

TABLE 7 DISSOLVED METALS

Dissolved Metals

Dissolved Metals	Units	D.L.	CCME FAL	BC CSR AW	Sample Stations																	
					L08-124			MW08-127			MW08-128						MW08-130	MW09-152				
					08-OCT-08	08-OCT-09	09-OCT-08	08-OCT-09	14-Oct-10	08-OCT-08	08-OCT-09	11-Jul-10	3-Sep-10	Dup	14-Oct-10	Dup	07-OCT-08	26-JUN-09	Dup	08-OCT-09	Dup	14-Oct-10
Aluminum (Al)	mg/L	0.005*	0.1 ₆	-	0.0065	0.0037	15.3	0.0108	0.0116	0.0338	0.0084	0.0504	0.0335	0.0344	0.0279	0.0276	0.0077	0.0178	0.0181	0.0066	0.0245	0.0132
Antimony (Sb)	mg/L	0.0005*	-	0.20	<0.00050	<0.00010	<0.0025	0.00013	<0.00010	<0.00050	0.00011	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00050	0.00032	0.00029	0.00011	0.00012	0.00046
Arsenic (As)	mg/L	0.0005*	0.005	0.05	<0.00050	0.00038	0.0027	0.00066	0.00079	0.00233	0.00404	0.00469	0.00944	0.00905	0.00813	0.00856	0.00065	0.0018	0.00174	0.00084	0.00090	0.00030
Barium (Ba)	mg/L	0.02	-	10	0.084	0.0874	0.257	0.0496	0.117	0.143	0.107	0.204	0.195	0.199	0.185	0.187	0.401	0.016	0.0164	0.0212	0.0217	0.0463
Beryllium (Be)	mg/L	0.001*	-	0.053	<0.0010	<0.00050	<0.0050	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050
Boron (B)	mg/L	0.1	-	50	<0.10	0.050	0.31	0.067	0.017	<0.10	0.021	0.024	0.017	0.018	0.017	0.017	<0.10	0.806	0.817	0.690	0.725	<0.00050
Cadmium (Cd)	mg/L	0.000017*	0.000017	0.00001 - 0.00006 ₆	<0.000017	<0.000080	0.000206	<0.000080	<0.000017	0.000249	<0.00020	0.000041	0.000208	0.000209	0.000187	0.000193	0.000018	<0.00020	<0.0020	<0.00010	<0.00020	0.000018
Calcium (Ca)	mg/L	0.1	-	-	29.5	26.7	14.9	17.1	44.2	29.3	29.8	46.8	55.2	55.2	54.8	54.0	50.4	15.7	15.6	20.4	20.5	12.8
Chromium (Cr)	mg/L	0.001*	-	-	0.0013	<0.0030	0.0179	<0.0060	<0.00050	<0.0010	<0.0030	<0.0015	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.003	<0.0030	<0.0020	<0.0030	<0.00050
Cobalt (Co)	mg/L	0.003*	-	0.04	0.00178	0.00138	0.0057	0.00045	0.00025	0.00126	0.00043	0.00017	0.00014	0.00016	0.00017	0.00016	0.00328	<0.00020	<0.00020	0.00017	0.00017	<0.00010
Copper (Cu)	mg/L	0.001*	0.002-0.004 ₉	0.002 - 0.009 ₈	0.0046	0.00408	0.0474	0.00102	0.00059	<0.0010	0.00046	0.00025	0.00024	0.00031	<0.00050	<0.00050	0.0182	<0.00020	0.00021	0.00040	0.00062	0.01440
Iron (Fe)	mg/L	0.03	0.3	-	0.133	0.324	8.85	1.09	2.27	10.8	5.96	15.4	9.0	8.96	10.1	9.15	<0.030	0.083	0.093	0.098	0.094	0.040
Lead (Pb)	mg/L	0.0005*	0.001 - 0.007 ₁₁	0.004 - 0.016 ₁₀	<0.00050	<0.000050	0.0066	0.000141	<0.000050	<0.00050	<0.000050	<0.000050	<0.000050	0.000335	<0.000050	<0.000050	<0.00050	<0.00010	<0.00010	<0.000050	0.000052	0.000162
Lithium (Li)	mg/L	0.005	-	-	0.0194	0.0189	0.043	0.0188	0.0057	0.0152	0.0139	0.0070	0.0077	0.0074	0.0078	0.0080	0.0127	0.063	<0.061	0.0580	0.0586	0.0189
Magnesium (Mg)	mg/L	0.1	-	-	96.1	72.6	8.59	7.73	31.2	22.5	17.5	33.0	40.0	39.8	39.8	40.0	43.3	7.79	7.83	10.9	11.0	3.74
Manganese (Mn)	mg/L	0.0003*	-	-	0.0506	0.0508	0.260	0.222	0.797	0.544	0.336	0.485	0.392	0.389	0.368	0.362	0.0888	0.0255	0.0254	0.0294	0.0304	0.00075
Mercury (Hg)	mg/L	0.00002	-	0.001	<0.000020	--	<0.00010	--	<0.000010	<0.000020	--	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000020	<0.000050	<0.000050	--	--	<0.000010
Molybdenum (Mo)	mg/L	0.001*	0.073	10	0.0119	0.0281	0.0345	0.0230	0.00388	0.0194	0.0627	0.00663	0.015	0.0152	0.015	0.0157	0.0466	0.0497	0.0497	0.0382	0.0403	0.0119
Nickel (Ni)	mg/L	0.001*	0.025 - 0.15 ₁₃	0.025 - 0.15 ₁₃	0.0024	0.00208	0.0151	0.00663	0.00102	0.0027	0.00371	<0.00050	<0.00050	<0.00050	0.00057	0.00051	0.0108	<0.0010	<0.0010	0.00054	0.00071	0.00124
Potassium (K)	mg/L	2	-	-	3.4	3.5	6.6	2.7	3.6	4.2	3.0	4.3	<0.30	<0.30	4.2	4.0	3.0	3.2	3.2	3.2	3.2	<2.0
Selenium (Se)	mg/L	0.001*	0.001	0.01	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0020	<0.0020	<0.0010	<0.0010	<0.0010
Silver (Ag)	mg/L	0.00002*	0.0001	0.0005 - 0.015 ₁₄	<0.000020	0.000010	0.00133	<0.000010	0.000012	0.000031	0.000013	0.000039	0.000031	0.000037	0.000032	0.000029	<0.000020	<0.000020	<0.000020	<0.000010	<0.000010	<0.000010
Sodium (Na)	mg/L	2	-	-	10.5	8.1	72.9	58.8	6.8	23.3	36.0	0.114	4.4	4.4	4.9	4.9	13.9	147	148	112	112	36.0
Thallium (Tl)	mg/L	0.002*	0.0008	0.003	<0.00020	<0.00010	<0.0010	<0.00010	<0.00010	<0.00020	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00020	<0.00020	<0.00020	<0.00010	<0.00010	<0.00010
Tin (Sn)	mg/L	0.0005*	-	-	<0.00050	0.00014	0.0027	0.00036	<0.00010	0.00071	0.00048	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00333	<0.00020	<0.00020	0.00022	0.00022	0.00023
Titanium (Ti)	mg/L	0.01	-	1	<0.010	<0.010	0.354	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Uranium (U)	mg/L	0.0002*	-	0.30	0.0199	0.0175	0.0027	0.000918	0.00688	0.00324	0.00428	0.00470	0.0114	0.0114	0.0104	0.0113	0.00230	0.00662	0.00658	0.00764	0.00765	0.00258
Vanadium (V)	mg/L	0.001*	-	-	<0.0010	<0.0010	0.0229	<0.0010	<0.0010	<0.0010	<0.0010	0.0023	0.0011	0.0011	<0.0010	<0.0010	<0.0010	<0.0020	<0.0020	<0.0010	<0.0010	<0.0010
Zinc (Zn)	mg/L	0.005	0.03	0.075 - 2.4 ₁₅	<0.0050	0.0022	0.0327	0.0076	<0.0030	0.0090	0.0063	0.0045	<0.0010	0.0014	<0.0030	<0.0030	0.0061	<0.0020	<0.0020	0.0018	0.0031	0.0246
Chromium (VI)	mg/L	0.001	-	-	--	<0.0010	--	<0.0010	--	--	<0.0010	--	--	--	--	--	--	0.0032	0.0015	<0.0010	<0.0010	--

Notes:

1. **Bolded** and/or Underlined result implies a guideline exceedance, **Blue** indicates guidelines less than detection limits available
2. D.L. = laboratory detection limit
3. ** implies detection limit varied - '<' (less than) value implies detection limit
4. **CCME FAL** - Canadian Council of Ministers of the Environment Freshwater Aquatic Life guidelines (December 2007)
5. **BC CSR AW** - British Columbia Contaminated Sites Regulation Aquatic Life Guidelines; provided for comparison only
6. Aluminum guideline is 100 µg/L when pH≥ 6.5
7. Cadmium guideline:
0.1 µg/L when [CaCO3] is 0 - 30 mg/L
0.3 µg/L when [CaCO3] is 30 - 90 mg/L
0.5 µg/L when [CaCO3] is 90 - 150 mg/L
0.6 µg/L when [CaCO3] is > 150 mg/L
8. Copper guideline:
2 µg/L when [CaCO3] is 0 - 50 mg/L
3 µg/L when [CaCO3] is 50 - 75 mg/L
4 µg/L when [CaCO3] is 75 - 100 mg/L
5 µg/L when [CaCO3] is 100 - 125 mg/L
6 µg/L when [CaCO3] is 125 - 150 mg/L
7 µg/L when [CaCO3] is 150 - 175 mg/L
8 µg/L when [CaCO3] is 175 - 200 mg/L
9 µg/L when [CaCO3] is > 200 mg/L
9. Copper guideline:
2 µg/L when [CaCO3] is 0 - 120 mg/L
3 µg/L when [CaCO3] is 120 - 180 mg/L
4 µg/L when [CaCO3] is > 180 mg/L
10. Lead guideline:
4 µg/L when [CaCO3] is 0 - 50 mg/L
5 µg/L when [CaCO3] is 50 - 100 mg/L
6 µg/L when [CaCO3] is 100 - 200 mg/L
110 µg/L when [CaCO3] is 200 - 300 mg/L
160 µg/L when [CaCO3] is > 300 mg/L
11. Lead guideline:
1 µg/L when [CaCO3] is 0 - 60 mg/L
2 µg/L when [CaCO3] is 60 - 120 mg/L
4 µg/L when [CaCO3] is 120 - 180 mg/L
7 µg/L when [CaCO3] is > 180 mg/L
12. Manganese guideline:
1 µg/L when [CaCO3] is 0 - 60 mg/L
2 µg/L when [CaCO3] is 60 - 120 mg/L
4 µg/L when [CaCO3] is 120 - 180 mg/L
7 µg/L when [CaCO3] is > 180 mg/L
13. Nickel guideline:
25 µg/L when [CaCO3] is 0 - 60 mg/L
65 µg/L when [CaCO3] is 60 - 120 mg/L
110 µg/L when [CaCO3] is 120 - 180 mg/L
150 µg/L when [CaCO3] is > 180 mg/L
14. Silver guideline:
0.5 µg/L when [CaCO3] < 100 mg/L
15 µg/L when [CaCO3] > 100 mg/L
15. Zinc guideline:
7.5 µg/L when [CaCO3] is 0 - 90 mg/L
15 µg/L when [CaCO3] is 90 - 100 mg/L
90 µg/L when [CaCO3] is 100 - 200 mg/L
165 µg/L when [CaCO3] is 200 - 300 mg/L
240 µg/L when [CaCO3] is > 300 mg/L
- *

TABLE 8: SUMMARY OF GROUNDWATER PARAMETERS

Monitoring Well	TDS (mg/L)	EC (μ S/cm)	pH	Hydrogeochemical Facies	Exceeds CSR and/ or CCME Guidelines
L08-124	274 – 422	460 – 738	8.10 – 8.25	Magnesium-Calcium-Carbonate	Aluminum, Cadmium, Copper, Iron, Silver
MW08-127	240 – 487	404 – 878	6.86 – 8.16	Sodium -Calcium-Carbonate-Sulphate	Aluminum, Cadmium, Copper, Iron, Lead, Silver
MW08-128	230 – 335	367 – 482	7.41 – 7.90	Sodium/Magnesium-Calcium-Magnesium/Sodium-Carbonate	Aluminum, Arsenic, Cadmium, Iron, Silver
MW08-130	331 – 335	557 – 558	8.10 - 8.21	Magnesium-Calcium-Carbonate	Aluminum, Cadmium, Copper, Iron, Silver
MW09-152	388 – 464	587 – 721	8.17 – 8.56	Sodium -Calcium-Carbonate-Chlorate	n.a.

Notes:

TDS – Total Dissolved Solids

EC – Electrical Conductivity

mg/L – milligram per liter

 μ S/cm – microsiemen pre centimetre

n.a. –data not available (total metals not collected)

APPENDIX D

Results from Hydraulic Tests



Stantec
4370 Dominion St
Burnaby, BC

Stantec

Slug Test Analysis Report

Project: Thor Lake

Number: 1036222.02

Client: Avalon Ventures

Location: Thor Lake, NT

Slug Test: L08-123

Test Well: L08-123

Test conducted by: JT

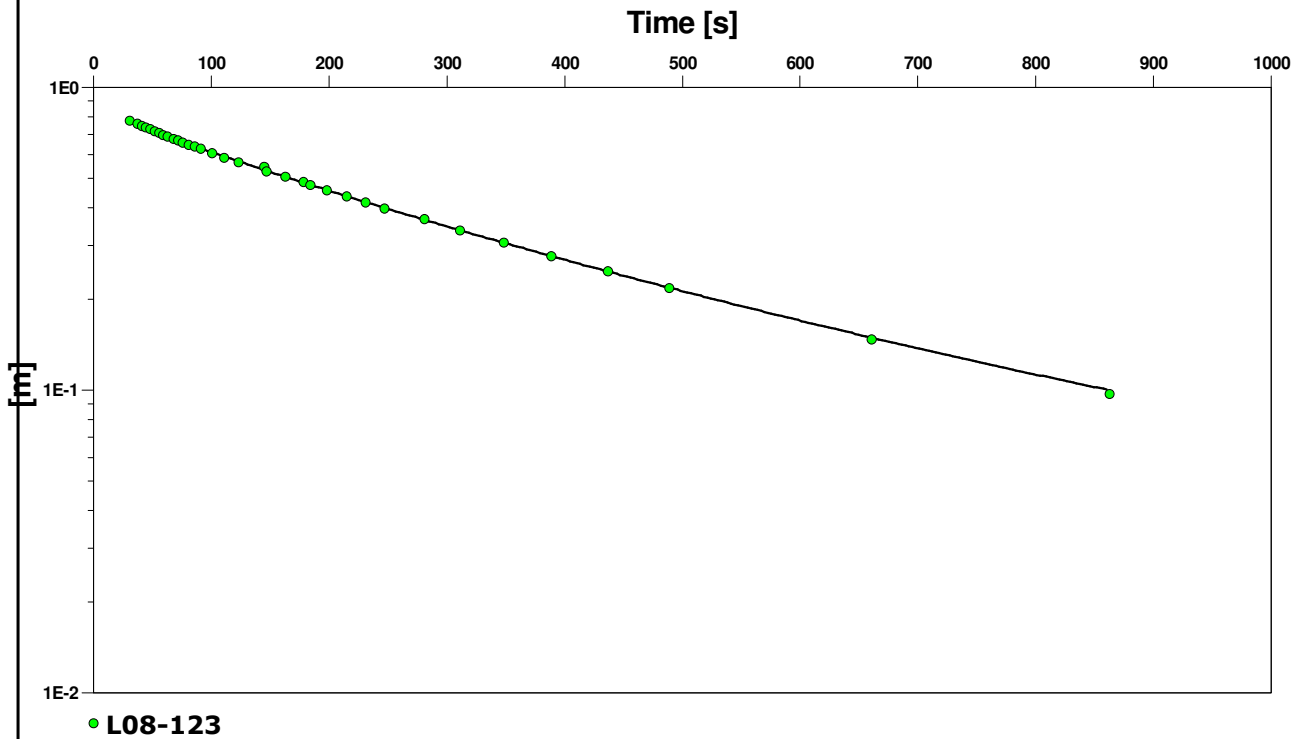
Test date: 8/10/2008

Analysis performed by: JT

MW08-128 Cooper et al.

Date: 11/26/2009

Aquifer Thickness: 207.00 m



Calculation after Cooper-Bredehoeft-Papadopoulos

Observation well	Transmissivity [m ² /s]	K [m/s]	Well-bore storage coefficient
L08-123	1.25×10^{-5}	6.06×10^{-8}	4.28×10^{-5}



Stantec
4370 Dominion St
Burnaby, BC

Stantec

Slug Test Analysis Report

Project: Thor Lake

Number: 1036222.02

Client: Avalon Ventures

Location: Thor Lake, NT

Slug Test: L08-123

Test Well: L08-123

Test conducted by: JT

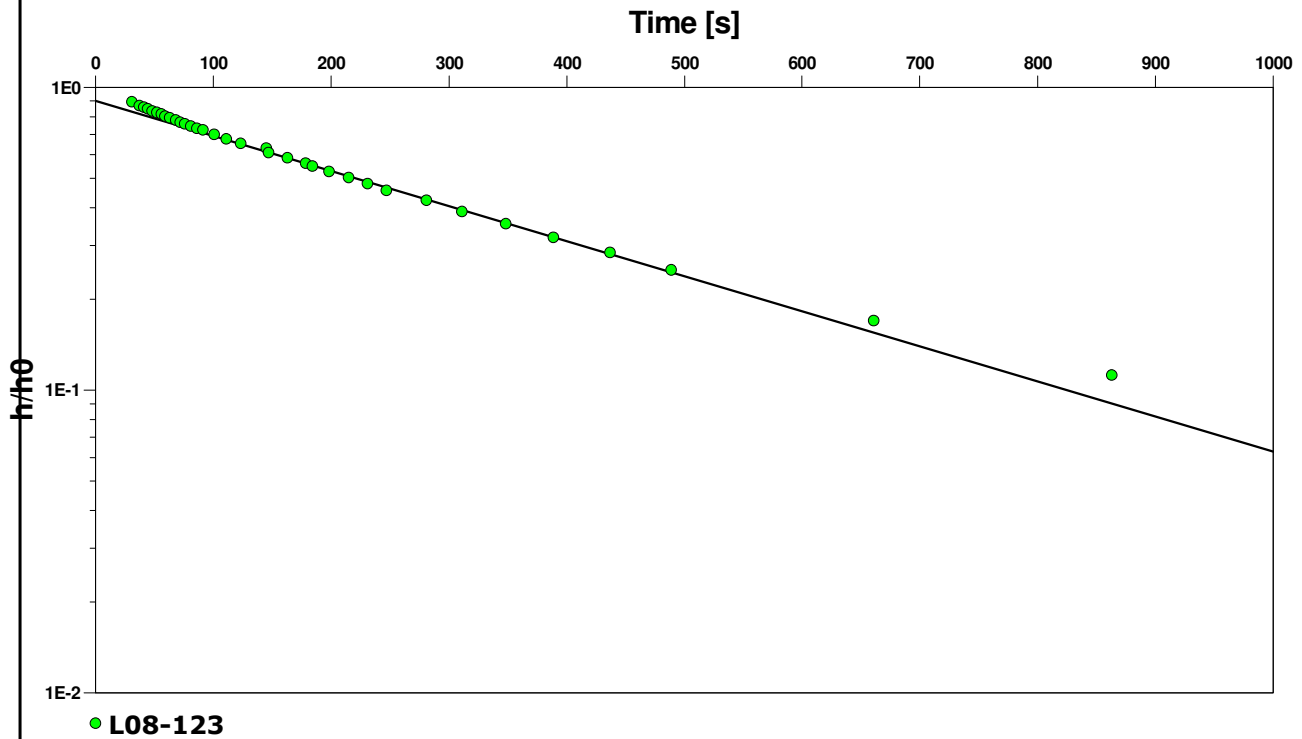
Test date: 8/10/2008

Analysis performed by: JT

MW08-128 Hvorslev

Date: 12/1/2009

Aquifer Thickness: 207.00 m



Calculation after Hvorslev

Observation well

K

[m/s]

L08-123

8.35×10^{-8}



Stantec
4370 Dominion St
Burnaby, BC

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Slug Test Analysis Report

Project: Thor Lake

Number: 1036222.02

Client: Avalon Ventures

Location: Thor Lake, NT

Slug Test: L08-123

Test Well: L08-124

Test conducted by: JT

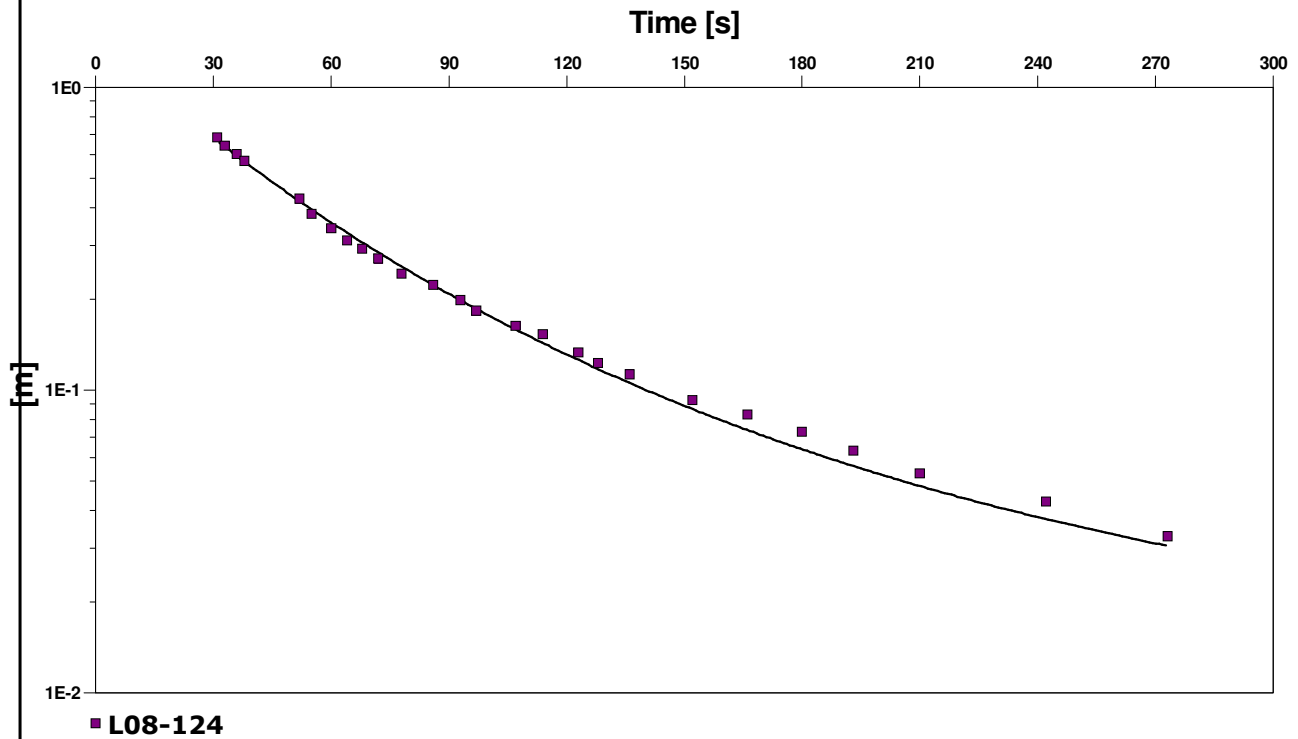
Test date: 8/10/2008

Analysis performed by: JT

MW08-128 Cooper et al.

Date: 11/26/2009

Aquifer Thickness: 198.00 m



Calculation after Cooper-Bredehoeft-Papadopoulos

Observation well	Transmissivity [m ² /s]	K [m/s]	Well-bore storage coefficient
L08-124	1.02×10^{-4}	5.17×10^{-7}	9.73×10^{-5}



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Slug Test Analysis Report

Project: Thor Lake

Number: 1036222.02

Client: Avalon Ventures

Location: Thor Lake, NT

Slug Test: L08-123

Test Well: L08-124

Test conducted by: JT

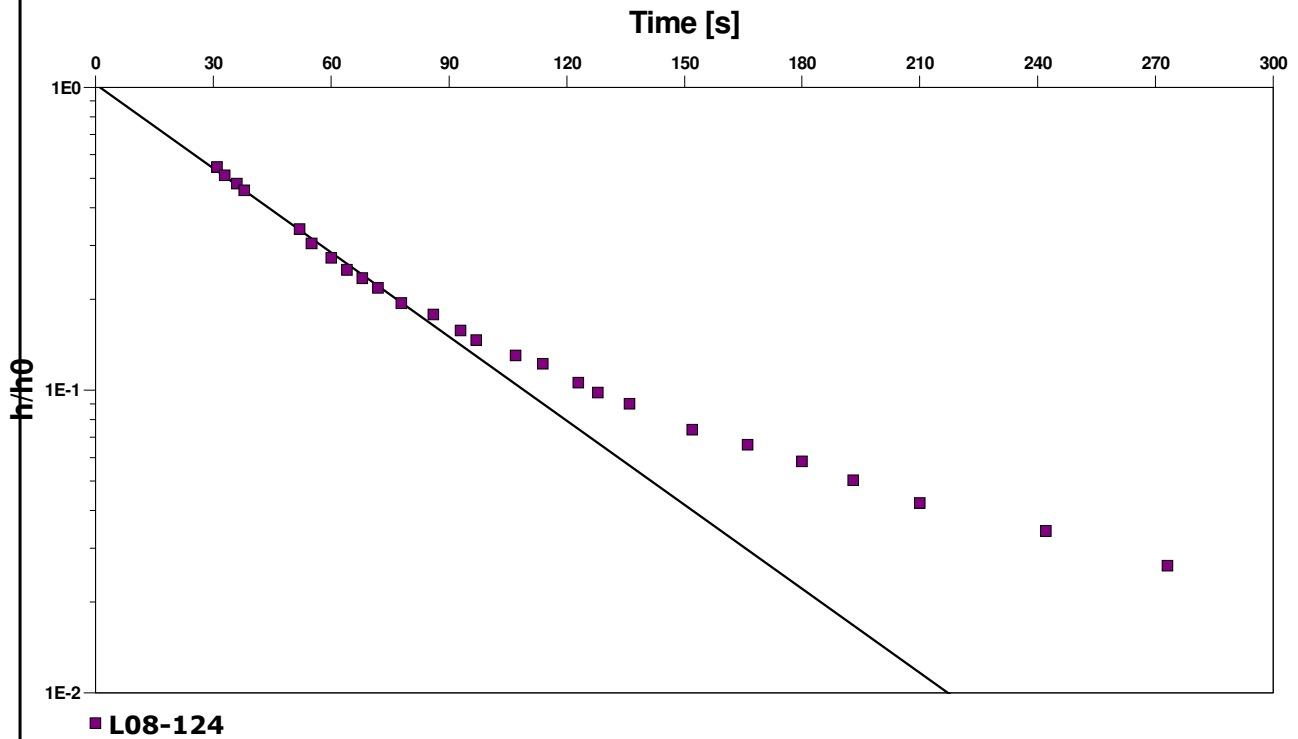
Test date: 8/10/2008

Analysis performed by: JT

MW08-128 Hvorslev

Date: 12/1/2009

Aquifer Thickness: 198.00 m



Calculation after Hvorslev

Observation well

K

[m/s]

L08-124

6.88×10^{-7}



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Slug Test Analysis Report

Project: Thor Lake

Number: 1036222.02

Client: Avalon Ventures

Location: Thor Lake, NT

Slug Test: MWL08-127

Test Well: MWL08-127

Test conducted by: JT

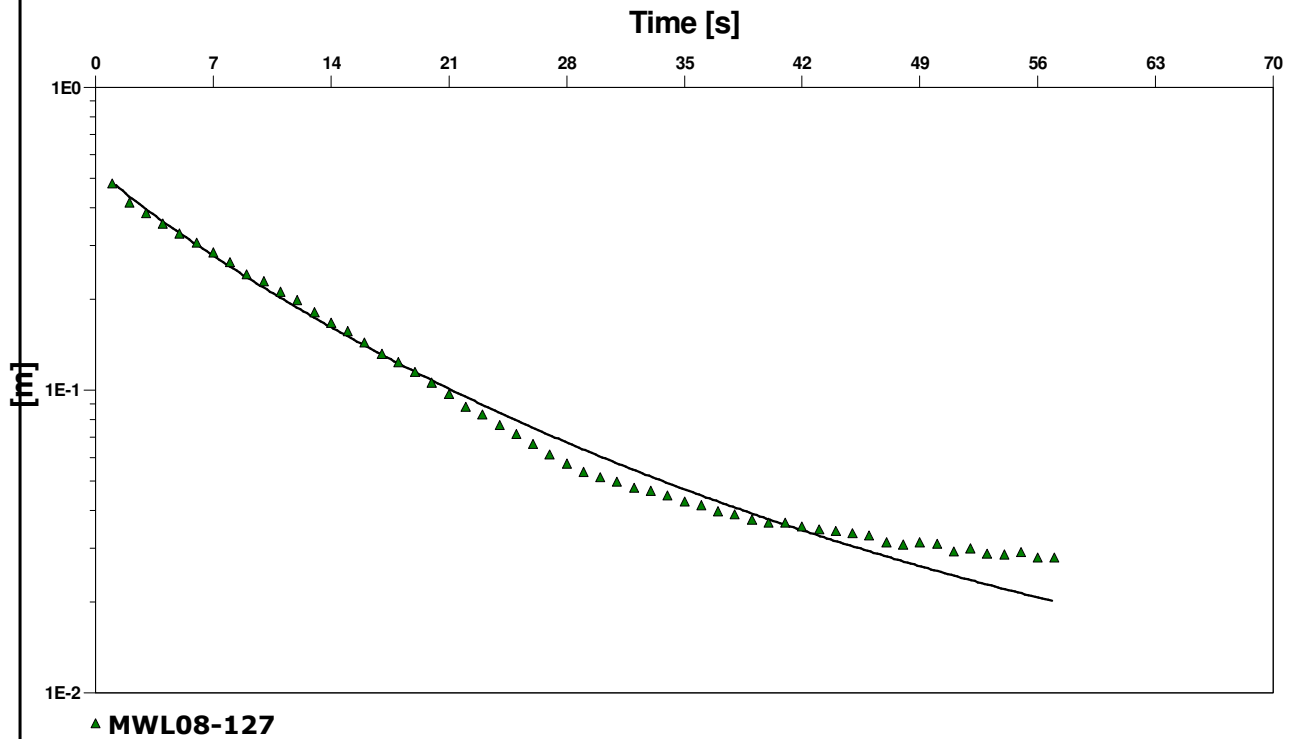
Test date: 8/13/2008

Analysis performed by: JT

MW08-128 Cooper et al.

Date: 11/26/2009

Aquifer Thickness: 200.00 m



Calculation after Cooper-Bredehoeft-Papadopoulos

Observation well	Transmissivity [m ² /s]	K [m/s]	Well-bore storage coefficient
MWL08-127	1.51×10^{-4}	7.56×10^{-7}	1.63×10^{-4}



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Slug Test Analysis Report

Project: Thor Lake

Number: 1036222.02

Client: Avalon Ventures

Location: Thor Lake, NT

Slug Test: MWL08-127

Test Well: MWL08-127

Test conducted by: JT

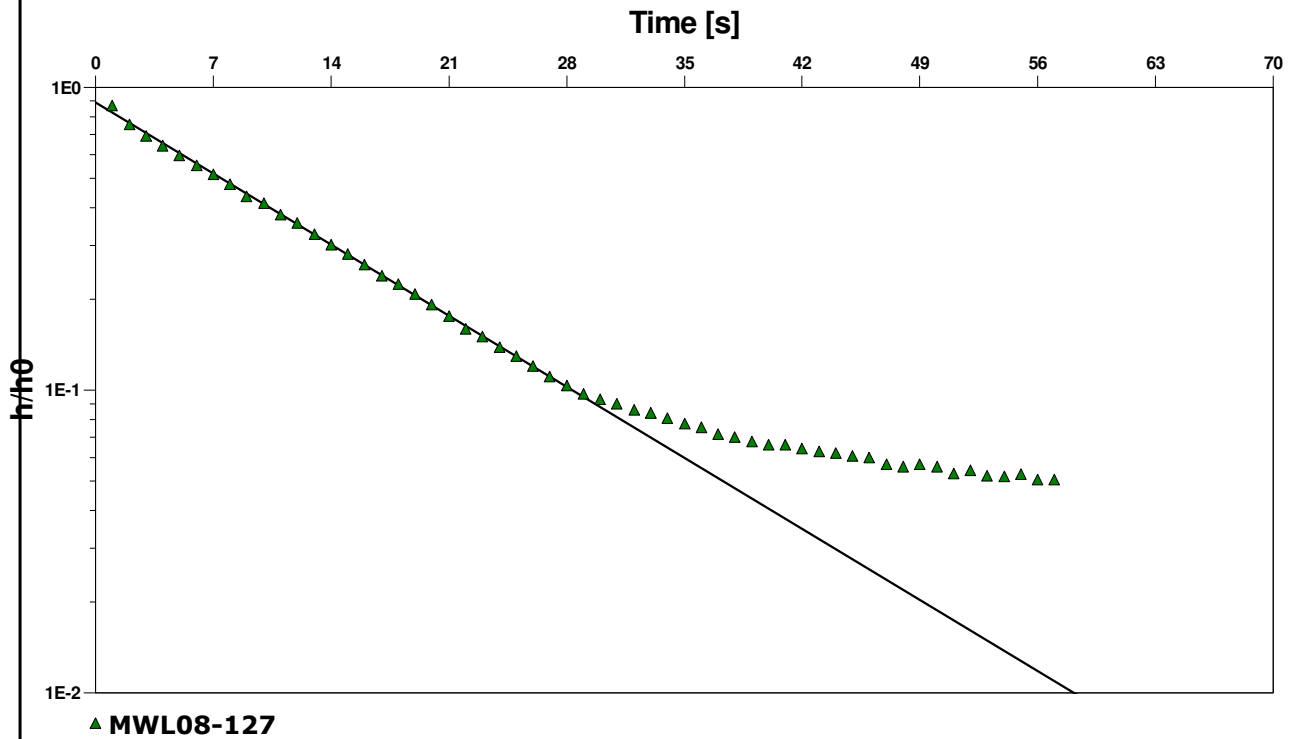
Test date: 8/13/2008

Analysis performed by: JT

MW08-128 Hvorslev

Date: 12/1/2009

Aquifer Thickness: 200.00 m



Calculation after Hvorslev

Observation well

K

[m/s]

MWL08-127

1.56×10^{-5}



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Slug Test Analysis Report

Project: Thor Lake

Number: 1036222.02

Client: Avalon Ventures

Location: Thor Lake, NT

Slug Test: MWL08-127

Test Well: MWL08-127

Test conducted by: JT

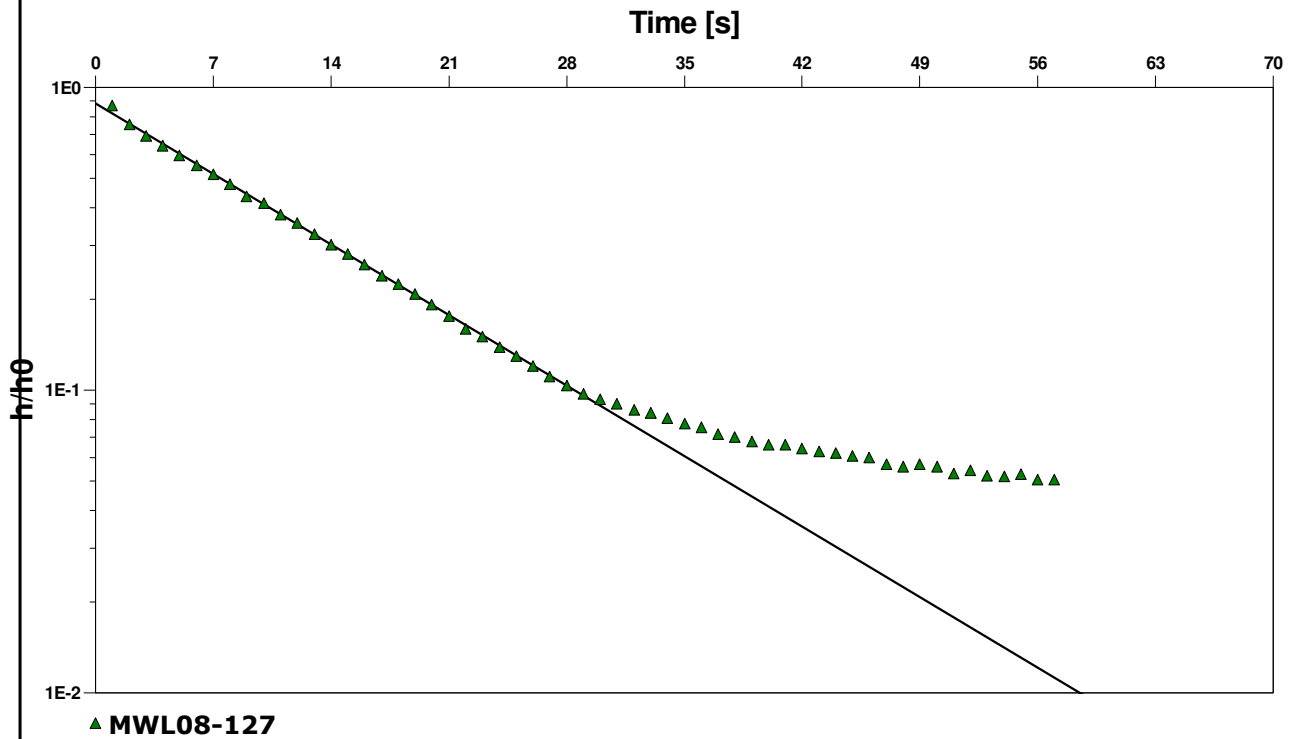
Test date: 8/13/2008

Analysis performed by: JT

MW08-128 B&R

Date: 12/1/2009

Aquifer Thickness: 200.00 m



Calculation after Bouwer && Rice

Observation well

K

[m/s]

MWL08-127

1.03×10^{-5}



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Slug Test Analysis Report

Project: Thor Lake

Number: 1036222.02

Client: Avalon Ventures

Location: Thor Lake, NT

Slug Test: MWL08-128

Test Well: MWL08-128

Test conducted by: JT

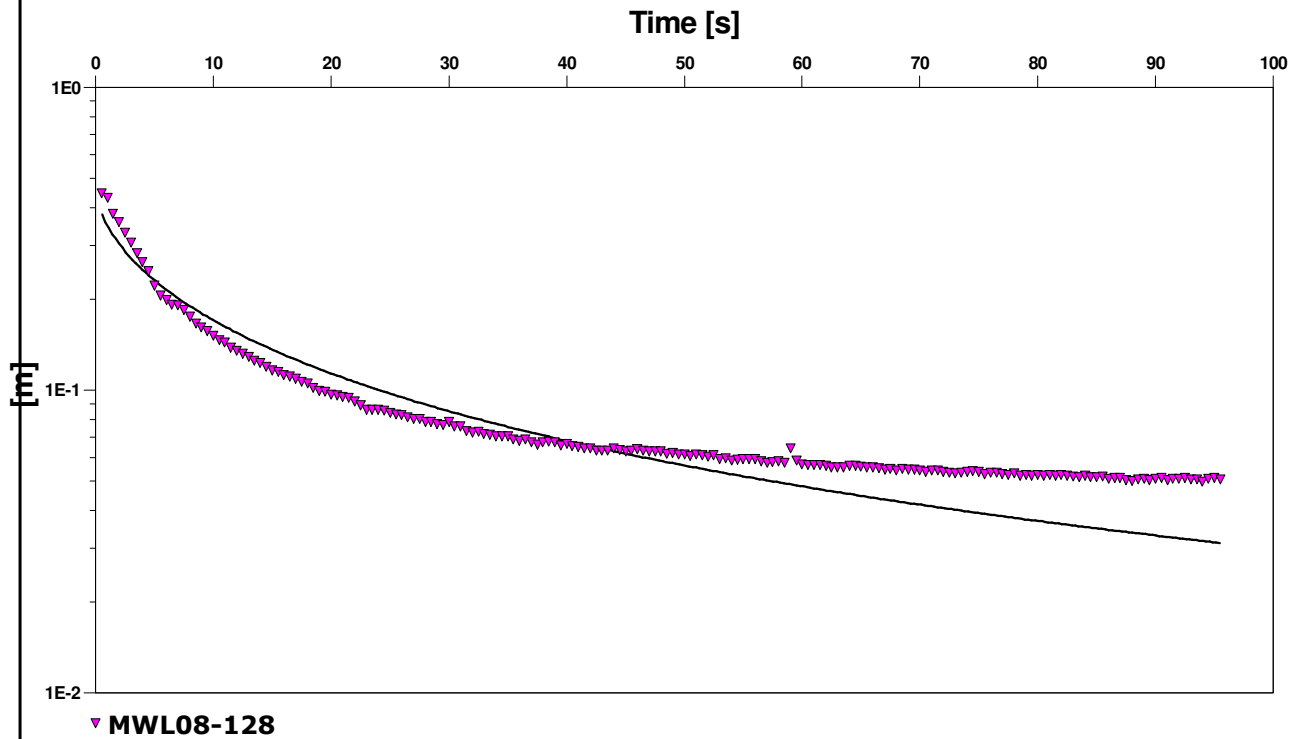
Test date: 9/23/2008

Analysis performed by: JT

MWL08-128 Cooper et al.

Date: 11/26/2009

Aquifer Thickness: 10.30 m



Calculation after Cooper-Bredehoeft-Papadopoulos

Observation well	Transmissivity [m ² /s]	K [m/s]	Well-bore storage coefficient
MWL08-128	2.72×10^{-5}	2.64×10^{-6}	5.00×10^{-1}



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Slug Test Analysis Report

Project: Thor Lake

Number: 1036222.02

Client: Avalon Ventures

Location: Thor Lake, NT

Slug Test: MWL08-128

Test Well: MWL08-128

Test conducted by: JT

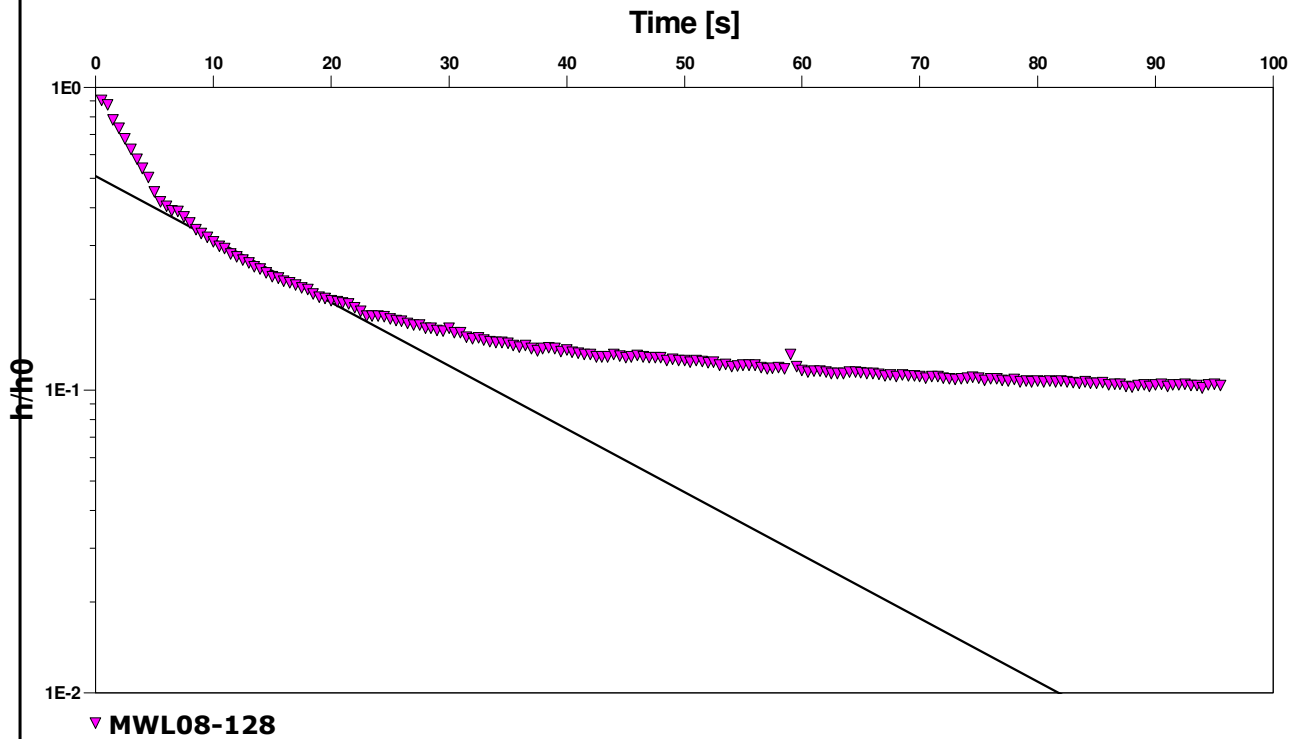
Test date: 9/23/2008

Analysis performed by: JT

MW08-128 Hvorslev

Date: 12/1/2009

Aquifer Thickness: 10.30 m



Calculation after Hvorslev

Observation well

K

[m/s]

MWL08-128

3.08×10^{-5}



Stantec
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Slug Test Analysis Report

Project: Thor Lake

Number: 1036222.02

Client: Avalon Ventures

Location: Thor Lake, NT

Slug Test: MWL08-128

Test Well: MWL08-128

Test conducted by: JT

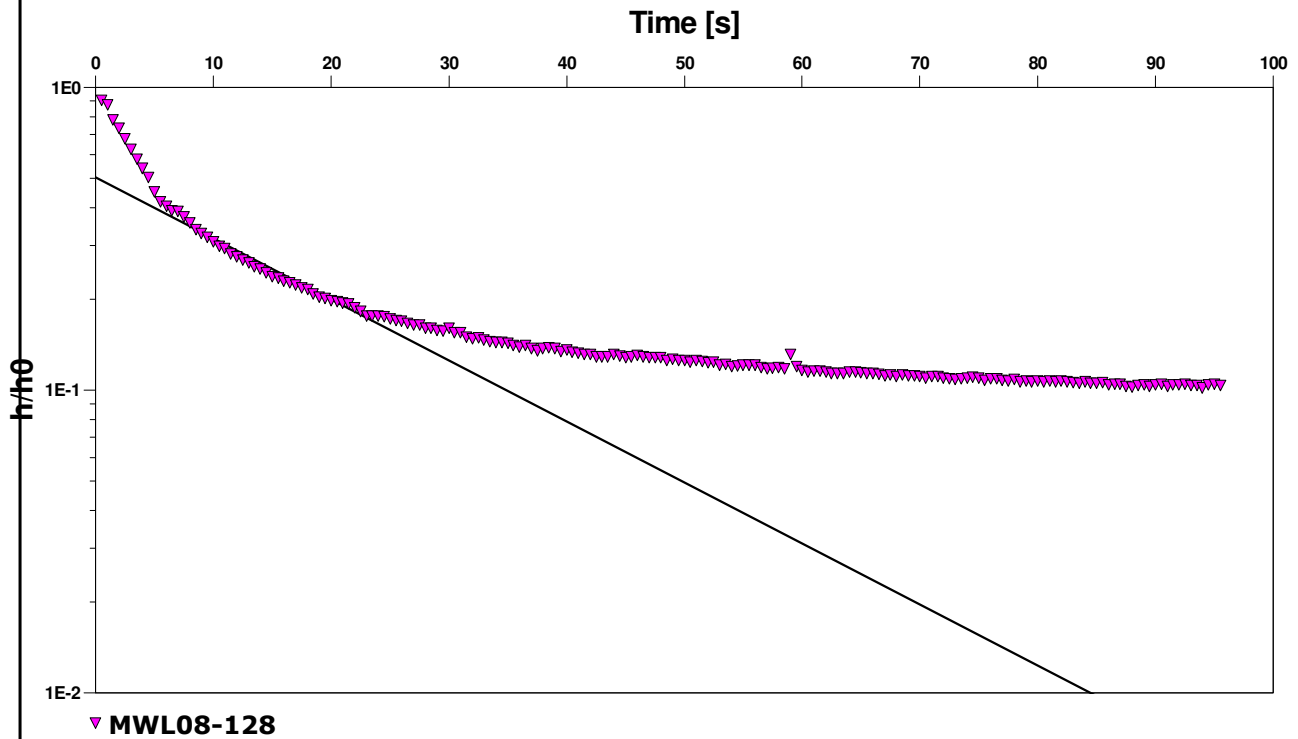
Test date: 9/23/2008

Analysis performed by: JT

MW08-128 B&R

Date: 12/1/2009

Aquifer Thickness: 10.30 m



Calculation after Bouwer & Rice

Observation well

K

[m/s]

MWL08-128

2.30×10^{-5}



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Slug Test Analysis Report

Project: Thor Lake

Number: 1036222.02

Client: Avalon Ventures

Location: Thor Lake, NT

Slug Test: MWL08-130

Test Well: MWL08-130

Test conducted by: JT

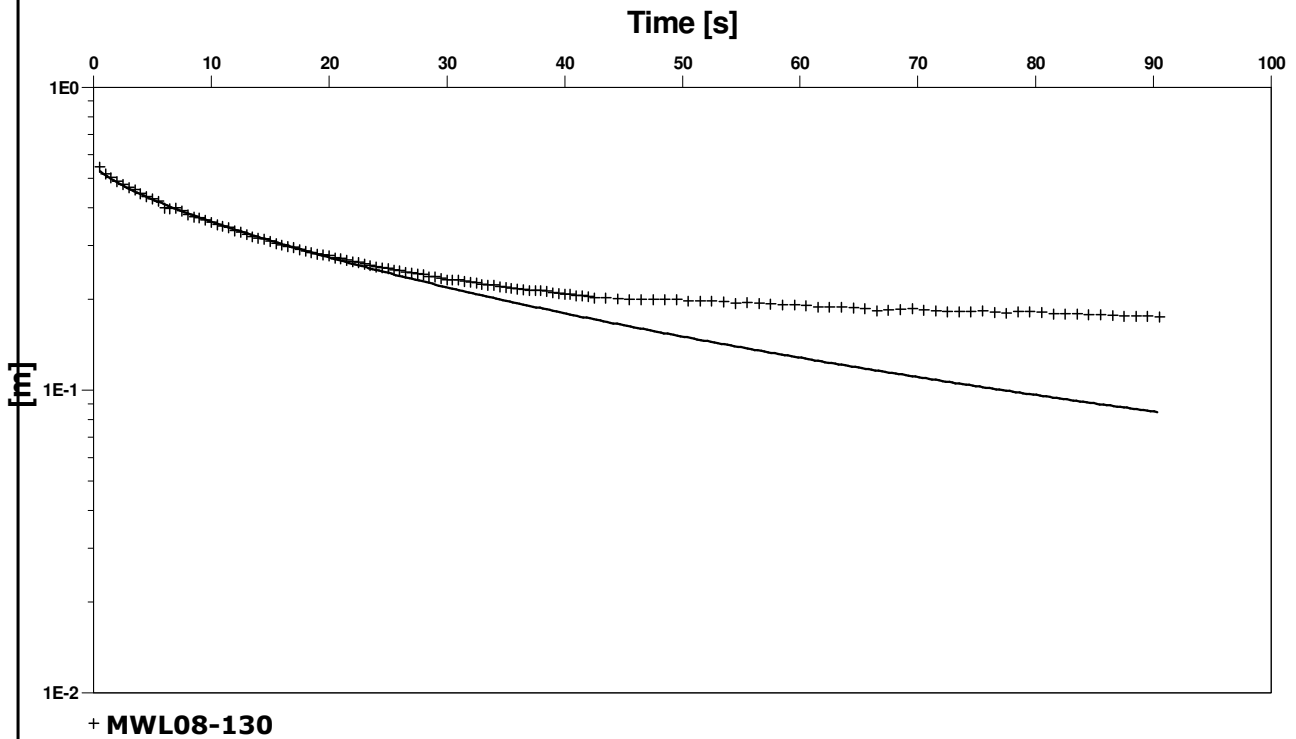
Test date: 9/23/2008

Analysis performed by: JT

MW08-128 Cooper et al.

Date: 11/26/2009

Aquifer Thickness: 13.70 m



Calculation after Cooper-Bredehoeft-Papadopoulos

Observation well	Transmissivity [m ² /s]	K [m/s]	Well-bore storage coefficient
MWL08-130	2.12×10^{-5}	1.55×10^{-6}	3.57×10^{-2}



Stantec
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Slug Test Analysis Report

Project: Thor Lake

Number: 1036222.02

Client: Avalon Ventures

Location: Thor Lake, NT

Slug Test: MWL08-130

Test Well: MWL08-130

Test conducted by: JT

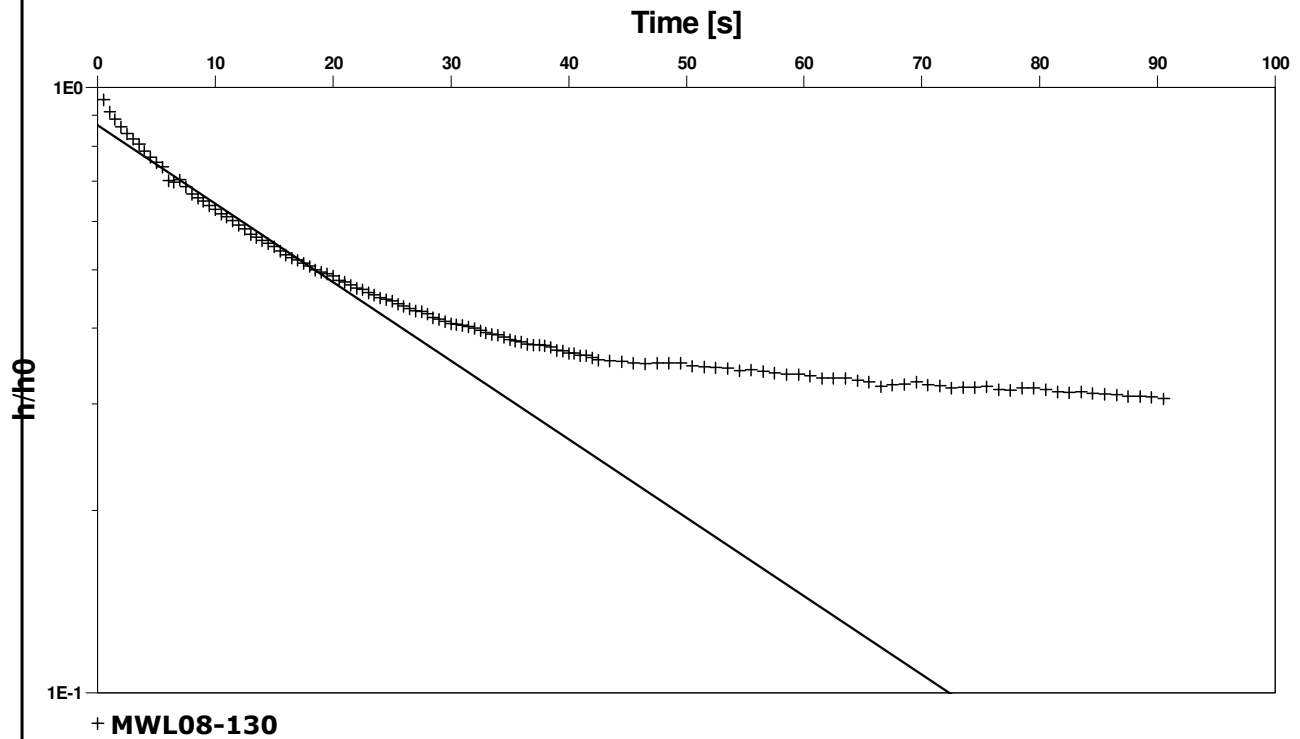
Test date: 9/23/2008

Analysis performed by: JT

MW08-128 Hvorslev

Date: 12/1/2009

Aquifer Thickness: 13.70 m



Calculation after Hvorslev

Observation well

K

[m/s]

MWL08-130

1.04×10^{-5}



Stantec
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Burnaby, BC

Stantec

Slug Test Analysis Report

Project: Thor Lake

Number: 1036222.02

Client: Avalon Ventures

Location: Thor Lake, NT

Slug Test: MWL08-130

Test Well: MWL08-130

Test conducted by: JT

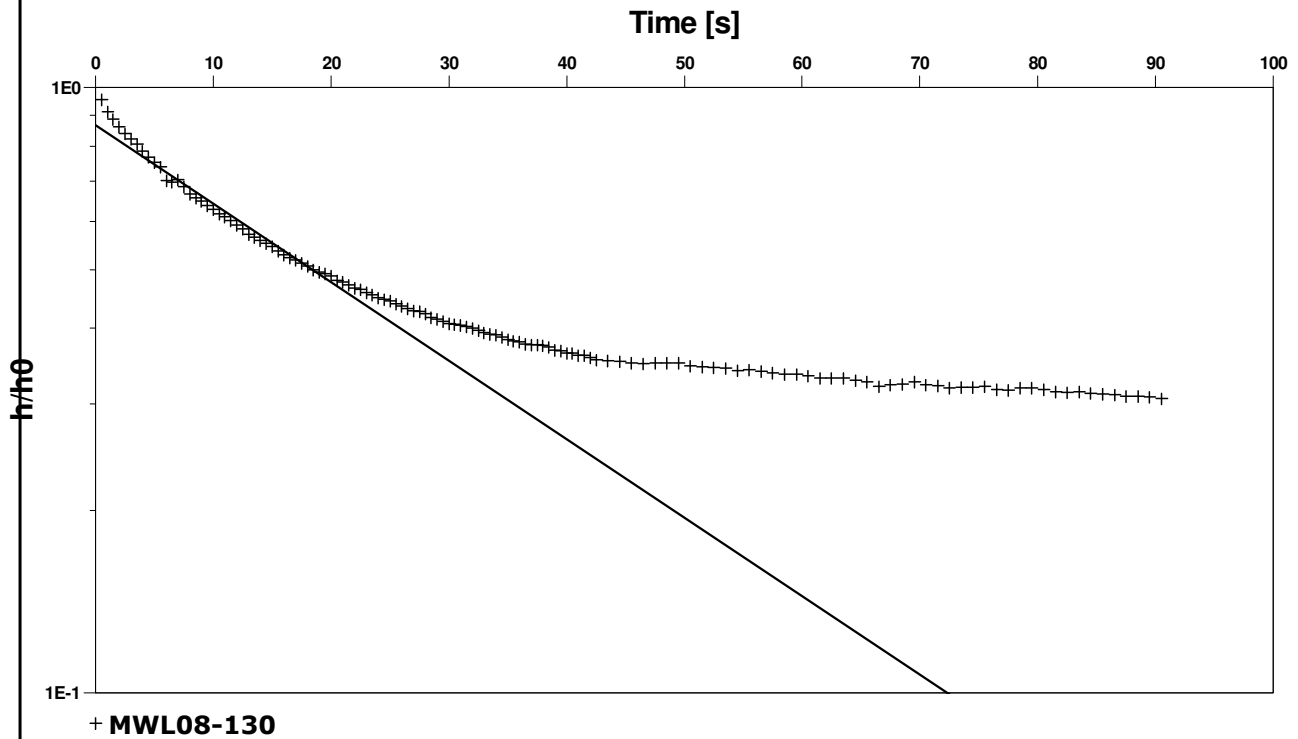
Test date: 9/23/2008

Analysis performed by: JT

MW08-128 B&R

Date: 12/1/2009

Aquifer Thickness: 13.70 m



Calculation after Bouwer & Rice

Observation well

K

[m/s]

MWL08-130

8.09×10^{-6}

Hole #	<u>L09-152</u>
Design Test Interval:	<u>410' - 636' = 225'</u>
Test #:	<u>1</u>

Step	P (psi)	Pi (m)	gal/min	Q (m3/s)	R (m)	rb (m)	T (m2/d)	68.5
1	25	18.635	1.6	0.000101	5	0.038	4.21E-06	6.15E-08 m/s
2	50	36.21	2.4	0.000151	5	0.038	3.25E-06	4.74E-08 m/s
3	75	53.785	3	0.000189	5	0.038	2.73E-06	3.99E-08 m/s
4	100	71.36	3.3	0.000208	5	0.038	2.27E-06	3.31E-08 m/s
3b	75	53.785	2.4	0.000151	5	0.038	2.19E-06	3.19E-08 m/s
2b	50	36.21	1.6	0.000101	5	0.038	2.17E-06	3.16E-08 m/s

Client: Avalon
 Project: Thor Lake
 Project #: 1036222
 Personnel: JT

Collar E.L.: 1.06 m
 Trend:
 Plunge:
 Date: 25-Mar-09

Hole # L09-152
 Design Test Interval: 300'
 Test #: 3

Measurements:

Depth to WT: 3.3 m.b. t.o.p
 Top of Packer Interval:
 Bottom of Packer 311'
 Interval (or Bottom of hole): 626'
 Packer Int. Midpoint
 (double packer): //
 Water Flushed:
 (Vol./Time/Until Clean): clean
 Packer Inflation Pressure: 500 psi
 Stickup Height:
 Borehole Outside Diametric: NQ 3"
 Packer Pipe ID / or
 Drill Rod ID:

Measurement Units

Volume: gal
 Pressure: psi
 Length: ft

Time

Start Packer Testing:
 Start Flushing:
 End Flushing:
 End Packer Testing:

Pressure Interval

Minutes	Pressure	Volume	Δ Volume
0	20	0	-
1	20	2	2
2	20	3	1
3	20	4.8	1.8
4	20	7.7	2.9
5	20	9.5	1.8
6	20	11.3	1.8
7	20	13.1	1.8
0	40	0	-
1	40	2.9	2.9
2	40	5.8	2.9
3	40	8.7	2.9
0	60	0	-
1	60	3.7	3.7
2	60	7.3	3.6
3	60	10.9	3.6
4	60	14.3	3.4
5	60	17.8	3.5
6	60	20.8	3
7	60	23.8	3
8	60	26.8	3
0	80	0	-
1	80	3.7	3.7
2	80	7.3	3.6
3	80	10.8	3.5
4	80	14.3	3.5
5	80	17.8	3.5
0	100	0	-
1	100	3.7	3.7
2	100	7.5	3.8
3	100	11	3.5
4	100	14.7	3.7
5	100	18.4	3.7
6	100	22	3.6
7	100	25.6	3.6
8	100	29.2	3.6

Pressure Interval

Minutes	Pressure	Volume	Δ Volume
0	120	0	-
1	120	4	4
2	120	7.9	3.9
3	120	11.7	3.8
4	120	15.2	3.5
5	120	18.7	3.5
6	120	22.2	3.5
7	120		
8	120	29.1	6.9
0	180	0	-
1	180	5.3	5.3
2	180	10.6	5.3
3	180	15.9	5.3
0	120	0	-
1	120	4	4
2	120	7.3	3.3
3	120	10.6	3.3
4	120	14.1	3.5
5	120	17.3	3.2
6	120	20.5	3.2
7	120	23.7	3.2
0	100	0	-
1	100	2.9	2.9
2	100	5.6	2.7
3	100	8.4	2.8
4	100	11.2	2.8
5	100	14	2.8
0	80	0	-
1	80	2.5	2.5
2	80	4.9	2.4
3	80	7.4	2.5
4	80	9.9	2.5
5	80	12.4	2.5

$$P_i = P_g + h_g + h_s - h_f$$

P_g = gauge pressure (m)
 h_g = height of gauge above ground level (m)
 h_s = depth to pre-test water level (m)
 h_f = frictional losses (m)

$$K = T/b$$

Step	P (psi)	P_i (m)	gal/min	Q (m3/s)	R (m)	r_b (m)	T (m2/d)	96
1	20	15.12	1.8	0.000114		5	0.038	5.84E-06
2	40	29.18	2.9	0.000183		5	0.038	4.87E-06
3	60	43.24	3	0.000189		5	0.038	3.40E-06
4	80	57.3	3.5	0.000221		5	0.038	2.99E-06
5	100	71.36	3.6	0.000227		5	0.038	2.47E-06
6	120	85.42	3.5	0.000221		5	0.038	2.01E-06
7	180	127.6	5.3	0.000334		5	0.038	2.04E-06
6a	120	85.42	3.2	0.000202		5	0.038	1.84E-06
5a	100	71.36	2.8	0.000177		5	0.038	1.92E-06
4a	80	57.3	2.5	0.000158		5	0.038	2.14E-06

ID	L09-152
Test Interval:	415 ft
Test #:	4

Depth to WT:	3.3 m
Top of Packer Interval:	211'
Bottom of Packer	
Interval (or Bottom of hole):	626'
Packer Int. Midpoint	
(double packer):	//
Water Flushed:	
(Vol./Time/Until Clean):	clean
Borehole Outside Diametric:	NQ 3"

Volume: gal

Pressure: psi

Length: ft

Minutes	Pressure	Volume	Δ Volume
0	20	0	-
1	20	2.7	2.7
2	20	5.3	2.6
3	20	7.8	2.5
4	20	10.2	2.4
5	20	12.6	2.4
6	20	14.9	2.3
7	20	17.3	2.4
0	40	0	-
1	40	3.8	3.8
2	40	7.5	3.7
3	40	11.3	3.8
4	40	15	3.7
5	40	18.7	3.7
6	40	22.4	3.7
0	60	0	-
1	60	4.8	4.8
2	60	9.7	4.9
3	60	14.6	4.9
4	60	19.5	4.9
0	80	0	-
1	80	6.3	6.3
2	80	12.5	6.2
3	80	18.7	6.2
4	80	24.9	6.2
0	100	0	-
1	100	8.4	8.4
2	100	16.5	8.1
3	100	24.6	8.1
4	100	32.7	8.1

[illegible]

P_g = gauge pressure (m)
 h_g = height of gauge above ground level (m)
 h_s = depth to pre-test water level (m)
 h_f = frictional losses (m)

Step	P (psi)	Pi (m)	gal/min	Q (m3/s)	R (m)	rb (m)	T (m2/d)	126.5
1	20	15.12	2.4	0.000151	5	0.038	7.78E-06	6.15E-08
2	40	29.18	3.7	0.000233	5	0.038	6.22E-06	4.91E-08
3	60	43.24	4.9	0.000309	5	0.038	5.56E-06	4.39E-08
4	80	57.3	6.2	0.000391	5	0.038	5.31E-06	4.19E-08
5	100	71.36	8.1	0.000511	5	0.038	5.57E-06	4.40E-08
6	120	85.42	8	0.000505	5	0.038	4.59E-06	3.63E-08
6a	100	71.36	6.9	0.000435	5	0.038	4.74E-06	3.75E-08
5a	80	57.3	5.3	0.000334	5	0.038	4.53E-06	3.58E-08
4a	60	43.24	4.6	0.00029	5	0.038	5.22E-06	4.12E-08

Collar E.I.: 1.06 m
Trend: _____
Plunge: _____
Date: 25-Mar-09

Measurements:

Pressure Interval

[illegible]

Measurement Units

Volume: gal

Pressure: psi

Length: ft

Time

Start Packer Testing: _____

Start Flushing: _____

End Flushing: _____

End Packer Testing: _____

$$P_i = P_g + h_g + h_s - h_f$$

P_g = gauge pressure (m)
 h_g = height of gauge above ground level (m)
 h_s = depth to pre-test water level (m)
 h_f = frictional losses (m)

$$K = T/b$$

Step	P (psi)	Pi (m)	Q (gal/min)	Q (m3/s)	R (m)	rb (m)	T (m2/d)	3
1	20	15.12	0	0	5	0.038	0	0.00E+00
2	40	29.18	0.4	2.52E-05	5	0.038	6.72E-07	2.24E-07
3	60	43.24	1.2	7.57E-05	5	0.038	1.36E-06	4.54E-07
4	80	57.3	1.4	8.83E-05	5	0.038	1.2E-06	3.99E-07
5	100	71.36	2	1.26E-04	5	0.038	1.37E-06	4.58E-07
4a	80	57.3	1.4	8.83E-05	5	0.038	1.2E-06	3.99E-07
3a	60	43.24	1.2	7.57E-05	5	0.038	1.36E-06	4.54E-07
2a	40	29.18	0.7	4.42E-05	5	0.038	1.18E-06	3.92E-07

Hole #	L09-152
Design Test Interval:	10 ft
Test #:	6

Start Packer Testing: _____
 Start Flushing: _____
 End Flushing: _____
 End Packer Testing: _____

Step	P (psi)	Pi (m)	Gal/Min	Q (m3/s)	R (m)	rb (m)	T (m2/d)	3
1	20	17.8	1.2	0.00007572	10	0.0379	3.78E-06	1.26E-06 m/s
2	40	31.86	2.9	0.00018299	10	0.0379	5.10E-06	1.70E-06 m/s
3	60	45.92	3.7	0.00023347	10	0.0379	4.51E-06	1.50E-06 m/s
4	80	59.98	6.4	0.00040384	10	0.0379	5.98E-06	1.99E-06 m/s
5	100	74.04	8	0.0005048	10	0.0379	6.05E-06	2.02E-06 m/s
4a	80	59.98	5.1	0.00032181	10	0.0379	4.76E-06	1.59E-06 m/s
3a	60	45.92	3.8	0.00023978	10	0.0379	4.64E-06	1.55E-06 m/s

APPENDIX E

Hydrogeochemical Plots

Chart 1 - Stiff Diagram for MW08-124

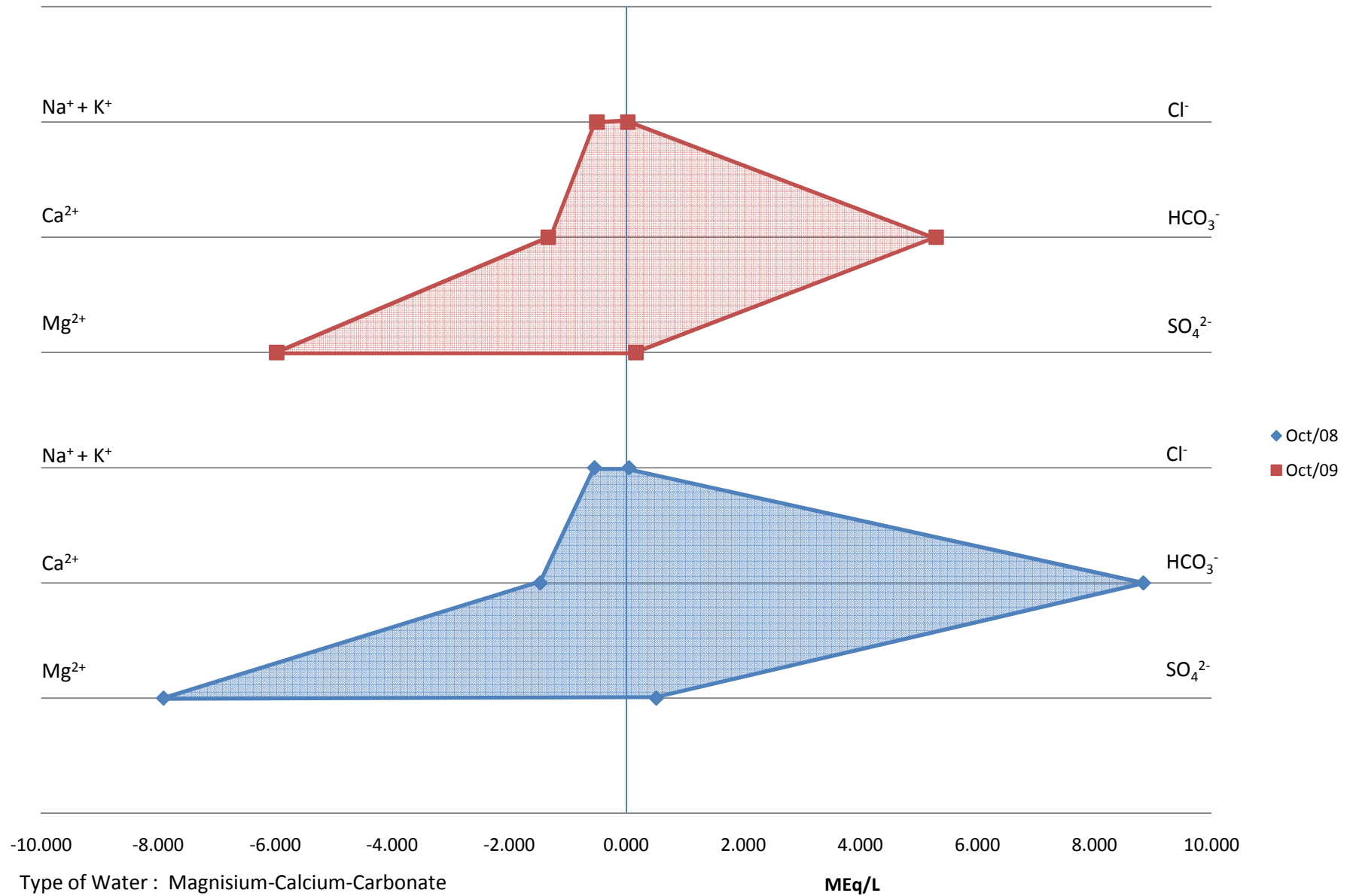


Chart 2 - Stiff Diagram for MW08-127

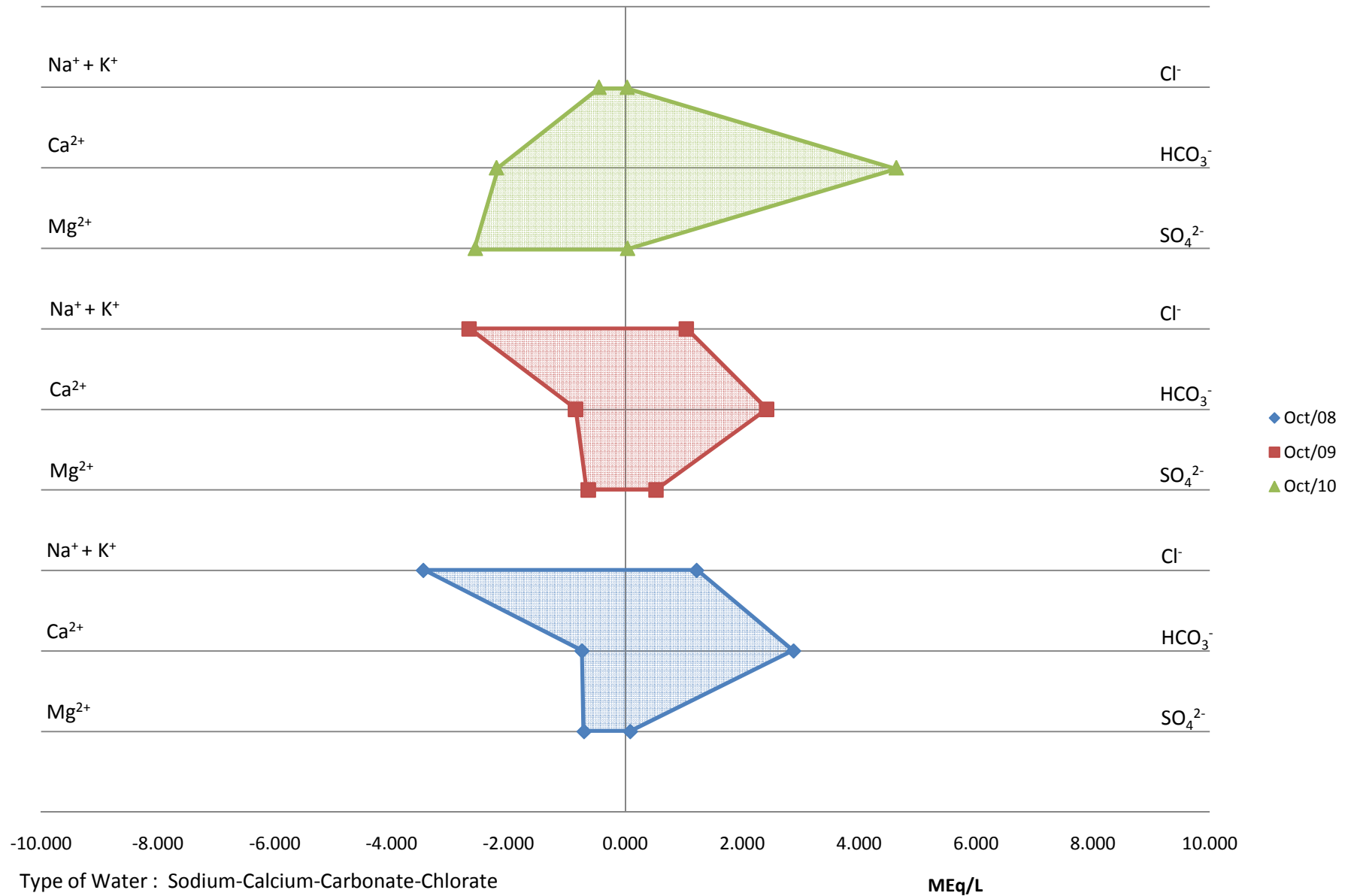


Chart 3 - Stiff Diagram for MW08-128

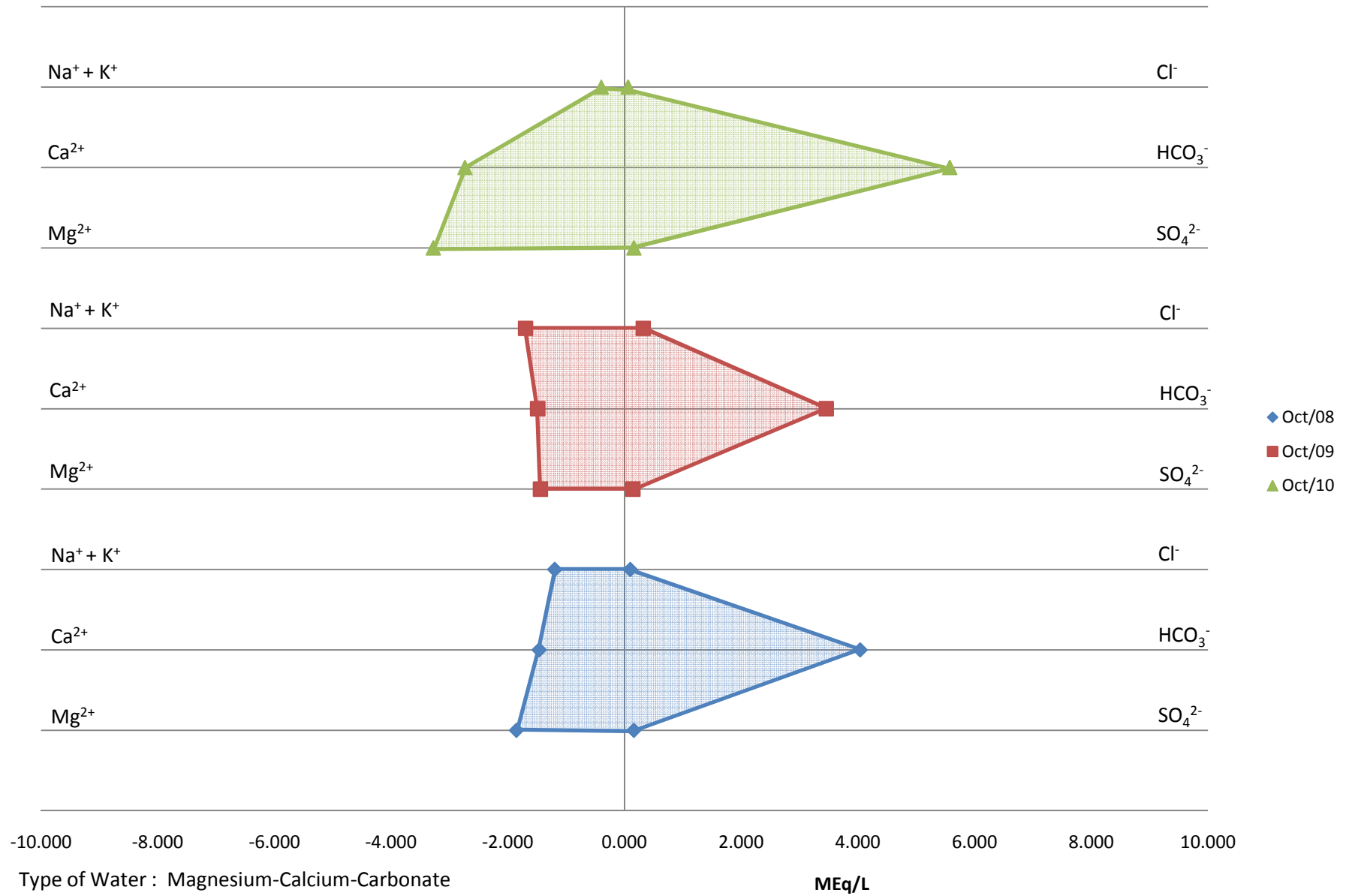


Chart 4- Stiff Diagram for MW08-130

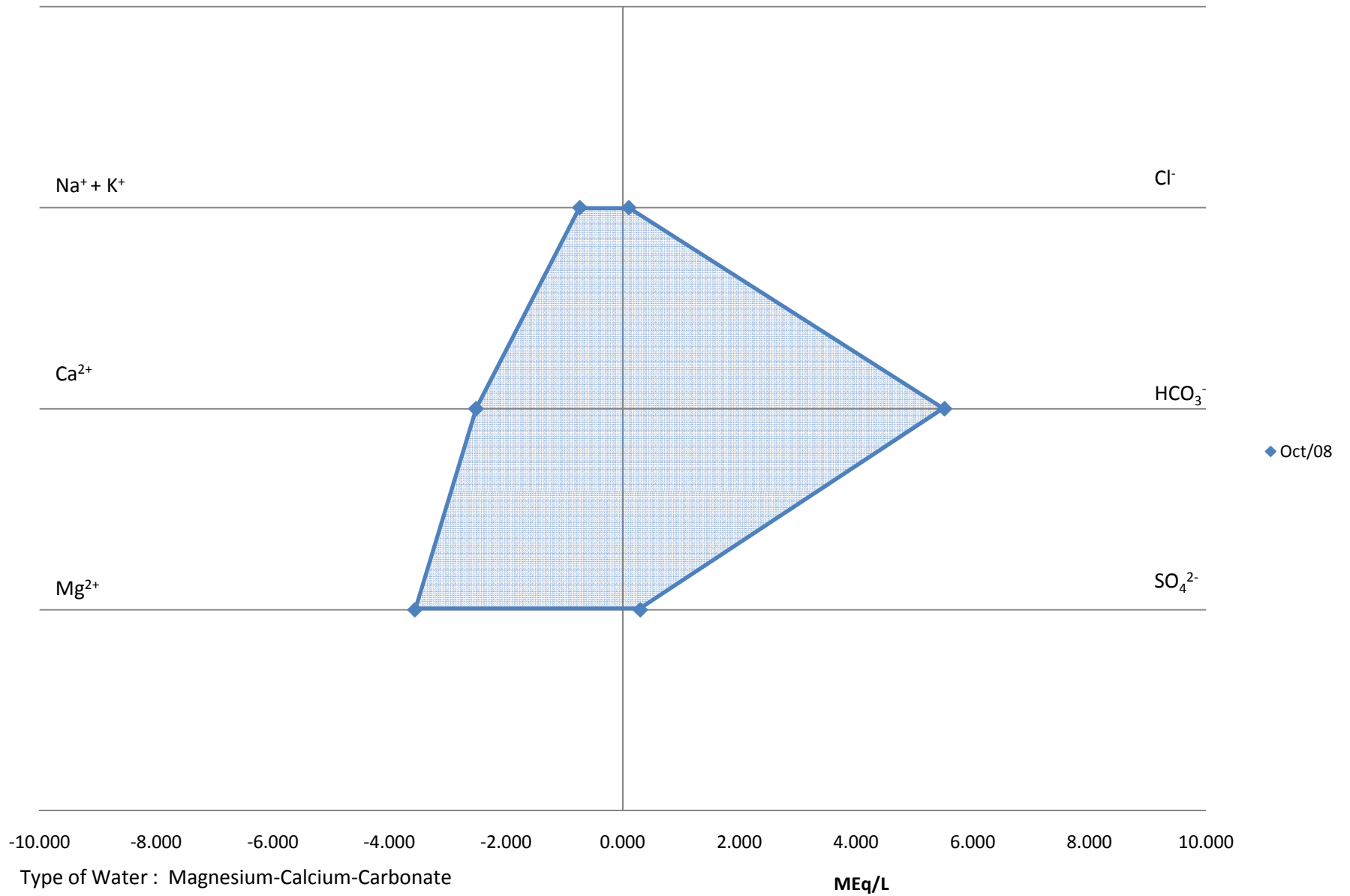
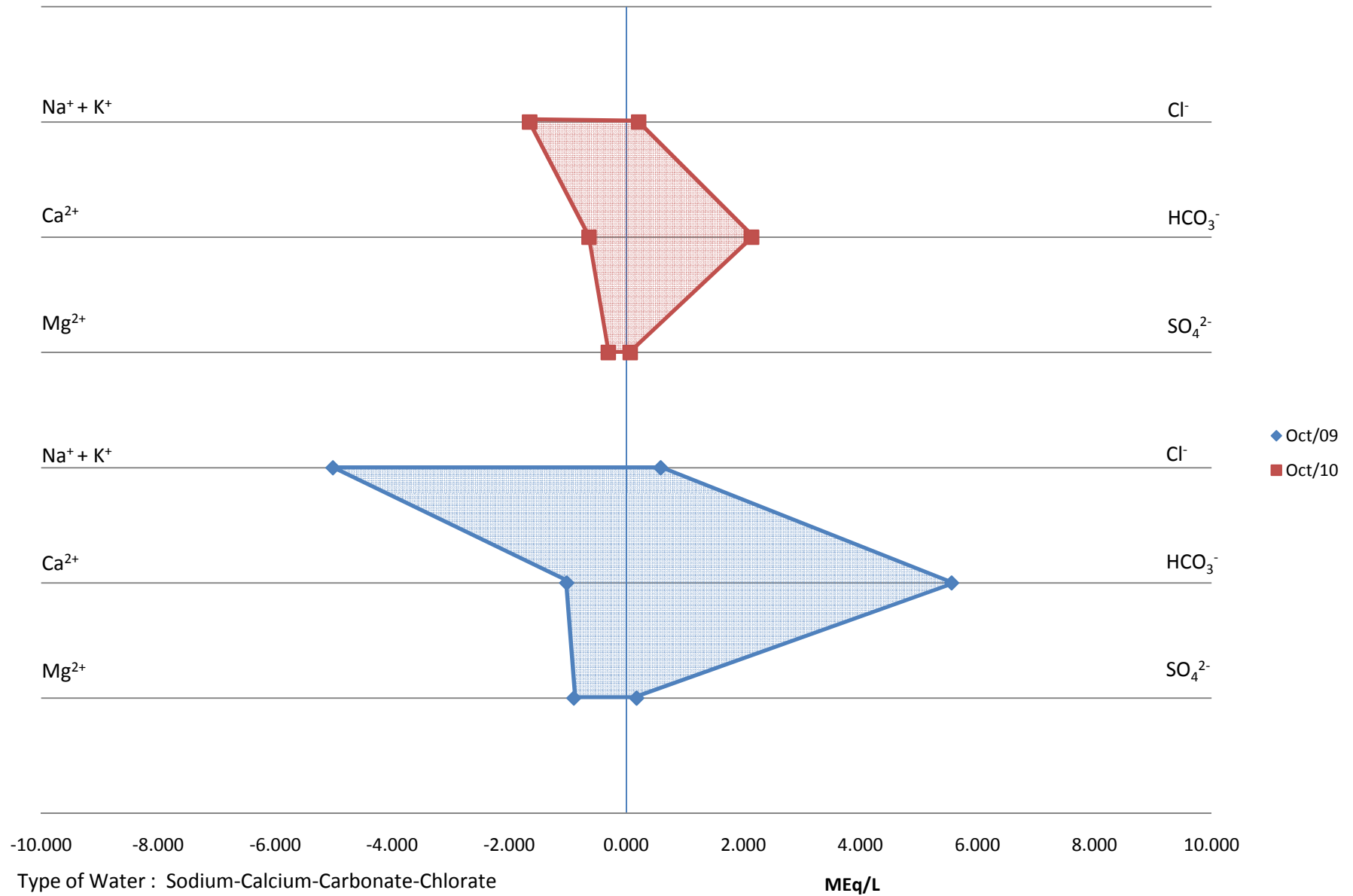
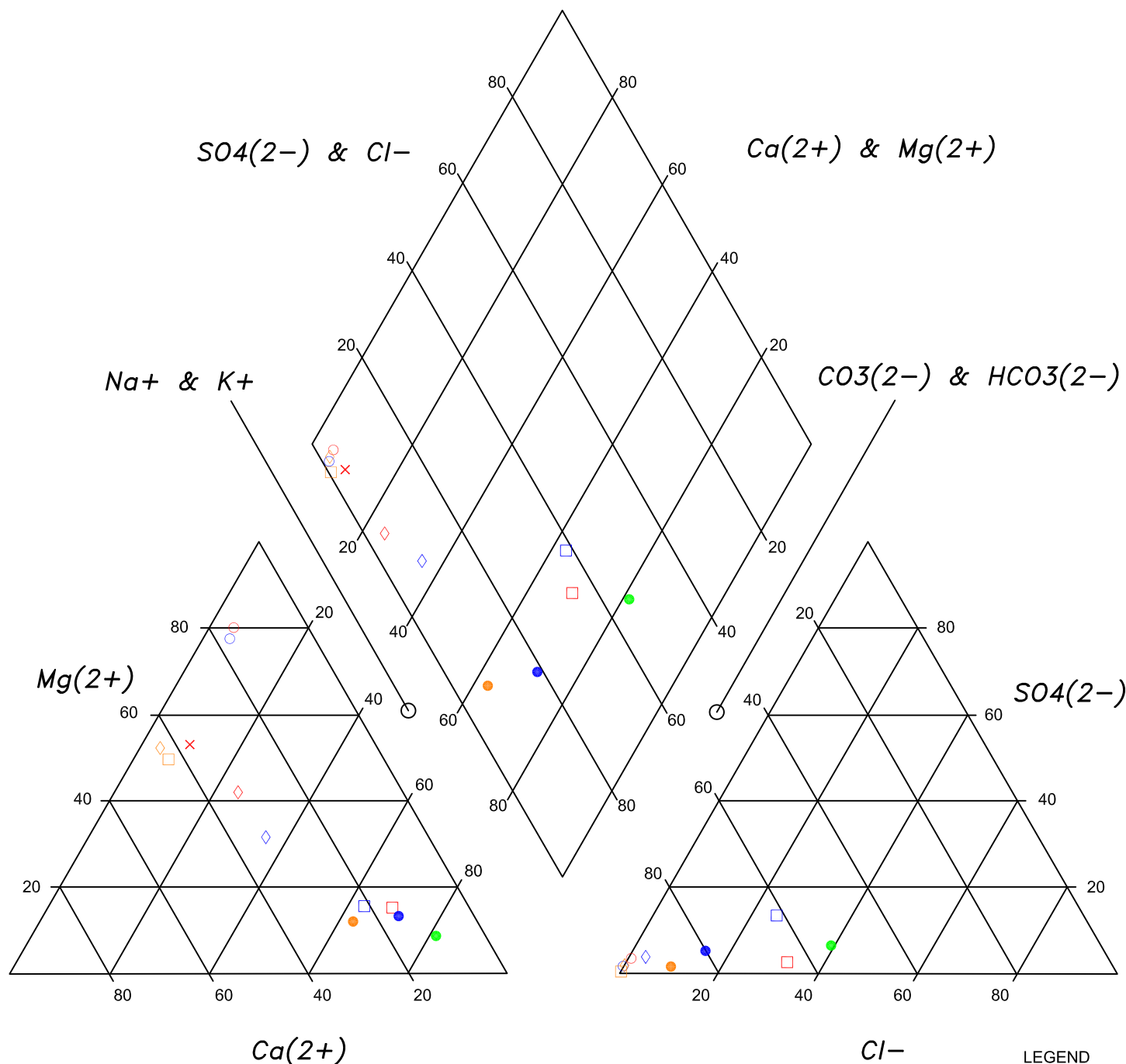


Chart 5 - Stiff Diagram for MW09-152





LEGEND

- L08-124
- MW08-127
- ◇ MW08-128
- × MW08-130
- MW09-152
- OCT 2008
- JUNE 2009
- OCT 2009
- OCT 2010

NOTE: THIS DRAWING ILLUSTRATES SUPPORTING INFORMATION SPECIFIC TO A JACQUES WHITFORD STANTEC LIMITED REPORT AND MUST NOT BE USED FOR OTHER PURPOSES.

PIPER PLOT

THOR LAKE ENVIRONMENTAL BASELINE
THOR LAKE

Job No.: 123510431
Scale: N.T.S.
Date: 03-Nov-10
Dwn. By: SS
App'd By:

Chart No.:

6



Stantec

Client: AVALON VENTURES



APPENDIX F

Laboratory Certificates



Environmental Division

Certificate of Analysis

JACQUES WHITFORD AXYS LTD.

ATTN: JENNIFER TODD

4370 DOMINION ST 5TH FLOOR

BURNABY BC V5G 4L7

Reported On: 10-OCT-08 04:33 PM

Lab Work Order #: L688290

Date Received: 26-SEP-08

Project P.O. #: 1036222.OD / Z9100

Job Reference: 1036222.OD / Z9100

Legal Site Desc: AVALON VENTURES - THOR LAKE

CofC Numbers: C048742

Other Information:

Comments: The detection limits for some metals have been increased due to high levels of metals in the samples or interferences encountered during analysis.

Bryan Mark
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 LABORATORY GROUP ANALYTICAL REPORT

		Sample ID				
		Description				
		Sampled Date				
		Sampled Time				
		Client ID				
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	878	482	557		
	Hardness (as CaCO3) (mg/L)	142	261	282		
	pH (pH)	8.15	7.59	8.10		
	Total Suspended Solids (mg/L)	33.0	49.5	14.5		
	Total Dissolved Solids (mg/L)	487	335	331		
	Turbidity (NTU)	13.0	79.3	4.05		
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	287	251	266		
	Ammonia as N (mg/L)	<0.020	0.581	0.066		
	Bromide (Br) (mg/L)	0.358	<0.25	<0.050		
	Chloride (Cl) (mg/L)	108	3.6	3.48		
	Fluoride (F) (mg/L)	2.54	1.29	1.05		
	Nitrate (as N) (mg/L)	<0.0050	<0.025	5.07		
	Nitrite (as N) (mg/L)	<0.0010	0.0137	0.227		
	Total Kjeldahl Nitrogen (mg/L)	0.477	1.88	0.813		
	Ortho Phosphate as P (mg/L)	<0.0010	0.0016	<0.0010		
	Total Phosphate as P (mg/L)	0.024	0.030	0.0062		
	Sulfate (SO4) (mg/L)	1.00	4.8	14.9		
Organic / Inorganic Carbon	Total Organic Carbon (mg/L)	10.4	30.9	16.0		
Total Metals	Aluminum (Al)-Total (mg/L)	0.566	0.552	0.811		
	Antimony (Sb)-Total (mg/L)	<0.0010	<0.00050	<0.00050		
	Arsenic (As)-Total (mg/L)	0.0017	0.0231	0.00102		
	Barium (Ba)-Total (mg/L)	0.044	0.179	0.440		
	Beryllium (Be)-Total (mg/L)	<0.0020	<0.0010	<0.0010		
	Boron (B)-Total (mg/L)	0.67	<0.10	<0.10		
	Cadmium (Cd)-Total (mg/L)	0.000316	0.000430	0.000156		
	Calcium (Ca)-Total (mg/L)	24.3	49.1	48.3		
	Chromium (Cr)-Total (mg/L)	<0.0020	0.0013	0.0071		
	Cobalt (Co)-Total (mg/L)	<0.00060	0.00146	0.00316		
	Copper (Cu)-Total (mg/L)	0.0276	0.0033	0.0402		
	Iron (Fe)-Total (mg/L)	0.837	8.89	2.69		
	Lead (Pb)-Total (mg/L)	<0.0010	0.00253	0.00360		
	Lithium (Li)-Total (mg/L)	0.051	0.0161	0.0154		
	Magnesium (Mg)-Total (mg/L)	19.8	33.6	39.1		
	Manganese (Mn)-Total (mg/L)	0.190	0.490	0.123		
	Mercury (Hg)-Total (mg/L)	<0.000020	<0.000020	<0.000020		
	Molybdenum (Mo)-Total (mg/L)	0.0286	0.0241	0.0559		
	Nickel (Ni)-Total (mg/L)	0.0020	0.0035	0.0108		
	Potassium (K)-Total (mg/L)	5.9	7.8	3.9		

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID				
		Description				
		Sampled Date				
		Sampled Time				
		Client ID				
Grouping	Analyte					
WATER						
Total Metals	Selenium (Se)-Total (mg/L)	<0.0020	<0.0010	0.0011		
	Silver (Ag)-Total (mg/L)	0.000396	0.000332	0.00351		
	Sodium (Na)-Total (mg/L)	131	11.8	16.6		
	Thallium (Tl)-Total (mg/L)	<0.00040	<0.00020	<0.00020		
	Tin (Sn)-Total (mg/L)	<0.0010	<0.00050	0.00053		
	Titanium (Ti)-Total (mg/L)	<0.010	0.010	0.016		
	Uranium (U)-Total (mg/L)	0.0132	0.0266	0.00273		
	Vanadium (V)-Total (mg/L)	<0.0020	0.0021	<0.0010		
	Zinc (Zn)-Total (mg/L)	0.0091	0.0140	0.0118		
Speciated Metals	Chromium, Hexavalent (mg/L)	<0.001	<0.001	<0.001		

Reference Information

Additional Comments for Sample Listed:

Samplenum	Matrix	Report Remarks	Sample Comments
Methods Listed (if applicable):			
ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)
ALK-COL-VA	Water	Alkalinity by Colourimetric (Automated)	APHA 310.2
This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method.			
ALK-PCT-VA	Water	Alkalinity by Auto. Titration	APHA 2320 "Alkalinity"
This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
ANIONS-BR-IC-VA	Water	Bromide by Ion Chromatography	APHA 4110 "Determination of Anions by IC
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 routinely determined by this method include: bromide, chloride, fluoride, nitrate, nitrite and sulphate.			
ANIONS-CL-IC-VA	Water	Chloride by Ion Chromatography	APHA 4110 "Determination of Anions by IC
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 routinely determined by this method include: bromide, chloride, fluoride, nitrate, nitrite and sulphate.			
ANIONS-F-IC-VA	Water	Fluoride by Ion Chromatography	APHA 4110 "Determination of Anions by IC
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 routinely determined by this method include: bromide, chloride, fluoride, nitrate, nitrite and sulphate.			
ANIONS-NO2-IC-VA	Water	Nitrite by Ion Chromatography	APHA 4110 "Determination of Anions by IC
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 routinely determined by this method include: bromide, chloride, fluoride, nitrate, nitrite and sulphate.			
ANIONS-NO3-IC-VA	Water	Nitrate by Ion Chromatography	APHA 4110 "Determination of Anions by IC
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 routinely determined by this method include: bromide, chloride, fluoride, nitrate, nitrite and sulphate.			
ANIONS-SO4-IC-VA	Water	Sulfate by Ion Chromatography	APHA 4110 "Determination of Anions by IC
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 routinely determined by this method include: bromide, chloride, fluoride, nitrate, nitrite and sulphate.			
CARBONS-TOC-VA	Water	Total organic carbon by combustion	APHA 5310 "TOTAL ORGANIC CARBON (TOC)"
This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".			
CR-CR6-ED	Water	Chromium, Hexavalent (Cr +6)	APHA 3500-Cr C (Ion Chromatography)
EC-PCT-VA	Water	Conductivity (Automated)	APHA 2510 Auto. Conduc.
This analysis is carried out using procedures adapted from APHA Method 2510 "Conductivity". Conductivity is determined using a conductivity electrode.			
HARDNESS-CALC-VA	Water	Hardness	APHA 2340B

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)
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Hardness is calculated from Calcium and Magnesium concentrations, and is expressed as calcium carbonate equivalents.

HG-TOT-CCME-CVAFS-VA Water Total Mercury in Water by CVAFS (CCME) EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" 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).

MET-TOT-CCME-ICP-VA Water Total Metals in Water by ICPOES (CCME) EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" 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 hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-TOT-CCME-MS-VA Water Total Metals in Water by ICPMS (CCME) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" 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 hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

NH3-SIE-VA Water Ammonia by SIE APHA 4500-NH3 "Nitrogen (Ammonia)"

This analysis is carried out, on sulphuric acid preserved samples, using procedures adapted from APHA Method 4500-NH3 "Nitrogen (Ammonia)". Ammonia is determined using an ammonia selective electrode.

PH-PCT-VA Water pH by Meter (Automated) APHA 4500-H "pH Value"

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

PO4-DO-COL-VA Water Dissolved ortho Phosphate by Color APHA 4500-P "Phosphorous"

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

PO4-T-COL-VA Water Total Phosphate P by Color APHA 4500-P "Phosphorous"

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

TDS-VA Water Total Dissolved Solids by Gravimetric APHA 2540 C - GRAVIMETRIC

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, TDS is determined by evaporating the filtrate to dryness at 180 degrees celsius.

TKN-SIE-VA Water Total Kjeldahl Nitrogen by SIE APHA 4500-Norg (TKN)

This analysis is carried out using procedures adapted from APHA Method 4500-Norg "Nitrogen (Organic)". Total kjeldahl nitrogen is determined by sample digestion at 367 celcius with analysis using an ammonia selective electrode.

TSS-VA Water Solids by Gravimetric APHA 2540 D - GRAVIMETRIC

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, TSS is determined by drying the filter at 104 degrees celsius.

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)
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TURBIDITY-VA	Water	Turbidity by Meter	APHA 2130 "Turbidity"
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This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

**** Laboratory Methods employed follow in-house procedures, which are generally based on nationally or internationally accepted methodologies. The last two letters of the above ALS Test Code column indicate the laboratory that performed analytical analysis for that test. Refer to the list below:**

Laboratory Definition Code	Laboratory Location	Laboratory Definition Code	Laboratory Location
ED	ALS LABORATORY GROUP - EDMONTON, ALBERTA, CANADA	VA	ALS LABORATORY GROUP - VANCOUVER, BC, CANADA

GLOSSARY OF REPORT TERMS

Surr - A surrogate is an organic compound that is similar to the target analyte(s) in chemical composition and behavior but not normally detected in environmental samples. Prior to sample processing, samples are fortified with one or more surrogate compounds.

The reported surrogate recovery value provides a measure of method efficiency.

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

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

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.

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

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

Page 1 of 1

GENF14.00

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GENF14.00

ALS LABORATORY GROUP SAMPLE RECEIPT CONFIRMATION

Company: JACQUES WHITFORD AXYS LTD.
ATTN: JENNIFER TODD
Fax Number: 604-436-3752
Account Manager: NATASHA MARKOVIC-MIROVIC
Job Reference: 1036222.OD / Z9100
Project P.O. #: 1036222.OD / Z9100
Date Sampled: 20-SEP-08
Date Received: 26-SEP-08 **Estimated Completion Date:** 09-OCT-08
Sampled By: JT
Workorder #: **L688290**
Chain of Custody #: C048742

Sample #/SampleID/DateSampled/DateDue: L688290-1/MWL08-127/20-SEP-08/09-OCT-08

Matrix	Product Description	Product Due*
Water	Alkalinity by Colourimetric (Automated)	
Water	Anions by Ion Chromatography	
	Bromide by Ion Chromatography	
	Chloride by Ion Chromatography	
	Fluoride by Ion Chromatography	
	Nitrite by Ion Chromatography	
	Nitrate by Ion Chromatography	
	Sulfate by Ion Chromatography	
Water	Total organic carbon by combustion	
Water	Chromium, Hexavalent (Cr +6)	
Water	Conductivity (Automated)	
Water	Total Metals in Water (CCME/BCWQG)	
	Hardness	
	Total Mercury in Water by CVAFS (CCME)	
	Total Metals in Water by ICPOES (CCME)	
	Total Metals in Water by ICPMS (CCME)	
Water	Ammonia by SIE	
Water	pH by Meter (Automated)	
Water	Dissolved ortho Phosphate by Color	
Water	Total Phosphate P by Color	
Misc.	Handling/Disposal Fee	

ALS Laboratory Group strives to deliver on-time results to our clients at all times. However, there are times when, due to capacity issues or other unforeseen circumstances, we are unable to meet our expected TATs. The information above is related to a recent workorder you have submitted to our laboratory. We have also included a summary on the parameters of interest for this workorder. In the event that you have an inquiry, please refer to the Work Order # (L+6 digits) when calling your Account Manager.

IMPORTANT: The accompanying message is intended only for the use of the individual or entity to which it is addressed and may represent an attorney-client communication or otherwise contain information privileged, confidential and exempt from disclosure under applicable law. If the reader of this message is not the intended recipient, you are hereby notified that any dissemination, distribution or copying or other use of the communication is strictly prohibited. If you receive the communication in error, please notify us immediately by telephone, and return the message to us at the above address via Canadian Postal Service postage due. Thank you.

Sample #/SampleID/DateSampled/DateDue: L688290-1/MWL08-127/20-SEP-08/09-OCT-08

Matrix	Product Description	Product Due*
Water	Total Dissolved Solids by Gravimetric	
Water	Total Kjeldahl Nitrogen by SIE	
Water	Solids by Gravimetric	
Water	Turbidity by Meter	

Sample #/SampleID/DateSampled/DateDue: L688290-2/MWL08-128/20-SEP-08/09-OCT-08

Matrix	Product Description	Product Due*
Water	Alkalinity by Colourimetric (Automated)	
Water	Anions by Ion Chromatography	
	Bromide by Ion Chromatography	
	Chloride by Ion Chromatography	
	Fluoride by Ion Chromatography	
	Nitrite by Ion Chromatography	
	Nitrate by Ion Chromatography	
	Sulfate by Ion Chromatography	
Water	Total organic carbon by combustion	
Water	Chromium, Hexavalent (Cr +6)	
Water	Conductivity (Automated)	
Water	Total Metals in Water (CCME/BCWQG)	
	Hardness	
	Total Mercury in Water by CVAFS (CCME)	
	Total Metals in Water by ICPOES (CCME)	
	Total Metals in Water by ICPMS (CCME)	
Water	Ammonia by SIE	
Water	pH by Meter (Automated)	
Water	Dissolved ortho Phosphate by Color	
Water	Total Phosphate P by Color	
Misc.	Handling/Disposal Fee	
Water	Total Dissolved Solids by Gravimetric	
Water	Total Kjeldahl Nitrogen by SIE	
Water	Solids by Gravimetric	
Water	Turbidity by Meter	

Sample #/SampleID/DateSampled/DateDue: L688290-3/MWL08-130/21-SEP-08/09-OCT-08

Matrix	Product Description	Product Due*
Water	Alkalinity by Colourimetric (Automated)	

ALS Laboratory Group strives to deliver on-time results to our clients at all times. However, there are times when, due to capacity issues or other unforeseen circumstances, we are unable to meet our expected TATs. The information above is related to a recent workorder you have submitted to our laboratory. We have also included a summary on the parameters of interest for this workorder. In the event that you have an inquiry, please refer to the Work Order # (L+6 digits) when calling your Account Manager.

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Matrix	Product Description	Product Due*
Water	Anions by Ion Chromatography	
	Bromide by Ion Chromatography	
	Chloride by Ion Chromatography	
	Fluoride by Ion Chromatography	
	Nitrite by Ion Chromatography	
	Nitrate by Ion Chromatography	
	Sulfate by Ion Chromatography	
Water	Total organic carbon by combustion	
Water	Chromium, Hexavalent (Cr +6)	
Water	Conductivity (Automated)	
Water	Total Metals in Water (CCME/BCWQG)	
	Hardness	
	Total Mercury in Water by CVAFS (CCME)	
	Total Metals in Water by ICPOES (CCME)	
	Total Metals in Water by ICPMS (CCME)	
Water	Ammonia by SIE	
Water	pH by Meter (Automated)	
Water	Dissolved ortho Phosphate by Color	
Water	Total Phosphate P by Color	
Misc.	Handling/Disposal Fee	
Water	Total Dissolved Solids by Gravimetric	
Water	Total Kjeldahl Nitrogen by SIE	
Water	Solids by Gravimetric	
Water	Turbidity by Meter	

* INDICATES ESTIMATED COMPLETION DATE OF REQUESTED PRODUCT IF DIFFERENT THAN THE ESTIMATED COMPLETION DATE.

Notice of Sub-contract Laboratory Service

Please be advised that the following tests will be subcontracted to the corresponding laboratory:

Chromium, Hexavalent (Cr +6) Subcontracted to: ALS LABORATORY GROUP - EDMONTON, ALBERTA, CANADA

Please contact your Account Manager immediately should you have questions or concerns regarding this arrangement. Approval of this arrangement shall be implied unless otherwise notified by you.

ALS Laboratory Group strives to deliver on-time results to our clients at all times. However, there are times when, due to capacity issues or other unforeseen circumstances, we are unable to meet our expected TATs. The information above is related to a recent workorder you have submitted to our laboratory. We have also included a summary on the parameters of interest for this workorder. In the event that you have an inquiry, please refer to the Work Order # (L+6 digits) when calling your Account Manager.

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Environmental Division

Certificate of Analysis

JACQUES WHITFORD

ATTN: JENNIFER TODD

4370 DOMINION STREET, 5TH FLOOR
PO BOX 21
BURNABY BC V5G 4L7

Reported On: 30-OCT-08 04:38 PM

Lab Work Order #: L694303

Date Received: 10-OCT-08

Project P.O. #:

Job Reference: 1036222.02./79100

Legal Site Desc:

CofC Numbers: 08-011347

Other Information:

Comments: For some of the submitted water samples, the measured concentration of specific dissolved parameters is greater than the corresponding total parameters concentration. The explanation for these findings is one or a combination of the following:

- laboratory method variability;
- field sampling method variability;
- bias introduced during general handling, filtering, storage, transportation and/or analysis of the sample;
- field sample grab bias - where separate grab samples are processed to produce total and dissolved samples;
- field sample split bias - where total and dissolved parameters samples are produced from the same grab sample.

For further clarification on any of the above information, please contact your ALS account manager.

Bryan Mark
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 LABORATORY GROUP ANALYTICAL REPORT

		Sample ID	L694303-1	L694303-2	L694303-3	L694303-4	
		Description	WATER	WATER	WATER	WATER	
		Sampled Date	08-OCT-08	09-OCT-08	08-OCT-08	07-OCT-08	
		Sampled Time		10:00			
		Client ID	MWL08-124	MWL08-127	MWL08-128	MWL08-130	
Grouping	Analyte						
WATER							
Physical Tests	Conductivity (uS/cm)		738	405	382	558	
	Hardness (as CaCO3) (mg/L)		469	72.6	166	304	
	pH (pH)		8.25	8.16	7.90	8.21	
	Total Suspended Solids (mg/L)		110	213	29.2	3.2	
	Total Dissolved Solids (mg/L)		422	291	258	335	
	Turbidity (NTU)		171	1150	42.2	2.69	
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)		442	144	202	276	
	Ammonia as N (mg/L)		<0.020	0.024	0.610	0.070	
	Bromide (Br) (mg/L)		<0.050	<0.25	<0.25	<0.050	
	Chloride (Cl) (mg/L)		1.55	43.2	3.5	3.68	
	Fluoride (F) (mg/L)		2.41	1.37	0.97	1.04	
	Nitrate (as N) (mg/L)		0.475	<0.025	<0.025	5.55	
	Nitrite (as N) (mg/L)		0.0254	0.0079	0.0078	0.237	
	Total Kjeldahl Nitrogen (mg/L)		0.470	2.19	1.79	0.872	
	Ortho Phosphate as P (mg/L)		<0.0010	0.0087	<0.0010	<0.0010	
	Total Phosphate as P (mg/L)		<0.020	0.066	0.163	0.0044	
	Sulfate (SO4) (mg/L)		24.5	4.0	7.7	14.4	
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)		7.78	28.7	25.5	15.8	
	Total Organic Carbon (mg/L)		14.4	48.9	26.9	15.6	
Total Metals	Aluminum (Al)-Total (mg/L)		1.14	37.0	0.302	0.178	
	Antimony (Sb)-Total (mg/L)		<0.00050	<0.0025	<0.00050	<0.00050	
	Arsenic (As)-Total (mg/L)		0.00067	0.0067	0.00512	0.00054	
	Barium (Ba)-Total (mg/L)		0.160	0.473	0.156	0.407	
	Beryllium (Be)-Total (mg/L)		<0.0010	<0.0050	<0.0010	<0.0010	
	Boron (B)-Total (mg/L)		<0.10	0.33	<0.10	<0.10	
	Cadmium (Cd)-Total (mg/L)		0.000254	0.000287	0.000282	0.000060	
	Calcium (Ca)-Total (mg/L)		30.9	17.6	29.1	50.5	
	Chromium (Cr)-Total (mg/L)		0.0104	0.0489	0.0010	<0.0010	
	Cobalt (Co)-Total (mg/L)		0.00439	0.0143	0.00138	0.00349	
	Copper (Cu)-Total (mg/L)		0.0256	0.0804	0.0029	0.0272	
	Iron (Fe)-Total (mg/L)		32.1	37.4	14.5	0.303	
	Lead (Pb)-Total (mg/L)		0.00069	0.0146	0.00103	<0.00050	
	Lithium (Li)-Total (mg/L)		0.0208	0.075	0.0147	0.0126	
	Magnesium (Mg)-Total (mg/L)		94.1	17.2	22.1	43.0	
	Manganese (Mn)-Total (mg/L)		0.188	0.619	0.552	0.100	
	Mercury (Hg)-Total (mg/L)		<0.000020	<0.00010	<0.000020	<0.000020	
	Molybdenum (Mo)-Total (mg/L)		0.0215	0.0359	0.0177	0.0456	
	Nickel (Ni)-Total (mg/L)		0.0075	0.0396	0.0036	0.0115	

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID	L694303-1	L694303-2	L694303-3	L694303-4	
		Description	WATER	WATER	WATER	WATER	
		Sampled Date	08-OCT-08	09-OCT-08	08-OCT-08	07-OCT-08	
		Sampled Time		10:00			
		Client ID	MWL08-124	MWL08-127	MWL08-128	MWL08-130	
Grouping	Analyte						
WATER							
Total Metals	Potassium (K)-Total (mg/L)	3.9	10.5	4.1	3.1		
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0050	<0.0010	<0.0010		
	Silver (Ag)-Total (mg/L)	0.00470	0.00229	0.000171	0.00377		
	Sodium (Na)-Total (mg/L)	10.6	74.5	22.3	13.8		
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.0010	<0.00020	<0.00020		
	Tin (Sn)-Total (mg/L)	0.00196	<0.0025	0.00176	0.00106		
	Titanium (Ti)-Total (mg/L)	0.018	0.696	0.010	<0.010		
	Uranium (U)-Total (mg/L)	0.0197	0.0035	0.00382	0.00235		
	Vanadium (V)-Total (mg/L)	0.0013	0.0642	0.0012	<0.0010		
	Zinc (Zn)-Total (mg/L)	0.0188	0.0987	0.0139	0.0052		
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	0.0065	15.3	0.0338	0.0077		
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.0025	<0.00050	<0.00050		
	Arsenic (As)-Dissolved (mg/L)	<0.00050	0.0027	0.00233	0.00065		
	Barium (Ba)-Dissolved (mg/L)	0.084	0.257	0.143	0.401		
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0050	<0.0010	<0.0010		
	Boron (B)-Dissolved (mg/L)	<0.10	0.31	<0.10	<0.10		
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	0.000206	0.000249	0.000018		
	Calcium (Ca)-Dissolved (mg/L)	29.5	14.9	29.3	50.4		
	Chromium (Cr)-Dissolved (mg/L)	0.0013	0.0179	<0.0010	<0.0010		
	Cobalt (Co)-Dissolved (mg/L)	0.00178	0.0057	0.00126	0.00328		
	Copper (Cu)-Dissolved (mg/L)	0.0046	0.0474	<0.0010	0.0182		
	Iron (Fe)-Dissolved (mg/L)	0.133	8.85	10.8	<0.030		
	Lead (Pb)-Dissolved (mg/L)	<0.00050	0.0066	<0.00050	<0.00050		
	Lithium (Li)-Dissolved (mg/L)	0.0194	0.043	0.0152	0.0127		
	Magnesium (Mg)-Dissolved (mg/L)	96.1	8.59	22.5	43.3		
	Manganese (Mn)-Dissolved (mg/L)	0.0506	0.260	0.544	0.0888		
	Mercury (Hg)-Dissolved (mg/L)	<0.000020	<0.00010	<0.000020	<0.000020		
	Molybdenum (Mo)-Dissolved (mg/L)	0.0119	0.0345	0.0194	0.0466		
	Nickel (Ni)-Dissolved (mg/L)	0.0024	0.0151	0.0027	0.0108		
	Potassium (K)-Dissolved (mg/L)	3.4	6.6	4.2	3.0		
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0050	<0.0010	<0.0010		
	Silver (Ag)-Dissolved (mg/L)	<0.000020	0.00133	0.000031	<0.000020		
	Sodium (Na)-Dissolved (mg/L)	10.5	72.9	23.3	13.9		
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.0010	<0.00020	<0.00020		
	Tin (Sn)-Dissolved (mg/L)	<0.00050	0.0027	0.00071	0.00333		
	Titanium (Ti)-Dissolved (mg/L)	<0.010	0.354	<0.010	<0.010		
	Uranium (U)-Dissolved (mg/L)	0.0199	0.0027	0.00324	0.00230		
	Vanadium (V)-Dissolved (mg/L)	<0.0010	0.0229	<0.0010	<0.0010		
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	0.0327	0.0090	0.0061		

Reference Information

Additional Comments for Sample Listed:

Sample Number	Matrix	Report Remarks	Sample Comments
Methods Listed (if applicable):			
ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)
ALK-COL-VA	Water	Alkalinity by Colourimetric (Automated)	APHA 310.2
This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method.			
ALK-PCT-VA	Water	Alkalinity by Auto. Titration	APHA 2320 "Alkalinity"
This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
ANIONS-BR-IC-VA	Water	Bromide by Ion Chromatography	APHA 4110 "Determination of Anions by IC
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 routinely determined by this method include: bromide, chloride, fluoride, nitrate, nitrite and sulphate.			
ANIONS-CL-IC-VA	Water	Chloride by Ion Chromatography	APHA 4110 "Determination of Anions by IC
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 routinely determined by this method include: bromide, chloride, fluoride, nitrate, nitrite and sulphate.			
ANIONS-F-IC-VA	Water	Fluoride by Ion Chromatography	APHA 4110 "Determination of Anions by IC
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 routinely determined by this method include: bromide, chloride, fluoride, nitrate, nitrite and sulphate.			
ANIONS-NO2-IC-VA	Water	Nitrite by Ion Chromatography	APHA 4110 "Determination of Anions by IC
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 routinely determined by this method include: bromide, chloride, fluoride, nitrate, nitrite and sulphate.			
ANIONS-NO3-IC-VA	Water	Nitrate by Ion Chromatography	APHA 4110 "Determination of Anions by IC
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 routinely determined by this method include: bromide, chloride, fluoride, nitrate, nitrite and sulphate.			
ANIONS-SO4-IC-VA	Water	Sulfate by Ion Chromatography	APHA 4110 "Determination of Anions by IC
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 routinely determined by this method include: bromide, chloride, fluoride, nitrate, nitrite and sulphate.			
CARBONS-DOC-VA	Water	Dissolved organic carbon by combustion	APHA 5310 "TOTAL ORGANIC CARBON (TOC)"
This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)". Dissolved carbon (DOC) fractions are determined by filtering the sample through a 0.45 micron membrane filter prior to analysis.			
CARBONS-TOC-VA	Water	Total organic carbon by combustion	APHA 5310 "TOTAL ORGANIC CARBON (TOC)"
This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".			
EC-PCT-VA	Water	Conductivity (Automated)	APHA 2510 Auto. Conduc.
This analysis is carried out using procedures adapted from APHA Method 2510 "Conductivity". Conductivity is determined using a conductivity electrode.			

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)
HARDNESS-CALC-VA	Water	Hardness	APHA 2340B
Hardness is calculated from Calcium and Magnesium concentrations, and is expressed as calcium carbonate equivalents.			
HG-DIS-CCME-CVAFS-VA	Water	Diss. Mercury in Water by CVAFS (CCME)	EPA 3005A/245.7
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" 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 filtration (EPA Method 3005A) and 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).			
HG-TOT-CCME-CVAFS-VA	Water	Total Mercury in Water by CVAFS (CCME)	EPA 245.7
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" 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).			
MET-DIS-CCME-ICP-VA	Water	Diss. Metals in Water by ICPOES (CCME)	EPA SW-846 3005A/6010B
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" 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 hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).			
MET-DIS-CCME-MS-VA	Water	Diss. Metals in Water by ICPMS (CCME)	EPA SW-846 3005A/6020A
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" 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 hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).			
MET-TOT-CCME-ICP-VA	Water	Total Metals in Water by ICPOES (CCME)	EPA SW-846 3005A/6010B
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" 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 hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).			
MET-TOT-CCME-MS-VA	Water	Total Metals in Water by ICPMS (CCME)	EPA SW-846 3005A/6020A
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" 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 hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).			
NH3-SIE-VA	Water	Ammonia by SIE	APHA 4500-NH3 "Nitrogen (Ammonia)"
This analysis is carried out, on sulphuric acid preserved samples, using procedures adapted from APHA Method 4500-NH3 "Nitrogen (Ammonia)". Ammonia is determined using an ammonia selective electrode.			
PH-PCT-VA	Water	pH by Meter (Automated)	APHA 4500-H "pH Value"
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			
PO4-DO-COL-VA	Water	Dissolved ortho Phosphate by Color	APHA 4500-P "Phosphorous"
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the			

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)
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ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

PO4-T-COL-VA	Water	Total Phosphate P by Color	APHA 4500-P "Phosphorous"
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This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

TDS-VA	Water	Total Dissolved Solids by Gravimetric	APHA 2540 C - GRAVIMETRIC
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This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, TDS is determined by evaporating the filtrate to dryness at 180 degrees celsius.

TKN-SIE-VA	Water	Total Kjeldahl Nitrogen by SIE	APHA 4500-Norg (TKN)
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This analysis is carried out using procedures adapted from APHA Method 4500-Norg "Nitrogen (Organic)". Total kjeldahl nitrogen is determined by sample digestion at 367 celcius with analysis using an ammonia selective electrode.

TSS-VA	Water	Total Suspended Solids by Gravimetric	APHA 2540 D - GRAVIMETRIC
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This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, TSS is determined by drying the filter at 104 degrees celsius.

TURBIDITY-VA	Water	Turbidity by Meter	APHA 2130 "Turbidity"
---------------------	-------	--------------------	-----------------------

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

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

The last two letters of the above ALS Test Code column indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location	Laboratory Definition Code	Laboratory Location
VA	ALS LABORATORY GROUP - VANCOUVER, BC, CANADA		

GLOSSARY OF REPORT TERMS

Surr - A surrogate is an organic compound that is similar to the target analyte(s) in chemical composition and behavior but not normally detected in enviromental samples. Prior to sample processing, samples are fortified with one or more surrogate compounds.

The reported surrogate recovery value provides a measure of method efficiency.

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

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

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.

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

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



L694303

Report to:		Report Format / Distribution		Service Requested: (rush - subject to availability)	
Company: Jacques Whitford		Standard: <input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> Excel <input type="checkbox"/> Digital		<input type="checkbox"/> Regular (Default)	
Contact: Jennifer Todd		Select: <input checked="" type="checkbox"/> Email 1: jennifer.todd@jacqueswhitford.com		<input type="checkbox"/> Priority (2-3 Business Days) - 50% Surcharge	
Address: 4370 Dominion St. Suite 100 Burnaby BC V5G 4L7		Email 2: whitford.com		<input type="checkbox"/> Emergency (1 Business Day) - 100% Surcharge	
Phone: 604 436 3452				<input type="checkbox"/> For Emergency < 1 Day. ASAP or Weekend - Contact ALS	
Invoice To: Same as Report? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No?		Client / Project Information:		Analysis Request	
Company:		Job #: 1036222-02-179100		(Indicate Filtered or Preserved, F/P)	
Contact:		PO / A/E:			
Address:		Legal Site Description:			
Phone:		Quote #:			
Fax:		ALS Contact:			
Lab Work Order # (lab use only)		Sampler:			
Sample #	Sample Identification (This description will appear on the report)	Date	Time	Sample Type	Number of Containers
1	MWLO8-124	Oct 8		GW	
2	MWLO8-127	Oct 9/08 10am		"	
3	MWLO8-128	Oct 8/08		"	
4	MWLO8-130	Oct 7/08		"	
<p>Preserved & Filtered in Yellowknife → * Note: for MWLO8-127 could not filter or preserve. DOC / Dissolved Metals samples, please close in lab!</p>					

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 specified on the back page of the white - report copy.	
SHIPMENT RELEASE (lab use only)	SHIPMENT VERIFICATION (lab use only)
Released by: [Signature] Date & Time: Oct 9/08 15:00	Verified by: [Signature] Date & Time: Oct 9/08 15:00
Observations: Yes / No ? If Yes attach SIF	
REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION	



Environmental Division

Certificate of Analysis

JACQUES WHITFORD

ATTN: JENNIFER TODD

4370 DOMINION STREET, 5TH FLOOR
PO BOX 21
BURNABY BC V5G 4L7

Report Date: 10-JUL-09 16:19 (MT)

Version: FINAL

Lab Work Order #: **L784443**

Date Received: **26-JUN-09**

Project P.O. #: THOR LAKE

Job Reference: 1036222.02

Legal Site Desc:

CofC Numbers: 08-011419

Other Information:

Comments:


LINDSAY JONES
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 LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L784443-1 WATER 26-JUN-09 10:00 152	L784443-2 WATER 26-JUN-09 10:00 163			
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	717	721			
	Hardness (as CaCO3) (mg/L)	71.4	71.3			
	pH (pH)	8.52	8.56			
	Total Suspended Solids (mg/L)	110	116			
	Total Dissolved Solids (mg/L)	466	464			
	Turbidity (NTU)	35.1	34.1			
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	287	282			
	Ammonia as N (mg/L)	0.100	0.103			
	Bromide (Br) (mg/L)	0.188	0.193			
	Chloride (Cl) (mg/L)	61.8	62.0			
	Fluoride (F) (mg/L)	4.37	4.38			
	Nitrate (as N) (mg/L)	<0.0050	<0.0050			
	Nitrite (as N) (mg/L)	<0.0010	<0.0010			
	Total Kjeldahl Nitrogen (mg/L)	0.705	0.681			
	Sulfate (SO4) (mg/L)	12.6	12.6			
Organic / Inorganic Carbon	Total Organic Carbon (mg/L)	9.32	8.78			
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	0.0176	0.0181			
	Antimony (Sb)-Dissolved (mg/L)	0.00032	0.00029			
	Arsenic (As)-Dissolved (mg/L)	0.00180	0.00174			
	Barium (Ba)-Dissolved (mg/L)	0.0160	0.0164			
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010			
	Bismuth (Bi)-Dissolved (mg/L)	<0.0010	<0.0010			
	Boron (B)-Dissolved (mg/L)	0.806	0.817			
	Cadmium (Cd)-Dissolved (mg/L)	<0.00020	<0.00020			
	Calcium (Ca)-Dissolved (mg/L)	15.7	15.6			
	Chromium (Cr)-Dissolved (mg/L)	<0.0030	<0.0030			
	Cobalt (Co)-Dissolved (mg/L)	<0.00020	<0.00020			
	Copper (Cu)-Dissolved (mg/L)	<0.00020	0.00021			
	Iron (Fe)-Dissolved (mg/L)	0.083	0.093			
	Lead (Pb)-Dissolved (mg/L)	<0.00010	<0.00010			
	Lithium (Li)-Dissolved (mg/L)	0.063	0.061			
	Magnesium (Mg)-Dissolved (mg/L)	7.79	7.83			
	Manganese (Mn)-Dissolved (mg/L)	0.0255	0.0254			
	Mercury (Hg)-Dissolved (mg/L)	<0.000050	<0.000050			
	Molybdenum (Mo)-Dissolved (mg/L)	0.0497	0.0497			
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010			
	Phosphorus (P)-Dissolved (mg/L)	<0.30	<0.30			
	Potassium (K)-Dissolved (mg/L)	3.2	3.2			
	Selenium (Se)-Dissolved (mg/L)	<0.0020	<0.0020			
	Silicon (Si)-Dissolved (mg/L)	4.09	4.02			

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L784443-1 WATER 26-JUN-09 10:00 152	L784443-2 WATER 26-JUN-09 10:00 163			
Grouping	Analyte					
WATER						
Dissolved Metals	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020			
	Sodium (Na)-Dissolved (mg/L)	147	148			
	Strontium (Sr)-Dissolved (mg/L)	0.270	0.269			
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020			
	Tin (Sn)-Dissolved (mg/L)	<0.00020	<0.00020			
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010			
	Uranium (U)-Dissolved (mg/L)	0.00662	0.00658			
	Vanadium (V)-Dissolved (mg/L)	<0.0020	<0.0020			
	Zinc (Zn)-Dissolved (mg/L)	<0.0020	<0.0020			
Speciated Metals	Hexavalent Chromium (mg/L)	0.0032	0.0015			

Reference Information

Additional Comments for Sample Listed:

Sample Number	Matrix	Report Remarks	Sample Comments
Methods Listed (if applicable):			
ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)
ALK-COL-VA	Water	Alkalinity by Colourimetric (Automated)	APHA 310.2
This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method.			
ANIONS-BR-IC-VA	Water	Bromide by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-CL-IC-VA	Water	Chloride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-F-IC-VA	Water	Fluoride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-NO2-IC-VA	Water	Nitrite by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Specifically, the nitrite detection is by UV absorbance and not conductivity.			
ANIONS-NO3-IC-VA	Water	Nitrate by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Specifically, the nitrate detection is by UV absorbance and not conductivity.			
ANIONS-SO4-IC-VA	Water	Sulfate by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
CARBONS-TOC-VA	Water	Total organic carbon by combustion	APHA 5310 "TOTAL ORGANIC CARBON (TOC)"
This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".			
CARBONS-TOC-VA	Water	Total organic carbon by combustion	APHA 5310 TOTAL ORGANIC CARBON (TOC)
This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".			
CR-CR6-ED	Water	Chromium, Hexavalent (Cr +6)	APHA 3500-Cr C (Ion Chromatography)
EC-PCT-VA	Water	Conductivity (Automated)	APHA 2510 Auto. Conduc.
This analysis is carried out using procedures adapted from APHA Method 2510 "Conductivity". Conductivity is determined using a conductivity electrode.			
HARDNESS-CALC-VA	Water	Hardness	APHA 2340B
Hardness is calculated from Calcium and Magnesium concentrations, and is expressed as calcium carbonate equivalents.			
HG-DIS-CVAFS-VA	Water	Dissolved Mercury in Water by CVAFS	EPA SW-846 3005A & EPA 245.7

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)
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This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" 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 filtration (EPA Method 3005A) and 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).

MET-DIS-ICP-VA	Water	Dissolved Metals in Water by ICPOES	EPA SW-846 3005A/6010B
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This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" 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 filtration (EPA Method 3005A) and analysis by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-DIS-LOW-MS-VA	Water	Dissolved Metals in Water by ICPMS(Low)	EPA SW-846 3005A/6020A
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This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" 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 preliminary sample treatment by filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

NH3-SIE-VA	Water	Ammonia by SIE	APHA 4500 D. - NH3 NITROGEN (AMMONIA)
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This analysis is carried out, on sulphuric acid preserved samples, using procedures adapted from APHA Method 4500-NH3 "Nitrogen (Ammonia)". Ammonia is determined using an ammonia selective electrode.

PH-PCT-VA	Water	pH by Meter (Automated)	APHA 4500-H "pH Value"
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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

PH-PCT-VA	Water	pH by Meter (Automated)	APHA 4500-H pH Value
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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

TDS-VA	Water	Total Dissolved Solids by Gravimetric	APHA 2540 C - GRAVIMETRIC
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This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, TDS is determined by evaporating the filtrate to dryness at 180 degrees celsius.

TKN-SIE-VA	Water	Total Kjeldahl Nitrogen by SIE	APHA 4500-Norg (TKN)
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This analysis is carried out using procedures adapted from APHA Method 4500-Norg "Nitrogen (Organic)". Total kjeldahl nitrogen is determined by sample digestion at 367 celcius with analysis using an ammonia selective electrode.

TSS-VA	Water	Total Suspended Solids by Gravimetric	APHA 2540 D - GRAVIMETRIC
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This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, TSS is determined by drying the filter at 104 degrees celsius.

TURBIDITY-VA	Water	Turbidity by Meter	APHA 2130 "Turbidity"
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This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

TURBIDITY-VA	Water	Turbidity by Meter	APHA 2130 Turbidity
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This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

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

The last two letters of the above ALS Test Code column indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)	
Laboratory Definition Code	Laboratory Location	Laboratory Definition Code	Laboratory Location	
VA	ALS LABORATORY GROUP - VANCOUVER, BC, CANADA	ED	ALS LABORATORY GROUP - EDMONTON, ALBERTA, CANADA	

GLOSSARY OF REPORT TERMS

Surr - A surrogate is an organic compound that is similar to the target analyte(s) in chemical composition and behavior but not normally detected in enviromental samples. Prior to sample processing, samples are fortified with one or more surrogate compounds.

The reported surrogate recovery value provides a measure of method efficiency.

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

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

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.

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

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

[illegible]

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SHIPMENT RELEASE (client use)		SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)		
Released by:	Date & Time:	Received by:	Date:	Time:	Temperature:	Verified by:	Date & Time:	Observations: Yes / No ? If Yes attach SIF

ALS LABORATORY GROUP SAMPLE RECEIPT CONFIRMATION

Company: JACQUES WHITFORD
ATTN: JENNIFER TODD
Fax Number: 604-436-3752
Account Manager: NATASHA MARKOVIC-MIROVIC
Job Reference:
Project P.O. #:
Date Sampled: 26-JUN-09
Date Received: 26-JUN-09 **Estimated Completion Date:** 11-JUL-09
Sampled By: JT
Workorder #: **L784443**
Chain of Custody #: 08-011419

Sample #/SampleID/DateSampled/DateDue: L784443-1/152/26-JUN-09/11-JUL-09

Matrix	Product Description	Product Due*
Water	Alkalinity by Colourimetric (Automated)	
Water	Anions by Ion Chromatography	
	Bromide by Ion Chromatography	
	Chloride by Ion Chromatography	
	Fluoride by Ion Chromatography	
	Nitrite by Ion Chromatography	
	Nitrate by Ion Chromatography	
	Sulfate by Ion Chromatography	
Water	Total organic carbon by combustion	
Water	Chromium, Hexavalent (Cr +6)	
Water	Conductivity (Automated)	
Water	Dissolved Mercury in Water by CVAFS	
Water	Diss. Metals in Water by ICPOES & ICPMS	
	Hardness	
	Dissolved Metals in Water by ICPOES	
	Dissolved Metals in Water by ICPMS(Low)	
Water	Ammonia by SIE	
Water	pH by Meter (Automated)	
Misc.	Handling/Disposal Fee	
Water	Total Dissolved Solids by Gravimetric	
Water	Total Kjeldahl Nitrogen by Auto. Colour	

ALS Laboratory Group strives to deliver on-time results to our clients at all times. However, there are times when, due to capacity issues or other unforeseen circumstances, we are unable to meet our expected TATs. The information above is related to a recent workorder you have submitted to our laboratory. We have also included a summary on the parameters of interest for this workorder. In the event that you have an inquiry, please refer to the Work Order # (L+6 digits) when calling your Account Manager.

IMPORTANT: The accompanying message is intended only for the use of the individual or entity to which it is addressed and may represent an attorney-client communication or otherwise contain information privileged, confidential and exempt from disclosure under applicable law. If the reader of this message is not the intended recipient, you are hereby notified that any dissemination, distribution or copying or other use of the communication is strictly prohibited. If you receive the communication in error, please notify us immediately by telephone, and return the message to us at the above address via Canadian Postal Service postage due. Thank you.

Sample #/SampleID/DateSampled/DateDue: L784443-1/152/26-JUN-09/11-JUL-09

Matrix	Product Description	Product Due*
Water	Total Suspended Solids by Gravimetric	
Water	Turbidity by Meter	

Sample #/SampleID/DateSampled/DateDue: L784443-2/163/26-JUN-09/11-JUL-09

Matrix	Product Description	Product Due*
Water	Alkalinity by Colourimetric (Automated)	
Water	Anions by Ion Chromatography	
	Bromide by Ion Chromatography	
	Chloride by Ion Chromatography	
	Fluoride by Ion Chromatography	
	Nitrite by Ion Chromatography	
	Nitrate by Ion Chromatography	
	Sulfate by Ion Chromatography	
Water	Total organic carbon by combustion	
Water	Chromium, Hexavalent (Cr +6)	
Water	Conductivity (Automated)	
Water	Dissolved Mercury in Water by CVAFS	
Water	Diss. Metals in Water by ICPOES & ICPMS	
	Hardness	
	Dissolved Metals in Water by ICPOES	
	Dissolved Metals in Water by ICPMS(Low)	
Water	Ammonia by SIE	
Water	pH by Meter (Automated)	
Misc.	Handling/Disposal Fee	
Water	Total Dissolved Solids by Gravimetric	
Water	Total Kjeldahl Nitrogen by Auto. Colour	
Water	Total Suspended Solids by Gravimetric	
Water	Turbidity by Meter	

* INDICATES ESTIMATED COMPLETION DATE OF REQUESTED PRODUCT IF DIFFERENT THAN THE ESTIMATED COMPLETION DATE.

Notice of Sub-contract Laboratory Service

Please be advised that the following tests will be subcontracted to the corresponding laboratory:

Chromium, Hexavalent (Cr +6) Subcontracted to: ALS LABORATORY GROUP - EDMONTON, ALBERTA, CANADA

Please contact your Account Manager immediately should you have questions or concerns regarding this arrangement. Approval of this arrangement shall be implied unless otherwise notified by you.

ALS Laboratory Group strives to deliver on-time results to our clients at all times. However, there are times when, due to capacity issues or other unforeseen circumstances, we are unable to meet our expected TATs. The information above is related to a recent workorder you have submitted to our laboratory. We have also included a summary on the parameters of interest for this workorder. In the event that you have an inquiry, please refer to the Work Order # (L+6 digits) when calling your Account Manager.

IMPORTANT: The accompanying message is intended only for the use of the individual or entity to which it is addressed and may represent an attorney-client communication or otherwise contain information privileged, confidential and exempt from disclosure under applicable law. If the reader of this message is not the intended recipient, you are hereby notified that any dissemination, distribution or copying or other use of the communication is strictly prohibited. If you receive the communication in error, please notify us immediately by telephone, and return the message to us at the above address via Canadian Postal Service postage due. Thank you.

[illegible]

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

SHIPMENT RELEASE (client use)		SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)		
Released by:	Date & Time:	Received by:	Date:	Time:	Temperature:	Verified by:	Date & Time:	Observations: Yes / No ? If Yes attach SIF



Environmental Division

Certificate of Analysis

JACQUES WHITFORD

ATTN: JENNIFER TODD

4370 DOMINION STREET, 5TH FLOOR
PO BOX 21
BURNABY BC V5G 4L7

Report Date: 26-OCT-09 14:03 (MT)

Version: FINAL

Lab Work Order #: **L829174**

Date Received: **13-OCT-09**

Project P.O. #: THOR LAKE

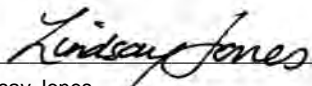
Job Reference: 1036222.02/Z9100

Legal Site Desc: GROUNDWATER SAMPLES

CofC Numbers: 09-020378

Other Information:

Comments:


Lindsay Jones
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 LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L829174-1	L829174-2	L829174-3	L829174-4	L829174-5
		08-OCT-09	08-OCT-09	08-OCT-09	08-OCT-09	08-OCT-09
		MW08-127	MW08-128	MW09-152	L08-124	DUP1
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	404	367	592	460	587
	Hardness (as CaCO3) (mg/L)	74.5	147	95.9	365	96.5
	pH (pH)	6.86	7.41	8.17	8.10	8.24
	Total Suspended Solids (mg/L)	56.8	17.8	23.3	28.8	35.8
	Total Dissolved Solids (mg/L)	240	230	388	274	399
	Turbidity (NTU)	42.7	20.0	22.6	70.6	19.8
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	121	173	278	265	289
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)	121	173	278	265	289
	Ammonia as N (mg/L)	0.063	0.575	0.106	0.046	0.067
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)	36.9	11.4	20.8	0.84	21.0
	Fluoride (F) (mg/L)	0.720	1.16	2.76	2.19	2.79
	Nitrate (as N) (mg/L)	0.0063	<0.0050	<0.0050	0.125	<0.0050
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	0.508	1.14	0.716	0.481	0.769
	Ortho Phosphate as P (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Phosphate as P (mg/L)	0.060	0.041	0.0078	0.019	0.0148
	Sulfate (SO4) (mg/L)	25.1	6.88	8.40	7.80	7.08
Organic / Inorganic Carbon	Total Organic Carbon (mg/L)	11.8	14.9	19.7	11.9	18.5
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	0.0108	0.0084	0.0066	0.0037	0.0245
	Antimony (Sb)-Dissolved (mg/L)	0.00013	0.00011	0.00011	<0.00010	0.00012
	Arsenic (As)-Dissolved (mg/L)	0.00066	0.00404	0.00084	0.00038	0.00090
	Barium (Ba)-Dissolved (mg/L)	0.0496	0.107	0.0212	0.0874	0.0217
	Beryllium (Be)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Bismuth (Bi)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Boron (B)-Dissolved (mg/L)	0.067	0.021	0.690	0.050	0.725
	Cadmium (Cd)-Dissolved (mg/L)	<0.000080	<0.00020	<0.00010	<0.000080	<0.00020
	Calcium (Ca)-Dissolved (mg/L)	17.1	29.8	20.4	26.7	20.5
	Chromium (Cr)-Dissolved (mg/L)	<0.0060	<0.0030	<0.0020	<0.0030	<0.0030
	Cobalt (Co)-Dissolved (mg/L)	0.00045	0.00043	0.00017	0.00138	0.00017
	Copper (Cu)-Dissolved (mg/L)	0.00102	0.00046	0.00040	0.00408	0.00062
	Iron (Fe)-Dissolved (mg/L)	1.09	5.96	0.098	0.324	0.094
	Lead (Pb)-Dissolved (mg/L)	0.000141	<0.000050	<0.000050	<0.000050	0.000052
	Lithium (Li)-Dissolved (mg/L)	0.0188	0.0139	0.0580	0.0189	0.0586
	Magnesium (Mg)-Dissolved (mg/L)	7.73	17.5	10.9	72.6	11.0
	Manganese (Mn)-Dissolved (mg/L)	0.222	0.336	0.0294	0.0508	0.0304
	Molybdenum (Mo)-Dissolved (mg/L)	0.0230	0.0627	0.0382	0.0281	0.0403
	Nickel (Ni)-Dissolved (mg/L)	0.00663	0.00371	0.00054	0.00208	0.00071