



INVESTIGATION ON ZINC CONTROLS AT THE CROSS VALLEY POND – FARO MINE COMPLEX

Report prepared for:

GOVERNMENT OF YUKON Assessment and Abandoned Mines Branch Department of Energy, Mines and Resources Yukon Government 4114 4th Avenue, Room 2C Whitehorse, Yukon Y1A 2C6

Report prepared by:

ECOMETRIX INCORPORATED 6800 Campobello Road Mississauga, Ontario L5N 2L8

Ref: 10-1753 December 2010

INVESTIGATION ON ZINC CONTROLS AT THE CROSS VALLEY POND – FARO MINE COMPLEX

lipte

Erin Clyde, M.Sc. Project Manager

Ronald V. Nicholson, Ph.D. Project Principal



EXECUTIVE SUMMARY

The Faro Mine Complex is a decommissioned lead-zinc mine property located 15 km north of the Town of Faro and approximately 200 km northeast of the City of Whitehorse. Currently, the Government of Yukon manages the Site and care and maintenance are provided by Denison Environmental Services. Closure planning for the Faro Mine Complex commenced in 2003 and closure activities are currently on-going.

EcoMetrix Incorporated was retained by the Government of Yukon to investigate the controls on zinc concentrations in the Cross Valley Pond (CVP) and to provide recommendations for short- and long-term mitigation strategies for zinc concentrations.

Sampling was conducted at five stations in the CVP to obtain representative samples of pond water, sludge and porewater. Sludge samples were transported to the EcoMetrix Laboratory for sludge stability tests that consisted of 3 cells maintained at pH values of 6, 8 and 9, as well as a control cell. Geochemical modeling was performed for pH-solubility relationships for zinc oxide and zinc hydroxide, as well as for pH-sorption relations for zinc on hydrous ferric oxide sorption sites.

Results from the chemical characterization of the pond water, sludge and porewater exhibited trends of low zinc concentrations associated with high pH values, while higher zinc concentrations coincided with lower pH values. The results from the sludge stability tests supported this observation and showed that when pH values in the overlying water were near 8, zinc concentrations remained below the discharge criteria of 0.5 mg/L. When pH values were adjusted to 6 in the overlying water, zinc concentrations were in the range of 0.65 to 7 mg/L. Geochemical modeling showed that the concentrations of zinc could be explained by zinc desorption from hydrous ferric oxide sorption sites, a phenomena that is known to be controlled by pH. Together, these results indicated that pH is the master variable that controls zinc concentrations in the CVP.

During the sludge stability tests daily pH adjustments with hydrochloric acid were required to maintain a pH value of 6. A control cell that did not receive any pH adjustments maintained a pH value of about 8 over the test period. These observations, together with pH values in the sludge porewater of approximately 8.5, indicate that the pH values in the CVP should remain close to 8. However, pH values of approximately 6.5 have been measured in the pond. The observed low pH values suggest that there is likely an on-going input of acidity that has resulted in depressed pH values and elevated zinc concentrations in the CVP.

As part of the investigation potential sources of acidity that may control pH in the pond were investigated and include oxidation of dissolved manganese, seepage flows from the Rose Creek Diversion Ditch, seepage below the Intermediate Dam and under-ice carbon dioxide



accumulation. Seepage of historic tailings porewater that contains ferrous iron below the Intermediate Dam appears to be the most plausible source of acidity to the CVP.

If seepage below the Intermediate Dam is responsible for the observed depressed pH values, it is expected that low pH values and elevated zinc concentrations will persist in the future. It is also likely that the movement of zinc through the tailings porewater is being retarded at this time and that in the future seepage containing high zinc concentrations will release higher zinc concentrations to the CVP. However, further investigation of subsurface flow below the Intermediate Dam is required to verify if seepage of tailings porewater is the source of acidity in the CVP.

For short-term mitigation of the pH and zinc concentrations in the CVP a lime demand of 210 t-CaO/Mm³ of water was calculated. This amount of lime would be required to raise the pH of the pond water above 8, resulting in zinc concentrations below the discharge criteria of 0.5 mg/L. However, if an on-going source of acidity in the pond does exist, it is expected that depressed pH values and elevated zinc concentrations will recur within a year and that annual lime additions to the CVP may be required. The addition of lime to the CVP may be challenging because the even distribution of lime throughout the pond may not be easily attainable in this shallow pond with a large surface area.

Potential long-term mitigation options included isolation of sludge from the water column using a thin bentonite layer as a diffusion barrier, removal of sludge from the CVP and placement of a clean base layer, construction of a polishing pond cell within the existing CVP and discontinued use of the CVP as polishing pond.



13

TABLE OF CONTENTS

1.0	INTRO	DDUCTION					
1.1	Objec	tives and Scope of Work1.1					
2.0	METH	IODS					
2.1	Sample Collection and Processing						
	2.1.1	Pond Water Samples2.1					
	2.1.2	Solids Samples2.1					
	2.1.3	Porewater Samples					
2.2	Labora	atory Tests					
	2.2.1	Sludge Stability Tests					
	2.2.2	Manganese Oxidation Tests2.3					
3.0	RESU	LTS					
3.1	Field Program						
	3.1.1	Pond Water					
	3.1.2	Solids					
	3.1.3	Porewater					
3.2	Labora	Laboratory Tests					
	3.2.1	Sludge Stability Tests					
	3.2.2	Manganese Oxidation Tests					
4.0	DISCL	JSSION					
4.1	pH Controls on Zinc Concentrations4.1						
4.2		ial pH Controls on CVP Water					
	4.2.1	Manganese Oxidation					
	4.2.2	Dilution from the Rose Creek Diversion Ditch Seepage					
	4.2.3	Seepage Beneath the Intermediate Dam					
	4.2.4	Under-Ice Carbon Dioxide Accumulation					
4.3	Implica	ations of On-going Acidity Loads to the CVP					
4.4		Demand Calculations					
4.5		Potential Mitigation Options for Zinc Control					
	4.5.1	In-Situ pH Adjustment					
	4.5.2	Isolation of Sludge from the Water Column with a Bentonite Barrier4.9					



	4.5.3	Removal of Sludge from the CVP	4.9
	4.5.4	Construction of a Polishing Pond Cell within the CVP	4.9
	4.5.5	Discontinue Use of the CVP as a Polishing Pond	4.10
5.0	SUMN	IARY OF CONCLUSIONS	5.1
6.0	REFE	RENCES	6.1
APP	ENDIX 1	Laboratory Certificates of Analysis	



LIST OF TABLES

- 3.1 Summary of Selected Constituents in Pond Water
- 3.2 Summary of Selected Constituents in Sludge Solids
- 3.3 Summary of Selected Constituents in Sludge Porewater
- 3.4 Summary of Selected Constituents in Overlying Water from the Sludge Stability Tests
- 4.1 Summary of Selected Constituents in the CVP and Rose Creek
- 4.2 Calculated Lime Demand for the Faro CVP

LIST OF FIGURES

- 1.1 Site Map and General Location of the Faro Mine Complex
- 2.1 Sampling Station Locations
- 2.2 Test Cell Set-Up for the Sludge Stability Tests
- 3.1 Depth Profiles for Selected Constituents in Pond Water
- 3.2 Depth Profiles for Selected Constituents in Sludge Solids
- 3.3 Depth Profiles for Selected Constituents in Porewater and Pond Water
- 3.4 Time Trend Plots for Selected Constituents from the Sludge Stability Tests
- 4.1 Zinc Concentrations in Waters and Theoretical Solubility of ZnO_(s) and Zn(OH)_{2(s)}
- 4.2 Zinc Concentrations in Waters and Theoretical Sorption of Zinc onto Hydrous Ferric Oxides (HFO)
- 4.3 Manganese Concentrations in Waters and Theoretical Solubility of MnCO_{3(s)}
- 4.4 Schematic of Potential Flow Paths Beneath the Intermediate Dam



1.0 INTRODUCTION

The Faro Mine Complex (the Site) is a decommissioned lead-zinc mine property located 15 km north of the Town of Faro and approximately 200 km northeast of the City of Whitehorse (Figure 1.1). The Faro Mine operated intermittently between 1969 and 1998, producing approximately 55 millions tonnes of tailings that were deposited into the Rose Creek Tailings Area. After closure, the Faro Mine was placed into receivership. Currently, the Government of Yukon manages the Site and care and maintenance are provided by Denison Environmental Services (DES). Closure planning for the Faro Mine Complex commenced in 2003 and closure activities are currently on-going.

EcoMetrix Incorporated (EcoMetrix) was retained by the Government of Yukon to investigate the controls on zinc concentrations in the Cross Valley Pond (CVP) and to provide recommendations for short- and long-term mitigation strategies for zinc control in the CVP.

Water treatment is a major aspect of care and maintenance for the Site with pH control to remove metals. The CVP is used as a polishing pond for treated water from the Faro Mill, as well as treated water from the Intermediate Pond via the Down Valley Treatment Plant. The CVP is the final clarification for water prior to release to the environment that discharges into Rose Creek.

The allowable discharge concentration for zinc in treated water is 0.5 mg/L. The concentrations of zinc in the CVP have been variable in the past and vary with depth in the pond. Concentrations of zinc have trended up at times and there is a concern that the values may consistently exceed the discharge criteria if not appropriately controlled.

1.1 Objectives and Scope of Work

The objectives of the study were to investigate zinc concentrations in pond water, sludge and porewater in the CVP to develop an understanding on the controls of zinc concentrations in the pond water and to provide recommendations for short- and long-term mitigation of zinc concentrations.

The scope of work for this investigation included the following:

- collection of sludge solids, porewater and pond water from representative areas in the CVP;
- data assessment of constituent concentrations in the solids, porewater and pond water to understand controls on zinc concentrations; and
- recommendations for controlling zinc concentrations in the CVP.



2.0 METHODS

The following section presents the methodologies used for sample collection and processing, as well as for the laboratory sludge stability and manganese oxidation tests.

2.1 Sample Collection and Processing

Sampling was conducted at five stations in the CVP to obtain representative samples of pond water, sludge, (hereafter referred to as solids) and porewater. Pond water, solids and porewater were sampled to gain an understanding of the controls on the observed elevated zinc concentrations in the CVP. The locations of the five stations are presented in **Figure 2.1**.

2.1.1 Pond Water Samples

Pond water samples were collected at all five stations from the top, middle and bottom of the water column using a Beta Van Dorn Bottle.

The pH of the pond water samples were measured in the field and recorded. The pond water samples for alkalinity and dissolved metals were field filter through 0.45 µm nylon filters. Samples for metals analyses were preserved with nitric acid. Water samples were collected in samples bottles supplied by ALS.

Pond water samples were sent to ALS for chemical analysis that included metals, major ions and alkalinity.

2.1.2 Solids Samples

Solids samples for porewater extraction and depth profiling were collected at three (CVP10-1, CVP10-2 and CVP10-5) of the five stations using a 2-inch K-B coring device. At each location a total of five cores were collected to achieve sufficient sample volume for porewater extraction from the solids.

The cores were sectioned at 5 cm intervals to a depth of 15 cm. The intervals from the core sets from each station were composited and placed into dedicated Ziploc bags. The samples were transported to the EcoMetrix Laboratory for porewater extraction.

After the porewater extraction process (described in **Section 2.1.3**) the solids samples were placed into dedicated Ziploc bags. Samples were submitted to ALS Environmental Laboratories (ALS) for chemical analyses that included metals.

Solids samples for sludge stability testing at the EcoMetrix Laboratory were collected at all five stations using an Ekman dredge. The solids from each station were placed into



dedicated buckets and transported back to the EcoMetrix Laboratory to be used for sludge stability tests.

2.1.3 Porewater Samples

Porewater samples were extracted from the core samples at the EcoMetrix Laboratory. Each 5 cm interval from the composited core sets at each sampling station was transferred into 750 mL centrifuge bottles. The samples were centrifuged at approximately 3,500 rmp for 20 to 30 minutes. After centrifugation, the porewater was decanted and filtered through a 0.45 µm nylon filter. The pH of the filtered porewater samples was measured and recorded. The samples were transferred into sample bottles supplied by ALS. Samples for metals analyses were preserved with nitric acid.

Porewater samples were submitted to ALS for chemical analysis that included metals, major ions and alkalinity.

2.2 Laboratory Tests

This section describes the methods used for the sludge stability and manganese oxidation tests conducted in the EcoMetrix Laboratory.

2.2.1 Sludge Stability Tests

Four test cells were assembled using approximately 0.5 kg of sludge and 1 L of pond water collected from the CVP (**Figure 2.2**). The pond water was decanted off the top of the sludge from the buckets of sludge collected for laboratory testing.

Three cells were maintained at pH values of 6, 8 and 9 using either hydrochloric acid or a lime solution. The lime solution was created using distilled water and a small amount of quick lime (calcium oxide – CaO). The pH in one cell was not adjusted to serve as a control.

The cells were sampled daily for 8 days. Prior to sampling, the pH of the test cells were modified accordingly and left for at least 30 minutes to stabilize. Sampling consisted of removal of 100 mL of solution and replacement with an equal amount of pond water. The pH in the test cells was then adjusted accordingly. The overlying water samples were filtered through a 0.45 μ m nylon filter and the pH of the samples was measured and recorded. The samples were acidified with nitric acid and submitted to ALS for metals analyses.

Two samples of pond water were sampled on Days 0 and 6. The pH values at the time of sample collection were measured and recorded. The samples were filtered through 0.45 µm nylon filters, preserved with nitric and submitted to ALS for metals analysis.



2.2.2 Manganese Oxidation Tests

A titration using 3% hydrogen peroxide, a strong oxidant, was performed on the CVP water used for the sludge stability tests. The water used to assess whether the oxidation of manganese would alter the pH of the water contained about 33 mg/L of manganese. Hydrogen peroxide was added to the water at 1 to 5 mL increments to a total volume of 60 mL. The same titration was completed on distilled water that does not contain significant amounts of manganese. The changes in pH values were measured and recorded for each incremental hydrogen peroxide addition.



3.0 RESULTS

The results from the field program and laboratory tests are presented in the following Section. The primary Constituents of Concern (COCs) in the CVP are zinc, manganese and iron, with pH as an important parameter. Therefore, the focus of this Section is on these parameters. Summaries of the data are provided in **Tables 3.1 to 3.4**. Complete analytical results are provided in **Appendix 1**.

3.1 Field Program

The field program focused on the collection of representative samples for characterization and chemical analysis. The results revealed important trends and characteristics for pond water, solids and the porewater within the solids. Specifically, the results showed low zinc concentrations associated with high pH values, while higher zinc concentrations coincided with lower pH values. Trends for pH together with zinc concentrations in pond water and solids porewater can provide important insight into the potential release of zinc into the pond water.

3.1.1 Pond Water

A summary of the results from the pond water analyses is presented in **Table 3.1**. Depth profiles of dissolved concentrations for select constituents in pond water are presented **Figure 3.1**.

The pH values measured in the pond water were consistent among sampling stations at each depth. The trend for pH values at each location showed decreasing values with depth. At the top of the water column pH values ranged from 7.38 to 7.83. At depths below 2 metres, pH values decreased and remained consistent at values ranging from 6.36 and 6.51.

Alkalinity (as CaCO₃) concentrations measured in the pond water were consistent among sampling stations at each depth. The trend for alkalinity at each location showed increasing values with depth. At the top of the water column (0 to 1 m) alkalinity concentrations ranged from 88 to 139 mg/L. At depths below 2 metres, alkalinity concentrations increased and ranged between 208 and 342 mg/L.

Zinc concentrations in the pond water were also consistent among sampling stations at each depth. The trend for zinc exhibited increasing concentrations with depth in the water column. At the top of the water column (0 to 1 m), zinc concentrations were in the range of 0.21 to 0.23 mg/L for dissolved zinc and 0.22 to 0.24 mg/L for total zinc. Below a depth of approximately 2 metres, dissolved zinc concentrations ranged from 0.37 to 0.61 mg/L and total zinc concentrations were in the range of 0.39 to 0.60 mg/L.



Similar trends to those observed for zinc were also observed for manganese concentrations in the pond water. Manganese concentrations were consistent with depth among sampling stations and manganese concentrations increase with depth in the water column. Dissolved manganese concentrations ranged from 6.47 to 14.1 mg/L in the top of the water column (0 to 1 m). Total manganese at the top of the water column ranged from 7.39 to 13.4 mg/L. Below depths of approximately 2 metres, dissolved and total manganese concentrations were in the ranges of 22.0 to 47.6 mg/L and 25.2 to 53.6 mg/L, respectively.

In general, dissolved iron concentrations in the pond water were below the detection limit of 0.03 mg/L. The dissolved iron concentrations that were detected ranged from 0.03 to 0.73 mg/L, with the highest concentrations measured at CVP10-5 at a depth of about 2 metres. Total iron concentrations exhibited similar concentrations among the sample stations and generally increased with depth. The total iron concentrations in the top 1 metre of the water column ranged from 0.34 to 0.72 mg/L. At depths below approximately 2 metres, total iron concentrations ranged from 0.45 to 1.4 mg/L.

3.1.2 Solids

A summary of the results from the solids analyses is presented in **Table 3.2**. The concentrations of select constituents as a function of depth are provided **Figure 3.2**.

The results from the solids analyses at CVP10-1 showed different chemistry in the solids compared to CVP10-2 and CVP10-5 (**Figure 3.2**). At the time of sampling it was recognized that the solids collected from this location were tailings, with minor amounts of sludge in the upper most section (0 to 5 cm).

The zinc concentrations at CVP10-1 ranged from 2,130 to 5,560 mg/kg and showed an increasing trend with depth. Manganese concentrations ranged from 2,870 to 9,050 mg/kg and exhibited a decreasing trend with depth. Iron concentrations ranged from 21,700 to 98,500 mg/kg and showed an increasing trend over the depth profile.

The results for CVP10-2 and CVP10-5 exhibited similar concentrations that were consistent with depth (**Figure 3.2**). Zinc concentrations were in the range of 8,800 to 9,730 mg/kg. Manganese concentrations ranged from 26,200 to 37,700 mg/kg and iron concentrations ranged from 42,000 to 55,900 mg/kg.

3.1.3 Porewater

A summary of the results from the porewater analyses is presented in **Table 3.3**. Depth profiles for select constituents in the porewater are shown in **Figure 3.3**. **Figure 3.3** also illustrates the concentrations of constituents in the pond water as a function of depth at the respective porewater sample stations. The pond water samples in this figure represent dissolved constituent concentrations from the top, middle and bottom of the water column



and are not plotted to scale. The depths at which the samples were collected are provided in **Table 3.1**.

Because the solids collected at CVP10-1 were considered to be tailings, the porewater results at this location are discussed separately.

The pH values measured in the porewater at CVP10-1 ranged from 8.49 to 11.90, with the highest value measured in the 5 to 10 cm interval. The dissolved zinc concentrations in the porewater ranged from 0.004 to 0.263 mg/L. Dissolved manganese concentrations ranged from 0.003 to 0.032 mg/L and dissolved iron concentrations ranged from less than 0.05 to 0.10 mg/L. The highest zinc and iron concentrations and the lowest manganese concentration were measured in the 5 to 10 cm interval.

The results for CVP10-2 and CVP10-5 exhibited similar concentrations and consistent trends with depth (Figure 3.3). The lowest pH values in the porewater were measured in the 0 to 5 cm intervals and were about 8. The pH values increased with depth and ranged from 8.73 to 8.87 at depths of 5 to 15 cm. Dissolved zinc concentrations exhibited an inverse trends to that noted for pH. The highest zinc concentrations were measured in the 0 to 5 cm interval with values of approximately 0.16 mg/L. Lower zinc concentrations were observed at depths between 5 and 15 cm that were in the range of 0.02 to 0.03 mg/L. Dissolved manganese concentrations showed similar trends to those for zinc with values approximately 0.02 in the top 5 cm that decreased to less the detection limit of 0.001 mg/L at depths between 5 and 15 cm. Dissolved iron concentrations in the porewater were consistent below the detection limit of 0.05 mg/L.

3.2 Laboratory Tests

This section describes the results from sludge stability tests and manganese oxidation test completed at the EcoMetrix Laboratory.

3.2.1 Sludge Stability Tests

A summary of the results from the sludge stability tests is presented in **Table 3.4**. The results for select constituents are also presented as time trend plots in **Figure 3.4**.

Time trend plots for pH values measured from the samples submitted for testing are shown in **Figure 3.4**. The pH values were maintained consistent with time for the cells with pH adjustments that include CVP10-ST-6, CVP10-ST-8 and CVP10-ST-9. At the time the tests were initiated (Day 0), the control cell, CVP10-ST-C, that did not receive any pH adjustment exhibited an initial pH of 7.2. This cell was to represent sludge stability at a pH value of about 7. However, by Day 1 the pH in this cell had increased to approximately 8 and remained between 7.8 and 8 for the rest of the test period. The pH in the pond water that was used to replace sample volumes was sampled twice in the eight day period and the pH values of the water were 7.0 and 7.1 on Days 0 and 6, respectively.



The time trend plots for zinc showed an increase in zinc concentrations with decreasing pH. The cell that was maintained at a pH value of about 6 exhibited the highest zinc concentrations that ranged from 0.65 to 7 mg/L. The cells maintained at pH 8 and 9 exhibited zinc concentrations that ranged from 0.02 to 1 mg/L and from less than the detection limit of 0.003 to 1 mg/L, respectively. The zinc concentrations in the control cell ranged from 0.02 to 3. mg/L. The pond water used to replace the sampled water volume maintained constant zinc concentrations of about 1 mg/L over the test period.

Manganese displayed behaviour similar to that of zinc, with the highest manganese concentrations in the cell maintained at pH 6 and lower manganese concentrations with increasing pH. Manganese concentrations in the cell maintain at pH 6 ranged from 9.7 to 32 mg/L. The cells maintained at pH 8 and 9 had manganese concentrations that ranged from 5 to 25 mg/L and 0.4 to 9.5 mg/L, respectively. The manganese concentrations in the control cell ranged from 5 to 32 mg/L. The pond water used to replace the sampled water volume maintained constant manganese concentrations of approximately 32 mg/L over the test period.

3.2.2 Manganese Oxidation Tests

Results from the manganese oxidation test showed that after the addition of 60 mL of the hydrogen peroxide solution, the pH of the water had decreased from 7.8 to 6.8. The same titration on distilled water that does not contain significant amounts of manganese exhibited similar changes in pH from 7.5 to 6.9 with the addition of 60 mL of hydrogen peroxide.



4.0 DISCUSSION

Results from the chemical characterization of the pond water, sludge and porewater exhibited trends of low zinc concentrations associated with high pH values, while higher zinc concentrations coincided with lower pH values.

The trends for pH together with zinc concentrations in pond water and sludge porewater provide important insight into the potential release of zinc into the pond water.

One mechanism for release of soluble constituents is via diffusive flux from porewater to surface water. Diffusion is controlled by concentration gradients, whereby, higher zinc concentrations in the porewater can result in higher concentrations of this constituent in the water column. However, the results from the porewater and pond water exhibited zinc concentrations in the ranges of 0.02 to 0.16 mg/L and 0.21 to 0.61 mg/L, respectively. The lower zinc concentrations measured in the porewater compared to those measured in the pond water indicate that diffusion as a potential mechanism for the release of zinc into the pond water was not supported by the results from this study.

A second mechanism for the release of soluble zinc relates to pH controls on the solubility of constituents. For many metals, including zinc, solubility theory suggests that lower metal concentrations are associated with higher pH values. The results from the field study support this relationship because samples that exhibited the highest constituent concentrations also exhibited the lowest pH values.

Sludge stability tests were completed to test the hypothesis that the release of soluble zinc could be controlled by the pH of the pond water. The results from the sludge stability tests also demonstrated that pH exhibited a strong influence on zinc concentrations. When the pH of the overlying water was maintained at a pH value of 6, zinc concentrations were range of 0.65 to 7 mg/L. However, when the overlying water was maintained at pH values near 8 lower zinc concentrations in the range of 0.02 to 1 mg/L were measured.

The results from the field study and the sludge tests showed that elevated zinc concentrations are related to low pH values, suggesting that there is a pH control on the solubility of zinc in the CVP.

4.1 pH Controls on Zinc Concentrations

A conceptual model for the precipitation of zinc as a function of pH was developed to investigate the relationships between pH and zinc concentrations. Theoretical solubility for two common solid phases of zinc, zinc oxide $(ZnO_{(s)})$ and zinc hydroxide $(Zn(OH)_{2(s)})$, were calculated using aqueous thermodynamic data provided in the Visual MINTEQ v.3 database (Gustafsson, 2010). All available data for dissolved zinc concentrations in pond water and porewater from the CVP together with the data for the overlying water from the sludge stability tests were plotted as zinc concentration in mg/L vs. pH in **Figure 4.1**. The



data were compared to the theoretical solubility $ZnO_{(s)}$ and $Zn(OH)_{2(s)}$ as a function of pH in **Figure 4.1** to determine if the data conformed to a pH-solubility relationship. All measured zinc concentrations were below the theoretical saturation concentrations indicating that the dissolution of zinc from the solid phases does not represent a control on the zinc concentrations within the CVP.

Further consideration of the relationships between pH and zinc indicated that adsorption of zinc onto precipitating hydrous ferric oxides (HFO, or commonly referred to as ferric hydroxide) could represent a potential control on zinc concentrations in the CVP. Metal concentrations can be controlled by sorption reactions onto HFO surfaces that involve the coordination of metal ions with oxygen atoms and the release of protons from the solid surface via the following reaction:

 $Fe-OH + Me^{2+} = Fe-O-Me^+ + H^+$

This reaction indicates that the sorption of a metal onto HFO is pH dependant. Because the H⁺ ions compete for sorption sites, higher metal sorption takes place at higher pH values.

Geochemical calculations using the program Visual MINTEQ v.3 (Gustafsson, 2010) were completed using reasonable HFO surface properties from the literature (Dzombak and Morel, 1990). Initial concentrations of 0.38 mg/L and 0.61 mg/L for zinc and iron, respectively were used and represent the average pond water concentrations measured in the CVP (Table 3.1).

The results from the adsorption calculations together with zinc data from the pond water, porewater and sludge stability tests are presented in **Figure 4.2**. The data are plotted as zinc concentrations in mg/L vs. pH. The data were compared to the theoretical sorption of zinc onto HFO as a function of pH in **Figure 4.2** to verify if the data conform to a pH-sorption relationship. The data show an excellent fit to the theoretical adsorption curve for zinc sorption onto HFO and indicate that zinc concentrations in the CVP are controlled by sorption reactions onto ferric hydroxide precipitates. Therefore, lower pH values in the pond water result in desorption of zinc from ferric hydroxide sorption sites, thereby resulting in higher zinc concentrations in the pond water.

Results from chemical characterization of the pond water showed similar concentrations of total zinc compared to dissolved zinc concentrations (**Table 3.1**) indicating that the source of zinc in the CVP is primarily in the dissolved form. The results also showed higher zinc concentrations at the bottom of the water column. Together, these results suggest that the source of the zinc is desorption of zinc at the sludge-water interface from HFO present in the sludge and its subsequent diffusion into the water column.

The results from the field study, sludge stability tests and geochemical modeling indicate that pH is the master variable that controls the zinc concentrations in the CVP.



4.2 Potential pH Controls on CVP Water

Observations from the sludge stability tests, together with pH values of approximately 8.5 measured in the sludge porewater, suggest that the pH values in the CVP water should remain close to 8. During the sludge stability tests daily pH adjustments were required to maintain desired pH values in the overlying water. Test cell CVP10-ST-6 required daily pH adjustment using hydrochloric acid to maintain a pH of 6 indicating that on-going acidity consumption was occurring. The control test cell that did not receive any pH adjustments maintained a pH of about 8 over the test period. These observations suggest that the pond water in contact with the sludge, with no inputs of acidity or alkalinity should remain at a pH value near 8. This is reasonable for lime generated sludge that typically contains CaCO₃ solids as a result of raising the pH of water containing dissolved carbonate. However, pH values of approximately 6.5 were measured during the field study at depths near the sludge-water interface and similar pH values have been measured during routine monitoring by DES (2010). These observations suggest that there is most likely a source of acidity that has depressed the pH in the water in the CVP at depth below 2 metres. Because zinc concentrations in the CVP are dependent on pH, potential sources of acidity that control the pH of the pond were considered in this study.

4.2.1 Manganese Oxidation

Results from the field study showed manganese concentrations as high as 48 mg/L in the pond water. It was hypothesized that the oxidation of manganese within the CVP could be a source of acidity and therefore responsible for the low pH values at depths below 2 metres. Manganese is oxidized in water according to the following equation:

$$Mn^{2+} + 2H_2O = MnO_{2(s)} + 4H^+ + 2e^-$$

This equation indicates that when manganese oxidizes it precipitates as manganese oxide $(MnO_{2(s)})$. During precipitation acidity is generated in the form of hydrogen ions.

A titration using 3% hydrogen peroxide, a strong oxidant, was performed on the CVP water used for the sludge stability tests. The water used to assess whether the oxidation of manganese would alter its pH contained about 33 mg/L of manganese. The results from the titration showed that after the addition of 60 mL of the hydrogen peroxide solution, the pH of the water had decreased from 7.8 to 6.8. However, the same titration on distilled water that does not contain significant amounts of manganese exhibited similar changes in pH from 7.5 to 6.9 with the addition of 60 mL of hydrogen peroxide. These results do not support the assumption that manganese oxidation is a source of acidity in the CVP.

If manganese oxidation and precipitation were responsible for the depressed pH values in the CVP the expected trends for the pond water should exhibit lower pH values that correspond with lower manganese concentrations. Instead, the highest manganese



concentrations were associated with lower pH values in the CVP (Figure 3.1) and indicate that this control on pH is not supported by the data.

The results from the titration and the field study suggest that manganese oxidation does not control the pH in the CVP. Instead the results suggest that pH controls the concentrations of dissolved manganese.

The theoretical solubility of manganese carbonate ($MnCO_{3(s)}$) was calculated as a function of pH to validate the assumption that manganese concentrations are controlled by a pHsolubility relationship. Theoretical $MnCO_{3(s)}$ solubility was calculated using the aqueous thermodynamic data provided in the Visual MINTEQ v.3 database (Gustafsson, 2010). All available data for dissolved manganese concentrations from the pond water, porewater and the overlying water from the sludge stability tests are plotted as manganese concentration in mg/L vs. pH in **Figure 4.3**. The data were compared to the theoretical solubility of $MnCO_{3(s)}$ as a function of pH in **Figure 4.3**. The results shows that manganese concentrations measured in the pond water and from the sludge stability tests were in agreement with the trends for the theoretical solubility curve for $MnCO_{3(s)}$ indicating that dissolution of $MnCO_{3(s)}$ at lower pH values is the dominant control on the concentrations of manganese in the CVP.

4.2.2 Dilution from the Rose Creek Diversion Ditch Seepage

Another potential source of acidity and low pH in the CVP that was investigated was the dilution of CVP water by seepage from Rose Creek Diversion Canal (RCDC). Geochemical calculations using the program PHREEQC (Parkhurst and Appelo, 1999) were completed to assess the potential mixing and dilution of CVP water with seepage from the RCDC.

The model inputs for the seepage volume and chemistry from the RCDC were obtained from the CVP operational report completed by DES (2010). Routine monitoring data at station X2 (North fork of Rose Creek at access road) were considered representative of the chemistry of the seepage (**Table 4.1**). The maximum seepage rate of 5,800 m³ calculated by DES (2010) was used in the model as it was considered to be a conservative estimate. The model input for the volume of water in the CVP was assumed to be 1×10^6 m³. The inputs for the CVP water chemistry were average constituents concentrations measured in the pond water samples collected during field sampling in August 2010 (**Table 4.1**).

The results of the modeling calculations indicated that the initial pH of 6.89 in the CVP did not change when mixed with seepage water from the RCDC. This result suggests that another mechanism is responsible for depressed pH values with depth in the CVP.

4.2.3 Seepage Beneath the Intermediate Dam

Ref. 10-1753 December 2010

A fourth potential source for depressed pH values in the CVP could be seepage of historical tailings porewater beneath the Intermediate Dam. The change in elevation between the



Rose Creek Tailings Area and the CVP has likely induced sub-surface flow (seepage) below or through the Intermediate Dam. Downward seepage on the upstream side of the Intermediate Dam could result in upward flow on the downstream side, thereby displacing the tailings porewater into the water column in the CVP. Seepage would generally be concentrated near the toe of the dam because the shortest travel path for sub-surface water flow represents the highest hydraulic gradients that control flow. A schematic for the flow conditions beneath the Intermediate Dam are shown is **Figure 4.4**.

The Faro tailings were exposed for many years during mine operation and post-closure. Therefore, the tailings generated acid and other oxidation products that resided in the tailings porewater and overtime have been transported slowly downward in the tailings. At depth, it is likely that tailings porewater contains iron in the ferrous (Fe^{2+}) form. This form of iron is stable under the anoxic conditions that would exist at depth in the tailings and is relatively mobile. If seepage water containing ferrous iron daylights in the CVP it would come into contact with oxygen. When ferrous iron comes into contact with oxygen at neutral pH, it oxidizes rapidly to ferric iron (Fe^{3+}) and then precipitates as ferric hydroxide solid $(Fe(OH)_3)$. During precipitation, acid, in the form of hydrogen ions, is released and water that has precipitated ferric hydroxide typically exhibits pH values between 3 and 4. The pH values measured at depth in the CVP of about 6.5 suggest that the acidity generated by ferric iron precipitation is being neutralized by the dissolution of sludge at the sludge-water interface. The neutralization of acidity in the CVP is consistent with sludge stability tests whereby daily adjustments using hydrochloric acid were necessary to maintain a pH of 6 in the overlying water.

Ferrous iron (Fe²⁺) is a highly mobile constituent and if seepage of historical tailings porewater beneath the Intermediate Dam is occurring, it is expected that Fe²⁺ would be one of the first constituents that would daylight in the CVP. It is likely that the movement of other constituents, such as zinc, through the tailings porewater at this time is retarded via neutralization reactions. However, in the future, zinc in the tailings porewater may be released to the CVP resulting in higher zinc concentrations in the pond water.

Further investigation of the seepage flow and chemistry would be needed to verify if seepage of tailings porewater containing ferrous iron is the source of the depressed pH values measured at depth in the CVP. A mass balance on acidity inputs to the pond could be used to infer acid inputs rather than a more costly hydrogeologic study.

4.2.4 Under-Ice Carbon Dioxide Accumulation

During the winter months the accumulation of carbon dioxide (CO_2) under the ice in the CVP has been observed. It has been suggested that the accumulation of CO_2 in the pond may be linked to the depressed pH values (John Brodie, pers. Comm., 2010).

When water is in equilibrium with the atmosphere, CO_2 dissolves in water to form carbonic acid (H_2CO_3). Carbonic acid is a weak acid that dissociates in water to form bicarbonate



(HCO₃⁻), carbonate (CO₃²⁻) and hydrogen ions (H⁺). The dissociation of CO₂ and the carbon species present depend on the pH of the water. At pH values of less than 6.4, H₂CO₃ is the dominant carbonate species, while at pH values between 6.4 and 10.3 carbonate is primarily in the form of HCO₃⁻. Above pH values of 10.3 carbonate is predominantly in the form of CO₃²⁻.

Chemical equilibrium theory for carbonate in water suggests that the pH of pure water in equilibrium with atmospheric CO₂ will be about 5.7. Equilibrium theory also suggests that increases in CO₂ concentrations result in decreases in pH. However, water in the CVP contains alkalinity that acts to buffer H_2CO_3 resulting in pH values greater than 5.6 in the pond water.

The observed accumulation of CO_2 under the ice during the winter indicates that a source of CO_2 must exist in the CVP. There are two potential sources that include bacterial respiration related to a source of organic carbon and/or dissolution of carbonate solids in the sludge. Carbon dioxide is a by-product of bacterial respiration of organic carbon and could be a potential source for CO_2 under the ice in the CVP. However, for respiration to occur a source of organic carbon must be present to support bacterial respiration. Because no data are available for organic carbon concentrations in the CVP solids, further investigation is warranted before any conclusions can be made as to whether bacterial respiration is a potential source for CO_2 accumulation under the ice.

Results from this investigation have provided evidence for an on-going source of acidity that has resulted in depressed pH values and is effectively dissolving sludge in the CVP. Dissolution of lime generated sludge that contains $CaCO_3$ results in the liberation of CO_2 into the water column. Therefore, the dissolution of sludge resulting from inputs of acidity to the CVP is a potential source for the observed accumulation of CO_2 under the ice.

During the ice-free period, any CO₂ that may be generated in the pond will readily de-gas to the atmosphere and will not be observable.

4.3 Implications of On-going Acidity Loads to the CVP

Observations relating to the control cell that maintained a pH of 8 in the sludge stability tests, together with pH values of approximately 8.5 measured in the sludge porewater suggest that the pH values in the CVP water should be maintained at values near 8 by equilibrium reactions with the carbonate sludge. However, pH values of approximately 6.5 were measured during the field study at depths near the sludge-water interface and similar pH values have been measured during routine monitoring by DES (2010). These results suggest that there is an on-going source of acidity loads to the CVP that is acting to lower pH and to raise zinc concentrations. The acidity being added to the pond is effectively dissolving the sludge and this process neutralizes the acidity and maintains the pH at values close to 6.5.



During the sludge stability tests approximately 72 mg of acidity as CaCO₃ per litre of water was required each day, on average, to maintain a pH of 6. The acidity load required to maintain the pH of 6 from the sludge stability tests was scaled up to estimate the amount of acidity needed to maintain the water in the CVP at a pH of 6, assuming a volume of 1 million cubic metres. The calculated acidity load is equivalent to a lime demand of 148 tonnes of CaO per Mm³ per annum.

For illustration purposes, this acidity load was converted to an equivalent load of dissolved ferrous iron that is known to be an important product of sulphide oxidation in the tailings. The acidity load is also equivalent to seepage containing 1,000 mg/L flowing into the pond at a rate of 7 L per second. This appears to be a plausible iron concentration and flow rate for seepage beneath the Intermediate Dam.

If seepage from the intermediate dam is responsible for the observed depressed pH values in the CVP, it is expected that low pH values and elevated zinc concentrations will persist in the future. The sludge in the pond will be an on-going source of alkalinity to buffer the acidity from the seepage well into the future. Therefore, pH values likely will not decrease much below current values of approximately 6.5. However, if sufficient acidity is added to the CVP, the zinc concentrations can increase to values near 1 mg/L as shown in the sludge stability test maintained at a pH of 6.

4.4 Lime Demand Calculations

The results from the field program and sludge stability tests indicated that pH is the major control on the zinc concentrations in the CVP and that zinc concentrations less than the discharge criteria of 0.5 mg/L can be attained when the pH of the overlying water is maintained at pH values of 8 or more. A lime demand for the CVP was completed to estimate the amount of lime required to overcome the carbonate alkalinity and to raise the pH of the water to a target value of 8.5 and is presented in **Table 4.2**.

The lime demand was calculated using the minimum, maximum and average values for the constituent concentrations measured in the pond water (**Table 3.1**) that are expected to contribute to alkalinity consumption and the lime demand.

The estimated average lime demand was calculated to be 150 tonnes of CaO per million cubic metres to raise the pH of the CVP water from an average pH of 6.9 to approximately 8.5. A safety factor of 1.4 was applied to the lime demand because experience with in-situ lime treatments at other sites has shown that to increase pH in a pit or pond usually requires more lime than that estimated from a lime demand using analytical data. Therefore, an effective lime demand would be approximately 210 tonnes of CaO per million cubic metres of water in the CVP.



4.5 Potential Mitigation Options for Zinc Control

The following section provides potential mitigation options to control zinc concentrations in the CVP.

4.5.1 In-Situ pH Adjustment

One mitigation option for the elevated zinc concentrations would be to control the pH in the CVP by the addition of lime (CaO). The lime demand calculated in **Section 4.4** indicated that an initial addition of approximately 210 t-CaO/Mm³ of water would be required to raise the pH to 8.5 and attain zinc concentrations below the discharge criteria of 0.5 mg/L. The addition of 210 t-CaO/Mm³ of water would represent a short-term mitigation strategy and would address the current zinc issue in the pond.

However, results from the sludge stability tests, the field study and routine monitoring have indicated the strong likelihood that there is a persistent input of acidity that results in ongoing depression of pH. Calculations of acidity loads required to maintain a pH of 6 indicated that an acidity load equivalent to 148 tonnes-CaO per Mm³ per year may be entering the CVP. It is anticipated that most of this acidity will be consumed by a combination of alkalinity in the pond water and dissolution of the sludge. Nevertheless, if there is an on-going acidity load to the CVP is present, it is expected that low pH values and elevated zinc concentrations will persist in the future, resulting in the need for annual lime additions to maintain pH values of about 8.5 and to attain zinc concentrations below the discharge criteria of 0.5 mg/L.

For short-term mitigation in the pond in-situ pH adjustment using lime would be an appropriate mitigation strategy. It is expected that if a source of acidity in the pond does exist, depressed pH values and elevated zinc concentrations would recur within one year. This exercise could provide important evidence to develop a strategy to mitigate the CVP in the long-term.

If in-situ lime addition was chosen as a mitigation option, lime would have to be evenly distributed through out the pond to be effective. However, even distributing lime to the pond water may be difficult. Turnover of a water body is dependent on an aspect ratio, whereby the extent of a convection cell is a function of the ratio of its horizontal dimension to its vertical one. Because the CVP is a relatively shallow pond it does not effectively turnover or mix as one large cell. Instead, turnover in the CVP would occur as several smaller cells. Therefore, the addition of lime to one area of the pond would not necessarily result in distribution of the lime to all areas of the pond and lime would have to be added to the water column throughout the entire pond.

The addition of a dense lime slurry to cover the sludge in the CVP was suggested as a potential in-situ pH adjustment method (John Brodie, pers. Comm., 2010). The lime would neutralize the added acidity with the effect that lime would dissolve rather than sludge.



However, even distribution of the lime slurry cover to the bottom of the entire CVP would be challenging. As well, the addition of excess lime to pond may result in pH values that are above 8.5 resulting in pond water that is not suitable for discharge.

4.5.2 Isolation of Sludge from the Water Column with a Bentonite Barrier

A suggested potential mitigation option to control zinc concentrations in the CVP was to isolate the sludge from the water column using a bentonite barrier (John Brodie, pers. Comm., 2010). The bentonite could act as a diffusion barrier between the sludge and the overlying CVP water. If the sludge is isolated from the water column, any low pH values in the bottom of the water should not be in direct contact with the sludge and will therefore prevent the instantaneous dissolution or de-sorption of zinc from the sludge. In effect, the zinc concentrations in the CVP should remain low and close to values of 0.02 mg/L that are measured in the outflow from the Faro Mill Treatment Plant.

The placement of the diffusion barrier could be accomplished by adding a bentonite slurry to the water column and allowing the bentonite to settle on top of the sludge. Care should be taken so that the bentonite settles on top of the sludge and does not displace it. Further testing and verification on the feasibility and effectiveness of this treatment option should be completed if this option is carried forward. Testing may include bench-scale laboratory studies on the settling rate for the bentonite, together with varying thickness applications to determine the thickness of bentonite required to isolate the sludge from interacting with the water column.

4.5.3 Removal of Sludge from the CVP

Results from the sludge chemical characterization provide an indication of the zinc inventory in the solids. The zinc concentrations in the sludge ranged from 8,880 to 9,710 mg/kg indicating that there is sufficient inventory of zinc that could be released for many years. Because the primary source of the zinc concentrations is likely related to the concentrations of zinc adsorbed to ferric hydroxides, the removal of the sludge from the pond may be a viable mitigation option. This option would include dewatering of the CVP and the physical removal of the sludge. A clean layer of sand or till should be considered for placement at the bottom of the CVP to isolate any residual sludge from the water column when the pond is refilled. However, if seepage beneath the dam is a source of ongoing acidity, water in the CVP may require periodic treatment for acidity.

4.5.4 Construction of a Polishing Pond Cell within the CVP

A polishing pond cell that provides an appropriate volume and residence time for settling could be constructed within the existing CVP. The cell should be constructed away from the Intermediate Dam so that seepage from the tailings would not influence water quality in the cell. This option would require less effort for sludge removal because sludge would only

813



have to be removed from the settling cell. However, water quality on the outside of the cell may still have elevated zinc concentrations that would require treatment.

4.5.5 Discontinue Use of the CVP as a Polishing Pond

Because the results from this study suggest that there is an on-going source of acidity to the CVP that has resulted in depressed pH values and elevated zinc concentrations in the pond water, the discontinued use of the CVP as a polishing pond should be considered as a mitigation option. This investigation has provided evidence that suggests that elevated zinc concentrations in the CVP may persist into the future, if the sludge is in contact with the pond water. Therefore, water quality issues in the CVP would not be resolved with this mitigation option and periodic treatment of the pond water for zinc would be required. The on-going acidity loads to the CVP warrant further investigation before discontinuing use of the CVP for polishing purposes.



5.0 SUMMARY OF CONCLUSIONS

The objectives of the study were to investigate zinc concentrations in pond water, sludge and porewater in the CVP to develop an understanding on the controls of zinc concentrations in the pond water and to provide recommendations for short- and long-term mitigation of zinc concentrations.

The key conclusions from this investigation are as follows:

- Results from the chemical characterization of the pond water and sludge porewater together with results from the sludge stability tests indicated that there is a pH control on the zinc concentrations in the CVP.
- Geochemical modeling indicated that the dissolution of zinc oxide or zinc hydroxide does not represent a control on the zinc concentrations, and indicated that zinc concentrations in the CVP are controlled by sorption reactions onto hydrous ferric oxide.
- Results from the field study, sludge stability testing and geochemical modeling indicated that pH is the master variable controlling zinc concentrations in the CVP.
- Observations from the sludge stability tests together with the pH values measured in the sludge porewater suggested that pH values in the CVP should remain close to 8. However, pH values of 6.5 have consistently been measured in the pond water. These observations suggest that there is most likely an on-going input of acidity that has depressed the pH in the CVP.
- The oxidation of dissolved manganese was investigated but was not considered to be a source of acidity in the CVP and therefore is not responsible for the low pH values.
- Dilution from seepage water from the Rose Creek Diversion Ditch was considered but does not appear to be responsible for the depressed pH values at depth in the CVP.
- Seepage of tailings porewater below the Intermediate Dam that contains ferrous iron appears to be a plausible source of acidity to the CVP and may be responsible for the observed depressed pH values measured in the pond water. If seepage from the Intermediate Dam is responsible for the observed depressed pH values, it is expected that low pH values and elevated zinc concentrations will persist in the future.
- Further investigation of the seepage flow and chemistry is required to verify if seepage of tailings porewater is the source acidity and depressed pH values in the

Ref. 10-1753 December 2010



CVP. A mass balance investigation on acidity inputs to the pond could be used to infer acid inputs in place of a more costly hydrogeologic study.

- A lime demand of 210 t- CaO/Mm³ of water was estimated to address the short-term mitigation of the pH and zinc concentrations in the CVP. This amount of lime would be required to raise the pH of the pond water to values above 8. At pH values at or above 8, zinc concentrations below the discharge criteria of 0.5 mg/L could be attained.
- If an on-going source of acidity in the pond does exist, it is expected that depressed pH values and elevated zinc concentrations would recur. Therefore, the addition of lime and subsequent acidity mass balance investigation could provide important evidence to develop a strategy to mitigate the CVP in the long-term.
- Addition of lime to the CVP, however, may be challenging because the even distribution of lime throughout the pond will be limited by the degree of mixing that is achievable in the pond.
- Long-term mitigation options included the isolation of sludge from the water column using a thin layer of settled bentonite as a diffusion barrier, removal of the sludge from the CVP and placement of a clean base layer, construction of polishing pond cell within the existing CVP and discontinued use of the CVP as a polishing pond.



6.0 REFERENCES

- DES (Denison Environmental Services), 2010. Faro Mine Complex Cross Valley Pond Report – Field Program: September to November 2009. Prepared for: Government of Yukon, January 2010.
- Dzombak, D.A. and F.M.M. Morel, 1990. Surface Complexation Modeling: Hydrous Ferric Oxide. Wiley-Interscience, New York, 393 pp.
- Gustafsson, J.P., 2010. Visual MINTEQ v.3 Database. Available Online: www.lwr.kth.se/English/OurSoftware/vminteq/.
- Parkhurst, D.L. and C.A.J. Appelo, 1999. User's Guide to PHREEQC (Version 2) A Computer Program for Speciation, Batch-Reaction, one-Dimensional Transport, and Inverse Geochemical Calculations. U.S. Department of the Interior, Water-Resources Investigations Report 99-4259.



Π

0

[]

+11 - 75

Ē

L

[

TABLES

3

ed Constituents in Pond Water

eld pH	Alkalinity	Zinc		Manganese		Iron	
ыц рн	Aikainiity	Dissolved	Total	Dissolved	Total	Dissolved	Total
Units)	(mg/L as CaCO ₃)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
43	109	0.217	0.226	8.02	9.77	<0.030	0.419
6.46	247	0.549	0.549	34.1	37.5	0.030	0.501
.36	332	0.504	0.474	47.6	48.2	< 0.030	0.526
83	87.5	0.223	0.225	6.74	7.39	<0.030	0.340
6.70	139	0.268	0.240	14.1	13,4	0.429	0.721
[^] 40	208	0.605	0.600	44.2	48.6	0.060	0.530
38	109	0.230	0.243	8.61	10.7	<0.030	0.389
6.37	333	0.566	0.603	44.1	50.9	<0.030	0.449
°.36	333	0.470	0.488	47.6	53.6	0.039	0.884
59	105	0.213	0.223	7.87	8.64	< 0.030	0.397
6.36	327	0.501	0.482	43.3	46.2	< 0.030	0.564
^R 36	342	0.475	0.484	46.6	52.7	0.153	1.24
59	105	0.215	0.231	7.89	8.97	<0.030	0.409
/.60	101	0.210	0.228	7.83	8.61	<0.030	0.407
6.51	324	0.369	0.387	22.0	25.2	0.727	1.37
83	87.5	0.210	0.223	6.74	7.39	<0.030	0.340
36	342	0.605	0.603	47.6	53.6	0.727	1.37
6.89	213	0.374	0.379	26.0	28.7	0.114	0.610

... verse to represent minimum and maximum hydrogen ions present in solution

Comple ID	Zinc	Manganese	Iron	
Sample ID -	(mg/kg)	(mg/kg)	(mg/kg)	
CVP10-1 (0-5)	2,130	9,050	21,700	
CVP10-1 (5-10)	3,400	7,480	60,100	
CVP10-1 (10-15)	5,560	2,870	98,500	
CVP10-2 (0-5)	8,880	37,700	55,900	
CVP10-2 (5-10)	9,090	33,500	54,400	
CVP10-2 (10-15)	9,070	35,000	42,700	
CVP10-5 (0-5)	9,320	35,000	50,600	
CVP10-5 (5-10)	9,580	36,200	42,700	
CVP10-5 (10-15)	9,730	26,200	42,000	

Table 3.2: Summary of Selected Constituents in Sludge Solids

Table 3.3: Summary of Selected Constituents in Sludge Porewater

Comple ID	pН	Alkalinity	Zinc	Manganese	Iron
Sample ID –	(pH units)	(mg/L as CaCO ₃)	(mg/L)	(mg/L)	(mg/L)
CVPPW10-1 (0-5)	9.32	61	0.004	0.0259	<0.050
CVPPW10-1 (5-10)	11.90	1610	0.263	0.0033	0.103
CVPPW10-1 (10-15)	8.49	37	0.005	0.0315	<0.050
CVPPW10-2 (0-5)	8.00	192	0.162	0.0386	<0.050
CVPPW10-2 (5-10)	8.73	60	0.022	<0.0010	<0.050
CVPPW10-2 (10-15)	8.74	34	0.015	<0.0010	<0.050
CVPPW10-5 (0-5)	7.99	164	0.164	0.0091	<0.050
CVPPW10-5 (5-10)	8.87	52	0.025	<0.0010	<0.050
CVPPW10-5 (10-15)	8.76	39	0.025	<0.0010	<0.050

Notes:

PW - Porewater

Sample ID	pН	Calcium	Manganese	Zinc	Sulphate
Cample ID	(pH units)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
CVP10-ST-PW					
Day 0	7.01	354	33.8	1.46	1,710
Day 6	7.11	321	31.5	1.24	1,662
CVP10-ST-6					
Day 0	6.34	339	32.3	6.95	1,650
Day 1	6.06	325	26.9	5.58	1,590
Day 2	5.98	360	22.5	4.08	2,070
Day 3	5.89	343	21.1	3.19	1,821
Day 6	5.77	278	9.66	0.868	1,626
Day 7	6.01	289	9.90	0.755	1,602
Day 8	6.00	290	9.87	0.646	1,590
CVP10-ST-C					
Day 0	7.24	344	32.4	3.03	1,650
Day 1	7.96	304	22.3	0.98	1,530
Day 2	7.86	301	15.9	0.387	1,845
Day 3	7.95	294	13.6	0.224	1,851
Day 6	7.86	227	5.00	0.023	1,641
Day 7	7.74	237	5.88	0.075	1,656
Day 8	7.77	229	5.80	0.066	1,644
CVP10-ST-8					-
Day 0	7.91	331	25.2	1.01	1,710
Day 1	7.98	300	15.5	0.033	1,764
Day 2	7.86	295	11.3	< 0.030	1,767
Day 3	7.99	288	10.2	0.055	1,764
Day 6	8.00	238	5.06	0.015	1,620
Day 7	7.97	247	6.20	0.038	1,617
Day 8	7.92	240	6.34	0.044	1,596
CVP10-ST-9	-				
Day 0	8.65	310	9.55	0.992	1,698
Day 1	8.89	252	0.546	0.0045	1,542
Day 2	8.88	277	0.863	0.0064	1,557
Day 3	8.99	276	1.21	<0.0030	1,521
Day 6	9.05	225	0.371	<0.015	1,509
Day 7	8.93	251	1.00	0.028	1,518
Day 8	8.88	240	0.859	< 0.015	1,506

Table 3.4: Summary of Selected Constituents in Overlying Water from the Sludge Stability Tests

Notes:

PW - Pond Water used to replenish water column in test cells

Parameter	Units	CVP ^a	Rose Creek (X2) ^b
pН	pH units	6.89	7.8
Alkalinity	mg/L, as CaCO ₃	213	101
Ca	mg/L	413	31.8
Fe	mg/L	0.11	0.10
Mg	mg/L	90.2	7.48
Mn	mg/L	26.0	0.084
Na	mg/L	27.2	2.41
Si	mg/L	5.24	4.99
Sr	mg/L	1.15	0.14
SO₄	mg/L	1,313	23.8
Zn	mg/L	0.374	0.068
Volume of Water	m ³	1,000,000 ^c	5,300 ^d

Table 4.1: Summary of Select Constiuents in the CVP and Rose Creek

Notes:

^a The values for the CVP represent an average of all samples

^b The values from Rose Creek site X2 were taken as an average from DES (2010)

^c The volume of water for the CVP was estimated from the dimensions of the pond and the average water depth measured in August 2010

^d The volume of seepage from Rose Creek is equal to the maximum seepage rate reported by DES (2010)

	Lime Demand	Lime Demand With 40% Contingency	
	(t-CaO/Mm ³)	(t-CaO/Mm ³)	
Minimum	56	79	
Maximum	254	356	
Average	150	210	

Table 4.2: Calculated Lime Demand for the Faro CVP



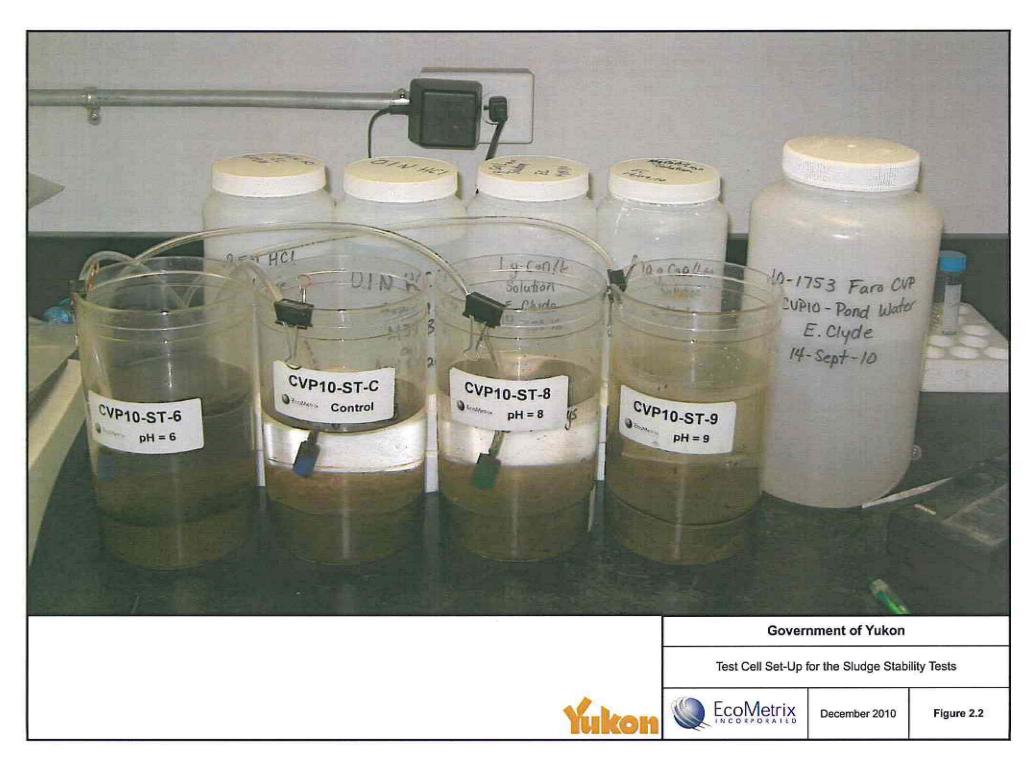
FIGURES

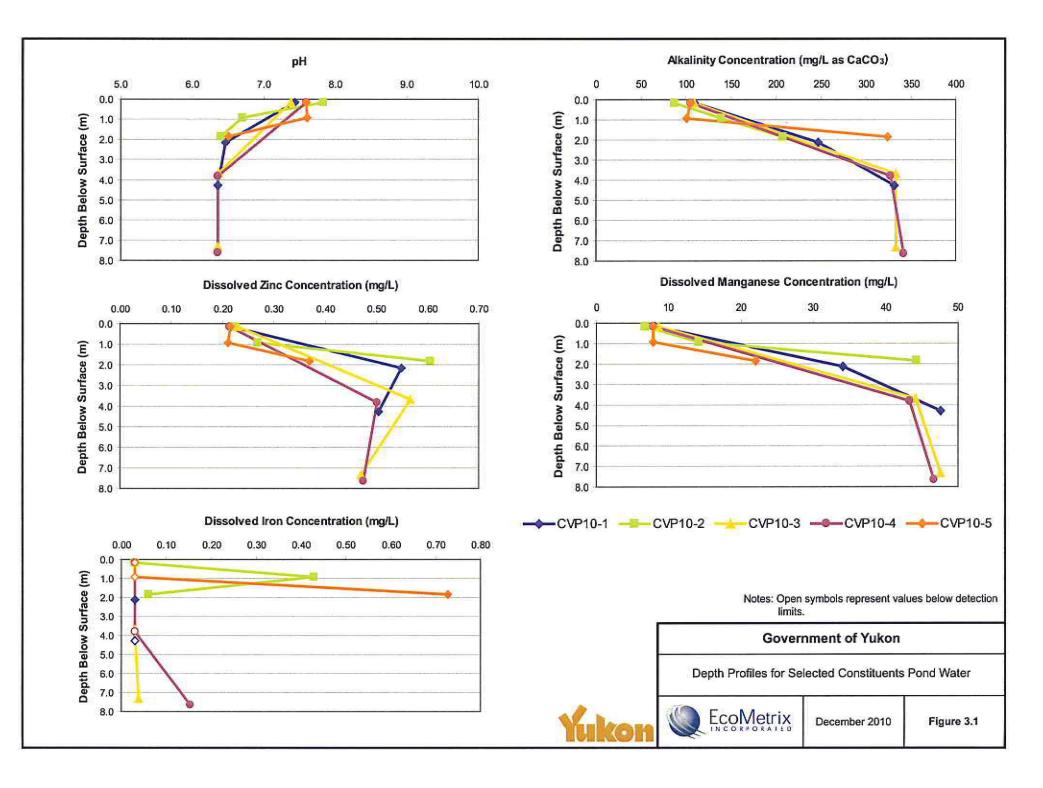
1

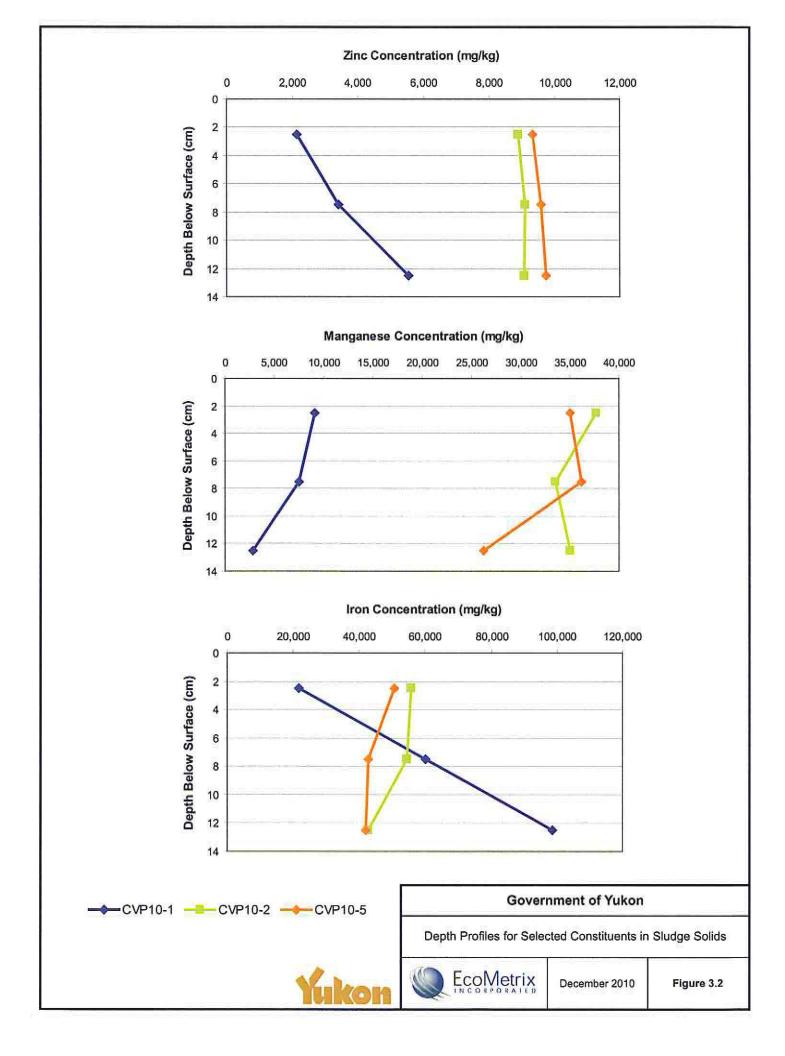


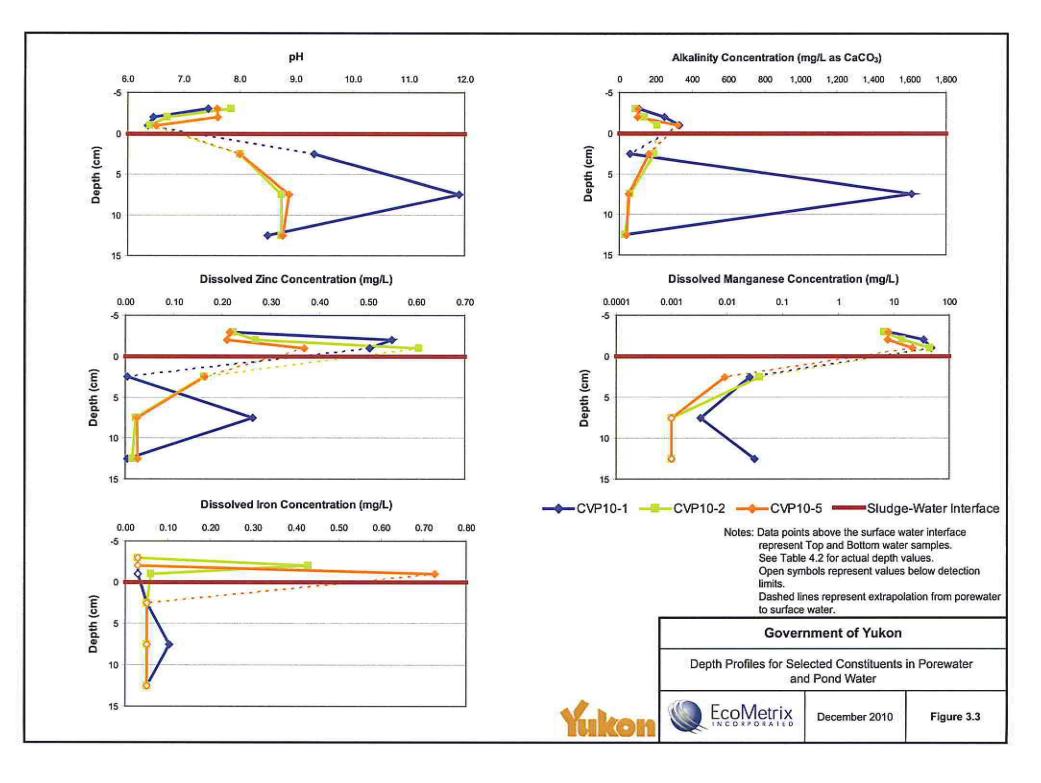


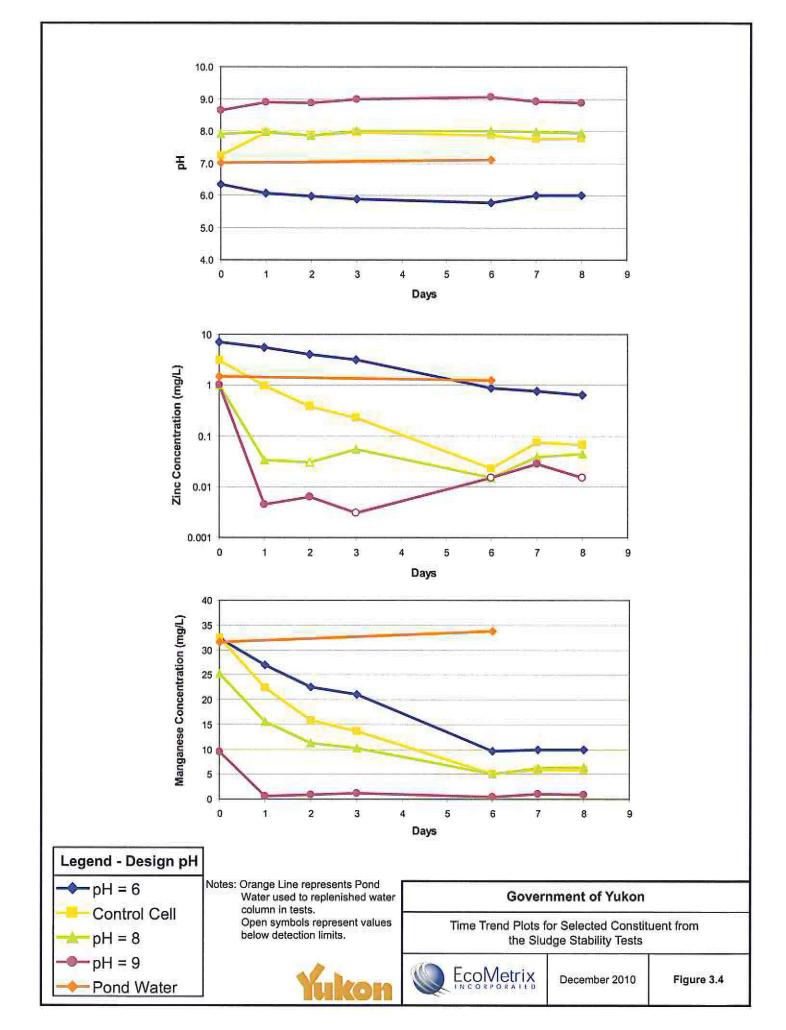




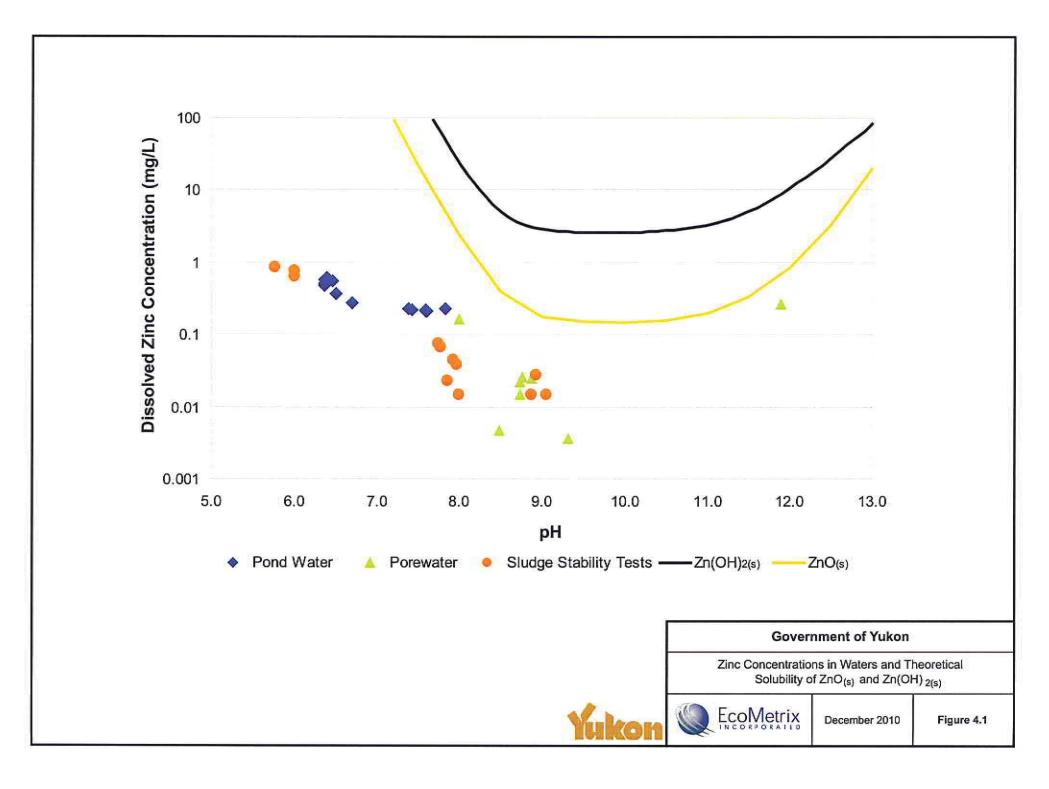


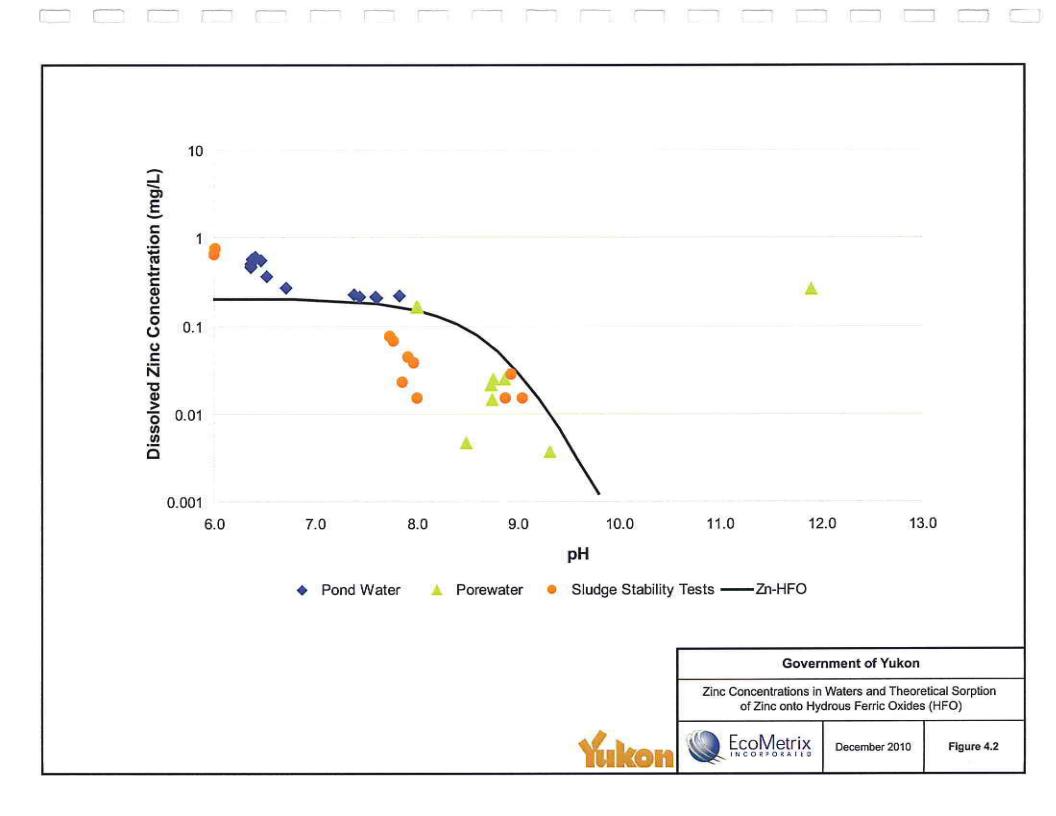


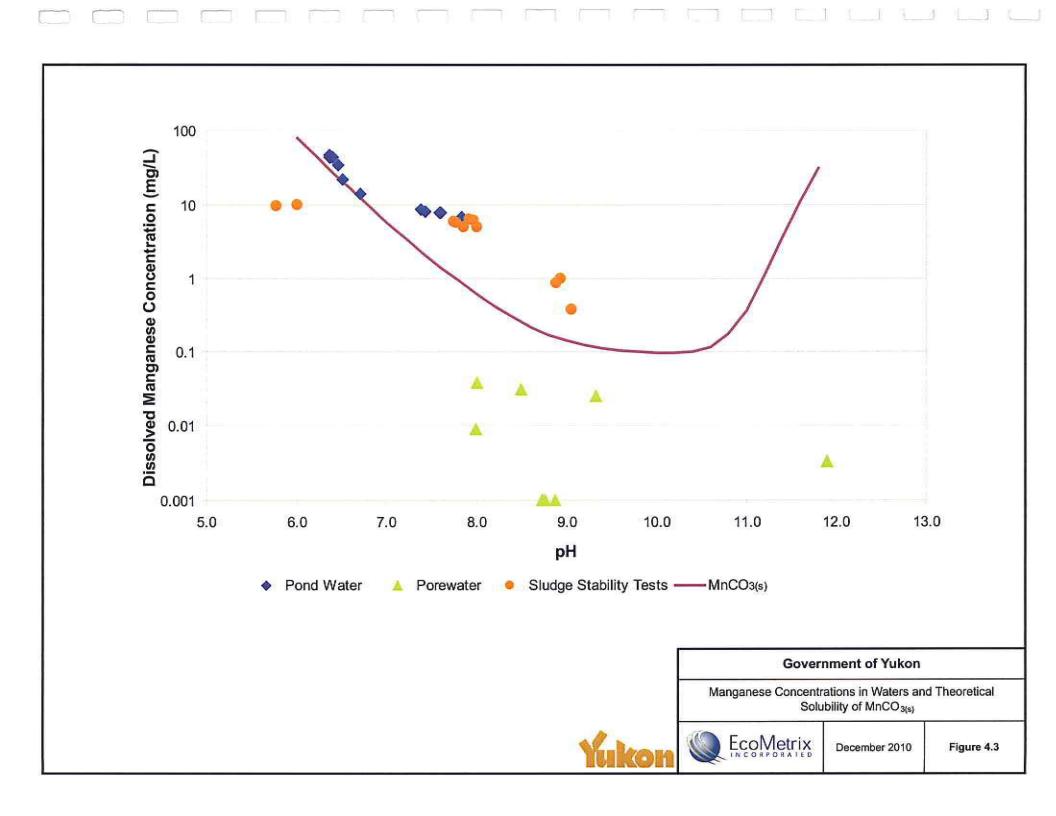


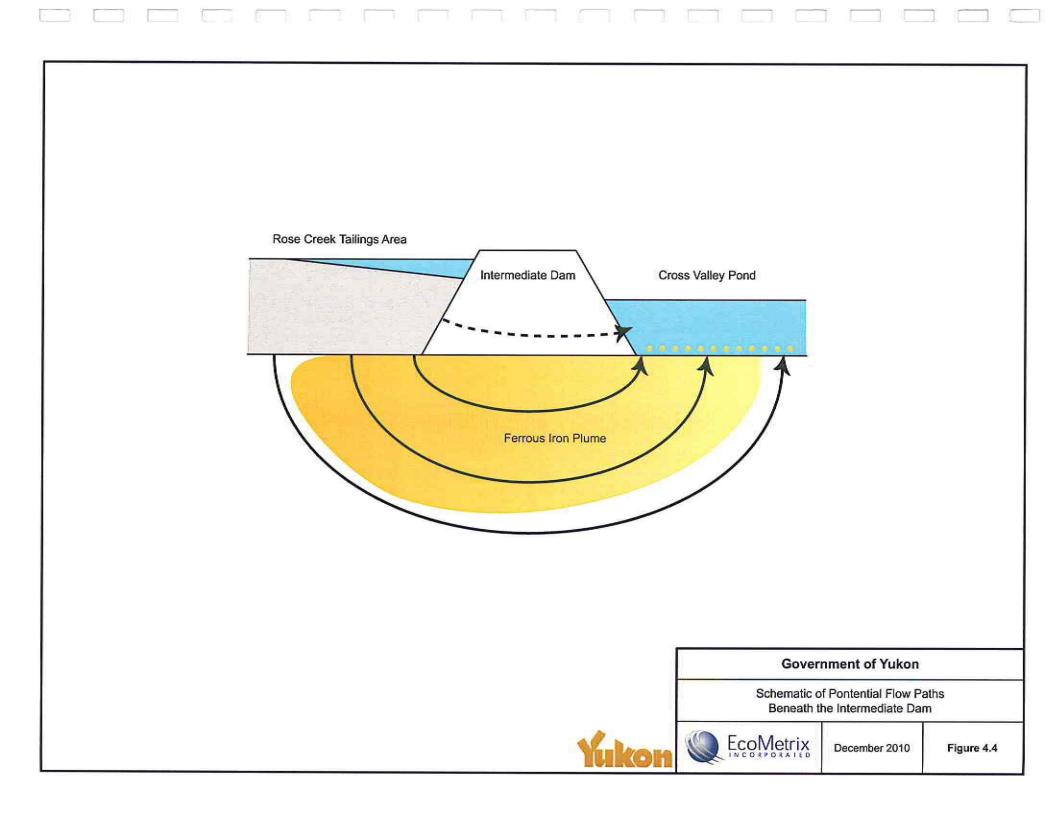














APPENDIX 1

8 12

Laboratory Certificates of Analysis



ECOMETRIX INCORPORATED ATTN: Erin Clyde 6800 CAMPOBELLO ROAD MISSISSAUGA ON L5N 2L8

Phone: 905-794-2325

Date Received: 17-AUG-10 Report Date: 20-SEP-10 17:05 (MT) FINAL REV. 2 Version:

Certificate of Analysis

Lab Work Order #: L920954 Project P.O. #: Job Reference: Legal Site Desc: C of C Numbers:

NOT SUBMITTED

10-040123, 10-040124

Comments:

20-SEP-10: Alkalinity and dissolved metals included in this version of the report.

n Mh

Bryan Mark Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 8081 Lougheed Hwy, Suite 100, Burnaby, BC V5A 1W9 Canada | Phone: +1 604 253 4188 | Fax: +1 604 253 6700 ALS CANADA LIMITED Part of the ALS Group A Campbell Brothers Limited Company

www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNER

L920954 CONTD.... PAGE 2 of 11 20-SEP-10 17:05 (MT)

ALS LABORATORY GROUP ANALYTICAL REPORT

	Sample ID Description Sampled Date Sampled Time Client ID	L920954-1 : 10-AUG-10 CVP10-1A	L920954-2 10-AUG-10 CVP10-1B	L920954-3 10-AUG-10 CVP10-1C	L920954-4 10-AUG-10 CVP10-2A	L920954-5 10-AUG-10 CVP10-2B
Grouping WATER	Analyte					Yahiyin alalo
Physical Tests	Hardness (as CaCO3) (mg/L)	1050	1500	1580	950	1110
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	109	247	332	87.5	139
Total Metals	Aluminum (AI)-Total (mg/L)	0.0052	O.010	0.010	0.0073	O.0050
	Antimony (Sb)-Total (mg/L)	<0.00050	0.0010	<0.0010	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	DLA <0.00050	<0.0010	<0.0010	<0.00050	0.00050
	Barium (Ba)-Total (mg/L)	0.0159	0.0217	0.0233	0.0156	0.0173
	Beryllium (Be)-Total (mg/L)	<0.0025	<0.0050	<0.0050	<0.0025	<0.0025
	Bismuth (Bi)-Total (mg/L)	<0.0025	<0.0050	<0.0050	<0.0025	<0.0025
	Boron (B)-Total (mg/L)	OLA <0.050	OLA <0.10	OLA <0.10	<0.050	0.050
	Cadmium (Cd)-Total (mg/L)	DLA <0.00025	DLA <0.00050	DLA <0.00050	<0.00025	مام 0.00025<
	Calcium (Ca)-Total (mg/L)	301	435	460	277	323
	Chromium (Cr)-Total (mg/L)	OLA <0.0025	<0.0050	0.0050	<0.0025	OLA <0.0025
	Cobalt (Co)-Total (mg/L)	0.0169	0.0658	0.0837	0.0135	0.0244
	Copper (Cu)-Total (mg/L)	0.00109	DLA <0.0010	DLA <0.0010	0.00091	0.00078
	Iron (Fe)-Total (mg/L)	0.419	0.501	0.526	0.340	0.721
	Lead (Pb)-Total (mg/L)	0.00313	0.00264	0.00211	0.00401	0.00330
	Lithium (Li)-Total (mg/L)	0.038	DLA 0.050<	<0.050	0.044	0.041
	Magnesium (Mg)-Total (mg/L)	71.5	101	104	63.0	74.4
	Manganese (Mn)-Total (mg/L)	9.77	37.5	48.2	7.39	13.4
	Molybdenum (Mo)-Total (mg/L)	0.00056	DLA <0.00050	0.00051	0.00054	0.00065
	Nickel (Ni)-Total (mg/L)	0.0231	0.0935	0.115	0.0180	0.0312
	Phosphorus (P)-Total (mg/L)	<0.30	<0.30	<0.30	<0.30	<0.30
	Potassium (K)-Total (mg/L)	7.2	6.4	6.4	67	7.2
	Selenium (Se)-Total (mg/L)	DLA <0.0050	DLA <0.010	OLA <0.010	0.0050	DLA <0.0050
	Silicon (Si)-Total (mg/L)	2.84	6.57	8.05	2.16	3.30
	Silver (Ag)-Total (mg/L)	DLA <0.000050	DLA <0.00010	DLA <0.00010	<0.000050	0.000050
	Sodium (Na)-Total (mg/L)	22.1	31.3	32.8	19.6	22.8
	Strontium (Sr)-Total (mg/L)	0.960	1.26	1.33	1.02	1.07
	Sulfur (S)-Total (mg/L)	339	441	474	312	368
	Thallium (TI)-Total (mg/L)	0.00062	0.0010	<0.0010	0.00075	0.00062
	Tin (Sn)-Total (mg/L)	OLA <0.00050	OLA <0.0010	OLA <0.0010	DLA <0.00050	dla 0.00050>
	Titanium (Ti)-Total (mg/L)	<0.010	0.015	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	0.00152	0.00436	0.00500	0.00118	0.00197
	Vanadium (V)-Total (mg/L)	DLA <0.0050	_{DLA} <0.010	0.010	DLA <0.0050	ola <0.0050
	Zinc (Zn)-Total (mg/L)	0.226	0.549	0.474	0.225	0.240
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	OLA <0.0050	DLA <0.010	DLA <0.010	DLA <0.0050	DLA <0.0050
	Antimony (Sb)-Dissolved (mg/L)	OLA <0.00050	0.0010	DLA <0.0010	DLA <0.00050	DLA <0.00050

L920954 CONTD PAGE 3 of 11

20-SEP-10 17:05 (MT)

ALS LABORATORY GROUP ANALYTICAL REPORT

	Sample ID Description	L920954-6	L920954-7	L920954-8	L920954-9	L920954-10
	Sampled Date Sampled Time	10-AUG-10 CVP10-2C	11-AUG-10 CVP10-3A	11-AUG-10 CVP10-3B	11-AUG-10 CVP10-3C	11-AUG-10 CVP10-4A
	Client ID	CVP10-2C	CVP10-3A	CVP10-3B	CVP10-3C	CVP10-4A
Grouping	Analyte					
WATER						
Physical Tests	Hardness (as CaCO3) (mg/L)	1700	975	1610	1640	1030
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	208	109	333	333	105
Total Metals	Aluminum (AI)-Total (mg/L)	0LA	0.0054	0.010	_{0LA}	<0.0050
	Antimony (Sb)-Total (mg/L)	DLA <0.0010	0.00050	DLA <0.0010	ola <0.0010	O.00050
	Arsenic (As)-Total (mg/L)	<0.0010	OLA <0.00050	DLA <0.0010	<0.0010	0.00050
	Barium (Ba)-Total (mg/L)	0.0210	0.0177	0.0208	0.0199	0.0159
	Beryllium (Be)-Total (mg/L)	<0.00210 DLA <0.0050	<0.0025	<0.0050	<0.0050	<0.0025
	Bismuth (Bi)-Total (mg/L)	<0.0050 <0.0050	<0.0025 <0.0025	<0.0050 DLA <0.0050	<0.0050 <0.0050	<0.0025 <0.0025
	Boron (B)-Total (mg/L)	<0.10	<0.050	<0.10	<0.10	<0.050
	Cadmium (Cd)-Total (mg/L)	<0.00050	<0.000 <0.00025	<0.10 DLA <0.00050	<0.00050	ام <0.00025
	Calcium (Ca)-Total (mg/L)	495	283	471	480	300
	Chromium (Cr)-Total (mg/L)	<0.0050	<0.0025	<0.0050	<0.0050	< 0.0025
	Cobalt (Co)-Total (mg/L)	0.0836	0.0190	0.0887	0.0970	0.0166
	Copper (Cu)-Total (mg/L)	<0.0010	0.00351	0.0007 DLA <0.0010	<0.0010	0.00079
	Iron (Fe)-Total (mg/L)	0.530	0.389	0.449	0.884	0.397
	Lead (Pb)-Total (mg/L)	0.00249	0.00397	0.00187	0.00112	0.00315
	Lithium (Li)-Total (mg/L)	DLA	1020020000	DLA	DLA	AND DESCRIPTION OF
	Magnesium (Mg)-Total (mg/L)	<0.050	0.041	<0.050	<0.050	0.038
	Manganese (Mn)-Total (mg/L)	113	64.9	106	107	69.4
	Molybdenum (Mo)-Total (mg/L)	48.6	10.7	50.9	53.6 DLA	8.64
	Nickel (Ni)-Total (mg/L)	0.00103	0.00060	0.00051	<0.00050	0.00049
	Phosphorus (P)-Total (mg/L)	0.114	0.0272	0.125	0.128	0.0226
		<0.30	<0.30	<0.30	<0.30	<0.30
	Potassium (K)-Total (mg/L)	6.9 DLA	6.6 DLA	6.6 DLA	6.5 DLA	7.1 D
	Selenium (Se)-Total (mg/L)	<0.010	<0.0050	<0.010	<0.010	<0.0050
	Silicon (Si)-Total (mg/L)	8.34 DLA	2.57 DLA	8.11 DLA	7.97 DLA	2.65 p
	Silver (Ag)-Total (mg/L)	<0.00010	<0.000050	<0.00010	<0.00010	<0.00005
	Sodium (Na)-Total (mg/L)	34.6	20.3	33.4	33.2	21.4
	Strontium (Sr)-Total (mg/L)	1.36	1.05	1.39	1.43	0.982
	Sulfur (S)-Total (mg/L)	544 DLA	324	510 DLA	535 DLA	352
	Thallium (TI)-Total (mg/L)	<0.0010 DLA	0.00066 DLA	<0.0010 DLA	<0.0010 DLA	0.00065 D
	Tin (Sn)-Total (mg/L)	<0.0010	<0.00050	<0.0010	<0.0010	<0.00050
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	0.00504	0.00159	0.00528	0.00512	0.00145
	Vanadium (V)-Total (mg/L)	0.010	<0.0050	<0.010	0.010	<0.0050
	Zinc (Zn)-Total (mg/L)	0.600	0.243	0.603	0.488	0.223
Dissolved Metals	Aluminum (AI)-Dissolved (mg/L)	<0.010	<0.0050	<0.010	<0.010	<0.0050
	Antimony (Sb)-Dissolved (mg/L)	<0.0010	<0.00050	<0.0010	<0.0010	<0.00050

L920954 CONTD.... PAGE 4 of 11

ALS LABORATORY GROUP ANALYTICAL REPORT

RT 20-SEP-10 17:05 (MT)

	Sample ID	L920954-11	L920954-12	L920954-13	L920954-14	L920954-15
	Description Sampled Date	11-AUG-10	11-AUG-10	11-AUG-10	11-AUG-10	11-AUG-10
	Sampled Time	CVP10-4B	CVP10-4C	CVP10-5A	CVP10-5B	CVP10-5C
	Client ID	CVPID-ID	CVP ID-IC	CVI ID-DA	GVI 10-3D	01110-00
Grouping	Analyte					
WATER						
Physical Tests	Hardness (as CaCO3) (mg/L)	1720	1860	1080	1100	1470
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	327	342	105	101	324
Total Metals	Aluminum (Al)-Total (mg/L)	<0.010	<0.010	O.0050	<0.0050	DLA <0.0050
	Antimony (Sb)-Total (mg/L)	OLA <0.0010	<0.0010	<0.00050	<0.00050	OLA <0.00050
	Arsenic (As)-Total (mg/L)	OLA <0.0010	<0.0010	0.00050	<0.00050	0.00055
	Barium (Ba)-Total (mg/L)	0.0209	0.0193	0.0165	0.0159	0.0188
	Beryllium (Be)-Total (mg/L)	<0.0050	OLA <0.0050	<0.0025	<0.0025	0.0025
	Bismuth (Bi)-Total (mg/L)	<0.0050	<0.0050	<0.0025	<0.0025	<0.0025
	Boron (B)-Total (mg/L)	DLA <0.10	<0.10	0LA <0.050	<0.050	0.050
	Cadmium (Cd)-Total (mg/L)	DLA <0.00050	DLA <0.00050	DLA <0.00025	<0.00025	OLA <0.00025
	Calcium (Ca)-Total (mg/L)	501	542	315	321	428
	Chromium (Cr)-Total (mg/L)	<0.0050	<0.0050	<0.0025	<0.0025	OLA
	Cobalt (Co)-Total (mg/L)	0.0862	0.100	0.0174	0.0167	0.0502
	Copper (Cu)-Total (mg/L)	DLA 0.0010<	DLA <0.0010	0.00095	0.00081	0.00075
	Iron (Fe)-Total (mg/L)	0.564	1.24	0.409	0.407	1.37
	Lead (Pb)-Total (mg/L)	0.00120	DLA <0.00050	0.00321	0.00310	0.00262
	Lithium (Li)-Total (mg/L)	DLA <0.050	DLA <0.050	0.039	0.039	0.030
	Magnesium (Mg)-Total (mg/L)	113	122	71.3	73.0	96.8
	Manganese (Mn)-Total (mg/L)	46.2	52.7	8.97	8.61	25.2
	Molybdenum (Mo)-Total (mg/L)	OLA <0.00050	DLA <0.00050	0.00057	0.00052	0.00053
	Nickel (Ni)-Total (mg/L)	0.117	0.131	0.0235	0.0225	0.0638
	Phosphorus (P)-Total (mg/L)	<0.30	<0.30	<0.30	<0.30	<0.30
	Potassium (K)-Total (mg/L)	7.1	7.4	7.2	7.2	7.6
	Selenium (Se)-Total (mg/L)	OLA <0.010	DLA <0.010	<0.0050	<0.0050	O.0050
	Silicon (Si)-Total (mg/L)	8.55	8.96	2.73	2.72	5.83
	Silver (Ag)-Total (mg/L)	<0.00010	<0.00010	<0.000050	<0.000050	O.000050
	Sodium (Na)-Total (mg/L)	35.4	36.9	21.7	21.6	27.8
	Strontium (Sr)-Total (mg/L)	1.33	1.47	1.02	0.990	1.14
	Sulfur (S)-Total (mg/L)	554	604	369	368	473
	Thallium (TI)-Total (mg/L)	<0.0010	OLA <0.0010	0.00068	0.00066	DLA <0.00050
	Tin (Sn)-Total (mg/L)	DLA <0.0010	OLA <0.0010	DLA <0.00050	0.00050	DLA <0.00050
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	0.00491	0.00524	0.00152	0.00147	0.00338
	Vanadium (V)-Total (mg/L)	<0.010	<0.010	DLA <0.0050	DLA <0.0050	DLA <0.0050
	Zinc (Zn)-Total (mg/L)	0.482	0.484	0.231	0.228	0.387
Dissolved Metals	Aluminum (AI)-Dissolved (mg/L)	DLA <0.010	DLA <0.010	DLA <0.0050	DLA <0.0050	DLA <0.0050
	Antimony (Sb)-Dissolved (mg/L)	DLA <0.0010	DLA <0.0010	OLA <0.00050	<0.00050	O.00050

ALS LABORATORY GROUP ANALYTICAL REPORT

L920954 CONTD.... PAGE 9 of 11 20-SEP-10 17:05 (MT)

	Sample ID Description Sampled Date Sampled Time Client ID	L920954-16 11-AUG-10 DUP 1			
Frouping	Analyte				
VATER		(1999) (1997) (1997)	1		
Dissolved Metals	Arsenic (As)-Dissolved (mg/L)	<0.0010			
	Barium (Ba)-Dissolved (mg/L)	0.0206			
	Beryllium (Be)-Dissolved (mg/L)	<0.0050			
	Bismuth (Bi)-Dissolved (mg/L)	<0.0050			
	Boron (B)-Dissolved (mg/L)	<0.10			
	Cadmium (Cd)-Dissolved (mg/L)	DLA <0.00050			
	Calcium (Ca)-Dissolved (mg/L)	519			
	Chromium (Cr)-Dissolved (mg/L)	OLA <0.0050			
	Cobalt (Co)-Dissolved (mg/L)	0.0783			
	Copper (Cu)-Dissolved (mg/L)	DLA <0.0010		3	
	Iron (Fe)-Dissolved (mg/L)	<0.030			
	Lead (Pb)-Dissolved (mg/L)	0.00050			
	Lithium (Li)-Dissolved (mg/L)	<0.050			
	Magnesium (Mg)-Dissolved (mg/L)	109	l.		
	Manganese (Mn)-Dissolved (mg/L)	40.5	-		
	Molybdenum (Mo)-Dissolved (mg/L)	0.00135			
	Nickel (Ni)-Dissolved (mg/L)	0.106			
	Phosphorus (P)-Dissolved (mg/L)	<0.30			
	Potassium (K)-Dissolved (mg/L)	6.0			
	Selenium (Se)-Dissolved (mg/L)	OLA <0.010			
	Silicon (Si)-Dissolved (mg/L)	7.91			
	Silver (Ag)-Dissolved (mg/L)	0.00010			
	Sodium (Na)-Dissolved (mg/L)	32.6			
	Strontium (Sr)-Dissolved (mg/L)	1.26			
	Sulfur (S)-Dissolved (mg/L)	485			
	Thallium (TI)-Dissolved (mg/L)	0.0010			
	Tin (Sn)-Dissolved (mg/L)	OLA <0.0010			
	Titanium (Ti)-Dissolved (mg/L)	0.012			
	Uranium (U)-Dissolved (mg/L)	0.00546			
	Vanadium (V)-Dissolved (mg/L)	<0.010			
	Zinc (Zn)-Dissolved (mg/L)	0.581			

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

		Deference Informe	tion	PAGE 10 of 11 20-SEP-10 17:05 (MT)
		Reference Informa	uon	
Jualifiers for Individual Pa		Listed:		
Qualifier Description	1524 15		arean and a second	; ; ; =) =(
DLA Detection L	imit Adjust.	ed For required dilution		
st Method References:				
S Test Code	Matrix	Test Description	Method Reference**	
K-COL-VA	Water	Alkalinity by Colourimetric (Automated)	APHA 310.2	
This analysis is carried out u colourimetric method.	using proce	edures adapted from EPA Method 310.2 "Alkalinity"	. Total Alkalinity is determined us	sing the methyl orange
RDNESS-CALC-VA	Water	Hardness	APHA 2340B	
lardness is calculated from	Calcium a	nd Magnesium concentrations, and is expressed a	s calcium carbonate equivalents.	
ET-DIS-ICP-VA	Water	Dissolved Metals in Water by ICPOES	EPA SW-846 3005A/6010	B
American Public Health Ass	ociation, a ction Agen	edures adapted from "Standard Methods for the Exa nd with procedures adapted from "Test Methods for cy (EPA). The procedure involves filtration (EPA M PA Method 6010B).	r Evaluating Solid Waste" SW-84	6 published by the United
ET-DIS-LOW-MS-VA	Water	Dissolved Metals in Water by ICPMS(Low)	EPA SW-846 3005A/6020	A
American Public Health Ass States Environmental Protein	ociation, a ction Agen	edures adapted from "Standard Methods for the Exa nd with procedures adapted from "Test Methods fo cy (EPA). The procedures involves preliminary sar coupled plasma - mass spectrometry (EPA Method	r Evaluating Solid Waste" SW-84 nple treatment by filtration (EPA	6 published by the United
ET-TOT-ICP-VA	Water	Total Metals in Water by ICPOES	EPA SW-846 3005A/6010)B
American Public Health Ass States Environmental Prote	sociation, a ction Agen	edures adapted from "Standard Methods for the Exa nd with procedures adapted from "Test Methods fo cy (EPA). The procedures may involve preliminary . Instrumental analysis is by inductively coupled pla	r Evaluating Solid Waste" SW-84 sample treatment by acid digest	I6 published by the United ion, using either hotblock or
;T-TOT-LOW-MS-VA	Water	Total Metals in Water by ICPMS(Low)	EPA SW-846 3005A/6020	
American Public Health Ass States Environmental Prote	sociation, a ction Agen	edures adapted from "Standard Methods for the Ex- ind with procedures adapted from "Test Methods fo icy (EPA). The procedures may involve preliminary thod 3005A). Instrumental analysis is by inductively	r Evaluating Solid Waste" SW-84 sample treatment by acid digest	I6 published by the United ion, using either hotblock or
-DIS-ICP-VA	Water	Dissolved Sulfur in Water by ICPOES	EPA SW-846 3005A/6010	
American Public Health Ass States Environmental Prote	sociation, a ction Agen	edures adapted from "Standard Methods for the Ex ind with procedures adapted from "Test Methods fo icy (EPA). The procedures may involve preliminary thod 3005A). Instrumental analysis is by inductively	r Evaluating Solid Waste" SW-84 sample treatment by acid diges	46 published by the United ion, using either hotblock or
submitted samples, is often	lost during	ot give total sulphur results for all samples. Sulphic the sampling, preservation and analysis process. phur present in a particular sample.	de or other volatile forms of sulph The data reported as total and/o	ur that may be present in r dissolved sulphur
TOT-ICP-VA	Water	Total Sulfur in Water by ICPOES	EPA SW-846 3005A/601	
American Public Health Ass States Environmental Prote	sociation, a	edures adapted from "Standard Methods for the Ex and with procedures adapted from "Test Methods for locy (EPA). The procedures may involve preliminary thod 3005A). Instrumental analysis is by inductivel	r Evaluating Solid Waste" SW-84 sample treatment by acid diges	46 published by the United tion, using either hotblock or
ubmitted samples, is often	lost during	ot give total sulphur results for all samples. Sulphic g the sampling, preservation and analysis process. Iphur present in a particular sample.	de or other volatile forms of sulph The data reported as total and/c	our that may be present in or dissolved sulphur
ALS test methods may inco	rporate mo	difications from specified reference methods to imp	prove performance.	
e last two letters of the abo	ove test co	de(s) indicate the laboratory that performed analyti	cal analysis for that test. Refer to	the list below:
aboratory Definition Code	Labo	ratory Location		
1		ABORATORY GROUP - VANCOUVER, BC, CAN	ADA	
ain of Custody Numbers:				
10-040123	10-040	124		
10-040123	10-040	147		

Reference Information

GLOSSARY OF REPORT TERMS

Surrogate A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

mg/kg milligrams per kilogram based on dry weight of sample. mg/kg wwt milligrams per kilogram based on wet weight of sample.

mg/kg lwt milligrams per kilogram based on lipid-adjusted weight of sample.

mg/L milligrams per kilogram based on ipid-adjusted weight of sample. mg/L milligrams per litre.

£

< - Less than.

D.L. The reported Detection Limit, also known as the Limit of Reporting (LOR).

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.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

ALS Laboratory Group ANALYTICAL CHEMISTRY & TESTING SERVICES Environmental Division	Cha	in of Custody / , Canada Toll F <u>www.a</u>			orm										401 ∠°'	
Report To Frin Cluple	Report Fo	ormat / Distributio	on			Se	rvice	Reque	sted:	(Ru	sh sut	oject to	o availa	ability)	
Company: Froubbrix	Standard:	Other (:	specify):			R	egula	r (Stan	dard 1	Tuma	round	Times		x	-	
Contact: Frin Clude	Select: PI	DF_X_Excel	X Digital	Fax		in the second	A DAME AND	, Date I	-	_					arges	apply)
Address: 6800 Campakella Rd	Email 1: 6	eclyde@ec	metrix.	ca				ency (1								
Hississauna AN LSN 218		smitheeu				F	or Em	ergend	-	the second second second	No. of Concession, name			d - Co	ntact A	LS
Phone: (905) 794-2325 Fax(905) 794-2338											ysis F					
Invoice To Same as Report ? (circle) Yes or No (if No, provide details)	Client / Pr	roject Information	n					(Indic	ate Fil	Itered	or Pr	eserve	ed, F/F	P)		-
Copy of Invoice with Report? (circle) Yes or No	Job #:					1	4	4	K	2	K	K		\leq	4	4
Company:	PO / AFE:							1	10	1	1	8				il er
Contact:	LSD:								31 L	1	4				1	1
Address:										1	1		1	8		lan
Phone: Fax:	Quote #:										1	1	1 1	8		a ter
	ALS Contact:		Sampler:							ł						ar of Containance
Sample Identification		Date	Time	Same	ole Type					1						Muchae
(This description will appear on the report)		(dd-mmm-yy)	(hh:mm)				-	-	-	-	4-	+			-+	
CVP10-1A		10-08-10		W	ater					1						
CVPIO-IR			1								line -	3				_
CVP10 - 1C														6		
				+	1		-		1	1	T	1				12
CVP10-2A				-			+		+	+	+	+	1	1		_
CVPID-2B		ta					-+-			+-		+-	-	-		
CVPIO-2C		V		-			-+		-	-	-	-	-	-		
CVP10-3A	1.14	11-08-10										1				
CVPIO-3R											1	1				
CUPIO-3C		1			10											Č.
State and				+			-			1						6
CUPIO-4A				╈						+	-	-	1-	-		
CVPIO-4B				-	J			-	+		+	+		-	\vdash	-+-
CUPIO-4C		V V			10											_
		ructions / Regula														

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as spacified on the back page of the white - report copy.

		AN COMPANY	. W	Alter	an and a second		and a second	en set de contra	in a she afor some	
	Date:	Time:	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ?
dunlyde	B-08-10	0	Received by:	AUGH	1135	√ °C				If Yes add SIF

	Chai	in of Custody / Canada Toll F	ree: 1 800 66					04012	
Environmental Division (ALS)		www.a	isglobal.com				Page	e Zof	6
Report To Frin Chude	Report Fo	ormat / Distributi	01		Service Requ	uested: (Rush s	ubject to availat	pility)	
company: Ecolletity	Standard:	Other (specify):		Regular (Sta	indard Tumarour	nd Times)) X	61	
Contact: Epin Clude	Select: PI		XDigital	Fax	Priority, Date	e Req'd:	(S	urcharges ap	oply)
Address: 6800 Campabello Rd	Email 1: 6	eclyde@e		ica l	Emergency	(1 Business Day)	- 100% Surcha	rge	1
1 Massissanga ON ISN 218		1smith@e			For Emerger	ncy < 1 Day, ASA	P or Weekend	- Contact AL!	S
Phone: (905) 794-2325 Fax: (905) 794-2338							Request		
Invoice To Same as Report ? (circle) Yes or No (if No, provide details)	Client / Pr	roject Informatio	n		(Ind	icate Filtered or I	Preserved, F/P)	
Copy of Invoice with Report? (circle) Yes or No	Job #:				M	M		$\Delta \mu$	1
Сотралу:	PO/AFE:	1							
Contact:	LSD:						111		
Address:									Jers
Phone: Fax:	Quote #:								lai
	ALS Contact:		Sampler:						Number of Containers
Sample Identification (This description will appear on the report)		Date (dd-mmm-yy)	Time (hh:mm)	Sample Type					Numbe
CVPID-SA		11-08-10		Water					
CVPID-5B		1 -0 -0		1				1	
				+ + +					and the second
CVPID-5C				+- <u>+</u> +	-+-+-+		+-+-+		
DUP I	ليصيبهم			V					
				1	-1-1-1				
									+
							╺┼╍┼╸┼		
	inecial Inst	uctions / Regula	tions / Hazard	ous Details	والاصادية				
Samples may contain elevated 2n				- Co	୪.				
Failure to complete all	portions of	this form may d	lelay analysis.	Please fill in this fo	orm LEGIBLY.				
By the use of this form the user acknowledges						the white - repo	rt copy.		
The second s		and the second			H side of the				* *
Released by: Date: Time: Receiv Date: 13-08-10	red by:	Date:	Time:	Temperature:	/enfied by:	Date:	Time:	Observa Yes / No If Yes ad	ations:
								II 100 d0	



Environmental Division

					and the second
		Certificate	of Analysis		
ECOMETRIX INC				Report Date:	14-SEP-10 10:10 (MT)
ATTN: ERIN CLYDE	E			Version:	FINAL
6000 Campobello Ro	ad				
Mississauga ON L5	N 2L8				
_ab Work Order #:	L929609			Date Receive	ad: 09-SEP-10
Project P.O. #:	NOT SUBMITTED				
Job Reference:	10-1753				
Legal Site Desc:					
CofC Numbers:	98050				
Other Information:					
Comments:					
		(\sim		
	Æ	mension U	$\left(\right)$		
	_4	Dmenin O	man lene¥.		
	Emersor				
	Account	Manager			
THIS REPORT S	SHALL NOT BE REPRODUCED E WILL BE DISPOSED OF AFTER 3	XCEPT IN FULL WITHO	UT THE WRITTEN AUTHO	RITY OF THE LABOR	TORY.

ALS Canada Ltd.

Part of the ALS Laboratory Group 5730 Coopers Avenue, Unit #26 , Mississauga, ON L4Z 2E9 Phone: +1 905 507 6910 Fax: +1 905 507 6927 www.alsglobal.com A Campbell Brothers Limited Company

Reference Information

est Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
AS,SB,SE-3050-MS-WT	Soil	As, Sb and Se by ICP/MS	SW846 3050B/6020A
MET-WT	Soil	Metal Scan (ICP)	EPA 3050/6010B
Sample is vigorously diges	ted with nitri	c acid and hydrogen peroxide. Analysis is c	onducted by ICP/OES.
S-WT	Soil	Sulfur (S)	EPA 3050
ALS test methods may inco	rporate mod	ifications from specified reference methods	to improve performance.
The last two letters of the al	ove test co	de(s) indicate the laboratory that performed	analytical analysis for that test. Refer to the list below:
Laboratory Definition Cod	e Labor	atory Location	
WΤ	ALS L	ABORATORY GROUP - WATERLOO, ON	TARIO, CANADA
hain of Custody Numbers			

98050

GLOSSARY OF REPORT TERMS

Surrogate A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. mg/kg milligrams per kilogram based on dry weight of sample.

mg/kg wwt milligrams per kilogram based on wet weight of sample.

mg/kg lwt milligrams per kilogram based on lipid-adjusted weight of sample.

mg/L milligrams per litre.

< - Less than.

D.L. The reported Detection Limit, also known as the Limit of Reporting (LOR).

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. Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



			Workorder:	L929609	F	Report Date: 14	-SEP-10	Pa	ge 1 of
		npobello Road Iga ON L5N 2L			0.				
"est		Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
AS,SB,SE-3050-M	IS-WT	Soil							
Batch R	1464564								
WG1165513-2 Arsenic (As)	CRM		WT-SS-1	102		%		10-155	13-SEP-10
WG1165513-7 Antimony (Sb)	LCS			105		%		80-120	13-SEP-10
Arsenic (As)				94		%		80-120	13-SEP-10
Selenium (Se)				86		%		80-120	13-SEP-10
WG1165513-1 Antimony (Sb)	мв			<1.0		mg/kg		1	13-SEP-10
Arsenic (As)				<1.0		mg/kg		1	13-SEP-10
Selenium (Se)				<1.0		mg/kg		1	13-SEP-10
WG1165513-6	MS		WG1165513-			11000000000000		2	
Antimony (Sb)				109		%		80-120	13-SEP-10
Arsenic (As)				N/A	MS-B	%		Ϋ́	13-SEP-10
Selenium (Se)				98		%		80-120	13-SEP-10
MET-WT		Soil							
Batch R	1464449								
WG1165513-2	CRM		WT-SS-1						
Aluminum (AI)				118		%		70-130	13-SEP-10
Barium (Ba)				92		%		70-130	13-SEP-10
Cadmium (Cd))			88		%		70-130	13-SEP-10
Calcium (Ca)	25			92		%		70-130	13-SEP-10
Chromium (Cr)			89		%		70-130	13-SEP-10
Cobalt (Co)				101		%		70-130	13-SEP-10
Copper (Cu)				99		%		70-130	13-SEP-10
Iron (Fe)				109		%		70-130	13-SEP-10
Lead (Pb)	2.2			85		%		70-130	13-SEP-10
Magnesium (N				106		%		70-130	13-SEP-10
Manganese (M				93 02		% %		70-130	13-SEP-10
Molybdenum (wo)			93 02				70-130	13-SEP-10
Nickel (Ni) Phosphorus (F	2)			92 94		% %		70-130	13-SEP-10
Prosphorus (F Potassium (K)				94 122		%		70-130	13-SEP-10
Sodium (Na)				122		%		70-130	13-SEP-10
Si 6				75		%		70-130	13-SEP-10
Strontium (Sr)						%		70-130	13-SEP-10
Vanadium (V) WG1165561-2				102		70		70-130	13-SEP-10



Chromium (Cr)

Workorder: L929609 Report Date: 14-SEP-10 Page 2 of 4 Test Matrix Result Qualifier Units RPD Limit Reference Analyzed MET-WT Soil Batch R1464449 WG1165561-2 CVS Aluminum (AI) 107 % 70-130 13-SEP-10 Barium (Ba) 102 % 60-140 13-SEP-10 Beryllium (Be) 100 % 80-120 13-SEP-10 Bismuth (Bi) 100 % 80-120 13-SEP-10 Boron (B) 99 % 80-120 13-SEP-10 Cadmium (Cd) 99 % 80-120 13-SEP-10 Calcium (Ca) 106 % 80-120 13-SEP-10 Chromium (Cr) 104 % 80-120 13-SEP-10 Cobalt (Co) 101 % 80-120 13-SEP-10 Copper (Cu) 102 % 80-120 13-SEP-10 Iron (Fe) 115 % 80-120 13-SEP-10 Lead (Pb) 91 % 80-120 13-SEP-10 Magnesium (Mg) 105 % 80-120 13-SEP-10 Manganese (Mn) % 98 80-120 13-SEP-10 Molybdenum (Mo) 102 % 80-120 13-SEP-10 Nickel (Ni) 104 % 80-120 13-SEP-10 Phosphorus (P) 91 % 80-120 13-SEP-10 Potassium (K) 93 % 60-140 13-SEP-10 Silver (Ag) 96 % 80-120 13-SEP-10 Sodium (Na) 108 % 60-140 13-SEP-10 Strontium (Sr) 97 % 63-138 13-SEP-10 Thallium (TI) 103 % 80-120 13-SEP-10 Uranium (U) 100 % 80-120 13-SEP-10 Vanadium (V) 95 % 80-120 13-SEP-10 Zinc (Zn) 100 % 80-120 13-SEP-10 WG1165513-1 MB Aluminum (AI) <5.0 ug/g 5 13-SEP-10 Barium (Ba) <1.0 ug/g 1 13-SEP-10 Beryllium (Be) < 0.50 ug/g 0.5 13-SEP-10 Bismuth (Bi) <1.0 1 ug/g 13-SEP-10 Boron (B) <5.0 ug/g 5 13-SEP-10 Cadmium (Cd) <0.50 ug/g 0.5 13-SEP-10 Calcium (Ca) <20 ug/g 20 13-SEP-10

<1.0

ug/g

1

13-SEP-10



est	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
			West Halver		0.000	000 F		
MET-WT	Soil							
Batch R1464449								
WG1165513-1 MB Cobalt (Co)			<1.0		ug/g		1	13-SEP-10
Copper (Cu)			<1.0		ug/g		1	13-SEP-10
Iron (Fe)			<20		ug/g		5	13-SEP-10
Lead (Pb)			<1.0		ug/g		1	13-SEP-10
Magnesium (Mg)			<20		ug/g		20	13-SEP-10
Manganese (Mn)			<1.0		ug/g		1	13-SEP-10
Molybdenum (Mo)			<1.0		ug/g		1	13-SEP-10
Nickel (Ni)			<1.0		ug/g		1	13-SEP-10
Phosphorus (P)			<10		ug/g		10	13-SEP-10
Potassium (K)			<10		ug/g		10	13-SEP-10
Silver (Ag)			<0.20		ug/g		0.2	13-SEP-10
Sodium (Na)			<20		ug/g		20	13-SEP-10
Strontium (Sr)			<1.0		ug/g		1	13-SEP-10
Thallium (TI)			<0.50		ug/g		0.5	13-SEP-10
Tin (Sn)			<5.0		ug/g		5	13-SEP-10
Titanium (Ti)			<5.0		ug/g		5	13-SEP-10
Uranium (U)			<1.0		ug/g		1	13-SEP-10
Vanadium (V)			<1.0		ug/g		1	13-SEP-10
Zinc (Zn)			<1.0		ug/g		1	13-SEP-10
Zirconium (Zr)			<1.0		ug/g		1	13-SEP-10
S-WT	Soil							
Batch R1464449								
WG1165513-1 MB Sulfur (S)			<10		mg/kg		10	13-SEP-10

Workorder: L929609

Report Date: 14-SEP-10

Legend:

Limit	99% Confidence Interval (Laboratory Control Limits)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
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

Sample Parameter Qualifier Definitions:

Qualifier	Description
J	Duplicate results and limits are expressed in terms of absolute difference.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

[ິ]ເພບສ໌ ດິສສ໌ດ5ບ CHAIN OF CUSTODY / ANALYTICAL SERVICES REQUEST FORM **60 NORTHLAND ROAD, UNIT 1** PAGE / WATERLOO, ON N2V 2B8 Phone: (519) 886-6910 Specify date required | Service requested 2 day TAT (50".) Note: all TAT Quoted material is in business days which exclude At % 1 reservations at Fax: (519) 886-9047 statutory holidays and weeknnih. TAT samples received past 5 day (Regular) Hent day TAT (100 -) CANADA TOLL FREE: 1-800-668-9878 3.00 pm or Saturday/Sunday begin the next day. 3-4 day IAI (25 J Same day TAT (2001.) COMPANY NAME PLEASE INDICATE FILTERED. oMetrix CRITERIA ANALYSIS REQUEST Criteria on report Ves [] No [] PRESERVED OR BOTH OFFICE (F. P. F/P) Bog 153/04 -----PROJECT MANAGER SUBMISSION 2 3 Table 1 Enn Clyde TGLP MISA PWQO PROJECT # 10-1753 ENTE ODWS OTHER **REPORT FORMAT / DISTRIBUTION** D.T.H-2338 CONTAINERS 1p Martal DATE TIME ENT X EMAIL FAX HICH S CUOIADC'# PO+ SELECT POF DIGITAL $1000 \times$ Include EMART CLYDE @ RCONXTRIX. Ca BIN # SAMPLING INFORMATION HS NUMBER OF FMAIL ? VSMith Quecimetrix. Ca Sample Date Tone TYPE. MATRIX ï Lane 12112 C. 137112 Linfe CCRM GRAD SAMPLE DESCRIPTION TO APPEAR ON REPORT LAB ID COMMENTS (24 hr) 2 Li. (dd-non-yy) (hh mm) X 1 CUP10-1 (0-5) 08-09-10 × -2 CUP16-1 (5-10 08-09-10 X X .3 CVP10-1 (10-15 08-09-10 X X X 08.09-10 CUP10-2 10-5 х 08-09-10 х CUP10-2 (5-10 × -6 08-09-10 CUP10-2 110 X X -7 CB: 09-10 X CUP10-5 (0-5, 18 CUP10-5 (5-10) × 08-07-10 Х X CNP10-5 (10-15 9 08-09-10 SPECIAL INSTRUCTIONS/COMMENTS THE QUESTIONS BELOW MUST BE ANSWERED FOR WATER SAMPLES [CHECK Yes, OR No.] SAMPLE CONDITION 221 622 66729 St. 121. Are any samples taken from a regulated DW System? Yes No If yes, an authorized drinking water COC MUST be used for this submission. 102 102 10 1 10 Is the water sampled intended to be notable for human consumption? Yes No AND FAT SHRVATIONS ROUT Yes [] No [yes add 24 09-10 Quale number must be provided to enclose TAT may vary dependent on complexity of deand lab workhoot 3: Any known or corspected traverds relating to a sample. at time of submission. Please contact lites conhrm TATs must be noted on the chain of custody in comments section proper pricing. White - Report copy YELLOW - File copy PINK - Customer copy D-- 000 0.



Environmental Division

<u>8</u> MITTED		ort Date: 14-SEP-10 14:24 (MT) Version: FINAL
	Dat	
		e Received: 09-SEP-10
		e Received: 09-SEP-10
		e Received: 09-SEP-10
MITTED	ŝ	
Emerson Perez	∫man Tene¥.	
		Emerson Perez Account 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.

ALS Canada Ltd. Part of the ALS Laboratory Group 5730 Coopers Avenue, Unit #26 , Mississauga, ON L4Z 2E9 Phone: +1 905 507 6910 Fax: +1 905 507 6927 www.alsglobal.com A Campbell Brothers Limited Company

PAGE 2 of 4 14-SEP-10 14:24 (MT)

ALS LABORATORY GROUP ANALYTICAL REPORT

	Sample ID Description Sampled Date Sampled Time Client ID	L929596-1 WATER 08-SEP-10 CVPPW10-1 (0-5)	L929596-2 WATER 08-SEP-10 CVPPW10-1 (5-10)	L929596-3 WATER 08-SEP-10 CVPPW10-1 (10- 15)	L929596-4 WATER 08-SEP-10 CVPPW10-2 (0-5)	L929596-5 WATER 08-SEP-10 CVPPW10-2 (5-10
				10,		
Grouping	Analyte		-	ecole al levente		
WATER			110-021-021		2000000	-
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	61	1610	37	192	60
Dissolved Metals	Aluminum (AI)-Dissolved (mg/L)	<0.010	0.041	0.019	<0.010	<0.010
	Antimony (Sb)-Dissolved (mg/L)	<0.0050	<0.0050	0.0366	<0.0050	<0.0050
	Arsenic (As)-Dissolved (mg/L)	0.0096	<0.0010	0.0051	<0.0010	<0.0010
	Barium (Ba)-Dissolved (mg/L)	0.048	1.78	0.725	<0.010	<0.010
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Bismuth (Bi)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Dissolved (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Cadmium (Cd)-Dissolved (mg/L)	0.00034	<0.00010	0.00029	<0.00010	<0.00010
	Calcium (Ca)-Dissolved (mg/L)	256	664	69.0	114	85.1
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Dissolved (mg/L)	0.0176	<0.00050	<0.00050	0.00202	<0.00050
	Copper (Cu)-Dissolved (mg/L)	0.0201	0.0314	<0.0010	0.0013	0.0018
	Iron (Fe)-Dissolved (mg/L)	<0.050	0.103	<0.050	<0.050	<0.050
	Lead (Pb)-Dissolved (mg/L)	<0.0010	0.282	0.0071	<0.0010	<0.0010
	Magnesium (Mg)-Dissolved (mg/L)	3.41	<0.50	4.10	348	290
	Manganese (Mn)-Dissolved (mg/L)	0.0259	0.0033	0.0315	0.0386	<0.0010
	Molybdenum (Mo)-Dissolved (mg/L)	0.113	0.0645	0.0913	0.0023	<0.0010
	Nickel (Ni)-Dissolved (mg/L)	2000		0.0013	<0.0020	<0.0010
	Phosphorus (P)-Dissolved (mg/L)	0.480	0.0662		100000 0000000000000000000000000000000	<0.0020
	Potassium (K)-Dissolved (mg/L)	0.062	0.066	<0.050	<0.050	11216202034540
	Selenium (Se)-Dissolved (mg/L)	8.9	13.0	20.3	5.9	5.8
	Silicon (Si)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Silver (Ag)-Dissolved (mg/L)	3.5	<1.0	<1.0	<1.0	<1.0
	Sodium (Na)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Strontium (Sr)-Dissolved (mg/L)	17.3	10.8	19.5	26.7	25.1
		0.287	0.386	0.277	0.300	0.278
	Sulfur (S)-Dissolved (mg/L)	243	61.9	250	530	492
	Thallium (TI)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	0.00147
	Tin (Sn)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Titanium (Ti)-Dissolved (mg/L)	0.0103	<0.0020	0.0106	0.0257	0.0230
	Tungsten (W)-Dissolved (mg/L)	<0.010	0.078	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Vanadium (V)-Dissolved (mg/L)	0.0015	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	0.0037	0.263	0.0047	0.162	0.0218
	Zirconium (Zr)-Dissolved (mg/L)	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040

L929596 CONTD.... PAGE 3 of 4 14-SEP-10 14:24 (MT)

ALS LABORATORY GROUP ANALYTICAL REPORT

	Sample ID Description Sampled Date Sampled Time Client ID	L929596-6 WATER 08-SEP-10 CVPPW10-2 (10- 15)	L929596-7 WATER 08-SEP-10 CVPPW10-5 (0-5)	L929596-8 WATER 08-SEP-10 CVPPW10-5 (5-10)	L929596-9 WATER 08-SEP-10 CVPPW10-5 (10- 15)	L929596-10 WATER 08-SEP-10 BLANK
Grouping	Analyte					
WATER	on en altalis, en en altale d'Antalente des dans					
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	34	164	52	39	<10
Dissolved Metals	Aluminum (AI)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Antimony (Sb)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Arsenic (As)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Barium (Ba)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Bismuth (Bi)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Dissolved (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Cadmium (Cd)-Dissolved (mg/L)	<0.00010	<0.00010	0.00014	0.00015	<0.00010
	Calcium (Ca)-Dissolved (mg/L)	140	108	76.1	98,1	<0.50
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Copper (Cu)-Dissolved (mg/L)	0.0015	0.0018	0.0016	0.0019	0.0060
	Iron (Fe)-Dissolved (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Lead (Pb)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Magnesium (Mg)-Dissolved (mg/L)	DLM 187	огм 319	313 DLM	283 DLM	<0.50
	Manganese (Mn)-Dissolved (mg/L)	<0.0010	0.0091	<0.0010	<0.0010	<0.0010
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (NI)-Dissolved (mg/L)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Phosphorus (P)-Dissolved (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Potassium (K)-Dissolved (mg/L)	5.9	5.7	5.7	6.1	<1.0
	Selenium (Se)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Silicon (Si)-Dissolved (mg/L)	<1.0	1.1	<1.0	<1.0	<1.0
	Silver (Ag)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Sodium (Na)-Dissolved (mg/L)	22.4	25.6	25.6	27.0	<0.50
	Strontium (Sr)-Dissolved (mg/L)	0.536	0.299	0.317	0.438	<0.0010
	Sulfur (S)-Dissolved (mg/L)	425	564	546	539	<5.0
	Thallium (TI)-Dissolved (mg/L)	0.00165	<0.00030	0.00078	0.00131	<0.00030
	Tin (Sn)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Titanium (Ti)-Dissolved (mg/L)	0.0189	0.0244	0.0243	0.0227	<0.0020
	Tungsten (W)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	0.0148	0.164	0.0251	0.0253	< 0.0030
	Zirconium (Zr)-Dissolved (mg/L)	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040

Reference Information

Qualifiers for Individual Parameters Listed:

Qualifier	Description		
DLM	Detection Limit	Adjusted For Sample Matrix Effects	
est Method R	leferences:		
LS Test Code	Mat	trix Test Description	Method Reference**
⊾K-WT	Wat	er Alkalinity, Total (as CaCO3)	APHA 2320B
MET-DIS-FF-WT Water		er Metal Scan-Dissolved	EPA 200.8
-DIS-WT	Wat	er Sulfur (S) - Dissolved	EPA 200.8
ALS test metho	ods may incorpora	te modifications from specified reference method	Is to improve performance.
⁺he last two lett	ers of the above to	est code(s) indicate the laboratory that performed	analytical analysis for that test. Refer to the list below:
_aboratory Def	inition Code	Laboratory Location	
WТ		ALS LABORATORY GROUP - WATERLOO, ON	TARIO, CANADA
ain of Custod	ly Numbers:		
		And the second sec	

98049

LOSSARY OF REPORT TERMS

urrogate A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

mg/kg milligrams per kilogram based on dry weight of sample.

g/kg wwt milligrams per kilogram based on wet weight of sample.

y/kg lwt milligrams per kilogram based on lipid-adjusted weight of sample.

mg/L milligrams per litre.

< - Less than. The reported Detection Limit, also known as the Limit of Reporting (LOR). L.

/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.

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

nalytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



01	ECOMETRIX INC							
	6000 Campobello Road Mississauga ON L5N 2L	.8						
Contact:	ERIN CLYDE Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
0498 58. 566855		Neierence	Nesult	quanner	Units	RFD	Linn	Analyzeu
ALK-WT	Water							
	1462867							
WG1164753-2 Alkalinity, Total	CVS L(as CaCO3)		94		%		85-115	10-SEP-10
WG1164753-1	MB						00-110	IU-SEF-II
Alkalinity, Total			<10		mg/L		10	10-SEP-10
MET-DIS-FF-WT	Water							
	1464504							
WG1165637-1	CVS							
Aluminum (AI)-	Dissolved		105		%		80-120	13-SEP-10
Antimony (Sb)-	Dissolved		104		%		80-120	13-SEP-10
Arsenic (As)-Dissolved			101		%		80-120	13-SEP-10
Barium (Ba)-Di	ssolved		100		%		80-120	13-SEP-10
Beryllium (Be)-Dissolved			106		%		80-120	13-SEP-10
Bismuth (Bi)-Di	issolved		107		%		80-120	13-SEP-10
Boron (B)-Diss	olved		105		%		70-130	13-SEP-1
Cadmium (Cd)	-Dissolved		107		%		80-120	13-SEP-10
Calcium (Ca)-D	Dissolved		109		%		80-120	13-SEP-10
Chromium (Cr)	Dissolved		114		%		80-120	13-SEP-10
Cobalt (Co)-Dis	ssolved		114		%		80-120	13-SEP-10
Copper (Cu)-D	issolved		109		%		80-120	13-SEP-10
Iron (Fe)-Disso	lved		104		%		80-120	13-SEP-10
Lead (Pb)-Diss	olved		111		%		80-120	13-SEP-10
Magnesium (M	g)-Dissolved		105		%		80-120	13-SEP-10
Manganese (M	n)-Dissolved		110		%		80-120	13-SEP-10
Molybdenum (N	No)-Dissolved		108		%		80-120	13-SEP-10
Nickel (Ni)-Dise	solved		113		%		80-120	13-SEP-10
Phosphorus (P)-Dissolved		103		%		70-130	13-SEP-10
Potassium (K)-	Dissolved		106		%		80-120	13-SEP-10
Selenium (Se)-	Dissolved		108		%		80-120	13-SEP-10
Silver (Ag)-Dise	solved		104		%		80-120	13-SEP-10
Sodium (Na)-D	issolved		107		%		80-120	13-SEP-10
Strontium (Sr)-	Dissolved		106		%		80-120	13-SEP-10
Thallium (TI)-D	issolved		106		%		80-120	13-SEP-10
Uranium (U)-Di	issolved		111		%		80-120	13-SEP-10
Vanadium (V)-I	Dissolved		110		%		80-120	13-SEP-10
Zinc (Zn)-Disso	blved		111		%		80-120	13-SEP-10



		Workorder:	L323330		Report Date: 14		1 6	ge 2 of
lest .	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-DIS-FF-WT	Water							
Batch R1464	504							
	vs		400		0/		70 400	
Silicon (Si)-Dissolve	ed		102		%		70-130	13-SEP-10
Tin (Sn)-Dissolved	10.000 × 4		89		%		80-120	13-SEP-10
Titanium (Ti)-Disso			100		%		80-120	13-SEP-10
Tungsten (W)-Diss			92		%		70-130	13-SEP-10
Zirconium (Zr)-Diss	solved		98		%		80-120	13-SEP-10
WG1165637-3 M Aluminum (Al)-Diss			<0.010		mg/L		0.01	13-SEP-10
Antimony (Sb)-Diss			<0.0050		mg/L		0.005	13-SEP-10
Arsenic (As)-Dissol		12	<0.0010		mg/L		0.001	13-SEP-10
Barium (Ba)-Dissol			<0.010		mg/L		0.01	13-SEP-10
Beryllium (Be)-Diss			<0.0010		mg/L		0.001	13-SEP-10
Bismuth (Bi)-Dissol			<0.0010		mg/L		0.001	13-SEP-10
Boron (B)-Dissolve			<0.050		mg/L		0.05	13-SEP-10
Cadmium (Cd)-Dis			<0.00010		mg/L		0.0001	13-SEP-10
Calcium (Ca)-Disso			<0.50		mg/L		0.5	13-SEP-10
Chromium (Cr)-Dis			<0.0010		mg/L		0.001	13-SEP-10
Cobalt (Co)-Dissolv			<0.00050		mg/L		0.0005	13-SEP-10
Copper (Cu)-Disso	lved		<0.0010		mg/L		0.001	13-SEP-10
Iron (Fe)-Dissolved			<0.050		mg/L		0.05	13-SEP-10
Lead (Pb)-Dissolve	d		<0.0010		mg/L		0.001	13-SEP-10
Magnesium (Mg)-D	Dissolved		<0.50		mg/L		0.5	13-SEP-10
Manganese (Mn)-D	Dissolved		<0.0010		mg/L		0.001	13-SEP-10
Molybdenum (Mo)-	Dissolved		<0.0010		mg/L		0.001	13-SEP-10
Nickel (Ni)-Dissolve	ed		<0.0020		mg/L		0.002	13-SEP-10
Phosphorus (P)-Dis	ssolved		<0.050		mg/L		0.05	13-SEP-10
Potassium (K)-Diss	solved		<1.0		mg/L		1	13-SEP-10
Selenium (Se)-Diss			<0.0050		mg/L		0.005	13-SEP-10
Silicon (Si)-Dissolv	ed		<1.0		mg/L		1	13-SEP-1
Silver (Ag)-Dissolv	ed		<0.00010		mg/L		0.0001	13-SEP-1
Sodium (Na)-Disso	blved		<0.50		mg/L		0.5	13-SEP-10
Sodium (Na)-Disso Strontium (Sr)-Diss	solved		<0.0010		mg/L		0.001	13-SEP-10
Thallium (TI)-Disso	lved		<0.00030		mg/L		0.0003	13-SEP-10
Tin (Sn)-Dissolved			<0.0010		mg/L		0.001	13-SEP-10
Titanium (Ti)-Disso			<0.0020		mg/L		0.002	13-SEP-1



		Workorder	L929596		Report Date:	14-SEP-10	Pa	ige 3 of 4
Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-DIS-FF-WT	Water							
Batch R1464504								
WG1165637-3 MB	596				32300.04 -		1201200	
Tungsten (W)-Dissolve			<0.010		mg/L		0.01	13-SEP-10
Uranium (U)-Dissolved			<0.0050		mg/L		0.005	13-SEP-10
Vanadium (V)-Dissolve	d		<0.0010		mg/L		0.001	13-SEP-10
Zinc (Zn)-Dissolved			<0.0030		mg/L		0.003	13-SEP-10
Zirconium (Zr)-Dissolve	be		<0.0040		mg/L		0.004	13-SEP-10
Batch R1465783								
WG1166370-2 CVS Tin (Sn)-Dissolved			94		%		80-120	14-SEP-10
Zirconium (Zr)-Dissolve	be		94		%		80-120	14-SEP-10
WG1166370-3 MB Tin (Sn)-Dissolved			<0.0010		mg/L		0.001	14-SEP-10
Zirconium (Zr)-Dissolve	ed		<0.0040		mg/L		0.004	14-SEP-10
S-DIS-WT	Water							
Batch R1464504	1992049							
WG1165637-2 CVS								
Sulfur (S)-Dissolved			89		%		63-138	13-SEP-10
WG1165637-3 MB								
Sulfur (S)-Dissolved			<5.0		mg/L		5	13-SEP-10
Batch R1465783	i -							
WG1166370-2 CVS Sulfur (S)-Dissolved		-	92		%		63-138	14-SEP-10
WG1166370-3 MB								
Sulfur (S)-Dissolved			<5.0		mg/L		5	14-SEP-10

Workorder: L929596

Report Date: 14-SEP-10

Limit	99% Confidence Interval (Laboratory Control Limits)	
DUP	Duplicate	
RPD	Relative Percent Difference	
N/A	Not Available	
LCS	Laboratory Control Sample	
SRM	Standard Reference Material	
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	

ample Parameter Qualifier Definitions:

5	Qualifier	Description
ŕ	J	Duplicate results and limits are expressed in terms of absolute difference.
I	RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

old Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

LS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government equirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the JS EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

he ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-'etermined data quality objectives to provide confidence in the accuracy of associated test results.

/lease note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

60 NORTHLAND ROAD, UNIT 1	сн	AIN OF CUSTOD	Y / ANALYT	ICAL SERVICES REQUES	Colc# 09804
WATERLOO, ON N2V 2B8 Phone: (519) 886-6910	LS) Mate: all TAT Gualed male	nal is in hospess days which	rexclude	Specify date required Service rec	nuested 2 day TAT (50%)
Fax: (519) 886-9047 CANADA TOLL FREE: 1-800-668-9878	statutory holidays and we	ekends. IAI samples received		5 d . Regist) Nest day TAT (100°.)
	3.00 pm or Saturday/Sund	a service of the serv		- 1 <u>13-4</u> d to 1 <u>9</u> 1 <u>(</u> 2	Same day TAT (2007.) 1 PLEASE INDICATE FILTERED.
Tarrice EcoMetrix	CRITERIA Coletto en report Ye		ay (n.) ay a co	ANALYSIS REQUEST	PRESERVED OR BOTH
I TPROJECT OWNAGED	Reg 153-04		PF		1 (F, P, F/P)
Erin Clyde	labe 1 2 3	,	$\overline{\mathcal{A}}$		SUBMISSION #
10HOJECT 10-1753	ODWS OTHER	·	ארד		ENTERECRY
(105) TH-2325 GOSTH-2338	REPORT FORMAT / DISTRIE		d		1150
	EMAIL X Fax b	оти	Eviz i		DATE TIME ENTENED
	ADDV III		12.8		09-59110
SAMPLING INFORMATION	EMAILI CLIVE CUCINETTIX	.ca 100	in the		
Sample Dute Time TYPE _ LIATBIX _	EMAIL 2 VSmith Celupitinx	(a 10)	I SIX		D11+
Dute Time 1 1 4 1 4 (24 m) 0 4 m 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	SAMPLE DESCRIPTION TO APPEAR		AK		COMMETITS LABID
(8-09-10) X	CVPPWIO-1 (0-	5) 12	$X^{\perp}X^{\perp}$		
08-09-10 XI	CVPPW10 - 1 (5-	10) 2	XX		.4
08-09-10 X	CVPPW10-1 (10-		x x		
08-09-10 X	CUPPW 10-2 (0-5		XX	1 - 1 - 1 - 1 - 1 - 1	
08-09-10	CVPPW10-2 (5-10		XX		-5
08-09-10 X	CVPPL010-2 (10-1		XX	1-1-1-1-1	-6
08-09-10 X	CUPPW10-510-5		XX		
08-09-10 X	CUPPW 10-5 (5-10	· ·	XX		-8
08-09-10 X	CVPPW 10-5 (10-15	N	XXI		
08-09-10 X	BLANK	12	XIXI		10
		MAT	MAN	CUMEN	
		TACL	SUN	JAMER L	
SPECIAL INSTRUCTIONS/COMMI	ENTS THE OUE	STIONS BELOW MUST BE	ANSWERED FO		OR No) SAMPLE CONDITION
1		ples taken from a regu	-		No 1000
1				used for this submission.	COOLDS INTIMED [] 7C
1 1-14-21 (D10)	Is the water	sampled interved to b	e polable for h		
ECIUS	B-09-10)	Hoke		inter yet 9/0	12-15 Vesti No
Lun Clyple	108-09-10	IVI D AT LABEN	V	09-5970 1	3:00 Hyes add SIF
NOTES AND CONDITION. 1. Ounte number multiple provided to ensure	2. IAT may very dependent on a	iomplexity of another 24	lah werkload	3 Any known or surge	cited buzards relating to a cample
proper pricing	at time of submission. Please	contact the lati to anhrm			e Chain of custody in comments section.
White - Rep	port copy YEL	LOW - File copy		PINK - Cust	omer copy



ECOMETRIX INC ATTN: ERIN CLYDE 6000 Campobello Road Mississauga ON L5N 2L8 Phone: 905-794-2325

 $\Rightarrow concerning = \hat{M}$

Date Received: 15-SEP-10 Report Date: 20-SEP-10 14:05 (MT) Version: FINAL

Certificate of Analysis

NOT SUBMITTED

10-1753

98051

Lab Work Order #: L931816 Project P.O. #: Job Reference: Legal Site Desc: C of C Numbers:

menson Uman Tene 1.

Emerson Perez Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 5730 Coopers Avenue, Unit #26 , Mississauga, ON L4Z 2E9 Canada | Phone: +1 905 507 6910 | Fax: +1 905 507 6927 ALS CANADA LIMITED Part of the ALS Group A Campbell Brothers Limited Company

www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNER

L931816 CONTD.... PAGE 2 of 3 20-SEP-10 14:05 (MT)

ALS LABORATORY GROUP ANALYTICAL REPORT

	Sample ID Description Sampled Date Sampled Time	L931816-1 WATER 14-SEP-10	L931816-2 WATER 14-SEP-10	L931816-3 WATER 14-SEP-10	L931816-4 WATER 14-SEP-10	L931816-5 WATER 14-SEP-10
	Client ID	CVP10 - ST - PW DAY 0	CVP10 - ST - 6 DAY 0	CVP10 - ST - C DAY 0	CVP10 - ST - 8 DAY 0	CVP10 - ST - 9 DAY 0
Grouping	Analyte					
WATER						
Dissolved Metals	Aluminum (AI)-Dissolved (mg/L)	<1.0 DLM	OLM <1.0	OLM <1.0	<1.0	<0.10
	Antimony (Sb)-Dissolved (mg/L)	<0.50	<0.50	OLM	<0.50	<0.050
	Arsenic (As)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.010
	Barium (Ba)-Dissolved (mg/L)	<1.0	OLM <1.0	DLM <1.0	<1.0	<0.10
	Beryllium (Be)-Dissolved (mg/L)	<0.10	<0.10	OLM <0.10	<0.10	o. 0.010<
	Bismuth (Bi)-Dissolved (mg/L)	<0.10	<0.10	олм <0.10	<0.10	<0.010
	Boron (B)-Dissolved (mg/L)	<5.0	<5.0	<5.0	<5.0	<0.50
	Cadmium (Cd)-Dissolved (mg/L)	<0.010 DLM	<0.010 DLM	<0.010 DLM	<0.010 DLM	<0.0010
	Calcium (Ca)-Dissolved (mg/L)	354	339	344	331	310
	Chromium (Cr)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10	0.024
	Cobalt (Co)-Dissolved (mg/L)	0.111	0.099	0.096	<0.050	0.0111
	Copper (Cu)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.010
	Iron (Fe)-Dissolved (mg/L)	<5.0	<5.0	<5.0	<5.0	<0.50
	Lead (Pb)-Dissolved (mg/L)	<0.10 DLM	<0.10 DLM	<0.10	<0.10 DLM	<0.010
	Magnesium (Mg)-Dissolved (mg/L)	216 DLM	216	218	224	209
	Manganese (Mn)-Dissolved (mg/L)	33.8 DLM	32.3 DLM	32.4 DLM	25.2 DLM	9.55
ž,	Molybdenum (Mo)-Dissolved (mg/L)	<0.10 DLM	<0.10 DLM	<0.10	<0.10	<0.010
2	Nickel (Ni)-Dissolved (mg/L)	<0.20	<0.20	<0.10 <0.20	<0.20	0.035
	Phosphorus (P)-Dissolved (mg/L)	<5.0	<5.0	<5.0	<5.0	<0.50
	Potassium (K)-Dissolved (mg/L)	<100 DLM	<100	<100	<100	<10
	Selenium (Se)-Dissolved (mg/L)	DLM	DLM	DLM	DLM	D
	Silicon (Si)-Dissolved (mg/L)	<0.50 <100	<0.50 <100	<0.50 <100	<0.50 	<0.050 <10
	Silver (Ag)-Dissolved (mg/L)	DLM	DLM	DLM	DLM	D
	Sodium (Na)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	< 0.0010
	Strontium (Sr)-Dissolved (mg/L)	<50	<50	<50	<50 DLM	31.3
	Sulfur (S)-Dissolved (mg/L)	1.03 DLM	0.96	1.01	0.95	0.878
	Thallium (TI)-Dissolved (mg/L)	570 DLM	550 DLM	550 DLM	570 DLM	566
	Tin (Sn)-Dissolved (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.0030
	Titanium (Ti)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10 DLM	< 0.010
	Tungsten (W)-Dissolved (mg/L)	<0.20	<0.20	<0.20 DLM	<0.20	0.023
	Uranium (U)-Dissolved (mg/L)	<1.0	<1.0	<1.0	<1.0 DLM	<0.10
	Vanadium (V)-Dissolved (mg/L)	<0.50	<0.50	<0.50 DLM	<0.50	<0.050
	Zinc (Zn)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.010
	Zirconium (Zr)-Dissolved (mg/L)	1.46 DLM	6.95 DLM	3.03 DLM	1.01 DLM	0.992
	(<0.40	<0.40	<0.40	<0.40	<0.040

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

Qualifiers for Individual Parameters Listed:

acuantici or statement			
Qualifier	Description		
DLM	Detection Limit Adju	sted For Sample Matrix Effects	
est Method I	References:		
LS Test Code	e Matrix	Test Description	Method Reference**
ET-DIS-FF-W	VT Water	Metal Scan-Dissolved	EPA 200.8
B-DIS-WT	Water	Sulfur (S) - Dissolved	EPA 200.8
ALS test meth	nods may incorporate m	odifications from specified reference meth	ods to improve performance.
he last two let	tters of the above test c	ode(s) indicate the laboratory that perform	ed analytical analysis for that test. Refer to the list below:
aboratory De	finition Code Labo	pratory Location	
٧T	ALS	LABORATORY GROUP - WATERLOO, C	DNTARIO, CANADA
ain of Custo	dy Numbers:		- K
98051			
GLOSSARY O	F REPORT TERMS		

urrogate A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For oplicable tests, surrogates are added to samples prior to analysis as a check on recovery.

mg/kg milligrams per kilogram based on dry weight of sample.

mg/kg wwt milligrams per kilogram based on wet weight of sample. Ig/kg lwt milligrams per kilogram based on lipid-adjusted weight of sample.

Ig/L milligrams per litre.

--- Less than.

D.L. The reported Detection Limit, also known as the Limit of Reporting (LOR).

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

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

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

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Workorder: L931816

Report Date: 20-SEP-10

Page 1 of 6

Client:	ECOMETRIX INC 6000 Campobello Roa Mississauga ON L5N							
Contact:	ERIN CLYDE							
est	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-DIS-FF-WT	Water							
Batch I	R1468424							
WG1167826-1	50.0x06277522760.0x0							
Aluminum (Al			100		%		80-120	16-SEP-10
Antimony (Sb			100		%		80-120	16-SEP-10
Arsenic (As)-			98		%		80-120	16-SEP-10
Barium (Ba)-I	Dissolved		98		%		80-120	16-SEP-10
Beryllium (Be)-Dissolved		103		%		80-120	16-SEP-10
Bismuth (Bi)-	Dissolved		100		%		80-120	16-SEP-10
Boron (B)-Dis	ssolved		93		%		70-130	16-SEP-10
Cadmium (Co	d)-Dissolved		103		%		80-120	16-SEP-10
Calcium (Ca)	-Dissolved		100		%		80-120	16-SEP-10
Chromium (C	r)-Dissolved		103		%		80-120	16-SEP-10
Cobalt (Co)-D	Dissolved		103		%		80-120	16-SEP-10
Copper (Cu)-	Dissolved		103		%		80-120	16-SEP-10
Iron (Fe)-Dise	solved		98		%		80-120	16-SEP-10
Lead (Pb)-Di	ssolved		105		%		80-120	16-SEP-10
Magnesium (Mg)-Dissolved		102		%		80-120	16-SEP-10
Manganese (Mn)-Dissolved		99		%		80-120	16-SEP-10
Molybdenum	(Mo)-Dissolved		104		%		80-120	16-SEP-10
Nickel (Ni)-Di	issolved		103		%		80-120	16-SEP-10
Phosphorus ((P)-Dissolved		100		%		70-130	16-SEP-10
Potassium (K	()-Dissolved		100		%		80-120	16-SEP-10
Selenium (Se	e)-Dissolved		99		%		80-120	16-SEP-10
Silver (Ag)-Di	issolved		94		%		80-120	16-SEP-10
Sodium (Na)-	Dissolved		103		%		80-120	16-SEP-10
Strontium (Sr)-Dissolved		100		%		80-120	16-SEP-10
Thallium (TI)-	Dissolved		102		%		80-120	16-SEP-10
Uranium (U)-	Dissolved		102		%		80-120	16-SEP-10
Vanadium (V)-Dissolved		97		%		80-120	16-SEP-10
Zinc (Zn)-Dis	solved		102		%		80-120	16-SEP-10
WG1167826-2 Silicon (Si)-D			120		%		70-130	16-SEP-10
Tin (Sn)-Diss			93		%		80-120	16-SEP-10
Titanium (Ti)-			98		%		80-120	16-SEP-10
Tungsten (W			90		%		70-130	16-SEP-10
	,)-Dissolved		97		%		80-120	16-SEP-10



			Qualit	y Conti	ol Report			
		Workorder	L931816		Report Date: 2	0-SEP-10	Pa	ge 2 of
Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-DIS-FF-WT	Water							
Batch R1468	424							
WG1167826-3 M								
Aluminum (Al)-Diss			<0.010		mg/L		0.01	16-SEP-10
Antimony (Sb)-Diss			<0.0050		mg/L		0.005	16-SEP-10
Arsenic (As)-Dissol			<0.0010		mg/L		0.001	16-SEP-10
Barium (Ba)-Dissol			<0.010		mg/L		0.01	16-SEP-10
Beryllium (Be)-Diss	olved		<0.0010		mg/L		0.001	16-SEP-10
Bismuth (Bi)-Dissol	ved		<0.0010		mg/L		0.001	16-SEP-10
Boron (B)-Dissolved	d		<0.050		mg/L		0.05	16-SEP-10
Cadmium (Cd)-Diss	solved		<0.00010		mg/L		0.0001	16-SEP-10
Calcium (Ca)-Disso	blved		<0.50		mg/L		0.5	16-SEP-10
Chromium (Cr)-Dis	solved		<0.0010		mg/L		0.001	16-SEP-10
Cobalt (Co)-Dissolv	red		<0.00050		mg/L		0.0005	16-SEP-10
Copper (Cu)-Dissol	ved		<0.0010		mg/L		0.001	16-SEP-10
Iron (Fe)-Dissolved			<0.050		mg/L		0.05	16-SEP-10
Lead (Pb)-Dissolve	d		<0.0010		mg/L		0.001	16-SEP-10
Magnesium (Mg)-D	issolved		<0.50		mg/L		0.5	16-SEP-10
Manganese (Mn)-D	lissolved		<0.0010		mg/L		0.001	16-SEP-10
Molybdenum (Mo)-l	Dissolved		<0.0010		mg/L		0.001	16-SEP-10
Nickel (Ni)-Dissolve	ed		<0.0020		mg/L		0.002	16-SEP-10
Phosphorus (P)-Dis	solved		<0.050		mg/L		0.05	16-SEP-1
Potassium (K)-Diss	olved		<1.0		mg/L		1	16-SEP-10
Selenium (Se)-Diss	olved		<0.0050		mg/L		0.005	16-SEP-10
Silicon (Si)-Dissolve	ed		<1.0		mg/L		1	16-SEP-10
Silver (Ag)-Dissolve	ed		<0.00010		mg/L		0.0001	16-SEP-10
Sodium (Na)-Disso	lved		<0.50		mg/L		0.5	16-SEP-10
Strontium (Sr)-Diss	olved		<0.0010		mg/L		0.001	16-SEP-1(
Thallium (TI)-Dissol	lved		<0.00030		mg/L		0.0003	16-SEP-10
Tin (Sn)-Dissolved			<0.0010		mg/L		0.001	16-SEP-10
Titanium (Ti)-Disso	ived		<0.0020		mg/L		0.002	16-SEP-10
Tungsten (W)-Diss			<0.010		mg/L		0.01	16-SEP-10
Uranium (U)-Dissol			<0.0050		mg/L		0.005	16-SEP-10
Vanadium (V)-Diss			<0.0010		mg/L		0.001	16-SEP-10
Zinc (Zn)-Dissolved			<0.0030		mg/L		0.003	16-SEP-10
Zirconium (Zr)-Diss			<0.0040		mg/L		0.004	16-SEP-10

Quality Control Report



Workorder: L931816 Report Date: 20-SEP-10 Page 3 of 6 Qualifier Test Matrix Result Units RPD Limit Reference Analyzed MET-DIS-FF-WT Water Batch R1471246 WG1168514-1 CVS Aluminum (AI)-Dissolved 103 % 80-120 17-SEP-10 Antimony (Sb)-Dissolved 104 % 80-120 17-SEP-10 Arsenic (As)-Dissolved 99 % 80-120 17-SEP-10 Barium (Ba)-Dissolved 100 % 80-120 17-SEP-10 Beryllium (Be)-Dissolved 105 % 80-120 17-SEP-10 Bismuth (Bi)-Dissolved 101 % 80-120 17-SEP-10 Boron (B)-Dissolved 104 % 70-130 17-SEP-10 Cadmium (Cd)-Dissolved 105 % 80-120 17-SEP-10 Calcium (Ca)-Dissolved 100 % 80-120 17-SEP-10 Chromium (Cr)-Dissolved 103 % 80-120 17-SEP-10 Cobalt (Co)-Dissolved 101 % 80-120 17-SEP-10 Copper (Cu)-Dissolved 105 % 80-120 17-SEP-10 Iron (Fe)-Dissolved 99 % 80-120 17-SEP-10 Lead (Pb)-Dissolved 103 % 80-120 17-SEP-10 Magnesium (Mg)-Dissolved 104 % 80-120 17-SEP-10 Manganese (Mn)-Dissolved 100 % 80-120 17-SEP-10 Molybdenum (Mo)-Dissolved 109 % 80-120 17-SEP-10 Nickel (Ni)-Dissolved 104 % 80-120 17-SEP-10 Phosphorus (P)-Dissolved 101 % 70-130 17-SEP-10 Potassium (K)-Dissolved 102 % 80-120 17-SEP-10 Selenium (Se)-Dissolved 102 % 80-120 17-SEP-10 Silver (Ag)-Dissolved 102 % 80-120 17-SEP-10 Sodium (Na)-Dissolved % 104 80-120 17-SEP-10 Strontium (Sr)-Dissolved 102 % 80-120 17-SEP-10 Thallium (TI)-Dissolved 102 % 80-120 17-SEP-10 Uranium (U)-Dissolved 103 % 80-120 17-SEP-10 Vanadium (V)-Dissolved 97 % 80-120 17-SEP-10 Zinc (Zn)-Dissolved 105 % 80-120 17-SEP-10 WG1168514-2 CVS 107 % Silicon (Si)-Dissolved 70-130 17-SEP-10 Tin (Sn)-Dissolved 98 % 80-120 17-SEP-10 Titanium (Ti)-Dissolved 102 % 80-120 17-SEP-10 Tungsten (W)-Dissolved 93 % 70-130 17-SEP-10 Zirconium (Zr)-Dissolved 98 % 80-120 17-SEP-10

Quality Control Report

WG1168514-3 MB



est	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
est	Watrix	Reference	Result	Quaimer	Units	KP D	Lunit	Analyzeu
MET-DIS-FF-WT	Water							
Batch R147								
WG1168514-3 I Aluminum (Al)-Dis	MB		<0.010		mg/L		0.01	17-SEP-10
Antimony (Sb)-Dis			<0.0050		mg/L		0.005	17-SEP-10
Arsenic (As)-Diss			<0.0010		mg/L		0.001	17-SEP-10
Barium (Ba)-Disso			<0.010		mg/L		0.001	17-SEP-10
Beryllium (Be)-Dis			<0.0010		mg/L		0.001	17-SEP-10
Bismuth (Bi)-Disse			<0.0010		mg/L		0.001	17-SEP-10
Boron (B)-Dissolv			<0.050		mg/L		0.05	17-SEP-10
Cadmium (Cd)-Di			<0.00010		mg/L		0.0001	17-SEP-10
Calcium (Ca)-Diss			<0.50		mg/L		0.5	17-SEP-10
Chromium (Cr)-Di			<0.0010		mg/L		0.001	17-SEP-10
Cobalt (Co)-Disso			<0.00050		mg/L		0.0005	17-SEP-10
Copper (Cu)-Diss			<0.0010		mg/L		0.001	17-SEP-1
Iron (Fe)-Dissolve			<0.050		mg/L		0.05	17-SEP-1
Lead (Pb)-Dissolv			<0.0010		mg/L		0.001	17-SEP-1
Magnesium (Mg)-			<0.50		mg/L		0.5	17-SEP-1
Manganese (Mn)-	Dissolved		<0.0010		mg/L		0.001	17-SEP-1
Molybdenum (Mo))-Dissolved		<0.0010		mg/L		0.001	17-SEP-1
Nickel (Ni)-Dissolv	ved		<0.0020		mg/L		0.002	17-SEP-10
Phosphorus (P)-D	Dissolved		<0.050		mg/L		0.05	17-SEP-10
Potassium (K)-Dis	ssolved		<1.0		mg/L		1	17-SEP-1
Selenium (Se)-Dis	ssolved		<0.0050		mg/L		0.005	17-SEP-1
Silicon (Si)-Dissol	ved		<1.0		mg/L		1	17-SEP-1
Silver (Ag)-Dissol	ved		<0.00010		mg/L		0.0001	17-SEP-10
Sodium (Na)-Diss	olved		<0.50		mg/L		0.5	17-SEP-10
Strontium (Sr)-Dis	solved		<0.0010		mg/L		0.001	17-SEP-1
Thallium (TI)-Diss	olved		<0.00030		mg/L		0.0003	17-SEP-1
Tin (Sn)-Dissolved	d		<0.0010		mg/L		0.001	17-SEP-1
Titanium (Ti)-Diss	olved		<0.0020		mg/L		0.002	17-SEP-1
Tungsten (W)-Dis	solved		<0.010		mg/L		0.01	17-SEP-1
Uranium (U)-Diss	olved		<0.0050		mg/L		0.005	17-SEP-1
Vanadium (V)-Dis	solved		<0.0010		mg/L		0.001	17-SEP-1
Zinc (Zn)-Dissolve	ed		<0.0030		mg/L		0.003	17-SEP-1
Zirconium (Zr)-Dis	ssolved		<0.0040		mg/L		0.004	17-SEP-1

S-DIS-WT

Water

19



	Workorder:	L931816	Report Date: 20-SEP-10	Pag	ge 5 of 6
Test Mat	trix Reference	Result Qualifier	Units RPD	Limit	Analyzed
S-DIS-WT Wat	iter				
Batch R1468424					
WG1167826-2 CVS					
Sulfur (S)-Dissolved		94	%	63-138	16-SEP-10
WG1167826-3 MB					
Sulfur (S)-Dissolved		<5.0	mg/L	5	16-SEP-10
Batch R1471246					
WG1168514-2 CVS					
Sulfur (S)-Dissolved		103	%	63-138	17-SEP-10
WG1168514-3 MB					
Sulfur (S)-Dissolved		<5.0	mg/L	5	17-SEP-10

Workorder: L931816

Report Date: 20-SEP-10

eq	en	d	•
		-	

Limit	99% Confidence Interval (Laboratory Control Limits)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
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

ample Parameter Qualifier Definitions:

Qualifier	Description
, J	Duplicate results and limits are expressed in terms of absolute difference.

Hold Time Exceedances:

Il test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the JS EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

he ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to nsure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined data quality objectives to provide confidence in the accuracy of associated test results.

'lease note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Vork Order.

1. Quote Auto Completizionos pinper pricing.	EC	DJ. a women	Concernation	inter ucon	UM	2			14719-10	14-09-10	14-09-10	14-04-10	14-09-16	(bd-ma-)7)	Sample Deal Time	CALIF	QUOINT DAM	ACCOUNT	ちてくろう	PROJECT . 10-	Erin vi	X	OFFICE	SUTIN ACTUALINGS	CANADA TOLL FREE:	Phone: (519) 885-8910 Fax: (519) 888-9047	60 NORTHLAND ROAD, UN WATERLOO, ON NZV 288
its AND COMPLEXENS: Cucies aumber must be provided to encura proper pricing.			no le mon	contan such	~+~·· 0 - ·	DECIAL INSTRUCTIONS COMMA			 ×	×	*	*	*	77 mm 77	DeadTime TYPE MATRIX		NO4		15 Mar 14-1228	1753	induc	ide		EcoNetrix	FREE: 1-800-068-9078		NIT 1
2 TAT I	5-07-10	14-09-		>		FNITE			CVPID	OUPID	CUPID-ST-	CUPIO -ST-	CUPIO-	SALIPLE D	EMAIL2	CUMLI CC	SELECT: POF	Eura X	RB	ODWS	TQP	0.7	Rep 153/04	CRITERIA			
2 TAT may vary dependent on complexity of analysis and lab workload at time of submission. Please contact the lab to content TATS	10 August August adorson	10 Accements Digit	is the water sampled intended to be potable b	Are any samples taken from a regulated DW System? If yes, an authorized chinking varier COC MUST be used for this		THE OURSTIONS BO ON MIST BE ANSWERED FOR WATER SAM			-ST-9 Day O 1 X	ST-8 Day O 1 X	5	-ST-6 Duy O 11 X	-ST-RUDAYO 11X	SALIFLE DESCRIPTION TO APPEAR ON REPORT	EAO	hat monthing to a	X DIGITAL X BOTH	FAX BOTH		OTHER Sobe	MISACOMPA	2 3	75	Criteria on report Ves D No D	300 pm or Seconday/Sunday beyin the read day:	Acuter all TAT Granted methodia in an burshness days which everyone analyticary ballitary and weeksmits. TAT samples morehood same	CHAIN OF CUSTODY / ANAL
3. Any known or suspected incourds totaling to a sample must be noted on the chain of custody in comments section.	CSSSI OF-OF-IO ISSO	2000 1/2/10 1480		ystem? Yes () No () be used for this submission.		FOR WATER SAMPLES I CHECK The Dat No.1																		AMALYSIS REQUEST	3-4 day 101 (25 %)	Sprony date requested	CHAIN OF CUSTODY / ANALYTICAL SERVICES REQUEST FORM
ds rotaling to a sample	12	TAS D NOT	MAREAL D C	80	HICH	SAMPLE CONDITION				h-	-3	-2	-1	CONNENTS LAB ID	D12+		12-868-10	DATETRAE ENTERED:	TON	ENTERED BIT	LA JIAID		1 R.P. MAY	PRESERVED OR BOTH	Same day Dit (200%)	2 day: DAT (50%)	PAGE _ O

1 1



ECOMETRIX INC ATTN: Erin Clyde 6800 Campobello Road Mississauga ON L5N 2L8 Phone: 905-794-2325

artonrammanian (

Date Received: 16-SEP-10 Report Date: 20-SEP-10 14:15 (MT) Version: FINAL

Certificate of Analysis

Lab Work Order #: L932342 Project P.O. #: Job Reference: Legal Site Desc: C of C Numbers:

NOT SUBMITTED 10-1753

98055

nenson Uman Tene 1

Emerson Perez Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 5730 Coopers Avenue, Unit #26 , Mississauga, ON L4Z 2E9 Canada | Phone: +1 905 507 6910 | Fax: +1 905 507 6927 ALS CANADA LIMITED Part of the ALS Group A Campbell Brothers Limited Company

www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNER

L932342 CONTD.... PAGE 2 of 3 20-SEP-10 14:15 (MT)

ALS LABORATORY GROUP ANALYTICAL REPORT

	Sample ID Description Sampled Date Sampled Time Client ID	L932342-1 WATER 15-SEP-10 CVP10-ST-6 DAY 1	L932342-2 WATER 15-SEP-10 CVP10-ST-C DAY 1	L932342-3 WATER 15-SEP-10 CVP10-ST-8 DAY 1	L932342-4 WATER 15-SEP-10 CVP10-ST-9 DAY 1
Grouping	Analyte				
WATER					
Dissolved Metals	Aluminum (AI)-Dissolved (mg/L)	<1.0 DLM	<1.0	оли (0.10	0.029
	Antimony (Sb)-Dissolved (mg/L)	DLM	DLM	DLM	0.028
	Arsenic (As)-Dissolved (mg/L)	<0.50	<0.50	<0.050 DLM	<0.0050
	Barium (Ba)-Dissolved (mg/L)	<0.10	<0.10	<0.010 DLM	<0.0010
	Beryllium (Be)-Dissolved (mg/L)	<1.0	<1.0 DLM	<0.10	<0.010
	Bismuth (Bi)-Dissolved (mg/L)	<0.10 0LM	<0.10 DLM	<0.010	<0.0010
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.010	<0.0010
	Cadmium (Cd)-Dissolved (mg/L)	<5.0	<5.0 DLM	<0.50 DLM	<0.050
	Calcium (Ca)-Dissolved (mg/L)	<0.010 DLM	<0.010 DLM	<0.0010 DLM	<0.00010
	Chromium (Cr)-Dissolved (mg/L)	325 DLM	304 DLM	300 DLM	252
	Cobalt (Co)-Dissolved (mg/L)	<0.10 оlm	<0.10 DLM	<0.010 _{DLM}	<0.0010
		0.080 DLM	0.054 DLM	0.0251 DLM	<0.00050
	Copper (Cu)-Dissolved (mg/L)	<0.10 DLM	<0.10 DLM	<0.010 DLM	0.0013
	Iron (Fe)-Dissolved (mg/L)	<5.0 DLM	<5.0 DLM	<0.50 DLM	<0.050
	Lead (Pb)-Dissolved (mg/L)	<0.10 DLM	<0.10 DLM	<0.010 DLM	<0.0010 DLM
	Magnesium (Mg)-Dissolved (mg/L)	229 DLM	235 DLM	235 DLM	203
	Manganese (Mn)-Dissolved (mg/L)	26.9 DLM	22.3 DLM	15.5 DLM	0.546
	Molybdenum (Mo)-Dissolved (mg/L)	<0.10	<0.10 DLM	<0.010 DLM	0.0035
	Nickel (Ni)-Dissolved (mg/L)	<0.20	<0.20	0.029 DLM	0.0045
	Phosphorus (P)-Dissolved (mg/L)	<5.0 DLM	<5.0 DLM	<0.50 DLM	<0.050
	Potassium (K)-Dissolved (mg/L)	<100 DLM	<100	<10 DLM	5.9
	Selenium (Se)-Dissolved (mg/L)	<0.50	<0.50	<0.050	<0.0050
	Silicon (Si)-Dissolved (mg/L)	<100	<100	<10	3.1
	Silver (Ag)-Dissolved (mg/L)	<0.010	<0.010	<0.0010	<0.00010
	Sodium (Na)-Dissolved (mg/L)	<50 OLM	<50 OLM	33.2 DLM	28.9
	Strontium (Sr)-Dissolved (mg/L)	0.95	0.89 DLM	0.859	0.701
	Sulfur (S)-Dissolved (mg/L)	530 DLM	510 DLM	588 DLM	514
	Thallium (TI)-Dissolved (mg/L)	<0.030	<0.030	<0.0030	0.00053
	Tin (Sn)-Dissolved (mg/L)	<0.10 ^{DLM}	<0.10	<0.010	<0.0010
	Titanium (Ti)-Dissolved (mg/L)	<0.20 ^{DLM}	<0.20 ^{DLM}	0.025	0.0219
	Tungsten (W)-Dissolved (mg/L)	<1.0 DLM	<1.0 DLM	<0.10	<0.010
	Uranium (U)-Dissolved (mg/L)	<0.50	<0.50	OLM <0.050	<0.0050
	Vanadium (V)-Dissolved (mg/L)	<0.10	<0.10	олм <0.010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	5.58	0.98	0.033	0.0045
	Zirconium (Zr)-Dissolved (mg/L)	оцм <0.40	<0.40	OLM <0.040	<0.0040
			2011 - 22	800 Mar	

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

1		Reference Ir	formation
	dividual Parameters	Listed:	
Qualifier	Description		
DLM	Detection Limit Adjus	ted For Sample Matrix Effects	
est Method Re	ferences:		
LS Test Code	Matrix	Test Description	Method Reference**
ET-DIS-FF-WT	Water	Metal Scan-Dissolved	EPA 200.8
-DIS-WT	Water	Sulfur (S) - Dissolved	EPA 200.8
and the second se		difications from specified reference met	
he last two letter	rs of the above test co	de(s) indicate the laboratory that perform	med analytical analysis for that test. Refer to the list below:
aboratory Defin	ition Code Labo	atory Location	
VT	ALS L	ABORATORY GROUP - WATERLOO,	ONTARIO, CANADA
nain of Custody	Numbers:		
98055			
ng/L milligrams - Less than. D.L. The reported V/A Result not a 	a per litre. ed Detection Limit, als available. Refer to qu rted relate only to the s RWISE STATED, ALL o	ed on lipid-adjusted weight of sample. o known as the Limit of Reporting (LOR alifier code and definition for explanation samples as receieved by the laboratory. SAMPLES WERE RECEIVED IN ACCE ts with the DRAFT watermark are subje	n. EPTABLE CONDITION.
			κ.



		Workorder	: L932342	2	Report Date: 2	0-SEP-10	Pa	ige 1 of 4
Client: Contact:	ECOMETRIX INC 6800 Campobello Road Mississauga ON L5N 3 Erin Clyde							₩205 L 30200 L
Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-DIS-FF-V	WT Water							
Batch	R1471246							
WG116851								
Aluminum	(AI)-Dissolved		103		%		80-120	17-SEP-10
Antimony ((Sb)-Dissolved		104		%		80-120	17-SEP-10
Arsenic (A	s)-Dissolved		99		%		80-120	17-SEP-10
Barium (Ba	a)-Dissolved		100		%		80-120	17-SEP-10
Beryllium ((Be)-Dissolved		105		%		80-120	17-SEP-10
Bismuth (E	Bi)-Dissolved		101		%		80-120	17-SEP-10
Boron (B)-	Dissolved		104		%		70-130	17-SEP-10
Cadmium	(Cd)-Dissolved		105		%		80-120	17-SEP-10
Calcium (C	Ca)-Dissolved		100		%		80-120	17-SEP-10
Chromium	(Cr)-Dissolved		103		%		80-120	17-SEP-10
Cobalt (Co	o)-Dissolved		101		%		80-120	17-SEP-10
Copper (C	u)-Dissolved		105		%		80-120	17-SEP-10
Iron (Fe)-D	Dissolved		99		%		80-120	17-SEP-10
Lead (Pb)-	-Dissolved		103		%		80-120	17-SEP-10
Magnesiur	m (Mg)-Dissolved		104		%		80-120	17-SEP-10
Manganes	e (Mn)-Dissolved		100		%		80-120	17-SEP-10
Molybdenu	um (Mo)-Dissolved		109		%		80-120	17-SEP-10
Nickel (Ni)	-Dissolved		104		%		80-120	17-SEP-10
Phosphoru	us (P)-Dissolved		101		%		70-130	17-SEP-10
Potassium	n (K)-Dissolved		102		%		80-120	17-SEP-10
Selenium ((Se)-Dissolved		102		%		80-120	17-SEP-10
Silver (Ag))-Dissolved		102		%		80-120	17-SEP-10
Sodium (N	la)-Dissolved		104		%		80-120	17-SEP-10
Strontium	(Sr)-Dissolved		102		%		80-120	17-SEP-10
Thallium (*	TI)-Dissolved		102		%		80-120	17-SEP-10
Uranium (l	U)-Dissolved		103		%		80-120	17-SEP-10
Vanadium	(V)-Dissolved		97		%		80-120	17-SEP-10
Zinc (Zn)-l	Dissolved		105		%		80-120	17-SEP-10
WG116851 Silicon (Si)	4-2 CVS)-Dissolved		107		%		70-130	17-SEP-10
Tin (Sn)-D			98		%		80-120	17-SEP-10
	Ti)-Dissolved		102		%		80-120	
The second with the	(W)-Dissolved		93		%		70-130	17-SEP-10
8 8	(Zr)-Dissolved		98		%			17-SEP-10
WOddcord	stymute resultation ent				20		80-120	17-SEP-10

WG1168514-3 MB



		Workorder	L932342		Report Date: 2	0-SEP-10	Pa	ge 2 of
ſest	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-DIS-FF-WT	Water							
Batch R1471	246							
WG1168514-3 M Aluminum (Al)-Diss			<0.010		mg/L		0.01	17-SEP-10
Antimony (Sb)-Diss	olved		<0.0050		mg/L		0.005	17-SEP-10
Arsenic (As)-Dissol	ved		<0.0010		mg/L		0.001	17-SEP-10
Barium (Ba)-Dissol	ved		<0.010		mg/L		0.01	17-SEP-10
Beryllium (Be)-Diss	olved		<0.0010		mg/L		0.001	17-SEP-10
Bismuth (Bi)-Dissol	ved		<0.0010		mg/L		0.001	17-SEP-10
Boron (B)-Dissolve	d		<0.050		mg/L		0.05	17-SEP-10
Cadmium (Cd)-Dis:	solved		<0.00010		mg/L		0.0001	17-SEP-10
Calcium (Ca)-Disso	blved		<0.50		mg/L		0.5	17-SEP-10
Chromium (Cr)-Dis	solved		<0.0010		mg/L		0.001	17-SEP-10
Cobalt (Co)-Dissolv	ved		<0.00050		mg/L		0.0005	17-SEP-10
Copper (Cu)-Dissol	lved		<0.0010		mg/L		0.001	17-SEP-10
Iron (Fe)-Dissolved	l,		<0.050		mg/L		0.05	17-SEP-10
Lead (Pb)-Dissolve	d		<0.0010		mg/L		0.001	17-SEP-10
Magnesium (Mg)-D	issolved		<0.50		mg/L		0.5	17-SEP-10
Manganese (Mn)-D	Dissolved		<0.0010		mg/L		0.001	17-SEP-10
Molybdenum (Mo)-	Dissolved		<0.0010		mg/L		0.001	17-SEP-10
Nickel (Ni)-Dissolve	ed		<0.0020		mg/L		0.002	17-SEP-10
Phosphorus (P)-Dis	ssolved		<0.050		mg/L		0.05	17-SEP-10
Potassium (K)-Diss	solved		<1.0		mg/L		1	17-SEP-1(
Selenium (Se)-Diss	solved		<0.0050		mg/L		0.005	17-SEP-10
Silicon (Si)-Dissolv	ed		<1.0		mg/L		1	17-SEP-10
Silver (Ag)-Dissolve	ed		<0.00010		mg/L		0.0001	17-SEP-10
Sodium (Na)-Disso	lved		<0.50		mg/L		0.5	17-SEP-10
Strontium (Sr)-Diss	solved		<0.0010		mg/L		0.001	17-SEP-10
Thallium (TI)-Disso	lved		<0.00030		mg/L		0.0003	17-SEP-10
Tin (Sn)-Dissolved			<0.0010		mg/L		0.001	17-SEP-10
Titanium (Ti)-Disso	olved		<0.0020		mg/L		0.002	17-SEP-10
Tungsten (W)-Diss	olved		<0.010		mg/L		0.01	17-SEP-10
Uranium (U)-Disso	lved		<0.0050		mg/L		0.005	17-SEP-10
Vanadium (V)-Diss	olved		<0.0010		mg/L		0.001	17-SEP-10
Zinc (Zn)-Dissolved	đ		<0.0030		mg/L		0.003	17-SEP-10
Zirconium (Zr)-Dise	solved		<0.0040		mg/L		0.004	17-SEP-10

S-DIS-WT

14

Water



		Workorder	: L932342		Report Date: 2	0-SEP-10	Pa	ige 3 of 4
Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
S-DIS-WT	Water							
Batch R1471	246							
WG1168514-2 CV Sulfur (S)-Dissolved	1275		103		%		63-138	17-SEP-10
WG1168514-3 MI Sulfur (S)-Dissolved			<5.0		mg/L		5	17-SEP-10

Workorder: L932342

Report Date: 20-SEP-10

	Limit	99% Confidence Interval (Laboratory Control Limits)
	DUP	Duplicate
	RPD	Relative Percent Difference
1	N/A	Not Available
	LCS	Laboratory Control Sample
	SRM	Standard Reference Material
	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

Sample Parameter Qualifier Definitions:

1	Qualifier	Description
ĥ	J	Duplicate results and limits are expressed in terms of absolute difference.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

ATERLOO, O hone: (519) 8						(A	LS)	Note: all TAT	Ovoted mater	ial le in huchwes	days w	hich e	rciude		Specif	y date req	ulred	Servi	ce rad	quest	ed	2 day TAT (50%)	X
17: (519) 886	-9047			1	-	AL INVIT	ronmentel	atatutory hol	idays and week	kennis. TAT somp	ilea rea	erived p	1251		-			5 day (Next day IAT (100%)	
ANADA TOLI					878			Stor pro or S	aurchy/Sunda	y bogin the mext	ulay:	-1			1			34 00	TAT 12	5%)		Same day TAT (200%)	
MPANY NAME	Ecol	101	rix	C			CRITERIA	Criteria on	report Yes	D No C	_				AN	IALYSIS I	EQU	EST				PLEASE INDICATE FILTE	RED.
FICE							Reg 153/04					FA	2									(F, P, F/P)	
DIECT MANAGE	R						Table 1	2 3				17				1			5			SUBMISSION I	2 - 2
Frin C	hde	2				1	1CLP		IN/DO		-		E			i					-	19823	421
CJECT / /A	175	2					ODWS						0						0 1			ENTERED BY	
Enin C	225	FAX				-		ORT FORMA		ITION	- 0	2	E		0 1				1 1		1	MGI	
COUNT #	25 Y	905	119	1-4	3.38						VE9	橋	9									DATE/TIME ENTERED:	a al la
UOTATIONS		POI		_		-	EMAIL X				GONTAINERS	K	ar	de la								16-SEF	2~10
*		1	-				EMAILI COL				8	6.	K	F								BINE OIL	Call and the
SAM Sample Date	PLINQ IN	***	PE		ATR	X	EMAIL2	Trucci	curano		- OF	R	(hc									617-	2
Sample Date				-							VBER	d	9	1					10				
(dd-mm-yy)	(bhimm)	COMP	GRAB	WATER	SOL	OTHEN	SAMPLE DI	SCHIPTION	IC APPEAR	ON REPORT	N	100								1		COMMENTS	LABID
-09-10				×	- No		CVPIQ	-ST-	6 Day	<u>cl</u>	1	X										-	-1
5-09-10				x			CVPIO-	ST-C	Day		1	X	r:433.32			Tata da la	1, M. 1	a na	-seatac	10.000	e detes	The Association of the Associati	1-2
5-09-10		5		X		1	CUPIO-			1	1	X											-3
12			1	x			CVPIO	- Alternation and - Contraction of the Contraction		1	1	X	1	1	-				1				-4.
5-09-10		-					CVIIC	<u> </u>	1 0007		+	1	-	-			-				1		
		-			-							-		-									
		-		-							-			[]									
		1_		-							+	-				-+					į		
			_									1	-	-			_						
									-	a marine in the													
											1						1	İ					
				-	-								1									-	
		-			1				• • • • • • • • • • • • • • • • • • •	****		T	1								1	-	
	SPECIAL	INST	RUC	TION	S/CO	1444	INTS		THE GUEST	TIONS BELOW	MUST	BE A	NSWER	D FOR	WATER	SAMPLI	5 (OHECI	(Yes		and the second s	SAMPLE CON	
May co.	rta	'n	1	les	va	te	d 2n	And	any sampl	es lakan Iro	m u re	gula	ted DW	System	u?			-	Yes [A C	o B		MEAN TEMP
0							100 A 100	tt y	es, en autho	rized drinkin	ig wat	ar CO	C MUS	T be u	sed fo	r titis su	brais	sion.				COLO	11
								is t	he water sa	mpled Inten	ded to	be p	otabla	for hur	nan ce	onsumpl	ion?		Yes [N	A	AMPIENT	1101
AMOLED BY F	r				-		15-Sept	-10	PECEN	ED 84	1	00	1st	C	5	DICE	K/	80	12	40		Yes Who D	INIT
ELVIQUENCE BY	Ti						DATE & TIME ,		PECEN	ED AT LAG SY	1	75	-/	<	-8	9000.3	to.	-		30		It yas add SIF	
NOTES AND	Uly	ne					16-Set	-10			0-	Y	/			10 09	1110	/	171	20		10	4



ECOMETRIX INC ATTN: Erin Clyde 6800 Campobello Road Mississauga ON L5N 2L8 Phone: 905-794-2325

Date Received: 21-SEP-10 Report Date: 23-SEP-10 03:12 (MT) Version: FINAL

Certificate of Analysis

Lab Work Order #: L933667 Project P.O. #: Job Reference: Legal Site Desc: C of C Numbers:

NOT SUBMITTED 10-1753

98059

Samples analyzed using lowest possible dilution. EP/MS Comments:

man lene f renion

Emerson Perez Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 5730 Coopers Avenue, Unit #26 , Mississauga, ON L4Z 2E9 Canada | Phone: +1 905 507 6910 | Fax: +1 905 507 6927 ALS CANADA LIMITED Part of the ALS Group A Campbell Brothers Limited Company

www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNER

L933007 CONTD.... PAGE 2 of 3 23-SEP-10 03:12 (MT)

ALS LABORATORY GROUP ANALYTICAL REPORT

1	Sample ID Description Sampled Date Sampled Time Client ID	L933667-1 WATER 16-SEP-10 CVP10-ST-6 DAY 2	L933667-2 WATER 16-SEP-10 CVP10-ST-C DAY 2	L933667-3 WATER 16-SEP-10 CVP10-ST-8 DAY 2	L933667-4 WATER 16-SEP-10 CVP10-ST-9 DAY 2	
Grouping	Analyte					
WATER						
Dissolved Metals	Aluminum (AI)-Dissolved (mg/L)	<1.0	<0.10	<0.10	0.045	
	Antimony (Sb)-Dissolved (mg/L)	<0.50	<0.050	OLM <0.050	<0.0050	
	Arsenic (As)-Dissolved (mg/L)	оли <0.10	OLM <0.010	OLM <0.010	<0.0010	
	Barium (Ba)-Dissolved (mg/L)	<1.0	OLM <0.10	OLM <0.10	<0.010	
	Beryllium (Be)-Dissolved (mg/L)	<0.10	оли <0.010	OLM <0.010	<0.0010	
	Bismuth (Bi)-Dissolved (mg/L)	<0.10	OLM <0.010	OLM <0.010	<0.0010	
	Boron (B)-Dissolved (mg/L)	оли <5.0	<0.50	<0.50	<0.050	
	Cadmium (Cd)-Dissolved (mg/L)	<0.010	<0.0010	<0.0010	<0.00010	
	Calcium (Ca)-Dissolved (mg/L)	360 DLM	301	295	277	
	Chromium (Cr)-Dissolved (mg/L)	<0.10	<0.010	<0.010	<0.0010	
	Cobalt (Co)-Dissolved (mg/L)	0.064	0.0355	0.0212	<0.00050	
	Copper (Cu)-Dissolved (mg/L)	<0.10	<0.010	<0.010	0.0016	
	Iron (Fe)-Dissolved (mg/L)	<5.0	<0.50	<0.50	<0.050	
	Lead (Pb)-Dissolved (mg/L)	<0.10 DLM	<0.010 DLM	<0.010	<0.0010	
	Magnesium (Mg)-Dissolved (mg/L)	239 DLM	237 DLM	232 DLM	204	
	Manganese (Mn)-Dissolved (mg/L)	22.5	15.9 DLM	11.3 DLM	0.863	
	Molybdenum (Mo)-Dissolved (mg/L)	<0.10	<0.010	OLM <0.010	0.0037	
	Nickel (Ni)-Dissolved (mg/L)	оля <0.20	0.037	0.026	0.0052	
	Phosphorus (P)-Dissolved (mg/L)	<5.0	<0.50	<0.50	<0.050	
	Potassium (K)-Dissolved (mg/L)	<100 DLM	<10 DLM	<10 DLM	6.2	
	Selenium (Se)-Dissolved (mg/L)	оля со.50	<0.050	<0.050	<0.0050	
	Silicon (Si)-Dissolved (mg/L)	<100 DLM	<10	<10 DLM	2.8	
	Silver (Ag)-Dissolved (mg/L)	<0.010	<0.0010	<0.0010	<0.00010	
	Sodium (Na)-Dissolved (mg/L)	-0.010 DLM 70	33.2	32.6	27.2	
	Strontium (Sr)-Dissolved (mg/L)	0.95	0.858	0.826	0.752	
	Sulfur (S)-Dissolved (mg/L)	690	615	0.820 DLM 589	519	
	Thallium (TI)-Dissolved (mg/L)	<0.030	<0.0030	<0.0030	0.00049	
	Tin (Sn)-Dissolved (mg/L)	<0.10	<0.000 <0.010	<0.0000 	<0.0010	
	Titanium (Ti)-Dissolved (mg/L)	<0.10 <0.20	0.024	0.025	0.0230	
	Tungsten (W)-Dissolved (mg/L)	<1.0	<0.10	<0.10	<0.010	
	Uranium (U)-Dissolved (mg/L)	<0.50	<0.050	<0.050	<0.0050	
	Vanadium (V)-Dissolved (mg/L)	<0.10 DLM	<0.010	<0.030 PLM <0.010	<0.0010	
	Zinc (Zn)-Dissolved (mg/L)	4.08	0.387	<0.010 20.030	0.0064	
	Zirconium (Zr)-Dissolved (mg/L)	<0.40	<0.040	<0.030 DLM <0.040	<0.0040	
		10.00			Avenue av	

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

Qualifier	Description		
эLM	Detection Limit Adjust	ted For Sample Matrix Effects	
est Method Re	eferences:		
.S Test Code	Matrix	Test Description	Method Reference**
	Water	Metal Scan-Dissolved	EPA 200.8
S-DIS-WT	Water	Sulfur (S) - Dissolved	EPA 200.8
LS test method	ds may incorporate mo	difications from specified reference meth	ods to improve performance.
The last two lette	rs of the above test co	de(s) indicate the laboratory that perform	ed analytical analysis for that test. Refer to the list below:
boratory Defir	nition Code Labor	atory Location	
ys T	ALS L	ABORATORY GROUP - WATERLOO, C	DNTARIO, CANADA
' ain of Custody	Numbers:		
98059			

GLOSSARY OF REPORT TERMS

irrogate A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For plicable tests, surrogates are added to samples prior to analysis as a check on recovery.

nig/kg milligrams per kilogram based on dry weight of sample.

mg/kg wwt milligrams per kilogram based on wet weight of sample.

7/kg lwt milligrams per kilogram based on lipid-adjusted weight of sample.

g/L milligrams per litre.

- Less than.

D.L. The reported Detection Limit, also known as the Limit of Reporting (LOR).

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

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

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

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



		Workorder:	L933667		Report Date: 2	3-SEP-10	Pa	nge 1 of 4
Client: Contact:	ECOMETRIX INC 6800 Campobello Road Mississauga ON L5N 2 Erin Clyde	L8						
Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
	The second se		1903993		2411121	(ST T)	1.55	
MET-DIS-FF-V Batch	R1474416							
WG117098	6-1 CVS							
	(AI)-Dissolved		98		%		80-120	22-SEP-10
	(Sb)-Dissolved		102		%		80-120	22-SEP-10
16 Jan - Carl 1900 (201	s)-Dissolved		102		%		80-120	22-SEP-10
0	a)-Dissolved		102		%		80-120	22-SEP-10
: 영말 ⁽¹⁾ 전 (1) (1) (1) (1) (1) (1) (1) (1) (1) (1)	(Be)-Dissolved		109		%		80-120	22-SEP-10
	Bi)-Dissolved		104		%		80-120	22-SEP-10
Boron (B)-			111		%		70-130	22-SEP-10
	(Cd)-Dissolved		107		%		80-120	22-SEP-10
	Ca)-Dissolved		109		%		80-120	22-SEP-10
	(Cr)-Dissolved		106		%		80-120	22-SEP-10
	b)-Dissolved		104		%		80-120	22-SEP-10
	u)-Dissolved		107		%		80-120	22-SEP-10
Iron (Fe)-E			96		%		80-120	22-SEP-10
Lead (Pb)-			105		%		80-120	22-SEP-10
승규 소설을 통하려면	m (Mg)-Dissolved		107		%		80-120	22-SEP-10
	e (Mn)-Dissolved		104		%		80-120	22-SEP-10
	um (Mo)-Dissolved		115		%		80-120	22-SEP-10
Nickel (Ni)			114		%		80-120	22-SEP-10
	us (P)-Dissolved		97		%		70-130	22-SEP-10
	(K)-Dissolved		106		%		80-120	22-SEP-10
	(Se)-Dissolved		109		%		80-120	22-SEP-10
Silver (Ag)			100		%		80-120	22-SEP-10
State State	la)-Dissolved		108		%		80-120	22-SEP-10
	(Sr)-Dissolved		107		%		80-120	22-SEP-10
	TI)-Dissolved		110		%		80-120	22-SEP-10
The Property of the International Contract of the Contract of the International Contract of the	U)-Dissolved		113		%		80-120	22-SEP-10
	(V)-Dissolved		101		%		80-120	22-SEP-10
Zinc (Zn)-I			105		%		80-120	22-SEP-10
WG117098 Silicon (Si)	6-2 CVS)-Dissolved		106		%		70-130	22-SEP-10
Tin (Sn)-D			92		%		80-120	22-SEP-10
191 million (191	Ti)-Dissolved		108		%		80-120	22-SEP-10
	(W)-Dissolved		93		%		70-130	22-SEP-10
	(Zr)-Dissolved		104		%		80-120	22-SEP-10
WG117098	6.2 MD						and Mental	networking 1973

WG1170986-3 MB



est	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
IET-DIS-FF-WT	Water			VG+CLWU 199		161423-00	2013/052	<u>2010</u> 201185-0707620
Batch R1474								
WG1170986-3 M								
Aluminum (AI)-Diss			<0.010		mg/L		0.01	22-SEP-10
Antimony (Sb)-Diss	olved		<0.0050		mg/L		0.005	22-SEP-10
Arsenic (As)-Dissol	ved		<0.0010		mg/L		0.001	22-SEP-10
Barium (Ba)-Dissolv	ved		<0.010		mg/L		0.01	22-SEP-10
Beryllium (Be)-Diss	olved		<0.0010		mg/L		0.001	22-SEP-10
Bismuth (Bi)-Dissol	ved		<0.0010		mg/L		0.001	22-SEP-10
Boron (B)-Dissolved	t		<0.050		mg/L		0.05	22-SEP-10
Cadmium (Cd)-Diss	solved		<0.00010		mg/L		0.0001	22-SEP-10
Calcium (Ca)-Disso	lved		<0.50		mg/L		0.5	22-SEP-10
Chromium (Cr)-Dise	solved		<0.0010		mg/L		0.001	22-SEP-10
Cobalt (Co)-Dissolv	ed		<0.00050		mg/L		0.0005	22-SEP-10
Copper (Cu)-Dissol	ved		<0.0010		mg/L		0.001	22-SEP-10
Iron (Fe)-Dissolved			<0.050		mg/L		0.05	22-SEP-10
Lead (Pb)-Dissolve	d		<0.0010		mg/L		0.001	22-SEP-10
Magnesium (Mg)-D	issolved		<0.50		mg/L		0.5	22-SEP-10
Manganese (Mn)-D	issolved		<0.0010		mg/L		0.001	22-SEP-10
Molybdenum (Mo)-I	Dissolved		<0.0010		mg/L		0.001	22-SEP-10
Nickel (Ni)-Dissolve	ed		<0.0020		mg/L		0.002	22-SEP-10
Phosphorus (P)-Dis	solved		<0.050		mg/L		0.05	22-SEP-10
Potassium (K)-Diss	olved		<1.0		mg/L		1	22-SEP-10
Selenium (Se)-Diss	olved		<0.0050		mg/L		0.005	22-SEP-10
Silicon (Si)-Dissolve	ed		<1.0		mg/L		1	22-SEP-10
Silver (Ag)-Dissolve	bd		<0.00010		mg/L		0.0001	22-SEP-10
Sodium (Na)-Dissol	ved		<0.50		mg/L		0.5	22-SEP-10
Strontium (Sr)-Diss	olved		<0.0010		mg/L		0.001	22-SEP-10
Thallium (TI)-Dissol	ved		<0.00030		mg/L		0.0003	22-SEP-10
Tin (Sn)-Dissolved			<0.0010		mg/L		0.001	22-SEP-10
Titanium (Ti)-Dissol	lved		<0.0020		mg/L		0.002	22-SEP-10
Tungsten (W)-Disso	olved		<0.010		mg/L		0.01	22-SEP-10
Uranium (U)-Dissol	ved		<0.0050		mg/L		0.005	22-SEP-10
Vanadium (V)-Disso	olved		<0.0010		mg/L		0.001	22-SEP-10
Zinc (Zn)-Dissolved			<0.0030		mg/L		0.003	22-SEP-10
Zirconium (Zr)-Diss	olved		<0.0040		mg/L		0.004	22-SEP-10

S-DIS-WT

Water

17



		Workorder	: L933667	7	Report Date: 2	3-SEP-10	Pa	ge 3 of 4
Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
S-DIS-WT	Water							
Batch R1474	416							
WG1170986-2 CN Sulfur (S)-Dissolved	Contract of Contra		106		%		63-138	22-SEP-10
WG1170986-3 MI Sulfur (S)-Dissolved			<5.0		mg/L		5	22-SEP-10

Workorder: L933667

Report Date: 23-SEP-10

1		
18	Limit	99% Confidence Interval (Laboratory Control Limits)
	DUP	Duplicate
	RPD	Relative Percent Difference
	N/A	Not Available
	LCS	Laboratory Control Sample
	SRM	Standard Reference Material
	MS	Matrix Spike
	MSD	Matrix Spike Duplicate
	ADE	Average Desorption Efficiency
4	MB	Method Blank
	IRM	Internal Reference Material
	CRM	Certified Reference Material
	CCV	Continuing Calibration Verification
	CVS	Calibration Verification Standard
	LCSD	Laboratory Control Sample Duplicate

sample Parameter Qualifier Definitions:

1	Qualifier	Description
Ē	J	Duplicate results and limits are expressed in terms of absolute difference.
	RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Iold Time Exceedances:

egend:

All test results reported with this submission were conducted within ALS recommended hold times.

LS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government equirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against preletermined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

NATERLOD, O Phone: (519) 8	86-6910				(AI	LS)	Note ANTA	T Quoted material is in but mess	day 2 m	nch cred	.dr	Spe	city date req	hored	Servi	ce re	quest	ed	2 day TAT (50%)		
Fax: (519) 886 CANADA TOLI	-9047	4 01	N E	A	19		- Martine Martine I	Sheet She	costays and wardends TAT came		mad pas					5 day 1			12	Next day TAT (100%)	1000	
CANADA TOLL					-	-			Saturday/Sunday begin the nest		1			AMALYSIS REQUEST					Same day TAT (200%) PLEASE INDICATE FILTE	RÉO,		
FFICE	Eco	Me	tr	ix_		+	CRITERIA Reg 153/04	Cuteria c	n recon Yes the		Fp		1			251			Γ	PRESERVED OR BOTH		
ROJECT ALANAGE	A					-		2 3	9										-	SUBMISSION #		
Erin C						- H	280 B		PWCO	(muld)					- 1				1	193366	77	
EYIN C	190-	,	- 44			-					. 9			1						ENTERED BY:		
PROJECT # 10 -		211						ORT FORM	-1.0	3			1 1						MG1			
7051 174-66						-	and the second se		and the second s	÷ER	100		15							DATE/TIME ENTERED		
ELIAIL									THER STRIBUTION SE HAND SE									<u> </u>		21-SEP-	$\langle n \rangle$	
						-		yde Gecometrix ca			SH					-				Gut 4		
Sample Date	PUNG IN	ORA I Y			780			740 0	Ceciomern X. CA		14									6225	·	
Dale (comm-;y)	Time (24 Au) (hhtmm)	COMP	CLAS	WATER	5	OHER	SAMPLE DE	SCRIPTIO	N TO APPEAR ON REPORT	NUMBE	100									COMMENTS	LAB 10	
16-09-10				X			CVPID-	57-6	DAY 2	1	X										-1	
16-09-10				x			CVP10-	ST-C	DAY 2	11	X										-2	
16-09-10				X	T				DAY 2	1	X	1									1-3	
16-09-10				X					T-9 DAY2		X										-4	
					i	i					-										1	
			1		T					T												
			• ••••		Ť	-											-				1	
			-	-	+					-				+	-	-			i -			
					÷									++	-	-			-			
		-	- 1			-				+				- -	-							
		1			4					-	-		_		-			_				
		1_			1		CHITC	T	THE QUESTIONS BELOW	MUST	RE AN	VERED	FOR WAT	ER SAMPLI	15 1	CHECK	Yes.	OR N		SAMPLE COND	TION	
	SPECIAL	INSI	RUC	TIONS	CO	MATE			ve any samples taken fro					Cit Griphi Li			Yes	_	• 🗆	FROZEN C		
									yes, an authorized delnkin		-	Contraction of the second		for this su	hmis		16.5			cao S	18	
									the water sampled inten								Yes [• 0	OCOLHE HITATED	1 1	
SMPLED SY	0			-			CATE & THINE		RECEIVEDAT					DALES	WE /	,	1			ORSERVATIONS	TIMI -	
E	EC 16-01-					DATELTIME		PLOEIVEDALI UNOT			-	-		ALL ALL	a	_	15:		Tes D No C' Il yes add SIF	M		
	aling Cluble 20-09						20-09-	PECEWEDAS LADOR								1						



ECOMETRIX INC ATTN: Erin Clyde 6800 Campobello Road Mississauga ON L5N 2L8 Phone: 905-794-2325

Date Received: 21-SEP-10 Report Date: 23-SEP-10 03:10 (MT) Version: FINAL

Certificate of Analysis

Lab Work Order #: L933657 Project P.O. #: Job Reference: Legal Site Desc: C of C Numbers:

NOT SUBMITTED 10-1753

98060

Samples analyzed using lowest possible dilution. EP/MS Comments:

man lene ¥ renion

Emerson Perez Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 5730 Coopers Avenue, Unit #26 , Mississauga, ON L4Z 2E9 Canada | Phone: +1 905 507 6910 | Fax: +1 905 507 6927 ALS CANADA LIMITED Part of the ALS Group A Campbell Brothers Limited Company

www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNER

PAGE 2 of 3 23-SEP-10 03:10 (MT)

ALS LABORATORY GROUP ANALYTICAL REPORT

	Sample ID Description Sampled Date Sampled Time Client ID	L933657-1 WATER 17-SEP-10 CVP10-ST-6 DAY 3	L933657-2 WATER 17-SEP-10 CVP10-ST-C DAY 3	L933657-3 WATER 17-SEP-10 CVP10-ST-8 DAY 3	L933657-4 WATER 17-SEP-10 CVP10-ST-9 DAY 3	
Grouping	Analyte					
WATER Dissolved Metals	Aluminum (AI)-Dissolved (mg/L)	DLM	DLM	DLM		
Dissoluted metals	Antimony (Sb)-Dissolved (mg/L)	<0.10	<0.10 DLM	<0.10	0.023	
	Arsenic (As)-Dissolved (mg/L)	<0.050	<0.050 DLM	<0.050	<0.0050	
	Barium (Ba)-Dissolved (mg/L)	<0.010	<0.010 DLM	<0.010	<0.0010	
	Beryllium (Be)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.010	
	Bismuth (Bi)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.0010	
	Boron (B)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.0010	
	Cadmium (Cd)-Dissolved (mg/L)	<0.50 DLM	<0.50 DLM	<0.50 DLM	<0.050	
	Calcium (Ca)-Dissolved (mg/L)	0.0022	<0.0010	<0.0010	<0.00010	
	Chromium (Cr)-Dissolved (mg/L)	343 DLM	294 DLM	288 DLM	276	
	Cobalt (Co)-Dissolved (mg/L)	<0.010 DLM	<0.010 DLM	<0.010 DLM	<0.0010	
	Copper (Cu)-Dissolved (mg/L)	0.0562 DLM	0.0292 DLM	0.0215 DLM	0.00059	
	Iron (Fe)-Dissolved (mg/L)	<0.010 DLM	<0.010 DLM	<0.010 DLM	0.0013	
	Lead (Pb)-Dissolved (mg/L)	<0.50 DLM	<0.50 DLM	<0.50 DLM	<0.050	
	Magnesium (Mg)-Dissolved (mg/L)	<0.010 DLM	<0.010 DLM	<0.010 DLM	<0.0010 DLM	
	Manganese (Mn)-Dissolved (mg/L)	239 DLM	248 DLM	236 DLM	20.3	
	Molybdenum (Mo)-Dissolved (mg/L)	21.1 DLM	13.6 DLM	10.2 DLM	1.21	
		<0.010 DLM	<0.010	<0.010 _{DLM}	0.0039	
	Nickel (Ni)-Dissolved (mg/L)	0.059 DLM	0.032 DLM	0.026 DLM	0.0052	
	Phosphorus (P)-Dissolved (mg/L) Potassium (K)-Dissolved (mg/L)	<0.50 DLM	<0.50 DLM	<0.50 DLM	<0.050	
	St. Physical Science of the state of the second state of the se	<10 DLM	<10 DLM	<10 DLM	6.1	
	Selenium (Se)-Dissolved (mg/L)	<0.050 DLM	<0.050 DLM	<0.050 DLM	<0.0050	
	Silicon (Si)-Dissolved (mg/L)	<10 DLM	<10 DLM	<10 DLM	2.5	
	Silver (Ag)-Dissolved (mg/L)	<0.0010 DLM	<0.0010 DLM	<0.0010 DLM	<0.00010	
	Sodium (Na)-Dissolved (mg/L)	32.6 DLM	34.0 DLM	31.8 DLM	27.8	
	Strontium (Sr)-Dissolved (mg/L)	0.928 DLM	0.843 DLM	0.796 DLM	0.740	
	Sulfur (S)-Dissolved (mg/L)	607 DLM	617 DLM	588 DLM	507	
	Thallium (TI)-Dissolved (mg/L)	<0.0030 DLM	<0.0030 DLM	<0.0030 DLM	0.00048	
	Tin (Sn)-Dissolved (mg/L)	<0.010 DLM	<0.010 DLM	<0.010 DLM	<0.0010	
	Titanium (Ti)-Dissolved (mg/L)	0.024 DLM	0.024 DLM	0.023 DLM	0.0224	
	Tungsten (W)-Dissolved (mg/L)	<0.10 DLM	<0.10 DLM	<0.10 DLM	<0.010	
	Uranium (U)-Dissolved (mg/L)	<0.050 DLM	<0.050 DLM	<0.050 DLM	<0.0050	
	Vanadium (V)-Dissolved (mg/L)	<0.010 DLM	<0.010 DLM	<0.010 DLM	<0.0010	
	Zinc (Zn)-Dissolved (mg/L)	3.19 DLM	0.224 DLM	0.055 DLM	<0.0030	
	Zirconium (Zr)-Dissolved (mg/L)	<0.040	<0.040	<0.040	<0.0040	

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

e for Individual Parameters Listed

Qualifiers for	Individual Parameters	Listed:		
Qualifier	Description			
DLM	Detection Limit Adjus	ted For Sample Matrix Effects		
est Method F		Test Description	Method Reference**	
			EPA 200.8	
wET-DIS-FF-W	T Water Water	Metal Scan-Dissolved Sulfur (S) - Dissolved	EPA 200.8	
0-010-111	446161	ound (o) - Dissolved		

LS test methods may incorporate modifications from specified reference methods to improve performance.

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 Location
ALS LABORATORY GROUP - WATERLOO, ONTARIO, CANADA

98060

GLOSSARY OF REPORT TERMS

urrogate A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For oplicable tests, surrogates are added to samples prior to analysis as a check on recovery.

mg/kg milligrams per kilogram based on dry weight of sample.

mg/kg wwt milligrams per kilogram based on wet weight of sample.

g/kg lwt milligrams per kilogram based on lipid-adjusted weight of sample.

g/L milligrams per litre.

-- Less than.

D.L. The reported Detection Limit, also known as the Limit of Reporting (LOR).

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

est results reported relate only to the samples as receieved by the laboratory.

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

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Workorder: L933657

Report Date: 23-SEP-10

Page 1 of 4

Client:	ECOMETRIX INC 6800 Campobello Roa Mississauga ON L5N								
Contact:	Erin Clyde								
est	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed	
MET-DIS-FF-V	NT Water								
Batch	R1474416								
WG117098									
	(AI)-Dissolved		98		%		80-120	22-SEP-10	
	(Sb)-Dissolved		102		%		80-120	22-SEP-10	
	s)-Dissolved		102		%		80-120	22-SEP-10	
	a)-Dissolved		102		%		80-120	22-SEP-10	
	(Be)-Dissolved		109		%		80-120	22-SEP-10	
Bismuth (E	3i)-Dissolved		104		%		80-120	22-SEP-10	
Boron (B)-	Dissolved		111		%		70-130	22-SEP-10	
Cadmium	(Cd)-Dissolved		107		%		80-120	22-SEP-10	
Calcium (C	Ca)-Dissolved		109		%		80-120	22-SEP-10	
Chromium	(Cr)-Dissolved		106		%		80-120	22-SEP-10	
Cobalt (Co)-Dissolved		104		%		80-120	22-SEP-10	
Copper (C	u)-Dissolved		107		%		80-120	22-SEP-10	
Iron (Fe)-D	Dissolved		96		%		80-120	22-SEP-10	
Lead (Pb)-	Dissolved		105		%		80-120	22-SEP-10	
Magnesiur	m (Mg)-Dissolved	a 194	107		%		80-120	22-SEP-10	
Manganes	e (Mn)-Dissolved		104		%		80-120	22-SEP-10	
Molybdenu	um (Mo)-Dissolved		115		%		80-120	22-SEP-10	
Nickel (Ni)	-Dissolved		114		%		80-120	22-SEP-10	
Phosphoru	us (P)-Dissolved		97		%		70-130	22-SEP-10	
Potassium	(K)-Dissolved		106		%		80-120	22-SEP-10	
Selenium ((Se)-Dissolved		109		%		80-120	22-SEP-10	
Silver (Ag)	-Dissolved		100		%		80-120	22-SEP-10	
Sodium (N	a)-Dissolved		108		%		80-120	22-SEP-10	
Strontium	(Sr)-Dissolved		107		%		80-120	22-SEP-10	
Thallium (1	TI)-Dissolved		110		%		80-120	22-SEP-10	
Uranium (l	U)-Dissolved		113		%		80-120	22-SEP-10	
1	(V)-Dissolved		101		%		80-120	22-SEP-10	
Zinc (Zn)-E	Dissolved		105		%		80-120	22-SEP-10	
WG117098	6-2 CVS								
)-Dissolved		106		%		70-130	22-SEP-10	
Tin (Sn)-Di			92		%		80-120	22-SEP-10	
and the second second	Ti)-Dissolved		108		%		80-120	22-SEP-10	
15	(W)-Dissolved		93		%		70-130	22-SEP-10	
Zirconium	(Zr)-Dissolved		104		%		80-120	22-SEP-10	



Workorder: L933657 Report Date: 23-SEP-10 Page 2 of 4 RPD Test Matrix Result Qualifier Units Limit Analyzed Reference MET-DIS-FF-WT Water Batch R1474416 WG1170986-3 MB Aluminum (AI)-Dissolved < 0.010 mg/L 0.01 22-SEP-10 Antimony (Sb)-Dissolved < 0.0050 mg/L 0.005 22-SEP-10 < 0.0010 Arsenic (As)-Dissolved mg/L 0.001 22-SEP-10 Barium (Ba)-Dissolved < 0.010 mg/L 0.01 22-SEP-10 Beryllium (Be)-Dissolved < 0.0010 mg/L 0.001 22-SEP-10 **Bismuth (Bi)-Dissolved** < 0.0010 mg/L 0.001 22-SEP-10 Boron (B)-Dissolved < 0.050 mg/L 0.05 22-SEP-10 Cadmium (Cd)-Dissolved < 0.00010 0.0001 mg/L 22-SEP-10 Calcium (Ca)-Dissolved <0.50 mg/L 0.5 22-SEP-10 Chromium (Cr)-Dissolved < 0.0010 mg/L 0.001 22-SEP-10 Cobalt (Co)-Dissolved <0.00050 mg/L 0.0005 22-SEP-10 Copper (Cu)-Dissolved < 0.0010 mg/L 0.001 22-SEP-10 Iron (Fe)-Dissolved < 0.050 mg/L 0.05 22-SEP-10 Lead (Pb)-Dissolved < 0.0010 mg/L 0.001 22-SEP-10 Magnesium (Mg)-Dissolved <0.50 mg/L 0.5 22-SEP-10 Manganese (Mn)-Dissolved < 0.0010 mg/L 0.001 22-SEP-10 Molybdenum (Mo)-Dissolved < 0.0010 mg/L 0.001 22-SEP-10 Nickel (Ni)-Dissolved < 0.0020 mg/L 0.002 22-SEP-10 Phosphorus (P)-Dissolved < 0.050 mg/L 0.05 22-SEP-10 Potassium (K)-Dissolved <1.0 mg/L 1 22-SEP-10 <0.0050 Selenium (Se)-Dissolved mg/L 0.005 22-SEP-10 <1.0 Silicon (Si)-Dissolved mg/L 1 22-SEP-10 Silver (Ag)-Dissolved < 0.00010 mg/L 0.0001 22-SEP-10 Sodium (Na)-Dissolved <0.50 mg/L 0.5 22-SEP-10 Strontium (Sr)-Dissolved < 0.0010 mg/L 0.001 22-SEP-10 Thallium (TI)-Dissolved < 0.00030 mg/L 0.0003 22-SEP-10 Tin (Sn)-Dissolved < 0.0010 mg/L 0.001 22-SEP-10 Titanium (Ti)-Dissolved < 0.0020 mg/L 0.002 22-SEP-10 Tungsten (W)-Dissolved < 0.010 mg/L 0.01 22-SEP-10 Uranium (U)-Dissolved < 0.0050 mg/L 0.005 22-SEP-10 Vanadium (V)-Dissolved < 0.0010 mg/L 0.001 22-SEP-10 Zinc (Zn)-Dissolved < 0.0030 mg/L 0.003 22-SEP-10 Zirconium (Zr)-Dissolved < 0.0040 mg/L 0.004 22-SEP-10

Quality Control Report

S-DIS-WT

Water

Fl



		Workorder	: L933657	7	Report Date: 2	3-SEP-10	Pa	ige 3 of 4
Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
S-DIS-WT	Water							
Batch R147441 WG1170986-2 CVS	6		17272					
Sulfur (S)-Dissolved			106		%		63-138	22-SEP-10
WG1170986-3 MB Sulfur (S)-Dissolved			<5.0		mg/L		5	22-SEP-10

Workorder: L933657

Report Date: 23-SEP-10

Limit	99% Confidence Interval (Laboratory Control Limits)	
DUP	Duplicate	
RPD	Relative Percent Difference	
V/A	Not Available	
CS	Laboratory Control Sample	
SRM	Standard Reference Material	
4S	Matrix Spike	
/ISD	Matrix Spike Duplicate	
DE	Average Desorption Efficiency	
в	Method Blank	
RM	Internal Reference Material	
CRM	Certified Reference Material	
CCV	Continuing Calibration Verification	
VS	Calibration Verification Standard	
CSD	Laboratory Control Sample Duplicate	

Jample Parameter Qualifier Definitions:

	Qualifier	Description
r i	J	Duplicate results and limits are expressed in terms of absolute difference.
	RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

fold Time Exceedances:

nond

All test results reported with this submission were conducted within ALS recommended hold times.

λLS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government equirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against preletermined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

1	WATERLOO, O Phone: (519) 8	86-6910				(AL	-5)	HORE: SAL TA	AT QUON	d material a	in buniness o	-	ich me	NOT	See	city date r	covided	Serv	ice re	quest	ed	2 day TAT (50%)	
	Fax: (519) 686				م	1.5 8		anymental	Celutory I.	ridirs a	nd meeten	te TAT Lumph		wed pur	\$		5 day (Regular)						Next day TAT (100%)	1
	CANADA TOLL	*				78			100 pan or	Saturday	r/Sunday De	gin the next o	tag.				3-4 Gay TAT (25%)				X	Same day TAT (200%)		
ł	OMPANY MAKE	Ecol	let	à	x		+	CRITERIA	Cidena	on repor	I Yes ()	Ne	-	=1	<u> </u>	- 1-	ANALYSIS	REOU	EST	r		-	PLEASE INDICATE FILTE	HED,
ĺ				_			_	Reg 153/04					1	F/P	P					-		1_	(F, P, F/P)	and the second second
	HOUNCE LIANAGE						1	Table 1 2	LP MISA PWOO WYS OTHER										(1			SUBMISSION #	1
	Erin Ci	you	2				_							15	1 1								L93369	>+
	PROJECT /D-	175:	3				-							5					1	8 8			ENTERED BY:	
	GOC)754-2325 FAX BI								REPORT FORMAT / DISTRIBUTION					1 Ba							MOL			
								FAX BOTH				TAIN	Hetals							21-SEP	-10			
	NOTATION		POT						ectyde @ Ecometrix. Ca_									{		5 8			Part of	
	Sample Date	Time	TYP	_	-	TRIX	_	EMAILI ECU	pee	Levelometrix.Ca_			1011	SH									BINS B22	5
1	Date (dd-mm-yy)	Jime (24 h/) (24 mm)	COMP	BARD	MATER	SOR	OTHER	SAMPLE DES	SCRIPTIC	IN TO A	PPEAR ON	REPORT	NUWBERI OF CONTAINERS	100-									COMMENTS	LASIC
	17-09-10			Ľ	x			CVP10-	ST-	67	Jary 3	3	1	X										-1
	17-09-10				X		k	CUPIO - :	ST-C	c ī	June .	3	1	X										-2
Enronorte	17-09-10		T		x	T	_	CUPIO-					1	×										-3
	7-09-10			-	X			CUPIO- S					L	X										-4
				+	+	+	+						+	<u> </u>		+								
				+	+	+	1						\vdash									1	-	-
											-													
			\square	-	-	+	-						-				-					-		
				-	-	+	-						-				-	-						
							1																	
		SPECIAL	INSTR	UCT	IONS	CON	IME	NTS				NS BELOW			NIT CONTRACTOR		ER SAM	LES	CHEC	-			SAMPLE COND	NEAN 15
										. /70	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	taken fret					forthic	cub min	rine	Yes			0010	2.
										AND DECEMBER OF		zed drinkin pled intens								Yes (• 🗆	000000 miture	1 1.0
	SAUPLED BY			• • •			1	DATESTINE	•••••	1	AECENED	x/	ð	10			OATE .	TANK	1.	1			ANSIENT	I NNIT
	RELINCUSSION D					D-09-10 DAIEL IME 20-09-10			RECERSO	A Cont	-	1	R		ades	<i>द्</i> सि,	10	210	1.2	0	Yes and Sir	m		
	NOTES AND C	mber mu	NS U Le p	ovid	ed 10	ensu	re		ay valy d			leany of anal		nd lab	vorklead								relating to a sample stody in comments section	



ECOMETRIX INC ATTN: ERIN CLYDE 6000 Campobello Road Mississauga ON L5N 2L8 Phone: 905-794-2325 Date Received: 23-SEP-10 Report Date: 07-OCT-10 17:24 (MT) Version: FINAL

Certificate of Analysis

Lab Work Order #: L935026 Project P.O. #: NOT SUBMITTED Job Reference: 10-1753 Legal Site Desc: C of C Numbers: 98061

nenson Uman lene 7.

Emerson Perez Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 5730 Coopers Avenue, Unit #26 , Mississauga, ON L4Z 2E9 Canada | Phone: +1 905 507 6910 | Fax: +1 905 507 6927 ALS CANADA LIMITED Part of the ALS Group A Campbell Brothers Limited Company

www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNER

L935026 CONTD.... PAGE 2 of 3 07-OCT-10 17:24 (MT)

ALS LABORATORY GROUP ANALYTICAL REPORT

	Sample ID Description Sampled Date Sampled Time Client ID	L935026-1 WATER 20-SEP-10 CVP10-ST-6 DAY 6	L935026-2 WATER 20-SEP-10 CVP10-ST-C DAY 6	L935026-3 WATER 20-SEP-10 CVP10-ST-8 DAY 6	L935026-4 WATER 20-SEP-10 CVP10-ST-9 DAY 6	L935026-5 WATER 20-SEP-10 CVP10-ST-PW DAY 6
Grouping	Analyte					
Grouping WATER Dissolved Metals	Aluminum (Al)-Dissolved (mg/L) Antimony (Sb)-Dissolved (mg/L) Barium (Ba)-Dissolved (mg/L) Barium (Ba)-Dissolved (mg/L) Beryllium (Be)-Dissolved (mg/L) Bismuth (Bl)-Dissolved (mg/L) Boron (B)-Dissolved (mg/L) Cadmium (Cd)-Dissolved (mg/L) Calcium (Ca)-Dissolved (mg/L) Cobalt (Co)-Dissolved (mg/L) Cobalt (Co)-Dissolved (mg/L) Copper (Cu)-Dissolved (mg/L) Lead (Pb)-Dissolved (mg/L) Lead (Pb)-Dissolved (mg/L) Magnesium (Mg)-Dissolved (mg/L) Magnesium (Mg)-Dissolved (mg/L) Molybdenum (Mo)-Dissolved (mg/L) Nickel (Ni)-Dissolved (mg/L) Phosphorus (P)-Dissolved (mg/L) Selenium (Se)-Dissolved (mg/L) Silver (Ag)-Dissolved (mg/L) Silver (Ag)-Dissolved (mg/L) Sulfur (S)-Dissolved (mg/L) Sulfur (S)-Dissolved (mg/L) Sulfur (Ti)-Dissolved (mg/L) Thallium (Ti)-Dissolved (mg/L) Titanium (Ti)-Dissolved (mg/L)	 <0.015 DLM <0.00050 <0.00050 0.0153 DLM <0.0025 <0.0025 <0.0025 <0.00101 278 DLM <0.0025 <0.00050 <0.0025 <0.00298 <0.015 <0.00298 <0.025 <0.00298 <0.0011 <1.5 <0.00298 <0.0011 <1.5 <0.00298 <0.0011 <1.5 <0.00298 <0.00150 <0.00150 <0.00050 <	0.029 <0.00050 0.0111 <0.0025 <0.0025 <0.00050 227 0.00050 227 0.00050 0.0139 <0.00050 0.0139 <0.0025 229 5.00 0.0025 229 5.00 0.00394 0.0269 0.00394 0.0269 0.00394 0.0269 0.00394 0.0269 0.00394 0.0269 0.00394 0.0269 0.00394 0.00050 1.93 0.00 28.0 0.677 547 0.00055 <0.00050 0.0055 0.00050 0.0055 0.00050 0.0055 0.00050 0.0055 0.00050 0.0055 0.0050 0.0055	0.024 <0.00050 0.0121 0.0025 0.0025 0.0025 0.00050 238 0.00050 0.0147 0.00050 0.0147 0.0025 230 5.06 0.00425 0.0161 0.00425 0.0161 0.00425 0.0161 0.00425 0.0161 0.00425 0.0161 0.00425 0.0161 230 5.06 0.00425 0.00161 0.00425 0.0161 2.10 0.00050 2.10 0.00050 2.10 0.00050 2.10 0.00050 2.10 0.0005	0,024 <0.00050 0.00871 <0.0025 CLM <0.0025 CLM <0.0025 CLM <0.00050 225 CLM <0.00050 0.00209 CLM <0.0025 CLM <0.0025 CLM <0.0025 CLM <0.0025 CLM <0.0025 CLM <0.0025 CLM <0.0025 CLM <0.0025 CLM <0.0025 CLM <0.0025 CLM <0.0025 CLM <0.0025 CLM <0.0025 CLM <0.0025 CLM <0.0025 CLM <0.0025 CLM <0.0025 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.00050 CLM <0.	0.556 0.00181 <0.00050 0.0127 <0.0025 <0.0025 0.000434 321 <0.00050 0.104 0.0025 185 31.5 0.00541 0.102 185 31.5 0.00541 0.102 185 31.5 0.00541 0.102 0.102 0.00050 3.91 <0.00050 3.91 <0.00050 29.2 0.939 554 <0.00050 0.0005
	Vanadium (V)-Dissolved (mg/L) Zinc (Zn)-Dissolved (mg/L)	0.00222 DLM <0.0050 0.868	0.00599 DLM <0.0050 0.023	0.00549 DLM <0.0050 0.015	0.00321 DLM <0.0050 DLM <0.015	0.0132 <0.0050 1.24

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

PAGE 3 of 3 07-OCT-10 17:24 (MT)

Qualifier	Description			
DLM	Detection Lin	nit Adjust	ed For Sample Matrix Effects	
st Method	References:			
LS Test Co	de l	Matrix	Test Description	Method Reference**
ET-D-CCMS	5-VA V	Vater	Dissolved Metals in Water by CRC ICPMS	APHA 3030 B&E / EPA SW-846 6020A
American Pu States Envir	ublic Health Assoc onmental Protecti	ciation, an	nd with procedures adapted from "Test Methods for cy (EPA). The procedures may involve preliminary	mination of Water and Wastewater" published by the Evaluating Solid Waste" SW-846 published by the United sample treatment by acid digestion, using hotblock, or asma - mass spectrometry (modifed from EPA Method
DIS-ICP-VA	x V	Vater	Dissolved Sulfur in Water by ICPOES	EPA SW-846 3005A/6010B
	이 방법들은 것 같아요. 것 같아요. 그 것 같아요. 것 같아요. 것 같아요. 것 같아요. 것	 Antipage and the second se second second sec		e a chevro a protoco de la constanta de la constanta de la distancia contra constanta del bacco del desta del consta
American Po States Envir microwave o Method 6010	ublic Health Assoc onmental Protecti oven, or filtration (0B).	ciation, an ion Agend EPA Met	nd with procedures adapted from "Test Methods for by (EPA). The procedures may involve preliminary hod 3005A). Instrumental analysis is by inductively	coupled plasma - optical emission spectrophotometry (EPA
American Pu States Envir microwave c Method 6010 Method Limi submitted sa	ublic Health Assoc onmental Protecti oven, or filtration (0B). itation: This meth amples, is often lo	ciation, an ion Agend EPA Meth nod will no ost during	nd with procedures adapted from "Test Methods for by (EPA). The procedures may involve preliminary hod 3005A). Instrumental analysis is by inductively of give total sulphur results for all samples. Sulphid	Evaluating Solid Waste" SW-846 published by the United sample treatment by acid digestion, using either hotblock or
American Po States Envir microwave o Method 6010 Method Limi submitted sa represents a	ublic Health Associonmental Protectionen, or filtration (oven, or filtration (ob). itation: This methamples, is often lo all non-volatile forr	ciation, ai ion Agend EPA Meth nod will no ost during ms of sult	nd with procedures adapted from "Test Methods for by (EPA). The procedures may involve preliminary hod 3005A). Instrumental analysis is by inductively of give total sulphur results for all samples. Sulphid the sampling, preservation and analysis process.	Evaluating Solid Waste" SW-846 published by the United sample treatment by acid digestion, using either hotblock or coupled plasma - optical emission spectrophotometry (EPA e or other volatile forms of sulphur that may be present in The data reported as total and/or dissolved sulphur
American Po States Envir microwave o Method 6010 Method Limi submitted sa represents a ALS test me	ublic Health Assoc onmental Protection oven, or filtration (0B). (tation: This meth amples, is often lo all non-volatile forr thods may incorpo	ciation, ai ion Agend EPA Meti nod will no ost during ms of sulp orate mod	nd with procedures adapted from "Test Methods for cy (EPA). The procedures may involve preliminary hod 3005A). Instrumental analysis is by inductively of give total sulphur results for all samples. Sulphid the sampling, preservation and analysis process. ohur present in a particular sample.	Evaluating Solid Waste" SW-846 published by the United sample treatment by acid digestion, using either hotblock or coupled plasma - optical emission spectrophotometry (EPA e or other volatile forms of sulphur that may be present in The data reported as total and/or dissolved sulphur rove performance.
American Po States Envir microwave o Method 6010 Method Limi submitted sa represents a ALS test me he last two li	ublic Health Assoc onmental Protection oven, or filtration (0B). (tation: This meth amples, is often lo all non-volatile forr thods may incorpo	ciation, and ion Agend EPA Meth nod will no ost during ms of sulf orate mod re test cod	nd with procedures adapted from "Test Methods for cy (EPA). The procedures may involve preliminary hod 3005A). Instrumental analysis is by inductively of give total sulphur results for all samples. Sulphid the sampling, preservation and analysis process. ohur present in a particular sample. difications from specified reference methods to imp	Evaluating Solid Waste" SW-846 published by the United sample treatment by acid digestion, using either hotblock or coupled plasma - optical emission spectrophotometry (EPA e or other volatile forms of sulphur that may be present in The data reported as total and/or dissolved sulphur rove performance.
American Pro States Envir nicrowave of Method 6010 Method Limi submitted sa represents a ALS test me ne last two l aboratory D	ublic Health Associonmental Protectionen, or filtration (DB). Itation: This methamples, is often lo all non-volatile forr thods may incorpo- etters of the above	ciation, an ion Agend EPA Meth nod will no ost during ms of sulp orate mod re test coor Labor	nd with procedures adapted from "Test Methods for cy (EPA). The procedures may involve preliminary hod 3005A). Instrumental analysis is by inductively of give total sulphur results for all samples. Sulphid the sampling, preservation and analysis process, obur present in a particular sample. difications from specified reference methods to imp fe(s) indicate the laboratory that performed analytic	Evaluating Solid Waste" SW-846 published by the United sample treatment by acid digestion, using either hotblock or coupled plasma - optical emission spectrophotometry (EPA e or other volatile forms of sulphur that may be present in The data reported as total and/or dissolved sulphur rove performance.
American Pro States Envir microwave of Method 6010 Method Limi submitted sa represents a ALS test me he last two li aboratory D A	ublic Health Associonmental Protectionen, or filtration (DB). Itation: This methamples, is often lo all non-volatile forr thods may incorpo- etters of the above	ciation, an ion Agend EPA Meth nod will no ost during ms of sulp orate mod re test coor Labor	nd with procedures adapted from "Test Methods for cy (EPA). The procedures may involve preliminary hod 3005A). Instrumental analysis is by inductively at give total sulphur results for all samples. Sulphid the sampling, preservation and analysis process. ohur present in a particular sample. difications from specified reference methods to imp de(s) indicate the laboratory that performed analytic atory Location	Evaluating Solid Waste" SW-846 published by the United sample treatment by acid digestion, using either hotblock or coupled plasma - optical emission spectrophotometry (EPA e or other volatile forms of sulphur that may be present in The data reported as total and/or dissolved sulphur rove performance.

LOSSARY OF REPORT TERMS

Jurrogate A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. mg/kg milligrams per kilogram based on dry weight of sample.

- ng/kg wwt milligrams per kilogram based on wet weight of sample.
- ng/kg lwt milligrams per kilogram based on lipid-adjusted weight of sample.

mg/L milligrams per litre.

< - Less than.

1.L. The reported Detection Limit, also known as the Limit of Reporting (LOR).

VA Result not available. Refer to qualifier code and definition for explanation.

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

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

nalytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Client: Contact:	ECOMETRIX INC 6000 Campobello Road Mississauga ON L5N 2L ERIN CLYDE	8						
est	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
IET-D-CCMS-	/A Water							
Batch	R1480945							
WG1172989 Aluminum (/			<0.0010		mg/L		0.001	27-SEP-10
	b)-Dissolved		<0.00010		mg/L		0.0001	27-SEP-10
Arsenic (As)			<0.00010		mg/L		0.0001	27-SEP-10
Barium (Ba)			<0.000050	i i	mg/L		0.00005	27-SEP-10
	e)-Dissolved		<0.00050		mg/L		0.0005	27-SEP-10
Bismuth (Bi)	NOT THE CONTRACT OF A DECEMBER OF A DECEMBER OF A		<0.00050		mg/L		0.0005	27-SEP-10
Boron (B)-D	issolved		<0.010		mg/L		0.01	27-SEP-10
Cadmium (C	d)-Dissolved		<0.000010	1	mg/L		0.00001	27-SEP-10
Calcium (Ca	a)-Dissolved		<0.020		mg/L		0.02	27-SEP-10
Chromium (Cr)-Dissolved		<0.00010		mg/L		0.0001	27-SEP-10
Cobalt (Co)-	Dissolved		<0.00010		mg/L		0.0001	27-SEP-10
Copper (Cu))-Dissolved		<0.00010		mg/L		0.0001	27-SEP-10
Iron (Fe)-Dis	ssolved		<0.030		mg/L		0.03	27-SEP-10
Lead (Pb)-D	issolved		<0.000050		mg/L		0.00005	27-SEP-10
Lithium (Li)-	Dissolved		<0.0050		mg/L		0.005	27-SEP-10
Magnesium	(Mg)-Dissolved		<0.0050		mg/L		0.005	27-SEP-10
Manganese	(Mn)-Dissolved		<0.000050	Ì	mg/L		0.00005	27-SEP-10
Molybdenum	n (Mo)-Dissolved		<0.000050		mg/L		0.00005	27-SEP-10
Nickel (Ni)-E	Dissolved		<0.00050		mg/L		0.0005	27-SEP-10
Phosphorus	(P)-Dissolved		<0.30		mg/L		0.3	27-SEP-10
Potassium (K)-Dissolved		<0.050		mg/L		0.05	27-SEP-10
Selenium (S	e)-Dissolved		<0.00010		mg/L		0.0001	27-SEP-10
Silicon (Si)-[Dissolved		<0.050		mg/L		0.05	27-SEP-10
Silver (Ag)-D	Dissolved		<0.000010		mg/L		0.00001	27-SEP-10
Sodium (Na)	a faith a start		<0.050		mg/L		0.05	27-SEP-10
Strontium (S			<0.00010		mg/L		0.0001	27-SEP-10
Thallium (TI)	non Grinnen Sammersen		<0.00010		mg/L		0.0001	27-SEP-10
Tin (Sn)-Dis			<0.00010		mg/L		0.0001	27-SEP-10
Titanium (Ti			<0.010		mg/L		0.01	27-SEP-10
Uranium (U)			<0.000010	i -	mg/L		0.00001	27-SEP-10
Vanadium ()	/)-Dissolved		< 0.0010		mg/L		0.001	27-SEP-10

S-DIS-ICP-VA

Water

1465



1

		Workorder:	L935026		Report Date:	07-OCT-10	Pa	age 2 of 3
Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
S-DIS-ICP-VA Batch R1480883 WG1172989-1 MB Sulfur (S)-Dissolved	Water		<0.50		mg/L		0.5	27-SEP-10
WG1172989-5 MB Sulfur (S)-Dissolved			<0.50		mg/L		0.5	27-SEP-10

Workorder: L935026

Report Date: 07-OCT-10

Legend:

Limit	99% Confidence Interval (Laboratory Control Limits)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
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

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

		에 뜨겁니다. 요즘 뜨겁니	cur 052061
60 NORTHLAND ROAD, UNIT 1	CHAIN OF CUSTODY / ANA	LYTICAL SERVICES REQUEST FORM	PAGE / OF /
WATERLOO, ON N2V 288 Phone: (519) 886-6910		- Convice restorted	E
Fax: (519) 886-9047	Note: all TAT Oroled material is in business days which evolutie statutory bolidays and weekends. TAT samples received past	Specify date required / Service requested	2 day IM (50 -) Next day IM (1095)
CANADA TOLL FREE: 1-800-668-9878	3.00 pm or Saturday/Sunday begin the next day.	[J-1 day 147 (25 .)]	Same any TAT (200 -4
COMPANY NAME ECOMetrix CRITE	RIA Cr4eta on report 10577 No[1]	ANALYSIS REQUEST	PLEASE INDICATE FILTERED, PRESERVED OR BOTH
OFFICE Bog 153 (Fp		(F. P. F/P)
PROJECT MANAGER	2 3		508/118510// =
Erin Clycle			L935026
PROJECT # 10-1753 OIWS	OTHEN		ENTERED BY.
(905) 794 2325 FAX	Sector and the sector		WBQ
	X FAX HOTH		DATE TING ENTERED.
OUDIATION# PO* SELECT			23-3EP-10
SAMPLING INFORMATION EMAIL1	eclyde@ecometrix.ca. 253		BIN #2797
Sumple Date Time TYPE MATRIX EMAIL2	Part		D281
Date 10me a g d g SAMP (dd-mm-yy) (dh-mm) 2 3 3 3 3 3 3 3			COMMENTS LABID
20-09-10 X CUP	10-ST-6 DAY6 1X		
20-09-10 X CUPI	U-ST-C DAY6 1 X		1-2
	0-ST-8 DAY6 1 X		
	0-ST-9_ DAY_61_X		
	U-ST-PW DAYG 1X		1
			1
			<u> </u>
			f
	· _, _, _	i -i -: -i -: -i -i - i -	· · · · · · · · · · · · · · · · · · ·
SPECIAL INSTRUCTIONS/COMMENTS	THE OLIESTIONS BELOW MUST BE ANEWED	ED FOR WATER SAMPLES (CHECK Yes OR No)	SAMPLE CONDITION
Samples contain elevated 2	Are any samples taken from a regulated DW		
contrain elevance 2	If yes, an authorized drinking water COC MUS		cau init
	is the water sampled intended to be potable	J	
1	at Through (har fe I	
	09-10	Sept 23/10 12:50	Vics () 1. If yes add Sil
_ cun Clyple 23-	09-10	- 25 3910 15:00	!/
NOTES AND CONDITIONS: 1. Quote number must be provided to ensure proper pricing.	TAT may vary dependent on comparish of analysis and lab workloa at tage of submission. Please control the lab to contine TATs	d 3 Any known or suspected bazard must be noted on the clean of cu	- relating to a sample relady in continents section
White - Report copy	YELLOW - File copy	PINK - Customer copy	D 000 D



ECOMETRIX INC ATTN: ERIN CLYDE 6000 Campobello Road Mississauga ON L5N 2L8 Phone: 905-794-2325 Date Received: 23-SEP-10 Report Date: 08-OCT-10 01:38 (MT) Version: FINAL

Certificate of Analysis

Lab Work Order #: L935060

Project P.O. #: Job Reference: Legal Site Desc: C of C Numbers: NOT SUBMITTED 10-1753

bers: 98062

menson Uman Tene 1

Emerson Perez Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS; 5730 Coopers Avenue, Unit #26 , Mississauga, ON L4Z 2E9 Canada | Phone: +1 905 507 6910 | Fax: +1 905 507 6927 ALS CANADA LIMITED Part of the ALS Group A Campbell Brothers Limited Company

and the content of the t

www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNER

PAGE 2 of 3 08-OCT-10 01:38 (MT)

ALS LABORATORY GROUP ANALYTICAL REPORT

	Sample ID Description Sampled Date Sampled Time Client ID	L935060-1 WATER 21-SEP-10 CVP10-ST-6 DAY 7	L935060-2 WATER 21-SEP-10 CVP10-ST-C DAY 7	L935060-3 WATER 21-SEP-10 CVP10-ST-8 DAY 7	L935060-4 WATER 21-SEP-10 CVP10-ST-9 DAY 7	i.
Grouping	Analyte					
WATER	- Indijo	a i sa waki i	8 c			
Dissolved Metals	Aluminum (AI)-Dissolved (mg/L)	0.150	0.266	0.055	0.684	
seconstan de l'altra	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	0.00055	
	Arsenic (As)-Dissolved (mg/L)	<0.00050	<0.00050 <0.00050	<0.00050 0LM <0.00050	<0.00050	
	Barium (Ba)-Dissolved (mg/L)	0.0150	0.0111	0.0120	0.00948	
	Beryllium (Be)-Dissolved (mg/L)	<0.0025	<0.0025	<0.0025	<0.0025	
	Bismuth (Bi)-Dissolved (mg/L)	<0.0025 	<0.0025 <0.0025	<0.0025	<0.0025 <0.0025	
	Boron (B)-Dissolved (mg/L)	<0.0020 	<0.0023 DLM <0.050	<0.050	<0.050 	
	Cadmium (Cd)-Dissolved (mg/L)	0.000959	0.000064	<0.000050	<0.0000 	
	Calcium (Ca)-Dissolved (mg/L)	289	237	247	251	
	Chromium (Cr)-Dissolved (mg/L)	289 DLM <0.00050	<0.00050	<0.00050	0.00055	
	Cobalt (Co)-Dissolved (mg/L)	<0.00050	0.0174	0.0185	0.00332	
	Copper (Cu)-Dissolved (mg/L)	<0.0025	<0.0025	<0.0025	0.00332 рім <0.0025	
	Iron (Fe)-Dissolved (mg/L)	DLM	<0.0025 <0.15	<0.0025 	<0.15	
	Lead (Pb)-Dissolved (mg/L)	<0.15 DLM <0.00025	<0.15 c0.00025	<0.15 DLM <0.00025	<0.15 DLM <0.00025	
	Lithium (Li)-Dissolved (mg/L)	DLM	DLM	<0.0025 PLM <0.025	<0.0025 DLM <0.025	
	Magnesium (Mg)-Dissolved (mg/L)	<0.025 226	<0.025 240	238	216	
	Manganese (Mn)-Dissolved (mg/L)			6.20	1.00	
	Molybdenum (Mo)-Dissolved (mg/L)	9.90	5.88	0.00433	0.00439	
	Nickel (Ni)-Dissolved (mg/L)	0.00311	0.00413	0.00433	0.00439	
	Phosphorus (P)-Dissolved (mg/L)	0.0324	0.0315	DLM	DLM	
	Potassium (K)-Dissolved (mg/L)	<1.5	<1.5	<1.5	<1.5	
	Selenium (Se)-Dissolved (mg/L)	6.30 DLM	6.68 DLM	6.70	6.92	
	Silicon (Si)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	
	Silver (Ag)-Dissolved (mg/L)	2.06	2.09 DLM	2.26 DLM	2.32 DLM	
	in the fifth and the state of the first state of the stat	<0.000050	<0.000050	<0.000050	<0.000050	
	Sodium (Na)-Dissolved (mg/L)	27.7	29.2	29.3	28.5	
	Strontium (Sr)-Dissolved (mg/L)	0.838	0.710	0.723	0.704	
	Sulfur (S)-Dissolved (mg/L)	534	552	539	506 DLM	
	Thallium (TI)-Dissolved (mg/L)	0.00057 DLM	0.00055 DLM	0.00054 DLM	<0.00050 DLM	
	Tin (Sn)-Dissolved (mg/L)	<0.00050 DLM	<0.00050 DLM	<0.00050 DLM	<0.00050 DLM	
	Titanium (Ti)-Dissolved (mg/L)	<0.050	<0.050	<0.050	<0.050	
	Uranium (U)-Dissolved (mg/L)	0.00260 DLM	0.00634 DLM	0.00620 DLM	0.00383 DLM	
	Vanadium (V)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	
	Zinc (Zn)-Dissolved (mg/L)	0.755	0.075	0.038	0.028	
		1				

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

÷...

Qualifiers for Individual Parameters Listed:

Qualifiers for Individu	ual Parameters	Listed:	
Qualifier Desc	ription		
DLM Detec	tion Limit Adjus	ted For Sample Matrix Effects	
est Method Referen	ces:		
ALS Test Code	Matrix	Test Description	Method Reference**
MET-D-CCMS-VA	Water	Dissolved Metals in Water by CRC ICPMS	APHA 3030 B&E / EPA SW-846 6020A
American Public Healt States Environmental	h Association, a Protection Agen	nd with procedures adapted from "Test Methods for cy (EPA). The procedures may involve preliminary	amination of Water and Wastewater" published by the - Evaluating Solid Waste" SW-846 published by the United sample treatment by acid digestion, using hotblock, or lasma - mass spectrometry (modifed from EPA Method
S-DIS-ICP-VA	Water	Dissolved Sulfur in Water by ICPOES	EPA SW-846 3005A/6010B
submitted samples, is represents all non-vola	often lost during atile forms of sul		e or other volatile forms of sulphur that may be present in The data reported as total and/or dissolved sulphur
		The second s	
The last two letters of th	ie above test co	de(s) indicate the laboratory that performed analytic	al analysis for that test. Refer to the list below:
aboratory Definition	Code Labo	ratory Location	
/A	ALS L	ABORATORY GROUP - VANCOUVER, BC, CANA	NDA
hain of Custody Numt	oers:		
98062			
GLOSSARY OF REPO			

mg/kg lwt milligrams per kilogram based on lipid-adjusted weight of sample.

mg/L milligrams per litre.

< - Less than.

D.L. The reported Detection Limit, also known as the Limit of Reporting (LOR).

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.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



60 M	COMETRIX INC 000 Campobello Road lississauga ON L5N 21 RIN CLYDE	Workorder:	2333000		Report Date: 08	-001-10	ιą	ge 1 of 3
st	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
ET-D-CCMS-VA	Water							
	480945							
WG1172989-1	MB							
Aluminum (AI)-D	lissolved		<0.0010		mg/L		0.001	27-SEP-10
Antimony (Sb)-D	lissolved		<0.00010		mg/L		0.0001	27-SEP-10
Arsenic (As)-Dis	solved		<0.00010		mg/L		0.0001	27-SEP-10
Barium (Ba)-Dis	solved		<0.000050)	mg/L		0.00005	27-SEP-10
Beryllium (Be)-D	lissolved		<0.00050		mg/L		0.0005	27-SEP-10
Bismuth (Bi)-Dis	solved		<0.00050		mg/L		0.0005	27-SEP-10
Boron (B)-Dissol	lved		<0.010		mg/L		0.01	27-SEP-10
Cadmium (Cd)-D	Dissolved		<0.000010)	mg/L		0.00001	27-SEP-10
Calcium (Ca)-Di	ssolved		<0.020		mg/L		0.02	27-SEP-10
Chromium (Cr)-I	Dissolved		<0.00010		mg/L		0.0001	27-SEP-10
Cobalt (Co)-Diss	solved		<0.00010		mg/L		0.0001	27-SEP-10
Copper (Cu)-Dis	solved		<0.00010		mg/L		0.0001	27-SEP-10
Iron (Fe)-Dissolv	ved		<0.030		mg/L		0.03	27-SEP-10
Lead (Pb)-Disso	lved		<0.000050	0	mg/L		0.00005	27-SEP-10
Lithium (Li)-Diss	olved		<0.0050		mg/L		0.005	27-SEP-10
Magnesium (Mg)-Dissolved		<0.0050		mg/L		0.005	27-SEP-10
Manganese (Mn)-Dissolved		<0.000050)	mg/L		0.00005	27-SEP-10
Molybdenum (M	o)-Dissolved		<0.000050	0	mg/L		0.00005	27-SEP-10
Nickel (Ni)-Disso	olved		<0.00050		mg/L		0.0005	27-SEP-10
Phosphorus (P)-	Dissolved		<0.30		mg/L		0.3	27-SEP-10
Potassium (K)-D	Dissolved		<0.050		mg/L		0.05	27-SEP-10
Selenium (Se)-D	Dissolved		<0.00010		mg/L		0.0001	27-SEP-10
Silicon (Si)-Disso	olved		<0.050		mg/L		0.05	27-SEP-10
Silver (Ag)-Disso	olved		<0.00001	D	mg/L		0.00001	27-SEP-10
Sodium (Na)-Dis	ssolved		<0.050		mg/L		0.05	27-SEP-10
Strontium (Sr)-D			<0.00010		mg/L		0.0001	27-SEP-10
Thallium (TI)-Dis	ssolved		<0.00010		mg/L		0.0001	27-SEP-10
Tin (Sn)-Dissolv	ed		<0.00010		mg/L		0.0001	27-SEP-10
Titanium (Ti)-Dis			<0.010		mg/L		0.01	27-SEP-10
Uranium (U)-Dis			<0.00001	D	mg/L		0.00001	27-SEP-10
Vanadium (V)-D			<0.0010		mg/L		0.001	27-SEP-10
Zinc (Zn)-Dissol			<0.0010		mg/L		0.001	27-SEP-10

S-DIS-ICP-VA

Water

1



		Workorder	: L935060)	Report Date: 0	8-OCT-10	Р	age 2 of 3
Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
S-DIS-ICP-VA	Water							
Batch R1480883								
WG1172989-1 MB Sulfur (S)-Dissolved			<0.50		mg/L		0.5	27-SEP-10
WG1172989-5 MB Sulfur (S)-Dissolved			<0.50		mg/L		0.5	27-SEP-10

Workorder: L935060

Report Date: 08-OCT-10

	the source of the	
	Limit	99% Confidence Interval (Laboratory Control Limits)
ĥ,	DUP	Duplicate
	RPD	Relative Percent Difference
	N/A	Not Available
	LCS	Laboratory Control Sample
	SRM	Standard Reference Material
	MS	Matrix Spike
	MSD	Matrix Spike Duplicate
	ADE	Average Desorption Efficiency
	MB	Method Blank
	IRM	Internal Reference Material
ġ	CRM	Certified Reference Material
	CCV	Continuing Calibration Verification
	CVS	Calibration Verification Standard
	LCSD	Laboratory Control Sample Duplicate
		11 N M M M N M M M M M N M N M N M N M N

fold Time Exceedances:

.egend:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pretetermined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

Fax: (519) 886-9047 Itel Homematical Istatul CANADA TOLL FREE: 1-800-668-9878 $3.00 p$ OFFICE ECOMONY NAME ECOMONY NAME ECOMONY NAME PHOJECT HANAGEH Feg 153 34 Table 1 2 PHOJECT HANAGEH TOLP MIS. TOLP MIS. PHOJECT # /D - 1753 ODWS OTH TOLP MIS. PHOJECT # /D - 1753 ODWS OTH TOLP MIS. PHOJECT # /D - 1753 ODWS OTH TOLP MIS. PHOJECT # /D - 1753 ODWS OTH TOLP MIS. PHOJECT # /D - 1753 ODWS OTH TOLP MIS. PHOJECT # /D - 1753 ODWS OTH TOLP MIS. PHOJECT # /D - 1753 ODWS OTH TOLP MIS. QUOTATION FAX REPORT F SELECT: PDF SELECT: PDF Sample Date/Time TYPE MATRIX EMAIL: EMAIL: QUOTATION EXAMPLE OESCRE SAMPLE OESCRE SAMPLE OESCRE Q1-09-10 X CVP10 - ST Z Z	all TAT Qualed material is in business days which we hade tary holidays and weekends. TAT samples, received past pm or Saturday/Sunday begin the next day. Thereis on report Yes [] No [] A PWCO_ HER CORMAT / DISTRIBUTION FAX BOTH DIGITAL BOTH X CARCEMENT IX. CA PTICUTO APPEAR ON HEPORT -6 DAY 7 1 X -8 DAY 7 1 X		C of C # 098062 PAGE / OF PAGE
	THE QUESTIONS BELOW MUST BE ANSWERED F Are any samples taken from a regulated DW Sys If yes, an authorized drinking water COC MUST b Is the water sampled intended to be potable for DECEMENTATION AND ADDRESS AND HAD WORKCARD DECEMENTATION OF A DRESS AND HAD WORKCARD Submission Please contact the late to confirm TATS. YELLOW - File copy	stem? Yes $1 \text{ No } X$ e used for this submission. human consumption? Yes $1 \text{ No } X$	



ECOMETRIX INC ATTN: ERIN CLYDE 6000 Campobello Road Mississauga ON L5N 2L8 Phone: 905-794-2325

and which have a

Date Received: 23-SEP-10 Report Date: 08-OCT-10 01:40 (MT) Version: FINAL

Certificate of Analysis

Lab Work Order #: L935069 Project P.O. #: NOT SUBMITTED Job Reference: 10-1753

Legal Site Desc: C of C Numbers:

98063

nenson Uman lene f.

Emerson Perez Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 5730 Coopers Avenue, Unit #26 , Mississauga, ON L4Z 2E9 Canada | Phone: +1 905 507 6910 | Fax: +1 905 507 6927 ALS CANADA LIMITED Part of the ALS Group A Campbell Brothers Limited Company

www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNER

PAGE 2 of 3 08-OCT-10 01:40 (MT)

ALS LABORATORY GROUP ANALYTICAL REPORT

	Sample ID Description Sampled Date Sampled Time Client ID	L935069-1 WATER 22-SEP-10 CVP10-ST-6 DAY 8	L935069-2 WATER 22-SEP-10 CVP10-ST-C DAY 8	L935069-3 WATER 22-SEP-10 CVP10-ST-8 DAY 8	L935069-4 WATER 22-SEP-10 CVP10-ST-9 DAY 8
Grouping	Analyte				
WATER					
Grouping WATER Dissolved Metals	Analyte Aluminum (AI)-Dissolved (mg/L) Antimony (Sb)-Dissolved (mg/L) Arsenic (As)-Dissolved (mg/L) Barium (Ba)-Dissolved (mg/L) Beryllium (Be)-Dissolved (mg/L) Bismuth (Bi)-Dissolved (mg/L) Boron (B)-Dissolved (mg/L) Cadmium (Cd)-Dissolved (mg/L) Calcium (Ca)-Dissolved (mg/L) Cabalt (Co)-Dissolved (mg/L) Cobalt (Co)-Dissolved (mg/L) Copper (Cu)-Dissolved (mg/L) Iron (Fe)-Dissolved (mg/L) Lithium (Li)-Dissolved (mg/L) Magnesium (Mg)-Dissolved (mg/L) Manganese (Mn)-Dissolved (mg/L) Molybdenum (Mo)-Dissolved (mg/L) Nickel (Ni)-Dissolved (mg/L) Phosphorus (P)-Dissolved (mg/L) Potassium (K)-Dissolved (mg/L) Selenium (Se)-Dissolved (mg/L) Silicon (Si)-Dissolved (mg/L) Silicon (Si)-Dissolved (mg/L)	<0.015 DLM <0.00050 0.0150 DLM <0.0025 DLM <0.0025 DLM <0.0025 DLM <0.00050 0.000882 290 DLM <0.00050 0.0309 0.0309 0.00025 232 9.87 0.00316 0.0331 DLM <1.5 6.35 DLM <0.00050 2.16 DLM <0.00050	0.017 <0.00050 0.0108 0.0025 0.0025 0.00050 0.00074 229 <0.00050 0.0177 0.00050 0.0177 0.00025 0.00025 236 5.80 0.00412 0.0290 0.0025 236 5.80 0.00412 0.0290 0LM <0.025 236 5.80 0.00412 0.0290 0LM <0.025 236 5.80 0.00412 0.0290 0LM <0.025 0LM <0.0025 0LM <0.0025 0LM <0.0025 0LM <0.0025 0LM <0.00050 0.0177 0LM <0.0025 0LM <0.00050 0.0177 0LM <0.0025 0LM <0.0025 0LM <0.0025 0LM <0.00025 0LM <0.00025 0LM <0.00025 0LM <0.00025 0LM <0.00025 0LM <0.00025 0LM <0.00025 0LM <0.00025 0LM <0.00025 0LM <0.00025 0LM <0.00025 0LM <0.0025 0LM <0.0025 0LM <0.0025 0LM <0.0025 0LM <0.0025 0LM <0.0025 0LM <0.0025 0LM <0.0025 0LM <0.0025 0LM <0.0025 0LM <0.0025 0LM <0.0025 0LM <0.0025 0LM <0.0025 0LM <0.0025 0LM <0.0025 0LM <0.0025 0LM <0.0025 0LM <0.0025 0LM <0.0025 0LM <0.0025 0LM <0.0025 0LM <0.0025 0LM <0.0025 0LM <0.0025 0LM <0.0025 0LM <0.0025 0LM <0.0025 0LM <0.0025 0LM <0.0025 0LM <0.0025 0LM <0.0025 0LM <0.00050 0LM <0.00050 0LM <0.00050 0LM <0.00050 0LM <0.00050 0LM <0.00050 0LM <0.00050 0LM <0.00050 0LM <0.00050 0LM <0.00050 0LM <0.00050 0LM <0.00050 0LM <0.00050 0LM <0.00050 0LM <0.00050 0LM <0.00050 0LM <0.00050 0LM <0.00050 0LM <0.00050 0LM <0.00050 0LM <0.00050 0LM <0.00050 0LM <0.00050 0LM <0.00050 0LM <0.00050 0LM <0.00050 0LM <0.00050 0LM <0.00050 0LM <0.00050 0LM <0.00050 0LM <0.00050 0LM <0.00050 0LM <0.00050 0LM <0.00050 0LM <0.00050 0LM <0.00050 0LM <0.00050 0LM <0.00050 0LM <0.00050 0LM <0.00050 0LM <0.00050 0LM <0.00050 0LM <0.00050 0LM <0.00050 0LM <0.00050 0LM <0.00050 0LM <0.00050 0LM <0.00050 0LM <0.00050 0LM <0.00050 0LM <0.00050 0LM <0.00050 0LM <0.00050 0LM <0.00050 0LM <0.00050 0LM <0.00050 0LM <0.00050 0LM <0.00050 0LM <0.00050 0LM <0.00050 0LM <0.00050 0LM <0.00050 0LM <0.00050 0LM <0.00050 0LM <0.00050 0LM <0.00050 0LM <0.0	0.296 COUNTS	0.068 0.00050 0.00881 0LM <0.0025 0LM <0.0025 0LM <0.00050 240 240 0.00050 0.00265 0.00265 0.00265 0.0025 207 0.859 0.00426 0.0055 0LM <1.5 6.52 0LM <0.00050 2.28 0LM 0.00050
	Sodium (Na)-Dissolved (mg/L) Strontium (Sr)-Dissolved (mg/L) Sulfur (S)-Dissolved (mg/L) Thallium (Ti)-Dissolved (mg/L) Tin (Sn)-Dissolved (mg/L) Titanium (Ti)-Dissolved (mg/L) Uranium (U)-Dissolved (mg/L) Vanadium (V)-Dissolved (mg/L) Zinc (Zn)-Dissolved (mg/L)	28.1 0.852 530 0.00058 CLM <0.00050 0.00303 0.00303 0.0050 0.646	28.6 0.693 548 0.00057 0LM <0.00050 0.00638 0.00638 0.0050 0.0066	28.9 0.720 532 0.00055 0.00050 0.0050 0.00638 c0.0050 0.00638 0.0044	27.4 0.679 502 0.00050 0.00050 0.00050 0.00384 0.00050 0.00384 0.0050 0.00384 0.0050 0.00384 0.0050 0.0015

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

NEEDED IN THE SPECTRUM

Construction and Construction and Construction	n						
DLM Detection	Detection Limit Adjusted For Sample Matrix Effects						
est Method References:							
LS Test Code	Matrix	Test Description	Method Reference**				
ET-D-CCMS-VA	Water	Dissolved Metals in Water by CRC ICPMS	APHA 3030 B&E / EPA SW-846 6020A				
American Public Health Ast States Environmental Prote	sociation, a action Agen	nd with procedures adapted from "Test Methods fo cy (EPA). The procedures may involve preliminary	amination of Water and Wastewater" published by the r Evaluating Solid Waste" SW-846 published by the United sample treatment by acid digestion, using hotblock, or lasma - mass spectrometry (modifed from EPA Method				
-DIS-ICP-VA	Water	Dissolved Sulfur in Water by ICPOES	EPA SW-846 3005A/6010B				
Method 6010B).							
submitted samples, is ofter	n lost during	ot give total sulphur results for all samples. Sulphic the sampling, preservation and analysis process. phur present in a particular sample.	e or other volatile forms of sulphur that may be present in The data reported as total and/or dissolved sulphur				
submitted samples, is ofter represents all non-volatile f	o lost during forms of sul	the sampling, preservation and analysis process.	The data reported as total and/or dissolved sulphur				
submitted samples, is ofter represents all non-volatile f ALS test methods may inco	n lost during orms of sul orporate mo	the sampling, preservation and analysis process. phur present in a particular sample.	The data reported as total and/or dissolved sulphur prove performance.				
submitted samples, is ofter represents all non-volatile f ALS test methods may inco The last two letters of the ab	n lost during orms of sul orporate mo	the sampling, preservation and analysis process. phur present in a particular sample. difications from specified reference methods to imp	The data reported as total and/or dissolved sulphur prove performance.				
submitted samples, is ofter represents all non-volatile f ALS test methods may inco The last two letters of the ab aboratory Definition Code	n lost during forms of sul prporate mo love test co e Labor	the sampling, preservation and analysis process. phur present in a particular sample. difications from specified reference methods to imp de(s) indicate the laboratory that performed analytic	The data reported as total and/or dissolved sulphur prove performance.				
submitted samples, is ofter represents all non-volatile f ALS test methods may inco	n lost during orms of sul orporate mo ove test co e Labor ALS L	the sampling, preservation and analysis process. phur present in a particular sample. difications from specified reference methods to imp de(s) indicate the laboratory that performed analytic ratory Location	The data reported as total and/or dissolved sulphur prove performance.				

g/kg wwt milligrams per kilogram based on wet weight of sample.

g/kg lwt milligrams per kilogram based on lipid-adjusted weight of sample.

mg/L milligrams per litre.

< - Less than.

.L. The reported Detection Limit, also known as the Limit of Reporting (LOR).

/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. ''NLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

nalytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



		Workorder:	2000000		Report Date: 08	501-10	гa	ge 1 of
Client:	ECOMETRIX INC 6000 Campobelio Road Mississauga ON L5N 2L	8						
Contact: est	ERIN CLYDE Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-	BAY STAN MARK PES							
Batch	R1480945							
WG1172989								
	(Al)-Dissolved		<0.0010		mg/L		0.001	27-SEP-10
Antimony (Sb)-Dissolved		<0.00010		mg/L		0.0001	27-SEP-10
Arsenic (As	s)-Dissolved		<0.00010		mg/L		0.0001	27-SEP-10
Barium (Ba	a)-Dissolved		<0.000050)	mg/L		0.00005	27-SEP-10
Beryllium (f	Be)-Dissolved		<0.00050		mg/L		0.0005	27-SEP-10
Bismuth (B	i)-Dissolved		<0.00050		mg/L		0.0005	27-SEP-10
Boron (B)-D	Dissolved		<0.010		mg/L		0.01	27-SEP-10
Cadmium ((Cd)-Dissolved		<0.000010)	mg/L		0.00001	27-SEP-10
Calcium (C	a)-Dissolved		<0.020		mg/L		0.02	27-SEP-10
Chromium	(Cr)-Dissolved		<0.00010		mg/L		0.0001	27-SEP-10
Cobalt (Co))-Dissolved		<0.00010		mg/L		0.0001	27-SEP-10
Copper (Cu	u)-Dissolved		<0.00010		mg/L		0.0001	27-SEP-10
Iron (Fe)-D	issolved		<0.030		mg/L		0.03	27-SEP-10
Lead (Pb)-l	Dissolved		<0.000050)	mg/L		0,00005	27-SEP-10
Lithium (Li)	-Dissolved		<0.0050		mg/L		0.005	27-SEP-10
Magnesium	n (Mg)-Dissolved		<0.0050		mg/L		0.005	27-SEP-10
Manganese	e (Mn)-Dissolved		<0.000050)	mg/L		0.00005	27-SEP-10
Molybdenu	m (Mo)-Dissolved		<0.000050)	mg/L		0.00005	27-SEP-10
Nickel (Ni)-	Dissolved		<0.00050		mg/L		0.0005	27-SEP-10
Phosphoru	s (P)-Dissolved		<0.30		mg/L		0.3	27-SEP-10
Potassium	(K)-Dissolved		<0.050		mg/L		0.05	27-SEP-10
Selenium (S	Se)-Dissolved		<0.00010		mg/L		0.0001	27-SEP-10
Silicon (Si)-	-Dissolved		<0.050		mg/L		0.05	27-SEP-10
Silver (Ag)-	Dissolved		<0.000010)	mg/L		0.00001	27-SEP-10
Sodium (Na	a)-Dissolved		<0.050		mg/L		0.05	27-SEP-10
Strontium (Sr)-Dissolved		<0.00010		mg/L		0.0001	27-SEP-10
Thallium (T	1)-Dissolved		<0.00010		mg/L		0.0001	27-SEP-10
Tin (Sn)-Dis	ssolved		<0.00010		mg/L		0.0001	27-SEP-10
Titanium (T	"I)-Dissolved		<0.010		mg/L		0.01	27-SEP-10
Uranium (U	J)-Dissolved		<0.000010)	mg/L		0.00001	27-SEP-10
Vanadium ((V)-Dissolved		<0.0010		mg/L		0.001	27-SEP-10
Zinc (Zn)-D)issolved		<0.0010		mg/L		0.001	27-SEP-10



		Workorder	: L935069		Report Date: 08	3-OCT-10	Р	age 2 of 3
Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
S-DIS-ICP-VA	Water							
Batch R1480883 WG1172989-1 MB								
Sulfur (S)-Dissolved			<0.50		mg/L		0.5	27-SEP-10
WG1172989-5 MB Sulfur (S)-Dissolved			<0.50		mg/L		0.5	27-SEP-10

Workorder: L935069

Report Date: 08-OCT-10

Legend:

Limit	99% Confidence Interval (Laboratory Control Limits)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
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
	news responses to an according to the construction of the construction of the test and the second statements of t

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

			102
60 NORTHLAND ROAD, UNIT 1	CHAIN OF CUSTODY / ANALYT	TICAL SERVICES REQUEST FORM	203
WATERLOO, ON N2V 2B8			
Env: (E10) 006 0047 ALS Definition of	r all TAT Quoted material is in business days which exclude dary holidays and weekends. TAT samples received past	Specify date required Service requested data 137 (50-)	
CANADA TOLL FREE: 1-800-668-9878	pm or Saturday/Sunday begin the next day.	5 day (Regular) X Next day TAT (100%)	
CONTRANY NAME ECO. Hetrix CRITERIA CH	tena on report Yes [] No [_'	ANALYSIS DEQUEST PLEASE INDICATE FILTERED,	
Grad:	FP	PRESERVED OR BOTH C (F, P, F/P)	
PROJECT MANAGER Reg 153/04			
Erin Clyde.	I , , ,	1 1 1 1 030069	54
		[9]501	
10-1753 ODWS OTH			
(905)774-2325 REPORT F	FORMAT / DISTRIBUTION	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
		DATE/TURE ENTERED:	
QUOINTION# PO# SELECT: PDF		23-568-10	
SAMPLING INFORMATION EMAIL I CLYDE		BIR#	1
Sample DateTime TYPE MATRIX EMAIL?			
Date Time S a SAMPLE DESCRI		I COMMENTS I LA	6 ID
(d tramey): (d trame) G G G G G G G G G G G G G G G G G G G			
22-09-10 X CUPIO-ST.	-6_ DAY 8 11X		1
	-C DAY 8 _ 1 X		<u> </u>
	8_ PAY 8X		2
22-09-10 X CVP10-ST-		-	
┝╸╶┊╾╵╎┿┝┥┽╺╸╸╸			
·		╺╎┉┙┉╎┉╎┉╎┈╎┈╹╷┉╹╷╸╎╸╵╸╵╸╶╴╶╴╴	
		- - - - -	
))
			÷
SPECIAL INSTRUCTIONS/COMMENTS	THE QUESTIONS BELOW MUST DE ANSWERED FO		in mail
Samples Contain Elevated 2n.	Are any samples taken from a regulated DW Sys	tem? Yes 1 No X HEAT	7
1 t	If yes, an authorized drinking water COC MUST be	e used for this submission. $\frac{1}{10000000000000000000000000000000000$	tu
[Is the water sampled intended to be potable for t		
ENVILOPEN FC 123-09-10	is crient	Instruction of the second seco	3/
THE PRATICAL DAY.	- that be	D2 CALLS 12 10 10 CO Uperadd SiF	
NOTES AND CONDUCIONS 23-09-10		17 20/ 10 [2/00]	_1
	any dependent on complexity of Andreas and lab workload submission. Please contact the Salvin content TATs	 Any known or suspected bazards relating to a sample must be noted to the plasm of our loop in comments section. 	1
White - Report conv	YFLLOW - File conv	PINK - Customer conve	18.000