) 539-5196
Fax (780) 513-2191

Saskatoon
124 Veterinary Road
Saskatoon, SK
Phone (306) 668-8370
Fax (306) 668-8383

Winnipeg
Phone (204) 945-3705
Fax (204) 945-0763

Thunder Bay
1081 Barton Street
Thunder Bay, ON
Phone (807) 623-6463
Fax (807) 623-7598

Ottawa
Phone (613) 731-1005
Fax (613) 736-1107

Wyoming
Phone (307) 235-5741
Fax (307) 235-1576

Canada Wide Phone

Western Canada Fax
1-800-236-7219

www.envirotest.com

ETL Enviro-Test

RECEIVED NOV 2 ? 2000

CHEMICAL ANALYSIS REPORT

GOLDER ASSOCIATES LTD
ATTN: VALERIE BERTRAND
500 4260 STILL CREEK DRIVE
BURNABY BC V5C 6C6

DATE: November 16, 2000

soils

Lab Work Order #: L20173
Sampled By: DP
Date Received: 10/24/00
Project P.O. #: 6132/6133
Project Reference: 002-2419-4500
Comments: ADDITIONAL 31-OCT-00 16:24

APPROVED BY:

ROY JONES
Project Manager

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L20173-1	P-SO-04 2200-02							
Sample Date								
Matrix:	SOIL							
		Arsenic (As)	562	0.1	mg/kg	25-OCT-00	26-OCT-00	JJ
L20173-3	P-SO-11 2200-03							
Sample Date								
Matrix:	SOIL							
		Arsenic (As)	5.2	0.1	mg/kg	25-OCT-00	26-OCT-00	JJ
L20173-4	P-SO-27 2300-03							
Sample Date								
Matrix:	SOIL							
		Arsenic (As)	16000	0.1	mg/kg		27-OCT-00	JJ
L20173-5	P-SO-37 2300-03							
Sample Date								
Matrix:	SOIL							
		Arsenic (As)	277	0.1	mg/kg	25-OCT-00	26-OCT-00	JJ
L20173-6	P-SO-21 2300-02							
Sample Date								
Matrix:	SOIL							
		Arsenic (As)	1700	0.1	mg/kg	25-OCT-00	26-OCT-00	JJ
L20173-7	P-SO-07 2200-02							
Sample Date								
Matrix:	SOIL							
		Arsenic (As)	1860	0.1	mg/kg	25-OCT-00	26-OCT-00	JJ
L20173-8	P-SO-15 2200-02							
Sample Date								
Matrix:	SOIL							
		Arsenic (As)	3640	0.1	mg/kg	25-OCT-00	26-OCT-00	JJ
L20173-9	P-SO-08 2200-03							
Sample Date								
Matrix:	SOIL							
		Arsenic (As)	1960	0.1	mg/kg	25-OCT-00	26-OCT-00	JJ
L20173-10	P-SO-27 2300-04							
Sample Date								
Matrix:	SOIL							
		Arsenic (As)	480	0.1	mg/kg	25-OCT-00	26-OCT-00	JJ
L20173-11	P-SO-07 2200-03							
Sample Date								
Matrix:	SOIL							

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L20173-11	P-SO-07 2200-03							
Sample Date								
Matrix:	SOIL							
		Arsenic (As)	2130	0.1	mg/kg	25-OCT-00	26-OCT-00	JJ
L20173-12	P-SO-29 2300-02							
Sample Date								
Matrix:	SOIL							
		Arsenic (As)	7120	0.1	mg/kg	25-OCT-00	26-OCT-00	JJ
L20173-13	P-SO-27 2300-04							
Sample Date								
Matrix:	SOIL							
		Arsenic (As)	77.6	0.1	mg/kg		27-OCT-00	JJ
L20173-14	P-SO-27 2300-02							
Sample Date								
Matrix:	SOIL							
		Arsenic (As)	6830	0.1	mg/kg		27-OCT-00	JJ
L20173-18	P-SO-13 2300-03							
Sample Date								
Matrix:	SOIL							
		Arsenic (As)	804	0.1	mg/kg		27-OCT-00	JJ
L20173-19	P-S-0-13 2300-04							
Sample Date								
Matrix:	SOIL							
		Arsenic (As)	675	0.1	mg/kg		27-OCT-00	JJ
L20173-20	P-S-0-22 2300-03							
Sample Date								
Matrix:	SOIL							
		Arsenic (As)	588	0.1	mg/kg		27-OCT-00	JJ
L20173-21	P-S-0-24-2300-03							
Sample Date								
Matrix:	SOIL							
		Arsenic (As)	4950	0.1	mg/kg		27-OCT-00	JJ
L20173-22	P-SO-27 2300-03 DUPLICATE							
Sample Date								
Matrix:	SOIL							
		Arsenic (As)	15800	0.1	mg/kg		09-NOV-00	JJ

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By

Methodology Reference

ETL Test Code	Test Description	Methodology Reference (Based On)
AS-HYD-ED	Arsenic (As)	APHA 3114 C AAS - Hydride

CHAIN OF CUSTODY RECORD/ANALYSIS REQUEST

L20173

No. 8132 page 1 of 2

Golder Associates

500 - 4260 Still Creek Drive
Burnaby, British Columbia, Canada V5C 6C6
Telephone (604) 298-6623 Fax (604) 298-5253

Project Number: 002-3118-4500	Laboratory Name: ETL
Short Title: Miramar ~~FFF~~ - Giant Soil Sampling	Address: 9936-67th Ave, Edmonton
Golder Contact: Valerie Bertrand	Telephone/Fax: (780)-468-9870 / Contact: Roy Jones

Analyses Required: Arsenic, Multiple Metals, ASTMD-OD, PSD-HYD-OD, Due Friday

Sample Control Number (SCN)	[redacted]	Sample Matrix (over)	Date Sampled (D / M / Y)	[redacted]	Number of Containers	Arsenic					RUSH	Remarks (over)
P50-04 2300-02 - 01	[redacted]	Soil	July 00	[redacted]	1	✓						-1
P50-46 2300-03 - 02	[redacted]			[redacted]	1	✓						-23
P50-37 2300-02 - 03	[redacted]			[redacted]	1	✓						-34
P50-37 2300-03 - 04	[redacted]			[redacted]	1	✓						-45
P50-24 2300-02 - 05	[redacted]			[redacted]	1	✓						-56
P50-24 2300-03 - 06	[redacted]			[redacted]	1	✓						~~[illegible]~~ -21
P50-07 2300-02 - 07	[redacted]			[redacted]	1	✓						-78 -7
P50-19 2300-02 - 08	[redacted]			[redacted]	1	✓						-89 -8
P50-07 2300-03 - 09	[redacted]			[redacted]	1	✓						-910 -9
P50-37 2300-04 - 10	[redacted]			[redacted]	1	✓						~~-1011~~ -10
P50-07 2300-03 - 11	[redacted]			[redacted]	1	✓						~~-1112~~ -11
P50-20 2300-02 - 12	[redacted]			[redacted]	1	✓						~~-1213~~ -12
P50-37 2300-04 - 13	[redacted]			[redacted]	1	✓						~~-1314~~ -13
P50-27 2300-02 - 14	[redacted]			[redacted]	1	✓						~~-1415~~ -14
P50-13 2300-03 - 15	[redacted]	↓	↓	[redacted]	1	✓						~~[illegible]~~ -15

Sampler's Signature: D Bynan	Relinquished by: Signature D Bynan	Company: Golder	Date: 23 Oct 00	Time	Received by: Signature: Jim Watt	Company
Sample Storage (°C)	Relinquished by: Signature	Company	Date: Oct 24-00	Time: 0900	Received by: Signature	Company
Comments:	Method of Shipment:	Waybill No.:	Received for Lab by:		Date:	Time
	Shipped by:	Shipment Condition: Seal Intact:	Temp (°C)	Cooler opened by:	Date:	Time

WHITE: Golder Copy YELLOW: Lab Co. PINK: Lab Returns with Final Report

Golder Associates
500 - 4260 Still Creek Drive
Burnaby, British Columbia, Canada V5C 6C6
Telephone (604) 298 6623 Fax (604) 298 5253

CHAIN OF CUSTODY RECORD/ANALYSIS REQUEST

L20173

No. 813 page 2 of 2

Project Number: C02-2418-4500	Laboratory Name: ETL		
Short Title: Giant Soil Sampling	Address: 9936-67 Ave Edmonton		
Golder Contact: Valerie Bertrand	Telephone/Fax: 780-468 9878	Contact: Ky Jones	

Analyses Required

Sample Control Number (SCN)	[redacted]	Sample Matrix (over)	Date Sampled (D/M/Y)	[redacted]	Number of Containers	Arsenic	Methyl...	[illegible]	As-HYD-[illegible]	PREP-HYD-[illegible]			RUSH	Remarks (over)
250-13 250-04 - 01	[redacted]	Soil	July 00	[redacted]	1	✓								-19 -[illegible]
150-22 250-21 - 02	[redacted]			[redacted]	1	✓								-20 -[illegible]
~~- 03~~	[redacted]			[redacted]										
- 04	[redacted]			[redacted]										
- 05	[redacted]			[redacted]										
- 06	[redacted]			[redacted]										
- 07	[redacted]			[redacted]										
- 08	[redacted]			[redacted]										
- 09	[redacted]			[redacted]										
- 10	[redacted]			[redacted]										
- 11	[redacted]			[redacted]										
- 12	[redacted]			[redacted]										
- 13	[redacted]			[redacted]										
- 14	[redacted]			[redacted]										
- 15	[redacted]			[redacted]										

Sampler's Signature: V Bertrand	Relinquished by: Signature: V Bertrand	Company: Golder	Date: 23 Oct 00	Time	Received by: Signature	Company
Sample Storage (°C)	Relinquished by: Signature	Company	Date	Time	Received by: Signature	Company
Comments:	Method of Shipment	Waybill No.:		Received for Lab by:	Date	Time
	Shipped by	Shipment Condition: Seal Intact:		Temp (°C) / Cooler opened by:	Date	Time

ENVIRO-TEST QC REPORT

Workorder L20173

QC Type: BLANK

Lab QC Number:		Result	Qualifier	Units	Limit	Analyzed
WG22388-1						
AS-HYD-ED	Arsenic (As)	0.1		mg/kg	0.5	09-NOV-00

QC Type: MB

Lab QC Number:		Result	Qualifier	Units	Limit	Analyzed
WG21795-1						
AS-HYD-ED	Arsenic (As)	0.4		mg/kg	0.5	27-OCT-00

QC Type: DUP

Lab QC Number:		RPD	Qualifier	Limit %	Analyzed
WG21795-5					
AS-HYD-ED	Arsenic (As)	14	H	12.5	27-OCT-00
WG21795-7					
AS-HYD-ED	Arsenic (As)	44	G	12.5	27-OCT-00
WG22388-2					
AS-HYD-ED	Arsenic (As)	11		12.5	09-NOV-00

QC Type: MS

Lab QC Number:		% Recovery	Qualifier	Limit %	Analyzed
WG21795-4					
AS-HYD-ED	Arsenic (As)	94		79.6-120	27-OCT-00
WG21795-6					
AS-HYD-ED	Arsenic (As)	96		79.6-120	27-OCT-00
WG22388-3					
AS-HYD-ED	Arsenic (As)	84		79.6-120	09-NOV-00

QC Type: SRM

Lab QC Number:		% Recovery	Qualifier	Limit %	Analyzed
WG21795-2					
AS-HYD-ED	Arsenic (As)	99		85.5-114	27-OCT-00
WG21795-3					
AS-HYD-ED	Arsenic (As)	82	H	85.5-114	27-OCT-00

ENVIRO-TEST QC REPORT

Workorder L20173

Legend:

Limit 95% Confidence Interval (Laboratory Warning Limits)
DUP Duplicate
RPD Relative Percent Difference ((higher result-lower result)/Average, expressed as %)
N/A Not Available
LCS Laboratory Control Sample
SRM Standard Reference Materials
MS Matrix Spike
MSD Matrix Spike Duplicate
ADE Average Desorption Efficiency
MB Method Blank
IRM Internal Reference Material
CRM Certified Reference Material

Qualifier:

RPD-NA Relative Percent Difference Not Available due to result(s) being less than detection limit.
A Method blank exceeds detection limit. Blank correction applied, where appropriate.
B Method blank result exceeds detection limit, however, it is less than 5% of sample concentration. Blank correction not applied.
C Method blank result exceeds detection limit, however, it is less than 5% of the regulatory limit for the analyte of interest. Blank correction not applied.
D Duplicate result exceeds limit due to increased variability for low level samples.
E Matrix spike limit exceeded due to high sample background.
F Silver recovery low, likely due to elevated choride levels in sample.
G Outlier - No assignable cause for nonconformity has been determined.
H Result fall within the 99% Confidence Interval (Laboratory Control Limits)

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A DIVISION OF ... CHEMISTRY ANALYTICAL ...

CHEMICAL ANALYSIS REPORT

GOLDER ASSOCIATES LTD
ATTN: VALERIE BERTRAND
500 4260 STILL CREEK DRIVE
BURNABY BC V5C 6C6

DATE: November 24, 2000

Lab Work Order #: L17890, REVISED
BC Seds + soils

Project P.O. #:

Project Reference:

Sampled By: DP

Date Received: 09/22/00

Comments:

APPROVED BY: ____________________
ROY JONES
Project Manager

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L17890-1	PSO-44-09/00-01							
Sample Date	21-SEP-00							
Matrix:	SEDIMENT							
		Arsenic (As)	2590	0.1	mg/kg		16-OCT-00	YZ
		Sulphate (SO4)	7850	10	mg/kg		29-SEP-00	JZ
		Acid Volatile Sulphides	30	10	mg/kg		16-OCT-00	BA
		pH	7.8	0.1	pH		27-SEP-00	RT
L17890-2	PSO-44-09/00-02							
Sample Date	21-SEP-00							
Matrix:	SEDIMENT							
		Arsenic (As)	2620	0.1	mg/kg		16-OCT-00	YZ
		Sulphate (SO4)	3420	10	mg/kg		29-SEP-00	JZ
		Acid Volatile Sulphides	<10	10	mg/kg		16-OCT-00	BA
		pH	7.8	0.1	pH		27-SEP-00	RT
L17890-3	PSO-44-09/00-03							
Sample Date	21-SEP-00							
Matrix:	SEDIMENT							
		Arsenic (As)	2740	0.1	mg/kg		16-OCT-00	YZ
		Sulphate (SO4)	1690	10	mg/kg		29-SEP-00	JZ
		Acid Volatile Sulphides	30	10	mg/kg		16-OCT-00	BA
		pH	7.7	0.1	pH		27-SEP-00	RT
L17890-4	PSO-43-09/00-01							
Sample Date	21-SEP-00							
Matrix:	SEDIMENT							
		Arsenic (As)	1890	0.1	mg/kg		16-OCT-00	YZ
		Sulphate (SO4)	2420	10	mg/kg		29-SEP-00	JZ
		Acid Volatile Sulphides	<10	10	mg/kg		16-OCT-00	BA
		pH	8.0	0.1	pH		27-SEP-00	RT
L17890-5	PSO-43-09/00-02							
Sample Date	21-SEP-00							
Matrix:	SEDIMENT							
		Arsenic (As)	2480	0.1	mg/kg		16-OCT-00	YZ
		Sulphate (SO4)	2050	10	mg/kg		29-SEP-00	JZ
		Acid Volatile Sulphides	10	10	mg/kg		16-OCT-00	BA
		pH	7.8	0.1	pH		27-SEP-00	RT
L17890-6	PSO-43-09/00-03							
Sample Date	21-SEP-00							
Matrix:	SEDIMENT							
		Arsenic (As)	2310	0.1	mg/kg		17-OCT-00	CC5
		Sulphate (SO4)	2690	10	mg/kg		29-SEP-00	JZ
		Acid Volatile Sulphides	30	10	mg/kg		16-OCT-00	BA
		pH	7.6	0.1	pH		27-SEP-00	RT

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L17890-7	BC-US-SD-09/30-01							
Sample Date	21-SEP-00							
Matrix:	SEDIMENT							
		Ammonia-N	<1	1	mg/kg		27-SEP-00	EK
		Arsenic (As) 3+	85.1	0.1	mg/kg		14-OCT-00	JJ
		Arsenic (As) 5+	30.6	0.1	mg/kg		14-OCT-00	JJ
		Total Organic Carbon						
		Organic Carbon	1.80	0.01	%		26-SEP-00	SKL
		Total Carbon	1.90	0.01	%		26-SEP-00	SKL
		Inorganic Carbon	0.08	0.01	%		26-SEP-00	SKL
		Metals (Strong Acid Rec.)						
		Silver (Ag)	<1	1	mg/kg		26-SEP-00	CC5
		Aluminum (Al)	6700	10	mg/kg		26-SEP-00	CC5
		Barium (Ba)	77.6	0.5	mg/kg		26-SEP-00	CC5
		Beryllium (Be)	<1	1	mg/kg		26-SEP-00	CC5
		Calcium (Ca)	3400	100	mg/kg		26-SEP-00	CC5
		Cadmium (Cd)	<0.5	0.5	mg/kg		26-SEP-00	CC5
		Cobalt (Co)	6	1	mg/kg		26-SEP-00	CC5
		Chromium (Cr)	29.9	0.5	mg/kg		26-SEP-00	CC5
		Copper (Cu)	20	1	mg/kg		26-SEP-00	CC5
		Iron (Fe)	13600	100	mg/kg		26-SEP-00	CC5
		Potassium (K)	1150	20	mg/kg		26-SEP-00	C
		Magnesium (Mg)	4930	10	mg/kg		26-SEP-00	CC5
		Manganese (Mn)	840	20	mg/kg		26-SEP-00	CC5
		Molybdenum (Mo)	<1	1	mg/kg		26-SEP-00	CC5
		Sodium (Na)	200	100	mg/kg		26-SEP-00	CC5
		Nickel (Ni)	15	2	mg/kg		26-SEP-00	CC5
		Phosphorus (P)	360	10	mg/kg		26-SEP-00	CC5
		Lead (Pb)	10	5	mg/kg		26-SEP-00	CC5
		Tin (Sn)	<5	5	mg/kg		26-SEP-00	CC5
		Strontium (Sr)	15	1	mg/kg		26-SEP-00	CC5
		Titanium (Ti)	362	5	mg/kg		26-SEP-00	CC5
		Thallium (Tl)	<1	1	mg/kg		26-SEP-00	CC5
		Vanadium (V)	32	1	mg/kg		26-SEP-00	CC5
		Zinc (Zn)	53.2	0.5	mg/kg		26-SEP-00	CC5
		Arsenic (As)						
		Arsenic (As)	116	0.1	mg/kg		14-OCT-00	JJ
		Arsenic (As)	171	0.1	mg/kg		26-SEP-00	CC5
L17890-8	BC-US-SD-09/30-02							
Sample Date	21-SEP-00							
Matrix:	SEDIMENT							
		Ammonia-N	<1	1	mg/kg		27-SEP-00	EK
		Arsenic (As) 3+	122	0.1	mg/kg		14-OCT-00	JJ
		Arsenic (As) 5+	40.4	0.1	mg/kg		14-OCT-00	JJ
		Total Organic Carbon						
		Organic Carbon	1.70	0.01	%		26-SEP-00	SKL
		Total Carbon	1.80	0.01	%		26-SEP-00	SKL
		Inorganic Carbon	0.11	0.01	%		26-SEP-00	SKL
		Metals (Strong Acid Rec.)						
		Silver (Ag)	<1	1	mg/kg		26-SEP-00	CC5
		Aluminum (Al)	6500	10	mg/kg		26-SEP-00	CC5

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L17890-8	BC-LS-SD-09/00-02							
Sample Date	21-SEP-00							
Matrix:	SEDIMENT							
		Metals (Strong Acid Rec.)						
		Barium (Ba)	75.1	0.5	mg/kg		26-SEP-00	CC5
		Beryllium (Be)	<1	1	mg/kg		26-SEP-00	CC5
		Calcium (Ca)	3400	100	mg/kg		26-SEP-00	CC5
		Cadmium (Cd)	<0.5	0.5	mg/kg		26-SEP-00	CC5
		Cobalt (Co)	7	1	mg/kg		26-SEP-00	CC5
		Chromium (Cr)	29.3	0.5	mg/kg		26-SEP-00	CC5
		Copper (Cu)	18	1	mg/kg		26-SEP-00	CC5
		Iron (Fe)	12900	100	mg/kg		26-SEP-00	CC5
		Potassium (K)	570	20	mg/kg		26-SEP-00	CC5
		Magnesium (Mg)	6010	10	mg/kg		26-SEP-00	CC5
		Manganese (Mn)	920	20	mg/kg		26-SEP-00	CC5
		Molybdenum (Mo)	<1	1	mg/kg		26-SEP-00	CC5
		Sodium (Na)	100	100	mg/kg		26-SEP-00	CC5
		Nickel (Ni)	36	2	mg/kg		26-SEP-00	CC5
		Phosphorus (P)	410	10	mg/kg		26-SEP-00	CC5
		Lead (Pb)	19	5	mg/kg		26-SEP-00	CC5
		Tin (Sn)	<5	5	mg/kg		26-SEP-00	CC5
		Strontium (Sr)	14	1	mg/kg		26-SEP-00	CC5
		Titanium (Ti)	325	5	mg/kg		26-SEP-00	CC5
		Thallium (Tl)	<1	1	mg/kg		26-SEP-00	CC5
		Vanadium (V)	24	1	mg/kg		26-SEP-00	CC5
		Zinc (Zn)	57.3	0.5	mg/kg		26-SEP-00	CC5
		Arsenic (As)						
		Arsenic (As)	172	0.1	mg/kg		14-OCT-00	JJ
		Arsenic (As)	209	0.1	mg/kg		26-SEP-00	CC5
L17890-9	BC-EFF-SD-09/00-01							
Sample Date	21-SEP-00							
Matrix:	SEDIMENT							
		Ammonia-N	2	1	mg/kg		27-SEP-00	EK
		Arsenic (As) 3+	973	0.1	mg/kg		14-OCT-00	JJ
		Arsenic (As) 5+	544	0.1	mg/kg		14-OCT-00	JJ
		Total Organic Carbon						
		Organic Carbon	0.20	0.01	%		29-SEP-00	SKL
		Total Carbon	2.10	0.01	%		29-SEP-00	SKL
		Inorganic Carbon	1.83	0.01	%		29-SEP-00	SKL
		Metals (Strong Acid Rec.)						
		Silver (Ag)	<1	1	mg/kg		26-SEP-00	CC5
		Aluminum (Al)	21200	10	mg/kg		26-SEP-00	CC5
		Barium (Ba)	12.8	0.5	mg/kg		26-SEP-00	CC5
		Beryllium (Be)	<1	1	mg/kg		26-SEP-00	CC5
		Calcium (Ca)	42200	100	mg/kg		26-SEP-00	CC5
		Cadmium (Cd)	1.2	0.5	mg/kg		26-SEP-00	CC5
		Cobalt (Co)	29	1	mg/kg		26-SEP-00	CC5
		Chromium (Cr)	58.8	0.5	mg/kg		26-SEP-00	CC5
		Copper (Cu)	97	1	mg/kg		26-SEP-00	CC5
		Iron (Fe)	64900	100	mg/kg		26-SEP-00	CC5
		Potassium (K)	860	20	mg/kg		26-SEP-00	CC5
		Magnesium (Mg)	20200	10	mg/kg		26-SEP-00	CC5

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L17890-9	BC-EFF-SD-09/00-01							
Sample Date	21-SEP-00							
Matrix:	SEDIMENT							
		Metals (Strong Acid Rec.)						
		Manganese (Mn)	830	20	mg/kg		26-SEP-00	CC5
		Molybdenum (Mo)	1	1	mg/kg		26-SEP-00	CC5
		Sodium (Na)	200	100	mg/kg		26-SEP-00	CC5
		Nickel (Ni)	71	2	mg/kg		26-SEP-00	CC5
		Phosphorus (P)	330	10	mg/kg		26-SEP-00	CC5
		Lead (Pb)	644	5	mg/kg		26-SEP-00	CC5
		Tin (Sn)	<5	5	mg/kg		26-SEP-00	CC5
		Strontium (Sr)	30	1	mg/kg		26-SEP-00	CC5
		Titanium (Ti)	52	5	mg/kg		26-SEP-00	CC5
		Thallium (Tl)	<1	1	mg/kg		26-SEP-00	CC5
		Vanadium (V)	66	1	mg/kg		26-SEP-00	CC5
		Zinc (Zn)	822	0.5	mg/kg		26-SEP-00	CC5
		Arsenic (As)						
		Arsenic (As)	1520	0.1	mg/kg		14-OCT-00	JJ
		Arsenic (As)	1940	0.1	mg/kg		26-SEP-00	CC5
L17890-10	BC-EFF-SD-09/00-02							
Sample Date	21-SEP-00							
Matrix:	SEDIMENT							
		Ammonia-N	4	1	mg/kg		27-SEP-00	BK
		Arsenic (As) 3+	940	0.1	mg/kg		14-OCT-00	JJ
		Arsenic (As) 5+	1050	0.1	mg/kg		14-OCT-00	JJ
		Total Organic Carbon						
		Organic Carbon	0.10	0.01	%		28-SEP-00	SKL
		Total Carbon	1.90	0.01	%		28-SEP-00	SKL
		Inorganic Carbon	1.77	0.01	%		28-SEP-00	SKL
		Metals (Strong Acid Rec.)						
		Silver (Ag)	<1	1	mg/kg		26-SEP-00	CC5
		Aluminum (Al)	20900	10	mg/kg		26-SEP-00	CC5
		Barium (Ba)	15.0	0.5	mg/kg		26-SEP-00	CC5
		Beryllium (Be)	<1	1	mg/kg		26-SEP-00	CC5
		Calcium (Ca)	39700	100	mg/kg		26-SEP-00	CC5
		Cadmium (Cd)	4.3	0.5	mg/kg		26-SEP-00	CC5
		Cobalt (Co)	29	1	mg/kg		26-SEP-00	CC5
		Chromium (Cr)	59.6	0.5	mg/kg		26-SEP-00	CC5
		Copper (Cu)	70	1	mg/kg		26-SEP-00	CC5
		Iron (Fe)	52600	100	mg/kg		26-SEP-00	CC5
		Potassium (K)	1130	20	mg/kg		26-SEP-00	CC5
		Magnesium (Mg)	19500	10	mg/kg		26-SEP-00	CC5
		Manganese (Mn)	780	20	mg/kg		26-SEP-00	CC5
		Molybdenum (Mo)	1	1	mg/kg		26-SEP-00	CC5
		Sodium (Na)	200	100	mg/kg		26-SEP-00	CC5
		Nickel (Ni)	66	2	mg/kg		26-SEP-00	CC5
		Phosphorus (P)	310	10	mg/kg		26-SEP-00	CC5
		Lead (Pb)	647	5	mg/kg		26-SEP-00	CC5
		Tin (Sn)	<5	5	mg/kg		26-SEP-00	CC5
		Strontium (Sr)	28	1	mg/kg		26-SEP-00	CC5
		Titanium (Ti)	49	5	mg/kg		26-SEP-00	CC5
		Thallium (Tl)	<1	1	mg/kg		26-SEP-00	CC5

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L17890-10	BC-FFF-SD-09/00-02							
Sample Date	21-SEP-00							
Matrix	SEDIMENT							
		Metals (Strong Acid Rec.)						
		Vanadium (V)	57	1	mg/kg		26-SEP-00	CC5
		Zinc (Zn)	826	0.5	mg/kg		26-SEP-00	CC5
		Arsenic (As)						
		Arsenic (As)	1990	0.1	mg/kg		14-OCT-00	JJ
		Arsenic (As)	2450	0.1	mg/kg		28-SEP-00	CC5
L17890-11	BC-DS1-SD-09/00-01							
Sample Date	21-SEP-00							
Matrix	SEDIMENT							
		Ammonia-N	3	1	mg/kg		27-SEP-00	EK
		Arsenic (As) 3+	642	0.1	mg/kg		14-OCT-00	JJ
		Arsenic (As) 5+	421	0.1	mg/kg		14-OCT-00	JJ
		Total Organic Carbon						
		Organic Carbon	1.30	0.01	%		28-SEP-00	SKL
		Total Carbon	2.50	0.01	%		28-SEP-00	SKL
		Inorganic Carbon	1.24	0.01	%		28-SEP-00	SKL
		Metals (Strong Acid Rec.)						
		Silver (Ag)	2	1	mg/kg		26-SEP-00	CC5
		Aluminum (Al)	20900	10	mg/kg		26-SEP-00	CC5
		Barium (Ba)	58.4	0.5	mg/kg		26-SEP-00	CC5
		Beryllium (Be)	<1	1	mg/kg		26-SEP-00	CC5
		Calcium (Ca)	28600	100	mg/kg		26-SEP-00	CC5
		Cadmium (Cd)	1.3	0.5	mg/kg		26-SEP-00	CC5
		Cobalt (Co)	44	1	mg/kg		26-SEP-00	CC5
		Chromium (Cr)	69.9	0.5	mg/kg		26-SEP-00	CC5
		Copper (Cu)	328	1	mg/kg		26-SEP-00	CC5
		Iron (Fe)	40900	100	mg/kg		26-SEP-00	CC5
		Potassium (K)	2000	20	mg/kg		26-SEP-00	CC5
		Magnesium (Mg)	20400	10	mg/kg		26-SEP-00	CC5
		Manganese (Mn)	620	20	mg/kg		26-SEP-00	CC5
		Molybdenum (Mo)	1	1	mg/kg		26-SEP-00	CC5
		Sodium (Na)	300	100	mg/kg		26-SEP-00	CC5
		Nickel (Ni)	105	2	mg/kg		26-SEP-00	CC5
		Phosphorus (P)	430	10	mg/kg		26-SEP-00	CC5
		Lead (Pb)	216	5	mg/kg		26-SEP-00	CC5
		Tin (Sn)	<5	5	mg/kg		26-SEP-00	CC5
		Strontium (Sr)	30	1	mg/kg		26-SEP-00	CC5
		Titanium (Ti)	476	5	mg/kg		26-SEP-00	CC5
		Thallium (Tl)	<1	1	mg/kg		26-SEP-00	CC5
		Vanadium (V)	70	1	mg/kg		26-SEP-00	CC5
		Zinc (Zn)	316	0.5	mg/kg		26-SEP-00	CC5
		Arsenic (As)						
		Arsenic (As)	1050	0.1	mg/kg		14-OCT-00	JJ
		Arsenic (As)	3260	0.1	mg/kg		28-SEP-00	CC5
L17890-12	BC-DS1-SD-09/00-02							
Sample Date	21-SEP-00							
Matrix	SEDIMENT							

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L17890-12	BC-DS1-SD-09/00-02							
Sample Date	21-SEP-00							
Matrix:	SEDIMENT							
		Ammonia-N	5	1	mg/kg		27-SEP-00	EK
		Arsenic (As) 3+	724	0.1	mg/kg		14-OCT-00	JJ
		Arsenic (As) 5+	94.1	0.1	mg/kg		14-OCT-00	JJ
		Total Organic Carbon						
		Organic Carbon	1.70	0.01	%		26-SEP-00	SKL
		Total Carbon	3.10	0.01	%		26-SEP-00	SKL
		Inorganic Carbon	1.37	0.01	%		26-SEP-00	SKL
		Metals (Strong Acid Rec.)						
		Silver (Ag)	1	1	mg/kg		26-SEP-00	CC5
		Aluminum (Al)	24400	10	mg/kg		26-SEP-00	CC5
		Barium (Ba)	82.7	0.5	mg/kg		26-SEP-00	CC5
		Beryllium (Be)	<1	1	mg/kg		26-SEP-00	CC5
		Calcium (Ca)	38200	100	mg/kg		26-SEP-00	CC5
		Cadmium (Cd)	1.1	0.5	mg/kg		26-SEP-00	CC5
		Cobalt (Co)	33	1	mg/kg		26-SEP-00	CC5
		Chromium (Cr)	73.2	0.5	mg/kg		26-SEP-00	CC5
		Copper (Cu)	211	1	mg/kg		26-SEP-00	CC5
		Iron (Fe)	41500	100	mg/kg		26-SEP-00	CC5
		Potassium (K)	2650	20	mg/kg		26-SEP-00	C
		Magnesium (Mg)	23300	10	mg/kg		26-SEP-00	CC5
		Manganese (Mn)	650	20	mg/kg		26-SEP-00	CC5
		Molybdenum (Mo)	1	1	mg/kg		26-SEP-00	CC5
		Sodium (Na)	300	100	mg/kg		26-SEP-00	CC5
		Nickel (Ni)	84	2	mg/kg		26-SEP-00	CC5
		Phosphorus (P)	410	10	mg/kg		26-SEP-00	CC5
		Lead (Pb)	177	5	mg/kg		26-SEP-00	CC5
		Tin (Sn)	<5	5	mg/kg		26-SEP-00	CC5
		Strontium (Sr)	37	1	mg/kg		26-SEP-00	CC5
		Titanium (Ti)	530	5	mg/kg		26-SEP-00	CC5
		Thallium (Tl)	<1	1	mg/kg		26-SEP-00	CC5
		Vanadium (V)	60	1	mg/kg		26-SEP-00	CC5
		Zinc (Zn)	231	0.5	mg/kg		26-SEP-00	CC5
		Arsenic (As)						
		Arsenic (As)	818	0.1	mg/kg		14-OCT-00	JJ
		Arsenic (As)	3190	0.1	mg/kg		26-SEP-00	CC5
L17890-13	BC-DS2-SD-09/00-0[illegible]							
Sample Date	21-SEP-00							
Matrix:	SEDIMENT							
		Ammonia-N	5	1	mg/kg		27-SEP-00	EK
		Arsenic (As) 3+	1320	0.1	mg/kg		14-OCT-00	JJ
		Arsenic (As) 5+	350	0.1	mg/kg		14-OCT-00	JJ
		Total Organic Carbon						
		Organic Carbon	0.80	0.01	%		26-SEP-00	SKL
		Total Carbon	1.50	0.01	%		26-SEP-00	S
		Inorganic Carbon	0.68	0.01	%		26-SEP-00	SKL
		Metals (Strong Acid Rec.)						
		Silver (Ag)	<1	1	mg/kg		26-SEP-00	CC5
		Aluminum (Al)	19300	10	mg/kg		26-SEP-00	CC5

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L17890-13	BC-DS2-SD-09/00-01							
Sample Date	21-SEP-00							
Matrix:	SEDIMENT							
		Metals (Strong Acid Rec.)						
		Barium (Ba)	60.5	0.5	mg/kg		26-SEP-00	CC5
		Beryllium (Be)	<1	1	mg/kg		26-SEP-00	CC5
		Calcium (Ca)	18500	100	mg/kg		26-SEP-00	CC5
		Cadmium (Cd)	3.1	0.5	mg/kg		26-SEP-00	CC5
		Cobalt (Co)	41	1	mg/kg		26-SEP-00	CC5
		Chromium (Cr)	32.2	0.5	mg/kg		26-SEP-00	CC5
		Copper (Cu)	298	1	mg/kg		26-SEP-00	CC5
		Iron (Fe)	50700	100	mg/kg		26-SEP-00	CC5
		Potassium (K)	1030	20	mg/kg		26-SEP-00	CC5
		Magnesium (Mg)	15400	10	mg/kg		26-SEP-00	CC5
		Manganese (Mn)	520	20	mg/kg		26-SEP-00	CC5
		Molybdenum (Mo)	1	1	mg/kg		26-SEP-00	CC5
		Sodium (Na)	300	100	mg/kg		26-SEP-00	CC5
		Nickel (Ni)	50	2	mg/kg		26-SEP-00	CC5
		Phosphorus (P)	430	10	mg/kg		26-SEP-00	CC5
		Lead (Pb)	463	5	mg/kg		26-SEP-00	CC5
		Tin (Sn)	<5	5	mg/kg		26-SEP-00	CC5
		Strontium (Sr)	28	1	mg/kg		26-SEP-00	CC5
		Titanium (Ti)	308	5	mg/kg		26-SEP-00	CC5
		Thallium (Tl)	<1	1	mg/kg		26-SEP-00	CC5
		Vanadium (V)	65	1	mg/kg		26-SEP-00	CC5
		Zinc (Zn)	620	0.5	mg/kg		26-SEP-00	CC5
		Arsenic (As)						
		Arsenic (As)	1670	0.1	mg/kg		14-OCT-00	JJ
		Arsenic (As)	5030	0.1	mg/kg		26-SEP-00	CC5
L17890-14	BC-DS2-SD-09/00-02							
Sample Date	21-SEP-00							
Matrix:	SEDIMENT							
		Ammonia-N	5	1	mg/kg		27-SEP-00	EK
		Arsenic (As) 3+	616	0.1	mg/kg		14-OCT-00	JJ
		Arsenic (As) 5+	24.3	0.1	mg/kg		14-OCT-00	JJ
		Total Organic Carbon						
		Organic Carbon	0.60	0.01	%		29-SEP-00	SKL
		Total Carbon	1.10	0.01	%		29-SEP-00	SKL
		Inorganic Carbon	0.52	0.01	%		29-SEP-00	SKL
		Metals (Strong Acid Rec.)						
		Silver (Ag)	<1	1	mg/kg		26-SEP-00	CC5
		Aluminum (Al)	20500	10	mg/kg		26-SEP-00	CC5
		Barium (Ba)	113	0.5	mg/kg		26-SEP-00	CC5
		Beryllium (Be)	<1	1	mg/kg		26-SEP-00	CC5
		Calcium (Ca)	14400	100	mg/kg		26-SEP-00	CC5
		Cadmium (Cd)	1.8	0.5	mg/kg		26-SEP-00	CC5
		Cobalt (Co)	24	1	mg/kg		26-SEP-00	CC5
		Chromium (Cr)	53.8	0.5	mg/kg		26-SEP-00	CC5
		Copper (Cu)	223	1	mg/kg		26-SEP-00	CC5
		Iron (Fe)	34000	100	mg/kg		26-SEP-00	CC5
		Potassium (K)	3250	20	mg/kg		26-SEP-00	CC5
		Magnesium (Mg)	11500	10	mg/kg		26-SEP-00	CC5

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L17890-14	BC-DS2-SD-09/00-02							
Sample Date	21-SEP-00							
Matrix:	SEDIMENT							
		Metals (Strong Acid Rec.)						
		Manganese (Mn)	400	20	mg/kg		26-SEP-00	CC5
		Molybdenum (Mo)	<1	1	mg/kg		26-SEP-00	CC5
		Sodium (Na)	400	100	mg/kg		26-SEP-00	CC5
		Nickel (Ni)	65	2	mg/kg		26-SEP-00	CC5
		Phosphorus (P)	440	10	mg/kg		26-SEP-00	CC5
		Lead (Pb)	222	5	mg/kg		26-SEP-00	CC5
		Tin (Sn)	<5	5	mg/kg		26-SEP-00	CC5
		Strontium (Sr)	39	1	mg/kg		26-SEP-00	CC5
		Titanium (Ti)	496	5	mg/kg		26-SEP-00	CC5
		Thallium (Tl)	<1	1	mg/kg		26-SEP-00	CC5
		Vanadium (V)	61	1	mg/kg		26-SEP-00	CC5
		Zinc (Zn)	544	0.5	mg/kg		26-SEP-00	CC5
		Arsenic (As)						
		Arsenic (As)	640	0.1	mg/kg		14-OCT-00	JJ
		Arsenic (As)	2240	0.1	mg/kg		26-SEP-00	CC5
L17890-15	BC-DS3-SD-09/00-01							
Sample Date	21-SEP-00							
Matrix:	SEDIMENT							
		Ammonia-N	<1	1	mg/kg		27-SEP-00	EK
		Arsenic (As) 3+	17.3	0.1	mg/kg		14-OCT-00	JJ
		Arsenic (As) 5+	14.4	0.1	mg/kg		14-OCT-00	JJ
		Total Organic Carbon						
		Organic Carbon	0.40	0.01	%		29-SEP-00	SKL
		Total Carbon	0.50	0.01	%		29-SEP-00	SKL
		Inorganic Carbon	0.09	0.01	%		29-SEP-00	SKL
		Metals (Strong Acid Rec.)						
		Silver (Ag)	<1	1	mg/kg		26-SEP-00	CC5
		Aluminum (Al)	17200	10	mg/kg		26-SEP-00	CC5
		Barium (Ba)	133	0.5	mg/kg		26-SEP-00	CC5
		Beryllium (Be)	<1	1	mg/kg		26-SEP-00	CC5
		Calcium (Ca)	3300	100	mg/kg		26-SEP-00	CC5
		Cadmium (Cd)	<0.5	0.5	mg/kg		26-SEP-00	CC5
		Cobalt (Co)	9	1	mg/kg		26-SEP-00	CC5
		Chromium (Cr)	41.5	0.5	mg/kg		26-SEP-00	CC5
		Copper (Cu)	28	1	mg/kg		26-SEP-00	CC5
		Iron (Fe)	25800	100	mg/kg		26-SEP-00	CC5
		Potassium (K)	3160	20	mg/kg		26-SEP-00	CC5
		Magnesium (Mg)	6790	10	mg/kg		26-SEP-00	CC5
		Manganese (Mn)	220	20	mg/kg		26-SEP-00	CC5
		Molybdenum (Mo)	<1	1	mg/kg		26-SEP-00	CC5
		Sodium (Na)	300	100	mg/kg		26-SEP-00	CC5
		Nickel (Ni)	24	2	mg/kg		26-SEP-00	CC5
		Phosphorus (P)	450	10	mg/kg		26-SEP-00	CC5
		Lead (Pb)	10	5	mg/kg		26-SEP-00	CC5
		Tin (Sn)	<5	5	mg/kg		26-SEP-00	CC5
		Strontium (Sr)	36	1	mg/kg		26-SEP-00	CC5
		Titanium (Ti)	654	5	mg/kg		26-SEP-00	CC5
		Thallium (Tl)	<1	1	mg/kg		26-SEP-00	CC5

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L17890-15	BC-DS3-SD-09/00-01							
Sample Date	21-SEP-00							
Matrix	SEDIMENT							
		Metals (Strong Acid Rec.)						
		Vanadium (V)	45	1	mg/kg		26-SEP-00	CC5
		Zinc (Zn)	53.2	0.5	mg/kg		26-SEP-00	CC5
		Arsenic (As)						
		Arsenic (As)	31.7	0.1	mg/kg		14-OCT-00	JJ
		Arsenic (As)	47.0	0.1	mg/kg		26-SEP-00	CC5
L17890-16	BC-DS3-SD-09/00-02							
Sample Date	21-SEP-00							
Matrix	SEDIMENT							
		Ammonia-N	<1	1	mg/kg		27-SEP-00	EK
		Arsenic (As) 3+	23.2	0.1	mg/kg		14-OCT-00	JJ
		Arsenic (As) 5+	13.5	0.1	mg/kg		14-OCT-00	JJ
		Total Organic Carbon						
		Organic Carbon	0.80	0.01	%		26-SEP-00	SKL
		Total Carbon	0.80	0.01	%		26-SEP-00	SKL
		Inorganic Carbon	0.09	0.01	%		26-SEP-00	SKL
		Metals (Strong Acid Rec.)						
		Silver (Ag)	<1	1	mg/kg		26-SEP-00	CC5
		Aluminum (Al)	17300	10	mg/kg		26-SEP-00	CC5
		Barium (Ba)	143	0.5	mg/kg		26-SEP-00	CC5
		Beryllium (Be)	<1	1	mg/kg		26-SEP-00	CC5
		Calcium (Ca)	3700	100	mg/kg		26-SEP-00	CC5
		Cadmium (Cd)	<0.5	0.5	mg/kg		26-SEP-00	CC5
		Cobalt (Co)	6	1	mg/kg		26-SEP-00	CC5
		Chromium (Cr)	42.1	0.5	mg/kg		26-SEP-00	CC5
		Copper (Cu)	36	1	mg/kg		26-SEP-00	CC5
		Iron (Fe)	20500	100	mg/kg		26-SEP-00	CC5
		Potassium (K)	3190	20	mg/kg		26-SEP-00	CC5
		Magnesium (Mg)	6820	10	mg/kg		26-SEP-00	CC5
		Manganese (Mn)	200	20	mg/kg		26-SEP-00	CC5
		Molybdenum (Mo)	<1	1	mg/kg		26-SEP-00	CC5
		Sodium (Na)	300	100	mg/kg		26-SEP-00	CC5
		Nickel (Ni)	25	2	mg/kg		26-SEP-00	CC5
		Phosphorus (P)	410	10	mg/kg		26-SEP-00	CC5
		Lead (Pb)	14	5	mg/kg		26-SEP-00	CC5
		Tin (Sn)	<5	5	mg/kg		26-SEP-00	CC5
		Strontium (Sr)	35	1	mg/kg		26-SEP-00	CC5
		Titanium (Ti)	562	5	mg/kg		26-SEP-00	CC5
		Thallium (Tl)	<1	1	mg/kg		26-SEP-00	CC5
		Vanadium (V)	46	1	mg/kg		26-SEP-00	CC5
		Zinc (Zn)	62.1	0.5	mg/kg		26-SEP-00	CC5
		Arsenic (As)						
		Arsenic (As)	36.3	0.1	mg/kg		14-OCT-00	JJ
		Arsenic (As)	91.2	0.1	mg/kg		26-SEP-00	CC5
L17890-17	BC-DS4-SD-09/00-01							
Sample Date	21-SEP-00							
Matrix	SEDIMENT							

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L17890-17	BC-OS4-SD-09/00-01							
Sample Date	21-SEP-00							
Matrix:	SEDIMENT							
		Ammonia-N	3	1	mg/kg		27-SEP-00	EK
		Arsenic (As) 3+	445	0.1	mg/kg		14-OCT-00	JJ
		Arsenic (As) 5+	47.1	0.1	mg/kg		14-OCT-00	JJ
		Total Organic Carbon						
		Organic Carbon	2.30	0.01	%		28-SEP-00	SKL
		Total Carbon	2.60	0.01	%		28-SEP-00	SKL
		Inorganic Carbon	0.36	0.01	%		28-SEP-00	SKL
		Metals (Strong Acid Rec.)						
		Silver (Ag)	<1	1	mg/kg		26-SEP-00	CC5
		Aluminum (Al)	19000	10	mg/kg		26-SEP-00	CC5
		Barium (Ba)	119	5.0	mg/kg		26-SEP-00	CC5
		Beryllium (Be)	<1	1	mg/kg		26-SEP-00	CC5
		Calcium (Ca)	9100	100	mg/kg		26-SEP-00	CC5
		Cadmium (Cd)	0.6	0.5	mg/kg		26-SEP-00	CC5
		Cobalt (Co)	28	1	mg/kg		26-SEP-00	CC5
		Chromium (Cr)	53.0	0.5	mg/kg		26-SEP-00	CC5
		Copper (Cu)	264	1	mg/kg		26-SEP-00	CC5
		Iron (Fe)	28200	100	mg/kg		26-SEP-00	CC5
		Potassium (K)	3530	20	mg/kg		26-SEP-00	C[illegible]
		Magnesium (Mg)	10800	10	mg/kg		26-SEP-00	CC5
		Manganese (Mn)	320	20	mg/kg		26-SEP-00	CC5
		Molybdenum (Mo)	<1	1	mg/kg		26-SEP-00	CC5
		Sodium (Na)	530	100	mg/kg		26-SEP-00	CC5
		Nickel (Ni)	72	2	mg/kg		26-SEP-00	CC5
		Phosphorus (P)	470	10	mg/kg		26-SEP-00	CC5
		Lead (Pb)	64	5	mg/kg		26-SEP-00	CC5
		Tin (Sn)	<5	5	mg/kg		26-SEP-00	CC5
		Strontium (Sr)	39	1	mg/kg		26-SEP-00	CC5
		Titanium (Ti)	683	5	mg/kg		26-SEP-00	CC5
		Thallium (Tl)	<1	1	mg/kg		26-SEP-00	CC5
		Vanadium (V)	59	1	mg/kg		26-SEP-00	CC5
		Zinc (Zn)	195	0.5	mg/kg		26-SEP-00	CC5
		Arsenic (As)						
		Arsenic (As)	432	0.1	mg/kg		14-OCT-00	JJ
		Arsenic (As)	1110	0.1	mg/kg		26-SEP-00	CC5
L17890-18	BC-OS4-SD-09/00-02							
Sample Date	21-SEP-00							
Matrix:	SEDIMENT							
		Ammonia-N	2	1	mg/kg		27-SEP-00	EK
		Arsenic (As) 3+	377	0.1	mg/kg		14-OCT-00	JJ
		Arsenic (As) 5+	145	0.1	mg/kg		14-OCT-00	JJ
		Total Organic Carbon						
		Organic Carbon	0.40	0.01	%		28-SEP-00	SKL
		Total Carbon	1.50	0.01	%		28-SEP-00	S[illegible]
		Inorganic Carbon	1.09	0.01	%		28-SEP-00	SKL
		Metals (Strong Acid Rec.)						
		Silver (Ag)	<1	1	mg/kg		26-SEP-00	CC5
		Aluminum (Al)	21400	10	mg/kg		26-SEP-00	CC5

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L17890-18	BC-0S4-SD-09/00-02							
Sample Date	21-SEP-00							
Matrix:	SEDIMENT							
		Metals (Strong Acid Rec.)						
		Barium (Ba)	57.5	0.5	mg/kg		26-SEP-00	CC5
		Beryllium (Be)	<1	1	mg/kg		26-SEP-00	CC5
		Calcium (Ca)	13900	100	mg/kg		26-SEP-00	CC5
		Cadmium (Cd)	0.6	0.5	mg/kg		26-SEP-00	CC5
		Cobalt (Co)	60	1	mg/kg		26-SEP-00	CC5
		Chromium (Cr)	61.2	0.5	mg/kg		26-SEP-00	CC5
		Copper (Cu)	263	1	mg/kg		26-SEP-00	CC5
		Iron (Fe)	35300	100	mg/kg		26-SEP-00	CC5
		Potassium (K)	3090	20	mg/kg		26-SEP-00	CC5
		Magnesium (Mg)	13100	10	mg/kg		26-SEP-00	CC5
		Manganese (Mn)	480	20	mg/kg		26-SEP-00	CC5
		Molybdenum (Mo)	1	1	mg/kg		26-SEP-00	CC5
		Sodium (Na)	500	100	mg/kg		26-SEP-00	CC5
		Nickel (Ni)	90	2	mg/kg		26-SEP-00	CC5
		Phosphorus (P)	450	10	mg/kg		26-SEP-00	CC5
		Lead (Pb)	70	5	mg/kg		26-SEP-00	CC5
		Tin (Sn)	<5	5	mg/kg		26-SEP-00	CC5
		Strontium (Sr)	37	1	mg/kg		26-SEP-00	CC5
		Titanium (Ti)	624	5	mg/kg		26-SEP-00	CC5
		Thallium (Tl)	<1	1	mg/kg		26-SEP-00	CC5
		Vanadium (V)	74	1	mg/kg		26-SEP-00	CC5
		Zinc (Zn)	246	0.5	mg/kg		26-SEP-00	CC5
		Arsenic (As)						
		Arsenic (As)	535	0.1	mg/kg		14-OCT-00	JJ
		Arsenic (As)	1440	0.1	mg/kg		26-SEP-00	CC5
L17890-20	L17890-9 SOLUBLE							
Sample Date	21-SEP-00							
Matrix	SEDIMENT							
		Antimony (Sb)	10.1	0.1	mg/kg		10-NOV-00	CC5
		Mercury (Hg)	<0.01	0.01	mg/kg		10-NOV-00	CC5
		Arsenic (As)	3.45	0.002	mg/kg		10-NOV-00	CC5
		Metals (Strong Acid Rec.)						
		Silver (Ag)	<0.02	0.02	mg/kg		10-NOV-00	CC5
		Aluminum (Al)	<0.2	0.2	mg/kg		10-NOV-00	CC5
		Barium (Ba)	0.01	0.01	mg/kg		10-NOV-00	CC5
		Beryllium (Be)	<0.02	0.02	mg/kg		10-NOV-00	CC5
		Calcium (Ca)	222	2	mg/kg		10-NOV-00	CC5
		Cadmium (Cd)	<0.01	0.01	mg/kg		10-NOV-00	CC5
		Cobalt (Co)	<0.02	0.02	mg/kg		10-NOV-00	CC5
		Chromium (Cr)	<0.01	0.01	mg/kg		10-NOV-00	CC5
		Copper (Cu)	<0.02	0.02	mg/kg		10-NOV-00	CC5
		Iron (Fe)	<2	2	mg/kg		10-NOV-00	CC5
		Potassium (K)	20.[illegible]	0.4	mg/kg		10-NOV-00	CC5
		Magnesium (Mg)	25.3	0.2	mg/kg		10-NOV-00	CC5
		Manganese (Mn)	<0.4	0.4	mg/kg		10-NOV-00	CC5
		Molybdenum (Mo)	0.06	0.03	mg/kg		10-NOV-00	CC5
		Sodium (Na)	47	2	mg/kg		10-NOV-00	CC5
		Nickel (Ni)	<0.04	0.04	mg/kg		10-NOV-00	CC5

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Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L17890-20	L17890-9 SOLUBLE							
Sample Date	21-SEP-00							
Matrix	SEDIMENT							
		Metals (Strong Acid Rec.)						
		Phosphorus (P)	<0.2	0.2	mg/kg		10-NOV-00	CC5
		Lead (Pb)	<0.1	0.1	mg/kg		10-NOV-00	CC5
		Tin (Sn)	<0.1	0.1	mg/kg		10-NOV-00	CC5
		Strontium (Sr)	0.70	0.02	mg/kg		10-NOV-00	CC5
		Titanium (Ti)	<0.1	0.1	mg/kg		10-NOV-00	CC5
		Thallium (Tl)	<0.02	0.02	mg/kg		10-NOV-00	CC5
		Vanadium (V)	<0.02	0.02	mg/kg		10-NOV-00	CC5
		Zinc (Zn)	0.02	0.01	mg/kg		10-NOV-00	CC5
L17890-21	L17890-10 SOLUBLE							
Sample Date	21-SEP-00							
Matrix	SEDIMENT							
		Antimony (Sb)	19.7	0.002	mg/kg		10-NOV-00	CC5
		Mercury (Hg)	<0.0002	0.0002	mg/kg		10-NOV-00	CC5
		Arsenic (As)	3.76	0.002	mg/kg		10-NOV-00	CC5
		Metals (Strong Acid Rec.)						
		Silver (Ag)	<0.02	0.02	mg/kg		10-NOV-00	C
		Aluminum (Al)	<0.2	0.2	mg/kg		10-NOV-00	C[illegible]
		Barium (Ba)	0.01	0.01	mg/kg		10-NOV-00	CC5
		Beryllium (Be)	<0.02	0.02	mg/kg		10-NOV-00	CC5
		Calcium (Ca)	162	2	mg/kg		10-NOV-00	CC5
		Cadmium (Cd)	<0.01	0.01	mg/kg		10-NOV-00	CC5
		Cobalt (Co)	<0.02	0.02	mg/kg		10-NOV-00	CC5
		Chromium (Cr)	<0.01	0.01	mg/kg		10-NOV-00	CC5
		Copper (Cu)	<0.02	0.02	mg/kg		10-NOV-00	CC5
		Iron (Fe)	<2	2	mg/kg		10-NOV-00	CC5
		Potassium (K)	21.[illegible]	0.4	mg/kg		10-NOV-00	CC5
		Magnesium (Mg)	24.8	0.2	mg/kg		10-NOV-00	CC5
		Manganese (Mn)	<0.4	0.4	mg/kg		10-NOV-00	CC5
		Molybdenum (Mo)	0.04	0.02	mg/kg		10-NOV-00	CC5
		Sodium (Na)	44	2	mg/kg		10-NOV-00	CC5
		Nickel (Ni)	<0.04	0.04	mg/kg		10-NOV-00	CC5
		Phosphorus (P)	<0.2	0.2	mg/kg		10-NOV-00	CC5
		Lead (Pb)	<0.1	0.1	mg/kg		10-NOV-00	CC5
		Tin (Sn)	<0.1	0.1	mg/kg		10-NOV-00	CC5
		Strontium (Sr)	0.42	0.02	mg/kg		10-NOV-00	CC5
		Titanium (Ti)	<0.1	0.1	mg/kg		10-NOV-00	CC5
		Thallium (Tl)	<0.02	0.02	mg/kg		10-NOV-00	CC5
		Vanadium (V)	<0.02	0.02	mg/kg		10-NOV-00	CC5
		Zinc (Zn)	0.02	0.01	mg/kg		10-NOV-00	CC5
L17890-22	L17890-11 SOLUBLE							
Sample Date	21-SEP-00							
Matrix	SEDIMENT							
		Antimony (Sb)	4.96	0.002	mg/kg		10-NOV-00	CC5
		Mercury (Hg)	<0.0002	0.0002	mg/kg		10-NOV-00	CC5
		Arsenic (As)	3.56	0.002	mg/kg		10-NOV-00	CC5
		Metals (Strong Acid Rec.)						

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L17890-22	L17890-11 SOLUBLE							
Sample Date: 21-SEP-00								
Matrix:	SEDIMENT							
		Metals (Strong Acid Rec.)						
		Silver (Ag)	<0.02	0.02	mg/kg		10-NOV-00	CC5
		Aluminum (Al)	<0.2	0.2	mg/kg		10-NOV-00	CC5
		Barium (Ba)	0.12	0.01	mg/kg		10-NOV-00	CC5
		Beryllium (Be)	<0.01	0.01	mg/kg		10-NOV-00	CC5
		Calcium (Ca)	177	2	mg/kg		10-NOV-00	CC5
		Cadmium (Cd)	<0.01	0.01	mg/kg		10-NOV-00	CC5
		Cobalt (Co)	0.02	0.02	mg/kg		10-NOV-00	CC5
		Chromium (Cr)	<0.01	0.01	mg/kg		10-NOV-00	CC5
		Copper (Cu)	<0.02	0.02	mg/kg		10-NOV-00	CC5
		Iron (Fe)	<2	2	mg/kg		10-NOV-00	CC5
		Potassium (K)	20.8	0.4	mg/kg		10-NOV-00	CC5
		Magnesium (Mg)	26.4	0.2	mg/kg		10-NOV-00	CC5
		Manganese (Mn)	0.5	0.4	mg/kg		10-NOV-00	CC5
		Molybdenum (Mo)	0.13	0.02	mg/kg		10-NOV-00	CC5
		Sodium (Na)	58	2	mg/kg		10-NOV-00	CC5
		Nickel (Ni)	0.09	0.04	mg/kg		10-NOV-00	CC5
		Phosphorus (P)	0.2	0.2	mg/kg		10-NOV-00	CC5
		Lead (Pb)	<0.1	0.1	mg/kg		10-NOV-00	CC5
		Tin (Sn)	<0.1	0.1	mg/kg		10-NOV-00	CC5
		Strontium (Sr)	0.91	0.02	mg/kg		10-NOV-00	CC5
		Titanium (Ti)	<0.1	0.1	mg/kg		10-NOV-00	CC5
		Thallium (Tl)	<0.02	0.02	mg/kg		10-NOV-00	CC5
		Vanadium (V)	<0.02	0.02	mg/kg		10-NOV-00	CC5
		Zinc (Zn)	0.02	0.01	mg/kg		10-NOV-00	CC5
L17890-23	L17890-12 SOLUBLE							
Sample Date: 21-SEP-00								
Matrix:	SEDIMENT							
		Antimony (Sb)	3.49	0.002	mg/kg		10-NOV-00	CC5
		Mercury (Hg)	<0.0002	0.0002	mg/kg		10-NOV-00	CC5
		Arsenic (As)	5.8	0.1	mg/kg		10-NOV-00	CC5
		Metals (Strong Acid Rec.)						
		Silver (Ag)	<0.02	0.02	mg/kg		10-NOV-00	CC5
		Aluminum (Al)	3.4	0.2	mg/kg		10-NOV-00	CC5
		Barium (Ba)	0.17	0.01	mg/kg		10-NOV-00	CC5
		Beryllium (Be)	<0.02	0.02	mg/kg		10-NOV-00	CC5
		Calcium (Ca)	169	2	mg/kg		10-NOV-00	CC5
		Cadmium (Cd)	<0.01	0.01	mg/kg		10-NOV-00	CC5
		Cobalt (Co)	0.02	0.02	mg/kg		10-NOV-00	CC5
		Chromium (Cr)	<0.01	0.01	mg/kg		10-NOV-00	CC5
		Copper (Cu)	<0.02	0.02	mg/kg		10-NOV-00	CC5
		Iron (Fe)	<2	2	mg/kg		10-NOV-00	CC5
		Potassium (K)	22.5	0.4	mg/kg		10-NOV-00	CC5
		Magnesium (Mg)	27.6	0.2	mg/kg		10-NOV-00	CC5
		Manganese (Mn)	<0.4	0.4	mg/kg		10-NOV-00	CC5
		Molybdenum (Mo)	0.13	0.02	mg/kg		10-NOV-00	CC5
		Sodium (Na)	47	2	mg/kg		10-NOV-00	CC5
		Nickel (Ni)	0.06	0.04	mg/kg		10-NOV-00	CC5
		Phosphorus (P)	<0.2	0.2	mg/kg		10-NOV-00	CC5

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L17890-23	L17890-12 SOLUBLE							
Sample Date:	21-SEP-00							
Matrix:	SEDIMENT							
		Metals (Strong Acid Rec.)						
		Lead (Pb)	<0.1	0.1	mg/kg		10-NOV-00	CC5
		Tin (Sn)	<0.1	0.1	mg/kg		10-NOV-00	CC5
		Strontium (Sr)	0.80	0.02	mg/kg		10-NOV-00	CC5
		Titanium (Ti)	<0.1	0.1	mg/kg		10-NOV-00	CC5
		Thallium (Tl)	<0.02	0.02	mg/kg		10-NOV-00	CC5
		Vanadium (V)	<0.02	0.02	mg/kg		10-NOV-00	CC5
		Zinc (Zn)	0.02	0.01	mg/kg		10-NOV-00	CC5
L17890-24	L17890-13 SOLUBLE							
Sample Date:	21-SEP-00							
Matrix:	SEDIMENT							
		Antimony (Sb)	11.2	0.002	mg/kg		10-NOV-00	CC5
		Mercury (Hg)	<0.0002	0.0002	mg/kg		10-NOV-00	CC5
		Arsenic (As)	9.29	0.002	mg/kg		10-NOV-00	CC5
		Metals (Strong Acid Rec.)						
		Silver (Ag)	<0.02	0.02	mg/kg		10-NOV-00	CC5
		Aluminum (Al)	<0.2	0.2	mg/kg		10-NOV-00	C
		Barium (Ba)	0.09	0.01	mg/kg		10-NOV-00	CC
		Beryllium (Be)	<0.02	0.02	mg/kg		10-NOV-00	CC5
		Calcium (Ca)	129	2	mg/kg		10-NOV-00	CC5
		Cadmium (Cd)	<0.01	0.01	mg/kg		10-NOV-00	CC5
		Cobalt (Co)	<0.02	0.02	mg/kg		10-NOV-00	CC5
		Chromium (Cr)	<0.01	0.01	mg/kg		10-NOV-00	CC5
		Copper (Cu)	<0.02	0.02	mg/kg		10-NOV-00	CC5
		Iron (Fe)	<2	2	mg/kg		10-NOV-00	CC5
		Potassium (K)	13.4	0.4	mg/kg		10 NOV 00	CC5
		Magnesium (Mg)	14.8	0.2	mg/kg		10-NOV-00	CC5
		Manganese (Mn)	<0.4	0.4	mg/kg		10-NOV-00	CC5
		Molybdenum (Mo)	0.04	0.02	mg/kg		10-NOV-00	CC5
		Sodium (Na)	41	2	mg/kg		10-NOV-00	CC5
		Nickel (Ni)	<0.04	0.04	mg/kg		10-NOV-00	CC5
		Phosphorus (P)	<0.2	0.2	mg/kg		10-NOV-00	CC5
		Lead (Pb)	<0.1	0.1	mg/kg		10-NOV-00	CC5
		Tin (Sn)	<0.1	0.1	mg/kg		10-NOV-00	CC5
		Strontium (Sr)	0.72	0.02	mg/kg		10-NOV-00	CC5
		Titanium (Ti)	<0.1	0.1	mg/kg		10-NOV-00	CC5
		Thallium (Tl)	<0.02	0.02	mg/kg		10-NOV-00	CC5
		Vanadium (V)	<0.02	0.02	mg/kg		10-NOV-00	CC5
		Zinc (Zn)	0.02	0.01	mg/kg		10-NOV-00	CC5
L17890-25	L17890-14 SOLUBLE							
Sample Date:	21-SEP-00							
Matrix:	SEDIMENT							
		Antimony (Sb)	6.07	0.002	mg/kg		10-NOV-00	[illegible]
		Mercury (Hg)	<0.0002	0.0002	mg/kg		10 NOV 00	CC5
		Arsenic (As)	2.86	0.002	mg/kg		10-NOV-00	CC5
		Metals (Strong Acid Rec.)						
		Silver (Ag)	<0.02	0.02	mg/kg		10-NOV-00	CC5

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L17890-25	L17890-14 SOLUBLE							
Sample Date	21-SEP-00							
Matrix:	SEDIMENT							
		Metals (Strong Acid Rec.)						
		Aluminum (Al)	0.2	0.2	mg/kg		10-NOV-00	CC5
		Barium (Ba)	0.17	0.01	mg/kg		10-NOV-00	CC5
		Beryllium (Be)	<0.02	0.02	mg/kg		10-NOV-00	CC5
		Calcium (Ca)	113	2	mg/kg		10-NOV-00	CC5
		Cadmium (Cd)	<0.01	0.01	mg/kg		10-NOV-00	CC5
		Cobalt (Co)	<0.02	0.02	mg/kg		10-NOV-00	CC5
		Chromium (Cr)	<0.01	0.01	mg/kg		10-NOV-00	CC5
		Copper (Cu)	<0.02	0.02	mg/kg		10-NOV-00	CC5
		Iron (Fe)	<2	2	mg/kg		10-NOV-00	CC5
		Potassium (K)	22.6	0.4	mg/kg		10-NOV-00	CC5
		Magnesium (Mg)	13.5	0.2	mg/kg		10-NOV-00	CC5
		Manganese (Mn)	<0.4	0.4	mg/kg		10-NOV-00	CC5
		Molybdenum (Mo)	0.09	0.02	mg/kg		10-NOV-00	CC5
		Sodium (Na)	36	2	mg/kg		10-NOV-00	CC5
		Nickel (Ni)	<0.04	0.04	mg/kg		10-NOV-00	CC5
		Phosphorus (P)	0.2	0.2	mg/kg		10-NOV-00	CC5
		Lead (Pb)	<0.1	0.1	mg/kg		10-NOV-00	CC5
		Tin (Sn)	<0.1	0.1	mg/kg		10-NOV-00	CC5
		Strontium (Sr)	0.85	0.02	mg/kg		10-NOV-00	CC5
		Titanium (Ti)	<0.1	0.1	mg/kg		10-NOV-00	CC5
		Thallium (Tl)	<0.02	0.02	mg/kg		10-NOV-00	CC5
		Vanadium (V)	<0.02	0.02	mg/kg		10-NOV-00	CC5
		Zinc (Zn)	0.02	0.01	mg/kg		10-NOV-00	CC5
L17890-26	L17890-17 SOLUBLE							
Sample Date	21-SEP-00							
Matrix	SEDIMENT							
		Antimony (Sb)	2.85	0.002	mg/kg		10-NOV-00	CC5
		Mercury (Hg)	<0.0002	0.0002	mg/kg		10-NOV-00	CC5
		Arsenic (As)	2.78	0.002	mg/kg		10-NOV-00	CC5
		Metals (Strong Acid Rec.)						
		Silver (Ag)	<0.02	0.02	mg/kg		10-NOV-00	CC5
		Aluminum (Al)	0.2	0.2	mg/kg		10-NOV-00	CC5
		Barium (Ba)	0.23	0.01	mg/kg		10-NOV-00	CC5
		Beryllium (Be)	<0.02	0.02	mg/kg		10-NOV-00	CC5
		Calcium (Ca)	148	2	mg/kg		10-NOV-00	CC5
		Cadmium (Cd)	<0.01	0.01	mg/kg		10-NOV-00	CC5
		Cobalt (Co)	<0.02	0.02	mg/kg		10-NOV-00	CC5
		Chromium (Cr)	<0.01	0.01	mg/kg		10-NOV-00	CC5
		Copper (Cu)	<0.02	0.02	mg/kg		10-NOV-00	CC5
		Iron (Fe)	<2	2	mg/kg		10-NOV-00	CC5
		Potassium (K)	25.7	0.4	mg/kg		10-NOV-00	CC5
		Magnesium (Mg)	21.2	0.2	mg/kg		10-NOV-00	CC5
		Manganese (Mn)	0.5	0.4	mg/kg		10-NOV-00	CC5
		Molybdenum (Mo)	0.11	0.02	mg/kg		10-NOV-00	CC5
		Sodium (Na)	101	2	mg/kg		10-NOV-00	CC5
		Nickel (Ni)	0.05	0.04	mg/kg		10-NOV-00	CC5
		Phosphorus (P)	0.2	0.2	mg/kg		10-NOV-00	CC5
		Lead (Pb)	<0.1	0.1	mg/kg		10-NOV-00	CC5

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L17890-25	L17890-17 SOLUBLE							
Sample Date	21-SEP-00							
Matrix:	SEDIMENT							
		Metals (Strong Acid Rec.)						
		Tin (Sn)	<0.1	0.1	mg/kg		10-NOV-00	CC5
		Strontium (Sr)	0.67	0.02	mg/kg		10-NOV-00	CC5
		Titanium (Ti)	<0.1	0.1	mg/kg		10-NOV-00	CC5
		Thallium (Tl)	<0.02	0.02	mg/kg		10-NOV-00	CC5
		Vanadium (V)	<0.02	0.02	mg/kg		10-NOV-00	CC5
		Zinc (Zn)	0.02	0.01	mg/kg		10-NOV-00	CC5
L17890-27	L17890-18 SOLUBLE							
Sample Date	21-SEP-00							
Matrix:	SEDIMENT							
		Antimony (Sb)	2.08	0.002	mg/kg		10-NOV-00	CC5
		Mercury (Hg)	<0.0002	0.0002	mg/kg		10-NOV-00	CC5
		Arsenic (As)	1.90	0.002	mg/kg		10-NOV-00	CC5
		Metals (Strong Acid Rec.)						
		Silver (Ag)	<0.02	0.02	mg/kg		10-NOV-00	CC5
		Aluminum (Al)	<0.2	0.2	mg/kg		10-NOV-00	CC5
		Barium (Ba)	0.14	0.01	mg/kg		10-NOV-00	C[illegible]
		Beryllium (Be)	<0.02	0.02	mg/kg		10-NOV-00	C[illegible]
		Calcium (Ca)	182	2	mg/kg		10-NOV-00	CC5
		Cadmium (Cd)	<0.01	0.01	mg/kg		10-NOV-00	CC5
		Cobalt (Co)	0.03	0.02	mg/kg		10-NOV-00	CC5
		Chromium (Cr)	<0.01	0.01	mg/kg		10-NOV-00	CC5
		Copper (Cu)	0.04	0.02	mg/kg		10-NOV-00	CC5
		Iron (Fe)	<2	2	mg/kg		10-NOV-00	CC5
		Potassium (K)	27.6	0.4	mg/kg		10-NOV-00	CC5
		Magnesium (Mg)	29.4	0.2	mg/kg		10-NOV-00	CC5
		Manganese (Mn)	1.1	0.4	mg/kg		10-NOV-00	CC5
		Molybdenum (Mo)	0.09	0.02	mg/kg		10-NOV-00	CC5
		Sodium (Na)	130	2	mg/kg		10-NOV-00	CC5
		Nickel (Ni)	0.08	0.04	mg/kg		10-NOV-00	CC5
		Phosphorus (P)	<0.2	0.2	mg/kg		10-NOV-00	CC5
		Lead (Pb)	<0.1	0.1	mg/kg		10-NOV-00	CC5
		Tin (Sn)	<0.1	0.1	mg/kg		10-NOV-00	CC5
		Strontium (Sr)	1.02	0.02	mg/kg		10-NOV-00	CC5
		Titanium (Ti)	<0.1	0.1	mg/kg		10-NOV-00	CC5
		Thallium (Tl)	<0.02	0.02	mg/kg		10-NOV-00	CC5
		Vanadium (V)	<0.02	0.02	mg/kg		10-NOV-00	CC5
		Zinc (Zn)	0.02	0.01	mg/kg		10-NOV-00	CC5

Methodology Reference

ETL Test Code	Test Description	Methodology Reference (Based On)
AS-AS3-ED	Arsenic (As) 3+	APHA 3114 C-AAS - Hydride
AS-AS5-ED	Arsenic (As) 5+	APHA 3114 C-AAS - Hydride
AS-HYD-ED	Arsenic (As)	APHA 3114 C-AAS - Hydride
AS-SOL-ED	Total Water-Soluble Arsenic	Birkholz et al + APHA 3114 C-(HGAAS)
C-TOT-ORG-SK	Total Organic Carbon	CSSS 21.4-High Temp Instrumental
HG-HYD-ED	Mercury (Hg)	APHA 3112 B-AAS Cold Vapor
METAL-EXD-ED	Metals (Strong Acid Leach)	SW 846 - 3051/6010-ICP-OES
NH4-ED	Ammonia-N	APHA 4500 NH3F-Colorimetry
PH-1:1-ED	pH	C. CSSS 16.3-Electrode on 1:1 extr.
SB-HYD-ED	Antimony (Sb)	APHA 3114 C-AAS-Hydride
SO4-ED	Sulfate (SO4)	APHA 4110 B-Ion Chromatography
SPECIAL REQ-IN-ED	Inorganics Special Request	
SULPHIDE-ACIDVOL-TB	Sulphide	EPA 9030B

EnviroTest

CHAIN OF CUSTODY / ANALYTICAL REQUEST FORM

Q5463

DATE: Sept 21/00 DATE REQUIRED:

SERVICE REQUESTED:

☐ REGULAR ☐ PRIORITY (50% SURCHARGE) ☐ EMERGENCY (100% SURCHARGE)

SPECIAL REQUIREMENTS / REGS (CIRCLE ONE)

MISA TIER I CCME

BC MELP AB MUST

OTHER

ANALYSIS REQUESTED: Total arsenic, sulfate, chloride, pH

L17890

SAMPLE ID	SAMPLED BY / DATE / TIME	LOCATION OF SAMPLING	SAMPLING METHOD	SAMPLE TYPE	Total arsenic	sulfate	chloride	pH	LAB SAMPLE NO.
BO-4A 09/00-01	DP Sept 21/00 1400	Grant	Corer	Sediment	X	X	X	X	1
BO-4A 09/00-02					X	X	X	X	2
BO-4A 09/00-03					X	X	X	X	3
BO-4B 09/00-01					X	X	X	X	4
BO-4B 09/00-02					X	X	X	X	5
BO-4B 09/00-03					X	X	X	X	6

PRESERVED

FILTERED

NOTES & CONDITIONS

1. Quote number must be provided to ensure proper pricing.
2. Turnaround times will vary dependant on complexity of analysis & Lab workload at time of submission. Please contact the Lab to confirm turnaround times.
3. All hazardous samples submitted must be labeled to comply with WHMIS regulations. This must include the nature of the hazard as well as a contact name & phone number that the Lab can contact for further information.

NOTE: Failure to properly complete all portions of this form may delay analysis.

NOTE: **Shaded areas MUST be completed in full by client for sample processing to occur.**

CLIENT: Golder Associates

CONTACT: Valerie Bertrand

REPORT ADDRESS: #500, 4260 Still Creek Dr., Burnaby BC V5C 6C6

BILLING ADDRESS:

NO. BOTTLES SUBMITTED: 6

PHONE: (604) 298-6623

FAX: 5253

QUOTE NO.:

PO NO.:

RELINQUISHED BY:	DATE:	RECEIVED BY:	DATE:
	TIME:	ETL LAB	TIME:
RELINQUISHED BY:	DATE:	RECEIVED BY:	DATE:
	TIME:	ETL LAB	TIME:

SAMPLE CONDITION UPON RECEIPT

FROZEN COLD AMBIENT

OTHER (BREAKAGE, LEAKAGE, ETC.)

WHITE – Report Copy

PINK – File Copy

YELLOW – Customer Copy

ETL EnviroTest — CHAIN OF CUSTODY / ANALYTICAL REQUEST FORM 1

ANALYSIS REQUESTED:

9936 - 67th Avenue, Edmonton, Alberta T6E 0P5
1313 - 44th Avenue N.E., Calgary, Alberta T2E 6L5
9505 - 111 Street, Grande Prairie, Alberta T8V 5W1
Saskatoon, Saskatchewan
Winnipeg, Manitoba
Thunder Bay, Ontario

Telephone: (780) 413-5227 Fax: (780) 437-2311
Telephone: (403) 291-9897 Fax: (403) 291-0298
Telephone: (780) 539-5196 Fax: (780) 513-2191
Telephone: (306) 668-8370 Fax: (306) 668-8383
Telephone: (204) 945-3705 Fax: (204) 945-0763
Telephone: (807) 623-6463 Fax: (807) 623-7598

DATE: Sept 2/96 DATE REQUIRED:

SERVICE REQUESTED:

☒ REGULAR ☐ PRIORITY (50% SURCHARGE) ☐ EMERGENCY (100% SURCHARGE)

SPECIAL REQUIREMENTS / REGS (CIRCLE ONE)

MISA TIER 1 CCME
BC MELP AB MUST
OTHER

Analyses (handwritten column heads): Metals-dissolved; Total Inorganic; Available Nutrients; TOC; Nutrients

L17890

SAMPLE ID	SAMPLED BY / DATE / TIME	LOCATION OF SAMPLING	SAMPLING METHOD	SAMPLE TYPE					LAB SAMPLE NO
SC-10-SO-9/96-01	BM Sept 2/96	VK	GRAB	(SS)	✓	✓	✓	✓	7
SC-10-SO-9/96-02	↓	↓	↓	↓	✓	✓	✓	✓	8
SC-11-SO-9/96-01					✓	✓	✓	✓	9
SC-11-SO-9/96-02					✓	✓	✓	✓	10
SC-12-SO-9/96-01					✓	✓	✓	✓	11
SC-12-SO-9/96-02					✓	✓	✓	✓	12
SC-U2-SO-9/96-01					✓	✓	✓	✓	13
SC-U2-SO-9/96-02					✓	✓	✓	✓	14
SC-U3-SO-9/96-01					✓	✓	✓	✓	15
SC-U3-SO-9/96-02					✓	✓	✓	✓	16

PRESERVED / FILTERED

NOTES & CONDITIONS

1. Quote number must be provided to ensure proper pricing.
2. Turnaround times will vary dependent on complexity of analysis & lab workload at time of submission. Please contact the lab to confirm turnaround times.
3. All hazardous samples submitted must be labeled to comply with WHMIS regulations. This must include the nature of the hazard, as well as a contact name & phone number that the Lab can contact for further information.

NOTE: Failure to properly complete all portions of this form may delay analysis.

NOTE: Shaded areas MUST be completed in full by client for sample processing to occur.

CLIENT: Golder Associates NO. BOTTLES SUBMITTED: 10

CONTACT: Vikki Enkedal PHONE: (604) 296-6623

PROJECT NUMBER: 962-1620 FAX: (604) 296-2323

ADDRESS: 4260 Still Creek Dr., Burnaby, BC V5C 6C6 QUOTE NO.: Q5463

BILLING ADDRESS: PO NO.:

RELINQUISHED BY: DATE: TIME:

RECEIVED BY: DATE: TIME:

RELINQUISHED BY: DATE: TIME:

ETL LAB RECEIVED BY: DATE: TIME:

ETL LAB

SAMPLE CONDITION UPON RECEIPT

FROZEN: COLD: AMBIENT:

OTHER (PACKAGE LEAKING, ETC.):

WHITE - Report Copy
PINK - File Copy
YELLOW - Customer Copy

ETL Enviro-Test

CHAIN OF CUSTODY / ANALYTICAL REQUEST FORM

9936 - 67th Avenue, Edmonton, Alberta T6E 0P5 — Telephone: (403) 413-5227 — Fax: (403) 437-2311
Toll free: Telephone: 1-800-668-9878 — Fax: 1-800-263-7219
1313 - 44 Avenue N.E., Calgary, Alberta T2E 6L5 — Telephone: (403) 291-9897 — Fax: (403) 291-0298
General Purpose Bldg., 124 Veterinary Road, Saskatoon, Sask. S7N 5E3 — Telephone: (306) 668-8370 — Fax: (306) 668-8383
1081 Barton Street, Thunder Bay, Ont. P7B 5N3 — Telephone: (807) 623-6463 — Fax: (807) 623-7598

DATE SUBMITTED: Sept 21/02 DATE REQUIRED: ____

SERVICE REQUESTED:
☒ REGULAR ☐ PRIORITY (50% SURCHARGE) ☐ EMERGENCY (100% SURCHARGE)

PRICING (CHECK ONE):
AS PER QUOTE #: ____ ☐
AS PER LIST PRICE: Q5463

ANALYSIS REQUESTED: Total Metals; Particle Size (ASTM); TOC; PAH; SAMPLE RECEIVED (Y OR N); SAMPLE BROKEN (Y OR N)

L17890

SAMPLE ID	SAMPLED BY	DATE / TIME SAMPLED	SAMPLE TYPE	Total Metals	Particle Size	TOC	PAH	LAB SAMPLE NO.
BC-DS4-SD-0902-01	HM	Sept 21/02 1400	SEDIMENT	✓	✓	✓	✓	17
BC-DS4-SD-0902-02	HM	Sept 21/02 1400	"	✓	✓	✓	✓	18

PRESERVED
FILTERED

NOTES & CONDITIONS:
1. Quote number must be provided to ensure proper pricing.
2. Turnaround times will vary dependant on complexity of analysis & lab workload at time of submission. Please contact the lab to confirm turnaround times.
3. All hazardous samples submitted must be labelled to comply with WHMIS regulations. This must include the nature of the hazard as well as a contact name and phone number that the lab can contact for further information.

NOTE: Failure to properly complete all portions of this form may delay analysis.

NOTE: Shaded areas MUST be completed in full by client for sample processing to occur.

QUOTE - Q5463

CLIENT: Golder Associates
NO. SAMPLES SUBMITTED: ____
CONTACT: Valerie Bertrand
NO. BOTTLES/SAMPLES: 2
REPORT ADDRESS: #500, 4260 Still Creek Dr., Burnaby, B.C. V5C 6C6
PHONE: (604) 298-6623
FAX: (604) 298-5253
BILLING ADDRESS: ____
P.O. NO.: ____
JOB NO.: ____
[illegible]

RELINQUISHED BY:	DATE	RECEIVED BY:	DATE
	TIME	ETL LAB.	TIME
RELINQUISHED BY:	DATE	RECEIVED BY:	DATE
	TIME	ETL LAB.	TIME

SAMPLE CONDITION UPON RECEIPT:
FROZEN: ____ COLD: ____ AMBIENT: ____
OTHER (BREAKAGE, LEAKAGE, ETC.): ____

WHITE - Report Copy
PINK - File Copy
YELLOW - Customer Copy

APPENDIX IV

GROUNDWATER WELL COMPLETION DETAILS

TEST PIT P-SO-01-2200

Location: Right side of tailings road, 15 m
Elevation:
Date: July 22, 2000
Logged By: N. Vachon

Depth (m)	Description	Sample (Interval, m) [Headspace, ppm]	Comments
0.0 - 0.6	Fine grained, black, roots, loose, dry, subrounded clast (ORGANIC)	Sa. 01 0.2 Sa. 02 0.5	
0.6 - 1.1	Stiff, light brown, moist, plastic CLAY.	Sa. 03 0.75	
1.1	End of Test Pit. Bedrock encountered.		

Remarks: Depth to seepage: no seeps
Depth to standing water: none
Rate of seepage
Terminated: 1.1 m, Bedrock

TEST PIT P-SO-02-2200

Location: Along tailing road 100 m north of P-SO-01-2200
Elevation:
Date: July 22, 2000
Logged By: N. Vachon

Depth (m)	Description	Sample (Interval, m) [Headspace, ppm]	Comments
0.0 0.2	Dark brown, fine grained, roots, dry ORGANIC.	Sa. 01 0.2	
0.0 0.4	Orange brown, angular to subrounded clast (pebble size), matrix is fine sand with silt, dry TILL.		
0.4	End of Test Pit. Bedrock encountered.		

Remarks: Depth to seepage: none
Depth to standing water: dry
Rate of seepage:
Terminated: 0.4 m, Bedrock

TEST PIT P-SO-03-2200

Location: 50 m south of powerlines
Elevation:
Date: July 22, 2000
Logged By: N. Vachon

Depth (m)	Description	Sample (Interval, m) [Headspace, ppm]	Comments
0.0 - 0.2	Grey, silty, no clast, very homogeneous, dry FILL	Sa. 01 0.1	
0.2 - 0.3	Organic, dark brown, fine grained, some roots, dry.		
0.3 - 0.8	Silt with some clay, brown, fine grained, some pebble-sized subrounded clast, dry.	Sa. 02 0.5	
0.8	End of Test Pit. Bedrock encountered.		

Remarks: Depth to seepage: none
Depth to standing water: dry
Rate of seepage:
Terminated: 0.8 m, Bedrock

TEST PIT P-SO-04-2200

Location: 50 m north of shed
Elevation:
Date: July 22, 2000
Logged By: D. Panayi

Depth (m)	Description	Sample (Interval, m) [Headspace, ppm]	Comments
0.0 - 0.1	Organic, silty clay, black, no clast, moist, some roots.		
0.1 - 0.9	Clay, dark brown, plastic, no clast, homogeneous, moist, roots. Colour gets lighter brown in bottom 30 cm.	Sa. 01 0.2 Sa. 02 0.5 Sa. 03 0.75	
0.9	End of Test Pit. Bedrock not encountered.		

Remarks: Depth to seepage: none
Depth to standing water: dry
Rate of seepage:
Terminated: 0.9 m

TEST PIT P-SO-05-2200

Location: 10 m north of road, west of TPR
Elevation:
Date: July 22, 2000
Logged By: D. Panayi

Depth (m)	Description	Sample (Interval, m) [Headspace, ppm]	Comments
0.0 - 1.3	Light brown, clay silt, homogeneous, dryer towards top, cobble-sized clast, some small roots to 0.5 m, varve clay - not tailings.	Sa. 01 0.2 Sa. 02 0.4 Sa. 03 0.7	
1.3	End of Test Pit. Bedrock encountered.		

Remarks: Depth to seepage: none
Depth to standing water: dry
Rate of seepage:
Terminated: 1.3 m

TEST PIT P-SO-06-2200

Location: West of water treatment sludge impoundments
Elevation:
Date: July 22, 2000
Logged By: D. Panayi

Depth (m)	Description	Sample (interval, m) [Headspace, ppm]	Comments
0.0 - 0.35	Fill, light brown, sand with pebbles and cobbles, angular to subrounded clast, dry, loose.	Sa. 01 0.2	
0.35 - 0.40	Organic, old top soil, black, roots, no clast.		
0.4 - 1.2	Clayish silt, light brown, no clast, stiff, dry.	Sa. 02 0.5 Sa. 03 0.75	
1.2	End of Test Pit. Bedrock encountered.		

Remarks: Depth to seepage: none
Depth to standing water: dry
Rate of seepage:
Terminated: 1.2 m

TEST PIT P-SO-07-2200

Location: Near crusher, 20 m from sand pile
Elevation:
Date: July 22, 2000
Logged By: D. Panayi

Depth (m)	Description	Sample (Interval, m) [Headspace, ppm]	Comments
0.0 - 1.7	Silty clay, brown, no clast, moist, roots to 20 cm, homogeneous to 1.7 m.	Sa. 01 0.2 Sa. 02 0.5 Sa. 03 0.7	
1.7	End of Test Pit. Bedrock not encountered.		

Remarks: Depth to seepage: none
Depth to standing water: dry
Rate of seepage:
Terminated: 1.7 m

TEST PIT P-SO-08-2200

Location: 200 m east of entrance
Elevation:
Date: July 22, 2000
Logged By: D. Panayi

Depth (m)	Description	Sample (Interval, m) [Headspace, ppm]	Comments
0.0 - 1.0	Fill, clast rich, angular clast, pebbles, cobbles, small boulder clast, matrix fine sand and silt, grey, dry to compacted.	Sa. 01 0.2 Sa. 02 0.5 Sa. 03 0.75	
1.0	End of Test Pit. Bedrock not encountered.		

Remarks: Depth to seepage: none
Depth to standing water: dry
Rate of seepage:
Terminated: 1.0 m

TEST PIT P-SO-09-2200

Location: 10 m north of road
Elevation
Date: July 22, 2000
Logged By: D. Panay

Depth (m)	Description	Sample (Interval, m) [Headspace, ppm]	Comments
0.0 - 1.6	Light grey to medium grey, clayish silt, roots down to 0.4 m, no clast, moist, 0.05 m topsoil, homogeneous.	Sa. 01 0.2 Sa. 02 0.5 Sa. 03 0.75	
1.6	End of Test Pit. Bedrock not encountered.		

Remarks: Depth to seepage: none
Depth to standing water: dry
Rate of seepage:
Terminated: 1.6 m

TEST PIT P-SO-10-2200

Location: 40 m north of entrance to portal
Elevation:
Date: July 25, 2000
Logged By: D. Panayi

Depth (m)	Description	Sample (Interval, m) [Headspace, ppm]	Comments
0.0 - 1.2	Clayish silt, brown, turns greyer past 1 m, no clast, moist, gets drier with depth, roots to 0.2 m, homogeneous.	Sa. 01 0.2 Sa. 02 0.4 Sa. 03 0.7	
1.2	End of Test Pit. Bedrock not encountered.		

Remarks: Depth to seepage: none
Depth to standing water: dry
Rate of seepage:
Terminated: 1.2 m
Dry headspace readings with 10.2 eV lamp photoionization detector.

TEST PIT P-SO-11-2200

Location: Mill area
Elevation:
Date: July 22, 2000
Logged By: D. Panayi

Depth (m)	Description	Sample (Interval, m) (Headspace, ppm)	Comments
0.0 - 0.6	Matrix silt and coarse sand, clast of pebbles and cobbles and small boulders, light grey, dry, fill.	Sa. 01 0.2 Sa. 02 0.4	
0.6 - 0.65	Dark brown, damp, matrix coarse sand, some vegetation, less clast.		
0.65 - 0.7	Grey fill as first layer.	Sa. 03 0.7	
0.7	End of Test Pit. Bedrock not encountered.		

Remarks:
Depth to seepage: none
Depth to standing water: dry
Rate of seepage:
Terminated: 0.7 m

TEST PIT P-SO-12-2200

Location: Mill area
Elevation:
Date: July 22, 2000
Logged By D. Panayi

Depth (m)	Description	Sample (Interval, m) (Headspace, ppm)	Comments
0.0 - 0.6	Grey, wet, matrix silt and coarse sand, clast angled pebbles to cobbles, fill.	Sa. 01 0.2 Sa. 02 0.4	
0.6 - 0.7	Reddish brown clay, no clast, very wet, hole filling up with water, could not go deeper due to water, fill.	Sa. 03 0.7	
0.7	End of Test Pit.		

Remarks:
Depth to seepage: none
Depth to standing water: dry
Rate of seepage:
Terminated: 0.7 m

TEST PIT P-SO-13-2200

Location: Mill area
Elevation:
Date: July 22, 2000
Logged By: D. Panayi

Depth (m)	Description	Sample (Interval, m) [Headspace, ppm]	Comments
0.0 - 0.7	Clast rich, clast angular, pebble to small boulder, matrix is coarse sand and silt, top 0.2-0.3 m is silt and sand, grey, dry on top, becoming damp at 0.5 m, water appearing in bottom at 0.5 m, fill, old metal parts (pipes and drill bits) seen 0.5 down.	Sa. 01 & Sa. 01A 0.2 Sa. 02 0.4 Sa. 03 0.7 Sa. 04 1.0	Note: Test pit was re-dug to make deeper and obtain duplicate at 0.2 m.
0.7	End of Test Pit.		

Remarks: Depth to seepage: none
Depth to standing water: dry
Rate of seepage:
Terminated: 0.7 m

TEST PIT P-SO-14-2200

Location: Mill area
Elevation:
Date: July 22, 2000
Logged By: D. Panayi

Depth (m)	Description	Sample (Interval, m) [Headspace, ppm]	Comments
0.0 - 0.7	Grey, silt matrix, angular pebbles to cobbles clasts, dry, fill, no vegetation, dry, getting damp with depth, fill, old core-sample found at 0.5 m.	Sa. 01 0.2 Sa. 02 0.4 Sa. 03 0.7	
0.7	End of Test Pit. Bedrock encountered.		

Remarks: Depth to seepage: none
Depth to standing water: dry
Rate of seepage:
Terminated: 0.7 m

TEST PIT P-SO-15-2200

Location: 70 m west of shaft
Elevation:
Date: July 23, 2000
Logged By: D. Panayi

Depth (m)	Description	Sample (Interval, m) [Headspace, ppm]	Comments
0.0 - 0.6	Light brown, fill, clast of angular pebbles and cobbles, clast rich, dry and compact, matrix of silt and coarse sand, slightly damper with depth, otherwise homogeneous.	Sa. C1 0.2 Sa. C2 0.4	
0.6 - 0.7	Reddish brown layer, otherwise identical to upper layer	Sa. C3 0.7	
0.7	End of Test Pit. Bedrock encountered.		

Remarks: Depth to seepage: none
Depth to standing water: dry
Rate of seepage:
Terminated: 0.7 m

TEST PIT P-SO-16-2200

Location: Mill area
Elevation:
Date: July 22, 2000
Logged By: D. Panayi

Depth (m)	Description	Sample (Interval, m) [Headspace, ppm]	Comments
0.0 - 0.1	Brown, pebble clast, coarse sand matrix, damp.		
0.1 - 0.3	Grey, heavy clast, clast subrounded pebbles to cobbles, silt matrix, damp.	Sa. 01 0.2	
0.3 - 0.4	Brown, pebble clast, coarse sand matrix, damp.	Sa. 02 0.4	
0.4 - 0.6	Grey, heavy clast, clast subrounded pebbles to cobbles, silt matrix, damp		
0.6 - 0.8	Brown, pebble clast, coarse sand matrix, damp, fill, old plastic bag seen at 0.5 m	Sa. 03 0.7	
1.0	End of Test Pit. Bedrock not encountered.		

Remarks: Depth to seepage: none
Depth to standing water: dry
Rate of seepage:
Terminated: 1.0 m

TEST PIT P-SO-17-2200

Location: Mill area 20 m east of telephone pole
Elevation
Date: July 22, 2000
Logged By: D. Panayi

Depth (m)	Description	Sample (Interval, m) [Headspace, ppm]	Comments
0.0 - 0.2	Organic, grass growing, black, moist, matrix is fine sand and earth, no clast, wet, roots.	Sa. 01 0.15	
0.2 - 0.5	Clay, light brown, no clast, moist, some roots.	Sa. 02 0.4	
0.5 - 0.7	Organic layer, clay matrix, black, old plants	Sa. 03 0.7	
0.7 - 1.2	Clay, light brown, no clast, wet, some roots.		
1.2	End of Test Pit. Bedrock not encountered		

Remarks: Depth to seepage: none
Depth to standing water: dry
Rate of seepage
Terminated: 1.2 m.

TEST PIT P-SO-18-2200

Location: Mill area
Elevation
Date: July 22, 2000
Logged By: D. Panayi

Depth (m)	Description	Sample (Interval, m) [Headspace, ppm]	Comments
0.0 - 0.05	Dark brown, oil-stained, matrix medium-grain sand, clast rounded pebbles, oily.	Sa. 01 0.02	
0.05 - 0.8	Damp, grey, oil-stained, matrix medium-grain sand, clast rounded pebbles, some boulder clast.	Sa. 02 0.2 Sa. 03 0.4 Sa. 04 0.7	
0.8	End of Test Pit. Bedrock not encountered.		

Remarks: Depth to seepage: none
Depth to standing water: dry
Rate of seepage:
Terminated: 0.8 m.

TEST PIT P-SO-19-2200

Location:
Elevation:
Date: July 23, 2000
Logged By: D. Panayi

Depth (m)	Description	Sample (Interval, m) [Headspace, ppm]	Comments
0.0 - 0.4	Brown, clast rich, clast subrounded pebbles and cobbles, matrix coarse to medium sand, dry, fill, very compacted, homogeneous to 0.4 m.	Sa. 01 0.2 Sa. 02 0.4	
0.4	End of Test Pit. Bedrock not encountered.		

Remarks: Depth to seepage: none
Depth to standing water: dry
Rate of seepage:
Terminated: 0.4 m

TEST PIT P-SO-20-2200

Location: Mill area
Elevation:
Date: July 23, 2000
Logged By: D. Panayi

Depth (m)	Description	Sample (Interval, m) [Headspace, ppm]	Comments
0.0 - 0.7	Reddish brown, clayish silt, which has turned chunky, chunks can be broken up by hand, clast of subrounded pebbles and cobbles, some roots down to 0.4 m, dry, not much clast.	Sa. 01 0.2 Sa. 02 0.4 Sa. 03 0.7	
0.7	End of Test Pit. Bedrock not encountered.		

Remarks: Depth to seepage: none
Depth to standing water: dry
Rate of seepage:
Terminated: 0.7 m

TEST PIT P-SO-21-2200

Location: Mill area
Elevation:
Date: July 22, 2000
Logged By: D. Panay:

Depth (m)	Description	Sample (Interval, m) [Headspace, ppm]	Comments
0.0 - 0.3	Reddish brown, silt matrix on surface, grey silt matrix below surface, clast rich, clast angular pebbles to boulders.	Sa. 01 & Sa. 01A 0.2	Note: Test pit re-dug to make deeper and obtain duplicate at 0.7 m.
0.3 - 0.8	Red clay, some pebble clast, angular pebbles.	Sa. 02 0.4 Sa. 03 0.75 Sa. 04 1.0	
0.8	End of Test Pit. Bedrock not encountered.		

Remarks: Depth to seepage: none
Depth to standing water: dry
Rate of seepage
Terminated: 1.0 m

TEST PIT P-SO-22-2300

Location: Road to old townsite, west of old A headframe
Elevation:
Date: July 23, 2000
Logged By: D. Panay:

Depth (m)	Description	Sample (Interval, m) [Headspace, ppm]	Comments
0.0 - 0.2	Organic, peaty, moist, no clast, roots.	Sa. 01 0.1 Sa. 02 0.2	
0.2 - 0.4	Clay, dark grey, no clast, hard and moist.	Sa. 03 0.4	Had to sample with shovel, as back-hoe could not reach site.
0.4	End of Test Pit. Bedrock not encountered.		

Remarks: Depth to seepage: none
Depth to standing water: dry
Rate of seepage:
Terminated: 0.4 m

TEST PIT P-SO-23-2300

Location: Road to old townsite, west of old A headframe
Elevation:
Date: July 23, 2000
Logged By: D. Panayi

Depth (m)	Description	Sample (Interval, m) [Headspace, ppm]	Comments
0.0 - 0.5	Dark brown, clayish soil, roots, dry, matrix silt or fine sand, little clast, but some large boulders, clast small pebbles, soft.	Sa. 01 0.2 Sa. 02 0.4	
0.5 - 0.7	Grey, clay, moist, little clast, hard, gradient between two soil types.	Sa. 03 0.7	
0.7	End of Test Pit. Bedrock not encountered.		

Remarks: Depth to seepage: none
Depth to standing water: dry
Rate of seepage:
Terminated: 0.7 m

TEST PIT P-SO-24-2300

Location: Town site
Elevation:
Date: July 23, 2000
Logged By: D. Panayi

Depth (m)	Description	Sample (Interval, m) [Headspace, ppm]	Comments
0.0 - 0.7	Clast rich, clast angular pebbles to small boulders, fill, dark grey, dry, roots to 0.1 m, fill, homogeneous to 0.7 m, matrix silty fine sand.	Sa. 01 0.2 Sa. 02 0.4 Sa. 03 0.7	
0.7	End of Test Pit. Bedrock not encountered.		

Remarks: Depth to seepage: none
Depth to standing water: dry
Rate of seepage:
Terminated: 0.7 m

TEST PIT P-SO-25-2300

Location: Town site
Elevation:
Date: July 23, 2000
Logged By: D. Panayi

Depth (m)	Description	Sample (Interval, m) [Headspace, ppm]	Comments
0.0 - 0.7	Light brown, clast rich, clast subrounded pebbles to boulders, roots to 0.3 m, matrix is fine sand, fill, homogeneous to 0.7 m, but gets slightly damp with depth.	Sa. 01 0.2 Sa. 02 0.4 Sa. 03 0.7	
0.7	End of Test Pit. Bedrock not encountered		

Remarks:
Depth to seepage: none
Depth to standing water: no standing water
Rate of seepage:
Terminated: 0.7 m

TEST PIT P-SO-26-2300

Location: Town site
Elevation:
Date: July 23, 2000
Logged By: D. Panayi

Depth (m)	Description	Sample (Interval, m) [Headspace, ppm]	Comments
0.0 - 0.3	Dark brown, organic, matrix fine to medium sand, dry, 0.03 m layer top soil, no clast	Sa. 01 ??	
0.3 - 0.6	Light brown, coarse sand, no clast, some roots, dry.	Sa. 02 ??	
0.6 - 0.8	Light grey, coarse sand matrix, pebble to cobble clast, dry.	Sa. 03 ??	
0.8	End of Test Pit. Bedrock not encountered.		

Remarks:
Depth to seepage: none
Depth to standing water: dry
Rate of seepage:
Terminated: 0.8 m

TEST PIT P-SO-27-2300

Location: Playground, Town site
Elevation
Date: July 23, 2000
Logged By: D. Panayi

Depth (m)	Description	Sample (Interval, m) [Headspace, ppm]	Comments
0.0 - 0.2	Light brown sand, fine, pebble and cobble clast, some roots to 0.2 m, dry on surface (2-3 cm), damp below.	Sa. 04 Surface	
0.2 - 0.7	Light grey, silt matrix, clast rich, pebble to boulder clast, fill, damp. All samples taken in this layer.	Sa. 01 0.2 Sa. 02 0.4 Sa. 03 0.7	
0.7	End of Test Pit. Bedrock not encountered.		

Remarks: Depth to seepage: none
Depth to standing water: dry
Rate of seepage:
Terminated: 0.7 m
Dry headspace readings with 10.2 eV lamp photoionization detector.

TEST PIT P-SO-28-2300

Location: Town site, next to old dock, 2 m off road in grass
Elevation:
Date: July 23, 2000
Logged By: D. Panayi

Depth (m)	Description	Sample (Interval, m) [Headspace, ppm]	Comments
0.0 - 0.2	Brown, clast subrounded pebbles and cobbles, clast rich, damp, matrix medium sand, 5 cm topsoil, roots 20 cm, fill, metal parts at 40 cm.	Sa. 01 0.2	
0.2 - 0.3	Layer of sand, beach sand?, light brown, fine, no clast, damp.		
0.3 - 0.7	Brown, clast subrounded pebbles and cobbles, clast rich, damp, matrix medium sand, 5 cm topsoil, roots 20 cm, fill, metal parts at 40 cm.	Sa. 02 0.2 Sa. 3 0.7	
0.7	End of Test Pit. Bedrock not encountered.		

Remarks: Depth to seepage: none
Depth to standing water: dry
Rate of seepage:
Terminated: 0.7 m

TEST PIT P-SO-30-2300

Location: Propane tanks area
Elevation
Date: July 23, 2000
Logged By. D. Panay.

Depth (m)	Description	Sample (Interval, m) [Headspace, ppm]	Comments
0.0 - 0.2	Dark brown, organic, no clast, dry, clayish, roots.	Sa. 01 0.2	
0.2 - 0.4	Brown, clay, dry, no clast.	Sa. 02 0.4	
0.4 - 0.7	Light grey, silt or fine sand, no clast, dry.	Sa. 03 0.7	
0.7	End of Test Pit. Bedrock not encountered.		

Remarks: Depth to seepage: none
Depth to standing water: dry
Rate of seepage:
Terminated: 0.7 m

TEST PIT P-SO-31-2200

Location: Propane tanks area
Elevation.
Date: July 23, 2000
Logged By: D. Panay.

Depth (m)	Description	Sample (Interval, m) [Headspace, ppm]	Comments
0.0 - 0.4	Black, organic, fine sand matrix, no clast, dry, blends into clay layer below over ???, roots.	Sa. 01 0.2 Sa. 02 0.4	
0.4 - 0.7	Clay, brown, moist, no clast.	Sa. 03 0.7	
0.7	End of Test Pit. Bedrock not encountered		

Remarks: Depth to seepage: none
Depth to standing water: dry
Rate of seepage
Terminated: 0.7 m

TEST PIT P-SO-32-2300

Location: Dyke rim, propane tank area
Elevation:
Date: July 23, 2000
Logged By: D. Panayi

Depth (m)	Description	Sample (Interval, m) [Headspace, ppm]	Comments
0.0 - 0.6	Fill, clast rich, clast angular boulders to pebbles, grey, matrix grey silt, dry, damp towards bottom, homogeneous to 0.6 m. compacted.	Sa. 01 0.2 Sa. 02 0.4 Sa. 03 0.6	
0.6	End of Test Pit. Bedrock not encountered.		

Remarks: Depth to seepage: none
Depth to standing water: dry
Rate of seepage:
Terminated: 0.6 m

TEST PIT P-SO-33-2500

Location: Highway north of site, along creek
Elevation:
Date: July 25, 2000
Logged By: N. Vachon

Depth (m)	Description	Sample (Interval, m) [Headspace, ppm]	Comments
0.0 - 0.15	Dark, fine grained, roots, dry, no clast, ORGANIC.		
0.15 - 0.95	Silt, some fine sand, moist, well sorted material, light brown SILT, getting really compact with depth.	Sa. 01 0.2 Sa. 02 0.5 Sa. 03 0.75	
0.95	End of Test Pit. Bedrock not encountered		

Remarks: Depth to seepage: none
Depth to standing water: dry
Rate of seepage:
Terminated: 0.95 m

TEST PIT P-SO-34-2500

Location: Highway north of site. North of TP33, 100 m before swamp
Elevation:
Date: July 25, 2000
Logged By: N. Vachon

Depth (m)	Description	Sample (Interval, m) [Headspace, ppm]	Comments
0.0 - 0.3	Light brown, fine grained, well sorted, dry, FILL.	Sa. 01 & Sa. 01A 0.2	
0.3 - 0.4	Dark, fine grained, dry, roots, ORGANIC		
0.4 - 1.2	Compact, moist, fine grained, brown, well sorted, no clast SILT. After 0.6 m, gradually turning into a compact, brown CLAY.	Sa. 02 0.5 Sa. 03 0.75	
1.2	End of Test Pit. Bedrock not encountered.		

Remarks: Depth to seepage: none
Depth to standing water: dry
Rate of seepage:
Terminated: 1.2 m

TEST PIT P-SO-35-2300

Location: Downstream of dam 7
Elevation:
Date: July 25, 2000
Logged By: D. Panayi

Depth (m)	Description	Sample (Interval, m) [Headspace, ppm]	Comments
0.0 - 0.8	Dark brown clay, no clast, dry at top - moist towards bottom, no roots, homogeneous.	Sa. 01 0.2 Sa. 02 0.4 Sa. 03 0.7	
0.8	End of Test Pit. Bedrock not encountered.		

Remarks: Depth to seepage: none
Depth to standing water: dry
Rate of seepage:
Terminated: 0.8 m

TEST PIT P-SO-36-2300

Location: Downstream of dam 7
Elevation:
Date: July 23, 2000
Logged By: D. Panayi

Depth (m)	Description	Sample (Interval, m) [Headspace, ppm]	Comments
0.0 - 0.6	Black, organic, roots, some dry clay chunks, dry, slightly damp towards bottom, matrix fine sand and earth, homogeneous through depth.	Sa. 01 0.2 Sa. 02 0.4 Sa. 03 0.6	
0.6	End of Test Pit. Bedrock encountered		

Remarks: Depth to seepage: none
Depth to standing water: dry
Rate of seepage:
Terminated: 0.6 m

TEST PIT P-SO-37-2300

Location: Downstream of dam 7
Elevation:
Date: July 23, 2000
Logged By: D. Panayi

Depth (m)	Description	Sample (Interval, m) [Headspace, ppm]	Comments
0.0 - 0.2	Black, soil with clay chunks, no clast, organic roots.	Sa. 01 0.2	
0.2 - 0.7	Grey, silt, heavy clast, clast angular, pebbles to boulders, some roots, damp.	Sa. 02 0.4 Sa. 03 0.7	
0.7 - 1.5	Brown, clay, little clast.	Sa. 04 1.5	
1.5	End of Test Pit. Bedrock not encountered.		

Remarks. Depth to seepage: none
Depth to standing water: dry
Rate of seepage:
Terminated: 1.5 m

TEST PIT P-SO-38-2500

Location: Highway north of site, south side of ditch.
Elevation:
Date: July 25, 2000
Logged By: N. Vachon

Depth (m)	Description	Sample (Interval, m) [Headspace, ppm]	Comments
0.0 - 0.5	Silt, fine grained, well sorted, few angular clasts, brown, dry SILT.	Sa. 01 0.2 Sa. 02 0.5	
0.5 - 1.1	Brown, compact, moist, well sorted, homogeneous, CLAY.	Sa. 03 0.75	
1.1	End of Test Pit. Bedrock not encountered.		

Remarks: Depth to seepage: none
Depth to standing water: dry
Rate of seepage:
Terminated: 1.1 m

TEST PIT P-SO-39-2500

Location: Akatche area, 40 m south of intersection
Elevation:
Date: July 25, 2000
Logged By: N. Vachon

Depth (m)	Description	Sample (Interval, m) [Headspace, ppm]	Comments
0.0 - 0.2	Dark, fine grained, roots, dry ORGANIC.	Sa. 01 0.2	
0.2 - 1.1	Brown, moist, homogeneous, compact, CLAY.	Sa. 02 0.5 Sa. 03 0.75	
1.1	End of Test Pit. Bedrock not encountered.		

Remarks: Depth to seepage: none
Depth to standing water: dry
Rate of seepage
Terminated: 1.1 m

TEST PIT P-SO-40-2500

Location: Akaitcho area
Elevation:
Date: July 25, 2000
Logged By: N. Vachon

Depth (m)	Description	Sample (Interval, m) [Headspace, ppm]	Comments
0.0 - 0.4	Brown, dry, coarse sand with a few subrounded pebbles, compact FILL.	Sa. 01 0.2	
0.4 - 0.7	Brown, dry, homogeneous, extremely compact and hard clay, no clasts CLAY.	Sa. 02 0.5 Sa. 03 0.7	
0.7	End of Test Pit. Bedrock not encountered.		

Remarks: Depth to seepage: none
Depth to standing water: dry
Rate of seepage:
Terminated: 0.7 m

TEST PIT P-SO-41-2500

Location: West of Akaitcho shaft (50 m)
Elevation:
Date: July 25, 2000
Logged By: N. Vachon

Depth (m)	Description	Sample (Interval, m) [Headspace, ppm]	Comments
0.0 - 0.2	Dark, fine grained, roots, dry, contains angular to subrounded clasts gravel to cobble size. ORGANIC.	Sa. 01 0.2	
0.2 - 0.9	Brown, well graded, contains gravel to cobble size clasts. Clasts are abundant, angular to subrounded. Matrix is silt size to medium sand size. Dry. Compact. TILL.	Sa. 02 0.5 Sa. 03 0.75	
0.9	End of Test Pit. Bedrock encountered.		

Remarks: Depth to seepage: none
Depth to standing water: dry
Rate of seepage:
Terminated: 0.9 m

TEST PIT P-SO-43-0900

Location: Tailings pond by Vee Lake [illegible] to Baker Creek
Elevation:
Date: September 21, 2000
Logged By: D. Panayi

Depth (m)	Description	Sample (Interval, m) [Headspace, ppm]	Comments
0.0 - 0.7	Fine, silty material, homogenous to 70 cm. Light brown, no vegetation or organics, dry, salt deposits on surface, no clast.	Sa. 1 0.2 Sa. 2 0.4 Sa. 3 0.7	

Remarks:
Depth to seepage: none
Depth to standing water: dry
Rate of seepage:
Terminated: 0.7 m, bedrock not encountered
Dry headspace readings with 10.2 eV lamp photoionization detector.

TEST PIT P-SO-44-0900

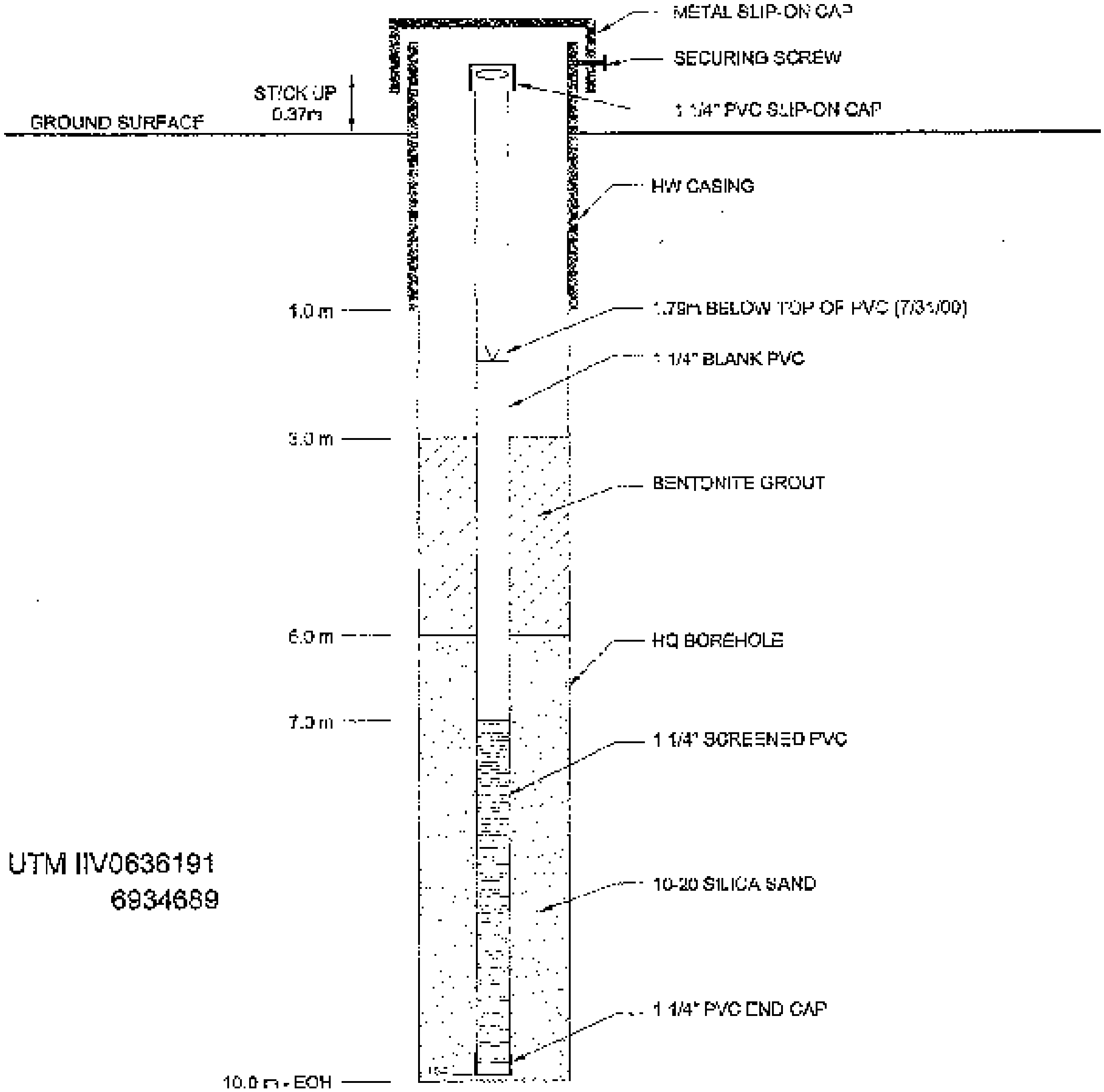
Location: 100 m from location P-SO-44-0900
Elevation:
Date: September 21, 2000
Logged By: D. Panayi

Depth (m)	Description	Sample (Interval, m) [Headspace, ppm]	Comments
0.0 - 0.7	Light brown silty material, no clast, homogenous to 0.7 m, dry, salts on surface, no vegetation or organics.	Sa. 1 0.2 Sa. 2 0.4 Sa. 3 0.7	

Remarks:
Depth to seepage: none
Depth to standing water: dry
Rate of seepage:
Terminated: 0.7 m, bedrock not encountered

APPENDIX V

GROUNDWATER SAMPLING SHEETS



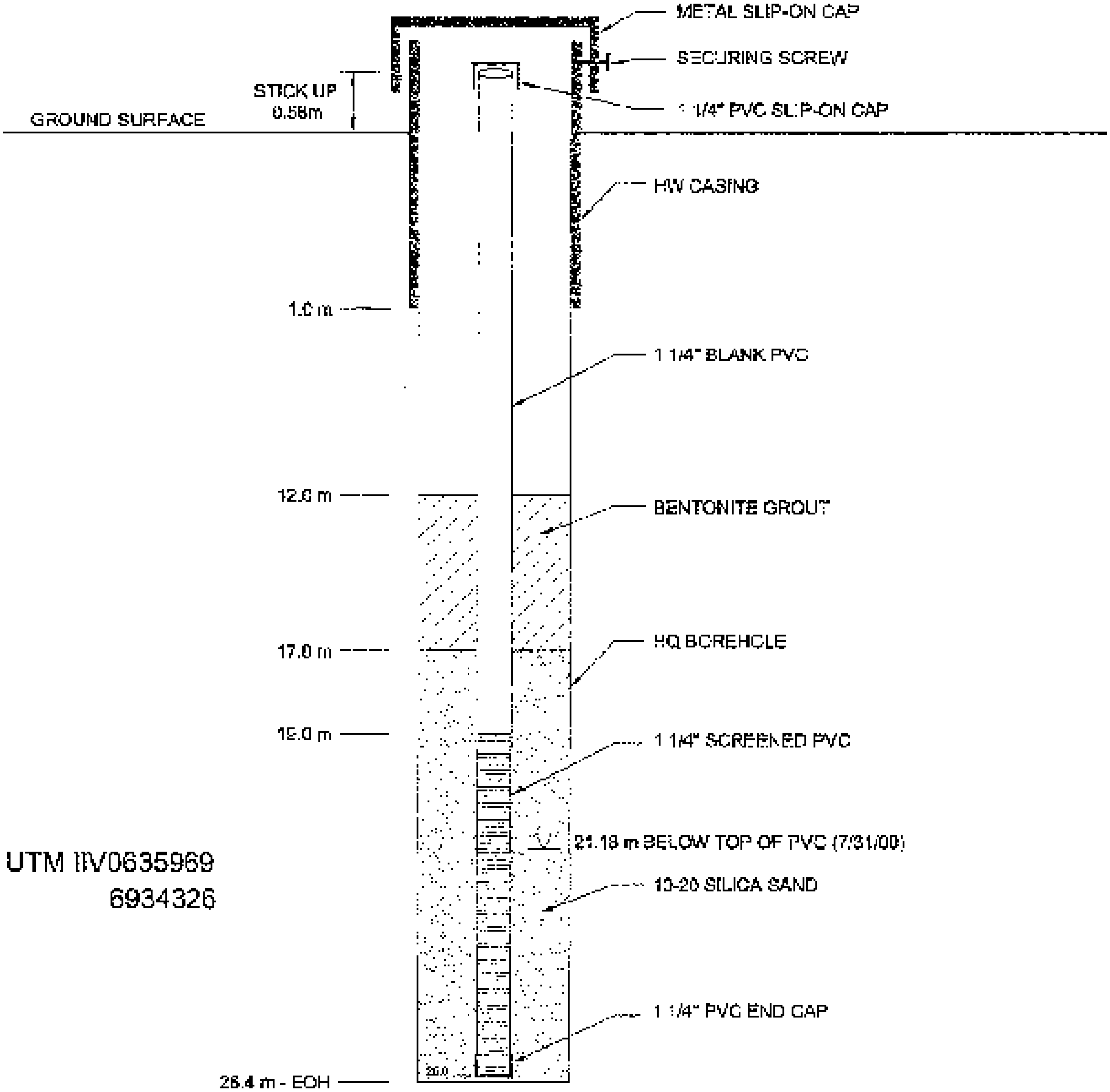
UTM IIV0636191
6934689

SCHEMATIC ONLY
NOT TO SCALE

Golder Associates

MONITORING WELL MW00-01
INSTALLATION DETAILS
MIRAMAR GIANT MINE

Drawn: JV	Date: Sep 28, 01	Figure:
Project No. 002-2418		Revision: 01



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SCHEMATIC ONLY
NOT TO SCALE

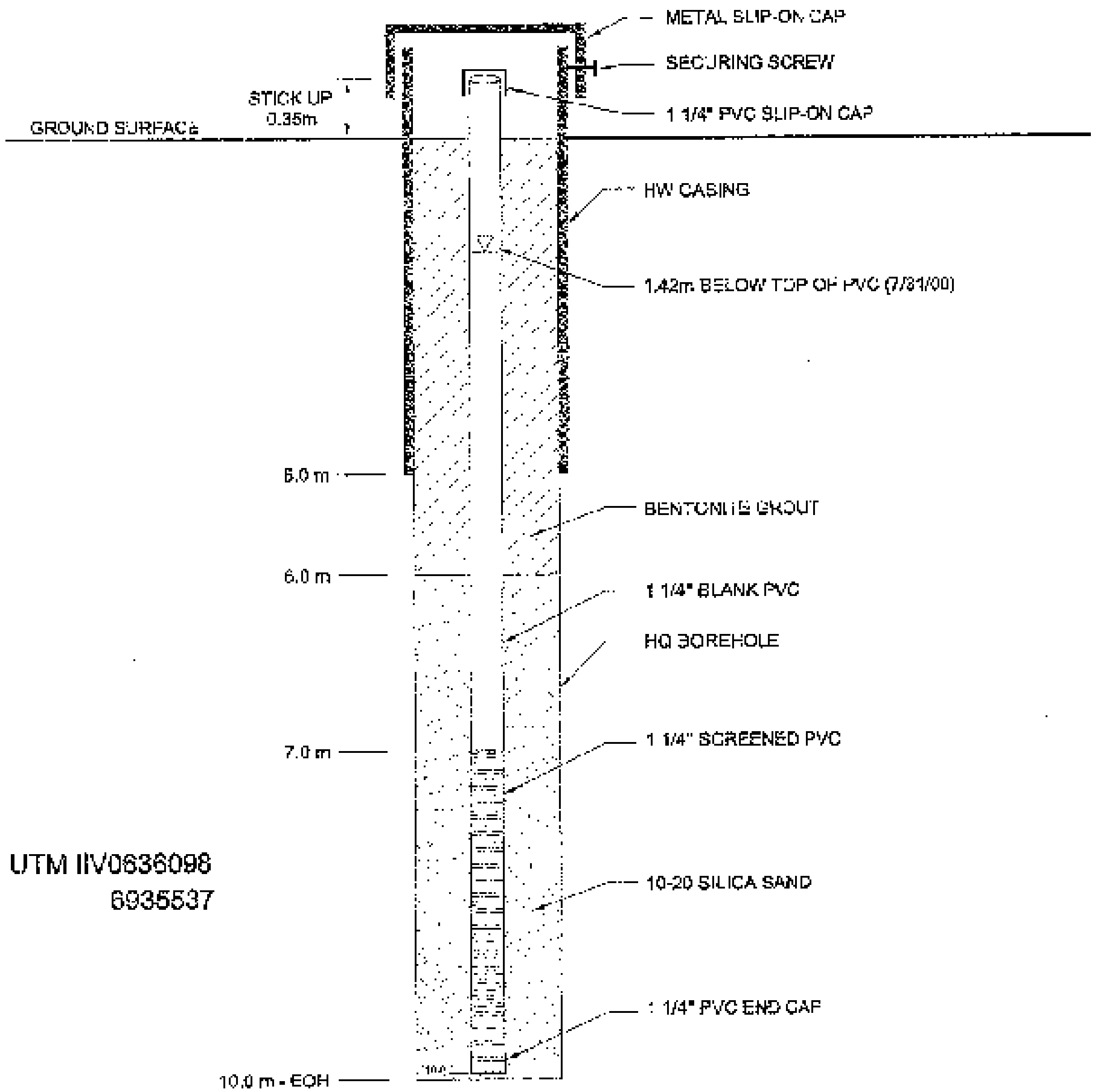
Golder Associates

MONITORING WELL MW00-02
INSTALLATION DETAILS
MIRAMAR GIANT MINE

Drawn: JK	Appr:	Date: Sep 28, 01	Figure:

Project No.: 002-2418

Revision No.:



UTM IIV0636098
6935537

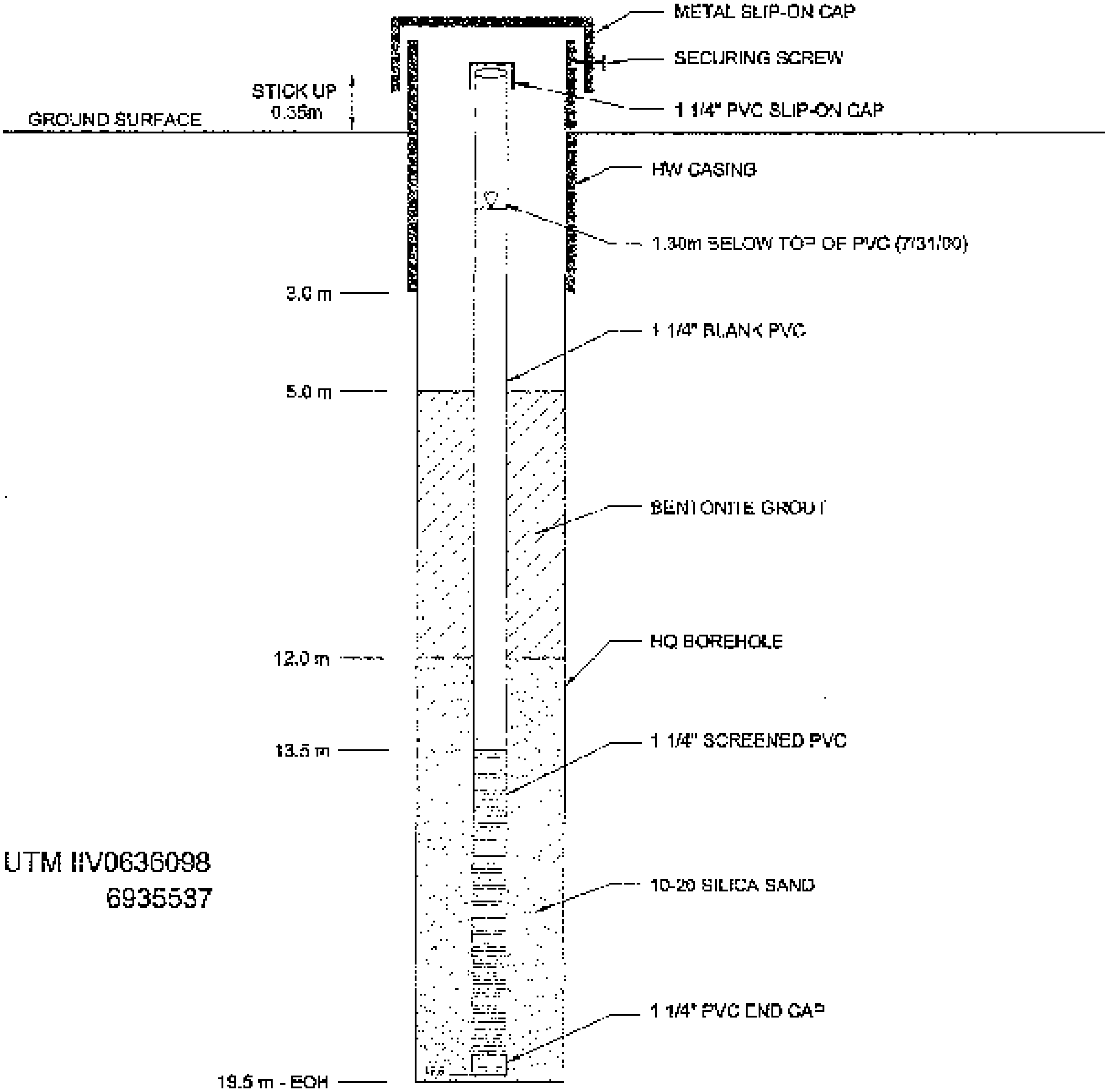
SCHEMATIC ONLY
NOT TO SCALE

Golder Associates

MONITORING WELL MW00-03-A
INSTALLATION DETAILS
MIRAMAR GIANT MINE

Drawn: | Appr.: | Date: Sep 26, 01 | Figure:

Project No.: 001-2416 Revision No.:



UTM IIV0636098
6935537

SCHEMATIC ONLY
NOT TO SCALE

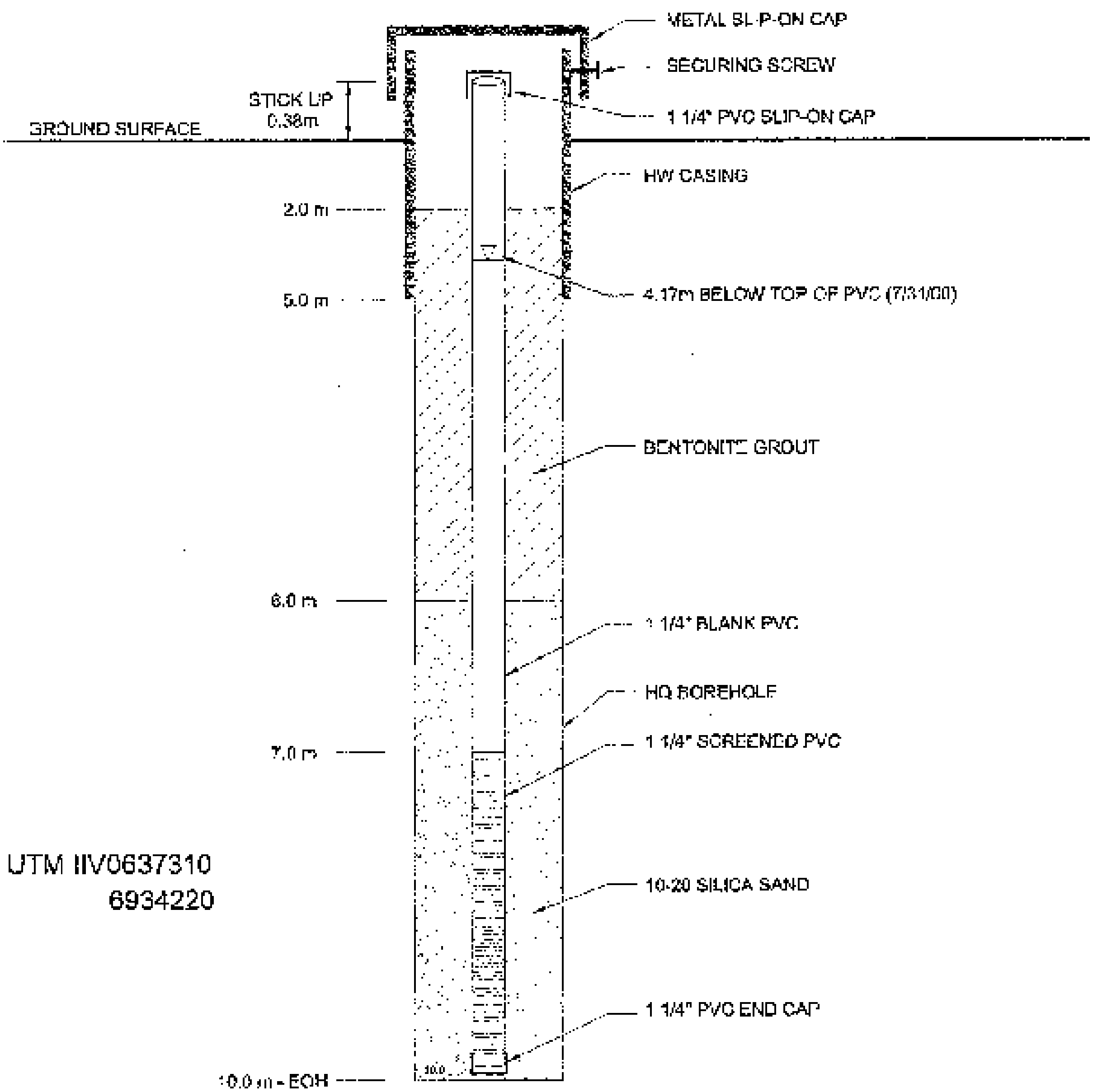
Golder Associates

MONITORING WELL MW00-53-B
INSTALLATION DETAILS
MIRAMAR GIANT MINE

Drawn: JK	App'd:	Date: Sep 26, 01	Figure

Project No.: 002-2415

Revision: ...



UTM IIV0637310
6934220

SCHEMATIC ONLY
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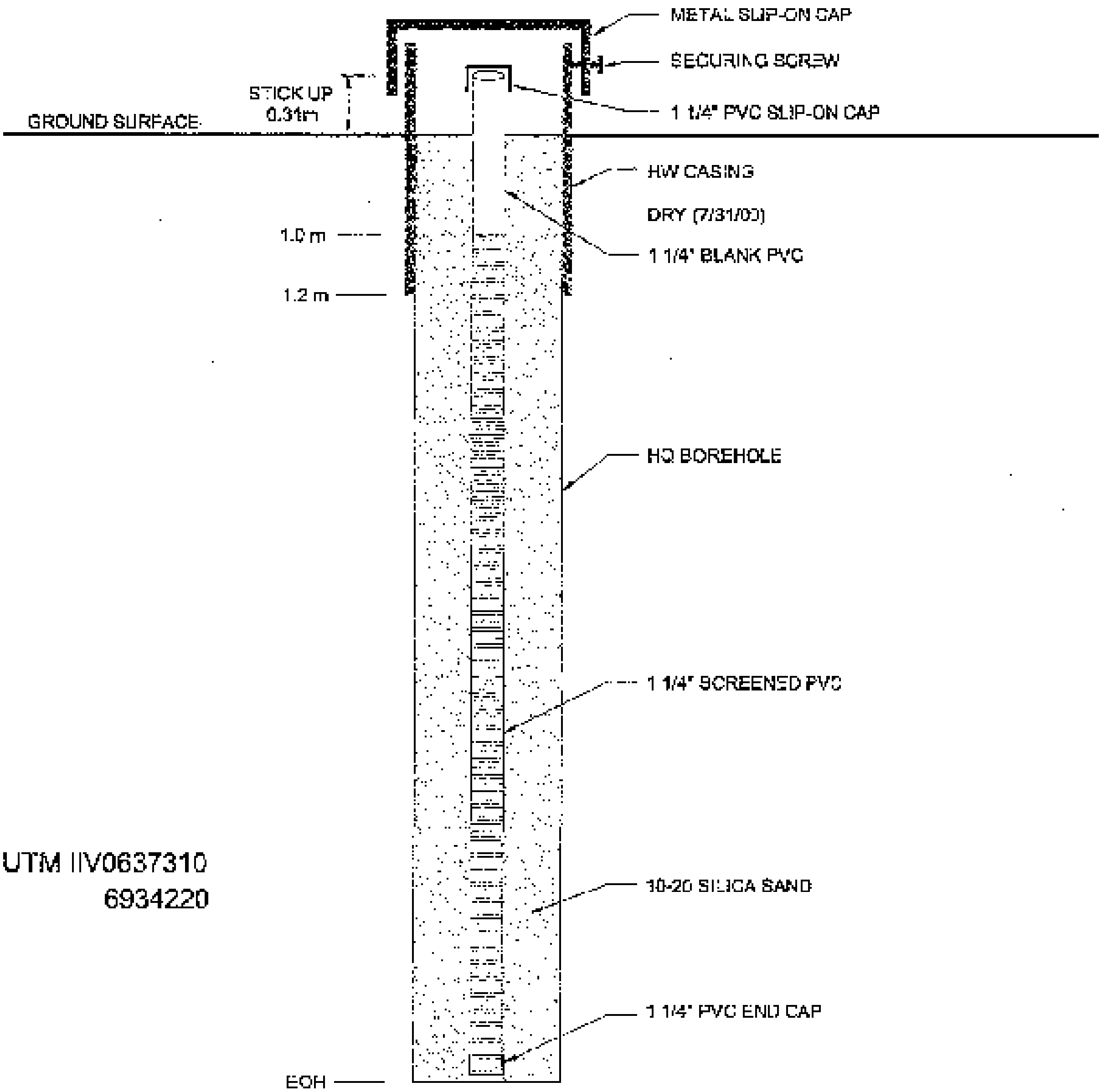
Golder Associates

MONITORING WELL MW00-04-A
INSTALLATION DETAILS
MIRAMAR GIANT MINE

Drawn:	Appr:	Date: Sep 28, 01	Figure

Project No: 002-2418



UTM IIV0637310
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SCHEMATIC ONLY
NOT TO SCALE

Golder Associates

MONITORING WELL MW00-04-B
INSTALLATION DETAILS
MIRAMAR GIANT MINE

Drawn: JC   Appr'd: Date: Sep 28, 01   Figure:

Project No.: 002-2410   Revision No.:

APPENDIX VI

GROUNDWATER AND SURFACE WATER ANALYTICAL REPORTS AND CHAIN-OF-CUSTODY RECORDS

Attachment A1-6

Golder Associates Ltd.
Groundwater Sampling Data Sheet

General Information

Well No.: *MW00-01* — GAL Job No.: *002-2418* — Short Title: *Myanmar / Wells / Giant*

Location: *Northwest Pond* — Date: *1-Aug-00* — Sample Collected by: *Nicolas Vachon*

Weather: *Sunny* — Time: *2:00 PM*

Temperature: 22 °C

Monitoring Well Information

Depth to Water below Top of Piezometer: 1.79 m — Piezometer Stick Up: 0.27 m

Piezometer Depth below Ground Surface: 10.0 m — Piezometer Internal ⌀: 1.0 inch

One Well Standing Volume: 4.3 Liters

Equipment List

pH and Temperature Meter: *Hanna Instrument*

Conductivity Meter: *Hanna Instrument*

Eh Meter: *Hanna Instrument*

Dissolved Oxygen: *Hach Colorimetric*

Alkalinity Kit: *Hach Kit*

Well purging performed by: *Waterra Hand Pump*

Well Sampling preformed with: *Peristaltic Pump*

Well Purging

Note:

Volume Removed (Liters)	pH	Cond. (µS/cm)	Temp. (°C)	Comments (i.e.: Color, Odor, Sheen, Turbidity etc.)
7.0	7.33	1555	10.4	Cloudy, silty
14.0	7.30	1575	9.4	Cloudy, silty
21.0	7.38	1739	10.5	Cloudy, silty
28.0	7.38	1614	9.5	Cloudy, silty
35.0	7.31	1606	9.4	Cloudy, silty
42.0	7.25	1624	9.5	Cloudy, silty

Field Parameters at Time of Sampling

pH: 7.95

Cond.: 1624 µS/cm

Eh: -70.0 mV

Temp: 9.5 °C

D.O.: 0.35 mg/L

Alkalinity — Sample Volume: 40 mL

Acid Concentration: 1.6 N H_2SO_4

Digit Required: 46

Alkalinity: 115.0 (as mg/L $CaCO_3$)

QAQC Note: Collected Duplicate Sample MW00-01A

Bottles	Bottle Type	Size	Filtering	Preservative	Analysis
1	Plastic	500 ml	No	None	Routine
2	Plastic	100 ml	No	1 ml 6N NaOH	Cyanide
3	Plastic	250 ml	Yes	5 ml 20% HNO_3	Dissolved Metals
4	Plastic	250 ml	No	5 ml 20% HNO_3	Total Metals
5	Plastic/Glass	500 ml	No	2 ml conc. H_2SO_4	Amonia (may include DOC-glass)
6	Glass	250 ml	No	None	Nitrate/Nitrite
7	Metal	250 ml	Yes	5 ml HNO_3	As Speciation
8	Glass, Amber	1 L	No	2 ml conc. HCl	Mineral Oil and Grease

Notes:

1. Routine parameters include major cations, major anions (SO_4^{2-}, Cl), hardness, alkalinity, pH, conductivity, TDS, TSS.
2. Dissolved Metals include arsenic speciation and metals (ICP-MS) AA for hydrides

Attachment A1-6

Golder Associates Ltd.
Groundwater Sampling Data Sheet

General Information

Well No.: *MW00-02* GAL Job No.: *002-2418* Short Title: *Miramar / Wells / Giant*

Location: *Tank Farm* Date: *1-Aug 00* Sample Collected by: *Nicolas Vachon*

Weather: *Sunny* Time: *12:30 PM*

Temperature: 22 °C

Monitoring Well Information

Depth to Water below Top of Piezometer: *21.15* m Piezometer Stick Up: *0.58* m

Piezometer Depth below Ground Surface: *25.0* m Piezometer Internal Ø: *1.0* inch

One Well Standing Volume: *3.2* Liters

Equipment List

pH and Temperature Meter: *Hanna Instrument*

Conductivity Meter: *Hanna Instrument*

Eh Meter: *Hanna Instrument*

Dissolved Oxygen: *Hach Colorimetric*

Alkalinity Kit: *Hach Kit*

Well purging performed by: *Waterra Hand Pump*

Well Sampling preformed with: *Waterra Hand Pump*

Well Purging

Note:

Volume Removed (Liters)	pH	Cond. (µS/cm)	Temp. (°C)	Comments (i.e.: Color, Odor, Sheen, Turbidity etc.)
3.5	7.62	1102	11.0	Cloudy, silty
7.0	7.75	1082	7.5	Cloudy, silty
10.5	7.75	1121	7.7	Cloudy, silty
14.0	7.76	1135	6.2	Cloudy, silty
17.5	7.75	1172	7.7	Cloudy, silty
21.0	7.72	1170	6.5	Cloudy, silty

Field Parameters at Time of Sampling

pH: 7.72

Cond.: 1170 µS/cm

Eh: 65.5 mV

Temp: 6.5 °C

D.O.: 2.5 mg/L

Alkalinity

Sample Volume: 40 mL

Acid Concentration: 1.6 N H_2SO_4

Digit Required: 82

Alkalinity: 205.0 (as mg/L $CaCO_3$)

QAQC Note:

Bottles	Bottle Type	Size	Filtering	Preservative	Analysis
1	Plastic	500 ml	No	None	Routine
2	Plastic	100 ml	No	1 ml 6N NaOH	Cyanide
3	Plastic	250 ml	Yes	5 ml 20% HNO_3	Dissolved Metals
4	Plastic	250 ml	No	5 ml 20% HNO_3	Total Metals
5	Plastic/Glass	500 ml	No	2 ml conc. H_2SO_4	Ammonia (may include DOC-glass)
6	Glass	250 ml	No	None	Nitrate/Nitrite
7	Metal	250 ml	Yes	5 ml HNO_3	As Speciation
8	Glass, Amber	1 L	No	2 ml conc. HCL	Mineral Oil and Grease

Notes:

1 Routine parameters include major cations, major anions (SO_4), Cl, hardness, alkalinity, pH, conductivity, TDS, TSS

2 Dissolved metals include arsenic speciation and mercury (ICP-MS; AA for hydrides.

Attachment A1-6

Golder Associates Ltd.
Groundwater Sampling Data Sheet

General Information

Well No.: *MW00-3A* GAI Job No.: *002-2415* Short Title: *Miramar / Wells / Giant*
Location: *Vee Lake Road* Date: *1-Aug-00* Sample Collected by: *Nicolas Vachon*
Weather: *Sunny* Time: *9:30 AM*
Temperature: 22 °C

Monitoring Well Information

Depth to Water below Top of Piezometer: *1.42* m Piezometer Stick Up: *0.35* m
Piezometer Depth below Ground Surface: *10.0* m Piezometer Internal D: *1.0* inch
One Well Standing Volume: *4.5* Liters

Equipment List

pH and Temperature Meter: *Hanna Instrument*
Conductivity Meter: *Hanna Instrument*
Eh Meter: *Hanna Instrument*
Dissolved Oxygen: *Hach Colorimetric*
Alkalinity Kit: *Hach Kit*

Well purging performed by: *Waterra Hand Pump*
Well Sampling preformed with: *Peristaltic Pump*

Well Purging

Note:

Volume Removed (Liters)	pH	Cond. (µS/cm)	Temp. (°C)	Comments (i.e.: Color, Odor, Sheen, Turbidity etc.)
7.0	6.94	1109	5.0	Cloudy, silty
14.0	6.95	1211	3.6	Cloudy, silty
21.0	7.16	1068	3.6	Cloudy, silty
28.0	7.05	964	3.8	Cloudy, silty
35.0	6.90	1055	3.8	Cloudy, silty
42.0	6.96	1075	4.1	Cloudy, silty
49.0	6.96	1120	5.1	Cloudy, silty
56.0	7.41	1212	5.1	Cloudy, silty
53.0	7.45	1240	4.3	Cloudy, silty

Field Parameters at Time of Sampling

pH: 7.45
Cond.: 1240 µS/cm
Eh: 88 mV
Temp: 4.3 °C

D.O.: 1.5 mg/L

Alkalinity
Sample Volume: 40 mL
Acid Concentration: 1.6 N H_2SO_4
Digit Required: 75
Alkalinity: 187.5 (as mg/L $CaCO_3$)

QAQC Note:

Bottles	Bottle Type	Size	Filtering	Preservative	Analysis
1	Plastic	500 ml	No	None	Routine
2	Plastic	100 ml	No	1 ml 6N NaOH	Cyanide
3	Plastic	250 ml	Yes	5 ml 20% HNO_3	Dissolved Metals
4	Plastic	250 ml	No	5 ml 20% HNO_3	Total Metals
5	Plastic/Glass	500 ml	No	2 ml conc. H_2SO_4	Amonia (may include DOC-glass)
6	Glass	250 ml	No	None	Nitrate/Nitrite
7	Metal	250 ml	Yes	5 ml HNO_3	As Speciation
8	Glass, Amber	1 L	No	2 ml conc. HCL	Mineral Oil and Grease

Notes:

1. Routine parameters include major cations, major anions (SO_4^{2-}, Cl), hardness, alkalinity, pH, conductivity, TDS, TSS.
2. Dissolved metals include arsenic speciation and mercury (ICP MS) AA As hydrides.

Attachment A1-6

Golder Associates Ltd.
Groundwater Sampling Data Sheet

General Information

Well No.: *MW00-3D* GAL Job No.: *002-2418* Short Title: *Miramar / Wells / Giant*
Location: *Vee Lake Road* Date: *1 Aug 00* Sample Collected by: *Nicolas Vachon*
Weather: *Sunny* Time: *10:30 AM*
Temperature: 22 °C

Monitoring Well Information

Depth to Water below Top of Piezometer: 1.30 m Piezometer Stick Up: 0.35 m
Piezometer Depth below Ground Surface: 19.5 m Piezometer Internal D: 1.0 inch
One Well Standing Volume: 9.4 Liters

Equipment List

pH and Temperature Meter: *Hanna Instrument*
Conductivity Meter: *Hanna Instrument*
Eh Meter: *Hanna Instrument*
Dissolved Oxygen: *Hach Colorimetric*
Alkalinity Kit: *Hach Kit*

Well purging performed by: *Waterra Hand Pump*
Well Sampling preformed with: *Peristaltic Pump*

Well Purging

Note:

Volume Removed (Liters)	pH	Cond. (mS/cm)	Temp. (°C)	Comments (i.e.: Color, Odor, Sheen, Turbidity etc.)
15.0	7.69	492	3.4	Cloudy, silty
30.0	7.60	562	3.3	Cloudy, silty
45.0	7.60	646	3.4	Cloudy, silty
60.0	7.34	757	3.6	Cloudy, silty
75.0	7.49	748	3.7	Cloudy, silty
90.0	7.61	950	3.0	Cloudy, silty
105.0	7.58	856	3.3	Cloudy, silty

Field Parameters at Time of Sampling

pH: 7.58
Cond.: 856 µS/cm
Eh: 67.4 mV
Temp: 3.3 °C

D.O.: 1.5 mg/L
Alkalinity
Sample Volume: 40 mL
Acid Concentration: 1.6 N H_2SO_4
Digit Required: 67
Alkalinity: 137.5 (as mg/L $CaCO_3$)

QAQC Note:

Bottles	Bottle Type	Size	Filtering	Preservative	Analysis
1	Plastic	500 ml	No	None	Routine
2	Plastic	100 ml	No	1 ml 6N NaOH	Cyanide
3	Plastic	250 ml	Yes	5 ml 20% HNO_3	Dissolved Metals
4	Plastic	250 ml	No	5 ml 20% HNO_3	Total Metals
5	Plastic/Glass	500 ml	No	2 ml conc. H_2SO_4	Amonia (may include DOC-glass)
6	Glass	250 ml	No	None	Nitrate/Nitrite
7	Metal	250 ml	Yes	5 ml HNO_3	As Speciation
8	Glass, Amber	1 L	No	2 ml conc. HCL	Mineral Oil and Grease

Notes:

1. Routine parameters include: major cations, major anions (SO_4^{2-}, Cl), hardness, alkalinity, pH, conductivity, TDS, TSS
2. Dissolved Metals include arsenic speciation, and mercury (ICP-MS); AA for hydrides

Attachment A1-6

Golder Associates Ltd.
Groundwater Sampling Data Sheet

General Information

Well No.: *MW00-4A* GAL Job No.: *002-2418* Short Title: *Miramar / Wells / Giant*

Location: *North Pond* Date: *1-Aug 00* Sample Collected by: *Nicolas Vachon*

Weather: *Sunny* Time: *5:30 PM*

Temperature: 22 °C

Monitoring Well Information

Depth to Water below Top of Piezometer: *4.17* m — Piezometer Stick Up: *0.38* m

Piezometer Depth below Ground Surface: *10.0* m — Piezometer internal D: *1.0* inch

One Well Standing Volume: *3.1* Liters

Equipment List

pH and Temperature Meter: *Hanna Instrument*

Conductivity Meter: *Hanna Instrument*

Eh Meter: *Hanna Instrument*

Dissolved Oxygen: *Hach Colorimetric*

Alkalinity Kit: *Hach Kit*

Well purging performed by: *Waterra Hand Pump*

Well Sampling preformed with: *Peristaltic Pump*

Well Purging

Note:

Volume Removed (Liters)	pH	Cond. (mS/cm)	Temp. (°C)	Comments (i.e.: Color, Odor, Sheen, Turbidity etc.)
5.0	7.85	1181	9.6	Cloudy, silty
10.0	7.89	1216	6.8	Cloudy, silty
15.0	7.98	940	7.0	Cloudy, silty
20.0	7.99	906	7.7	Cloudy, silty
25.0	7.9[illegible]	912	6.4	Cloudy, silty
30.0	7.82	773	6.4	Cloudy, silty
35.0	7.80	757	7.3	Cloudy, silty
40.0	7.80	758	6.5	Cloudy, silty

Field Parameters at Time of Sampling

pH 7.80

Cond. 758 mS/cm

Eh 83.[illegible] mV

Temp 6.5 °C

D.O.: 4.0 mg/L

Alkalinity

Sample Volume: 40 mL

Acid Concentration: 1.6 N H_2SO_4

Digit Required: 80

Alkalinity: 200.0 (as mg/L $CaCO_3$)

QAQC Note:

Bottles	Bottle Type	Size	Filtering	Preservative	Analysis
1	Plastic	500 ml	No	None	Routine
2	Plastic	100 ml	No	1 ml 6N NaOH	Cyanide
3	Plastic	250 ml	Yes	5 ml 20% HNO_3	Dissolved Metals
4	Plastic	250 ml	No	5 ml 20% HNO_3	Total Metals
5	Plastic/Glass	500 ml	No	2 ml conc. H_2SO_4	Ammonia (may include DOC-glass)
6	Glass	250 ml	No	None	Nitrate/Nitrite
7	Metal	250 ml	Yes	5 ml HNO_3	As Speciation
8	Glass, Amber	1 L	No	2 ml conc. HCl	Mineral Oil and Grease

Notes:

1. Routine parameters include [illegible] (SO_4, Cl), hardness, alkalinity, pH, conductivity, TDS, TSS
2. Dissolved Metals include arsenic [illegible] and mercury (ICP-MS) [illegible].

APPENDIX VII

HABITAT MAPPING STUDY NOTES

1988 Triumph Street Vancouver, BC Canada V5L 1K5

analytical
service
laboratories
Inc.

FAX: (604) 253-6700 TEL: (604) 253-4188

CHEMICAL ANALYSIS REPORT

Date: November 16, 2000

ASL File No. M3353

Report On: 002-2418/5300 Water Analysis

Report To: **Golder Associates Ltd.**
500 - 4260 Still Creek Drive
Burnaby, BC
V5C 6C6

Attention: **Ms. Valerie Bertrand**

Received: October 17, 2000

ASL ANALYTICAL SERVICE LABORATORIES LTD.
per:

Brent C. Mack, B.Sc. - Project Chemist
Heather A. Rosa, B.Sc. - Project Chemist

RESULTS OF ANALYSIS - Water File No. M3353

Sample ID		TLG-11-SW-10/00	TLG-7A-SW-10/00	TLG-7B-SW-10/00
Sample Date		00 10 16	00 10 16	00 10 16
Sample Time		12:10	12.30	12:50
ASL ID		*1*	*2*	*3*
Physical Tests				
Hardness	CaCO3	1140	771	588
Dissolved Anions				
Alkalinity-Total	CaCO3	136	169	252
Nutrients				
Nitrate Nitrogen	N	6.31	0.86	0.007
Nitrite Nitrogen	N	0.006	0.010	0.001
Cyanides				
Total Cyanide	CN	0.053	0.033	0.016
Dissolved Metals				
Aluminum	D-Al	<0.05	<0.05	<0.05
Antimony	D-Sb	0.5	0.2	<0.2
Arsenic	D-As	2.8	1.4	0.3
Barium	D-Ba	0.03	0.04	0.03
Beryllium	D-Be	<0.005	<0.005	<0.005
Boron	D-B	0.3	0.2	<0.1
Cadmium	D-Cd	<0.002	<0.002	<0.002
Calcium	D-Ca	296	203	166
Chromium	D-Cr	<0.01	<0.01	<0.01
Cobalt	D-Co	0.06	0.03	0.01
Copper	D-Cu	0.21	0.01	<0.01
Iron	D-Fe	<0.03	<0.03	<0.03
Lead	D-Pb	<0.01	<0.01	<0.01
Magnesium	D-Mg	95.4	64.2	42.5
Manganese	D-Mn	0.333	0.046	0.055
Mercury	D-Hg	<0.00005	<0.00005	<0.00005
Molybdenum	D-Mo	<0.03	<0.03	<0.03
Nickel	D-Ni	<0.05	<0.05	<0.05
Selenium	D-Se	<0.002	<0.01	<0.01
Silver	D-Ag	<0.001	<0.001	<0.001
Sodium	D-Na	111	81	36
Thallium	D-Tl	0.002	0.002	0.001
Uranium	D-U	0.0100	0.0042	0.0102
Zinc	D-Zn	0.015	<0.005	<0.005
Organic Parameters				
Dissolved Organic Carbon	C	6.1	9.0	8.7

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

cyanate hydrolysis method using an ammonia selective electrode. Thiocyanate is determined by the ferric nitrate colourimetric method.

Recommended Holding Time:
Sample: 14 days
Reference: APHA
For more detail see ASL "Collection & Sampling Guide'

Metals in Water

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" 20th Edition 1998 published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotplate or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by atomic absorption/emission spectrophotometry (EPA Method 7000 series), inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B), and/or inductively coupled plasma - mass spectrometry (EPA Method 6020).

Recommended Holding Time:

Sample:	6 months
Reference:	EPA
For more detail see:	ASL "Collection & Sampling Guide"

Mercury in Water

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" 20th Edition 1998 published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic absorption spectrophotometry (EPA Method 7470A/7471A).

Recommended Holding Time:

Sample:	28 days
Reference:	EPA
For more detail see:	ASL "Collection & Sampling Guide"

Appendix

CHAIN OF CUSTODY FORMS

Edmonton (Main)
9936 - 67 Avenue
Edmonton, AB
T6E 0P5
Phone: (780) 413-5227
Fax: (780) 437-2311

Edmonton (Downtown)
Industrial Hygiene
Unit 1, 10158 - 103 Street
Edmonton, AB
T5J 0X6
Phone: (780) 413-5235
Fax: (780) 424-4602

Calgary
Bay 2, 1212 - 44th Ave. N.E.
Calgary, AB
T2E 6L5
Phone: (403) 291-9897
Fax: (403) 291-0298

Grande Prairie
9505 - 111 Street
Grande Prairie, AB
T8V 5W1
Phone: (780) 539-5196
Fax: (780) 513-2191

Saskatoon
124 Veterinary Road
Saskatoon, SK
S7N 5E3
Phone: (306) 668-8370
Fax: (306) 668-8383
1-800-667-7645

Winnipeg
745 Logan Avenue
Winnipeg, MB
R3E 3L5
Phone: (204) 945-3705
Fax: (204) 945-0763

Thunder Bay
1081 Barton Street
Thunder Bay, ON
P7B 5N3
Phone: (807) 623-6463
Fax: (807) 623-7305

Ottawa
Enviro-Test Laboratories Inc.
319 St. Laurent Blvd.
Unit 1A
Ottawa, ON
K1G 4L5
Phone: (613) 731-7005
Fax: (613) 730-1107

Wyoming
420 West First Street
Casper, Wyoming 82601
Phone: (307) 235-0747
Fax: (307) 268-1578
1-800-565-0000

Canada Wide Phone:
1-800-668-0678

Western Canada Fax:
1-800-265-7219

www.envirotest.com

ETL Enviro·Test

A DIVISION OF ... ANALYTICAL ...

CHEMICAL ANALYSIS REPORT

GOLDER ASSOCIATES LTD
ATTN: VALERIE BERTRAND
500 4260 STILL CREEK DRIVE
BURNABY BC V5C 6C6

DATE: November 15, 2000

Lab Work Order #: L17745 Sampled By: CLIENT Date Received: 09/20/00

Project P.O. #: surf. water

Project Reference:

Comments: ADDITIONAL 16-OCT-00 08:50

APPROVED BY: ______________________

RON JONES
Project Manager

THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE WRITTEN AUTHORITY OF THE LABORATORY
ALL SAMPLES WILL BE DISPOSED OF AFTER 30 DAYS FOLLOWING ANALYSIS. PLEASE CONTACT THE LAB IF YOU REQUIRE ADDITIONAL SAMPLE STORAGE TIME.

ACCREDITATIONS: STANDARDS COUNCIL OF CANADA (SCC), IN COOPERATION WITH THE CANADIAN ASSOCIATION FOR ENVIRONMENTAL ANALYTICAL LABORATORIES (CAEAL), FOR SPECIFIC TESTS AS REGISTERED BY THE COUNCIL (EDMONTON, CALGARY, SASKATOON, WINNIPEG, THUNDER BAY)
AMERICAN INDUSTRIAL HYGIENE ASSOCIATION (AIHA) FOR INDUSTRIAL HYGIENE ANALYSIS (EDMONTON)
STANDARDS COUNCIL OF CANADA IN COOPERATION WITH THE CANADIAN FOOD INSPECTION AGENCY (CFIA) FOR FERTILIZER AND FEED TESTING (SASKATOON)

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L17746-3	BC-DS2-SW-09/00							
Sample Date	18-SEP-00							
Matrix:	WATER							
		Metals-Total						
		Silver (Ag)	<0.005	0.005	mg/L		27-SEP-00	CC5
		Aluminum (Al)	0.15	0.01	mg/L		27-SEP-00	CC5
		Barium (Ba)	0.025	0.003	mg/L		27-SEP-00	CC5
		Beryllium (Be)	<0.002	0.002	mg/L		27-SEP-00	CC5
		Calcium (Ca)	260	0.5	mg/L		27-SEP-00	CC5
		Cadmium (Cd)	<0.001	0.001	mg/L		27-SEP-00	CC5
		Cobalt (Co)	0.075	0.002	mg/L		27-SEP-00	CC5
		Chromium (Cr)	0.007	0.005	mg/L		27-SEP-00	CC5
		Copper (Cu)	0.028	0.001	mg/L		27-SEP-00	CC5
		Iron (Fe)	0.257	0.005	mg/L		27-SEP-00	CC5
		Potassium (K)	9.4	0.1	mg/L		27-SEP-00	CC5
		Magnesium (Mg)	49.8	0.1	mg/L		27-SEP-00	CC5
		Manganese (Mn)	0.055	0.001	mg/L		27-SEP-00	CC5
		Molybdenum (Mo)	0.027	0.005	mg/L		27-SEP-00	CC5
		Sodium (Na)	158	1	mg/L		27-SEP-00	CC5
		Nickel (Ni)	0.122	0.002	mg/L		27-SEP-00	CC5
		Phosphorus (P)	0.07	0.05	mg/L		27-SEP-00	CC5
		Lead (Pb)	<0.005	0.005	mg/L		27-SEP-00	CC5
		Tin (Sn)	<0.05	0.05	mg/L		27-SEP-00	CC5
		Strontium (Sr)	2.31	0.002	mg/L		27-SEP-00	CC5
		Titanium (Ti)	0.008	0.001	mg/L		27-SEP-00	CC5
		Thallium (Tl)	<0.05	0.05	mg/L		27-SEP-00	CC5
		Vanadium (V)	0.003	0.001	mg/L		27-SEP-00	CC5
		Zinc (Zn)	0.300	0.001	mg/L		27-SEP-00	CC5
		Ammonia-N	0.26	0.05	mg/L		25-SEP-00	EK
		Dissolved Organic Carbon	3	1	mg/L		25-SEP-00	HAN
		Nitrate-N	12.9	0.1	mg/L		22-SEP-00	LDD
		Nitrite-N	0.14	0.05	mg/L		22-SEP-00	LDD
L17746-4	BC-DS1-SW-09/00							
Sample Date	18-SEP-00							
Matrix:	WATER							
		Routine Water Analysis						
		Chloride (Cl)	262	1	mg/L		21-SEP-00	LDD
		Nitrate+Nitrite-N	12.7	0.1	mg/L		22-SEP-00	LDD
		pH, Conductivity and Total Alkalinity						
		pH	7.7	0.1	pH		20-SEP-00	PTT
		Conductivity (EC)	2170	0.2	uS/cm		20-SEP-00	PTT
		Bicarbonate (HCO3)	95	5	mg/L		20-SEP-00	PTT
		Carbonate (CO3)	<5	5	mg/L		20-SEP-00	PTT
		Hydroxide	<5	5	mg/L		20-SEP-00	PTT
		Alkalinity, Total	78	5	mg/L		20-SEP-00	PTT
		Ion Balance Calculation						
		Ion Balance	101		%		26-SEP-00	
		TDS (Calculated)	1520		mg/L		26-SEP-00	
		Hardness	903		mg/L		26-SEP-00	
		ICP metals and SO4 for routine water						
		Calcium (Ca)	259	0.5	mg/L		26-SEP-00	MCR
		Potassium (K)	11.3	0.1	mg/L		26-SEP-00	MCR

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L17746-4	BC-DS1-SW-09/00							
Sample Date	19-SEP-00							
Matrix:	WATER							
	Metals-Total							
		Nickel (Ni)	0.127	0.002	mg/L		27-SEP-00	CC5
		Phosphorus (P)	0.06	0.05	mg/L		27-SEP-00	CC5
		Lead (Pb)	<0.005	0.005	mg/L		27-SEP-00	CC5
		Tin (Sn)	<0.05	0.05	mg/L		27-SEP-00	CC5
		Strontium (Sr)	2.34	0.002	mg/L		27-SEP-00	CC5
		Titanium (Ti)	0.002	0.001	mg/L		27-SEP-00	CC5
		Thallium (Tl)	<0.05	0.05	mg/L		27-SEP-00	CC5
		Vanadium (V)	0.003	0.001	mg/L		27-SEP-00	CC5
		Zinc (Zn)	0.013	0.001	mg/L		27-SEP-00	CC5
		Ammonia-N	0.49	0.05	mg/L		25-SEP-00	EK
		Dissolved Organic Carbon	7	1	mg/L		25-SEP-00	PAN
		Nitrate-N	12.5	0.1	mg/L		22-SEP-00	LDD
		Nitrite-N	0.18	0.05	mg/L		22-SEP-00	LDD
L17746-5	BC-DS2-SW-09/00-C							
Sample Date	19-SEP-00							
Matrix:	WATER							
	Routine Water Analysis							
		Chloride (Cl)	285	1	mg/L		21-SEP-00	LDD
		Nitrate+Nitrite-N	12.6	0.1	mg/L		22-SEP-00	LDD
	pH, Conductivity and Total Alkalinity							
		pH	7.7	0.1	pH		20-SEP-00	PTT
		Conductivity (EC)	2140	0.2	uS/cm		20-SEP-00	PTT
		Bicarbonate (HCO3)	95	5	mg/L		20-SEP-00	PTT
		Carbonate (CO3)	<5	5	mg/L		20-SEP-00	PTT
		Hydroxide	<5	5	mg/L		20-SEP-00	PTT
		Alkalinity, Total	78	5	mg/L		20-SEP-00	PTT
	Ion Balance Calculation							
		Ion Balance	99.8		%		26-SEP-00	
		TDS (Calculated)	1520		mg/L		26-SEP-00	
		Hardness	883		mg/L		26-SEP-00	
	ICP metals and SO4 for routine water							
		Calcium (Ca)	260	0.5	mg/L		25-SEP-00	MCR
		Potassium (K)	11.9	0.1	mg/L		25-SEP-00	MCR
		Magnesium (Mg)	56.6	0.1	mg/L		25-SEP-00	MCR
		Sodium (Na)	142	1	mg/L		25-SEP-00	MCR
		Sulfate (SO4)	689	0.5	mg/L		25-SEP-00	MCR
		Antimony (Sb)-Dissolved	0.983	0.0004	mg/L		17-OCT-00	RG
		Arsenic (As) 3+-Dissolved	0.0050	0.0002	mg/L			JJ
		Arsenic (As) 5+-Dissolved	0.269	0.0002	mg/L			JJ
		Arsenic (As)-Dissolved	0.319	0.0004	mg/L		17-OCT-00	RG
	Metals, Dissolved							
		Silver (Ag)	<0.005	0.005	mg/L		25-SEP-00	CC5
		Aluminum (Al)	<0.01	0.01	mg/L		25-SEP-00	CC5
		Boron (B)	0.49	0.05	mg/L		25-SEP-00	CC5
		Barium (Ba)	0.015	0.002	mg/L		25-SEP-00	CC5
		Beryllium (Be)	<0.001	0.001	mg/L		25-SEP-00	CC5
		Cadmium (Cd)	<0.001	0.001	mg/L		25-SEP-00	CC5

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L17746-6	OP C1 SW 09/00							
Sample Date: 19-SEP-00								
Matrix:	WATER							
		Routine Water Analysis						
		Chloride (Cl)	36	1	mg/L		21-SEP-00	LDC
		Nitrate+Nitrite-N	<0.1	0.1	mg/L		22-SEP-00	LDC
		pH, Conductivity and Total Alkalinity						
		pH	8.0	0.1	pH		20-SEP-00	PTT
		Conductivity (EC)	1410	0.2	uS/cm		20-SEP-00	PTT
		Bicarbonate (HCO3)	201	5	mg/L		20-SEP-00	PTT
		Carbonate (CO3)	<5	5	mg/L		20-SEP-00	PTT
		Hydroxide	<5	5	mg/L		20-SEP-00	PTT
		Alkalinity, Total	164	5	mg/L		20-SEP-00	PTT
		Ion Balance Calculation						
		Ion Balance	94.5		%		26-SEP-00	
		TDS (Calculated)	947		mg/L		26-SEP-00	
		Hardness	686		mg/L		26-SEP-00	
		ICP metals and SO4 for routine water						
		Calcium (Ca)	197	0.5	mg/L		25-SEP-00	MOR
		Potassium (K)	4.7	0.1	mg/L		25-SEP-00	MOR
		Magnesium (Mg)	47.2	0.1	mg/L		25-SEP-00	MOR
		Sodium (Na)	21	1	mg/L		25-SEP-00	MOR
		Sulfate (SO4)	543	0.5	mg/L		25-SEP-00	MOR
		Antimony (Sb)-Dissolved	0.0585	0.0004	mg/L		17-OCT-00	RG
		Arsenic (As) 3+-Dissolved	0.0040	0.0002	mg/L			JJ
		Arsenic (As) 5+-Dissolved	0.148	0.0002	mg/L			JJ
		Arsenic (As)-Dissolved	0.171	0.0004	mg/L		17-OCT-00	RG
		Metals, Dissolved						
		Silver (Ag)	<0.005	0.005	mg/L		25-SEP-00	CC5
		Aluminum (Al)	<0.01	0.01	mg/L		25-SEP-00	CC5
		Boron (B)	0.17	0.05	mg/L		25-SEP-00	CC5
		Barium (Ba)	0.043	0.003	mg/L		25-SEP-00	CC5
		Beryllium (Be)	<0.001	0.001	mg/L		25-SEP-00	CC5
		Cadmium (Cd)	<0.001	0.001	mg/L		25-SEP-00	CC5
		Cobalt (Co)	<0.002	0.002	mg/L		25-SEP-00	CC5
		Chromium (Cr)	<0.005	0.005	mg/L		25-SEP-00	CC5
		Copper (Cu)	0.005	0.001	mg/L		25-SEP-00	CC5
		Iron (Fe)	<0.005	0.005	mg/L		25-SEP-00	CC5
		Manganese (Mn)	0.008	0.001	mg/L		25-SEP-00	CC5
		Molybdenum (Mo)	<0.005	0.005	mg/L		25-SEP-00	CC5
		Nickel (Ni)	0.012	0.002	mg/L		25-SEP-00	CC5
		Phosphorus (P)	<0.1	0.1	mg/L		25-SEP-00	CC5
		Lead (Pb)	<0.005	0.005	mg/L		25-SEP-00	CC5
		Tin (Sn)	<0.05	0.05	mg/L		25-SEP-00	CC5
		Strontium (Sr)	0.477	0.005	mg/L		25-SEP-00	CC5
		Titanium (Ti)	<0.001	0.001	mg/L		25-SEP-00	CC5
		Thallium (Tl)	<0.05	0.05	mg/L		25-SEP-00	CC5
		Vanadium (V)	<0.001	0.001	mg/L		25-SEP-00	CC5
		Zinc (Zn)	0.011	0.001	mg/L		25-SEP-00	CC5
		Antimony (Sb)-Total	0.0597	0.0004	mg/L		17-OCT-00	RG
		Arsenic (As)-Total	0.145	0.0004	mg/L		17-OCT-00	RG
		Metals-Total						
		Silver (Ag)	<0.005	0.005	mg/L		27-SEP-00	CC5

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L17748-7	OP-B2-SW-09/00							
Sample Date	19-SEP-00							
Matrix:	WATER							
		Routine Water Analysis						
		ICP metals and SO4 for routine water						
		Sodium (Na)	26	1	mg/L		25-SEP-00	MOR
		Sulfate (SO4)	870	0.5	mg/L		26-SEP-00	MOR
		Antimony (Sb)-Dissolved	0.386	0.0004	mg/L		17-OCT-00	RG
		Arsenic (As) 3+-Dissolved	0.116	0.0002	mg/L			JJ
		Arsenic (As) 5+-Dissolved	3.93	0.0002	mg/L			JJ
		Arsenic (As)-Dissolved	4.11	0.0004	mg/L		17-OCT-00	RG
		Metals, Dissolved						
		Silver (Ag)	<0.005	0.005	mg/L		25-SEP-00	CC5
		Aluminum (Al)	<0.01	0.01	mg/L		25-SEP-00	CC5
		Boron (B)	0.15	0.05	mg/L		25-SEP-00	CC5
		Barium (Ba)	0.028	0.003	mg/L		25-SEP-00	CC5
		Beryllium (Be)	<0.001	0.001	mg/L		25-SEP-00	CC5
		Cadmium (Cd)	<0.001	0.001	mg/L		25-SEP-00	CC5
		Cobalt (Co)	0.042	0.002	mg/L		25-SEP-00	CC5
		Chromium (Cr)	<0.005	0.005	mg/L		25-SEP-00	CC5
		Copper (Cu)	0.004	0.001	mg/L		25-SEP-00	CC5
		Iron (Fe)	<0.005	0.005	mg/L		25-SEP-00	CC5
		Manganese (Mn)	0.273	0.001	mg/L		25-SEP-00	CC5
		Molybdenum (Mo)	0.032	0.005	mg/L		25-SEP-00	CC5
		Nickel (Ni)	0.073	0.002	mg/L		25-SEP-00	CC5
		Phosphorus (P)	<0.1	0.1	mg/L		25-SEP-00	CC5
		Lead (Pb)	<0.005	0.005	mg/L		25-SEP-00	CC5
		Tin (Sn)	<0.05	0.05	mg/L		25-SEP-00	CC5
		Strontium (Sr)	0.773	0.005	mg/L		25-SEP-00	CC5
		Titanium (Ti)	<0.001	0.001	mg/L		25-SEP-00	CC5
		Thallium (Tl)	<0.05	0.05	mg/L		25-SEP-00	CC5
		Vanadium (V)	0.003	0.001	mg/L		25-SEP-00	CC5
		Zinc (Zn)	0.018	0.001	mg/L		25-SEP-00	CC5
		Antimony (Sb)-Total	0.389	0.0004	mg/L		17-OCT-00	RG
		Arsenic (As)-Total	4.15	0.0004	mg/L		17-OCT-00	RG
		Metals-Total						
		Silver (Ag)	<0.005	0.005	mg/L		27-SEP-00	CC5
		Aluminum (Al)	0.08	0.01	mg/L		27-SEP-00	CC5
		Barium (Ba)	0.029	0.003	mg/L		27-SEP-00	CC5
		Beryllium (Be)	<0.002	0.002	mg/L		27-SEP-00	CC5
		Calcium (Ca)	232	0.5	mg/L		27-SEP-00	CC5
		Cadmium (Cd)	<0.001	0.001	mg/L		27-SEP-00	CC5
		Cobalt (Co)	0.047	0.002	mg/L		27-SEP-00	CC5
		Chromium (Cr)	<0.005	0.005	mg/L		27-SEP-00	CC5
		Copper (Cu)	0.013	0.001	mg/L		27-SEP-00	CC5
		Iron (Fe)	<0.005	0.005	mg/L		27-SEP-00	CC5
		Potassium (K)	8.9	0.1	mg/L		27-SEP-00	CC5
		Magnesium (Mg)	83.2	0.1	mg/L		27-SEP-00	CC5
		Manganese (Mn)	0.295	0.001	mg/L		27-SEP-00	CC5
		Molybdenum (Mo)	0.033	0.005	mg/L		27-SEP-00	CC5
		Sodium (Na)	17	1	mg/L		27-SEP-00	CC5
		Nickel (Ni)	0.095	0.002	mg/L		27-SEP-00	CC5
		Phosphorus (P)	0.06	0.05	mg/L		27-SEP-00	CC5

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L17746-8	CP-B2-SW-09/00-6							
Sample Date	19-SEP-00							
Matrix:	WATER							
		Metals, Dissolved						
		Copper (Cu)	0.004	0.001	mg/L		25-SEP-00	CC5
		Iron (Fe)	<0.005	0.005	mg/L		25-SEP-00	CC5
		Manganese (Mn)	0.283	0.001	mg/L		25-SEP-00	CC5
		Molybdenum (Mo)	0.033	0.005	mg/L		25-SEP-00	CC5
		Nickel (Ni)	0.076	0.002	mg/L		25-SEP-00	CC5
		Phosphorus (P)	<0.1	0.1	mg/L		25-SEP-00	CC5
		Lead (Pb)	<0.005	0.005	mg/L		25-SEP-00	CC5
		Tin (Sn)	<0.05	0.05	mg/L		25-SEP-00	CC5
		Strontium (Sr)	0.783	0.005	mg/L		25-SEP-00	CC5
		Titanium (Ti)	<0.001	0.001	mg/L		25-SEP-00	CC5
		Thallium (Tl)	<0.05	0.05	mg/L		25-SEP-00	CC5
		Vanadium (V)	0.003	0.001	mg/L		25-SEP-00	CC5
		Zinc (Zn)	0.014	0.001	mg/L		25-SEP-00	CC5
		Antimony (Sb)-Total	0.425	0.0004	mg/L		17-OCT-00	RG
		Arsenic (As)-Total	4.35	0.0004	mg/L		17-OCT-00	RG
		Metals-Total						
		Silver (Ag)	<0.005	0.005	mg/L		27-SEP-00	CC5
		Aluminum (Al)	0.75	0.01	mg/L		27-SEP-00	CC5
		Barium (Ba)	0.063	0.003	mg/L		27-SEP-00	CC5
		Beryllium (Be)	<0.002	0.002	mg/L		27-SEP-00	CC5
		Calcium (Ca)	334	0.5	mg/L		27-SEP-00	CC5
		Cadmium (Cd)	<0.001	0.001	mg/L		27-SEP-00	CC5
		Cobalt (Co)	0.054	0.002	mg/L		27-SEP-00	CC5
		Chromium (Cr)	<0.005	0.005	mg/L		27-SEP-00	CC5
		Copper (Cu)	0.009	0.001	mg/L		27-SEP-00	CC5
		Iron (Fe)	1.38	0.005	mg/L		27-SEP-00	CC5
		Potassium (K)	9.7	0.1	mg/L		27-SEP-00	CC5
		Magnesium (Mg)	81.4	0.1	mg/L		27-SEP-00	CC5
		Manganese (Mn)	0.365	0.001	mg/L		27-SEP-00	CC5
		Molybdenum (Mo)	0.039	0.005	mg/L		27-SEP-00	CC5
		Sodium (Na)	18	1	mg/L		27-SEP-00	CC5
		Nickel (Ni)	0.099	0.002	mg/L		27-SEP-00	CC5
		Phosphorus (P)	0.17	0.05	mg/L		27-SEP-00	CC5
		Lead (Pb)	<0.005	0.005	mg/L		27-SEP-00	CC5
		Tin (Sn)	<0.05	0.05	mg/L		27-SEP-00	CC5
		Strontium (Sr)	0.911	0.002	mg/L		27-SEP-00	CC5
		Titanium (Ti)	0.013	0.001	mg/L		27-SEP-00	CC5
		Thallium (Tl)	<0.05	0.05	mg/L		27-SEP-00	CC5
		Vanadium (V)	0.008	0.001	mg/L		27-SEP-00	CC5
		Zinc (Zn)	0.025	0.001	mg/L		27-SEP-00	CC5
		Ammonia-N	1.20	0.05	mg/L		25-SEP-00	EK
		Dissolved Organic Carbon	3	1	mg/L		25-SEP-00	HAN
		Nitrate-N	26.8	0.1	mg/L		22-SEP-00	LDO
		Nitrite-N	0.80	0.05	mg/L		22-SEP-00	LDO

Methodology Reference

ETL Test Code	Test Description	Methodology Reference (Based On)
AS-AS3-DIS-ED	Arsenic (As) 3+ Dissolved	APHA 3114 C-AAS - Hydride
AS-AS5-DIS-ED	Arsenic (As) 5+ Dissolved	APHA 3114 C-AAS - Hydride
AS-DIS-HYD-ED	Arsenic (As)-Dissolved	APHA 3114 C-AAS - Hydride
AS-TOT-HYD-ED	Arsenic (As)-Total	APHA 3114 C-AAS - Hydride
C-DIS-ORG-ED	Dissolved Organic Carbon	APHA 5310 B-Instrumental
CL-ED	Chloride (Cl)	APHA 4500 Cl E-Colorimetry
CN-TOT-TB	Cyanide, Total	APHA 4500CN C E-Strong acid Dist Colorim
[illegible]-ROUTINE-ICP-ED	ICP metals and SO4 for routine water	APHA 3120 B-ICP-OES
IONBALANCE-ED	Ion Balance Calculation	APHA 1030E
METAL-DIS-ED	Metals, Dissolved	APHA 3120 B-ICP-OES
METAL-TOT-ED	Metals-Total	APHA 3120 B-ICP-OES
N2N3-ED	Nitrate+Nitrite-N	APHA 4500 NO3H-Colorimetry
NH4-ED	Ammonia-N	APHA 4500 NH3F-Colorimetry
NO2-ED	Nitrite-N	APHA 4500 NO2B-Colorimetry
NO3-ED	Nitrate-N	APHA 4500 NO3H-Colorimetry
PH/EC/ALK-ED	pH, Conductivity and Total Alkalinity	APHA 4500-H, 2510, 2320
SB-DIS-HYD-ED	Antimony (Sb)-Dissolved	APHA 3114 C-AAS-Hydride
SB-TOT-HYD-ED	Antimony (Sb)-Total	APHA 3114 C-AAS-Hydride

ENVIRO-TEST QC REPORT

Workorder L17746

Lab QC Number		Result	Qualifier	Units	Limit	Analyzed
	Beryllium (Be)	<0.002		mg/L	0.01	27-SEP-00
	Calcium (Ca)	<0.5		mg/L	2.5	27-SEP-00
	Cadmium (Cd)	<0.001		mg/L	0.005	27-SEP-00
	Cobalt (Co)	<0.002		mg/L	0.01	27-SEP-00
	Chromium (Cr)	<0.005		mg/L	0.025	27-SEP-00
	Copper (Cu)	<0.001		mg/L	0.005	27-SEP-00
	Iron (Fe)	0.142	A	mg/L	0.025	27-SEP-00
	Potassium (K)	<0.1		mg/L	0.5	27-SEP-00
	Magnesium (Mg)	<0.1		mg/L	0.5	27-SEP-00
	Manganese (Mn)	<0.001		mg/L	0.005	27-SEP-00
	Molybdenum (Mo)	<0.005		mg/L	0.025	27-SEP-00
	Sodium (Na)	<1		mg/L	5	27-SEP-00
	Nickel (Ni)	<0.002		mg/L	0.01	27-SEP-00
	Phosphorus (P)	0.08		mg/L	0.25	27-SEP-00
	Lead (Pb)	<0.005		mg/L	0.025	27-SEP-00
	Tin (Sn)	<0.05		mg/L	0.25	27-SEP-00
	Strontium (Sr)	<0.002		mg/L	0.01	27-SEP-00
	Titanium (Ti)	0.002		mg/L	0.005	27-SEP-00
	Thallium (Tl)	<0.05		mg/L	0.25	27-SEP-00
	Vanadium (V)	<0.001		mg/L	0.005	27-SEP-00
	Zinc (Zn)	0.030	A	mg/L	0.005	27-SEP-00

QC Type: MB

Lab QC Number:		Result	Qualifier	Units	Limit	Analyzed
WG20448-1						
AS-AS3-DIS-ED	Arsenic (As) 3+-Dissolved	<0.0002		mg/L	0.001	03-OCT-00
WG20448-2						
AS-AS5-DIS-ED	Arsenic (As) 5+-Dissolved	0.0004		mg/L	0.001	03-OCT-00

QC Type: MBLK

Lab QC Number:		Result	Qualifier	Units	Limit	Analyzed
WG19461-1						
C-DIS-ORG-ED	Dissolved Organic Carbon	<1		mg/L	1	25-SEP-00

QC Type: DUP

Lab QC Number:		RPD	Qualifier	Limit %	Analyzed
WG19190-4					
PH/EC/ALK-ED	pH	0.0		0.85	20-SEP-00
	Conductivity (EC)	0.0		1.03	20-SEP-00
	Bicarbonate (HCO3)	0.0		1.83	20-SEP-00
	Carbonate (CO3)	N/A	RPD-NA	1.83	20-SEP-00
	Hydroxide	N/A	RPD-NA		20-SEP-00
	Alkalinity, Total	0.0		1.25	20-SEP-00

ENVIRO-TEST QC REPORT

Workorder L17746

NH4-ED	Ammonia-N	2.6		4.33	25-SEP-00
WG19461-3					
C-DIS-ORG-ED	Dissolved Organic Carbon	3.7		6.53	25-SEP-00
WG20448-3					
AS-AS3-DIS-ED	Arsenic (As) 3+-Dissolved	7.8		7.26	03-OCT-00
WG20997-2					
AS-DIS-HYD-ED	Arsenic (As)-Dissolved	N/A	RPD-NA	20	17-OCT-00
WG20997-4					
AS-DIS-HYD-ED	Arsenic (As)-Dissolved	N/A	RPD-NA	20	17-OCT-00
WG20997-6					
AS-DIS-HYD-ED	Arsenic (As)-Dissolved	55	G	20	17-OCT-00
METAL-DIS-ED	Silver (Ag)	N/A	RPD-NA	20	17-OCT-00
	Aluminum (Al)	0.050		20	17-OCT-00
	Boron (B)	5.1		20	17-OCT-00
	Barium (Ba)	0.89		20	17-OCT-00
	Beryllium (Be)	N/A	RPD-NA	20	17-OCT-00
	Calcium (Ca)	0.70		20	17-OCT-00
	Cadmium (Cd)	N/A	RPD-NA	20	17-OCT-00
	Cobalt (Co)	N/A	RPD-NA	20	17-OCT-00
	Chromium (Cr)	N/A	RPD-NA	20	17-OCT-00
	Copper (Cu)	0.87		20	17-OCT-00
	Iron (Fe)	N/A	RPD-NA	20	17-OCT-00
	Potassium (K)	N/A	RPD-NA	20	17-OCT-00
	Magnesium (Mg)	1.3		20	17-OCT-00
	Manganese (Mn)	2.3		20	17-OCT-00
	Molybdenum (Mo)	N/A	RPD-NA	20	17-OCT-00
	Sodium (Na)	N/A	RPD-NA	20	17-OCT-00
	Nickel (Ni)	9.4		20	17-OCT-00
	Phosphorus (P)	1.1		20	17-OCT-00
	Lead (Pb)	N/A	RPD-NA	20	17-OCT-00
	Tin (Sn)	N/A	RPD-NA	20	17-OCT-00
	Strontium (Sr)	2.5		20	17-OCT-00
	Titanium (Ti)	5.4		20	17-OCT-00
	Thallium (Tl)	N/A	RPD-NA	20	17-OCT-00
	Vanadium (V)	85	D	20	17-OCT-00
	Zinc (Zn)	0.21		20	17-OCT-00
SB-DIS-HYD-ED	Antimony (Sb)-Dissolved	0.81		20	17-OCT-00
WG20997-8					
AS-DIS-HYD-ED	Arsenic (As)-Dissolved	0.074		20	17-OCT-00
METAL-DIS-ED	Silver (Ag)	N/A	RPD-NA	20	17-OCT-00
	Aluminum (Al)	2.1		20	17-OCT-00
	Boron (B)	45	D	20	17-OCT-00
	Barium (Ba)	0.67		20	17-OCT-00
	Beryllium (Be)	N/A	RPD-NA	20	17-OCT-00

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	Sulfate (SO4)	1.7		4.44	25-SEP-00
WG20997-12					
AS-DIS-HYD-ED	Arsenic (As)-Dissolved	1.4		20	17-OCT-00
METAL-DIS-ED	Silver (Ag)	N/A	RPD-NA	20	17-OCT-00
	Aluminum (Al)	17		20	17-OCT-00
	Boron (B)	14		20	17-OCT-00
	Barium (Ba)	0.63		20	17-OCT-00
	Beryllium (Be)	N/A	RPD-NA	20	17-OCT-00
	Calcium (Ca)	0.29		20	17-OCT-00
	Cadmium (Cd)	N/A	RPD-NA	20	17-OCT-00
	Cobalt (Co)	0.17		20	17-OCT-00
	Chromium (Cr)	N/A	RPD-NA	20	17-OCT-00
	Copper (Cu)	12		20	17-OCT-00
	Iron (Fe)	1.9		20	17-OCT-00
	Potassium (K)	0.71		20	17-OCT-00
	Magnesium (Mg)	0.96		20	17-OCT-00
	Manganese (Mn)	0.75		20	17-OCT-00
	Molybdenum (Mo)	N/A	RPD-NA	20	17-OCT-00
	Sodium (Na)	1.6		20	17-OCT-00
	Nickel (Ni)	3.14		20	17-OCT-00
	Phosphorus (P)	1.7		20	17-OCT-00
	Lead (Pb)	N/A	RPD-NA	20	17-OCT-00
	Tin (Sn)	N/A	RPD-NA	20	17-OCT-00
	Strontium (Sr)	0.86		20	17-OCT-00
	Titanium (Ti)	1.9		20	17-OCT-00
	Thallium (Tl)	N/A	RPD-NA	20	17-OCT-00
	Vanadium (V)	6.8		20	17-OCT-00
	Zinc (Zn)	29	D	20	17-OCT-00
WG20997-14					
AS-DIS-HYD-ED	Arsenic (As)-Dissolved	0.067		20	17-OCT-00
METAL-DIS-ED	Silver (Ag)	N/A	RPD-NA	20	17-OCT-00
	Aluminum (Al)	2.3		20	17-OCT-00
	Boron (B)	2.0		20	17-OCT-00
	Barium (Ba)	1.7		20	17-OCT-00
	Beryllium (Be)	N/A	RPD-NA	20	17-OCT-00
	Calcium (Ca)	0.73		20	17-OCT-00
	Cadmium (Cd)	N/A	RPD-NA	20	17-OCT-00
	Cobalt (Co)	0.12		20	17-OCT-00
	Chromium (Cr)	N/A	RPD-NA	20	17-OCT-00
	Copper (Cu)	3.0		20	17-OCT-00
	Iron (Fe)	0.93		20	17-OCT-00
	Potassium (K)	0.90		20	17-OCT-00
	Magnesium (Mg)	0.24		20	17-OCT-00
	Manganese (Mn)	N/A	RPD-NA	20	17-OCT-00
	Molybdenum (Mo)	1.3		20	17-OCT-00
	Sodium (Na)	0.33		20	17-OCT-00

ENVIRO-TEST QC REPORT

Workorder L17746

C Type: MS

Lab QC Number:		% Recovery	Qualifier	Limit %	Analyzed
WG19230-7					
CL-ED	Chloride (Cl)	105		95-106	21-SEP-00
WG19286-3					
N2N3-ED	Nitrate+Nitrite-N	103		88.2-107.5	22-SEP-00
WG19286-6					
NO3-ED	Nitrate-N	101		81.2-126	22-SEP-00
WG19302-3					
NO2-ED	Nitrite-N	98		94.6-104.1	22-SEP-00
WG19378-2					
CN-TOT-TB	Cyanide, Total	95		75-125	22-SEP-00
WG19404-5					
ETL-ROUTINE-ICP-ED	Calcium (Ca)	103		94.2-107.8	25-SEP-00
	Potassium (K)	99		92.3-104.7	25-SEP-00
	Magnesium (Mg)	107		98.9-110.2	25-SEP-00
	Sodium (Na)	106		92.1-116.3	25-SEP-00
	Sulfate (SO4)	101		89.2-109	25-SEP-00
WG19404-8					
ETL-ROUTINE-ICP-ED	Calcium (Ca)	102		94.2-107.8	25-SEP-00
	Potassium (K)	100		92.3-104.7	25-SEP-00
	Magnesium (Mg)	104		98.9-110.2	25-SEP-00
	Sodium (Na)	100		92.1-116.3	25-SEP-00
	Sulfate (SO4)	103		89.2-109	25-SEP-00
WG19431-4					
NH4-ED	Ammonia-N	114		81.3-130.2	25-SEP-00
WG19461-4					
C-DIS-ORG-ED	Dissolved Organic Carbon	95		88.8-104.2	25-SEP-00
WG20997-3					
AS-DIS-HYD-ED	Arsenic (As)-Dissolved	109		75-125	17-OCT-00
WG20997-5					
AS-DIS-HYD-ED	Arsenic (As)-Dissolved	103		75-125	17-OCT-00
WG20997-7					
AS-DIS-HYD-ED	Arsenic (As)-Dissolved	104		75-125	17-OCT-00
METAL-DIS-ED	Silver (Ag)	42	G	75-125	17-OCT-00
	Aluminum (Al)	97		75-125	17-OCT-00
	Boron (B)	111		75-125	17-OCT-00
	Barium (Ba)	102		75-125	17-OCT-00
	Beryllium (Be)	106		75-125	17-OCT-00
	Calcium (Ca)	111		75-125	17-OCT-00
	Cadmium (Cd)	94		75-125	17-OCT-00
	Cobalt (Co)	100		75-125	17-OCT-00
	Chromium (Cr)	99		75-125	17-OCT-00
	Copper (Cu)	93		75-125	17-OCT-00
	Iron (Fe)	100		75-125	17-OCT-00
	Potassium (K)	103		75-125	17-OCT-00

ENVIRO-TEST QC REPORT

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WG20997-13					
AS-DIS-HYD-ED	Arsenic (As)-Dissolved	106		75-125	17-OCT-00
METAL-DIS-ED	Silver (Ag)	92	G	75-125	17-OCT-00
	Aluminum (Al)	104		75-125	17-OCT-00
	Boron (B)	106		75-125	17-OCT-00
	Barium (Ba)	103		75-125	17-OCT-00
	Beryllium (Be)	111		75-125	17-OCT-00
	Calcium (Ca)	101		75-125	17-OCT-00
	Cadmium (Cd)	103		75-125	17-OCT-00
	Cobalt (Co)	100		75-125	17-OCT-00
	Chromium (Cr)	109		75-125	17-OCT-00
	Copper (Cu)	111		75-125	17-OCT-00
	Iron (Fe)	100		75-125	17-OCT-00
	Potassium (K)	101		75-125	17-OCT-00
	Magnesium (Mg)	99		75-125	17-OCT-00
	Manganese (Mn)	89		75-125	17-OCT-00
	Molybdenum (Mo)	93		75-125	17-OCT-00
	Sodium (Na)	96		75-125	17-OCT-00
	Nickel (Ni)	101		75-125	17-OCT-00
	Phosphorus (P)	102		75-125	17-OCT-00
	Lead (Pb)	109		75-125	17-OCT-00
	Tin (Sn)	101		75-125	17-OCT-00
	Strontium (Sr)	103		75-125	17-OCT-00
	Titanium (Ti)	103		75-125	17-OCT-00
	Thallium (Tl)	111		75-125	17-OCT-00
	Vanadium (V)	107		75-125	17-OCT-00
	Zinc (Zn)	100		75-125	17-OCT-00
WG20997-15					
AS-DIS-HYD-ED	Arsenic (As)-Dissolved	103		75-125	17-OCT-00
METAL-DIS-ED	Silver (Ag)	79		75-125	17-OCT-00
	Aluminum (Al)	106		75-125	17-OCT-00
	Boron (B)	105		75-125	17-OCT-00
	Barium (Ba)	118		75-125	17-OCT-00
	Beryllium (Be)	108		75-125	17-OCT-00
	Calcium (Ca)	81		75-125	17-OCT-00
	Cadmium (Cd)	103		75-125	17-OCT-00
	Cobalt (Co)	102		75-125	17-OCT-00
	Chromium (Cr)	107		75-125	17-OCT-00
	Copper (Cu)	99		75-125	17-OCT-00
	Iron (Fe)	102		75-125	17-OCT-00
	Potassium (K)	103		75-125	17-OCT-00
	Magnesium (Mg)	100		75-125	17-OCT-00
	Molybdenum (Mo)	101		75-125	17-OCT-00
	Sodium (Na)	95		75-125	17-OCT-00
	Nickel (Ni)	101		75-125	17-OCT-00
	Phosphorus (P)	104		75-125	17-OCT-00
	Lead (Pb)	106		75-125	17-OCT-00
	Tin (Sn)	102		75-125	17-OCT-00

ENVIRO-TEST QC REPORT

Workorder L17746

Legend:

Limit	95% Confidence Interval (Laboratory Warning Limits)
DUP	Duplicate
RPD	Relative Percent Difference ((higher result-lower result)/Average, expressed as %)
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Materials
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material

Qualifier:

RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.
A	Method blank exceeds detection limit. Blank correction applied, where appropriate.
B	Method blank result exceeds detection limit, however, it is less than 5% of sample concentration. Blank correction not applied.
C	Method blank result exceeds detection limit, however, it is less than 5% of the regulatory limit for the analyte of interest. Blank correction not applied.
D	Duplicate result exceeds limit due to increased variability for low level samples.
E	Matrix spike limit exceeded due to high sample background.
F	Silver recovery low, likely due to elevated choride levels in sample.
G	Outlier - No assignable cause for nonconformity has been determined.
H	Result fall within the 99% Confidence Interval (Laboratory Control Limits)

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CHEMICAL ANALYSIS REPORT

GOLDER ASSOCIATES LTD

DATE: November 16, 2000

ATTN: VALERIE BURTRAND

500 4260 STILL CREEK DRIVE

BURNABY BC V5C 6C6

Lab Work Order #: L17633 Sampled By: CLIENT Date Received: 09/21/00

Project P.O. #: surf. water

Project Reference:

Comments:

APPROVED BY:

DOUG JOHNSON

Project Manager

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L17833-1	BC-US-SW-09/00							
Sample Date	20-SEP-00							
Matrix:	WATER							
		Metals-Total						
		Aluminum (Al)	0.05	0.01	mg/L		28-SEP-00	MD
		Barium (Ba)	0.010	0.005	mg/L		28-SEP-00	MD
		Beryllium (Be)	<0.002	0.002	mg/L		28-SEP-00	MD
		Calcium (Ca)	22.0	0.5	mg/L		28-SEP-00	MD
		Cadmium (Cd)	<0.001	0.001	mg/L		28-SEP-00	MD
		Cobalt (Co)	<0.002	0.002	mg/L		28-SEP-00	MD
		Chromium (Cr)	<0.005	0.005	mg/L		28-SEP-00	MD
		Copper (Cu)	<0.001	0.001	mg/L		28-SEP-00	MD
		Iron (Fe)	0.166	0.005	mg/L		28-SEP-00	MD
		Potassium (K)	1.6	0.1	mg/L		28-SEP-00	MD
		Magnesium (Mg)	7.4	0.1	mg/L		28-SEP-00	MD
		Manganese (Mn)	0.025	0.001	mg/L		28-SEP-00	MD
		Molybdenum (Mo)	<0.005	0.005	mg/L		28-SEP-00	MD
		Sodium (Na)	6	1	mg/L		28-SEP-00	MD
		Nickel (Ni)	<0.002	0.002	mg/L		28-SEP-00	MD
		Phosphorus (P)	0.21	0.05	mg/L		28-SEP-00	MD
		Lead (Pb)	<0.005	0.005	mg/L		28-SEP-00	MD
		Tin (Sn)	<0.05	0.05	mg/L		28-SEP-00	MD
		Strontium (Sr)	0.078	0.002	mg/L		28-SEP-00	MD
		Titanium (Ti)	<0.001	0.001	mg/L		28-SEP-00	MD
		Thallium (Tl)	<0.05	0.05	mg/L		28-SEP-00	MD
		Vanadium (V)	<0.001	0.001	mg/L		28-SEP-00	MD
		Zinc (Zn)	0.020	0.001	mg/L		28-SEP-00	MD
		Ammonia-N	<0.05	0.05	mg/L		27-SEP-00	EK
		Dissolved Organic Carbon	15	1	mg/L		28-SEP-00	HAN
		Nitrate-N	<0.1	0.1	mg/L		22-SEP-00	LDD
		Nitrite-N	<0.05	0.05	mg/L		22-SEP-00	LDD
		Total Suspended Solids	3	3	mg/L		27-SEP-00	WNG
L17833-2	BC-EFF-SW-09/00							
Sample Date	20-SEP-00							
Matrix:	WATER							
		Routine Water Analysis						
		Chloride (Cl)	301	1	mg/L		22-SEP-00	LDD
		Nitrate+Nitrite-N	12.5	0.1	mg/L		22-SEP-00	LDD
		pH, Conductivity and Total Alkalinity						
		pH	7.6	0.1	pH		22-SEP-00	MOR
		Conductivity (EC)	2410	0.2	uS/cm		22-SEP-00	MOR
		Bicarbonate (HCO3)	107	5	mg/L		22-SEP-00	MOR
		Carbonate (CO3)	<5	5	mg/L		22-SEP-00	MOR
		Hydroxide	<5	5	mg/L		22-SEP-00	MOR
		Alkalinity, Total	88	5	mg/L		22-SEP-00	MOR
		Ion Balance Calculation						
		Ion Balance	97.7		%		28-SEP-00	
		TDS (Calculated)	1710		mg/L		28-SEP-00	
		Hardness	1000		mg/L		28-SEP-00	
		ICP metals and SO4 for routine water						
		Calcium (Ca)	288	0.5	mg/L		28-SEP-00	MOR
		Potassium (K)	14.4	0.1	mg/L		28-SEP-00	MOR

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L17833-2	BC-FFF-SW-09/00							
Sample Date	20-SEP-00							
Matrix:	WATER							
		Metals-Total						
		Manganese (Mn)	0.125	0.001	mg/L		28-SEP-00	MD
		Molybdenum (Mo)	0.024	0.005	mg/L		28-SEP-00	MD
		Sodium (Na)	176	1	mg/L		28-SEP-00	MD
		Nickel (Ni)	0.138	0.002	mg/L		28-SEP-00	MD
		Phosphorus (P)	0.08	0.05	mg/L		28-SEP-00	MD
		Lead (Pb)	<0.005	0.005	mg/L		28-SEP-00	MD
		Tin (Sn)	<0.05	0.05	mg/L		28-SEP-00	MD
		Strontium (Sr)	2.83	0.002	mg/L		28-SEP-00	MD
		Titanium (Ti)	0.005	0.001	mg/L		28-SEP-00	MD
		Thallium (Tl)	<0.05	0.05	mg/L		28-SEP-00	MD
		Vanadium (V)	0.004	0.001	mg/L		28-SEP-00	MD
		Zinc (Zn)	0.027	0.001	mg/L		28-SEP-00	MD
		Ammonia-N	0.78	0.05	mg/L		27-SEP-00	EK
		Dissolved Organic Carbon	5	1	mg/L		26-SEP-00	HAN
		Nitrate-N	12.1	0.1	mg/L		22-SEP-00	LDD
		Nitrite-N	0.38	0.05	mg/L		22-SEP-00	LDD
		Total Suspended Solids	<3	3	mg/L		27-SEP-00	WNG
L17833-3	DC DS -SW-09/00-D							
Sample Date	20-SEP-00							
Matrix:	WATER							
		Antimony (Sb)-Dissolved	0.0025	0.0004	mg/L		26-SEP-00	MD
		Arsenic (As)-Dissolved	0.0015	0.0004	mg/L		26-SEP-00	MD
		Mercury (Hg)-Dissolved	<0.0002	0.0002	mg/L		26-SEP-00	MD
		Metals, Dissolved						
		Silver (Ag)	<0.005	0.005	mg/L		26-SEP-00	MD
		Aluminum (Al)	<0.01	0.01	mg/L		26-SEP-00	MD
		Boron (B)	<0.05	0.05	mg/L		26-SEP-00	MD
		Barium (Ba)	<0.003	0.003	mg/L		26-SEP-00	MD
		Beryllium (Be)	<0.001	0.001	mg/L		26-SEP-00	MD
		Cadmium (Cd)	<0.001	0.001	mg/L		26-SEP-00	MD
		Cobalt (Co)	<0.002	0.002	mg/L		26-SEP-00	MD
		Chromium (Cr)	<0.005	0.005	mg/L		26-SEP-00	MD
		Copper (Cu)	<0.001	0.001	mg/L		26-SEP-00	MD
		Iron (Fe)	0.034	0.005	mg/L		26-SEP-00	MD
		Manganese (Mn)	0.001	0.001	mg/L		26-SEP-00	MD
		Molybdenum (Mo)	<0.005	0.005	mg/L		26-SEP-00	MD
		Nickel (Ni)	<0.002	0.002	mg/L		26-SEP-00	MD
		Phosphorus (P)	<0.1	0.1	mg/L		26-SEP-00	MD
		Lead (Pb)	<0.005	0.005	mg/L		26-SEP-00	MD
		Tin (Sn)	<0.05	0.05	mg/L		26-SEP-00	MD
		Strontium (Sr)	<0.005	0.005	mg/L		26-SEP-00	MD
		Titanium (Ti)	<0.001	0.001	mg/L		26-SEP-00	MD
		Thallium (Tl)	<0.05	0.05	mg/L		26-SEP-00	MD
		Vanadium (V)	<0.001	0.001	mg/L		26-SEP-00	MD
		Zinc (Zn)	0.007	0.001	mg/L		26-SEP-00	MD
		Antimony (Sb)-Total	0.0005	0.0004	mg/L		28-SEP-00	MD
		Arsenic (As)-Total	<0.0004	0.0004	mg/L		28-SEP-00	MD

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L17832-4	TLC-9-SW-30/00							
Sample Date	20-SEP-00							
Matrix:	WATER							
		Antimony (Sb)-Dissolved	0.0075	0.0004	mg/L		26-SEP-00	MD
		Arsenic (As)-Dissolved	0.313	0.0004	mg/L		26-SEP-00	MD
		Mercury (Hg)-Dissolved	<0.0002	0.0002	mg/L		26-SEP-00	MD
		Metals, Dissolved						
		Silver (Ag)	<0.005	0.005	mg/L		26-SEP-00	MD
		Aluminum (Al)	0.01	0.01	mg/L		26-SEP-00	MD
		Boron (B)	<0.05	0.05	mg/L		26-SEP-00	MD
		Barium (Ba)	0.031	0.003	mg/L		26-SEP-00	MD
		Beryllium (Be)	<0.001	0.001	mg/L		26-SEP-00	MD
		Cadmium (Cd)	<0.001	0.001	mg/L		26-SEP-00	MD
		Cobalt (Co)	0.025	0.002	mg/L		26-SEP-00	MD
		Chromium (Cr)	<0.005	0.005	mg/L		26-SEP-00	MD
		Copper (Cu)	0.006	0.001	mg/L		26-SEP-00	MD
		Iron (Fe)	0.248	0.005	mg/L		26-SEP-00	MD
		Manganese (Mn)	0.146	0.001	mg/L		26-SEP-00	MD
		Molybdenum (Mo)	<0.005	0.005	mg/L		26-SEP-00	MD
		Nickel (Ni)	0.005	0.002	mg/L		26-SEP-00	MD
		Phosphorus (P)	<0.1	0.1	mg/L		26-SEP-00	MD
		Lead (Pb)	<0.005	0.005	mg/L		26-SEP-00	MD
		Tin (Sn)	<0.05	0.05	mg/L		26-SEP-00	MD
		Strontium (Sr)	0.154	0.005	mg/L		26-SEP-00	MD
		Titanium (Ti)	<0.001	0.001	mg/L		26-SEP-00	MD
		Thallium (Tl)	<0.05	0.05	mg/L		26-SEP-00	MD
		Vanadium (V)	<0.001	0.001	mg/L		26-SEP-00	MD
		Zinc (Zn)	0.034	0.001	mg/L		26-SEP-00	MD
		Antimony (Sb)-Total	0.0086	0.0004	mg/L		28-SEP-00	MD
		Arsenic (As)-Total	0.366	0.0004	mg/L		28-SEP-00	MD
		Mercury (Hg)-Total	<0.0002	0.0002	mg/L		28-SEP-00	MD
		Metals-Total						
		Silver (Ag)	<0.005	0.005	mg/L		28-SEP-00	MD
		Aluminum (Al)	0.06	0.01	mg/L		28-SEP-00	MD
		Barium (Ba)	0.042	0.003	mg/L		28-SEP-00	MD
		Beryllium (Be)	<0.002	0.002	mg/L		28-SEP-00	MD
		Calcium (Ca)	153	0.5	mg/L		28-SEP-00	MD
		Cadmium (Cd)	<0.001	0.001	mg/L		28-SEP-00	MD
		Cobalt (Co)	0.045	0.002	mg/L		28-SEP-00	MD
		Chromium (Cr)	<0.005	0.005	mg/L		28-SEP-00	MD
		Copper (Cu)	0.009	0.001	mg/L		28-SEP-00	MD
		Iron (Fe)	0.410	0.005	mg/L		28-SEP-00	MD
		Potassium (K)	0.5	0.1	mg/L		28-SEP-00	MD
		Magnesium (Mg)	50.0	0.1	mg/L		28-SEP-00	MD
		Manganese (Mn)	0.207	0.001	mg/L		28-SEP-00	MD
		Molybdenum (Mo)	<0.005	0.005	mg/L		28-SEP-00	MD
		Sodium (Na)	48	1	mg/L		28-SEP-00	MD
		Nickel (Ni)	0.014	0.002	mg/L		28-SEP-00	MD
		Phosphorus (P)	0.15	0.05	mg/L		28-SEP-00	MD
		Lead (Pb)	<0.005	0.005	mg/L		28-SEP-00	MD
		Tin (Sn)	<0.05	0.05	mg/L		28-SEP-00	MD
		Strontium (Sr)	0.198	0.002	mg/L		28-SEP-00	MD
		Titanium (Ti)	0.002	0.001	mg/L		28-SEP-00	MD

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L17833-5	TLG-3-SW-00/00							
Sample Date	20-SEP-00							
Matrix:	WATER							
		Metals, Dissolved						
		Iron (Fe)	0.424	0.005	mg/L		26-SEP-00	MD
		Manganese (Mn)	0.015	0.001	mg/L		26-SEP-00	MD
		Molybdenum (Mo)	0.007	0.005	mg/L		26-SEP-00	MD
		Nickel (Ni)	0.018	0.002	mg/L		26-SEP-00	MD
		Phosphorus (P)	<0.1	0.1	mg/L		26-SEP-00	MD
		Lead (Pb)	<0.005	0.005	mg/L		26-SEP-00	MD
		Tin (Sn)	<0.05	0.05	mg/L		26-SEP-00	MD
		Strontium (Sr)	0.612	0.005	mg/L		26-SEP-00	MD
		Titanium (Ti)	<0.001	0.001	mg/L		26-SEP-00	MD
		Thallium (Tl)	<0.05	0.05	mg/L		26-SEP-00	MD
		Vanadium (V)	<0.001	0.001	mg/L		26-SEP-00	MD
		Zinc (Zn)	0.005	0.001	mg/L		26-SEP-00	MD
		Antimony (Sb)-Total	0.316	0.0004	mg/L		28-SEP-00	MD
		Arsenic (As)-Total	3.79	0.0004	mg/L		28-SEP-00	MD
		Cyanide, Total	0.002	0.002	mg/L	22-SEP-00	25-SEP-00	MRR
		Mercury (Hg)-Total	<0.0002	0.0002	mg/L		28-SEP-00	MD
		Metals-Total						
		Silver (Ag)	<0.005	0.005	mg/L		28-SEP-00	MD
		Aluminum (Al)	0.12	0.01	mg/L		28-SEP-00	MD
		Barium (Ba)	0.019	0.003	mg/L		28-SEP-00	MD
		Beryllium (Be)	<0.002	0.002	mg/L		28-SEP-00	MD
		Calcium (Ca)	278	0.5	mg/L		28-SEP-00	MD
		Cadmium (Cd)	<0.001	0.001	mg/L		28-SEP-00	MD
		Cobalt (Co)	0.003	0.002	mg/L		28-SEP-00	MD
		Chromium (Cr)	<0.005	0.005	mg/L		28-SEP-00	MD
		Copper (Cu)	0.012	0.001	mg/L		28-SEP-00	MD
		Iron (Fe)	0.508	0.005	mg/L		28-SEP-00	MD
		Potassium (K)	7.1	0.1	mg/L		28-SEP-00	MD
		Magnesium (Mg)	71.7	0.1	mg/L		28-SEP-00	MD
		Manganese (Mn)	0.016	0.001	mg/L		28-SEP-00	MD
		Molybdenum (Mo)	0.007	0.005	mg/L		28-SEP-00	MD
		Sodium (Na)	19	1	mg/L		28-SEP-00	MD
		Nickel (Ni)	0.020	0.002	mg/L		28-SEP-00	MD
		Phosphorus (P)	3.07	0.05	mg/L		28-SEP-00	MD
		Lead (Pb)	<0.005	0.005	mg/L		28-SEP-00	MD
		Tin (Sn)	<0.05	0.05	mg/L		28-SEP-00	MD
		Strontium (Sr)	0.562	0.002	mg/L		28-SEP-00	MD
		Titanium (Ti)	0.001	0.001	mg/L		28-SEP-00	MD
		Thallium (Tl)	<0.05	0.05	mg/L		28-SEP-00	MD
		Vanadium (V)	0.001	0.001	mg/L		28-SEP-00	MD
		Zinc (Zn)	0.005	0.001	mg/L		28-SEP-00	MD
		Ammonia-N	<0.05	0.05	mg/L		27-SEP-00	EK
		Dissolved Organic Carbon	7	1	mg/L		26-SEP-00	HAN
		Nitrate-N	<0.1	0.1	mg/L		22-SEP-00	LDD
		Nitrite-N	<0.05	0.05	mg/L		22-SEP-00	LDD
		Total Suspended Solids	7	3	mg/L		27-SEP-00	WNG

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L17833-6	TLG 3C-SW 09/00							
Sample Date	20-SEP-00							
Matrix:	WATER							
		Cyanide, Total	0.026	0.002	mg/L	22-SEP-00	25-SEP-00	MRR
		Mercury (Hg)-Total	<0.0002	0.0002	mg/L		26-SEP-00	MD
		Metals-Total						
		Silver (Ag)	<0.005	0.005	mg/L		28-SEP-00	MD
		Aluminum (Al)	0.06	0.01	mg/L		28-SEP-00	MD
		Barium (Ba)	0.035	0.003	mg/L		28-SEP-00	MD
		Beryllium (Be)	<0.002	0.002	mg/L		28-SEP-00	MD
		Calcium (Ca)	324	0.5	mg/L		28-SEP-00	MD
		Cadmium (Cd)	<0.001	0.001	mg/L		28-SEP-00	MD
		Cobalt (Co)	0.003	0.002	mg/L		28-SEP-00	MD
		Chromium (Cr)	<0.005	0.005	mg/L		28-SEP-00	MD
		Copper (Cu)	0.024	0.001	mg/L		28-SEP-00	MD
		Iron (Fe)	0.731	0.005	mg/L		28-SEP-00	MD
		Potassium (K)	9.3	0.1	mg/L		28-SEP-00	MD
		Magnesium (Mg)	61.1	0.1	mg/L		28-SEP-00	MD
		Manganese (Mn)	0.040	0.001	mg/L		28-SEP-00	MD
		Molybdenum (Mo)	0.013	0.005	mg/L		28-SEP-00	MD
		Sodium (Na)	37	1	mg/L		28-SEP-00	MD
		Nickel (Ni)	0.025	0.002	mg/L		28-SEP-00	MD
		Phosphorus (P)	0.06	0.05	mg/L		28-SEP-00	MD
		Lead (Pb)	<0.005	0.005	mg/L		28-SEP-00	MD
		Tin (Sn)	<0.05	0.05	mg/L		28-SEP-00	MD
		Strontium (Sr)	0.767	0.002	mg/L		28-SEP-00	MD
		Titanium (Ti)	0.003	0.001	mg/L		28-SEP-00	MD
		Thallium (Tl)	<0.05	0.05	mg/L		28-SEP-00	MD
		Vanadium (V)	0.001	0.001	mg/L		28-SEP-00	MD
		Zinc (Zn)	0.106	0.001	mg/L		28-SEP-00	MD
		Ammonia-N	<0.05	0.05	mg/L		27-SEP-00	EK
		Dissolved Organic Carbon	12	1	mg/L		29-SEP-00	HAN
		Nitrate-N	<0.1	0.1	mg/L		22-SEP-00	LDD
		Nitrite-N	<0.05	0.05	mg/L		22-SEP-00	LDD
		Total Suspended Solids	15	3	mg/L		27-SEP-00	WNG
L17833-7	TLG SP-SW 09/00							
Sample Date	20-SEP-00							
Matrix:	WATER							
		Routine Water Analysis						
		Chloride (Cl)	427	1	mg/L		22-SEP-00	LDD
		Nitrate+Nitrite-N	15.5	0.1	mg/L		22-SEP-00	LDD
		pH, Conductivity and Total Alkalinity						
		pH	8.1	0.1	pH		22-SEP-00	MOR
		Conductivity (EC)	2770	0.2	uS/cm		22-SEP-00	MOR
		Bicarbonate (HCO3)	142	5	mg/L		22-SEP-00	MOR
		Carbonate (CO3)	<5	5	mg/L		22-SEP-00	MOR
		Hydroxide	<5	5	mg/L		22-SEP-00	MOR
		Alkalinity, Total	116	5	mg/L		22-SEP-00	MOR
		Ion Balance Calculation						
		Ion Balance	97.5		%		26-SEP-00	
		TDS (Calculated)	1930		mg/L		26-SEP-00	
		Hardness	1110		mg/L		26-SEP-00	

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L17833-7	TLS-SP-SW-09/00							
Sample Date	20-SEP-00							
Matrix	WATER							
		Metals-Total						
		Sodium (Na)	180	1	mg/L		28-SEP-00	MD
		Nickel (Ni)	0.052	0.002	mg/L		28-SEP-00	MD
		Phosphorus (P)	0.07	0.05	mg/L		28-SEP-00	MD
		Lead (Pb)	<0.005	0.005	mg/L		28-SEP-00	MD
		Tin (Sn)	<0.05	0.05	mg/L		28-SEP-00	MD
		Strontium (Sr)	3.74	0.002	mg/L		28-SEP-00	MD
		Titanium (Ti)	0.003	0.001	mg/L		28-SEP-00	MD
		Thallium (Tl)	<0.05	0.05	mg/L		28-SEP-00	MD
		Vanadium (V)	0.006	0.001	mg/L		28-SEP-00	MD
		Zinc (Zn)	0.014	0.001	mg/L		28-SEP-00	MD
		Ammonia-N	0.06	0.05	mg/L		27-SEP-00	EK
		Dissolved Organic Carbon	6	1	mg/L		26-SEP-00	HAN
		Nitrate-N	15.2	0.1	mg/L		22-SEP-00	LDD
		Nitrite-N	0.27	0.05	mg/L		22-SEP-00	LDD
		Total Suspended Solids	12	3	mg/L		27-SEP-00	WNG
L17833-8	TLG-NP-SW-09/00							
Sample Date	20-SEP-00							
Matrix	WATER							
		Routine Water Analysis						
		Chloride (Cl)	340	1	mg/L		22-SEP-00	LDD
		Nitrate+Nitrite-N	13.5	0.1	mg/L		22-SEP-00	LDD
		pH, Conductivity and Total Alkalinity						
		pH	8.1	0.1	pH		22-SEP-00	MOR
		Conductivity (EC)	2590	0.2	uS/cm		22-SEP-00	MOR
		Bicarbonate (HCO3)	139	5	mg/L		22-SEP-00	MOR
		Carbonate (CO3)	<5	5	mg/L		22-SEP-00	MOR
		Hydroxide	<5	5	mg/L		22-SEP-00	MOR
		Alkalinity, Total	114	5	mg/L		22-SEP-00	MOR
		Ion Balance Calculation						
		Ion Balance	98.1		%		26-SEP-00	
		TDS (Calculated)	1830		mg/L		26-SEP-00	
		Hardness	1060		mg/L		26-SEP-00	
		ICP metals and SO4 for routine water						
		Calcium (Ca)	299	0.5	mg/L		25-SEP-00	MOR
		Potassium (K)	14.6	0.1	mg/L		25-SEP-00	MOR
		Magnesium (Mg)	81.0	0.1	mg/L		25-SEP-00	MOR
		Sodium (Na)	183	1	mg/L		25-SEP-00	MOR
		Sulfate (SO4)	806	0.5	mg/L		25-SEP-00	MOR
		Antimony (Sb)-Dissolved	1.64	0.0004	mg/L		26-SEP-00	MD
		Arsenic (As)-Dissolved	13.2	0.0004	mg/L		26-SEP-00	MD
		Mercury (Hg)-Dissolved	<0.0002	0.0002	mg/L		26-SEP-00	MD
		Metals, Dissolved						
		Silver (Ag)	<0.005	0.005	mg/L		26-SEP-00	MD
		Aluminum (Al)	0.07	0.01	mg/L		26-SEP-00	MD
		Boron (B)	0.43	0.05	mg/L		26-SEP-00	MD
		Barium (Ba)	0.016	0.003	mg/L		26-SEP-00	MD
		Beryllium (Be)	<0.001	0.001	mg/L		26-SEP-00	MD

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L17833-8	TLG-NP-SW-09/00							
Sample Date	20-SEP-00							
Matrix:	WATER							
		Total Suspended Solids	20	3	mg/L		27-SEP-00	WNG
L17833-9	TLG-210-SW-09/00							
Sample Date	20-SEP-00							
Matrix:	WATER							
		Routine Water Analysis						
		Chloride (Cl)	12	1	mg/L		22-SEP-00	LDD
		Nitrate+Nitrite-N	1.7	0.1	mg/L		22-SEP-00	LDD
		pH, Conductivity and Total Alkalinity						
		pH	8.0	0.1	pH		22-SEP-00	MOR
		Conductivity (EC)	1930	0.2	uS/cm		22-SEP-00	MOR
		Bicarbonate (HCO3)	75	5	mg/L		22-SEP-00	MOR
		Carbonate (CO3)	<5	5	mg/L		22-SEP-00	MOR
		Hydroxide	<5	5	mg/L		22-SEP-00	MOR
		Alkalinity, Total	62	5	mg/L		22-SEP-00	MOR
		Ion Balance Calculation						
		Ion Balance	99.8		%		26-SEP-00	
		TDS (Calculated)	1620		mg/L		26-SEP-00	
		Hardness	1180		mg/L		26-SEP-00	
		ICP metals and SO4 for routine water						
		Calcium (Ca)	270	0.5	mg/L		25-SEP-00	MOR
		Potassium (K)	5.7	0.1	mg/L		25-SEP-00	MOR
		Magnesium (Mg)	124	0.1	mg/L		25-SEP-00	MOR
		Sodium (Na)	31	1	mg/L		25-SEP-00	MOR
		Sulfate (SO4)	1130	0.5	mg/L		25-SEP-00	MOR
		Antimony (Sb)-Dissolved	0.120	0.0004	mg/L		29-SEP-00	MD
		Arsenic (As)-Dissolved	0.302	0.0004	mg/L		27-SEP-00	MD
		Mercury (Hg)-Dissolved	<0.0002	0.0002	mg/L		29-SEP-00	MD
		Metals, Dissolved						
		Silver (Ag)	<0.005	0.005	mg/L		28-SEP-00	MD
		Aluminum (Al)	<0.01	0.01	mg/L		28-SEP-00	MD
		Boron (B)	0.13	0.05	mg/L		28-SEP-00	MD
		Barium (Ba)	0.021	0.003	mg/L		28-SEP-00	MD
		Beryllium (Be)	<0.001	0.001	mg/L		28-SEP-00	MD
		Cadmium (Cd)	<0.001	0.001	mg/L		28-SEP-00	MD
		Cobalt (Co)	0.003	0.002	mg/L		28-SEP-00	MD
		Chromium (Cr)	<0.005	0.005	mg/L		28-SEP-00	MD
		Copper (Cu)	0.005	0.001	mg/L		28-SEP-00	MD
		Iron (Fe)	0.447	0.005	mg/L		28-SEP-00	MD
		Manganese (Mn)	0.505	0.001	mg/L		28-SEP-00	MD
		Molybdenum (Mo)	0.013	0.005	mg/L		28-SEP-00	MD
		Nickel (Ni)	0.015	0.002	mg/L		28-SEP-00	MD
		Phosphorus (P)	<0.1	0.1	mg/L		28-SEP-00	MD
		Lead (Pb)	<0.005	0.005	mg/L		28-SEP-00	MD
		Tin (Sn)	<0.05	0.05	mg/L		28-SEP-00	MD
		Strontium (Sr)	1.22	0.005	mg/L		28-SEP-00	MD
		Titanium (Ti)	<0.001	0.001	mg/L		28-SEP-00	MD
		Thallium (Tl)	<0.05	0.05	mg/L		28-SEP-00	MD
		Vanadium (V)	0.001	0.001	mg/L		28-SEP-00	MD

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L17833-10	LG-223-SW-09/00							
Sample Date	20-SEP-00							
Matrix:	WATER							
		Routine Water Analysis						
		Ion Balance Calculation						
		Ion Balance	96.3		%		26-SEP-00	
		TDS (Calculated)	1410		mg/L		26-SEP-00	
		Hardness	835		mg/L		26-SEP-00	
		ICP metals and SO4 for routine water						
		Calcium (Ca)	227	0.5	mg/L		25-SEP-00	MOR
		Potassium (K)	13.0	0.1	mg/L		25-SEP-00	MOR
		Magnesium (Mg)	66.1	0.1	mg/L		25-SEP-00	MOR
		Sodium (Na)	120	1	mg/L		25-SEP-00	MOR
		Sulfate (SO4)	636	0.5	mg/L		25-SEP-00	MOR
		Antimony (Sb)-Dissolved	1.38	0.0004	mg/L		26-SEP-00	MD
		Arsenic (As) 3+-Dissolved	0.0350	0.0002	mg/L			JJ
		Arsenic (As) 5+-Dissolved	1.28	0.0002	mg/L			JJ
		Arsenic (As)-Dissolved	1.53	0.0004	mg/L		26-SEP-00	MD
		Mercury (Hg)-Dissolved	<0.0002	0.0002	mg/L		26-SEP-00	MD
		Metals, Dissolved						
		Silver (Ag)	<0.005	0.005	mg/L		26-SEP-00	MD
		Aluminum (Al)	<0.01	0.01	mg/L		26-SEP-00	MD
		Boron (B)	0.55	0.05	mg/L		26-SEP-00	MD
		Barium (Ba)	0.033	0.005	mg/L		26-SEP-00	MD
		Beryllium (Be)	<0.001	0.001	mg/L		26-SEP-00	MD
		Cadmium (Cd)	<0.001	0.001	mg/L		26-SEP-00	MD
		Cobalt (Co)	0.072	0.002	mg/L		26-SEP-00	MD
		Chromium (Cr)	0.005	0.005	mg/L		26-SEP-00	MD
		Copper (Cu)	0.049	0.001	mg/L		26-SEP-00	MD
		Iron (Fe)	0.357	0.005	mg/L		26-SEP-00	MD
		Manganese (Mn)	0.708	0.001	mg/L		26-SEP-00	MD
		Molybdenum (Mo)	0.030	0.005	mg/L		26-SEP-00	MD
		Nickel (Ni)	0.031	0.002	mg/L		26-SEP-00	MD
		Phosphorus (P)	<0.1	0.1	mg/L		26-SEP-00	MD
		Lead (Pb)	<0.005	0.005	mg/L		26-SEP-00	MD
		Tin (Sn)	<0.05	0.05	mg/L		26-SEP-00	MD
		Strontium (Sr)	1.35	0.005	mg/L		26-SEP-00	MD
		Titanium (Ti)	0.001	0.001	mg/L		26-SEP-00	MD
		Thallium (Tl)	<0.05	0.05	mg/L		26-SEP-00	MD
		Vanadium (V)	0.004	0.001	mg/L		26-SEP-00	MD
		Zinc (Zn)	0.006	0.001	mg/L		26-SEP-00	MD
		Antimony (Sb)-Total	1.35	0.0004	mg/L		28-SEP-00	MD
		Arsenic (As)-Total	1.54	0.0004	mg/L		28-SEP-00	MD
		Cyanide, Total	0.027	0.002	mg/L	22-SEP-00	25-SEP-00	MRR
		Mercury (Hg)-Total	<0.0002	0.0002	mg/L		28-SEP-00	MD
		Metals-Total						
		Silver (Ag)	<0.005	0.005	mg/L		28-SEP-00	MD
		Aluminum (Al)	0.02	0.01	mg/L		28-SEP-00	MD
		Barium (Ba)	0.035	0.005	mg/L		28-SEP-00	MD
		Beryllium (Be)	<0.002	0.002	mg/L		28-SEP-00	MD
		Calcium (Ca)	236	0.5	mg/L		28-SEP-00	MD
		Cadmium (Cd)	<0.001	0.001	mg/L		28-SEP-00	MD

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L17833-11	TLG-22CP-SW-09/00							
Sample Date	28-SEP-00							
Matrix:	WATER							
		Arsenic (As) 3+-Dissolved	0.0290	0.0002	mg/L			JJ
		Arsenic (As) 5+-Dissolved	1.13	0.0002	mg/L			JJ
		Arsenic (As)-Dissolved	1.27	0.0004	mg/L		26-SEP-00	MD
		Mercury (Hg)-Dissolved	<0.0002	0.0002	mg/L		26-SEP-00	MD
		Metals, Dissolved						
		Silver (Ag)	<0.005	0.005	mg/L		26-SEP-00	MD
		Aluminum (Al)	<0.01	0.01	mg/L		26-SEP-00	MD
		Boron (B)	0.45	0.05	mg/L		26-SEP-00	MD
		Barium (Ba)	0.039	0.003	mg/L		26-SEP-00	MD
		Beryllium (Be)	<0.001	0.001	mg/L		26-SEP-00	MD
		Cadmium (Cd)	<0.001	0.001	mg/L		26-SEP-00	MD
		Cobalt (Co)	0.066	0.002	mg/L		26-SEP-00	MD
		Chromium (Cr)	0.008	0.005	mg/L		26-SEP-00	MD
		Copper (Cu)	0.035	0.001	mg/L		26-SEP-00	MD
		Iron (Fe)	0.380	0.005	mg/L		26-SEP-00	MD
		Manganese (Mn)	1.16	0.001	mg/L		26-SEP-00	MD
		Molybdenum (Mo)	0.027	0.005	mg/L		26-SEP-00	MD
		Nickel (Ni)	0.032	0.002	mg/L		26-SEP-00	MD
		Phosphorus (P)	<0.1	0.1	mg/L		26-SEP-00	MD
		Lead (Pb)	<0.005	0.005	mg/L		26-SEP-00	MD
		Tin (Sn)	<0.05	0.05	mg/L		26-SEP-00	MD
		Strontium (Sr)	1.24	0.005	mg/L		26-SEP-00	MD
		Titanium (Ti)	0.001	0.001	mg/L		26-SEP-00	MD
		Thallium (Tl)	<0.05	0.05	mg/L		26-SEP-00	MD
		Vanadium (V)	0.004	0.001	mg/L		26-SEP-00	MD
		Zinc (Zn)	0.022	0.001	mg/L		26-SEP-00	MD
		Antimony (Sb)-Total	1.22	0.0004	mg/L		28-SEP-00	MD
		Arsenic (As)-Total	1.18	0.0004	mg/L		26-SEP-00	MD
		Cyanide, Total	0.049	0.002	mg/L	22-SEP-00	25-SEP-00	MRR
		Mercury (Hg)-Total	<0.0002	0.0002	mg/L		28-SEP-00	MD
		Metals-Total						
		Silver (Ag)	<0.005	0.005	mg/L		28-SEP-00	MD
		Aluminum (Al)	0.24	0.01	mg/L		28-SEP-00	MD
		Barium (Ba)	0.040	0.003	mg/L		28-SEP-00	MD
		Beryllium (Be)	<0.002	0.002	mg/L		28-SEP-00	MD
		Calcium (Ca)	223	0.5	mg/L		28-SEP-00	MD
		Cadmium (Cd)	<0.001	0.001	mg/L		28-SEP-00	MD
		Cobalt (Co)	0.062	0.002	mg/L		28-SEP-00	MD
		Chromium (Cr)	0.006	0.005	mg/L		28-SEP-00	MD
		Copper (Cu)	0.044	0.001	mg/L		28-SEP-00	MD
		Iron (Fe)	0.546	0.005	mg/L		28-SEP-00	MD
		Potassium (K)	13.6	0.1	mg/L		28-SEP-00	MD
		Magnesium (Mg)	62.7	0.1	mg/L		28-SEP-00	MD
		Manganese (Mn)	1.11	0.001	mg/L		28-SEP-00	MD
		Molybdenum (Mo)	0.028	0.005	mg/L		28-SEP-00	MD
		Sodium (Na)	130	1	mg/L		28-SEP-00	MD
		Nickel (Ni)	0.034	0.002	mg/L		28-SEP-00	MD
		Phosphorus (P)	0.07	0.05	mg/L		28-SEP-00	MD
		Lead (Pb)	<0.005	0.005	mg/L		28-SEP-00	MD

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L17833-12	TLC-TC-SW-09/00							
Sample Date	20-SEP-00							
Matrix:	WATER							
		Metals, Dissolved						
		Iron (Fe)	0.266	0.005	mg/L		28-SEP-00	MD
		Manganese (Mn)	0.008	0.001	mg/L		28-SEP-00	MD
		Molybdenum (Mo)	<0.005	0.005	mg/L		28-SEP-00	MD
		Nickel (Ni)	0.003	0.002	mg/L		28-SEP-00	MD
		Phosphorus (P)	<0.1	0.1	mg/L		28-SEP-00	MD
		Lead (Pb)	<0.005	0.005	mg/L		28-SEP-00	MD
		Tin (Sn)	<0.05	0.05	mg/L		28-SEP-00	MD
		Strontium (Sr)	0.254	0.005	mg/L		28-SEP-00	MD
		Titanium (Ti)	<0.001	0.001	mg/L		28-SEP-00	MD
		Thallium (Tl)	<0.05	0.05	mg/L		28-SEP-00	MD
		Vanadium (V)	0.001	0.001	mg/L		28-SEP-00	MD
		Zinc (Zn)	0.009	0.001	mg/L		28-SEP-00	MD
		Antimony (Sb)-Total	0.0124	0.0004	mg/L		28-SEP-00	MD
		Arsenic (As)-Total	0.0757	0.0004	mg/L		28-SEP-00	MD
		Mercury (Hg)-Total	<0.0002	0.0002	mg/L		28-SEP-00	MD
		Metals-Total						
		Silver (Ag)	<0.005	0.005	mg/L		28-SEP-00	MD
		Aluminum (Al)	0.11	0.05	mg/L		28-SEP-00	MD
		Barium (Ba)	0.035	0.003	mg/L		28-SEP-00	MD
		Beryllium (Be)	<0.002	0.002	mg/L		28-SEP-00	MD
		Calcium (Ca)	52.5	0.5	mg/L		28-SEP-00	MD
		Cadmium (Cd)	<0.001	0.001	mg/L		28-SEP-00	MD
		Cobalt (Co)	0.010	0.002	mg/L		28-SEP-00	MD
		Chromium (Cr)	<0.005	0.005	mg/L		28-SEP-00	MD
		Copper (Cu)	0.002	0.001	mg/L		28-SEP-00	MD
		Iron (Fe)	0.272	0.005	mg/L		28-SEP-00	MD
		Potassium (K)	4.2	0.1	mg/L		28-SEP-00	MD
		Magnesium (Mg)	20.2	0.1	mg/L		28-SEP-00	MD
		Manganese (Mn)	0.013	0.001	mg/L		28-SEP-00	MD
		Molybdenum (Mo)	<0.005	0.005	mg/L		28-SEP-00	MD
		Sodium (Na)	23	1	mg/L		28-SEP-00	MD
		Nickel (Ni)	0.004	0.002	mg/L		28-SEP-00	MD
		Phosphorus (P)	0.07	0.05	mg/L		28-SEP-00	MD
		Lead (Pb)	<0.005	0.005	mg/L		28-SEP-00	MD
		Tin (Sn)	<0.05	0.05	mg/L		28-SEP-00	MD
		Strontium (Sr)	0.241	0.002	mg/L		28-SEP-00	MD
		Titanium (Ti)	0.005	0.001	mg/L		28-SEP-00	MD
		Thallium (Tl)	<0.05	0.05	mg/L		28-SEP-00	MD
		Vanadium (V)	0.001	0.001	mg/L		28-SEP-00	MD
		Zinc (Zn)	0.008	0.001	mg/L		28-SEP-00	MD
		Ammonia-N	<0.05	0.05	mg/L		27-SEP-00	EK
		Dissolved Organic Carbon	20	1	mg/L		28-SEP-00	RAX
		Nitrate-N	0.1	0.1	mg/L		27-SEP-00	LDD
		Nitrite-N	<0.05	0.05	mg/L		22-SEP-00	LDD
		Total Suspended Solids	4	3	mg/L		27-SEP-00	WNG
L17833-13	TLC-22B-SW-09/00-A							
Sample Date	20-SEP-00							
Matrix	WATER							

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L17833-13	TLG-22B-SW-09/00-A							
Sample Date	20-SEP-00							
Matrix:	WATER							
		Cyanide, Total	0.019	0.002	mg/L	22-SEP-00	26-SEP-00	MRR
		Mercury (Hg)-Total	<0.0002	0.0002	mg/L		28-SEP-00	MD
		Metals-Total						
		Silver (Ag)	<0.005	0.005	mg/L		28-SEP-00	MD
		Aluminum (Al)	0.05	0.01	mg/L		28-SEP-00	MD
		Barium (Ba)	0.035	0.003	mg/L		28-SEP-00	MD
		Beryllium (Be)	<0.002	0.002	mg/L		28-SEP-00	MD
		Calcium (Ca)	216	0.5	mg/L		28-SEP-00	MD
		Cadmium (Cd)	<0.001	0.001	mg/L		28-SEP-00	MD
		Cobalt (Co)	0.067	0.002	mg/L		28-SEP-00	MD
		Chromium (Cr)	0.006	0.005	mg/L		28-SEP-00	MD
		Copper (Cu)	0.053	0.001	mg/L		28-SEP-00	MD
		Iron (Fe)	0.416	0.005	mg/L		28-SEP-00	MD
		Potassium (K)	13.1	0.1	mg/L		28-SEP-00	MD
		Magnesium (Mg)	53.1	0.1	mg/L		28-SEP-00	MD
		Manganese (Mn)	0.798	0.001	mg/L		28-SEP-00	MD
		Molybdenum (Mo)	0.028	0.005	mg/L		28-SEP-00	MD
		Sodium (Na)	120	1	mg/L		28-SEP-00	MD
		Nickel (Ni)	0.001	0.002	mg/L		28-SEP-00	MD
		Phosphorus (P)	0.07	0.05	mg/L		28-SEP-00	MD
		Lead (Pb)	<0.005	0.005	mg/L		28-SEP-00	MD
		Tin (Sn)	<0.05	0.05	mg/L		28-SEP-00	MD
		Strontium (Sr)	1.23	0.002	mg/L		28-SEP-00	MD
		Titanium (Ti)	0.003	0.001	mg/L		28-SEP-00	MD
		Thallium (Tl)	<0.05	0.05	mg/L		28-SEP-00	MD
		Vanadium (V)	0.004	0.001	mg/L		28-SEP-00	MD
		Zinc (Zn)	0.006	0.001	mg/L		28-SEP-00	MD
		Ammonia-N	1.40	0.05	mg/L		27-SEP-00	EK
		Dissolved Organic Carbon	7	1	mg/L		26-SEP-00	HAN
		Nitrate-N	6.1	0.1	mg/L		22-SEP-00	LDD
		Nitrite-N	<0.05	0.05	mg/L		22-SEP-00	LDD
		Total Suspended Solids	<3	3	mg/L		27-SEP-00	WNG
L17833-14	TLG TL-SW-09/00							
Sample Date	20-SEP-00							
Matrix:	WATER							
		Routine Water Analysis						
		Chloride (Cl)	27	1	mg/L		22-SEP-00	LDD
		Nitrate+Nitrite-N	<0.1	0.1	mg/L		22-SEP-00	LDD
		pH, Conductivity and Total Alkalinity						
		pH	7.9	0.1	pH		22-SEP-00	MOR
		Conductivity (EC)	412	0.2	uS/cm		22-SEP-00	MOR
		Bicarbonate (HCO3)	133	5	mg/L		22-SEP-00	MOR
		Carbonate (CO3)	<5	5	mg/L		22-SEP-00	MOR
		Hydroxide	<5	5	mg/L		22-SEP-00	MOR
		Alkalinity, Total	109	5	mg/L		22-SEP-00	MOR
		Ion Balance Calculation						
		Ion Balance	104		%		25-SEP-00	
		TDS (Calculated)	241		mg/L		25-SEP-00	
		Hardness	191		mg/L		25-SEP-00	

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L17833-14	TLG-TL-SW-09/00							
Sample Date	20-SEP-00							
Matrix:	WATER							
		Metals-Total						
		Sodium (Na)	15	1	mg/L		28-SEP-00	MD
		Nickel (Ni)	0.003	0.002	mg/L		28-SEP-00	MD
		Phosphorus (P)	0.24	0.05	mg/L		28-SEP-00	MD
		Lead (Pb)	<0.005	0.005	mg/L		28-SEP-00	MD
		Tin (Sn)	<0.05	0.05	mg/L		28-SEP-00	MD
		Strontium (Sr)	0.194	0.002	mg/L		28-SEP-00	MD
		Titanium (Ti)	0.012	0.001	mg/L		28-SEP-00	MD
		Thallium (Tl)	<0.05	0.05	mg/L		28-SEP-00	MD
		Vanadium (V)	0.001	0.001	mg/L		28-SEP-00	MD
		Zinc (Zn)	0.007	0.001	mg/L		28-SEP-00	MD
		Ammonia-N	<0.05	0.05	mg/L		27-SEP-00	EK
		Dissolved Organic Carbon	24	1	mg/L		26-SEP-00	HAN
		Nitrate-N	<0.1	0.1	mg/L		22-SEP-00	LDD
		Nitrite-N	<0.05	0.05	mg/L		22-SEP-00	LDD
		Total Suspended Solids	5	3	mg/L		27-SEP-00	WNG
L17833-15	TLG-NWP-SW-09/00							
Sample Date	20-SEP-00							
Matrix:	WATER							
		Routine Water Analysis						
		Chloride (Cl)	315	1	mg/L		22-SEP-00	LDD
		Nitrate+Nitrite-N	10.2	0.1	mg/L		22-SEP-00	LDD
		pH, Conductivity and Total Alkalinity						
		pH	8.1	0.1	pH		22-SEP-00	MOR
		Conductivity (EC)	2140	0.2	uS/cm		22-SEP-00	MOR
		Bicarbonate (HCO3)	126	5	mg/L		22-SEP-00	MOR
		Carbonate (CO3)	<5	5	mg/L		22-SEP-00	MOR
		Hydroxide	<5	5	mg/L		22-SEP-00	MOR
		Alkalinity, Total	104	5	mg/L		22-SEP-00	MOR
		Ion Balance Calculation						
		Ion Balance	93.8		%		26-SEP-00	
		TDS (Calculated)	1430		mg/L		26-SEP-00	
		Hardness	822		mg/L		26-SEP-00	
		ICP metals and SO4 for routine water						
		Calcium (Ca)	233	0.5	mg/L		25-SEP-00	MOR
		Potassium (K)	10.5	0.1	mg/L		25-SEP-00	MOR
		Magnesium (Mg)	58.3	0.1	mg/L		25-SEP-00	MOR
		Sodium (Na)	145	1	mg/L		25-SEP-00	MOR
		Sulfate (SO4)	557	0.5	mg/L		25-SEP-00	MOR
		Antimony (Sb)-Dissolved	2.60	0.0004	mg/L		28-SEP-00	MD
		Arsenic (As) 3+-Dissolved	0.271	0.0002	mg/L			JJ
		Arsenic (As) 5+-Dissolved	9.93	0.0002	mg/L			JJ
		Arsenic (As)-Dissolved	10.0	0.0004	mg/L		28-SEP-00	MD
		Mercury (Hg)-Dissolved	<0.0002	0.0002	mg/L		28-SEP-00	MD
		Metals, Dissolved						
		Silver (Ag)	<0.005	0.005	mg/L		28-SEP-00	MD
		Aluminum (Al)	0.02	0.01	mg/L		28-SEP-00	MD

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L17833-15	TLG-NWP-SW-09/00							
Sample Date	20-SEP-00							
Matrix:	WATER							
		Dissolved Organic Carbon	5	1	mg/L		26-SEP-00	HAN
		Nitrate-N	0.1	0.1	mg/L		22-SEP-00	LDD
		Nitrite-N	0.07	0.05	mg/L		22-SEP-00	LDD
		Total Suspended Solids	82	3	mg/L		27-SEP-00	WNG
L17833-16	TLG-TV-SW-09/00							
Sample Date	20-SEP-00							
Matrix:	WATER							
		Dissolved Organic Carbon	21	1	mg/L		26-SEP-00	HAN

ETL EnviroTest **CHAIN OF CUSTODY / ANALYTICAL REQUEST F**

9936 - 67 Avenue, Edmonton, Alberta T6E 0P5
1313 - 44th Avenue N.E., Calgary, Alberta T2E 6L5
9505 - 111th Street, Grande Prairie, Alberta
General Services Bldg., 124 Veterinary Road, Saskatoon, Saskatchewan S7N 5E3
Winnipeg, Manitoba
Thunder Bay, Ontario

Telephone: (780) 413-5227 Fax: (780) 437-2311
Telephone: (403) 291-9897 Fax: (403) 291-0298
Telephone: (780) 539-5196 Fax: (780) 513-2154
Telephone: (306) 668-8370 Fax: (306) 668-8383
Telephone: (204) 945-3705 Fax: (204) 945-0763
Telephone: (807) 623-6463 Fax: (807) 623-7598

DATE: 20 Sept 00 DATE REQUIRED: ____

SERVICE REQUESTED:

☒ REGULAR ☐ PRIORITY (50% SURCHARGE) ☐ EMERGENCY (100% SURCHARGE)

SPECIAL REQUIREMENTS / REGS (CIRCLE ONE)
MISA TIER 1 CCME
BC MELP AB MUST
OTHER ____

ANALYSIS REQUESTED:

L17833

E - Add as per [illegible]

SAMPLE ID	SAMPLED BY / DATE / TIME	LOCATION OF SAMPLING	SAMPLING METHOD	SAMPLE TYPE	Routine	Dissolved Metals	Total Metals	Nitrate Nitrite (DL)	Ammonia	Cyanide	TOC	Arsenic Speciation	LAB SAMPLE NO.
BC-US-SD-09/00	20 Sept 00	Baker Creek		Water	✓	✓	✓	✓	✓				1
BC-FTF-SD-09/00	20 Sept 00	Baker Creek			✓	✓	✓	✓	✓	✓		✓	2
BC-151-SD-09/00 D		Giant Mine				✓	✓						3
TLG-4-SD-09/00					✓	✓	✓	✓	✓				4
TLG-3-SD-09/00					✓	✓	✓	✓	✓	✓		✓	5
TLG-3C-SD-09/00					✓	✓	✓	✓	✓	✓		✓	6
TLG-SP-SD-09/00					✓	✓	✓	✓	✓				7
TLG-NP-SD-09/00					✓	✓	✓	✓	✓				8
TLG-21P-SD-09/00					✓	✓	✓	✓	✓				9
TLG-28B-SD-09/00					✓	✓	✓	✓	✓	✓		✓	10
TLG-MCP-SD-09/00					✓	✓	✓	✓	✓	✓		✓	11

PRESERVED / FILTERED

NOTES & CONDITIONS

1. Quote number must be provided to ensure proper pricing.
2. Turnaround times will vary dependent on complexity of analysis & lab workload at time of submission. Please contact the Lab to confirm turnaround times.
3. All hazardous samples submitted must be labelled to comply with WHMIS regulations. This must include the nature of the hazard, as well as a contact name & phone number that the Lab can contact for further information.

NOTE: Failure to properly complete all portions of this form may delay analysis.

NOTE: **Shaded areas MUST be completed in full by client for sample processing to occur.**

CLIENT: Golder Associates NO. OF BOTTLES SUBMITTED: ____

CONTACT: Valerie Buchanan PHONE (604) 298-6623

REPORT ADDRESS: #500-4260 Still Creek Dr. (604) 298-5253
Burnaby, BC V5C 6C6 QUOTE NO: Q5463

BILLING ADDRESS: As above P.O. NO: ____

RELINQUISHED BY:	DATE / TIME	RECEIVED BY:	DATE / TIME
[signature]	DATE: 20 Sept 00 TIME: 1700	[signature] ETL LAB:	DATE: [illegible] TIME: [illegible]
RELINQUISHED BY:	DATE: TIME:	RECEIVED BY: ETL LAB:	DATE: TIME:

SAMPLE CONDITION UPON RECEIPT:
FROZEN: ____ COLD: ____ AMBIENT: ____
OTHER: (BREAKAGE, LEAKAGE, ETC.) ____

WHITE – Report Copy
PINK – File Copy
YELLOW – Customer Copy

ENVIRO-TEST QC REPORT

Workorder L17833

Type: **BLANK**

Lab QC Number:		Result	Qualifier	Units	Limit	Analyzed
WG19286-1						
N2N3-ED	Nitrate+Nitrite-N	<0.1		mg/L	0.1	22-SEP-00
NO3-ED	Nitrate-N	<0.1		mg/L	0.1	22-SEP-00
NO3-ED	Nitrate-N	<0.1		mg/kg	0.1	22-SEP-00
WG19302-1						
NO2-ED	Nitrite-N	<0.05		mg/L	0.05	22-SEP-00
WG19305-1						
CL-ED	Chloride (Cl)	<1		mg/L	1	22-SEP-00
WG19373-1						
CN-TOT-TB	Cyanide, Total	<0.002		mg/L	0.002	25-SEP-00
WG19404-1						
ETL-ROUTINE-ICP-ED	Calcium (Ca)	<0.5	<DL	mg/L	2.5	25-SEP-00
	Potassium (K)	<0.1	<DL	mg/L	0.5	25-SEP-00
	Magnesium (Mg)	<0.1	<DL	mg/L	0.5	25-SEP-00
	Sodium (Na)	<1		mg/L	5	25-SEP-00
	Sulfate (SO4)	<0.5	<DL	mg/L	2.5	25-SEP-00
WG19486-1						
AS-DIS-HYD-ED	Arsenic (As)-Dissolved	<0.0004		mg/L	0.002	26-SEP-00
HG-DIS-HYD-ED	Mercury (Hg)-Dissolved	<0.0002		mg/L	0.001	26-SEP-00
METAL-DIS-ED	Silver (Ag)	<0.005		mg/L	0.025	26-SEP-00
	Aluminum (Al)	<0.01		mg/L	0.05	26-SEP-00
	Boron (B)	<0.05		mg/L	0.25	26-SEP-00
	Barium (Ba)	<0.003		mg/L	0.015	26-SEP-00
	Beryllium (Be)	<0.001		mg/L	0.005	26-SEP-00
	Calcium (Ca)	<0.5		mg/L	2.5	26-SEP-00
	Cadmium (Cd)	<0.001		mg/L	0.005	26-SEP-00
	Cobalt (Co)	<0.002		mg/L	0.01	26-SEP-00
	Chromium (Cr)	<0.005		mg/L	0.025	26-SEP-00
	Copper (Cu)	<0.001		mg/L	0.005	26-SEP-00
	Iron (Fe)	0.005		mg/L	0.025	26-SEP-00
	Potassium (K)	<0.1		mg/L	0.5	26-SEP-00
	Magnesium (Mg)	<0.01		mg/L	0.05	26-SEP-00
	Manganese (Mn)	<0.001		mg/L	0.005	26-SEP-00
	Molybdenum (Mo)	<0.005		mg/L	0.025	26-SEP-00
	Sodium (Na)	<0.5		mg/L	2.5	26-SEP-00
	Nickel (Ni)	<0.002		mg/L	0.01	26-SEP-00
	Phosphorus (P)	<0.1		mg/L	0.5	26-SEP-00
	Lead (Pb)	<0.005		mg/L	0.025	26-SEP-00
	Tin (Sn)	<0.05		mg/L	0.25	26-SEP-00
	Strontium (Sr)	<0.005		mg/L	0.025	26-SEP-00
	Titanium (Ti)	<0.001		mg/L	0.005	26-SEP-00
	Thallium (Tl)	<0.05		mg/L	0.25	26-SEP-00
	Vanadium (V)	<0.001		mg/L	0.005	26-SEP-00
SB-DIS-HYD-ED	Antimony (Sb)-Dissolved	0.0004		mg/L	0.002	26-SEP-00
WG19488-1						
AS-DIS-HYD-ED	Arsenic (As)-Dissolved	<0.0004		mg/L	0.0004	27-SEP-00

ENVIRO-TEST QC REPORT

Workorder L17833

	Potassium (K)	<0.1		mg/L	0.5	28-SEP-00
	Magnesium (Mg)	<0.1		mg/L	0.5	28-SEP-00
	Manganese (Mn)	<0.001		mg/L	0.005	28-SEP-00
	Molybdenum (Mo)	<0.005		mg/L	0.025	28-SEP-00
	Sodium (Na)	<1		mg/L	5	28-SEP-00
	Nickel (Ni)	<0.002		mg/L	0.01	28-SEP-00
	Phosphorus (P)	0.05		mg/L	0.25	28-SEP-00
	Lead (Pb)	<0.005		mg/L	0.025	28-SEP-00
	Tin (Sn)	<0.05		mg/L	0.25	28-SEP-00
	Strontium (Sr)	<0.002		mg/L	0.01	28-SEP-00
	Titanium (Ti)	<0.001		mg/L	0.005	28-SEP-00
	Thallium (Tl)	<0.05		mg/L	0.25	28-SEP-00
	Vanadium (V)	<0.001		mg/L	0.005	28-SEP-00
	Zinc (Zn)	0.011	A	mg/L	0.005	28-SEP-00
WG19704-1						
METAL-TOT-ED	Silver (Ag)	<0.005		mg/L	0.025	28-SEP-00
	Aluminum (Al)	0.04		mg/L	0.05	28-SEP-00
	Boron (B)	<0.05		mg/L	0.25	28-SEP-00
	Barium (Ba)	<0.003		mg/L	0.015	28-SEP-00
	Beryllium (Be)	<0.002		mg/L	0.01	28-SEP-00
	Calcium (Ca)	<0.5		mg/L	2.5	28-SEP-00
	Cadmium (Cd)	<0.001		mg/L	0.005	28-SEP-00
	Cobalt (Co)	<0.002		mg/L	0.01	28-SEP-00
	Chromium (Cr)	<0.005		mg/L	0.025	28-SEP-00
	Copper (Cu)	<0.001		mg/L	0.005	28-SEP-00
	Iron (Fe)	0.013		mg/L	0.025	28-SEP-00
	Potassium (K)	0.1		mg/L	0.5	28-SEP-00
	Magnesium (Mg)	<0.1		mg/L	0.5	28-SEP-00
	Manganese (Mn)	<0.001		mg/L	0.005	28-SEP-00
	Molybdenum (Mo)	<0.005		mg/L	0.025	28-SEP-00
	Sodium (Na)	5		mg/L	5	28-SEP-00
	Nickel (Ni)	0.002		mg/L	0.01	28-SEP-00
	Phosphorus (P)	0.07		mg/L	0.25	28-SEP-00
	Lead (Pb)	<0.005		mg/L	0.025	28-SEP-00
	Tin (Sn)	<0.05		mg/L	0.25	28-SEP-00
	Strontium (Sr)	<0.002		mg/L	0.01	28-SEP-00
	Titanium (Ti)	<0.001		mg/L	0.005	28-SEP-00
	Thallium (Tl)	<0.05		mg/L	0.25	28-SEP-00
	Vanadium (V)	<0.001		mg/L	0.005	28-SEP-00
	Zinc (Zn)	0.010	A	mg/L	0.005	28-SEP-00
WG19726-1						
METAL-TOT-ED	Silver (Ag)	<0.005		mg/L	0.025	28-SEP-00
	Aluminum (Al)	0.09	A	mg/L	0.05	28-SEP-00
	Boron (B)	<0.05		mg/L	0.25	28-SEP-00
	Barium (Ba)	<0.003		mg/L	0.015	28-SEP-00
	Beryllium (Be)	<0.002		mg/L	0.01	28-SEP-00
	Calcium (Ca)	1.1		mg/L	2.5	28-SEP-00
	Cadmium (Cd)	<0.001		mg/L	0.005	28-SEP-00

Workorder L17833

	Sulfate (SO4)	1.2		4.44	25 SEP-00
WG19404-7					
ETL-ROUTINE-ICP-ED	Calcium (Ca)	0.065		1.19	25-SEP-00
	Potassium (K)	0.19		1.7	25-SEP-00
	Magnesium (Mg)	0.0		2.31	25-SEP-00
	Sodium (Na)	6.4		5.16	25-SEP-00
	Sulfate (SO4)	1.5		4.44	25-SEP-00
WG19409-4					
PH/EC/ALK-ED	pH	0.65		0.88	22-SEP-00
	Conductivity (EC)	3.0	G	1.03	22-SEP-00
	Bicarbonate (HCO3)	0.59		1.83	22-SEP-00
	Carbonate (CO3)	N/A	RPD-NA	1.83	22-SEP-00
	Hydroxide	N/A	RPD-NA		22-SEP-00
	Alkalinity, Total	0.59		1.25	22-SEP-00
WG19409-5					
PH/EC/ALK-ED	pH	0.17		0.88	22-SEP-00
	Conductivity (EC)	0.039		1.03	22-SEP-00
	Bicarbonate (HCO3)	0.17		1.83	22-SEP-00
	Carbonate (CO3)	N/A	RPD-NA	1.83	22-SEP-00
	Hydroxide	N/A	RPD-NA		22-SEP-00
	Alkalinity, Total	0.17		1.25	22-SEP-00
WG19409-6					
PH/EC/ALK-ED	pH	0.32		0.88	22-SEP-00
	Conductivity (EC)	0.0		1.03	22-SEP-00
	Bicarbonate (HCO3)	0.055		1.83	22-SEP-00
	Carbonate (CO3)	N/A	RPD-NA	1.83	22-SEP-00
	Hydroxide	N/A	RPD-NA		22-SEP-00
	Alkalinity, Total	0.055		1.25	22-SEP-00
WG19486-2					
AS-DIS-HYD-ED	Arsenic (As)-Dissolved	0.98		20	26-SEP-00
HG-DIS-HYD-ED	Mercury (Hg)-Dissolved	N/A	RPD-NA	20	26-SEP-00
METAL-DIS-ED	Silver (Ag)	N/A	RPD-NA	20	26-SEP-00
	Aluminum (Al)	5.1		20	26-SEP-00
	Boron (B)	5.4		20	26-SEP-00
	Barium (Ba)	0.63		20	26-SEP-00
	Beryllium (Be)	N/A	RPD-NA	20	26-SEP-00
	Calcium (Ca)	0.51		20	26-SEP-00
	Cadmium (Cd)	N/A	RPD-NA	20	26-SEP-00
	Cobalt (Co)	0.19		20	26-SEP-00
	Chromium (Cr)	9.6		20	26-SEP-00
	Copper (Cu)	0.034		20	26-SEP-00
	Iron (Fe)	0.22		20	26-SEP-00
	Potassium (K)	0.048		20	26-SEP-00
	Magnesium (Mg)	2.8		20	26-SEP-00
	Manganese (Mn)	1.1		20	26-SEP-00

ENVIRO-TEST QC REPORT

Workorder L17833

WG19644-3					
SOLIDS-TOTSUS-ED	Total Suspended Solids	1.2		16.5	27-SEP-00
WG19683-2					
METAL-TOT-ED	Silver (Ag)	N/A	RPD-NA	20	28-SEP-00
	Aluminum (Al)	40	D	20	28-SEP-00
	Boron (B)	N/A	RPD-NA	20	28-SEP-00
	Barium (Ba)	N/A	RPD-NA	20	28-SEP-00
	Beryllium (Be)	N/A	RPD-NA	20	28-SEP-00
	Calcium (Ca)	N/A	RPD-NA	20	28-SEP-00
	Cadmium (Cd)	N/A	RPD-NA	20	28-SEP-00
	Cobalt (Co)	N/A	RPD-NA	20	28-SEP-00
	Chromium (Cr)	N/A	RPD-NA	20	28-SEP-00
	Copper (Cu)	N/A	RPD-NA	20	28-SEP-00
	Iron (Fe)	52	D	20	28-SEP-00
	Potassium (K)	7.0		20	28-SEP-00
	Magnesium (Mg)	N/A	RPD-NA	20	28-SEP-00
	Manganese (Mn)	N/A	RPD-NA	20	28-SEP-00
	Molybdenum (Mo)	N/A	RPD-NA	20	28-SEP-00
	Sodium (Na)	N/A	RPD-NA	20	28-SEP-00
	Nickel (Ni)	N/A	RPD-NA	20	28-SEP-00
	Phosphorus (P)	48	D	20	28-SEP-00
	Lead (Pb)	N/A	RPD-NA	20	28-SEP-00
	Tin (Sn)	N/A	RPD-NA	20	28-SEP-00
	Strontium (Sr)	N/A	RPD-NA	20	28-SEP-00
	Titanium (Ti)	N/A	RPD-NA	20	28-SEP-00
	Thallium (Tl)	N/A	RPD-NA	20	28-SEP-00
	Vanadium (V)	N/A	RPD-NA	20	28-SEP-00
	Zinc (Zn)	42	G	20	28-SEP-00
WG19704-2					
METAL-TOT-ED	Silver (Ag)	N/A	RPD-NA	20	28-SEP-00
	Aluminum (Al)	19		20	28-SEP-00
	Boron (B)	0.59		20	28-SEP-00
	Barium (Ba)	0.49		20	28-SEP-00
	Beryllium (Be)	N/A	RPD-NA	20	28-SEP-00
	Calcium (Ca)	1.5		20	28-SEP-00
	Cadmium (Cd)	N/A	RPD-NA	20	28-SEP-00
	Cobalt (Co)	1.0		20	28-SEP-00
	Chromium (Cr)	4.4		20	28-SEP-00
	Copper (Cu)	0.59		20	28-SEP-00
	Iron (Fe)	1.2		20	28-SEP-00
	Potassium (K)	1.8		20	28-SEP-00
	Magnesium (Mg)	0.23		20	28-SEP-00
	Manganese (Mn)	1.8		20	28-SEP-00
	Molybdenum (Mo)	1.7		20	28-SEP-00
	Sodium (Na)	0.65		20	28-SEP-00
	Nickel (Ni)	1.9		20	28-SEP-00
	Phosphorus (P)	5.6		20	28-SEP-00

ENVIRO-TEST QC REPORT

Workorder L17833

WG19409-2					
PH/EC/ALK-ED	pH	102	G	99-101	22-SEP-00
	Conductivity (EC)	102		98.4-103	22-SEP-00
	Alkalinity, Total	103		95.2-104	22-SEP-00
WG19409-3					
PH/EC/ALK-ED	pH	102	G	99-101	22-SEP-00
	Conductivity (EC)	95		94-100	22-SEP-00
WG19548-2					
C-DIS-ORG-ED	Dissolved Organic Carbon	97		96-102	26-SEP-00
WG19577-2					
ETL-ROUTINE-ICP-ED	Calcium (Ca)	101		99.1-102.3	27-SEP-00
	Potassium (K)	100		98.4-101.8	27-SEP-00
	Magnesium (Mg)	103		101-106.5	27-SEP-00
	Sodium (Na)	102		95-104.6	27-SEP-00
	Sulfate (SO4)	101		97.9-104.2	27-SEP-00
WG19607-2					
NH4-ED	Ammonia-N	102		93.5-106.6	27-SEP-00
WG19644-4					
SOLIDS-TOTSUS-ED	Total Suspended Solids	94		69.8-106.2	27-SEP-00

QC Type: MS

Lab QC Number:		% Recovery	Qualifier	Limit %	Analyzed
WG19286-3					
N2N3-ED	Nitrate+Nitrite-N	103		88.2-107.8	22-SEP-00
WG19286-6					
NO3-ED	Nitrate-N	101		81.2-126	22-SEP-00
WG19302-3					
NO2-ED	Nitrite-N	95		94.6-104.1	22-SEP-00
WG19305-5					
CL-ED	Chloride (Cl)	102		95-106	22-SEP-00
WG19373-2					
CN-TOT-TB	Cyanide, Total	100		75-125	25-SEP-00
WG19404-8					
ETL-ROUTINE-ICP-ED	Calcium (Ca)	103		94.2-107.8	25-SEP-00
	Potassium (K)	99		92.3-104.7	25-SEP-00
	Magnesium (Mg)	107		98.9-110.2	25-SEP-00
	Sodium (Na)	106		92.1-116.3	25-SEP-00
	Sulfate (SO4)	101		89.2-109	25-SEP-00
19404-6					
ETL-ROUTINE-ICP-ED	Calcium (Ca)	102		94.2-107.8	25-SEP-00
	Potassium (K)	100		92.3-104.7	25-SEP-00
	Magnesium (Mg)	104		98.9-110.2	25-SEP-00
	Sodium (Na)	100		92.1-116.3	25-SEP-00

ENVIRO-TEST QC REPORT

Workorder L17833

		Potassium (K)	101		92.3-104.7	27-SEP-00
		Magnesium (Mg)	105		98.9-110.2	27-SEP-00
		Sodium (Na)	104		92.1-116.3	27-SEP-00
		Sulfate (SO4)	105		89.2-109	27-SEP-00
WG19607-6						
	NH4-ED	Ammonia-N	104		81.3-130.2	27-SEP-00
WG19607-7						
	NH4-ED	Ammonia-N	103		81.3-130.2	27-SEP-00
WG19683-3						
	METAL-TOT-ED	Silver (Ag)	87		75-125	28-SEP-00
		Aluminum (Al)	117		75-125	28-SEP-00
		Boron (B)	114		75-125	28-SEP-00
		Barium (Ba)	97		75-125	28-SEP-00
		Beryllium (Be)	102		75-125	28-SEP-00
		Calcium (Ca)	105		75-125	28-SEP-00
		Cadmium (Cd)	100		75-125	28-SEP-00
		Cobalt (Co)	97		75-125	28-SEP-00
		Chromium (Cr)	93		75-125	28-SEP-00
		Copper (Cu)	102		75-125	28-SEP-00
		Iron (Fe)	104		75-125	28-SEP-00
		Potassium (K)	101		75-125	28-SEP-00
		Magnesium (Mg)	103		75-125	28-SEP-00
		Manganese (Mn)	105		75-125	28-SEP-00
		Molybdenum (Mo)	103		75-125	28-SEP-00
		Sodium (Na)	104		75-125	28-SEP-00
		Nickel (Ni)	99		75-125	28-SEP-00
		Phosphorus (P)	96		75-125	28-SEP-00
		Lead (Pb)	110		75-125	28-SEP-00
		Tin (Sn)	108		75-125	28-SEP-00
		Strontium (Sr)	105		75-125	28-SEP-00
		Titanium (Ti)	102		75-125	28-SEP-00
		Thallium (Tl)	111		75-125	28-SEP-00
		Vanadium (V)	105		75-125	28-SEP-00
		Zinc (Zn)	103		75-125	28-SEP-00
WG19704-3						
	METAL-TOT-ED	Silver (Ag)	32	F	75-125	28-SEP-00
		Aluminum (Al)	106		75-125	28-SEP-00
		Boron (B)	106		75-125	28-SEP-00
		Barium (Ba)	97		75-125	28-SEP-00
		Beryllium (Be)	100		75-125	28-SEP-00
		Calcium (Ca)	146	E	75-125	28-SEP-00
		Cadmium (Cd)	99		75-125	28-SEP-00
		Cobalt (Co)	99		75-125	28-SEP-00
		Chromium (Cr)	97		75-125	28-SEP-00
		Copper (Cu)	97		75-125	28-SEP-00
		Iron (Fe)	102		75-125	28-SEP-00

ENVIRO-TEST QC REPORT

Workorder L17833

	Nitrite-N	1.0	3.65	22-SEP-00
WG19305-6				
CL-ED	Chloride (Cl)	0.0	1.19	22-SEP-00

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A DIVISION OF [illegible] ANALYTICAL [illegible]

CHEMICAL ANALYSIS REPORT

GOLDER ASSOCIATES LTD

DATE: November 23, 2000

ATTN: VALERIE BERTRAND

500 4260 STILL CREEK DRIVE

BURNABY BC V5C 6C6

Lab Work Order #: L18616   Sampled By: CLIENT   Date Received: 10/02/00

Project P.O. #: Surf. water

Project Reference: GIANT MINE

Comments: ADDITIONAL 23-OCT-00 13:55

APPROVED BY: ______________________

ROY JONES

Project Manager

THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE WRITTEN AUTHORITY OF THE LABORATORY. ALL SAMPLES WILL BE DISPOSED OF AFTER 30 DAYS FOLLOWING ANALYSIS. PLEASE CONTACT THE LAB IF YOU REQUIRE ADDITIONAL SAMPLE STORAGE TIME.

ACCREDITATIONS: STANDARDS COUNCIL OF CANADA (SCC), IN COOPERATION WITH THE CANADIAN ASSOCIATION FOR ENVIRONMENTAL ANALYTICAL LABORATORIES (CAEAL) FOR SPECIFIC TESTS AS REGISTERED BY THE COUNCIL (EDMONTON, CALGARY, SASKATOON, WINNIPEG, THUNDER BAY)
AMERICAN INDUSTRIAL HYGIENE ASSOCIATION (AIHA) FOR INDUSTRIAL HYGIENE ANALYSIS (EDMONTON)
W. STANDARDS COUNCIL OF CANADA IN COOPERATION WITH THE CANADIAN FOOD INSPECTION AGENCY (CFIA) FOR FERTILIZER AND FEED TESTING (SASKATOON)

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L18616-1	TLG-7A-SW-09/00							
Sample Date	20-SEP-00							
Matrix	WATER							
		Metals-Total						
		Beryllium (Be)	<0.002	0.002	mg/L		06-OCT-00	CC5
		Cadmium (Cd)	<0.001	0.001	mg/L		06-OCT-00	CC5
		Cobalt (Co)	0.027	0.002	mg/L		06-OCT-00	CC5
		Chromium (Cr)	<0.005	0.005	mg/L		06-OCT-00	CC5
		Copper (Cu)	0.008	0.001	mg/L		06-OCT-00	CC5
		Iron (Fe)	0.045	0.005	mg/L		06-OCT-00	CC5
		Manganese (Mn)	0.009	0.001	mg/L		06-OCT-00	CC5
		Molybdenum (Mo)	0.011	0.005	mg/L		06-OCT-00	CC5
		Nickel (Ni)	0.018	0.002	mg/L		06-OCT-00	CC5
		Phosphorus (P)	0.05	0.05	mg/L		06-OCT-00	CC5
		Lead (Pb)	<0.005	0.005	mg/L		06-OCT-00	CC5
		Tin (Sn)	<0.05	0.05	mg/L		06-OCT-00	CC5
		Strontium (Sr)	0.774	0.002	mg/L		06-OCT-00	CC5
		Titanium (Ti)	0.006	0.001	mg/L		06-OCT-00	CC5
		Thallium (Tl)	<0.05	0.05	mg/L		06-OCT-00	CC5
		Vanadium (V)	0.002	0.001	mg/L		06-OCT-00	CC5
		Zinc (Zn)	0.008	0.001	mg/L		06-OCT-00	CC5
		Ammonia-N	<0.05	0.05	mg/L		04-OCT-00	BT
L18616-2	TLG-7B-SW-09/00							
Sample Date	20-SEP-00							
Matrix:	WATER							
		Routine Water Analysis						
		Chloride (Cl)	242	1	mg/L		03-OCT-00	LDD
		Nitrate+Nitrite-N	<0.1	0.1	mg/L		04-OCT-00	LDD
		pH, Conductivity and Total Alkalinity						
		pH	7.4	0.1	pH		03-OCT-00	PTT
		Conductivity (EC)	2830	0.2	uS/cm		03-OCT-00	PTT
		Bicarbonate (HCO3)	509	5	mg/L		03-OCT-00	PTT
		Carbonate (CO3)	<5	5	mg/L		03-OCT-00	PTT
		Hydroxide	<5	5	mg/L		03-OCT-00	PTT
		Alkalinity, Total	418	5	mg/L		03-OCT-00	PTT
		Ion Balance Calculation						
		Ion Balance	97.3		%		08-OCT-00	
		TDS (Calculated)	2050		mg/L		08-OCT-00	
		Hardness	1390		mg/L		08-OCT-00	
		ICP metals and SO4 for routine water						
		Calcium (Ca)	351	0.5	mg/L		05-OCT-00	MOR
		Potassium (K)	3.8	0.1	mg/L		05-OCT-00	MOR
		Magnesium (Mg)	118	0.1	mg/L		05-OCT-00	MOR
		Sodium (Na)	134	1	mg/L		05-OCT-00	MOR
		Sulfate (SO4)	936	0.5	mg/L		05-OCT-00	MOR
		Arsenic (As)-Dissolved	0.293	0.0004	mg/L		11-OCT-00	OL
		Metals, Dissolved						
		Silver (Ag)	<0.005	0.005	mg/L		11-OCT-00	OL
		Aluminum (Al)	0.02	0.01	mg/L		11-OCT-00	OL
		Boron (B)	0.14	0.05	mg/L		11-OCT-00	OL
		Barium (Ba)	0.030	0.003	mg/L		11-OCT-00	OL
		Beryllium (Be)	<0.001	0.001	mg/L		11-OCT-00	OL

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L18616-3	TLG-7C-SW-09/00							
Sample Date	20-SEP-00							
Matrix:	WATER							
		Routine Water Analysis						
		pH, Conductivity and Total Alkalinity						
		Conductivity (EC)	1620	0.2	uS/cm		03-OCT-00	PTT
		Bicarbonate (HCO3)	309	5	mg/L		03-OCT-00	PTT
		Carbonate (CO3)	<5	5	mg/L		03-OCT-00	PTT
		Hydroxide	<5	5	mg/L		03-OCT-00	PTT
		Alkalinity, Total	253	5	mg/L		03-OCT-00	PTT
		Ion Balance Calculation						
		Ion Balance	96.0		%		03-OCT-00	
		TDS (Calculated)	1200		mg/L		03-OCT-00	
		Hardness	835		mg/L		06-OCT-00	
		ICP metals and SO4 for routine water						
		Calcium (Ca)	208	0.5	mg/L		05-OCT-00	MOR
		Potassium (K)	8.3	0.1	mg/L		05-OCT-00	MOR
		Magnesium (Mg)	76.0	0.1	mg/L		05-OCT-00	MOR
		Sodium (Na)	68	1	mg/L		05-OCT-00	MOR
		Sulfate (SO4)	562	0.5	mg/L		05-OCT-00	MOR
		Arsenic (As)-Dissolved	0.282	0.0004	mg/L		11-OCT-00	OL
		Metals, Dissolved						
		Silver (Ag)	<0.005	0.005	mg/L		11-OCT-00	OL
		Aluminum (Al)	0.01	0.01	mg/L		11-OCT-00	OL
		Boron (B)	0.06	0.05	mg/L		11-OCT-00	OL
		Barium (Ba)	0.043	0.003	mg/L		11-OCT-00	OL
		Beryllium (Be)	<0.001	0.001	mg/L		11-OCT-00	OL
		Cadmium (Cd)	<0.001	0.001	mg/L		11-OCT-00	OL
		Cobalt (Co)	0.021	0.002	mg/L		11-OCT-00	OL
		Chromium (Cr)	<0.005	0.005	mg/L		11-OCT-00	OL
		Copper (Cu)	0.003	0.001	mg/L		11-OCT-00	OL
		Iron (Fe)	<0.005	0.005	mg/L		11-OCT-00	OL
		Manganese (Mn)	0.018	0.001	mg/L		11-OCT-00	OL
		Molybdenum (Mo)	<0.005	0.005	mg/L		11-OCT-00	OL
		Nickel (Ni)	0.011	0.002	mg/L		11-OCT-00	OL
		Phosphorus (P)	<0.1	0.1	mg/L		11-OCT-00	OL
		Lead (Pb)	<0.005	0.005	mg/L		11-OCT-00	OL
		Tin (Sn)	<0.05	0.05	mg/L		11-OCT-00	OL
		Strontium (Sr)	0.505	0.005	mg/L		11-OCT-00	OL
		Titanium (Ti)	<0.001	0.001	mg/L		11-OCT-00	OL
		Thallium (Tl)	<0.05	0.05	mg/L		11-OCT-00	OL
		Vanadium (V)	<0.001	0.001	mg/L		11-OCT-00	OL
		Zinc (Zn)	0.013	0.001	mg/L		11-OCT-00	OL
		Arsenic (As)-Total	0.284	0.0004	mg/L		24-OCT-00	RG
		Metals-Total						
		Silver (Ag)	<0.005	0.005	mg/L		06-OCT-00	CCS
		Aluminum (Al)	0.02	0.01	mg/L		06-OCT-00	CCS
		Boron (B)	0.06	0.05	mg/L		06-OCT-00	CCS
		Barium (Ba)	0.051	0.003	mg/L		06-OCT-00	CCS
		Beryllium (Be)	<0.002	0.002	mg/L		06-OCT-00	CCS
		Cadmium (Cd)	<0.001	0.001	mg/L		06-OCT-00	CCS
		Cobalt (Co)	0.021	0.002	mg/L		06-OCT-00	CCS
		Chromium (Cr)	<0.005	0.005	mg/L		06-OCT-00	CCS
		Copper (Cu)	0.004	0.001	mg/L		06-OCT-00	CCS

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L18616-4	TL3-GL-SW-09/00							
Sample Date: 20-SEP-00								
Matrix: WATER								
		Metals, Dissolved						
		Manganese (Mn)	0.188	0.001	mg/L		11-OCT-00	OL
		Molybdenum (Mo)	<0.005	0.005	mg/L		11-OCT-00	OL
		Nickel (Ni)	0.003	0.002	mg/L		11-OCT-00	OL
		Phosphorus (P)	<0.1	0.1	mg/L		11-OCT-00	OL
		Lead (Pb)	<0.005	0.005	mg/L		11-OCT-00	OL
		Tin (Sn)	<0.05	0.05	mg/L		11-OCT-00	OL
		Strontium (Sr)	0.104	0.005	mg/L		11-OCT-00	OL
		Titanium (Ti)	<0.001	0.001	mg/L		11-OCT-00	OL
		Thallium (Tl)	<0.05	0.05	mg/L		11-OCT-00	OL
		Vanadium (V)	<0.001	0.001	mg/L		11-OCT-00	OL
		Zinc (Zn)	0.019	0.001	mg/L		11-OCT-00	OL
		Arsenic (As)-Total	0.205	0.0004	mg/L		24-OCT-00	RG
		Metals-Total						
		Silver (Ag)	<0.005	0.005	mg/L		06-OCT-00	CC5
		Aluminum (Al)	0.52	0.01	mg/L		06-OCT-00	CC5
		Boron (B)	<0.05	0.05	mg/L		06-OCT-00	CC5
		Barium (Ba)	0.023	0.005	mg/L		06-OCT-00	CC5
		Beryllium (Be)	<0.002	0.002	mg/L		06-OCT-00	CC5
		Cadmium (Cd)	<0.001	0.001	mg/L		06-OCT-00	CC5
		Cobalt (Co)	<0.002	0.002	mg/L		06-OCT-00	CC5
		Chromium (Cr)	<0.005	0.005	mg/L		06-OCT-00	CC5
		Copper (Cu)	0.002	0.001	mg/L		06-OCT-00	CC5
		Iron (Fe)	0.389	0.005	mg/L		06-OCT-00	CC5
		Manganese (Mn)	0.199	0.001	mg/L		06-OCT-00	CC5
		Molybdenum (Mo)	<0.005	0.005	mg/L		06-OCT-00	CC5
		Nickel (Ni)	0.003	0.002	mg/L		06-OCT-00	CC5
		Phosphorus (P)	0.25	0.05	mg/L		06-OCT-00	CC5
		Lead (Pb)	<0.005	0.005	mg/L		06-OCT-00	CC5
		Tin (Sn)	<0.05	0.05	mg/L		06-OCT-00	CC5
		Strontium (Sr)	0.111	0.002	mg/L		06-OCT-00	CC5
		Titanium (Ti)	0.011	0.001	mg/L		06-OCT-00	CC5
		Thallium (Tl)	<0.05	0.05	mg/L		06-OCT-00	CC5
		Vanadium (V)	<0.001	0.001	mg/L		06-OCT-00	CC5
		Zinc (Zn)	0.008	0.001	mg/L		06-OCT-00	CC5
		Ammonia-N	<0.05	0.05	mg/L		04-OCT-00	BT

EnviroTest — CHAIN OF CUSTODY / ANALYTICAL REQUEST FORM

9936 - 67th Avenue, Edmonton, Alberta T6E 0P5 — Telephone (780) 413-5220 — Fax (780) 437-2311
1315 - 44th Avenue N.E., Calgary, Alberta — Telephone (403) 291-9897 — Fax (403) 291-0298
Saskatoon, Saskatchewan — Telephone (306) 668-8370 — Fax (306) 668-8383
745 Logan Avenue, Winnipeg, Manitoba — Telephone (204) 945-3705 — Fax (204) 945-0763
Thunder Bay, Ontario — Telephone (807) 623-6463 — Fax (807) 623-7598

DATE: 28/09/00 DATE REQUIRED: ______

SERVICE REQUESTED:

☐ REGULAR ☐ PRIORITY (50% SURCHARGE) ☐ EMERGENCY (100% SURCHARGE)

SPECIAL REQUIREMENTS / REGS (CIRCLE ONE)

MISA TIER I CCME
BC MELP AB MUST
OTHER ______

ANALYSIS REQUESTED:

L18616

SAMPLE ID	SAMPLED BY / DATE / TIME	LOCATION OF SAMPLING	SAMPLING METHOD	SAMPLE TYPE	C-DIS-ORG-ED	AS-AS3-DIS-ED	AS-AS5-DIS-ED	METAL-DIS-ED	METAL-TOT-ED	NH4-ED	NO2-ED	~~NO3-ED~~	CL-ED	PO4-ED	CN-TOT-TR	LAB SAMPLE NO.
TLG-7A-SW-09/00	20/09/00	Giant-YK		Water	✓	✓	✓	✓	✓	✓	✓	✓		✓		1
TLG-7B-SW-09/00	20/09/00	Giant-YK		Water	✓	✓	✓	✓	✓	✓	✓	✓		✓		2
TLG-7C-SW-09/00	20/09/00	Giant-YK		Water	✓	✓	✓	✓	✓	✓	✓	✓				3
TLG-6L-SW-09/00					✓	✓	✓	✓	✓	✓	✓	✓				4
				PRESERVED / FILTERED												

NOTES & CONDITIONS

1. Quote number must be provided to ensure proper pricing.
2. Turnaround times will vary dependent on complexity of analysis & Lab workload at time of submission. Please contact the Lab to confirm turnaround times.
3. All hazardous samples submitted must be labeled to comply with WHMIS regulations. This must include the nature of the hazard, as well as a contact name & phone number so that the Lab can contact for further information.

NOTE: Failure to properly complete all portions of this form may delay analysis.

NOTE: Shaded areas MUST be completed in full by client for sample processing to occur.

A/C 10808

CLIENT: Golder Assoc's NO. BOTTLES SUBMITTED: 22

CONTACT: Valerie Bertrand PHONE: 604 296 4312

REPORT ADDRESS: 500-4260 Still Creek Dr. 604 298 5253

Burnaby, BC V5C 6C6 QUOTE NO: Q5463

INVOICE ADDRESS: same PO NO: Giant Mine

RELINQUISHED BY:	DATE: / TIME:	RECEIVED BY:	DATE: / TIME:
		ETL LAB	
RELINQUISHED BY:	DATE: / TIME:	RECEIVED BY:	DATE: / TIME:
		ETL LAB	

SAMPLE CONDITION ON RECEIPT:

FROZEN: ______ COLD ______ AMBIENT ______

OTHER (CUSTODY SEAL, ETC.): ______

WHITE - Report Copy
PINK - Lab Copy
YELLOW - Customer Copy

ENVIRO-TEST QC REPORT

Workorder L18616

	Calcium (Ca)	<0.5		mg/L	2.5	11-OCT-00
	Cadmium (Cd)	<0.001		mg/L	0.005	11-OCT-00
	Cobalt (Co)	<0.002		mg/L	0.01	11-OCT-00
	Chromium (Cr)	<0.005		mg/L	0.025	11-OCT-00
	Copper (Cu)	<0.001		mg/L	0.005	11-OCT-00
	Iron (Fe)	0.015		mg/L	0.025	11-OCT-00
	Potassium (K)	<0.1		mg/L	0.5	11-OCT-00
	Magnesium (Mg)	<0.01		mg/L	0.05	11-OCT-00
	Manganese (Mn)	<0.001		mg/L	0.005	11-OCT-00
	Molybdenum (Mo)	<0.005		mg/L	0.025	11-OCT-00
	Sodium (Na)	<0.5		mg/L	2.5	11-OCT-00
	Nickel (Ni)	<0.002		mg/L	0.01	11-OCT-00
	Phosphorus (P)	<0.1		mg/L	0.5	11-OCT-00
	Lead (Pb)	<0.005		mg/L	0.025	11-OCT-00
	Tin (Sn)	<0.05		mg/L	0.25	11-OCT-00
	Strontium (Sr)	<0.005		mg/L	0.025	11-OCT-00
	Titanium (Ti)	<0.001		mg/L	0.005	11-OCT-00
	Thallium (Tl)	<0.05		mg/L	0.25	11-OCT-00
	Vanadium (V)	<0.001		mg/L	0.005	11-OCT-00
	Zinc (Zn)	0.008	A	mg/L	0.005	11-OCT-00
WG21518-1						
AS-TOT-HYD-ED	Arsenic (As)-Total	<0.0004		mg/L	0.002	24-OCT-00

QC Type: DUP

Lab QC Number:		RPD	Qualifier	Limit %	Analyzed
WG20056-3					
NH4-ED	Ammonia-N	1.0		4.33	04-OCT-00
WG20172-4					
PH/EC/ALK-ED	pH	0.96	H	0.88	03-OCT-00
	Conductivity (EC)	3.1	G	1.03	03-OCT-00
	Bicarbonate (HCO3)	0.0055		1.83	03-OCT-00
	Carbonate (CO3)	N/A	RPD-NA	1.83	03-OCT-00
	Hydroxide	N/A	RPD-NA		03-OCT-00
	Alkalinity, Total	0.0065		1.25	03-OCT-00
WG20172-5					
PH/EC/ALK-ED	pH	0.75		0.88	03-OCT-00
	Conductivity (EC)	1.7	C	1.03	03-OCT-00
	Bicarbonate (HCO3)	2.9	G	1.83	03-OCT-00
	Carbonate (CO3)	N/A	RPD-NA	1.83	03-OCT-00
	Hydroxide	N/A	RPD-NA		03-OCT-00
	Alkalinity, Total	2.9	D	1.25	03-OCT-00
WG20172-6					
PH/EC/ALK-ED	pH	0.11		0.88	03-OCT-00
	Conductivity (EC)	1.9	G	1.03	03-OCT-00
	Bicarbonate (HCO3)	0.39		1.83	03-OCT-00

ENVIRO-TEST QC REPORT

Workorder L18616

	Nickel (Ni)	7.7		20	13-OCT-00
	Phosphorus (P)	N/A	RPD-NA	20	13-OCT-00
	Lead (Pb)	N/A	RPD-NA	20	13-OCT-00
	Tin (Sn)	N/A	RPD-NA	20	13-OCT-00
	Strontium (Sr)	0.026		20	13-OCT-00
	Titanium (Ti)	38	D	20	13-OCT-00
	Thallium (Tl)	N/A	RPD-NA	20	13-OCT-00
	Vanadium (V)	14		20	13-OCT-00
	Zinc (Zn)	38	D	20	13-OCT-00
WG20172-10					
PH/EC/ALK-ED	pH	0.0013		0.36	03-OCT-00
	Conductivity (EC)	0.086		1.03	03-OCT-00
	Bicarbonate (HCO3)	0.40		1.63	03-OCT-00
	Carbonate (CO3)	N/A	RPD-NA	1.63	03-OCT-00
	Hydroxide	N/A	RPD-NA		03-OCT-00
	Alkalinity, Total	0.40		1.25	03-OCT-00

QC Type: LCS

Lab QC Number:		% Recovery	Qualifier	Limit %	Analyzed
WG20038-2					
CL-ED	Chloride (Cl)	105		98.4-107	03-OCT-00
WG20038-3					
CL-ED	Chloride (Cl)	101		98.4-107	03-OCT-00
WG20056-2					
NH4-ED	Ammonia-N	102		93.5-108.6	04-OCT-00
WG20092-2					
N2N3-ED	Nitrate+Nitrite-N	112		89.2-118.9	04-OCT-00
WG20172-1					
PH/EC/ALK-ED	pH	101		99-101	03-OCT-00
	Conductivity (EC)	106		94-109	03-OCT-00
	Alkalinity, Total	100		96.2-104	03-OCT-00
WG20172-2					
PH/EC/ALK-ED	pH	99		99-101	03-OCT-00
	Conductivity (EC)	100		94-109	03-OCT-00
WG20172-3					
PH/EC/ALK-ED	pH	100		99-101	03-OCT-00
	Conductivity (EC)	94		94-109	03-OCT-00
[illegible]20242-2					
[illegible]-ROUTINE-ICP-ED	Calcium (Ca)	101		99.1-102.3	05-OCT-00
	Potassium (K)	100		98.4-101.6	05-OCT-00
	Magnesium (Mg)	104		101-105.5	05-OCT-00
	Sodium (Na)	100		95-104.6	05-OCT-00
	Sulfate (SO4)	102		97.9-104.2	05-OCT-00

ENVIRO-TEST QC REPORT

Workorder L18616

Type: **MSD**

Lab QC Number:		RPD	Qualifier	Limit %	Analyzed
WG20038-8					
CL-ED	Chloride (Cl)	0.98		1.19	03-OCT-00
WG20052-6					
N2N3-ED	Nitrate+Nitrite-N	2.1		4.48	04-OCT-00

dmonton (Main)
0?3 - 67 Avenue
dmonton, AB
5? 0P5
hone: (780) 413-5227
ax: (780) 437-2311

dmonton (Downtown)
ndustrial Hygiene
?? Flr, 10?38 - 103 Street
dmonton, AB
5J 0X6
hone: (780) 413-5262
ax: (780) 424-4602

algary
ay 2, 1313 - 44th Ave. NE
algary, AB
2E 6L5
hone: (403) 291-9897
ax: (403) 291-0298

rande Prairie
505 - 111 Street
rande Prairie, AB
8V 6W1
hone: (780) 539-5196
ax: (780) 513-2191

askatoon
24 Veterinary Road
askatoon, SK
7N 5E5
hone: (306) 668-8370
ax: (306) 668-8383
-800-667-7645

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45 Logan Avenue
Winnipeg, MB
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ttawa, ON
1G 4J8
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ax: (613) 736-1107

Wyoming
20 West First Street
asper, Wyoming 82601
hone: (307) 235-5741
ax: (307) 235-1075
-800-666-0505

anada Wide Phone:
-8 8-6675

Western Canada Fax:
800-288-7319

www.envirotest.com

ETL Enviro-Test

A DIVISION OF ENVIRO-TEST LABORATORIES / CANADA

CHEMICAL ANALYSIS REPORT

GOLDER ASSOCIATES LTD

DATE: November 16, 2000

ATTN: VALERIE BERTRAND

500 4260 STILL CREEK DRIVE

BURNABY BC V5C 6C6

surf. water

Lab Work Order #: L19645 Sampled By: DP Date Received: 10/17/00

Project P.O. #: GOLDER 002-2418

Project Reference: 002-2418-5300

Comments: ADDITIONAL 23-OCT-00 12:00

APPROVED BY: ______________________

ROY JONES
Project Manager

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L19648-3	TLG-11-SW-10/00							
Sample Date	16-OCT-00							
Matrix:	WATER							
		Metals, Dissolved						
		Nickel (Ni)	0.027	0.002	mg/L		23-OCT-00	RG
		Phosphorus (P)	<0.1	0.1	mg/L		23-OCT-00	RG
		Lead (Pb)	<0.005	0.005	mg/L		23-OCT-00	RG
		Tin (Sn)	<0.05	0.05	mg/L		23-OCT-00	RG
		Strontium (Sr)	1.29	0.005	mg/L		23-OCT-00	RG
		Titanium (Ti)	<0.001	0.001	mg/L		23-OCT-00	RG
		Thallium (Tl)	<0.05	0.05	mg/L		23-OCT-00	RG
		Vanadium (V)	0.004	0.001	mg/L		23-OCT-00	RG
		Zinc (Zn)	0.016	0.001	mg/L		23-OCT-00	RG
		Alkalinity, Total	131	5	mg/L		20-OCT-00	PTT
		Antimony (Sb)-Total	0.516	0.0004	mg/L		23-OCT-00	RG
		Arsenic (As)-Total	2.68	0.0004	mg/L		23-OCT-00	RG
		Cyanide, Total	0.027	0.002	mg/L	20-OCT-00	23-OCT-00	MRR
		Mercury (Hg)-Total	<0.0002	0.0002	mg/L		23-OCT-00	RG
		Metals-Total						
		Silver (Ag)	<0.005	0.005	mg/L		23-OCT-00	RG
		Aluminum (Al)	0.91	0.01	mg/L		23-OCT-00	RG
		Boron (B)	0.26	0.05	mg/L		23-OCT-00	RG
		Barium (Ba)	0.042	0.005	mg/L		23-OCT-00	RG
		Beryllium (Be)	<0.002	0.002	mg/L		23-OCT-00	RG
		Calcium (Ca)	234	0.5	mg/L		23-OCT-00	RG
		Cadmium (Cd)	<0.001	0.001	mg/L		23-OCT-00	RG
		Cobalt (Co)	0.065	0.002	mg/L		23-OCT-00	RG
		Chromium (Cr)	<0.005	0.005	mg/L		23-OCT-00	RG
		Copper (Cu)	0.262	0.001	mg/L		23-OCT-00	RG
		Iron (Fe)	0.915	0.005	mg/L		23-OCT-00	RG
		Potassium (K)	9.6	0.1	mg/L		23-OCT-00	RG
		Magnesium (Mg)	91.2	0.1	mg/L		23-OCT-00	RG
		Manganese (Mn)	0.389	0.001	mg/L		23-OCT-00	RG
		Molybdenum (Mo)	0.027	0.005	mg/L		23-OCT-00	RG
		Sodium (Na)	97	1	mg/L		23-OCT-00	RG
		Nickel (Ni)	0.015	0.002	mg/L		23-OCT-00	RG
		Phosphorus (P)	0.07	0.05	mg/L		23-OCT-00	RG
		Lead (Pb)	<0.005	0.005	mg/L		23-OCT-00	RG
		Tin (Sn)	<0.05	0.05	mg/L		23-OCT-00	RG
		Strontium (Sr)	1.24	0.002	mg/L		23-OCT-00	RG
		Titanium (Ti)	0.035	0.001	mg/L		23-OCT-00	RG
		Thallium (Tl)	<0.05	0.05	mg/L		23-OCT-00	RG
		Vanadium (V)	0.006	0.001	mg/L		23-OCT-00	RG
		Zinc (Zn)	0.101	0.001	mg/L		23-OCT-00	RG
		Ammonia-N	<0.05	0.05	mg/L		18-OCT-00	ET
		Dissolved Organic Carbon	7	1	mg/L		19-OCT-00	HAN
		Nitrate-N	3.0	0.1	mg/L		18-OCT-00	LDP
		Nitrite-N	<0.05	0.05	mg/L		18-OCT-00	LDP
L19648-4	TLG-11A-SW-10/00							
Sample Date	16-OCT-00							
Matrix:	WATER							

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L19648-4	TLG-11A-SW-10/00							
Sample Date	16-OCT-00							
Matrix:	WATER							
		Metals-Total						
		Magnesium (Mg)	65.4	0.1	mg/L		24-OCT-00	OL
		Manganese (Mn)	0.372	0.001	mg/L		24-OCT-00	OL
		Molybdenum (Mo)	0.027	0.005	mg/L		24-OCT-00	OL
		Sodium (Na)	131	1	mg/L		24-OCT-00	OL
		Nickel (Ni)	0.039	0.002	mg/L		24-OCT-00	OL
		Phosphorus (P)	0.08	0.05	mg/L		24-OCT-00	OL
		Lead (Pb)	<0.005	0.005	mg/L		24-OCT-00	OL
		Tin (Sn)	<0.05	0.05	mg/L		24-OCT-00	OL
		Strontium (Sr)	1.20	0.002	mg/L		24-OCT-00	OL
		Titanium (Ti)	0.028	0.001	mg/L		24-OCT-00	OL
		Thallium (Tl)	<0.05	0.05	mg/L		24-OCT-00	OL
		Vanadium (V)	0.005	0.001	mg/L		24-OCT-00	OL
		Zinc (Zn)	0.008	0.001	mg/L		24-OCT-00	OL
		Ammonia-N	<0.05	0.05	mg/L		19-OCT-00	BT
		Dissolved Organic Carbon	6	1	mg/L		19-OCT-00	HAN
		Nitrate-N	5.2	0.1	mg/L		19-OCT-00	LDD
		Nitrite-N	<0.05	0.05	mg/L		19-OCT-00	LDD

EnviroTest — CHAIN OF CUSTODY / ANALYTICAL REQUEST FORM

9936 - 67 Avenue, Edmonton, Alberta T6E 0P5 — Telephone (780) 413-5950 — Fax (780) 437-2311
Telephone 1-800-668-9878 — Fax 1-800-668-7219
Calgary, Alberta — Telephone (403) 291-9897 — Fax (403) 291-0298
Grande Prairie, Alberta — Telephone (780) 539-5196 — Fax (780) 513-7101
Saskatoon, Saskatchewan — Telephone (306) 668-8370 — Fax (306) 668-8383
Winnipeg, Manitoba — Telephone (204) 945-3705 — Fax (204) 945-0763
Thunder Bay, Ontario — Telephone (807) 623-6463 — Fax (807) 623-7598

DATE: 16 Oct 00 DATE REQUIRED: 30 October

SERVICE REQUESTED:
☒ REGULAR ☐ PRIORITY (50% SURCHARGE) ☐ EMERGENCY (100% SURCHARGE)

SPECIAL REQUIREMENTS / REGS (CIRCLE ONE)
MISA — TIER 1 — CCME
BC MELP — AB MUST
OTHER ____

ANALYSIS REQUESTED:

L19648

SAMPLE ID	SAMPLED BY / DATE / TIME	LOCATION OF SAMPLING	SAMPLING METHOD	SAMPLE TYPE	Nitrate / Nitrite	DOC (conventional EStrong)	Alkalinity	Arsenic Speciation	Cyanide	Ammonia	Total Metals	Dissolved Metals	LAB SAMPLE NO.
TLG-7A-SW-10/00	DP 16 Oct 00	Dam 7	Grab	H_2O	X	X	X	✓	X				
TLG-7B-SW-10/00	DP	Dam 7	Grab	H_2O	X	X	X	X	X				
TLG-11-SW-10/00	DP 115	Dam 11	Grab	H_2O	X	X	X	X	X	✓	X	X	
TLG-11A-SW-10/00	DP 125	Dam 11	Grab	H_2O	X	X	X	X	X	X	X	X	
					NO3-ED / NO2-ED	C-DIS-ORG-ED ✓	ALK-TOT-ED ✓		CN-TOT-B ✓	NH4-ED ✓	metal-tot-ed ✓	metal-dis-ed ✓	AS-DIS-HYD-ED / AS-AS3-DIS-ED / AS-AS5-DIS-ED
PRESERVED								✓	✓	✓	✓	✓	

4x 100mL p
4x 250mL up nut k
2x 125mL jar dissolved
4x 250mL metals (EDTA as spec)
2x 500mL pure nut.

NOTES & CONDITIONS
1. Quote number must be provided to ensure proper pricing.
2. Turnaround times will vary depending on complexity of analysis & Lab usage at time of submission. Please contact the Lab to confirm turnaround times.
3. All hazardous samples submitted must be labeled to comply with WHMIS regulations. This must include the nature of the hazard, as well as a contact name & phone number that the Lab can contact for further information.

NOTE: Failure to properly complete all portions of this form may delay analysis.

NOTE: Shaded areas MUST be completed in full by client for sample processing to occur

CLIENT: Golder Associates
CONTACT: Valerie Bertrand
REPORT ADDRESS: 4260 Still Creek Dr. #500 Burnaby BC V5C 6C6
BILLING ADDRESS: As above
NO. OF TEST SUBMITTED: 18
PHONE: (604) 298-6623
FAX: (604) 298-5253
QUOTE NO: Q5463
P.O. NO: Golder 002-2418

802-2418-5700

RELINQUISHED BY	DATE / TIME	RECEIVED BY	DATE / TIME
D Pawayi	16 Oct 00 / 1600	ETL LAB: [signature]	Oct-A00 / 10:10
RELINQUISHED BY	DATE / TIME	RECEIVED BY ETL LAB	DATE / TIME

SAMPLE CONDITION UPON RECEIPT: ✓
FROZEN ____ COLD ____ AMBIENT ____
DISPOSED BY: SIGNATURE, LAB NAME, DATE ____

WHITE - Report Copy
PINK - File Copy
YELLOW - Customer Copy

ENVIRO-TEST QC REPORT

Workorder L19648

	Molybdenum (Mo)	<0.005		mg/L	0.025	23-OCT-00
	Sodium (Na)	<0.5		mg/L	2.5	23-OCT-00
	Nickel (Ni)	<0.002		mg/L	0.01	23-OCT-00
	Phosphorus (P)	<0.1		mg/L	0.5	23-OCT-00
	Lead (Pb)	<0.005		mg/L	0.025	23-OCT-00
	Tin (Sn)	<0.05		mg/L	0.25	23-OCT-00
	Strontium (Sr)	<0.005		mg/L	0.025	23-OCT-00
	Titanium (Ti)	0.001		mg/L	0.005	23-OCT-00
	Thallium (Tl)	<0.05		mg/L	0.25	23-OCT-00
	Vanadium (V)	<0.001		mg/L	0.005	23-OCT-00
	Zinc (Zn)	0.002		mg/L	0.005	23-OCT-00
SB-DIS-HYD-ED	Antimony (Sb)-Dissolved	<0.0004		mg/L	0.002	23-OCT-00
WG21420-1						
METAL-TOT-ED	Silver (Ag)	<0.005		mg/L	0.025	24-OCT-00
	Aluminum (Al)	0.05		mg/L	0.05	24-OCT-00
	Boron (B)	<0.05		mg/L	0.25	24-OCT-00
	Barium (Ba)	<0.003		mg/L	0.015	24-OCT-00
	Beryllium (Be)	<0.002		mg/L	0.01	24-OCT-00
	Calcium (Ca)	<0.5		mg/L	2.5	24-OCT-00
	Cadmium (Cd)	<0.001		mg/L	0.005	24-OCT-00
	Cobalt (Co)	<0.002		mg/L	0.01	24-OCT-00
	Chromium (Cr)	<0.005		mg/L	0.025	24-OCT-00
	Copper (Cu)	0.001		mg/L	0.005	24-OCT-00
	Iron (Fe)	0.028	A	mg/L	0.025	24-OCT-00
	Potassium (K)	<0.1		mg/L	0.5	24-OCT-00
	Magnesium (Mg)	<0.1		mg/L	0.5	24-OCT-00
	Manganese (Mn)	<0.001		mg/L	0.005	24-OCT-00
	Molybdenum (Mo)	<0.005		mg/L	0.025	24-OCT-00
	Sodium (Na)	<1		mg/L	5	24-OCT-00
	Nickel (Ni)	<0.002		mg/L	0.01	24-OCT-00
	Phosphorus (P)	0.06		mg/L	0.25	24-OCT-00
	Lead (Pb)	<0.005		mg/L	0.025	24-OCT-00
	Tin (Sn)	<0.05		mg/L	0.25	24-OCT-00
	Strontium (Sr)	<0.002		mg/L	0.01	24-OCT-00
	Titanium (Ti)	<0.001		mg/L	0.005	24-OCT-00
	Thallium (Tl)	<0.05		mg/L	0.25	24-OCT-00
	Vanadium (V)	<0.001		mg/L	0.005	24-OCT-00
	Zinc (Zn)	0.010	A	mg/L	0.005	24-OCT-00
WG22281-1						
AS-AS3-DIS-ED	Arsenic (As) 3+-Dissolved	<0.0002		mg/L	0.001	02-NOV-00
AS-AS5-DIS-ED	Arsenic (As) 5+-Dissolved	<0.0002		mg/L	0.001	02-NOV-00
AS-DIS-HYD-ED	Arsenic (As)-Dissolved	<0.0004		mg/L	0.002	02-NOV-00

ENVIRO-TEST QC REPORT

Workorder L19248

ALK-TOT-ED	Alkalinity, Total	3.4	G	1.25	20-OCT-00

QC Type: LCS

Lab QC Number:		% Recovery	Qualifier	Limit %	Analyzed
WG21129-2					
NO2-ED	Nitrite-N	103		95-111.7	18-OCT-00
NO3-ED	Nitrate-N	103		95-111.7	18-OCT-00
WG21129-3					
NO2-ED	Nitrite-N	103		95-111.7	18-OCT-00
NO3-ED	Nitrate-N	103		95-111.7	18-OCT-00
WG21248-2					
NH4-ED	Ammonia-N	108		93.5-106.6	19-OCT-00
WG21262-2					
C-DIS-ORG-ED	Dissolved Organic Carbon	98		96-102	19-OCT-00
WG21289-1					
ALK-TOT-ED	Alkalinity, Total	103		95.2-104	20-OCT-00
WG22281-2					
AS-AS3-DIS-ED	Arsenic (As) 3+-Dissolved	94		90-110	02-NOV-00
WG22281-3					
AS-AS5-DIS-ED	Arsenic (As) 5+-Dissolved	69	G	90-110	02-NOV-00

QC Type: MS

Lab QC Number:		% Recovery	Qualifier	Limit %	Analyzed
WG21129-6					
NO2-ED	Nitrite-N	93	H	94.6-104.1	18-OCT-00
WG21248-4					
NH4-ED	Ammonia-N	109		81.3-130.2	19-OCT-00
WG21262-4					
C-DIS-ORG-ED	Dissolved Organic Carbon	99		88.8-104.2	19-OCT-00
WG21389-2					
CN-TOT-TB	Cyanide, Total	100		75-125	23-OCT-00
WG21397-5					
AS-DIS-HYD-ED	Arsenic (As)-Dissolved	115		75-125	23-OCT-00
HG-DIS-HYD-ED	Mercury (Hg)-Dissolved	109		75-125	23-OCT-00
METAL-DIS-ED	Silver (Ag)	91		75-125	23-OCT-00
	Aluminum (Al)	101		75-125	23-OCT-00
	Boron (B)	105		75-125	23-OCT-00
	Barium (Ba)	97		75-125	23-OCT-00
	Beryllium (Be)	107		75-125	23-OCT-00

ENVIRO-TEST QC REPORT

Workorder L19648

Legend:

Limit	95% Confidence Interval (Laboratory Warning Limits)
DUP	Duplicate
RPD	Relative Percent Difference ((higher result-lower result)/Average, expressed as %)
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Materials
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material

Qualifier:

RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.
A	Method blank exceeds detection limit. Blank correction applied, where appropriate.
B	Method blank result exceeds detection limit, however, it is less than 5% of sample concentration. Blank correction not applied.
C	Method blank result exceeds detection limit, however, it is less than 5% of the regulatory limit for the analyte of interest. Blank correction not applied.
D	Duplicate result exceeds limit due to increased variability for low level samples.
E	Matrix spike limit exceeded due to high sample background.
F	Silver recovery low, likely due to elevated chloride levels in sample.
G	Outlier - No assignable cause for nonconformity has been determined.
H	Result fall within the 99% Confidence Interval (Laboratory Control Limits)

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L14821-2	MW00-3A							
Sample Date	01-AUG-00							
Matrix:	WATER							
		Routine Water Analysis						
		Chloride (Cl)	132	1	mg/L		04-AUG-00	LDD
		Nitrate+Nitrite-N	0.3	0.1	mg/L		04-AUG-00	LDD
		pH, Conductivity and Total Alkalinity						
		pH	7.5	0.1	pH		04-AUG-00	PTT
		Conductivity (EC)	1790	0.2	uS/cm		04-AUG-00	PTT
		Bicarbonate (HCO3)	251	5	mg/L		04-AUG-00	PTT
		Carbonate (CO3)	<5	5	mg/L		04-AUG-00	PTT
		Hydroxide	<5	5	mg/L		04-AUG-00	PTT
		Alkalinity, Total	206	5	mg/L		04-AUG-00	PTT
		Ion Balance Calculation						
		Ion Balance	103		%		08-AUG-00	
		TDS (Calculated)	1190		mg/L		08-AUG-00	
		Hardness	618		mg/L		08-AUG-00	
		ICP metals and SO4 for routine water						
		Calcium (Ca)	156	0.5	mg/L		08-AUG-00	MDR
		Potassium (K)	11.5	0.1	mg/L		08-AUG-00	MDR
		Magnesium (Mg)	55.6	0.1	mg/L		08-AUG-00	MDR
		Sodium (Na)	163	1	mg/L		08-AUG-00	MDR
		Sulfate (SO4)	544	0.5	mg/L		08-AUG-00	MDR
		Antimony (Sb)-Dissolved	0.0056	0.0004	mg/L		11-AUG-00	MD
		Arsenic (As) 3+-Dissolved	0.0042	0.0002	mg/L		23-SEP-00	JJ
		Arsenic (As) 5+-Dissolved	0.0318	0.0002	mg/L		23-SEP-00	JJ
		Mercury (Hg)-Dissolved	<0.0002	0.0002	mg/L		11-AUG-00	MD
		Metals, Dissolved						
		Silver (Ag)	<0.005	0.005	mg/L		11-AUG-00	MD
		Aluminum (Al)	0.32	0.01	mg/L		11-AUG-00	MD
		Boron (B)	0.19	0.05	mg/L		11-AUG-00	MD
		Barium (Ba)	0.044	0.003	mg/L		11-AUG-00	MD
		Beryllium (Be)	<0.001	0.001	mg/L		11-AUG-00	MD
		Cadmium (Cd)	<0.001	0.001	mg/L		11-AUG-00	MD
		Cobalt (Co)	0.052	0.002	mg/L		11-AUG-00	MD
		Chromium (Cr)	<0.005	0.005	mg/L		11-AUG-00	MD
		Copper (Cu)	0.003	0.001	mg/L		11-AUG-00	MD
		Iron (Fe)	1.23	0.005	mg/L		11-AUG-00	MD
		Manganese (Mn)	0.435	0.001	mg/L		11-AUG-00	MD
		Molybdenum (Mo)	0.011	0.005	mg/L		11-AUG-00	MD
		Nickel (Ni)	0.008	0.002	mg/L		11-AUG-00	MD
		Phosphorus (P)	7.5	0.1	mg/L		11-AUG-00	MD
		Lead (Pb)	<0.005	0.005	mg/L		11-AUG-00	MD
		Tin (Sn)	<0.05	0.05	mg/L		11-AUG-00	MD
		Strontium (Sr)	1.63	0.005	mg/L		11-AUG-00	MD
		Titanium (Ti)	0.019	0.001	mg/L		11-AUG-00	MD
		Thallium (Tl)	<0.05	0.05	mg/L		11-AUG-00	MD
		Vanadium (V)	0.005	0.001	mg/L		11-AUG-00	MD
		Zinc (Zn)	0.003	0.001	mg/L		11-AUG-00	MD
		Arsenic (As)-Dissolved						
		Arsenic (As)-Dissolved	0.0380	0.0004	mg/L		07-SEP-00	JJ
		Arsenic (As)-Dissolved	0.0745	0.0004	mg/L		11-AUG-00	MD
		Antimony (Sb)-Total	0.0031	0.0004	mg/L		08-AUG-00	MD

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L14821-3	MW00-3B							
Sample Date	01-AUG-00							
Matrix:	WATER							
		Routine Water Analysis						
		ICP metals and SO4 for routine water						
		Potassium (K)	9.1	0.1	mg/L		08-AUG-00	MOR
		Magnesium (Mg)	47.2	0.1	mg/L		08-AUG-00	MOR
		Sodium (Na)	86	1	mg/L		08-AUG-00	MOR
		Sulfate (SO4)	378	0.5	mg/L		08-AUG-00	MOR
		Antimony (Sb)-Dissolved	0.0163	0.0004	mg/L		11-AUG-00	MD
		Arsenic (As) 3+-Dissolved	<0.0002	0.0002	mg/L		23-SEP-00	JJ
		Arsenic (As) 5+-Dissolved	0.0267	0.0002	mg/L		23-SEP-00	JJ
		Mercury (Hg)-Dissolved	<0.0002	0.0002	mg/L		11-AUG-00	MD
		Metals, Dissolved						
		Silver (Ag)	<0.005	0.005	mg/L		11-AUG-00	MD
		Aluminum (Al)	0.14	0.01	mg/L		11-AUG-00	MD
		Boron (B)	0.13	0.05	mg/L		11-AUG-00	MD
		Barium (Ba)	0.081	0.003	mg/L		11-AUG-00	MD
		Beryllium (Be)	<0.001	0.001	mg/L		11-AUG-00	MD
		Cadmium (Cd)	<0.001	0.001	mg/L		11-AUG-00	MD
		Cobalt (Co)	0.093	0.002	mg/L		11-AUG-00	MD
		Chromium (Cr)	<0.005	0.005	mg/L		11-AUG-00	MD
		Copper (Cu)	0.005	0.001	mg/L		11-AUG-00	MD
		Iron (Fe)	0.067	0.005	mg/L		11-AUG-00	MD
		Manganese (Mn)	3.285	0.001	mg/L		11-AUG-00	MD
		Molybdenum (Mo)	0.013	0.005	mg/L		11-AUG-00	MD
		Nickel (Ni)	0.004	0.002	mg/L		11-AUG-00	MD
		Phosphorus (P)	2.5	0.1	mg/L		11-AUG-00	MD
		Lead (Pb)	<0.005	0.005	mg/L		11-AUG-00	MD
		Tin (Sn)	<0.05	0.05	mg/L		11-AUG-00	MD
		Strontium (Sr)	1.42	0.005	mg/L		11-AUG-00	MD
		Titanium (Ti)	<0.001	0.001	mg/L		11-AUG-00	MD
		Thallium (Tl)	<0.05	0.05	mg/L		11-AUG-00	MD
		Vanadium (V)	0.009	0.001	mg/L		11-AUG-00	MD
		Zinc (Zn)	0.004	0.001	mg/L		11-AUG-00	MD
		Arsenic (As)-Dissolved						
		Arsenic (As)-Dissolved	0.0267	0.0004	mg/L		07-SEP-00	JJ
		Arsenic (As)-Dissolved	0.0465	0.0004	mg/L		11-AUG-00	MD
		Antimony (Sb)-Total	0.0133	0.0004	mg/L		08-AUG-00	MD
		Arsenic (As)-Total	0.0687	0.0004	mg/L		08-AUG-00	MD
		Cyanide, Total	0.014	0.002	mg/L	05-AUG-00	09-AUG-00	MRR
		Mercury (Hg)-Total	<0.0002	0.0002	mg/L		08-AUG-00	MD
		Metals-Total						
		Silver (Ag)	<0.005	0.005	mg/L		08-AUG-00	MD
		Aluminum (Al)	44.9	0.01	mg/L		08-AUG-00	MD
		Boron (B)	0.14	0.05	mg/L		08-AUG-00	MD
		Barium (Ba)	0.523	0.002	mg/L		08-AUG-00	MD
		Beryllium (Be)	<0.002	0.002	mg/L		08-AUG-00	MD
		Cadmium (Cd)	<0.001	0.001	mg/L		08-AUG-00	MD
		Cobalt (Co)	0.064	0.002	mg/L		08-AUG-00	MD
		Chromium (Cr)	0.053	0.005	mg/L		08-AUG-00	MD
		Copper (Cu)	0.092	0.001	mg/L		08-AUG-00	MD
		Iron (Fe)	59.5	0.005	mg/L		08-AUG-00	MD

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L14821-4	MW00-2							
Sample Date: 01-AUG-00								
Matrix:	WATER							
		Metals, Dissolved						
		Boron (B)	0.15	0.05	mg/L		11-AUG-00	MD
		Barium (Ba)	0.053	0.003	mg/L		11-AUG-00	MD
		Beryllium (Be)	<0.001	0.001	mg/L		11-AUG-00	MD
		Cadmium (Cd)	<0.001	0.001	mg/L		11-AUG-00	MD
		Cobalt (Co)	0.032	0.002	mg/L		11-AUG-00	MD
		Chromium (Cr)	<0.005	0.005	mg/L		11-AUG-00	MD
		Copper (Cu)	0.002	0.001	mg/L		11-AUG-00	MD
		Iron (Fe)	<0.005	0.005	mg/L		11-AUG-00	MD
		Manganese (Mn)	0.494	0.001	mg/L		11-AUG-00	MD
		Molybdenum (Mo)	0.024	0.005	mg/L		11-AUG-00	MD
		Nickel (Ni)	0.007	0.002	mg/L		11-AUG-00	MD
		Phosphorus (P)	0.9	0.1	mg/L		11-AUG-00	MD
		Lead (Pb)	<0.005	0.005	mg/L		11-AUG-00	MD
		Tin (Sn)	<0.05	0.05	mg/L		11-AUG-00	MD
		Strontium (Sr)	1.43	0.005	mg/L		11-AUG-00	MD
		Titanium (Ti)	<0.001	0.001	mg/L		11-AUG-00	MD
		Thallium (Tl)	<0.05	0.05	mg/L		11-AUG-00	MD
		Vanadium (V)	0.009	0.001	mg/L		11-AUG-00	MD
		Zinc (Zn)	0.002	0.001	mg/L		11-AUG-00	MD
		Arsenic (As)-Dissolved						
		Arsenic (As)-Dissolved	0.275	0.0004	mg/L		11-AUG-00	MD
		Arsenic (As)-Dissolved	0.290	0.0004	mg/L		07-SEP-00	JJ
		Antimony (Sb)-Total	0.167	0.0004	mg/L		08-AUG-00	MD
		Arsenic (As)-Total	2.58	0.0004	mg/L		08-AUG-00	MD
		Cyanide, Total	0.160	0.002	mg/L	05-AUG-00	09-AUG-00	MRB
		Mercury (Hg)-Total	<0.0002	0.0002	mg/L		08-AUG-00	MD
		Metals-Total						
		Silver (Ag)	<0.005	0.005	mg/L		08-AUG-00	MD
		Aluminum (Al)	204	0.01	mg/L		08-AUG-00	MD
		Boron (B)	0.37	0.05	mg/L		08-AUG-00	MD
		Barium (Ba)	1.10	0.003	mg/L		08-AUG-00	MD
		Beryllium (Be)	0.004	0.002	mg/L		08-AUG-00	MD
		Cadmium (Cd)	0.002	0.001	mg/L		08-AUG-00	MD
		Cobalt (Co)	0.382	0.002	mg/L		08-AUG-00	MD
		Chromium (Cr)	1.07	0.005	mg/L		08-AUG-00	MD
		Copper (Cu)	0.745	0.001	mg/L		08-AUG-00	MD
		Iron (Fe)	348	0.005	mg/L		08-AUG-00	MD
		Manganese (Mn)	8.21	0.001	mg/L		08-AUG-00	MD
		Molybdenum (Mo)	0.035	0.005	mg/L		08-AUG-00	MD
		Nickel (Ni)	0.535	0.002	mg/L		08-AUG-00	MD
		Phosphorus (P)	4.15	0.05	mg/L		08-AUG-00	MD
		Lead (Pb)	0.111	0.005	mg/L		08-AUG-00	MD
		Tin (Sn)	<0.05	0.05	mg/L		08-AUG-00	MD
		Strontium (Sr)	2.00	0.002	mg/L		08-AUG-00	MD
		Titanium (Ti)	8.29	0.001	mg/L		08-AUG-00	MD
		Thallium (Tl)	<0.05	0.05	mg/L		08-AUG-00	MD
		Vanadium (V)	1.01	0.001	mg/L		08-AUG-00	MD
		Zinc (Zn)	0.523	0.001	mg/L		08-AUG-00	MD
		Ammonia-N	3.17	0.05	mg/L		20-AUG-00	EK

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L14821-6	MW00-1							
Sample Date	01-AUG-00							
Matrix	WATER							
		Metals, Dissolved						
		Strontium (Sr)	2.04	0.005	mg/L		16-AUG-00	MD
		Titanium (Ti)	<0.001	0.001	mg/L		16-AUG-00	MD
		Thallium (Tl)	<0.05	0.05	mg/L		16-AUG-00	MD
		Vanadium (V)	0.003	0.001	mg/L		16-AUG-00	MD
		Zinc (Zn)	0.030	0.001	mg/L		16-AUG-00	MD
		Arsenic (As)-Dissolved						
		Arsenic (As)-Dissolved	2.50	0.0004	mg/L		07-SEP-00	JJ
		Arsenic (As)-Dissolved	4.40	0.0004	mg/L		16-AUG-00	MD
		Antimony (Sb)-Total	1.92	0.0004	mg/L		10-AUG-00	MD
		Arsenic (As) Total	1.81	0.0004	mg/L		10-AUG-00	MD
		Cyanide, Total	0.103	0.002	mg/L	05-AUG-00	09-AUG-00	MRR
		Mercury (Hg)-Total	<0.0002	0.0002	mg/L		10-AUG-00	MD
		Metals-Total						
		Silver (Ag)	<0.005	0.005	mg/L		10-AUG-00	MD
		Aluminum (Al)	1.74	0.01	mg/L		10-AUG-00	MD
		Boron (B)	0.63	0.05	mg/L		10-AUG-00	MD
		Barium (Ba)	0.020	0.003	mg/L		10-AUG-00	MD
		Beryllium (Be)	<0.002	0.002	mg/L		10-AUG-00	MD
		Cadmium (Cd)	<0.001	0.001	mg/L		10-AUG-00	MD
		Cobalt (Co)	0.081	0.002	mg/L		10-AUG-00	MD
		Chromium (Cr)	0.005	0.005	mg/L		10-AUG-00	MD
		Copper (Cu)	0.028	0.001	mg/L		10-AUG-00	MD
		Iron (Fe)	2.33	0.005	mg/L		10-AUG-00	MD
		Manganese (Mn)	0.314	0.001	mg/L		10-AUG-00	MD
		Molybdenum (Mo)	0.032	0.005	mg/L		10-AUG-00	MD
		Nickel (Ni)	0.013	0.002	mg/L		10-AUG-00	MD
		Phosphorus (P)	0.14	0.05	mg/L		10-AUG-00	MD
		Lead (Pb)	0.015	0.005	mg/L		10-AUG-00	MD
		Tin (Sn)	<0.05	0.05	mg/L		10-AUG-00	MD
		Strontium (Sr)	2.27	0.002	mg/L		10-AUG-00	MD
		Titanium (Ti)	0.018	0.001	mg/L		10-AUG-00	MD
		Thallium (Tl)	<0.05	0.05	mg/L		10-AUG-00	MD
		Vanadium (V)	0.010	0.001	mg/L		10-AUG-00	MD
		Zinc (Zn)	0.025	0.001	mg/L		10-AUG-00	MD
		Ammonia-N	3.34	0.05	mg/L		08-AUG-00	EK
		Nitrate-N	6.7	0.1	mg/L		04-AUG-00	LDD
		Nitrite-N	0.74	0.05	mg/L		04-AUG-00	LDD
		Oil and Grease	<1	1	mg/L	09-AUG-00	10-AUG-00	ZW
		Total Suspended Solids	41	3	mg/L		04-AUG-00	CMN
L14821-7	MW00-1A							
Sample Date	01-AUG-00							
Matrix	WATER							
		Routine Water Analysis						
		Chloride (Cl)	293	1	mg/L		04-AUG-00	LDD
		Nitrate+Nitrite-N	7.5	0.1	mg/L		04-AUG-00	LDD
		pH, Conductivity and Total Alkalinity						
		pH	7.8	0.1	pH		04-AUG-00	[illegible]

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L14821-7	MW00-1A							
Sample Date	01-AUG-00							
Matrix:	WATER							
		Metals-Total						
		Silver (Ag)	<0.005	0.005	mg/L		10-AUG-00	MD
		Aluminum (Al)	0.99	0.01	mg/L		10-AUG-00	MD
		Boron (B)	0.60	0.05	mg/L		10-AUG-00	MD
		Barium (Ba)	0.017	0.003	mg/L		10-AUG-00	MD
		Beryllium (Be)	<0.002	0.002	mg/L		10-AUG-00	MD
		Cadmium (Cd)	<0.001	0.001	mg/L		10-AUG-00	MD
		Cobalt (Co)	0.081	0.002	mg/L		10-AUG-00	MD
		Chromium (Cr)	0.006	0.005	mg/L		10-AUG-00	MD
		Copper (Cu)	0.027	0.001	mg/L		10-AUG-00	MD
		Iron (Fe)	1.89	0.005	mg/L		10-AUG-00	MD
		Manganese (Mn)	0.310	0.001	mg/L		10-AUG-00	MD
		Molybdenum (Mo)	0.032	0.005	mg/L		10-AUG-00	MD
		Nickel (Ni)	0.012	0.002	mg/L		10-AUG-00	MD
		Phosphorus (P)	0.14	0.05	mg/L		10-AUG-00	MD
		Lead (Pb)	0.014	0.005	mg/L		10-AUG-00	MD
		Tin (Sn)	<0.05	0.05	mg/L		10-AUG-00	MD
		Strontium (Sr)	2.34	0.002	mg/L		10-AUG-00	MD
		Titanium (Ti)	0.013	0.001	mg/L		10-AUG-00	MD
		Thallium (Tl)	<0.05	0.05	mg/L		10-AUG-00	MD
		Vanadium (V)	0.008	0.001	mg/L		10-AUG-00	MD
		Zinc (Zn)	0.026	0.001	mg/L		10-AUG-00	MD
		Ammonia-N	3.59	0.05	mg/L		09-AUG-00	BK
		Nitrate-N	7.1	0.1	mg/L		04-AUG-00	LDD
		Nitrite-N	0.72	0.05	mg/L		04-AUG-00	LDD
		Oil and Grease	<1	1	mg/L	09-AUG-00	10-AUG-00	ZW
		Total Suspended Solids	35	3	mg/L		04-AUG-00	CMN
L14821-6	MW00-4A							
Sample Date	01-AUG-00							
Matrix:	WATER							
		Routine Water Analysis						
		Chloride (Cl)	2	1	mg/L		04-AUG-00	LDD
		Nitrate+Nitrite-N	0.5	0.1	mg/L		04-AUG-00	LDD
		pH, Conductivity and Total Alkalinity						
		pH	7.7	0.1	pH		04-AUG-00	PTT
		Conductivity (EC)	972	0.2	uS/cm		04-AUG-00	PTT
		Bicarbonate (HCO3)	269	5	mg/L		04-AUG-00	PTT
		Carbonate (CO3)	<5	5	mg/L		04-AUG-00	PTT
		Hydroxide	<5	5	mg/L		04-AUG-00	PTT
		Alkalinity, Total	220	5	mg/L		04-AUG-00	PTT
		Ion Balance Calculation						
		Ion Balance	104		%		08-AUG-00	
		TDS (Calculated)	693		mg/L		08-AUG-00	
		Hardness	423		mg/L		08-AUG-00	
		ICP metals and SO4 for routine water						
		Calcium (Ca)	88.1	0.5	mg/L		08-AUG-00	MOR
		Potassium (K)	4.3	0.1	mg/L		08-AUG-00	MOR
		Magnesium (Mg)	48.2	0.1	mg/L		08-AUG-00	MOR
		Sodium (Na)	78	1	mg/L		08-AUG-00	MOR

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L14821-8	MW00-4A							
Sample Date	01-AUG-00							
Matrix:	WATER							
		Metals-Total						
		Phosphorus (P)	8.17	0.05	mg/L		10-AUG-00	MD
		Lead (Pb)	0.038	0.005	mg/L		10-AUG-00	MD
		Tin (Sn)	<0.05	0.05	mg/L		10-AUG-00	MD
		Strontium (Sr)	0.706	0.002	mg/L		10-AUG-00	MD
		Titanium (Ti)	7.13	0.001	mg/L		10-AUG-00	MD
		Thallium (Tl)	<0.05	0.05	mg/L		10-AUG-00	MD
		Vanadium (V)	0.532	0.001	mg/L		10-AUG-00	MD
		Zinc (Zn)	0.548	0.001	mg/L		10-AUG-00	MD
		Ammonia-N	0.16	0.05	mg/L		09-AUG-00	EK
		Nitrate-N	<0.1	0.1	mg/L		04-AUG-00	BD
		Nitrite-N	<0.05	0.05	mg/L		04-AUG-00	BD
		Oil and Grease	<1	1	mg/L	09-AUG-00	10-AUG-00	ZW
		Total Suspended Solids	3470	3	mg/L		04-AUG-00	CMN

CHAIN OF CUSTODY RECC...D/ANALYSIS REQUEST

L 148 x1
No. 1734 age __ of __

Golder Associates
500 - 4260 Still Creek Drive
Burnaby, British Columbia, Canada V5C 6C6
Telephone (604) 298-6623 Fax (604) 298-5253

Project Number: 002-2418 T7200	Laboratory Name: Enviro-Test Laboratories
Short Title: Miramar / A & R Plan / Giant	Address: 9936 - 67 Avenue Edmonton, AB
Golder Contact: Valerie Bertrand	Telephone/Fax: 403-413-5227 Contact: Rick Zolkiewski

Analyses Required

Sample Control Number (SCN)	[redacted]	Sample Matrix (over)	Date Sampled (D/M/Y)	[redacted]	Number of Containers	As per quote ...	Analyses	RUSH	Remarks (over)
MW00-3A -01	[redacted]	Water	1/8/00	[redacted]	7	X			
MW00-3B -02	[redacted]	Water	1/8/00	[redacted]	7	X			
MW00-2 -03	[redacted]	Water	1/8/00	[redacted]	7	X			
MW00-1 -04	[redacted]	Water	1/8/00	[redacted]	7	X	EDM		
MW00-1A -05	[redacted]	Water	1/8/00	[redacted]	7	X	WPG		
MW00-4A -06	[redacted]	Water	1/8/00	[redacted]	7	X	CAL		
-07	[redacted]			[redacted]			T.B		
-08	[redacted]			[redacted]			G.P		
-09	[redacted]			[redacted]			SK		
-10	[redacted]			[redacted]			* THESE TESTS BEING		
-11	[redacted]			[redacted]					
-12	[redacted]			[redacted]					
-13	[redacted]			[redacted]					
-14	[redacted]			[redacted]					
-15	[redacted]			[redacted]					

Sampler's Signature: [signature]	Relinquished by: Signature [signature]	Company	Date	Time	Received by: Signature	Company
Sample Storage (°C)	Relinquished by: Signature	Company	Date	Time	Received by: Signature	Company
Comments:	Method of Shipment: Air	Waybill No.:	Received for Lab by: [signature]		Date 03/08/00	Time 12:30
	Shipped by: [signature]	Shipment Condition: Seal Intact:	Temp (°C)	Cooler opened by:	Date	Time

WHITE: Golder Copy YELLOW: Lab Copy PINK: Lab Returns with Final Report

ENVIRO-TEST QC REPORT

Workorder L14821

	Potassium (K)	<0.1		mg/L	0.5	10-AUG-00
	Magnesium (Mg)	0.1		mg/L	0.5	10-AUG-00
	Manganese (Mn)	0.011	A	mg/L	0.005	10-AUG-00
	Molybdenum (Mo)	<0.005		mg/L	0.025	10-AUG-00
	Sodium (Na)	<1		mg/L	5	10-AUG-00
	Nickel (Ni)	<0.002		mg/L	0.01	10-AUG-00
	Phosphorus (P)	<0.05		mg/L	0.25	10-AUG-00
	Lead (Pb)	<0.005		mg/L	0.025	10-AUG-00
	Tin (Sn)	<0.05		mg/L	0.25	10-AUG-00
	Strontium (Sr)	<0.002		mg/L	0.01	10-AUG-00
	Titanium (Ti)	<0.001		mg/L	0.005	10-AUG-00
	Thallium (Tl)	<0.05		mg/L	0.25	10-AUG-00
	Vanadium (V)	<0.001		mg/L	0.005	10-AUG-00
	Zinc (Zn)	<0.001		mg/L	0.005	10-AUG-00
WG16309-1						
CN-TOT-TB	Cyanide, Total	<0.002		mg/L	0.002	09-AUG-00
WG16313-1						
ETL-ROUTINE-ICP-ED	Calcium (Ca)	<0.5	<DL	mg/L	2.5	08-AUG-00
	Potassium (K)	<0.1	<DL	mg/L	0.5	08-AUG-00
	Magnesium (Mg)	<0.1	<DL	mg/L	0.5	08-AUG-00
	Sodium (Na)	<1		mg/L	5	08-AUG-00
	Sulfate (SO4)	<0.5	<DL	mg/L	2.5	08-AUG-00
WG16399-1						
NH4-ED	Ammonia-N	<0.05		mg/L	0.05	09-AUG-00
NH4-FD	Ammonia-N	<1		mg/kg	1	09-AUG-00
WG16430-1						
OGG-ED	Oil and Grease	<1		mg	1	10-AUG-00
WG16496-1						
OGG-ED	Oil and Grease	<1		mg	1	10-AUG-00
WG16504-1						
OGG-ED	Oil and Grease	<1		mg	1	10-AUG-00
WG16587-1						
AS-DIS-HYD-ED	Arsenic (As)-Dissolved	<0.0004		mg/L	0.002	11-AUG-00
HG-DIS-HYD-ED	Mercury (Hg)-Dissolved	<0.0002		mg/L	0.001	11-AUG-00
METAL-DIS-ED	Silver (Ag)	<0.005		mg/L	0.025	11-AUG-00
	Aluminum (Al)	0.06	A	mg/L	0.05	11-AUG-00
	Boron (B)	<0.05		mg/L	0.25	11-AUG-00
	Barium (Ba)	<0.003		mg/L	0.015	11-AUG-00
	Beryllium (Be)	<0.001		mg/L	0.005	11-AUG-00
	Calcium (Ca)	<0.5		mg/L	2.5	11-AUG-00
	Cadmium (Cd)	<0.001		mg/L	0.005	11-AUG-00
	Cobalt (Co)	<0.002		mg/L	0.01	11-AUG-00
	Chromium (Cr)	<0.005		mg/L	0.025	11-AUG-00
	Copper (Cu)	<0.001		mg/L	0.005	11-AUG-00
	Iron (Fe)	0.011		mg/L	0.025	11-AUG-00

ENVIRO-TEST QC REPORT

Workorder L14821

SOLIDS-TOTSUS-ED	Total Suspended Solids	N/A	RPD-NA	16.5	04-AUG-00
WG16187-3					
SOLIDS-TOTSUS-ED	Total Suspended Solids	13		16.5	04-AUG-00
WG16187-4					
SOLIDS-TOTSUS-ED	Total Suspended Solids	15		16.5	04-AUG-00
WG16187-5					
SOLIDS-TOTSUS-ED	Total Suspended Solids	N/A	RPD-NA	16.5	04-AUG-00
WG16302-2					
METAL-TOT-ED	Silver (Ag)	N/A	RPD-NA	20	10-AUG-00
	Aluminum (Al)	22	H	20	10-AUG-00
	Boron (B)	N/A	RPD-NA	20	10-AUG-00
	Barium (Ba)	1.1		20	10-AUG-00
	Beryllium (Be)	N/A	RPD-NA	20	10-AUG-00
	Calcium (Ca)	1.4		20	10-AUG-00
	Cadmium (Cd)	N/A	RPD-NA	20	10-AUG-00
	Cobalt (Co)	0.72		20	10-AUG-00
	Chromium (Cr)	40	D	20	10-AUG-00
	Copper (Cu)	58	D	20	10-AUG-00
	Iron (Fe)	N/A	RPD-NA	20	10-AUG-00
	Potassium (K)	0.53		20	10-AUG-00
	Magnesium (Mg)	1.4		20	10-AUG-00
	Manganese (Mn)	0.21		20	10-AUG-00
	Molybdenum (Mo)	1.9		20	10-AUG-00
	Sodium (Na)	0.18		20	10-AUG-00
	Nickel (Ni)	9.9		20	10-AUG-00
	Phosphorus (P)	N/A	RPD-NA	20	10-AUG-00
	Lead (Pb)	N/A	RPD-NA	20	10-AUG-00
	Tin (Sn)	N/A	RPD-NA	20	10-AUG-00
	Strontium (Sr)	2.3		20	10-AUG-00
	Titanium (Ti)	30	D	20	10-AUG-00
	Thallium (Tl)	N/A	RPD-NA	20	10-AUG-00
	Vanadium (V)	54	D	20	10-AUG-00
	Zinc (Zn)	180	G	20	10-AUG-00
WG16309-3					
CN-TOT-TB	Cyanide, Total	22		25	09-AUG-00
WG16313-5					
ETL-ROUTINE-ICP-ED	Calcium (Ca)	0.40		1.19	08-AUG-00
	Potassium (K)	0.36		1.7	08-AUG-00
	Magnesium (Mg)	1.1		2.51	08-AUG-00
	Sodium (Na)	1.2		5.10	08-AUG-00
	Sulfate (SO4)	1.2		4.44	08-AUG-00
WG16313-7					
ETL-ROUTINE-ICP-ED	Calcium (Ca)	0.57		1.19	08-AUG-00
	Potassium (K)	7.7	D	1.7	08-AUG-00

ENVIRO-TEST QC REPORT

Workorder L14821

	Cadmium (Cd)	N/A	RPD-NA	20	11-AUG-00
	Cobalt (Co)	N/A	RPD-NA	20	11-AUG-00
	Chromium (Cr)	N/A	RPD-NA	20	11-AUG-00
	Copper (Cu)	0.77		20	11-AUG-00
	Iron (Fe)	0.24		20	11-AUG-00
	Potassium (K)	N/A	RPD-NA	20	11-AUG-00
	Magnesium (Mg)	N/A	RPD-NA	20	11-AUG-00
	Manganese (Mn)	0.52		20	11-AUG-00
	Molybdenum (Mo)	0.35		20	11-AUG-00
	Sodium (Na)	N/A	RPD-NA	20	11-AUG-00
	Nickel (Ni)	2.6		20	11-AUG-00
	Phosphorus (P)	N/A	RPD-NA	20	11-AUG-00
	Lead (Pb)	N/A	RPD-NA	20	11-AUG-00
	Tin (Sn)	N/A	RPD-NA	20	11-AUG-00
	Strontium (Sr)	N/A	RPD-NA	20	11-AUG-00
	Titanium (Ti)	15		20	11-AUG-00
	Thallium (Tl)	N/A	RPD-NA	20	11-AUG-00
	Vanadium (V)	N/A	RPD-NA	20	11-AUG-00
	Zinc (Zn)	0.29		20	11-AUG-00
WG16567-6					
AS-DIS-HYD-ED	Arsenic (As)-Dissolved	3.8		14.1	11-AUG-00
HG-DIS-HYD-ED	Mercury (Hg)-Dissolved	N/A	RPD-NA	46	11-AUG-00
METAL-DIS-ED	Silver (Ag)	N/A	RPD-NA	20	11-AUG-00
	Aluminum (Al)	6.6		20	11-AUG-00
	Boron (B)	N/A	RPD-NA	20	11-AUG-00
	Barium (Ba)	0.70		20	11-AUG-00
	Beryllium (Be)	N/A	RPD-NA	20	11-AUG-00
	Calcium (Ca)	N/A	RPD-NA	20	11-AUG-00
	Cadmium (Cd)	N/A	RPD-NA	20	11-AUG-00
	Cobalt (Co)	N/A	RPD-NA	20	11-AUG-00
	Chromium (Cr)	N/A	RPD-NA	20	11-AUG-00
	Copper (Cu)	2.1		20	11-AUG-00
	Iron (Fe)	N/A	RPD-NA	20	11-AUG-00
	Potassium (K)	N/A	RPD-NA	20	11-AUG-00
	Magnesium (Mg)	N/A	RPD-NA	20	11-AUG-00
	Manganese (Mn)	2.5		20	11-AUG-00
	Molybdenum (Mo)	N/A	RPD-NA	20	11-AUG-00
	Sodium (Na)	N/A	RPD-NA	20	11-AUG-00
	Nickel (Ni)	5.6		20	11-AUG-00
	Phosphorus (P)	N/A	RPD-NA	20	11-AUG-00
	Lead (Pb)	N/A	RPD-NA	20	11-AUG-00
	Tin (Sn)	N/A	RPD-NA	20	11-AUG-00
	Strontium (Sr)	N/A	RPD-NA	20	11-AUG-00
	Titanium (Ti)	11		20	11-AUG-00
	Thallium (Tl)	N/A	RPD-NA	20	11-AUG-00
	Vanadium (V)	N/A	RPD-NA	20	11-AUG-00
	Zinc (Zn)	5.4		20	11-AUG-00

ENVIRO-TEST QC REPORT

Workorder L14821

	Chromium (Cr)	N/A	RPD-NA	20	11-AUG-00
	Copper (Cu)	7.6		20	11-AUG-00
	Iron (Fe)	N/A	RPD-NA	20	11-AUG-00
	Potassium (K)	N/A	RPD-NA	20	11-AUG-00
	Magnesium (Mg)	N/A	RPD-NA	20	11-AUG-00
	Manganese (Mn)	5.7		20	11-AUG-00
	Molybdenum (Mo)	5.0		20	11-AUG-00
	Sodium (Na)	N/A	RPD-NA	20	11-AUG-00
	Nickel (Ni)	N/A	RPD-NA	20	11-AUG-00
	Phosphorus (P)	N/A	RPD-NA	20	11-AUG-00
	Lead (Pb)	N/A	RPD-NA	20	11-AUG-00
	Tin (Sn)	N/A	RPD-NA	20	11-AUG-00
	Strontium (Sr)	N/A	RPD-NA	20	11-AUG-00
	Titanium (Ti)	26	D	20	11-AUG-00
	Thallium (Tl)	N/A	RPD-NA	20	11-AUG-00
	Vanadium (V)	N/A	RPD-NA	20	11-AUG-00
	Zinc (Zn)	8.2		20	11-AUG-00
WG16567-12					
AS-DIS-HYD-ED	Arsenic (As)-Dissolved	1.1		14.1	11-AUG-00
HG-DIS-HYD-ED	Mercury (Hg)-Dissolved	N/A	RPD-NA	46	11-AUG-00
METAL-DIS-ED	Silver (Ag)	N/A	RPD-NA	20	11-AUG-00
	Aluminum (Al)	0.068		20	11-AUG-00
	Boron (B)	N/A	RPD-NA	20	11-AUG-00
	Barium (Ba)	2.9		20	11-AUG-00
	Beryllium (Be)	N/A	RPD-NA	20	11-AUG-00
	Calcium (Ca)	N/A	RPD-NA	20	11-AUG-00
	Cadmium (Cd)	N/A	RPD-NA	20	11-AUG-00
	Cobalt (Co)	N/A	RPD-NA	20	11-AUG-00
	Chromium (Cr)	N/A	RPD-NA	20	11-AUG-00
	Copper (Cu)	4.6		20	11-AUG-00
	Iron (Fe)	N/A	RPD-NA	20	11-AUG-00
	Potassium (K)	N/A	RPD-NA	20	11-AUG-00
	Magnesium (Mg)	N/A	RPD-NA	20	11-AUG-00
	Manganese (Mn)	0.84		20	11-AUG-00
	Molybdenum (Mo)	0.072		20	11-AUG-00
	Sodium (Na)	N/A	RPD-NA	20	11-AUG-00
	Nickel (Ni)	N/A	RPD-NA	20	11-AUG-00
	Phosphorus (P)	N/A	RPD-NA	20	11-AUG-00
	Lead (Pb)	N/A	RPD-NA	20	11-AUG-00
	Tin (Sn)	N/A	RPD-NA	20	11-AUG-00
	Strontium (Sr)	N/A	RPD-NA	20	11-AUG-00
	Titanium (Ti)	N/A	RPD-NA	20	11-AUG-00
	Thallium (Tl)	N/A	RPD-NA	20	11-AUG-00
	Vanadium (V)	N/A	RPD-NA	20	11-AUG-00
	Zinc (Zn)	0.95		20	11-AUG-00
WG16854-14					

ENVIRO-TEST QC REPORT

Workorder L14821

WG16187-6					
SOLIDS-TOTSUS-ED	Total Suspended Solids	98		89.6-106.2	04-AUG-00
WG16313-2					
ETL-ROUTINE-ICP-ED	Calcium (Ca)	102		99.1-102.3	08-AUG-00
	Potassium (K)	101		98.4-101.6	08-AUG-00
	Magnesium (Mg)	103		101-106.5	08-AUG-00
	Sodium (Na)	101		95-104.6	08-AUG-00
	Sulfate (SO4)	94		97.9-104.2	08-AUG-00
WG16399-2					
NH4-ED	Ammonia-N	100		93.5-106.6	09-AUG-00
NH4-ED	Ammonia-N	100		90-110	09-AUG-00
WG16430-2					
OGG-ED	Oil and Grease	85		70.9-94	10-AUG-00
WG16495-2					
OGG-ED	Oil and Grease	85		70.9-94	10-AUG-00
WG16504-2					
OGG-ED	Oil and Grease	77		70.9-94	10-AUG-00
316712-2					
AS-AS3-DIS-ED	Arsenic (As) 3+-Dissolved	98		90-110	23-SEP-00
WG16808-2					
AS-DIS-HYD-ED	Arsenic (As)-Dissolved	94	H	94.4-107	07-SEP-00
WG16808-3					
AS-DIS-HYD-ED	Arsenic (As)-Dissolved	96		94.4-107	07-SEP-00

QC Type: MS

Lab QC Number:		% Recovery	Qualifier	Limit %	Analyzed
WG16137-6					
CL-ED	Chloride (Cl)	104		95-106	04-AUG-00
WG16169-3					
N2N3-ED	Nitrate+Nitrite-N	99		88.2-107.8	04-AUG-00
WG16183-3					
NO2-ED	Nitrite-N	97		94.5-104.1	04-AUG-00
WG16302-3					
METAL-TOT-ED	Silver (Ag)	99		75-125	10-AUG-00
	Aluminum (Al)	111		75-125	10-AUG-00
	Boron (B)	105		75-125	10-AUG-00
	Barium (Ba)	110		75-125	10-AUG-00
	Beryllium (Be)	108		75-125	10-AUG-00
	Calcium (Ca)	114		75-125	10-AUG-00
	Cadmium (Cd)	106		75-125	10-AUG-00
	Cobalt (Co)	109		75-125	10-AUG-00
	Chromium (Cr)	104		75-125	10-AUG-00
	Copper (Cu)	108		75-125	10-AUG-00

ENVIRO-TEST QC REPORT

Workorder L14821

	Copper (Cu)	102	75-125	11-AUG-00
	Iron (Fe)	109	75-125	11-AUG-00
	Potassium (K)	112	75-125	11-AUG-00
	Magnesium (Mg)	110	75-125	11-AUG-00
	Manganese (Mn)	99	75-125	11-AUG-00
	Molybdenum (Mo)	108	75-125	11-AUG-00
	Sodium (Na)	103	75-125	11-AUG-00
	Nickel (Ni)	103	75-125	11-AUG-00
	Phosphorus (P)	107	75-125	11-AUG-00
	Lead (Pb)	114	75-125	11-AUG-00
	Tin (Sn)	110	75-125	11-AUG-00
	Strontium (Sr)	109	75-125	11-AUG-00
	Titanium (Ti)	109	75-125	11-AUG-00
	Thallium (Tl)	117	75-125	11-AUG-00
	Vanadium (V)	106	75-125	11-AUG-00
	Zinc (Zn)	110	75-125	11-AUG-00
SB-DIS-HYD-ED	Antimony (Sb)-Dissolved	109	75-125	11-AUG-00
WG16567-5				
AS-DIS-HYD-ED	Arsenic (As)-Dissolved	112	75-125	11-AUG-00
HG-DIS-HYD-ED	Mercury (Hg)-Dissolved	105	75-125	11-AUG-00
METAL-DIS-ED	Silver (Ag)	113	75-125	11-AUG-00
	Aluminum (Al)	111	75-125	11-AUG-00
	Boron (B)	110	75-125	11-AUG-00
	Barium (Ba)	111	75-125	11-AUG-00
	Beryllium (Be)	105	75-125	11-AUG-00
	Calcium (Ca)	113	75-125	11-AUG-00
	Cadmium (Cd)	106	75-125	11-AUG-00
	Cobalt (Co)	113	75-125	11-AUG-00
	Chromium (Cr)	107	75-125	11-AUG-00
	Copper (Cu)	110	75-125	11-AUG-00
	Iron (Fe)	116	75-125	11-AUG-00
	Potassium (K)	109	75-125	11-AUG-00
	Magnesium (Mg)	109	75-125	11-AUG-00
	Manganese (Mn)	111	75-125	11-AUG-00
	Molybdenum (Mo)	106	75-125	11-AUG-00
	Sodium (Na)	111	75-125	11-AUG-00
	Nickel (Ni)	112	75-125	11-AUG-00
	Phosphorus (P)	112	75-125	11-AUG-00
	Lead (Pb)	105	75-125	11-AUG-00
	Tin (Sn)	110	75-125	11-AUG-00
	Strontium (Sr)	112	75-125	11-AUG-00
	Titanium (Ti)	109	75-125	11-AUG-00
	Thallium (Tl)	110	75-125	11-AUG-00
	Vanadium (V)	107	75-125	11-AUG-00
	Zinc (Zn)	116	75-125	11-AUG-00
WG16567-7				

		Phosphorus (P)	108		75-125	11-AUG-00
		Lead (Pb)	106		75-125	11-AUG-00
		Tin (Sn)	109		75-125	11-AUG-00
		Strontium (Sr)	105		75-125	11-AUG-00
		Titanium (Ti)	109		75-125	11-AUG-00
		Thallium (Tl)	112		75-125	11-AUG-00
		Vanadium (V)	108		75-125	11-AUG-00
		Zinc (Zn)	103		75-125	11-AUG-00
WG16712-4						
	AS-AS3-DIS-ED	Arsenic (As) 3+-Dissolved	90		86.5-105.6	23-SEP-00
WG16808-5						
	AS-DIS-HYD-ED	Arsenic (As)-Dissolved	97		86.5-106	07-SEP-00
WG16808-6						
	AS-DIS-HYD-ED	Arsenic (As)-Dissolved	92		86.5-106	07-SEP-00
WG16567-11						
	AS-DIS-HYD-ED	Arsenic (As)-Dissolved	108		75-125	11-AUG-00
	HG-DIS-HYD-ED	Mercury (Hg)-Dissolved	96		75-125	11-AUG-00
	METAL-DIS-ED	Silver (Ag)	100		75-125	11-AUG-00
		Aluminum (Al)	88		75-125	11-AUG-00
		Boron (B)	101		75-125	11-AUG-00
		Barium (Ba)	112		75-125	11-AUG-00
		Beryllium (Be)	96		75-125	11-AUG-00
		Calcium (Ca)	114		75-125	11-AUG-00
		Cadmium (Cd)	104		75-125	11-AUG-00
		Cobalt (Co)	107		75-125	11-AUG-00
		Chromium (Cr)	105		75-125	11-AUG-00
		Copper (Cu)	104		75-125	11-AUG-00
		Iron (Fe)	110		75-125	11-AUG-00
		Potassium (K)	106		75-125	11-AUG-00
		Magnesium (Mg)	95		75-125	11-AUG-00
		Manganese (Mn)	102		75-125	11-AUG-00
		Molybdenum (Mo)	111		75-125	11-AUG-00
		Sodium (Na)	53	E	75-125	11-AUG-00
		Nickel (Ni)	104		75-125	11-AUG-00
		Phosphorus (P)	108		75-125	11-AUG-00
		Lead (Pb)	112		75-125	11-AUG-00
		Tin (Sn)	110		75-125	11-AUG-00
		Strontium (Sr)	117		75-125	11-AUG-00
		Titanium (Ti)	106		75-125	11-AUG-00
		Thallium (Tl)	114		75-125	11-AUG-00
		Vanadium (V)	108		75-125	11-AUG-00
		Zinc (Zn)	107		75-125	11-AUG-00
WG16567-13						
	AS-DIS-HYD-ED	Arsenic (As)-Dissolved	110		75-125	11-AUG-00
	HG-DIS-HYD-ED	Mercury (Hg)-Dissolved	95		75-125	11-AUG-00

ENVIRO-TEST QC REPORT

Workorder L14821

	Tin (Sn)	97		75-125	16-AUG-00
	Strontium (Sr)	102		75-125	16-AUG-00
	Titanium (Ti)	100		75-125	16-AUG-00
	Thallium (Tl)	91		75-125	16-AUG-00
	Vanadium (V)	101		75-125	16-AUG-00
	Zinc (Zn)	66		75-125	16-AUG-00
SB-DIS-HYD-ED	Antimony (Sb)-Dissolved	97		75-125	16-AUG-00

QC Type: MSD

Lab QC Number:		RPD	Qualifier	Limit %	Analyzed
WG16137-7					
CL-ED	Chloride (Cl)	0.96		1.19	04-AUG-00
WG16169-4					
N2N3-ED	Nitrate+Nitrite-N	0.0		4.48	04-AUG-00
WG16183-4					
NO2-ED	Nitrite-N	0.0		3.65	04-AUG-00

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LABORATORIES

A DIVISION OF ETL CHEMSPEC ANALYTICAL LIMITED

CHEMICAL ANALYSIS REPORT

GOLDER ASSOCIATES LTD
ATTN: BETTINA SANDER
500 4260 STILL CREEK DRIVE
BURNABY BC V5C 6C6

DATE: June 13, 2001

Lab Work Order #: L32566

Sampled By: CP

Date Received: 16-MAY-01

Project P.O. #:

Project Reference:

Comments:

APPROVED BY: ______________________

TONY CIARLA
Project Manager

ACCREDITATIONS: STANDARDS COUNCIL OF CANADA (SCC) IN COOPERATION WITH THE CANADIAN ASSOCIATION FOR ENVIRONMENTAL ANALYTICAL LABORATORIES (CAEAL) FOR SPECIFIC TESTS AS REGISTERED BY THE COUNCIL (EDMONTON, CALGARY, SASKATOON, WINNIPEG, THUNDER BAY)
AMERICAN INDUSTRIAL HYGIENE ASSOCIATION (AIHA) FOR INDUSTRIAL HYGIENE ANALYSIS (EDMONTON)
W/STANDARDS COUNCIL OF CANADA IN COOPERATION WITH THE CANADIAN FOOD INSPECTION AGENCY (CFIA) FOR FERTILIZER AND FEED TESTING (SASKATOON)

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L32566-1	BC-US-SW-05/01							
Sample Date: 15-MAY-01 01:00 PM								
Matrix: WATER								
		Total Metals						
		Total Major Metals						
		Magnesium (Mg)	4.4	0.1	mg/L		17-MAY-01	EC
		Sodium (Na)	3	1	mg/L		17-MAY-01	EC
		Iron (Fe)	0.179	0.005	mg/L		17-MAY-01	EC
		Manganese (Mn)	0.097	0.001	mg/L		17-MAY-01	EC
		Routine Water Analysis						
		Chloride (Cl)	4	1	mg/L		22-MAY-01	CNP
		Nitrate+Nitrite-N	<0.1	0.1	mg/L		22-MAY-01	CNP
		pH, Conductivity and Total Alkalinity						
		pH	7.4	0.1	pH		17-MAY-01	CMN
		Conductivity (EC)	135	0.2	uS/cm		17-MAY-01	CMN
		Bicarbonate (HCO3)	57	5	mg/L		17-MAY-01	CMN
		Carbonate (CO3)	<5	5	mg/L		17-MAY-01	CMN
		Hydroxide	<5	5	mg/L		17-MAY-01	CMN
		Alkalinity, Total	47	5	mg/L		17-MAY-01	CMN
		Ion Balance Calculation						
		Ion Balance	107		%		24-MAY-01	
		TDS (Calculated)	65		mg/L		24-MAY-01	
		Hardness	54		mg/L		24-MAY-01	
		ICP metals and SO4 for routine water						
		Calcium (Ca)	14.0	0.5	mg/L		23-MAY-01	MOR
		Potassium (K)	1.7	0.1	mg/L		23-MAY-01	MOR
		Magnesium (Mg)	4.6	0.1	mg/L		23-MAY-01	MOR
		Sodium (Na)	4	1	mg/L		23-MAY-01	MOR
		Sulfate (SO4)	8.2	0.5	mg/L		23-MAY-01	MOR
		Antimony (Sb)-Dissolved	0.0017	0.0004	mg/L		17-MAY-01	MD
		Arsenic (As)-Dissolved	0.0350	0.0004	mg/L		17-MAY-01	MD
		Mercury (Hg)-Dissolved	<0.0002	0.0002	mg/L		17-MAY-01	MD
		Antimony (Sb)-Total	0.0019	0.0004	mg/L		17-MAY-01	MD
		Arsenic (As)-Total	0.0390	0.0004	mg/L		17-MAY-01	MD
		Mercury (Hg)-Total	<0.0002	0.0002	mg/L		17-MAY-01	MD
		Ammonia-N	0.20	0.05	mg/L		22-MAY-01	LAK
		Dissolved Organic Carbon	12	1	mg/L		22-MAY-01	HAN
		Nitrate-N	<0.1	0.1	mg/L		22-MAY-01	CNP
		Nitrite-N	<0.05	0.05	mg/L		22-MAY-01	CNP
		Total Suspended Solids	<3	3	mg/L		16-MAY-01	WNG
L32566-2	BC-BFF-SW-05/01							
Sample Date: 15-MAY-01 01:00 PM								
Matrix: WATER								
		Dissolved Metals						
		Dissolved Trace Metals						
		Silver (Ag)	<0.005	0.005	mg/L		17-MAY-01	MD
		Aluminum (Al)	0.06	0.01	mg/L		17-MAY-01	MD
		Boron (B)	<0.05	0.05	mg/L		17-MAY-01	MD
		Barium (Ba)	0.012	0.003	mg/L		17-MAY-01	MD
		Beryllium (Be)	<0.001	0.001	mg/L		17-MAY-01	MD
		Cadmium (Cd)	<0.001	0.001	mg/L		17-MAY-01	MD

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L32566-2	BC-EFF-SW-05/01							
Sample Date: 15-MAY-01 01:00 PM								
Matrix: WATER								
		Routine Water Analysis						
		Nitrate+Nitrite-N	<0.1	0.1	mg/L		22-MAY-01	CNP
		pH, Conductivity and Total Alkalinity						
		pH	7.8	0.1	pH		17-MAY-01	CMN
		Conductivity (EC)	197	0.2	uS/cm		17-MAY-01	CMN
		Bicarbonate (HCO3)	53	5	mg/L		17-MAY-01	CMN
		Carbonate (CO3)	<5	5	mg/L		17-MAY-01	CMN
		Hydroxide	<5	5	mg/L		17-MAY-01	CMN
		Alkalinity, Total	43	5	mg/L		17-MAY-01	CMN
		Ion Balance Calculation						
		Ion Balance	102		%		24-MAY-01	
		TDS (Calculated)	103		mg/L		24-MAY-01	
		Hardness	79		mg/L		24-MAY-01	
		ICP metals and SO4 for routine water						
		Calcium (Ca)	21.1	0.5	mg/L		23-MAY-01	MOR
		Potassium (K)	2.1	0.1	mg/L		23-MAY-01	MOR
		Magnesium (Mg)	6.5	0.1	mg/L		23-MAY-01	MOR
		Sodium (Na)	5	1	mg/L		23-MAY-01	MOR
		Sulfate (SO4)	33.7	0.5	mg/L		23-MAY-01	MOR
		Antimony (Sb)-Dissolved	0.0103	0.0004	mg/L		17-MAY-01	MD
		Arsenic (As) 3+-Dissolved	0.0231	0.0002	mg/L		12-JUN-01	JJ
		Arsenic (As) 5+-Dissolved	0.113	0.0002	mg/L		12-JUN-01	JJ
		Arsenic (As)-Dissolved	0.138	0.0004	mg/L		17-MAY-01	MD
		Mercury (Hg)-Dissolved	<0.0002	0.0002	mg/L		17-MAY-01	MD
		Antimony (Sb) Total	0.0259	0.0004	mg/L		17-MAY-01	MD
		Arsenic (As)-Total	0.166	0.0004	mg/L		17-MAY-01	MD
		Cyanide, Total	<0.002	0.002	mg/L	18-MAY-01	18-MAY-01	SF
		Mercury (Hg)-Total	<0.0002	0.0002	mg/L		17-MAY-01	MD
		Ammonia-N	0.09	0.05	mg/L		22-MAY-01	LAK
		Dissolved Organic Carbon	13	1	mg/L		22-MAY-01	HAN
		Nitrate-N	<0.1	0.1	mg/L		22-MAY-01	CNP
		Nitrite-N	<0.05	0.05	mg/L		22-MAY-01	CNP
		Total Suspended Solids	9	3	mg/L		16-MAY-01	WNG
L32566-3	BC-D51-SW-05/01							
Sample Date: 15-MAY-01 01:00 PM								
Matrix: WATER								
		Dissolved Metals						
		Dissolved Trace Metals						
		Silver (Ag)	<0.005	0.005	mg/L		17-MAY-01	MD
		Aluminum (Al)	0.02	0.01	mg/L		17-MAY-01	MD
		Boron (B)	<0.05	0.05	mg/L		17-MAY-01	MD
		Barium (Ba)	0.009	0.003	mg/L		17-MAY-01	MD
		Beryllium (Be)	<0.001	0.001	mg/L		17-MAY-01	MD
		Cadmium (Cd)	<0.001	0.001	mg/L		17-MAY-01	MD
		Cobalt (Co)	<0.002	0.002	mg/L		17-MAY-01	MD
		Chromium (Cr)	<0.005	0.005	mg/L		17-MAY-01	MD
		Copper (Cu)	0.007	0.001	mg/L		17-MAY-01	MD
		Molybdenum (Mo)	<0.005	0.005	mg/L		17-MAY-01	MD

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L32566-3	BC-DS1-SW-05/01							
Sample Date: 15-MAY-01 01:00 PM								
Matrix: WATER								
		Routine Water Analysis						
		pH, Conductivity and Total Alkalinity						
		Bicarbonate (HCO3)	61	5	mg/L		17-MAY-01	CMN
		Carbonate (CO3)	<5	5	mg/L		17-MAY-01	CMN
		Hydroxide	<5	5	mg/L		17-MAY-01	CMN
		Alkalinity, Total	50	5	mg/L		17-MAY-01	CMN
		Ion Balance Calculation						
		Ion Balance	104		%		24-MAY-01	
		TDS (Calculated)	93		mg/L		24-MAY-01	
		Hardness	75		mg/L		24-MAY-01	
		ICP metals and SO4 for routine water						
		Calcium (Ca)	21.2	0.5	mg/L		23-MAY-01	MOR
		Potassium (K)	1.8	0.1	mg/L		23-MAY-01	MOR
		Magnesium (Mg)	5.3	0.1	mg/L		23-MAY-01	MOR
		Sodium (Na)	4	1	mg/L		23-MAY-01	MOR
		Sulfate (SO4)	26.5	0.5	mg/L		23-MAY-01	MOR
		Antimony (Sb)-Dissolved	0.0121	0.0004	mg/L		17-MAY-01	MD
		Arsenic (As) 3+-Dissolved	0.119	0.0002	mg/L		12-JUN-01	JJ
		Arsenic (As) 5+-Dissolved	0.593	0.0002	mg/L		12-JUN-01	JJ
		Arsenic (As)-Dissolved	0.656	0.0004	mg/L		17-MAY-01	MD
		Mercury (Hg)-Dissolved	<0.0002	0.0002	mg/L		17-MAY-01	MD
		Antimony (Sb)-Total	0.0131	0.0004	mg/L		17-MAY-01	MD
		Arsenic (As)-Total	0.662	0.0004	mg/L		17-MAY-01	MD
		Cyanide, Total	<0.002	0.002	mg/L	15-MAY-01	16-MAY-01	ST
		Mercury (Hg)-Total	<0.0002	0.0002	mg/L		17-MAY-01	MD
		Ammonia-N	0.16	0.05	mg/L		22-MAY-01	LAK
		Dissolved Organic Carbon	13	1	mg/L		22-MAY-01	HAN
		Nitrate-N	<0.1	0.1	mg/L		22-MAY-01	CNP
		Nitrite-N	<0.05	0.05	mg/L		22-MAY-01	CNP
		Total Suspended Solids	12	3	mg/L		18-MAY-01	WNG
L32566-4	BC-DS2-SW-05/01							
Sample Date: 15-MAY-01 01:00 PM								
Matrix: WATER								
		Dissolved Metals						
		Dissolved Trace Metals						
		Silver (Ag)	<0.005	0.005	mg/L		17-MAY-01	MD
		Aluminum (Al)	0.03	0.01	mg/L		17-MAY-01	MD
		Boron (B)	<0.05	0.05	mg/L		17-MAY-01	MD
		Barium (Ba)	0.011	0.003	mg/L		17-MAY-01	MD
		Beryllium (Be)	<0.001	0.001	mg/L		17-MAY-01	MD
		Cadmium (Cd)	<0.001	0.001	mg/L		17-MAY-01	MD
		Cobalt (Co)	<0.002	0.002	mg/L		17-MAY-01	MD
		Chromium (Cr)	<0.005	0.005	mg/L		17-MAY-01	MD
		Copper (Cu)	0.005	0.001	mg/L		17-MAY-01	MD
		Molybdenum (Mo)	<0.005	0.005	mg/L		17-MAY-01	MD
		Nickel (Ni)	0.002	0.002	mg/L		17-MAY-01	MD
		Phosphorus (P)	<0.1	0.1	mg/L		17-MAY-01	MD
		Lead (Pb)	<0.005	0.005	mg/L		17-MAY-01	MD

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L32566-4	BC-OS2-SW-05/01							
Sample Date: 15-MAY-01 01:00 PM								
Matrix: WATER								
		Routine Water Analysis						
		pH, Conductivity and Total Alkalinity						
		Alkalinity, Total	47	5	mg/L		17-MAY-01	CVN
		Ion Balance Calculation						
		Ion Balance	106		%		24-MAY-01	
		TDS (Calculated)	77		mg/L		24-MAY-01	
		Hardness	64		mg/L		24-MAY-01	
		ICP metals and SO4 for routine water						
		Calcium (Ca)	16.8	0.5	mg/L		23-MAY-01	MOR
		Potassium (K)	1.8	0.1	mg/L		23-MAY-01	MOR
		Magnesium (Mg)	5.3	0.1	mg/L		23-MAY-01	MOR
		Sodium (Na)	4	1	mg/L		23-MAY-01	MOR
		Sulfate (SO4)	17.1	0.5	mg/L		23-MAY-01	MOR
		Antimony (Sb)-Dissolved	0.0073	0.0004	mg/L		17-MAY-01	MD
		Arsenic (As) 3+-Dissolved	0.0160	0.0002	mg/L		12-JUN-01	JJ
		Arsenic (As) 5+-Dissolved	0.0796	0.0002	mg/L		12-JUN-01	JJ
		Arsenic (As)-Dissolved	0.0933	0.0004	mg/L		17-MAY-01	MD
		Mercury (Hg)-Dissolved	<0.0002	0.0002	mg/L		17-MAY-01	MD
		Antimony (Sb)-Total	0.0198	0.0004	mg/L		17-MAY-01	MD
		Arsenic (As)-Total	0.231	0.0004	mg/L		17-MAY-01	MD
		Cyanide, Total	<0.002	0.002	mg/L	18-MAY-01	18-MAY-01	SF
		Mercury (Hg)-Total	<0.0002	0.0002	mg/L		17-MAY-01	MD
		Ammonia-N	0.20	0.05	mg/L		22-MAY-01	LAK
		Dissolved Organic Carbon	13	1	mg/L		22-MAY-01	HAN
		Nitrate-N	<0.1	0.1	mg/L		22-MAY-01	CNP
		Nitrite-N	<0.05	0.05	mg/L		22-MAY-01	CNP
		Total Suspended Solids	21	3	mg/L		18-MAY-01	WNG
L32566-5	BC-OS2-SW-05/01 C							
Sample Date: 15-MAY-01 01:00 PM								
Matrix: WATER								
		Dissolved Metals						
		Dissolved Trace Metals						
		Silver (Ag)	<0.005	0.005	mg/L		17-MAY-01	MD
		Aluminum (Al)	0.03	0.01	mg/L		17-MAY-01	MD
		Boron (B)	<0.05	0.05	mg/L		17-MAY-01	MD
		Barium (Ba)	0.011	0.003	mg/L		17-MAY-01	MD
		Beryllium (Be)	<0.001	0.001	mg/L		17-MAY-01	MD
		Cadmium (Cd)	<0.001	0.001	mg/L		17-MAY-01	MD
		Cobalt (Co)	<0.002	0.002	mg/L		17-MAY-01	MD
		Chromium (Cr)	<0.005	0.005	mg/L		17-MAY-01	MD
		Copper (Cu)	0.005	0.001	mg/L		17-MAY-01	MD
		Molybdenum (Mo)	<0.005	0.005	mg/L		17-MAY-01	MD
		Nickel (Ni)	0.002	0.002	mg/L		17-MAY-01	MD
		Phosphorus (P)	<0.1	0.1	mg/L		17-MAY-01	MD
		Lead (Pb)	<0.005	0.005	mg/L		17-MAY-01	MD
		Tin (Sn)	<0.05	0.05	mg/L		17-MAY-01	MD
		Strontium (Sr)	0.051	0.005	mg/L		17-MAY-01	MD
		Titanium (Ti)	<0.001	0.001	mg/L		17-MAY-01	MD

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Lab ID	Sample ID	Test Description	Result	D.L.	Units	Extracted	Analyzed	By
L32566-5	BC-DS2-SW-05/01-C							
Sample Date: 15-MAY-01 01:00 PM								
Matrix: WATER								
		Routine Water Analysis						
		Ion Balance Calculation						
		TDS (Calculated)	79		mg/L		24-MAY-01	
		Hardness	64		mg/L		24-MAY-01	
		ICP metals and SO4 for routine water						
		Calcium (Ca)	16.9	0.5	mg/L		23-MAY-01	MOR
		Potassium (K)	1.0	0.1	mg/L		23-MAY-01	MOR
		Magnesium (Mg)	5.2	0.1	mg/L		23-MAY-01	MOR
		Sodium (Na)	4	1	mg/L		23-MAY-01	MOR
		Sulfate (SO4)	17.8	0.5	mg/L		23-MAY-01	MOR
		Antimony (Sb)-Dissolved	0.0074	0.0004	mg/L		17-MAY-01	MD
		Arsenic (As) 3+-Dissolved	0.0149	0.0002	mg/L		12-JUN-01	JJ
		Arsenic (As) 5+-Dissolved	0.0808	0.0002	mg/L		12-JUN-01	JJ
		Arsenic (As)-Dissolved	0.0927	0.0004	mg/L		17-MAY-01	MD
		Mercury (Hg)-Dissolved	<0.0002	0.0002	mg/L		17-MAY-01	MD
		Antimony (Sb)-Total	0.0205	0.0004	mg/L		17-MAY-01	MD
		Arsenic (As)-Total	0.229	0.0004	mg/L		17-MAY-01	MD
		Cyanide, Total	<0.002	0.002	mg/L	16-MAY-01	16-MAY-01	SF
		Mercury (Hg)-Total	<0.0002	0.0002	mg/L		17-MAY-01	MD
		Ammonia-N	0.20	0.05	mg/L		22-MAY-01	LAK
		Dissolved Organic Carbon	13	1	mg/L		22-MAY-01	IAN
		Nitrate-N	<0.1	0.1	mg/L		22-MAY-01	CNP
		Nitrite-N	<0.05	0.05	mg/L		22-MAY-01	CNP
		Total Suspended Solids	28	3	mg/L		18-MAY-01	WKG
L32566-6	BC-DS2-SW-05/01-D							
Sample Date: 15-MAY-01 01:00 PM								
Matrix: WATER								
		Dissolved Metals						
		Dissolved Trace Metals						
		Silver (Ag)	<0.005	0.005	mg/L		17-MAY-01	MD
		Aluminum (Al)	<0.01	0.01	mg/L		17-MAY-01	MD
		Boron (B)	<0.05	0.05	mg/L		17-MAY-01	MD
		Barium (Ba)	<0.003	0.003	mg/L		17-MAY-01	MD
		Beryllium (Be)	<0.001	0.001	mg/L		17-MAY-01	MD
		Cadmium (Cd)	<0.001	0.001	mg/L		17-MAY-01	MD
		Cobalt (Co)	<0.002	0.002	mg/L		17-MAY-01	MD
		Chromium (Cr)	<0.005	0.005	mg/L		17-MAY-01	MD
		Copper (Cu)	<0.001	0.001	mg/L		17-MAY-01	MD
		Molybdenum (Mo)	<0.005	0.005	mg/L		17-MAY-01	MD
		Nickel (Ni)	<0.002	0.002	mg/L		17-MAY-01	MD
		Phosphorus (P)	<0.1	0.1	mg/L		17-MAY-01	MD
		Lead (Pb)	<0.005	0.005	mg/L		17-MAY-01	MD
		Tin (Sn)	<0.05	0.05	mg/L		17-MAY-01	MD
		Strontium (Sr)	<0.005	0.005	mg/L		17-MAY-01	MD
		Titanium (Ti)	<0.001	0.001	mg/L		17-MAY-01	MD
		Thallium (Tl)	<0.05	0.05	mg/L		17-MAY-01	MD
		Vanadium (V)	<0.001	0.001	mg/L		17-MAY-01	MD
		Zinc (Zn)	0.003	0.001	mg/L		17-MAY-01	MD

Methodology Reference

ETL Test Code	Test Description	Methodology Reference (Based On)
AS-AS3-DIS-ED	Arsenic (As) 3+-Dissolved	APHA 3114 C-AAS - Hydride
AS-AS5-DIS-ED	Arsenic (As) 5+-Dissolved	APHA 3114 C-AAS - Hydride
AS-DIS-HYD-ED	Arsenic (As)-Dissolved	APHA 3114 C-AAS - Hydride
AS-TOT-HYD-ED	Arsenic (As)-Total	APHA 3114 C-AAS - Hydride
C-DIS-ORG-ED	Dissolved Organic Carbon	APHA 5310 B-Instrumental
CL-ED	Chloride (Cl)	APHA 4500 Cl E-Colorimetry
CN-TOT-TB	Cyanide, Total	APHA 4500CN C E Strong acid Dist Colorim
ETL-ROUTINE-ICP-ED	ICP metals and SO4 for routine water	APHA 3120 B-ICP-OES
HG-DIS-HYD-ED	Mercury (Hg)-Dissolved	APHA 3112 B-AAS Cold Vapor
HG-TOT-HYD-ED	Mercury (Hg)-Total	APHA 3112 B-AAS Cold Vapor
IONBALANCE-ED	Ion Balance Calculation	APHA 1030E
MET1-DIS-ED	Dissolved Trace Metals	APHA 3120 B-ICP-OES
MET1-TOT-ED	Total Trace Metals	APHA 3120 B-ICP-OES
MET2-DIS-ED	Dissolved Major Metals	APHA 3120 B-ICP-OES
MET2-TOT-ED	Total Major Metals	APHA 3120 B-ICP-OES
N2N3-ED	Nitrate+Nitrite-N	APHA 4500 NO3H-Colorimetry
NH4-ED	Ammonia-N	APHA4500NH3F Colorimetry
NO2-ED	Nitrite-N	APHA 4500 NO23-Colorimetry
NO3-ED	Nitrate-N	APHA 4500 NO3H-Colorimetry
PH/EC/ALK-ED	pH, Conductivity and Total Alkalinity	APHA 4500-H, 2510, 2320
SB-DIS-HYD-ED	Antimony (Sb)-Dissolved	APHA 3114 C-AAS-Hydride
SB-TOT-HYD-ED	Antimony (Sb)-Total	APHA 3114 C-AAS-Hydride
SOLIDS-TOTSUS-ED	Total Suspended Solids	APHA 2540 D-Gravimetric