

Arctic Gold and Silver Tailings Site

Monitoring Report 2004



Prepared by:
**Indian and Northern Affairs
Waste Management Program
Yukon Region**

Location

The Arctic Gold and Silver mill and tailings impoundment is located approximately 4 km south of the Village of Carcross on the road to both the Arctic Caribou and Big Thing mines on Montana Mountain (60° 08' 00" N, 134° 43' 20" W).



Figure 1: Location of Arctic Gold and Silver Tailings

Background

The Arctic Gold and Silver mill was in operation during the late 1960's. It is estimated that about 50,000 tonnes of ore were processed, using a basic flotation method (without cyanide) and leaving nearly 27,000 m³ of tailings.

A phase III environmental assessment was commissioned By DIAND, Waste Management in August, 1997. It was found that the tailings were acid generating and that seepage into a small lake adjacent to the tailings impoundment contained significant concentrations of metals. Several health and safety concerns and environmental risks were identified and it was recommended to clean up the site and assess remedial measures for the tailings (Public Works and Government Services Canada, 1998).

Geotechnical and geochemical testing and delineation of the tailings were initiated in 1998 and options for remediation were presented in a report prepared by Steffen Robertson and Kirsten Inc. (1999).

Clean up of the site and preparations to secure and cap the tailings were carried out in 1999 according to specifications prepared by Public Works and Government Services Canada (1999). The contract for the excavation of previously submerged tailings from the unnamed lake, adjacent to the tailings impoundment, took place during winter 1999/2000. The recovered tailings were expected to dry during the summer 2000 to be placed in the impoundment and covered with clay capping material. Due to a wet and cool summer, the tailings had not dried enough to the satisfaction of the engineer. The final work, including the seeding and fertilizing of the entire capped tailings pond, had therefore be postponed to the summer of 2001. Completion of all components of the remediation effort was achieved in September, 2001 (EBA Engineering Consultants Ltd., 2001).

Monitoring Program

DIAND Waste Management personnel carried out the annual site monitoring for 2004. This included:

- Visual inspection of capped tailings impoundment.
- State of vegetation and signs of erosion on all re-seeded areas.
- Inspection of tailings dam, drainage channels and diversion ditch.
- Inspection of the newly constructed spillway and dam of the unnamed lake.
- Sampling of ground water at selected monitoring wells and analysis for dissolved metals.
- Sampling of surface water at Tank Creek and analysis for dissolved metals.

Observations

The site was visited by Waste Management personnel on August 04, 2003. Weather conditions: partly cloudy, 15 °C and light wind NNE.

The overall state of the impoundment, tailings dam, drainage channel, diversion ditch, spillway and dam of the unnamed lake were satisfactory.

A small frog was observed in the drainage channel below the tailings impoundment.

There is a new beaver dam near the spillway (**Photo 1**), raising the water level of the unnamed lake approximately 0.5 m.

The vegetation on the tailings cover is for the most part doing very well with the exception of small patches that showed some signs of erosion.



Photo 1: Beaver Dam near the Spillway

Sampling of Monitoring Wells

Groundwater samples were taken from two selected monitoring wells (MW-2 and MW-1D) within the tailings impoundment area (see **Figure 2**). The well volume was established and each well was purged (3 x well volume) prior to sampling. Water quality data as recorded on site is shown in **Table 1** and sampling locations on **Figure 2**. The samples were filtered (0.45 μm) and sent to an accredited laboratory for dissolved metals analysis.

Surface Water Sampling

Surface water samples were taken from Tank Creek at the inflow (AGS-1) and outflow (AGS-2) of the unnamed lake. Water quality data as recorded on site is shown in **Table 1** and sampling locations on **Figure 2**. The samples were filtered (0.45 μm) and sent to an accredited laboratory for dissolved metals analysis.

Sample ID	Time	Temperature ($^{\circ}\text{C}$)	pH	Conductivity (μS)
MW-2	11:19	7.6	3.32	3999
MW-1D	12:05	7.0	6.6	270
AGS-1	12:43	7.5	6.82	43
AGS-2	13:09	11.2	7.01	56

Table 1: Water Quality Field Measurements

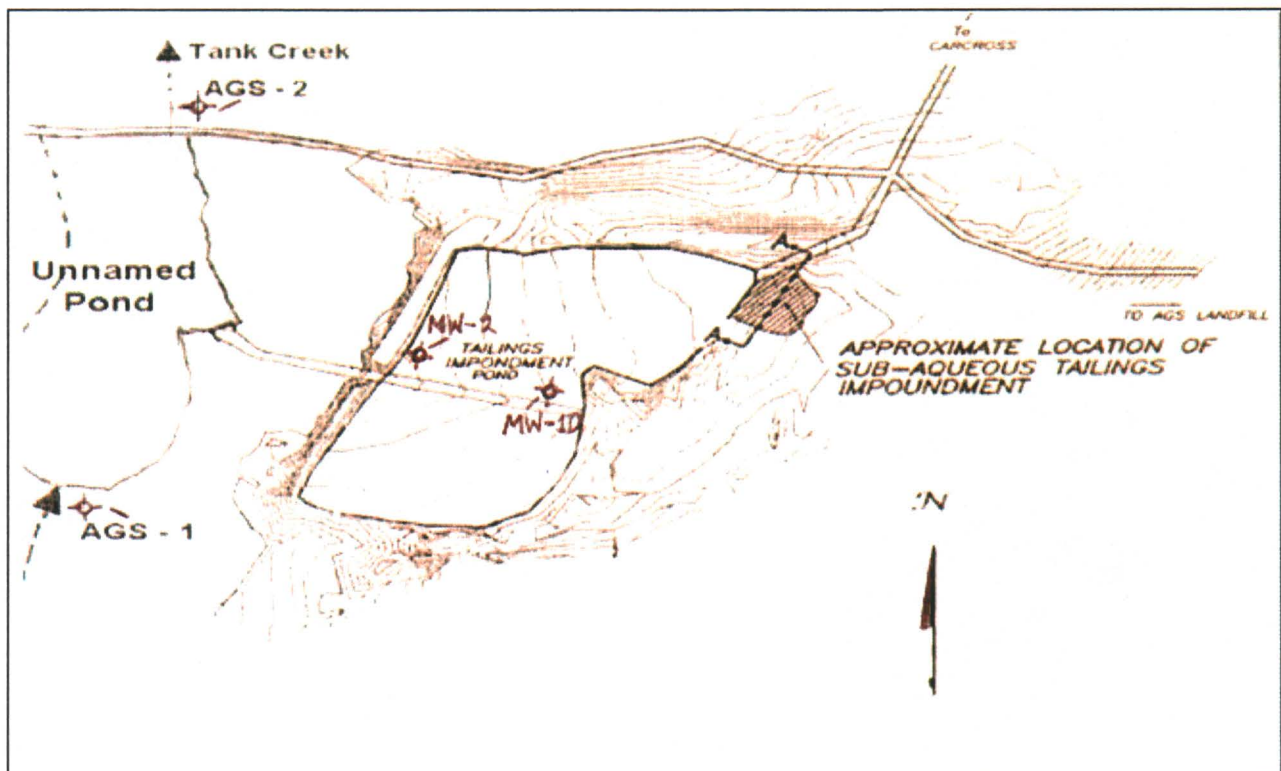


Figure 2: Water Sampling Locations

Analytical Results

The analysis of the groundwater samples for dissolved metals showed elevated levels of several metals in monitoring well MW-2 which is located near the lowest area in the tailings impoundment, next to the drainage channel. The results are generally similar to concentrations found in this well in 2001 (see **Table 2**). However, some metals are present in higher concentrations, while others are slightly lower. The water quality for this well (low pH and high conductivity – see **Table 1**) suggests that metals would be present in a dissolved state. Since the tailings are covered with a low permeable layer of clay capping material, acid generation should be strongly reduced or not happening at all. At this point it is unclear whether the water is ponding at the lowest spot with drainage from the tailings before they were capped or if it is recent acid rock drainage, in which case the low permeability cover would not be performing as effective as anticipated. Underground seepage from the containment cell into the surface water of Tank Creek cannot be confirmed at this time.

Parameter	MW-2 2001 mg/L	MW-2 2004 mg/L	CCME ^a Guidelines mg/L Total Metals	YCSR ^b Guidelines mg/L Total Metals
Arsenic	1.92	1.04	0.005	0.050
Aluminum	8.2	24.4	5 - 100	n/a
Zinc	55.8	83.5	30	0.075 – 2.4*
Copper	0.41	0.33	0.002 – 0.004	0.02 – 0.09*
Lead	< 0.05	0.067	0.3	0.04 – 0.16*
Iron	2000	2340	0.3	n/a

Table 2: Comparison of Metal Levels (dissolved) in Groundwater at MW-2

^a CCME: Canadian Council of Ministers of the Environment 1999- "Canadian Water Quality Guidelines for the Protection of Aquatic Life

^b YCSR: Yukon Contaminated Sites Regulations for the Protection of Aquatic Life (*depending on water hardness)



Photo 2: Surface Water Sampling at Tank Creek (outflow)

The analysis of the surface water samples for dissolved metals indicated a slight but insignificant increase in metal content in the outflow sample compared to the inflow (see **Appendix** for analytical report). The concentrations are well below the Yukon Contaminated Sites Regulations and CCME guidelines for the protection of aquatic life (YCSR 2002, CCME 2002).

The annual monitoring will be continued.

References

- CCME. 2002. *Canadian Environmental Quality Guidelines*. Canadian Council of Ministers of the Environment, Winnipeg, Manitoba.
- EBA Engineering Consultants Ltd. 2001. *Arctic Gold & Silver Tailings Site Remediation Near Carcross, Yukon*. Prepared for Public Works and Government Services Canada, Environmental Services, Western & Northern Region and DIAND Waste Management, Yukon Region. EBA Whitehorse, Yukon.
- EBA Engineering Consultants Ltd. 2001. *Monitoring of Low Permeability Cover Performance: Arctic Gold and Silver Mine Site, Carcross Yukon*. Prepared for the Mining Environment Research Group (MERG). EBA Whitehorse, Yukon.
- Indian and Northern Affairs. 2002. *Arctic Gold and Silver Tailings Site: Monitoring Report 2002*. Waste Management Program, Yukon Region, Whitehorse, Yukon.
- Indian and Northern Affairs. 2003. *Arctic Gold and Silver Tailings Site: Monitoring Report 2003*. Waste Management Program, Yukon Region, Whitehorse, Yukon.
- Public Works and Government Services Canada. 1998. *Phase III Environmental Assessment of the Arctic Gold and Silver Mill and Tailings Impoundment*. Environmental Services, Western & Northern Region, Edmonton, Alberta.
- Public Works and Government Services Canada. 1999. *Specifications: Arctic Gold and Silver, Environmental Clean Up of Mine Tailings Site*. Environmental Services, Western & Northern Region, Edmonton, Alberta.
- Steffen Robertson & Kirsten. 1999. *Final Report: Assessment of Remedial Measures for Arctic Gold & Silver Tailings Site*. SRK Consulting, Vancouver, B.C.
- YCSR. 2002. *Contaminated Sites Regulations: Generic Numerical Water Standards*. Environment Act. Yukon Territorial Government, Whitehorse, Yukon.

DIAND Waste Management and Northern Contaminants Programs
Arctic Gold and Silver Tailings Site - Monitoring Report, 2004

Appendix **(Analytical Report)**

ANALYTICAL REPORT

D.I.A.N.D. CONTAMINATES

DATE: 03-SEP-04 11:43 AM

Revision: 3

ATTN: WERNER LIEBAU

300 300 MAIN ST

WHITEHORSE YT Y1A 2B5

Lab Work Order #: L195168

Sampled By: W. LIEBAU

Date Received: 06-AUG-04

Project P.O. #:

Project Reference:

Comments:



DOUG JOHNSON
Director of Operations, Edmonton



RICK ZOLKIEWSKI
Client Service Specialist

THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE WRITTEN AUTHORITY OF THE LABORATORY.
ANY REMAINING SAMPLES WILL BE DISPOSED OF AFTER 30 DAYS FOLLOWING ANALYSIS. PLEASE CONTACT THE LAB IF YOU
REQUIRE ADDITIONAL SAMPLE STORAGE TIME.

LABORATORY ACCREDITATIONS:

- STANDARDS COUNCIL OF CANADA IN COOPERATION WITH THE CANADIAN ASSOCIATION FOR ENVIRONMENTAL ANALYTICAL LABORATORIES (CAEAL) FOR SPECIFIC TESTS AS REGISTERED BY THE COUNCIL (EDMONTON, CALGARY, GRANDE PRAIRIE, SASKATOON, WINNIPEG, THUNDER BAY, WATERLOO)
- AMERICAN INDUSTRIAL HYGIENE ASSOCIATION (AIHA) IN THE INDUSTRIAL HYGIENE PROGRAM (EDMONTON, WINNIPEG)
- STANDARDS COUNCIL OF CANADA IN COOPERATION WITH THE CANADIAN FOOD INSPECTION AGENCY (CFIA) FOR FERTILIZER AND FEED TESTING (SASKATOON) AND FOR MICROBIOLOGICAL TESTING IN FOOD (WINNIPEG)

LABORATORY RECOGNITIONS:

- STANDARDS COUNCIL OF CANADA - GLP COMPLIANT FACILITY (EDMONTON, OTTAWA)

9936 - 67 Avenue, Edmonton, Alberta T6E 0P5, Tel. (780) 413-5227, Fax (780) 437-2311
Canada Wide Tel. 1-800-668-9878 www.envirotest.com

(Edmonton, Calgary, Grande Prairie, Saskatoon, Winnipeg, Thunder Bay, Ottawa, Waterloo, Montreal)

ENVIRO-TEST ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier	D.L.	Units	Extracted	Analyzed	By	Batch
L195168-1 MW-2 ARCTIC GOLD AND SILVER								
Sample Date 04-AUG-04 11:19								
Matrix: WATER								
Dissolved Metals								
Dissolved Trace Metals (Low Level)								
Silver (Ag)	<0.0002		0.0002	mg/L		10-AUG-04	MX	R207602
Aluminum (Al)	24.4		0.01	mg/L		10-AUG-04	MX	R207602
Arsenic (As)	1.04		0.0004	mg/L		10-AUG-04	MX	R207602
Boron (B)	0.072		0.002	mg/L		10-AUG-04	MX	R207602
Barium (Ba)	0.0095		0.0001	mg/L		10-AUG-04	MX	R207602
Beryllium (Be)	0.0054		0.0005	mg/L		10-AUG-04	MX	R207602
Bismuth (Bi)	0.00009		0.00005	mg/L		10-AUG-04	MX	R207602
Cadmium (Cd)	0.0177		0.0001	mg/L		10-AUG-04	MX	R207602
Cobalt (Co)	1.94		0.0001	mg/L		10-AUG-04	MX	R207602
Chromium (Cr)	0.0290		0.0004	mg/L		10-AUG-04	MX	R207602
Copper (Cu)	0.326		0.0006	mg/L		10-AUG-04	MX	R207602
Molybdenum (Mo)	0.0009		0.0001	mg/L		10-AUG-04	MX	R207602
Nickel (Ni)	0.800		0.0001	mg/L		10-AUG-04	MX	R207602
Lead (Pb)	0.0679		0.0001	mg/L		10-AUG-04	MX	R207602
Antimony (Sb)	0.0022		0.0004	mg/L		10-AUG-04	MX	R207602
Selenium (Se)	0.0032		0.0004	mg/L		10-AUG-04	MX	R207602
Tin (Sn)	0.0003		0.0002	mg/L		10-AUG-04	MX	R207602
Strontium (Sr)	0.621		0.0001	mg/L		10-AUG-04	MX	R207602
Titanium (Ti)	0.0040		0.0003	mg/L		10-AUG-04	MX	R207602
Thallium (Tl)	0.00014		0.00005	mg/L		10-AUG-04	MX	R207602
Uranium (U)	0.0102		0.0001	mg/L		10-AUG-04	MX	R207602
Vanadium (V)	0.0583		0.0001	mg/L		10-AUG-04	MX	R207602
Zinc (Zn)	83.5		0.002	mg/L		11-AUG-04	MX	R208265
Dissolved Major Metals								
Calcium (Ca)	282		0.5	mg/L		09-AUG-04	HAS	R207218
Potassium (K)	10.6		0.1	mg/L		09-AUG-04	HAS	R207218
Magnesium (Mg)	99.6		0.01	mg/L		09-AUG-04	HAS	R207218
Sodium (Na)	39.2		0.5	mg/L		09-AUG-04	HAS	R207218
Iron (Fe)	2340		0.005	mg/L		10-AUG-04	HAS	R208010
Manganese (Mn)	49.6		0.001	mg/L		09-AUG-04	HAS	R207218
L195168-2 MW-10 ARCTIC GOLD AND SILVER								
Sample Date 04-AUG-04 12:05								
Matrix: WATER								
Dissolved Metals								
Dissolved Trace Metals (Low Level)								
Silver (Ag)	<0.0002		0.0002	mg/L		10-AUG-04	MX	R207602
Aluminum (Al)	0.15		0.01	mg/L		10-AUG-04	MX	R207602
Arsenic (As)	0.0041		0.0004	mg/L		10-AUG-04	MX	R207602
Boron (B)	0.012		0.002	mg/L		10-AUG-04	MX	R207602
Barium (Ba)	0.0327		0.0001	mg/L		10-AUG-04	MX	R207602
Beryllium (Be)	<0.0005		0.0005	mg/L		10-AUG-04	MX	R207602
Bismuth (Bi)	<0.00005		0.00005	mg/L		10-AUG-04	MX	R207602
Cadmium (Cd)	0.0002		0.0001	mg/L		10-AUG-04	MX	R207602
Cobalt (Co)	0.0032		0.0001	mg/L		10-AUG-04	MX	R207602
Chromium (Cr)	<0.0004		0.0004	mg/L		10-AUG-04	MX	R207602
Copper (Cu)	0.0023		0.0006	mg/L		10-AUG-04	MX	R207602
Molybdenum (Mo)	0.0015		0.0001	mg/L		10-AUG-04	MX	R207602
Nickel (Ni)	0.0029		0.0001	mg/L		10-AUG-04	MX	R207602
Lead (Pb)	0.0002		0.0001	mg/L		10-AUG-04	MX	R207602

ENVIRO-TEST ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier	D.L.	Units	Extracted	Analyzed	By	Batch
L195168-2 MW-10 ARCTIC GOLD AND SILVER Sample Date 04-AUG-04 12:05 Matrix: WATER								
Dissolved Metals								
Dissolved Trace Metals (Low Level)								
Antimony (Sb)	0.0005		0.0004	mg/L		10-AUG-04	MX	R207602
Selenium (Se)	<0.0004		0.0004	mg/L		10-AUG-04	MX	R207602
Tin (Sn)	<0.0002		0.0002	mg/L		10-AUG-04	MX	R207602
Strontium (Sr)	0.162		0.0001	mg/L		10-AUG-04	MX	R207602
Titanium (Ti)	0.0021		0.0003	mg/L		10-AUG-04	MX	R207602
Thallium (Tl)	<0.00005		0.00005	mg/L		10-AUG-04	MX	R207602
Uranium (U)	0.0014		0.0001	mg/L		10-AUG-04	MX	R207602
Vanadium (V)	0.0006		0.0001	mg/L		10-AUG-04	MX	R207602
Zinc (Zn)	<0.002		0.002	mg/L		11-AUG-04	MX	R208265
Dissolved Major Metals								
Calcium (Ca)	37.4		0.5	mg/L		09-AUG-04	HAS	R207218
Potassium (K)	2.4		0.1	mg/L		09-AUG-04	HAS	R207218
Magnesium (Mg)	7.94		0.01	mg/L		09-AUG-04	HAS	R207218
Sodium (Na)	3.6		0.5	mg/L		09-AUG-04	HAS	R207218
Iron (Fe)	0.118		0.005	mg/L		09-AUG-04	HAS	R207218
Manganese (Mn)	0.419		0.001	mg/L		09-AUG-04	HAS	R207218
L195168-3 AGC-1 ARCTIC GOLD AND SILVER Sample Date 04-AUG-04 12:43 Matrix: WATER								
Dissolved Metals								
Dissolved Trace Metals (Low Level)								
Silver (Ag)	<0.0002		0.0002	mg/L		10-AUG-04	MX	R207602
Aluminum (Al)	0.16		0.01	mg/L		10-AUG-04	MX	R207602
Arsenic (As)	0.0009		0.0004	mg/L		10-AUG-04	MX	R207602
Boron (B)	0.004		0.002	mg/L		10-AUG-04	MX	R207602
Barium (Ba)	0.0058		0.0001	mg/L		10-AUG-04	MX	R207602
Beryllium (Be)	<0.0005		0.0005	mg/L		10-AUG-04	MX	R207602
Bismuth (Bi)	<0.00005		0.00005	mg/L		10-AUG-04	MX	R207602
Cadmium (Cd)	<0.0001		0.0001	mg/L		10-AUG-04	MX	R207602
Cobalt (Co)	<0.0001		0.0001	mg/L		10-AUG-04	MX	R207602
Chromium (Cr)	<0.0004		0.0004	mg/L		10-AUG-04	MX	R207602
Copper (Cu)	0.0011		0.0006	mg/L		10-AUG-04	MX	R207602
Molybdenum (Mo)	0.0006		0.0001	mg/L		10-AUG-04	MX	R207602
Nickel (Ni)	0.0006		0.0001	mg/L		10-AUG-04	MX	R207602
Lead (Pb)	<0.0001		0.0001	mg/L		10-AUG-04	MX	R207602
Antimony (Sb)	0.0005		0.0004	mg/L		10-AUG-04	MX	R207602
Selenium (Se)	<0.0004		0.0004	mg/L		10-AUG-04	MX	R207602
Tin (Sn)	<0.0002		0.0002	mg/L		10-AUG-04	MX	R207602
Strontium (Sr)	0.0259		0.0001	mg/L		10-AUG-04	MX	R207602
Titanium (Ti)	0.0026		0.0003	mg/L		10-AUG-04	MX	R207602
Thallium (Tl)	<0.00005		0.00005	mg/L		10-AUG-04	MX	R207602
Uranium (U)	0.0001		0.0001	mg/L		10-AUG-04	MX	R207602
Vanadium (V)	0.0004		0.0001	mg/L		10-AUG-04	MX	R207602
Zinc (Zn)	0.007		0.002	mg/L		10-AUG-04	MX	R207602
Dissolved Major Metals								
Calcium (Ca)	5.9		0.5	mg/L		09-AUG-04	HAS	R207218
Potassium (K)	0.4		0.1	mg/L		09-AUG-04	HAS	R207218
Magnesium (Mg)	1.45		0.01	mg/L		09-AUG-04	HAS	R207218
Sodium (Na)	1.3		0.5	mg/L		09-AUG-04	HAS	R207218

ENVIRO-TEST ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier	D.L.	Units	Extracted	Analyzed	By	Batch
L195168-3 AGC-1 ARCTIC GOLD AND SILVER Sample Date 04-AUG-04 12:43 Matrix: WATER Dissolved Metals Dissolved Major Metals								
Iron (Fe)	0.141		0.005	mg/L		09-AUG-04	HAS	R207218
Manganese (Mn)	0.004		0.001	mg/L		09-AUG-04	HAS	R207218
L195168-4 AGC-2 ARCTIC GOLD AND SILVER Sample Date 04-AUG-04 13:09 Matrix: WATER Dissolved Metals Dissolved Trace Metals (Low Level)								
Silver (Ag)	<0.0002		0.0002	mg/L		10-AUG-04	MX	R207602
Aluminum (Al)	0.02		0.01	mg/L		19-AUG-04	MX	R210990
Arsenic (As)	0.0012		0.0004	mg/L		10-AUG-04	MX	R207602
Boron (B)	0.004		0.002	mg/L		10-AUG-04	MX	R207602
Barium (Ba)	0.0059		0.0001	mg/L		10-AUG-04	MX	R207602
Beryllium (Be)	<0.0005		0.0005	mg/L		10-AUG-04	MX	R207602
Bismuth (Bi)	<0.00005		0.00005	mg/L		10-AUG-04	MX	R207602
Cadmium (Cd)	<0.0001		0.0001	mg/L		10-AUG-04	MX	R207602
Cobalt (Co)	<0.0001		0.0001	mg/L		10-AUG-04	MX	R207602
Chromium (Cr)	<0.0004		0.0004	mg/L		10-AUG-04	MX	R207602
Copper (Cu)	0.0012		0.0006	mg/L		10-AUG-04	MX	R207602
Molybdenum (Mo)	0.0007		0.0001	mg/L		10-AUG-04	MX	R207602
Nickel (Ni)	0.0007		0.0001	mg/L		10-AUG-04	MX	R207602
Lead (Pb)	<0.0001		0.0001	mg/L		10-AUG-04	MX	R207602
Antimony (Sb)	<0.0004		0.0004	mg/L		10-AUG-04	MX	R207602
Selenium (Se)	<0.0004		0.0004	mg/L		10-AUG-04	MX	R207602
Tin (Sn)	<0.0002		0.0002	mg/L		10-AUG-04	MX	R207602
Strontium (Sr)	0.0319		0.0001	mg/L		10-AUG-04	MX	R207602
Titanium (Ti)	0.0009		0.0003	mg/L		10-AUG-04	MX	R207602
Thallium (Tl)	<0.00005		0.00005	mg/L		10-AUG-04	MX	R207602
Uranium (U)	0.0001		0.0001	mg/L		10-AUG-04	MX	R207602
Vanadium (V)	0.0002		0.0001	mg/L		10-AUG-04	MX	R207602
Zinc (Zn)	0.008		0.002	mg/L		10-AUG-04	MX	R207602
Dissolved Major Metals								
Calcium (Ca)	7.3		0.5	mg/L		09-AUG-04	HAS	R207218
Potassium (K)	0.6		0.1	mg/L		09-AUG-04	HAS	R207218
Magnesium (Mg)	1.73		0.01	mg/L		09-AUG-04	HAS	R207218
Sodium (Na)	1.6		0.5	mg/L		09-AUG-04	HAS	R207218
Iron (Fe)	0.157		0.005	mg/L		09-AUG-04	HAS	R207218
Manganese (Mn)	0.011		0.001	mg/L		09-AUG-04	HAS	R207218
L195168-5 AGC-D ARCTIC GOLD AND SILVER Sample Date 04-AUG-04 13:09 Matrix: WATER Dissolved Metals Dissolved Trace Metals (Low Level)								
Silver (Ag)	<0.0002		0.0002	mg/L		10-AUG-04	MX	R207602
Aluminum (Al)	0.02		0.01	mg/L		19-AUG-04	MX	R210990
Arsenic (As)	0.0011		0.0004	mg/L		10-AUG-04	MX	R207602
Boron (B)	0.004		0.002	mg/L		10-AUG-04	MX	R207602
Barium (Ba)	0.0061		0.0001	mg/L		10-AUG-04	MX	R207602
Beryllium (Be)	<0.0005		0.0005	mg/L		10-AUG-04	MX	R207602

Reference Information

Methods Listed (if applicable):

ETL Test Code	Matrix	Test Description	Preparation Method Reference(Based On)	Analytical Method Reference(Based On)
MET1-DIS-LOW-ED	Water	Dissolved Trace Metals (Low Level)		EPA 6020
MET2-DIS-ED	Water	Dissolved Major Metals		EPA 200.7

** Laboratory Methods employed follow in-house procedures, which are generally based on nationally or internationally accepted methodologies.

Chain of Custody numbers:

L195168

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location	Laboratory Definition Code	Laboratory Location
ED	Enviro-Test Laboratories - Edmonton, Alberta, Canada		

GLOSSARY OF REPORT TERMS

Surr - A surrogate is an organic compound that is similar to the target analyte(s) in chemical composition and behavior but not normally detected in environmental samples. Prior to sample processing, samples are fortified with one or more surrogate compounds. The reported surrogate recovery value provides a measure of method efficiency. The Laboratory warning units are determined under column heading D.L.

mg/kg (units) - unit of concentration based on mass, parts per million

mg/L (units) - unit of concentration based on volume, parts per million

< - Less than

D.L. - Detection Limit

N/A - Result not available. Refer to qualifier code and definition for explanation

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

UNLESS OTHERWISE STATED, SAMPLES ARE NOT CORRECTED FOR CLIENT FIELD BLANKS.

Although test results are generated under strict QA/QC protocols, any unsigned test reports, faxes, or emails are considered preliminary.

Enviro-Test Laboratories has an extensive QA/QC program where all analytical data reported is analyzed using approved referenced procedures followed by checks and reviews by senior managers and quality assurance personnel. However, since the results are obtained from chemical measurements and thus cannot be guaranteed, Enviro-Test Laboratories assumes no liability for the use or interpretation of the results.

Enviro-Test Quality Control Report

Workorder: L195168

Client: D.I.A.N.D. CONTAMINATES
 300 300 MAIN ST
 WHITEHORSE YT Y1A 2B5

Contact: WERNER LIEBAU

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET1-DIS-LOW-ED		Water						
Batch	R207602							
WG211660-10	DUP	L195558-15						
Aluminum (Al)		150	0.14		mg/L	3.5	9	10-AUG-04
Antimony (Sb)		<0.8	0.0005	J	mg/L	0.0000	0.0012	10-AUG-04
Arsenic (As)		1.4	0.0014	J	mg/L	0.0000	0.0012	10-AUG-04
Barium (Ba)		60.1	0.0599		mg/L	0.45	7.5	10-AUG-04
Beryllium (Be)		<0.5	<0.0005	RPD-NA	mg/L	N/A	7.8	10-AUG-04
Bismuth (Bi)		<0.05	<0.00005	RPD-NA	mg/L	N/A	20	10-AUG-04
Boron (B)		128	0.131		mg/L	2.1	9.1	10-AUG-04
Cadmium (Cd)		<0.1	<0.0001	RPD-NA	mg/L	N/A	25	10-AUG-04
Chromium (Cr)		2.4	0.0025	J	mg/L	0.0000	0.0012	10-AUG-04
Cobalt (Co)		0.5	0.0005	J	mg/L	0.0000	0.00031	10-AUG-04
Copper (Cu)		1.5	0.0014	J	mg/L	0.0001	0.0018	10-AUG-04
Lead (Pb)		1.2	0.0012		mg/L	0.87	12	10-AUG-04
Molybdenum (Mo)		9.3	0.0092		mg/L	0.54	6.5	10-AUG-04
Nickel (Ni)		12.2	0.0121		mg/L	0.49	11	10-AUG-04
Selenium (Se)		4.6	0.0045		mg/L	1.8	19	10-AUG-04
Silver (Ag)		<0.2	<0.0002	RPD-NA	mg/L	N/A	20	10-AUG-04
Strontium (Sr)		1770	1.78		mg/L	0.71	5	10-AUG-04
Thallium (Tl)		0.05	<0.00005	RPD-NA	mg/L	N/A	20	10-AUG-04
Tin (Sn)		<0.2	<0.0002	RPD-NA	mg/L	N/A	20	10-AUG-04
Titanium (Ti)		8.5	0.0082		mg/L	3.2	22	10-AUG-04
Uranium (U)		1.1	0.0012		mg/L	2.2	7.8	10-AUG-04
Vanadium (V)		3.2	0.0035		mg/L	7.7	18	10-AUG-04
Zinc (Zn)		38	0.038		mg/L	0.62	9.6	10-AUG-04
WG211660-6	DUP	L195169-7						
Aluminum (Al)		0.34	0.41	G	mg/L	19	9	10-AUG-04
Antimony (Sb)		0.0007	0.0007	J	mg/L	0.0000	0.0012	10-AUG-04
Arsenic (As)		0.172	0.168		mg/L	2.7	11	10-AUG-04
Barium (Ba)		0.0057	0.0057		mg/L	1.1	7.5	10-AUG-04
Beryllium (Be)		<0.0005	<0.0005	RPD-NA	mg/L	N/A	7.8	10-AUG-04
Bismuth (Bi)		<0.00005	<0.00005	RPD-NA	mg/L	N/A	20	10-AUG-04
Boron (B)		0.018	0.017	J	mg/L	0.000	0.0061	10-AUG-04
Cadmium (Cd)		0.0002	0.0002	J	mg/L	0.0000	0.00031	10-AUG-04
Chromium (Cr)		0.0013	0.0012	J		0.0001	0.0012	

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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<u>MET1-DIS-LOW-ED</u>		<u>Water</u>						
Batch	R207602							
WG211660-6	DUP	L195169-7						
Chromium (Cr)		0.0013	0.0012	J	mg/L	0.0001	0.0012	10-AUG-04
Cobalt (Co)		<0.0001	<0.0001	RPD-NA	mg/L	N/A	5.1	10-AUG-04
Copper (Cu)		0.0013	0.0018	J	mg/L	0.0004	0.0018	10-AUG-04
Lead (Pb)		<0.0001	0.0001	RPD-NA	mg/L	N/A	12	10-AUG-04
Molybdenum (Mo)		0.0012	0.0011		mg/L	1.7	6.5	10-AUG-04
Nickel (Ni)		0.0002	0.0002	J	mg/L	0.0000	0.00031	10-AUG-04
Phosphorus (P)		<0.01	<0.01	RPD-NA	mg/L	N/A	7.4	10-AUG-04
Selenium (Se)		<0.0004	<0.0004	RPD-NA	mg/L	N/A	19	10-AUG-04
Silver (Ag)		<0.0002	<0.0002	RPD-NA	mg/L	N/A	20	10-AUG-04
Strontium (Sr)		0.249	0.240		mg/L	3.6	5	10-AUG-04
Thallium (Tl)		<0.00005	<0.00005	RPD-NA	mg/L	N/A	20	10-AUG-04
Tin (Sn)		<0.0002	<0.0002	RPD-NA	mg/L	N/A	20	10-AUG-04
Titanium (Ti)		0.0005	0.0004	J	mg/L	0.0001	0.00092	10-AUG-04
Uranium (U)		0.0008	0.0008	J	mg/L	0.0000	0.00031	10-AUG-04
Vanadium (V)		0.0006	0.0005	J	mg/L	0.0000	0.00031	10-AUG-04
Zinc (Zn)		0.033	0.032		mg/L	0.97	9.6	10-AUG-04
WG211660-1	MB							
Aluminum (Al)			0.04		mg/L		0.05	10-AUG-04
Antimony (Sb)			<0.0004		mg/L		0.002	10-AUG-04
Arsenic (As)			<0.0004		mg/L		0.002	10-AUG-04
Barium (Ba)			<0.0001		mg/L		0.0005	10-AUG-04
Beryllium (Be)			<0.0005		mg/L		0.0025	10-AUG-04
Bismuth (Bi)			<0.00005		mg/L		0.00025	10-AUG-04
Boron (B)			0.002		mg/L		0.01	10-AUG-04
Cadmium (Cd)			<0.0001		mg/L		0.0005	10-AUG-04
Chromium (Cr)			<0.0004		mg/L		0.002	10-AUG-04
Cobalt (Co)			<0.0001		mg/L		0.0005	10-AUG-04
Copper (Cu)			<0.0006		mg/L		0.003	10-AUG-04
Lead (Pb)			<0.0001		mg/L		0.0005	10-AUG-04
Molybdenum (Mo)			<0.0001		mg/L		0.0005	10-AUG-04
Nickel (Ni)			<0.0001		mg/L		0.0005	10-AUG-04
Phosphorus (P)			<0.01		mg/L		0.01	10-AUG-04
Selenium (Se)			<0.0004		mg/L		0.002	10-AUG-04
Silver (Ag)			<0.0002		mg/L		0.001	10-AUG-04
Strontium (Sr)			<0.0001		mg/L		0.0005	10-AUG-04
Thallium (Tl)			<0.00005		mg/L		0.00025	10-AUG-04
Tin (Sn)			<0.0002		mg/L		0.001	10-AUG-04

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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<u>MET1-DIS-LOW-ED</u>		<u>Water</u>						
Batch	R207602							
WG211660-1	MB							
Titanium (Ti)			<0.0003		mg/L		0.0015	10-AUG-04
Uranium (U)			<0.0001		mg/L		0.0005	10-AUG-04
Vanadium (V)			<0.0001		mg/L		0.0005	10-AUG-04
Zinc (Zn)			0.003		mg/L		0.01	10-AUG-04
WG211660-11	MS	L195558-15						
Aluminum (Al)			105		%		86-117	10-AUG-04
Antimony (Sb)			115	H	%		92-112	10-AUG-04
Arsenic (As)			107		%		91-121	10-AUG-04
Barium (Ba)			110		%		83-119	10-AUG-04
Beryllium (Be)			112		%		83-123	10-AUG-04
Bismuth (Bi)			107		%		85-115	10-AUG-04
Boron (B)			112		%		84-116	10-AUG-04
Cadmium (Cd)			108		%		90-112	10-AUG-04
Chromium (Cr)			102		%		85-112	10-AUG-04
Cobalt (Co)			101		%		83-116	10-AUG-04
Copper (Cu)			105		%		84-113	10-AUG-04
Lead (Pb)			114		%		86-116	10-AUG-04
Molybdenum (Mo)			113		%		88-120	10-AUG-04
Nickel (Ni)			99		%		89-112	10-AUG-04
Phosphorus (P)			109		%		88-118	10-AUG-04
Selenium (Se)			104		%		88-126	10-AUG-04
Silver (Ag)			87		%		44-124	10-AUG-04
Strontium (Sr)			113	E	%		75-120	10-AUG-04
Thallium (Tl)			116	H	%		88-116	10-AUG-04
Tin (Sn)			116	H	%		94-114	10-AUG-04
Titanium (Ti)			111	H	%		91-109	10-AUG-04
Uranium (U)			110		%		88-118	10-AUG-04
Vanadium (V)			103		%		91-117	10-AUG-04
Zinc (Zn)			107		%		85-111	10-AUG-04
WG211660-7	MS	L195169-7						
Aluminum (Al)			129	G	%		86-117	10-AUG-04
Antimony (Sb)			125	G	%		92-112	10-AUG-04
Arsenic (As)			113		%		91-121	10-AUG-04
Barium (Ba)			110		%		83-119	10-AUG-04
Beryllium (Be)			126	H	%		83-123	10-AUG-04
Bismuth (Bi)			115	H	%		85-115	10-AUG-04
Boron (B)			122	H	%		84-116	10-AUG-04

COMMENTS: High bias issue was investigated and has been resolved.

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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<u>MET1-DIS-LOW-ED</u>		<u>Water</u>						
Batch	R207602							
WG211660-7	MS	L195169-7						
Cadmium (Cd)			113	H	%		90-112	10-AUG-04
Chromium (Cr)			107		%		85-112	10-AUG-04
Cobalt (Co)			106		%		83-116	10-AUG-04
Copper (Cu)			111		%		84-113	10-AUG-04
Lead (Pb)			124	G	%		86-116	10-AUG-04
Molybdenum (Mo)			116		%		88-120	10-AUG-04
Nickel (Ni)			105		%		89-112	10-AUG-04
Phosphorus (P)			109		%		88-118	10-AUG-04
Selenium (Se)			110		%		88-126	10-AUG-04
Silver (Ag)			106		%		44-124	10-AUG-04
Strontium (Sr)			81		%		75-120	10-AUG-04
Thallium (Tl)			124	G	%		88-116	10-AUG-04
Tin (Sn)			124	G	%		94-114	10-AUG-04
Titanium (Ti)			115	G	%		91-109	10-AUG-04
Uranium (U)			114		%		88-118	10-AUG-04
Vanadium (V)			107		%		91-117	10-AUG-04
Zinc (Zn)			115	H	%		85-111	10-AUG-04

COMMENTS: High bias issue was investigated and has been resolved.

Batch	R208265							
WG212646-2	DUP	L195551-1						
Aluminum (Al)		<0.01	<0.01	RPD-NA	mg/L	N/A	9	11-AUG-04
Antimony (Sb)		0.0009	0.0008	J	mg/L	0.0000	0.0012	11-AUG-04
Arsenic (As)		0.0314	0.0314		mg/L	0.032	11	11-AUG-04
Barium (Ba)		0.662	0.672		mg/L	1.6	7.5	11-AUG-04
Beryllium (Be)		<0.0005	<0.0005	RPD-NA	mg/L	N/A	7.8	11-AUG-04
Bismuth (Bi)		<0.00005	<0.00005	RPD-NA	mg/L	N/A	20	11-AUG-04
Boron (B)		1.35	1.31		mg/L	3.2	9.1	11-AUG-04
Cadmium (Cd)		<0.0001	<0.0001	RPD-NA	mg/L	N/A	25	11-AUG-04
Cobalt (Co)		0.0092	0.0093		mg/L	1.2	5.1	11-AUG-04
Copper (Cu)		<0.0006	<0.0006	RPD-NA	mg/L	N/A	10	11-AUG-04
Lead (Pb)		0.0002	0.0002	J	mg/L	0.0000	0.00031	11-AUG-04
Molybdenum (Mo)		0.0059	0.0060		mg/L	1.6	6.5	11-AUG-04
Nickel (Ni)		0.0137	0.0141		mg/L	2.7	11	11-AUG-04
Phosphorus (P)		0.23	0.24		mg/L	1.7	7.4	11-AUG-04
Selenium (Se)		<0.0004	<0.0004	RPD-NA	mg/L	N/A	19	11-AUG-04
Silver (Ag)		<0.0002	<0.0002	RPD-NA	mg/L	N/A	20	11-AUG-04
Strontium (Sr)		0.437	0.440		mg/L	0.74	5	11-AUG-04

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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<u>MET1-DIS-LOW-ED</u>		<u>Water</u>						
Batch	R208265							
WG212646-2	DUP	L195551-1						
Thallium (Tl)		<0.00005	<0.00005	RPD-NA	mg/L	N/A	20	11-AUG-04
Tin (Sn)		<0.0002	<0.0002	RPD-NA	mg/L	N/A	20	11-AUG-04
Titanium (Ti)		0.0048	0.0049		mg/L	2.4	22	11-AUG-04
Uranium (U)		0.0013	0.0013		mg/L	0.38	7.8	11-AUG-04
Vanadium (V)		0.0017	0.0018		mg/L	4.0	18	11-AUG-04
Zinc (Zn)		0.006	0.007	J	mg/L	0.001	0.0061	11-AUG-04
WG212646-4	DUP	L195495-7						
Aluminum (Al)		0.02	0.02	J	mg/L	0.00	0.031	11-AUG-04
Antimony (Sb)		<0.0004	<0.0004	RPD-NA	mg/L	N/A	11	11-AUG-04
Arsenic (As)		0.0008	0.0008	J	mg/L	0.0000	0.0012	11-AUG-04
Barium (Ba)		0.0206	0.0207		mg/L	0.80	7.5	11-AUG-04
Beryllium (Be)		<0.0005	<0.0005	RPD-NA	mg/L	N/A	7.8	11-AUG-04
Bismuth (Bi)		<0.00005	<0.00005	RPD-NA	mg/L	N/A	20	11-AUG-04
Boron (B)		0.004	0.004	J	mg/L	0.000	0.0061	11-AUG-04
Cadmium (Cd)		<0.0001	<0.0001	RPD-NA	mg/L	N/A	25	11-AUG-04
Chromium (Cr)		<0.0004	<0.0004	RPD-NA	mg/L	N/A	14	11-AUG-04
Cobalt (Co)		0.0003	0.0003	J	mg/L	0.0000	0.00031	11-AUG-04
Copper (Cu)		0.0080	0.0079		mg/L	1.9	10	11-AUG-04
Lead (Pb)		0.0004	0.0004	J	mg/L	0.0000	0.00031	11-AUG-04
Molybdenum (Mo)		0.0004	0.0004	J	mg/L	0.0000	0.00031	11-AUG-04
Nickel (Ni)		<0.0001	<0.0001	RPD-NA	mg/L	N/A	11	11-AUG-04
Phosphorus (P)		<0.01	<0.01	RPD-NA	mg/L	N/A	7.4	11-AUG-04
Selenium (Se)		0.0007	0.0005	J	mg/L	0.0002	0.0012	11-AUG-04
Silver (Ag)		<0.0002	<0.0002	RPD-NA	mg/L	N/A	20	11-AUG-04
Strontium (Sr)		0.211	0.209		mg/L	1.1	5	11-AUG-04
Thallium (Tl)		<0.00005	<0.00005	RPD-NA	mg/L	N/A	20	11-AUG-04
Tin (Sn)		<0.0002	<0.0002	RPD-NA	mg/L	N/A	20	11-AUG-04
Titanium (Ti)		0.0030	0.0027	J	mg/L	0.0003	0.00092	11-AUG-04
Uranium (U)		0.0058	0.0059		mg/L	1.4	7.8	11-AUG-04
Vanadium (V)		0.0003	0.0002	J	mg/L	0.0000	0.00031	11-AUG-04
Zinc (Zn)		0.012	0.012	J	mg/L	0.000	0.0061	11-AUG-04
WG212646-1	MB							
Aluminum (Al)			0.02		mg/L		0.05	11-AUG-04
Antimony (Sb)			<0.0004		mg/L		0.002	11-AUG-04
Arsenic (As)			<0.0004		mg/L		0.002	11-AUG-04
Barium (Ba)			<0.0001		mg/L		0.0005	11-AUG-04
Beryllium (Be)			<0.0005		mg/L		0.0025	11-AUG-04

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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<u>MET1-DIS-LOW-ED</u>		<u>Water</u>						
Batch	R208265							
WG212646-1	MB							
Bismuth (Bi)			<0.00005		mg/L		0.00025	11-AUG-04
Boron (B)			0.003		mg/L		0.01	11-AUG-04
Cadmium (Cd)			<0.0001		mg/L		0.0005	11-AUG-04
Chromium (Cr)			<0.0004		mg/L		0.002	11-AUG-04
Cobalt (Co)			<0.0001		mg/L		0.0005	11-AUG-04
Copper (Cu)			<0.0006		mg/L		0.003	11-AUG-04
Lead (Pb)			<0.0001		mg/L		0.0005	11-AUG-04
Molybdenum (Mo)			0.0007	A	mg/L		0.0005	11-AUG-04
Nickel (Ni)			<0.0001		mg/L		0.0005	11-AUG-04
Phosphorus (P)			<0.01		mg/L		0.01	11-AUG-04
Selenium (Se)			<0.0004		mg/L		0.002	11-AUG-04
Silver (Ag)			<0.0002		mg/L		0.001	11-AUG-04
Strontium (Sr)			<0.0001		mg/L		0.0005	11-AUG-04
Thallium (Tl)			<0.00005		mg/L		0.00025	11-AUG-04
Tin (Sn)			<0.0002		mg/L		0.001	11-AUG-04
Titanium (Ti)			<0.0003		mg/L		0.0015	11-AUG-04
Uranium (U)			<0.0001		mg/L		0.0005	11-AUG-04
Vanadium (V)			<0.0001		mg/L		0.0005	11-AUG-04
Zinc (Zn)			0.003		mg/L		0.01	11-AUG-04
WG212646-3	MS	L195551-1						
Aluminum (Al)			104		%		86-117	11-AUG-04
Antimony (Sb)			97		%		92-112	11-AUG-04
Arsenic (As)			113		%		91-121	11-AUG-04
Barium (Ba)			112	E	%		83-119	11-AUG-04
Beryllium (Be)			111		%		83-123	11-AUG-04
Bismuth (Bi)			107		%		85-115	11-AUG-04
Boron (B)			96		%		84-116	11-AUG-04
Cadmium (Cd)			107		%		90-112	11-AUG-04
Chromium (Cr)			109		%		85-112	11-AUG-04
Cobalt (Co)			109		%		83-116	11-AUG-04
Copper (Cu)			107		%		84-113	11-AUG-04
Lead (Pb)			105		%		86-116	11-AUG-04
Molybdenum (Mo)			98		%		88-120	11-AUG-04
Nickel (Ni)			107		%		89-112	11-AUG-04
Phosphorus (P)			111		%		88-118	11-AUG-04
Selenium (Se)			115		%		88-126	11-AUG-04
Silver (Ag)			18	G	%		44-124	11-AUG-04

Enviro-Test Quality Control Report

Workorder: L195168

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<u>MET1-DIS-LOW-ED</u>		<u>Water</u>						
Batch	R208265							
WG212646-3	MS	L195551-1						
Strontium (Sr)			105		%		75-120	11-AUG-04
Thallium (Tl)			108		%		88-116	11-AUG-04
Tin (Sn)			96		%		94-114	11-AUG-04
Titanium (Ti)			96		%		91-109	11-AUG-04
Uranium (U)			106		%		88-118	11-AUG-04
Vanadium (V)			110		%		91-117	11-AUG-04
Zinc (Zn)			97		%		85-111	11-AUG-04
WG212646-5	MS	L195495-7						
Aluminum (Al)			99		%		86-117	11-AUG-04
Antimony (Sb)			107		%		92-112	11-AUG-04
Arsenic (As)			96		%		91-121	11-AUG-04
Barium (Ba)			96		%		83-119	11-AUG-04
Beryllium (Be)			104		%		83-123	11-AUG-04
Bismuth (Bi)			97		%		85-115	11-AUG-04
Boron (B)			101		%		84-116	11-AUG-04
Cadmium (Cd)			96		%		90-112	11-AUG-04
Chromium (Cr)			95		%		85-112	11-AUG-04
Cobalt (Co)			94		%		83-116	11-AUG-04
Copper (Cu)			93		%		84-113	11-AUG-04
Lead (Pb)			97		%		86-116	11-AUG-04
Molybdenum (Mo)			102		%		88-120	11-AUG-04
Nickel (Ni)			94		%		89-112	11-AUG-04
Phosphorus (P)			99		%		88-118	11-AUG-04
Selenium (Se)			99		%		88-126	11-AUG-04
Silver (Ag)			82		%		44-124	11-AUG-04
Strontium (Sr)			94		%		75-120	11-AUG-04
Thallium (Tl)			97		%		88-116	11-AUG-04
Tin (Sn)			102		%		94-114	11-AUG-04
Titanium (Ti)			103		%		91-109	11-AUG-04
Uranium (U)			99		%		88-118	11-AUG-04
Vanadium (V)			96		%		91-117	11-AUG-04
Zinc (Zn)			90		%		85-111	11-AUG-04
<u>MET2-DIS-ED</u>		<u>Water</u>						
Batch	R207218							
WG211633-4	DUP	L195168-2						
Calcium (Ca)		37.4	36.7		mg/L	1.9	9.1	09-AUG-04
Iron (Fe)		0.118	0.099	G	mg/L	18	13	09-AUG-04

Enviro-Test Quality Control Report

Workorder: L195168

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET2-DIS-ED		Water						
Batch	R207218							
WG211633-4	DUP	L195168-2						
Magnesium (Mg)		7.94	7.77		mg/L	2.2	12	09-AUG-04
Manganese (Mn)		0.419	0.410		mg/L	2.2	12	09-AUG-04
Potassium (K)		2.4	2.4		mg/L	0.13	15	09-AUG-04
Sodium (Na)		3.6	3.6	J	mg/L	0.0	1.5	09-AUG-04
WG211633-6	DUP	L195169-7						
Calcium (Ca)		54.1	52.1		mg/L	3.7	9.1	09-AUG-04
Iron (Fe)		0.016	0.006	J	mg/L	0.010	0.015	09-AUG-04
Magnesium (Mg)		38.4	37.2		mg/L	3.1	12	09-AUG-04
Manganese (Mn)		0.004	0.004	J	mg/L	0.000	0.0031	09-AUG-04
Potassium (K)		0.8	0.8	J	mg/L	0.0	0.31	09-AUG-04
Sodium (Na)		3.7	3.6	J	mg/L	0.1	1.5	09-AUG-04
WG211633-1	MB							
Calcium (Ca)			<0.5		mg/L		2.5	09-AUG-04
Iron (Fe)			<0.005		mg/L		0.025	09-AUG-04
Magnesium (Mg)			<0.01		mg/L		0.05	09-AUG-04
Manganese (Mn)			<0.001		mg/L		0.005	09-AUG-04
Potassium (K)			<0.1		mg/L		0.5	09-AUG-04
Sodium (Na)			<0.5		mg/L		2.5	09-AUG-04
WG211633-5	MS	L195168-2						
Calcium (Ca)			95	E	%		85-112	09-AUG-04
Iron (Fe)			100		%		92-108	09-AUG-04
Magnesium (Mg)			99	E	%		88-108	09-AUG-04
Manganese (Mn)			99	E	%		94-106	09-AUG-04
Potassium (K)			103		%		84-126	09-AUG-04
Sodium (Na)			103		%		79-123	09-AUG-04
WG211633-7	MS	L195169-7						
Calcium (Ca)			89	E	%		85-112	09-AUG-04
Iron (Fe)			97		%		92-108	09-AUG-04
Magnesium (Mg)			91	E	%		88-108	09-AUG-04
Manganese (Mn)			96		%		94-106	09-AUG-04
Potassium (K)			106		%		84-126	09-AUG-04
Sodium (Na)			105		%		79-123	09-AUG-04
Batch	R208010							
WG212159-10	DUP	L196102-2						
Iron (Fe)		1170	1.17		mg/L	0.0	13	10-AUG-04
Manganese (Mn)		15	0.015		mg/L	0.0	12	10-AUG-04
WG212159-1	MB							
Calcium (Ca)			<0.5		mg/L		2.5	10-AUG-04

Enviro-Test Quality Control Report

Workorder: L195168

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET2-DIS-ED	Water							
Batch	R208010							
WG212159-1 MB								
Iron (Fe)			<0.005		mg/L		0.025	10-AUG-04
Magnesium (Mg)			0.01		mg/L		0.05	10-AUG-04
Manganese (Mn)			<0.001		mg/L		0.005	10-AUG-04
Potassium (K)			<0.1		mg/L		0.5	10-AUG-04
Sodium (Na)			<0.5		mg/L		2.5	10-AUG-04
WG212159-11 MS		L196102-2						
Calcium (Ca)			61	E	%		85-112	10-AUG-04
Iron (Fe)			96		%		92-108	10-AUG-04
Magnesium (Mg)			91	E	%		88-108	10-AUG-04
Manganese (Mn)			95		%		94-106	10-AUG-04
Potassium (K)			97	E	%		84-126	10-AUG-04
Sodium (Na)			99	E	%		79-123	10-AUG-04

Product - Batch and Sample Number Relations:

MET1-DIS-LOW-ED	1						
R207602		L195168-1	L195168-2	L195168-3	L195168-4	L195168-5	
MET1-DIS-LOW-ED	1						
R208265		L195168-1	L195168-2				
MET1-DIS-LOW-ED	1						
R210990		L195168-4	L195168-5				
MET2-DIS-ED	1						
R207218		L195168-1	L195168-2	L195168-3	L195168-4	L195168-5	
MET2-DIS-ED	1						
R208010		L195168-1					

9936 - 67th Avenue, Edmonton, Alberta T6E 0P5
 Edmonton Toll Free Line
 1313 - 44th Avenue N.E., Calgary, Alberta T2E 6L5
 9505 - 111th Street, Grande Prairie, Alberta T8V 5W1
 General Purpose Bldg., 124 Veterinary Road, Saskatoon, Saskatchewan S7N 5E3
 745 Logan Avenue, Winnipeg, Manitoba R3E 3L5
 1081 Barton Street, Thunder Bay, Ontario P7B 5N3

Telephone: (780) 413-5220 Fax: (780) 437-2311
 Telephone: 1-800-668-9878 Fax: 1-800-286-7319
 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

ANALYSIS REQUESTED:

L195168

DATE: Aug 05/04 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		

DISSOLVED METALS

SAMPLE ID	SAMPLED BY / DATE / TIME	LOCATION OF SAMPLING	SAMPLING METHOD	SAMPLE TYPE		LAB SAMPLE NO.
MW-2 250ml	W.LIEBAU/AUG 4, 04/11:19	ARCTIC GOLD & SILVER	GROUND	W	✓	
MW-10 250ml	W.LIEBAU/AUG 4, 04/12:05	AG & S	GROUND	W	✓	
AGC-1 250ml	W.LIEBAU/AUG 4, 04/12:43	AG & S	SURFACE	W	✓	
AGC-2 250ml	W.LIEBAU/AUG 4, 04/13:09	AG & S	SURFACE	W	✓	
AGC-D 250ml	W.LIEBAU/AUG 4, 04/13:09	AG & S	SURFACE	W	✓	
Not preserved!						
					✓	

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 and TDG 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: DIAND Waste Mgt.
 CONTACT: Werner Liebau
 REPORT ADDRESS: 300-300 Main St. Whitehorse, YT Y1A 2B5
 BILLING ADDRESS: Please call for credit card #

NO. BOTTLES SUBMITTED: _____
 PHONE: (867) 667-3272 or (667-3273)
 FAX: (867) 667-3271
 QUOTE NO: _____
 P.O. NO: _____
 JOB NO: _____
 LANDSITE NO: _____

RELINQUISHED BY: <u>W. Liebau</u>	DATE: <u>Aug 05/04</u> TIME: <u>11:00</u>	RECEIVED BY: <u>[Signature]</u>	DATE: <u>Aug 6/04</u> TIME: <u>10:41</u>
RELINQUISHED BY:	DATE:	RECEIVED BY:	DATE:
	TIME:		TIME:
		ETL LAB:	

SAMPLE CONDITION UPON RECEIPT:
 FROZEN: _____ COLD: _____ AMBIENT: _____
 OTHER: (BREAKAGE, LEAKAGE, ETC.) _____

Workorder # L195168

Legend:

Limit 95% Confidence Interval (Laboratory Warning Limits)
DUP Duplicate
RPD Relative Percent Difference
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
CCV Continuing Calibration Verification
CVS Calibration Verification Standard
LCSD Laboratory Control Sample Duplicate

Qualifier:

RPD-NA Relative Percent Difference Not Available due to result(s) being less than detection limit.
A Method blank exceeds acceptance limit. Blank correction not applied, unless the qualifier "RAMB" (result adjusted for method blank) appears in the Analytical Report.
B Method blank result exceeds acceptance limit, however, it is less than 5% of sample concentration. Blank correction not applied.
E Matrix spike recovery may fall outside the acceptance limits 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 falls within the 99% Confidence Interval (Laboratory Control Limits)
J Duplicate results and limit(s) are expressed in terms of absolute difference.
K The sample referenced above is of a non-standard matrix type; standard QC acceptance criteria may not be achievable.