ALS Environmental

CERTIFICATE OF ANALYSIS

Date:	**May 27, 2005**
ALS File No.	**V8143**
Report On:	**40692 Water Analysis**
Report To:	**Gartner Lee Ltd.** **2251 2nd Ave** **Whitehorse, YT** **Y1A 5W1**
Attention:	**Mr. Martin Guilbeault**
Received:	**May 13, 2005**

ALS ENVIRONMENTAL
per:

Brent C. Mack, B.Sc. - Client Services Coordinator
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File No. V8143

REMARKS

Please note that the detection limits for certain Anions & Metals have been increased for some of the samples reported in the following data tables due to sample matrix interferences.

File No. V8143

RESULTS OF ANALYSIS - Water

Sample ID			P03-02-01	P03-02-02	P03-03-02R	P03-02-03	P03-02-04
Sample Date			05-05-11	05-05-11	05-05-11	05-05-11	05-05-11
Sample Time			10:39	10:42	12:20	10:55	10:00
ALS ID			*1*	*2*	*3*	*4*	*5*
Physical Tests							
Conductivity	(uS/cm)		363	262	2390	263	515
Hardness	CaCO3		199	138	524	136	235
pH			8.05	7.73	4.61	7.47	7.15
Dissolved Anions							
Alkalinity-Total		CaCO3	148	92.9	4.5	92.5	64.0
Bromide	Br		-	-	<5.0	-	-
Sulphate	SO4		36.0	32.7	1630	33.2	192

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File No. V8143

RESULTS OF ANALYSIS - Water

Sample ID		P03-02-01	P03-02-02	P03-03-02R	P03-02-03	P03-02-04
Sample Date		05-05-11	05-05-11	05-05-11	05-05-11	05-05-11
Sample Time		10:39	10:42	12:20	10:55	10:00
ALS ID		*1*	*2*	*3*	*4*	*5*
Dissolved Metals						
Aluminum	D-Al	<0.010	<0.010	2.87	<0.010	<0.020
Antimony	D-Sb	<0.00050	<0.00050	<0.010	<0.00050	<0.0010
Arsenic	D-As	<0.0010	<0.0010	<0.020	<0.0010	<0.0020
Barium	D-Ba	0.085	0.083	<0.060	0.083	<0.060
Beryllium	D-Be	<0.015	<0.015	<0.015	<0.015	<0.015
Boron	D-B	<0.30	<0.30	<0.30	<0.30	<0.30
Cadmium	D-Cd	<0.000050	<0.000050	0.0174	<0.000050	0.00014
Calcium	D-Ca	63.0	42.4	126	41.8	74.1
Chromium	D-Cr	<0.00050	<0.00050	<0.010	<0.00050	<0.0010
Cobalt	D-Co	<0.00050	<0.00050	0.210	<0.00050	0.0053
Copper	D-Cu	<0.0010	<0.0010	0.060	<0.0010	<0.0020
Iron	D-Fe	0.136	<0.090	520	0.514	0.621
Lead	D-Pb	<0.0010	<0.0010	<0.020	<0.0010	<0.0020
Lithium	D-Li	<0.15	<0.15	<0.15	<0.15	<0.15
Magnesium	D-Mg	10.1	7.71	50.7	7.63	12.1
Manganese	D-Mn	0.611	<0.030	17.4	<0.030	8.88
Mercury	D-Hg	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Molybdenum	D-Mo	0.0023	<0.0010	<0.020	<0.0010	<0.0020
Nickel	D-Ni	<0.0050	<0.0050	0.27	<0.0050	0.055
Selenium	D-Se	<0.0010	<0.0010	<0.020	<0.0010	<0.0020
Silver	D-Ag	<0.000050	<0.000050	<0.0010	<0.000050	<0.00010
Sodium	D-Na	<6.0	<6.0	12.9	<6.0	8.7
Thallium	D-Tl	<0.00020	<0.00020	<0.0040	<0.00020	<0.00040
Titanium	D-Ti	<0.15	<0.15	<0.15	<0.15	<0.15
Uranium	D-U	0.00126	0.00069	<0.0040	0.00075	<0.00040
Vanadium	D-V	<0.090	<0.090	<0.090	<0.090	<0.090
Zinc	D-Zn	<0.015	<0.015	132	0.086	0.096

Remarks regarding the analyses appear at the beginning of this report.
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File No. V8143

RESULTS OF ANALYSIS - Water

Sample ID			P03-02-05	P03-02-06	P03-02-07	P03-02-08	P03-02-09
Sample Date			05-05-11	05-05-11	05-05-11	05-05-11	05-05-11
Sample Time			11:15	11:20	11:25	11:42	11:35
ALS ID			*6*	*7*	*8*	*9*	*10*
Physical Tests							
Conductivity	(uS/cm)		6150	7860	9620	10900	18800
Hardness	CaCO3		2310	2580	3050	2510	2180
pH			5.20	4.00	3.75	3.53	3.31
Dissolved Anions							
Alkalinity-Total		CaCO3	47.6	43.7	46.8	<2.0	<2.0
Bromide	Br		-	-	-	-	-
Sulphate	SO4		4860	6670	8980	11000	23600

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File No. V8143

RESULTS OF ANALYSIS - Water

Sample ID		P03-02-05	P03-02-06	P03-02-07	P03-02-08	P03-02-09
Sample Date		05-05-11	05-05-11	05-05-11	05-05-11	05-05-11
Sample Time		11:15	11:20	11:25	11:42	11:35
ALS ID		*6*	*7*	*8*	*9*	*10*
Dissolved Metals						
Aluminum	D-Al	<0.20	<0.20	<0.20	0.92	<1.0
Antimony	D-Sb	<0.010	<0.010	<0.010	<0.010	<0.050
Arsenic	D-As	<0.020	<0.020	<0.020	0.051	<0.10
Barium	D-Ba	<0.060	<0.060	<0.10	0.24	<0.40
Beryllium	D-Be	<0.015	<0.015	<0.025	<0.025	<0.10
Boron	D-B	<0.30	<0.30	<0.50	<0.50	<2.0
Cadmium	D-Cd	<0.0010	<0.0010	<0.0010	0.0061	<0.0050
Calcium	D-Ca	401	411	443	363	419
Chromium	D-Cr	<0.010	<0.010	<0.010	<0.010	<0.050
Cobalt	D-Co	<0.010	<0.010	<0.010	<0.010	<0.050
Copper	D-Cu	<0.020	<0.020	<0.020	0.067	<0.10
Iron	D-Fe	1180	1860	3030	4110	12700
Lead	D-Pb	<0.020	<0.020	0.020	2.74	0.30
Lithium	D-Li	0.15	0.20	<0.25	<0.25	<1.0
Magnesium	D-Mg	318	378	471	390	275
Manganese	D-Mn	21.7	19.9	23.3	30.5	70.5
Mercury	D-Hg	<0.00020	<0.00020	<0.00020	0.00076	<0.00020
Molybdenum	D-Mo	<0.020	<0.020	<0.020	<0.020	<0.10
Nickel	D-Ni	<0.10	<0.10	<0.10	<0.10	<0.50
Selenium	D-Se	<0.020	<0.020	<0.020	<0.020	<0.10
Silver	D-Ag	<0.0010	<0.0010	<0.0010	0.0012	<0.0050
Sodium	D-Na	333	368	322	223	54
Thallium	D-Tl	<0.0040	<0.0040	<0.0040	<0.0040	<0.020
Titanium	D-Ti	<0.15	<0.15	<0.25	<0.25	<1.0
Uranium	D-U	0.0040	<0.0040	<0.0040	<0.0040	<0.020
Vanadium	D-V	<0.090	0.107	<0.15	<0.15	<0.60
Zinc	D-Zn	<0.015	<0.015	<0.025	15.9	436

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RESULTS OF ANALYSIS - Water

Sample ID			P01-10B	P01-02-A	P01-08A	P03-03-02	P03-03-03
Sample Date			05-05-11	05-05-11	05-05-11	05-05-11	05-05-11
Sample Time			10:43	13:51	15:40	12:20	12:40
ALS ID			*11*	*12*	*13*	*14*	*15*
Physical Tests							
Conductivity	(uS/cm)		719	646	602	2380	591
Hardness	CaCO3		290	354	21.9	524	249
pH			7.40	8.09	7.37	4.38	6.03
Dissolved Anions							
Alkalinity-Total		CaCO3	213	208	109	4.4	8.8
Bromide	Br		-	-	-	<0.050	0.500
Sulphate	SO4		168	141	165	17.1	20.2

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File No. V8143

RESULTS OF ANALYSIS - Water

Sample ID		P01-10B	P01-02-A	P01-08A	P03-03-02	P03-03-03
Sample Date		05-05-11	05-05-11	05-05-11	05-05-11	05-05-11
Sample Time		10:43	13:51	15:40	12:20	12:40
ALS ID		*11*	*12*	*13*	*14*	*15*
Dissolved Metals						
Aluminum	D-Al	<0.020	<0.010	0.208	2.52	<0.10
Antimony	D-Sb	<0.0010	<0.00050	0.0162	<0.025	<0.0050
Arsenic	D-As	0.0067	<0.0010	0.0042	<0.050	<0.010
Barium	D-Ba	0.195	0.060	2.77	<0.060	<0.060
Beryllium	D-Be	<0.015	<0.015	<0.015	<0.015	<0.015
Boron	D-B	<0.30	<0.30	<0.30	<0.30	<0.30
Cadmium	D-Cd	<0.00010	0.000060	0.00113	0.0155	0.00612
Calcium	D-Ca	88.1	102	6.03	126	73.5
Chromium	D-Cr	<0.0010	<0.00050	0.0018	<0.025	<0.0050
Cobalt	D-Co	<0.0010	0.00051	0.0012	0.189	0.177
Copper	D-Cu	<0.0020	<0.0010	0.0217	0.057	<0.010
Iron	D-Fe	25.6	<0.090	6.03	523	14.6
Lead	D-Pb	<0.0020	<0.0010	0.768	<0.050	<0.010
Lithium	D-Li	<0.15	<0.15	<0.15	<0.15	<0.15
Magnesium	D-Mg	17.1	24.4	1.67	50.7	15.9
Manganese	D-Mn	4.65	1.04	0.163	17.4	10.9
Mercury	D-Hg	<0.00020	<0.00020	0.00038	<0.00020	<0.00020
Molybdenum	D-Mo	0.0082	0.0016	0.0301	<0.050	<0.010
Nickel	D-Ni	<0.010	<0.0050	<0.010	<0.25	0.199
Selenium	D-Se	<0.0020	<0.0010	<0.0020	<0.050	<0.010
Silver	D-Ag	<0.00010	<0.000050	0.00014	<0.0025	<0.00050
Sodium	D-Na	42.4	11.0	122	13.0	<6.0
Thallium	D-Tl	<0.00040	<0.00020	<0.00040	<0.010	<0.0020
Titanium	D-Ti	<0.15	<0.15	<0.15	<0.15	<0.15
Uranium	D-U	0.0169	0.00220	<0.00040	<0.010	<0.0020
Vanadium	D-V	<0.090	<0.090	<0.090	<0.090	<0.090
Zinc	D-Zn	1.36	<0.015	0.929	134	8.34

Remarks regarding the analyses appear at the beginning of this report.
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Appendix 1 - QUALITY CONTROL - Replicates

Water			P03-02-07 05-05-11 11:25	P03-02-07 QC # 441224
Physical Tests				
Conductivity	(uS/cm)		9620	9610
Hardness	CaCO3		3050	3100
pH			3.75	3.76
Dissolved Anions				
Alkalinity-Total		CaCO3	46.8	46.0
Sulphate	SO4		8980	8890

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File No. V8143

Appendix 1 - QUALITY CONTROL - Replicates

Water		P03-02-07 05-05-11 11:25	P03-02-07 QC # 441224
Dissolved Metals			
Aluminum	D-Al	<0.20	<0.20
Antimony	D-Sb	<0.010	<0.010
Arsenic	D-As	<0.020	<0.020
Barium	D-Ba	<0.10	<0.10
Beryllium	D-Be	<0.025	<0.025
Boron	D-B	<0.50	<0.50
Cadmium	D-Cd	<0.0010	<0.0010
Calcium	D-Ca	443	449
Chromium	D-Cr	<0.010	<0.010
Cobalt	D-Co	<0.010	<0.010
Copper	D-Cu	<0.020	<0.020
Iron	D-Fe	3030	3060
Lead	D-Pb	0.020	<0.020
Lithium	D-Li	<0.25	<0.25
Magnesium	D-Mg	471	480
Manganese	D-Mn	23.3	23.6
Mercury	D-Hg	<0.00020	<0.00020
Molybdenum	D-Mo	<0.020	<0.020
Nickel	D-Ni	<0.10	<0.10
Selenium	D-Se	<0.020	<0.020
Silver	D-Ag	<0.0010	<0.0010
Sodium	D-Na	322	326
Thallium	D-Tl	<0.0040	<0.0040
Titanium	D-Ti	<0.25	<0.25
Uranium	D-U	<0.0040	<0.0040
Vanadium	D-V	<0.15	<0.15
Zinc	D-Zn	<0.025	<0.025

Remarks regarding the analyses appear at the beginning of this report.
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Appendix 2 - METHODOLOGY

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

Conductivity in Water

This analysis is carried out using procedures adapted from APHA Method 2510 "Conductivity". Conductivity is determined using a conductivity electrode.

Recommended Holding Time:
Sample: 28 days
Reference: APHA

Laboratory Location: ALS Environmental, Vancouver

pH in Water

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode.

Recommended Holding Time:
Sample: 2 hours
Reference: APHA

Laboratory Location: ALS Environmental, Vancouver

Alkalinity in Water by Colourimetry

This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method.

Recommended Holding Time:
Sample: 14 days
Reference: APHA

Laboratory Location: ALS Environmental, Vancouver

Sulphate in Water

This analysis is carried out using procedures adapted from APHA Method 4500-SO4 "Sulphate". Sulphate is determined using the turbidimetric method.

Recommended Holding Time:
Sample: 28 days
Reference: APHA

Laboratory Location: ALS Environmental, Vancouver

Metals in Water

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

Recommended Holding Time:
Sample: 6 months
Reference: EPA

Laboratory Location: ALS Environmental, Vancouver

Mercury in Water

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" 20th Edition 1998 published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).

Recommended Holding Time:
Sample: 28 days
Reference: EPA

Laboratory Location: ALS Environmental, Vancouver

Dissolved Anions in Water by Ion Chromatography

This analysis is carried out using procedures adapted from APHA Method 4110 "Determination of Anions by Ion Chromatography" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Anions are determined by filtering the sample through a 0.45 micron membrane filter and injecting the filtrate onto a Dionex IonPac AG17 anion exchange column with a hydroxide eluent stream. Anions routinely determined by this method include: bromide, chloride, fluoride, nitrate, nitrite and sulphate.

Recommended Holding Time:
Sample: 28 days (bromide, chloride, fluoride, sulphate)
Sample: 2 days (nitrate, nitrite)

Appendix 2 - METHODOLOGY - Continued

Reference: APHA and EPA

Laboratory Location: ALS Environmental, Vancouver

Results contained within this certificate relate only to the samples as submitted.

This Certificate Of Analysis shall only be reproduced in full, except with the written approval of ALS Environmental.

End of Report