ALS Environmental

CERTIFICATE OF ANALYSIS

Date:	September 28, 2005
ALS File No.	W4400
Report On:	40692 Water Analysis
Report To:	**Gartner Lee Ltd.** 2251 2nd Ave Whitehorse, YT Y1A 5W1
Attention:	**Mr. Martin Guilbeault**
Received:	September 13, 2005

ALS ENVIRONMENTAL
per:

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REMARKS

The detection limits for some of the metals have been increased for several of the samples reported in the following data tables due to sample matrix interferences.

File No. W4400

RESULTS OF ANALYSIS - Water

Sample ID			P03-08-05R	P03-08-06	P03-08-07	P03-08-08	X18A
Sample Date			05-09-09	05-09-09	05-09-09	05-09-10	05-09-10
Sample Time			16:02	16:12	16:35	16:29	11:51
ALS ID			*1*	*2*	*3*	*4*	*5*
Physical Tests							
Conductivity	(uS/cm)		2360	2340	2400	582	1170
Hardness	CaCO3		1150	1170	1300	90.8	821
pH			7.32	7.14	7.44	7.99	7.80
Dissolved Anions							
Alkalinity-Total		CaCO3	249	20.3	56.4	123	255
Sulphate	SO4		1220	1340	1390	150	408

Remarks regarding the analyses appear at the beginning of this report.
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< = Less than the detection limit indicated.

File No. W4400

RESULTS OF ANALYSIS - Water

Sample ID		P03-08-05R	P03-08-06	P03-08-07	P03-08-08	X18A
Sample Date		05-09-09	05-09-09	05-09-09	05-09-10	05-09-10
Sample Time		16:02	16:12	16:35	16:29	11:51
ALS ID		*1*	*2*	*3*	*4*	*5*
Dissolved Metals						
Aluminum	D-Al	<0.050	<0.10	<0.10	<0.020	<0.050
Antimony	D-Sb	<0.0025	<0.0050	<0.0050	0.0064	<0.0025
Arsenic	D-As	<0.0050	<0.010	<0.010	0.0034	<0.0050
Barium	D-Ba	<0.020	<0.020	<0.020	0.038	0.241
Beryllium	D-Be	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Boron	D-B	<0.10	<0.10	<0.10	<0.10	<0.10
Cadmium	D-Cd	<0.00025	<0.00050	<0.00050	<0.00010	<0.00025
Calcium	D-Ca	326	445	497	20.9	244
Chromium	D-Cr	<0.0025	<0.0050	<0.0050	<0.0010	<0.0025
Cobalt	D-Co	<0.0025	<0.0050	<0.0050	0.0019	<0.0025
Copper	D-Cu	<0.0050	<0.010	<0.010	<0.0020	<0.0050
Iron	D-Fe	57.6	2.16	1.28	0.045	2.42
Lead	D-Pb	0.0069	<0.010	<0.010	0.0074	<0.0050
Lithium	D-Li	<0.050	0.054	<0.050	<0.050	<0.050
Magnesium	D-Mg	82.2	13.4	14.0	9.39	51.2
Manganese	D-Mn	6.44	0.679	1.08	0.048	0.830
Mercury	D-Hg	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Molybdenum	D-Mo	<0.0050	<0.010	0.042	0.0425	<0.0050
Nickel	D-Ni	<0.025	<0.050	<0.050	<0.010	<0.025
Selenium	D-Se	<0.0050	<0.010	<0.010	<0.0020	<0.0050
Silver	D-Ag	<0.00025	<0.00050	<0.00050	<0.00010	<0.00025
Sodium	D-Na	132	146	165	89.2	21.2
Thallium	D-Tl	<0.0010	<0.0020	<0.0020	<0.00040	<0.0010
Titanium	D-Ti	<0.050	<0.050	<0.050	<0.050	<0.050
Uranium	D-U	0.0020	<0.0020	<0.0020	<0.00040	0.0078
Vanadium	D-V	0.053	<0.030	<0.030	<0.030	<0.030
Zinc	D-Zn	0.0119	0.0089	0.0104	0.0395	0.0120

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RESULTS OF ANALYSIS - Water

Sample ID			X18B	P96-8B	TH86-17	P96-7	P03-04-01
Sample Date			05-09-10	05-09-10	05-09-10	05-09-10	05-09-10
Sample Time			12:24	17:00	15:45	16:23	10:29
ALS ID			*6*	*7*	*8*	*9*	*10*
Physical Tests							
Conductivity	(uS/cm)		826	6620	2060	2940	1880
Hardness	CaCO3		580	4080	105	2080	1110
pH			7.92	6.35	7.74	7.80	7.84
Dissolved Anions							
Alkalinity-Total		CaCO3	270	131	88.1	172	259
Sulphate	SO4		203	4980	15.8	1910	838

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File No. W4400

RESULTS OF ANALYSIS - Water

Sample ID		X18B	P96-8B	TH86-17	P96-7	P03-04-01
Sample Date		05-09-10	05-09-10	05-09-10	05-09-10	05-09-10
Sample Time		12:24	17:00	15:45	16:23	10:29
ALS ID		*6*	*7*	*8*	*9*	*10*
Dissolved Metals						
Aluminum	D-Al	<0.010	<1.0	<0.010	<0.10	<0.050
Antimony	D-Sb	<0.00050	<0.050	<0.00050	<0.0050	<0.0025
Arsenic	D-As	<0.0010	<0.10	<0.0010	<0.010	<0.0050
Barium	D-Ba	0.094	<0.040	0.063	<0.020	<0.020
Beryllium	D-Be	<0.0050	<0.010	<0.0050	<0.0050	<0.0050
Boron	D-B	<0.10	<0.20	<0.10	<0.10	<0.10
Cadmium	D-Cd	0.000278	0.0970	<0.000050	<0.00050	<0.00025
Calcium	D-Ca	172	431	30.6	605	363
Chromium	D-Cr	<0.00050	<0.050	<0.00050	<0.0050	<0.0025
Cobalt	D-Co	<0.00050	1.69	<0.00050	<0.0050	<0.0025
Copper	D-Cu	<0.0010	<0.10	<0.0010	<0.010	<0.0050
Iron	D-Fe	<0.030	9.85	0.477	<0.030	5.01
Lead	D-Pb	<0.0010	<0.10	<0.0010	<0.010	<0.0050
Lithium	D-Li	<0.050	0.20	<0.050	<0.050	<0.050
Magnesium	D-Mg	36.3	730	7.02	138	49.4
Manganese	D-Mn	1.91	90.7	<0.010	<0.010	1.44
Mercury	D-Hg	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Molybdenum	D-Mo	0.0015	<0.10	0.0013	<0.010	<0.0050
Nickel	D-Ni	0.0071	1.40	<0.0050	<0.050	<0.025
Selenium	D-Se	<0.0010	<0.10	<0.0010	<0.010	<0.0050
Silver	D-Ag	<0.000050	<0.0050	<0.000050	<0.00050	<0.00025
Sodium	D-Na	13.1	58.6	<2.0	20.5	94.8
Thallium	D-Tl	<0.00020	<0.020	<0.00020	<0.0020	<0.0010
Titanium	D-Ti	<0.050	<0.10	<0.050	<0.050	<0.050
Uranium	D-U	0.00646	<0.020	0.00075	0.0266	0.0066
Vanadium	D-V	<0.030	<0.20	<0.030	<0.040	<0.030
Zinc	D-Zn	0.0075	368	0.0135	0.0078	0.0082

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File No. W4400

RESULTS OF ANALYSIS - Water

Sample ID			P03-04-02	P03-04-03	P03-04-03R	P03-04-04	P03-04-05
Sample Date			05-09-10	05-09-10	05-09-10	05-09-10	05-09-10
Sample Time			11:02	11:25	11:29	10:08	11:45
ALS ID			*11*	*12*	*13*	*14*	*15*
Physical Tests							
Conductivity	(uS/cm)		1520	1410	1410	1410	1360
Hardness	CaCO3		1100	653	694	794	709
pH			6.97	6.92	6.90	6.85	7.18
Dissolved Anions							
Alkalinity-Total		CaCO3	110	93.9	90.6	92.8	121
Sulphate	SO4		776	715	711	702	604

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File No. W4400

RESULTS OF ANALYSIS - Water

Sample ID		P03-04-02	P03-04-03	P03-04-03R	P03-04-04	P03-04-05
Sample Date		05-09-10	05-09-10	05-09-10	05-09-10	05-09-10
Sample Time		11:02	11:25	11:29	10:08	11:45
ALS ID		*11*	*12*	*13*	*14*	*15*
Dissolved Metals						
Aluminum	D-Al	<0.050	<0.050	<0.050	<0.050	<0.050
Antimony	D-Sb	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025
Arsenic	D-As	<0.0050	<0.0050	<0.0050	<0.0050	0.0064
Barium	D-Ba	0.022	<0.020	<0.020	0.020	0.052
Beryllium	D-Be	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Boron	D-B	<0.10	<0.10	<0.10	<0.10	<0.10
Cadmium	D-Cd	0.00246	0.00055	0.00063	0.00056	<0.00025
Calcium	D-Ca	325	194	204	234	215
Chromium	D-Cr	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025
Cobalt	D-Co	0.0803	0.0636	0.0632	0.0659	0.0206
Copper	D-Cu	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Iron	D-Fe	0.156	0.371	0.393	0.494	21.7
Lead	D-Pb	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Lithium	D-Li	<0.050	<0.050	<0.050	<0.050	<0.050
Magnesium	D-Mg	70.5	41.1	45.0	51.1	42.0
Manganese	D-Mn	35.6	25.7	28.0	30.5	28.8
Mercury	D-Hg	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Molybdenum	D-Mo	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Nickel	D-Ni	0.132	0.103	0.102	0.107	<0.025
Selenium	D-Se	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Silver	D-Ag	<0.00025	<0.00025	<0.00025	<0.00025	<0.00025
Sodium	D-Na	33.3	23.3	25.8	29.4	23.9
Thallium	D-Tl	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Titanium	D-Ti	<0.050	<0.050	<0.050	<0.050	<0.050
Uranium	D-U	<0.0010	<0.0010	<0.0010	<0.0010	0.0016
Vanadium	D-V	<0.060	<0.040	<0.030	<0.080	<0.070
Zinc	D-Zn	0.0817	0.0487	0.0528	0.0569	0.0699

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File No. W4400

RESULTS OF ANALYSIS - Water

Sample ID			P03-04-06	P03-04-07	P03-04-08	P03-04-09
Sample Date			05-09-10	05-09-10	05-09-10	05-09-10
Sample Time			11:58	12:09	12:20	12:28
ALS ID			*16*	*17*	*18*	*19*
Physical Tests						
Conductivity	(uS/cm)		11600	10400	9960	7890
Hardness	CaCO3		1800	1700	1490	1470
pH			3.90	5.54	3.85	3.81
Dissolved Anions						
Alkalinity-Total		CaCO3	<2.0	51.5	51.0	2.8
Sulphate	SO4		12200	10700	10100	7500

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File No. W4400

RESULTS OF ANALYSIS - Water

Sample ID		P03-04-06	P03-04-07	P03-04-08	P03-04-09
Sample Date		05-09-10	05-09-10	05-09-10	05-09-10
Sample Time		11:58	12:09	12:20	12:28
ALS ID		*16*	*17*	*18*	*19*
Dissolved Metals					
Aluminum	D-Al	<0.50	<0.50	<0.50	<0.50
Antimony	D-Sb	<0.025	<0.025	<0.025	<0.025
Arsenic	D-As	<0.050	<0.050	<0.050	<0.050
Barium	D-Ba	<0.20	<0.20	<0.20	<0.20
Beryllium	D-Be	<0.050	<0.050	<0.050	<0.050
Boron	D-B	<1.0	<1.0	<1.0	<1.0
Cadmium	D-Cd	<0.0025	<0.0025	<0.0025	<0.0025
Calcium	D-Ca	441	448	449	489
Chromium	D-Cr	<0.025	<0.025	<0.025	<0.025
Cobalt	D-Co	<0.025	<0.025	<0.025	<0.025
Copper	D-Cu	<0.050	<0.050	<0.050	<0.050
Iron	D-Fe	6010	5320	5180	3700
Lead	D-Pb	<0.050	<0.050	<0.050	0.346
Lithium	D-Li	<0.50	<0.50	<0.50	<0.50
Magnesium	D-Mg	170	141	88.8	61.3
Manganese	D-Mn	48.2	39.2	30.8	19.1
Mercury	D-Hg	<0.00020	<0.00020	<0.00020	<0.00020
Molybdenum	D-Mo	<0.050	<0.050	<0.050	<0.050
Nickel	D-Ni	<0.25	<0.25	<0.25	<0.25
Selenium	D-Se	<0.050	<0.050	<0.050	<0.050
Silver	D-Ag	<0.0025	<0.0025	<0.0025	<0.0025
Sodium	D-Na	31	37	<20	<20
Thallium	D-Tl	<0.010	<0.010	<0.010	<0.010
Titanium	D-Ti	<0.50	<0.50	<0.50	<0.50
Uranium	D-U	<0.010	<0.010	<0.010	<0.010
Vanadium	D-V	<3.0	<2.5	<2.5	<2.0
Zinc	D-Zn	12.0	5.54	3.08	7.24

Remarks regarding the analyses appear at the beginning of this report.
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File No. W4400

Appendix 1 - QUALITY CONTROL - Replicates

Water			X18A	X18A	P03-04-01	P03-04-01
			05-09-10 11:51	QC # 463774	05-09-10 10:29	QC # 463775
Physical Tests						
Conductivity	(uS/cm)		1170	826	1880	1880
Hardness	CaCO3		821	781	1110	1240
pH			7.80	7.92	7.84	7.85
Dissolved Anions						
Alkalinity-Total		CaCO3	255	252	259	259
Sulphate	SO4		408	411	838	834

Remarks regarding the analyses appear at the beginning of this report.
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File No. W4400

Appendix 1 - QUALITY CONTROL - Replicates

Water		X18A	X18A	P03-04-01	P03-04-01
		05-09-10 11:51	QC # 463774	05-09-10 10:29	QC # 463775
Dissolved Metals					
Aluminum	D-Al	<0.050	<0.050	<0.050	<0.050
Antimony	D-Sb	<0.0025	<0.0025	<0.0025	<0.0025
Arsenic	D-As	<0.0050	<0.0050	<0.0050	<0.0050
Barium	D-Ba	0.241	0.230	<0.020	0.021
Beryllium	D-Be	<0.0050	<0.0050	<0.0050	<0.0050
Boron	D-B	<0.10	<0.10	<0.10	<0.10
Cadmium	D-Cd	<0.00025	<0.00025	<0.00025	<0.00025
Calcium	D-Ca	244	232	363	397
Chromium	D-Cr	<0.0025	<0.0025	<0.0025	<0.0025
Cobalt	D-Co	<0.0025	<0.0025	<0.0025	<0.0025
Copper	D-Cu	<0.0050	<0.0050	<0.0050	<0.0050
Iron	D-Fe	2.42	2.31	5.01	5.48
Lead	D-Pb	<0.0050	<0.0050	<0.0050	<0.0050
Lithium	D-Li	<0.050	<0.050	<0.050	<0.050
Magnesium	D-Mg	51.2	49.1	49.4	60.4
Manganese	D-Mn	0.830	0.791	1.44	1.59
Mercury	D-Hg	<0.00020	<0.00020	<0.00020	<0.00020
Molybdenum	D-Mo	<0.0050	<0.0050	<0.0050	<0.0050
Nickel	D-Ni	<0.025	<0.025	<0.025	<0.025
Selenium	D-Se	<0.0050	<0.0050	<0.0050	<0.0050
Silver	D-Ag	<0.00025	<0.00025	<0.00025	<0.00025
Sodium	D-Na	21.2	20.1	94.8	103
Thallium	D-Tl	<0.0010	<0.0010	<0.0010	<0.0010
Titanium	D-Ti	<0.050	<0.050	<0.050	<0.050
Uranium	D-U	0.0078	0.0083	0.0066	0.0067
Vanadium	D-V	<0.030	<0.030	<0.030	<0.030
Zinc	D-Zn	0.0120	0.0115	0.0082	0.0091

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

Appendix 2 - METHODOLOGY - Continued

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

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

End of Report