

License No: 8BC-EUR1621 Issued Date: August 11, 2016
Expiry Date: August 10, 2021

Project Name: Eureka Weather Station

Licensee: Environment and Climate Change Canada

Mailing Address: 160 Chemin Tour-de-l'isle
Montréal, Qc H3C 4G8
for Eureka Weather Station, Eureka, NU, X0A 0G0

Name of Company filing Annual Report (if different from Name of Licensee please clarify relationship between the two entities, if applicable):

Environment and Climate Change Canada

General Background Information on the Project (*optional):

Licence Requirements: the licensee must provide the following information in accordance with

Part B Item 1

A summary report of water use and waste disposal activities, including, but not limited to: methods of obtaining water; sewage and greywater management; drill waste management; solid and hazardous waste management.

Water Source(s):	Station Creek	
Water Quantity:	10 000	Quantity Allowable Domestic (cu.m)
	1 981	Actual Quantity Used Domestic (cu.m)
	0	Quantity Allowable Drilling (cu.m)
	0	Total Quantity Used Drilling (cu.m)

Waste Management and/or Disposal

- ☒ Solid Waste Disposal
☒ Sewage
☐ Drill Waste
☒ Greywater
☐ Hazardous
☐ Other:

Additional Details:

Appendix A: Quantity of Raw Water
Appendix B: Quality of Raw Water
Appendix C: Quality of Tap (non-drinking) Water
Appendix D: Quantity of Drinking Water Consumed
Appendix E: Quality of Drinking Water Consumed
Appendix F: Quantity of Waste Water Discharged
Appendix G: Quality of Waste Water Discharged
Appendix H: GPS Coordinates
Appendix K: Quality of Surface Water at monitoring stations EUR3 & EUR4

A list of unauthorized discharges and a summary of follow-up actions taken.

Spill No.: (as reported to the Spill Hot-line)
Date of Spill:
Date of Notification to an Inspector:
Additional Details: (impacts to water, mitigation measures, short/long term monitoring, etc)

There were no unauthorized discharges reported

Revisions to the Spill Contingency Plan

SCP submitted and approved - no revision required or proposed ▼

Additional Details:

Revisions to the Abandonment and Restoration Plan

N/A - not applicable ▼

Additional Details:

Progressive Reclamation Work Undertaken

Additional Details (i.e., work completed and future works proposed)

Work Completed in 2017/18

- a. Sewage treatment plant and New Water Lagoon project is currently suspended.
- b. New multipurpose support building construction is complete.
- c. Permafrost Study is currently suspended.
- d. Domestic Hot Water Plate Heat Exchanger project is complete.

Work Planned for 2018/19

- a. Project for a road from Black Top Creek to Remus Creek is underway. We are awaiting authorization to proceed.
- b. Project for a quarry at Remus Creek is underway. We are awaiting authorization to proceed.
- c. PEARL HVAC Recapitalization project is currently suspended.
- d. Indoor and outdoor lighting will continue to be progressively converted to LED
- e. Various equipment will be recommissioned
- f. A study on alternative energies could be conducted
- g. ECCC plans to optimize Eureka's energy consumption

See Appendix H for GPS Co-ordinates of each location where sources of water are utilized

The GPS Co-ordinates (in degrees, minutes and seconds of latitude and longitude) of each location where wastes associated with the licence are deposited;

Details attached

Additional Details:

See Appendix H for GPS Co-ordinates of each location where wastes associated with the licence are deposited.

Results of any additional sampling and/or analysis that was requested by an Inspector

Additional sampling requested by an Inspector or the Board (See below)

Additional Details: (date of request, analysis of results, data attached, etc)

See Appendix K for the results of the additional surface water runoff sample analysis required at the landfill area monitoring station EUR4 .

Any other details on water use or waste disposal requested by the Board by November 1 of the year being reported.

No additional sampling requested by an Inspector or the Board

Additional Details: (Attached or provided below)

Any responses or follow-up actions on inspection/compliance reports

No compliance report issued by INAC

Additional Details: (Dates of Report. Follow-up by the Licensee)

Any additional comments or information for the Board to consider

Date Submitted:	March 14, 2018
Submitted/Prepared by:	Jean-Philippe Cloutier-Dussault
Contact Information:	Tel: 514-283-4045
	Fax: 514-283-3020
	email: jean-philippe.cloutier-dussault@canada.ca

Quantities of Fresh Water pumped

Eureka 2017

Fresh Water: Station Creek

Fresh Water
Pump: Tsurmi Pump Model LB2-400 with a 30' head approx. 8.5 gal/minute x 2
pumps
Intake June 10 to Aug 18 periodic pumping to maintain full
324.5 hrs x 60 minutes x 17.0 gal = 427,380 gal 1940 cubic metres

Total 1940 cubic metres

Initial runoff captured and pumped. Creek flow did not stop this year, wet
weather, larger snow cover (more so than previous 4,5 years).

Appendix B

Quality of Raw Water

EUREKA RAW WATER ANALYSIS 2011-2017

Parameter	2011	2012	2013	2014	2015	2016	2017
TDS	2150	1130	3170	2910	Please refer to 2015 lab results	2410,0	1430 mg/L
Organic Carbon	3,2	4,9	4,0	2,0		3,7	2,5 mg/L
Hardness	1240	563	1600	155		1180,0	737 mg/L
Coliforms, Total	4,1	<1.0	47,3	<1.0		0,0	<1,0 MPN/100ml
Escherichia coli	<1.0	<1.0	<1.0	<1.0		0,0	<1,0 MPN/100ml
Aluminum	0,036	0,039	0,049	68,5		<0.02	13,8 ug/L
Antimony	<0.0001	0,0001	0,0002	0,5		<0.001	0,1 ug/L
Arsenic	0,0003	0,0142	0,0004	0,4		<0.001	0,3 ug/L
Barium	0,0687	0,0247	0,0642	0,0486		0,0501	9,1 ug/L
Beryllium	<0.0001	<0.0001	<0.0001	<0.0001		<0.001	<0,1 ug/L
Boron						0,217	
Cadmium	<0.00005	<0.0005	<0.00005	<0.0001		<0.0002	<0,1 ug/L
Chromium	0,0001	0,0007	0,0001	0,0012		<0.02	0,2 ug/L
Cobalt	0,0007	0,0004	<0.0001	<0.0001		<0.0005	0,7 ug/L
Copper	0,0012	0,0066	0,0164	0,0035		0,002	0,9 ug/L
Iron	0,009	0,09	0,032	0,152		<0.1	16 ug/L
Lead	<0.0001	<0.0001	0,0002	<0.0001		<0.001	<0,1 ug/L
Lithium	0,0368	0,0184	0,0479	0,0059		0,0464	53,2 ug/L
Manganese	0,0282	0,023	0,0031	0,0088		0,015	90,9 ug/L
Molybdenum	0,0004	0,0005	0,001	0,0003		0,00062	0,3 ug/L
Nickel	0,0061	0,0035	0,0027	0,0009		0,0052	19,6 ug/L
Selenium	0,0022	<0.0005	0,0031	<0.0005		<0.005	1,2 ug/L
Silver	<0.0001	<0.0001	0,0007	0,0002		<0.001	<0,1 ug/L
Strontium	1,11	0,55	1,38	0,159		1,14	604 ug/L
Thallium	<0.0001	<0.0001	<0.0001	<0.0001		<0.005	<0,1 ug/L
Titanium	0,0003	0,0012	0,0032	0,0014		<0.001	0,3 ug/L
Uranium	0,0001	0,0009	0,0025	0,0002		0,00199	0,8 ug/L
Vanadium	<0.0001	0,0107	0,0002	0,0002		<0.002	<0,1 ug/L
Zinc	0,0021	<0.005	0,0092	0,0059		<0.02	< 5,0 ug/L
Bromodichloromethane	n/a	<0.001	N/A*	<0.005		<0.0005	<0.005 mg/L
Bromoform	n/a	<0.001	N/A*	<0.005		<0.0005	<0.005 mg/L
Chloroform							<0.005 mg/L
Dibromochloromethane	n/a	<0.001	N/A*	<0.005		<0.0005	<0.005 mg/L
Trihalomethanes	n/a	<0.001	N/A*	<0.005		<0.01	<0.005 mg/L

Appendix B Quality of Raw Water



Taiga Environmental Laboratory
4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9
Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.:
180077

- CERTIFICATE OF ANALYSIS -

Client Sample ID: EULAG

Taiga Sample ID: 001

Client Project:
Sample Type: Water Lagoon
Received Date: 20-Feb-18
Sampling Date: 19-Feb-18
Sampling Time: 17:30
Location: Lagoon/Reverse Osmosis/Tap
Report Status: Final

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
<u>Inorganics - Nutrients</u>						
Organic Carbon, Total	2.5	0.5	mg/L	20-Feb-18	SM5310:B	
<u>Inorganics - Physicals</u>						
Solids, Total Dissolved	1430	10	mg/L	20-Feb-18	SM2540:C	
Turbidity	1.34	0.05	NTU	20-Feb-18	SM2130:B	
<u>Major Ions</u>						
Calcium	161	0.1	mg/L	23-Feb-18	SM4110:B	
Hardness	737	0.7	mg/L	23-Feb-18	SM4110:B	
Magnesium	81.6	0.1	mg/L	23-Feb-18	SM4110:B	
Sodium	164	0.1	mg/L	23-Feb-18	SM4110:B	
<u>Microbiology</u>						
Coliforms, Total	< 1.0	1.0	MPN/100ml	20-Feb-18	SM9223:B	
Escherichia coli	< 1.0	1.0	MPN/100ml	20-Feb-18	SM9223:B	
<u>Organics</u>						
Bromodichloromethane	< 0.005	0.005	mg/L	23-Feb-18	EPA8260B	110
Bromoform	< 0.005	0.005	mg/L	23-Feb-18	EPA8260B	110

ReportDate: Friday, March 02, 2018
Print Date: Friday, March 02, 2018

Page 2 of 11

Appendix B Quality of Raw Water



Taiga Environmental Laboratory
4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9
Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.:
180077

- CERTIFICATE OF ANALYSIS -

Client Sample ID: EULAG

Taiga Sample ID: 001

Chloroform	< 0.005	0.005	mg/L	23-Feb-18	EPA8260B	110
Dibromochloromethane	< 0.005	0.005	mg/L	23-Feb-18	EPA8260B	110
Trihalomethanes, Total	< 0.005	0.005	mg/L	23-Feb-18	EPA8260B	110
<u>Trace Metals, Total</u>						
Aluminum	13.8	5	µg/L	28-Feb-18	EPA200.8	
Antimony	0.1	0.1	µg/L	28-Feb-18	EPA200.8	
Arsenic	0.3	0.2	µg/L	28-Feb-18	EPA200.8	
Barium	9.1	0.1	µg/L	28-Feb-18	EPA200.8	
Beryllium	< 0.1	0.1	µg/L	28-Feb-18	EPA200.8	
Cadmium	< 0.1	0.1	µg/L	28-Feb-18	EPA200.8	
Cesium	< 0.1	0.1	µg/L	28-Feb-18	EPA200.8	
Chromium	0.2	0.1	µg/L	28-Feb-18	EPA200.8	
Cobalt	0.7	0.1	µg/L	28-Feb-18	EPA200.8	
Copper	0.9	0.2	µg/L	28-Feb-18	EPA200.8	
Iron	16	5	µg/L	28-Feb-18	EPA200.8	
Lead	< 0.1	0.1	µg/L	28-Feb-18	EPA200.8	
Lithium	53.2	0.2	µg/L	28-Feb-18	EPA200.8	
Manganese	90.9	0.1	µg/L	28-Feb-18	EPA200.8	
Molybdenum	0.3	0.1	µg/L	28-Feb-18	EPA200.8	
Nickel	19.6	0.1	µg/L	28-Feb-18	EPA200.8	
Rubidium	3.0	0.1	µg/L	28-Feb-18	EPA200.8	
Selenium	1.2	0.5	µg/L	28-Feb-18	EPA200.8	
Silver	< 0.1	0.1	µg/L	28-Feb-18	EPA200.8	
Strontium	604	0.1	µg/L	28-Feb-18	EPA200.8	
Thallium	< 0.1	0.1	µg/L	28-Feb-18	EPA200.8	

ReportDate: Friday, March 02, 2018
Print Date: Friday, March 02, 2018

Page 3 of 11

Appendix B
Quality of Raw Water



Taiga Environmental Laboratory
4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9
Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.:
180077

- CERTIFICATE OF ANALYSIS -

Client Sample ID: EULAG			Taiga Sample ID: 001		
Titanium	0.3	0.1	µg/L	28-Feb-18	EPA200.8
Uranium	0.8	0.1	µg/L	28-Feb-18	EPA200.8
Vanadium	< 0.1	0.1	µg/L	28-Feb-18	EPA200.8
Zinc	< 5.0	5	µg/L	28-Feb-18	EPA200.8

ReportDate: Friday, March 02, 2018
Print Date: Friday, March 02, 2018

Appendix C
Quality of Tap Water
EUREKA WATER ANALYSIS 2011-2017: TAP WATER

TAP WATER					GUIDELINES (mg/l)						
Parameter	2011	2012	2013	2014	2015	2016	2017	CANADIAN ¹		US EPA ²	
								MAC ¹	OG ² /AO ³	MCL ^{2*}	MCLG ³
TDS	1920	1290	2270	936	Please refer to 2015 lab results	1670	1190 mg/L				
Organic Carbon	2,7	3,3	3,2	4,2		2,86	2,8 mg/L				
Hardness	664	15,3	55,3	47,8		11,4	7,1 mg/L				
Coliforms, Total	<1.0	<1.0	<1.0	<1.0		0	<1,0 MPN/100ml	0/100 ml		100/100ml	0
Escherichia coli	<1.0	<1.0	<1.0	<1.0		0	<1,0 MPN/100ml	0/100 ml			0
Aluminum	0,0291	0,024	0,0035	0,0033		<0.02	2,7 ug/L		0,2	0.05-0.2	
Antimony	<0.0001	0,0001	0,0001	0,0001		<0.001	<0.1 ug/L				
Arsenic	0,0003	0,0007	0,0004	0,0004		<0.001	<0.2 ug/L				
Barium	0,0213	0,0004	0,0015	0,0015		0,00061	0,2 ug/L	1		2	2
Beryllium	<0.0001	<0.0001	<0.0001	<0.0001		<0.001	<0.1 ug/L			0,004	
Boron						0,152		5			
Cadmium	<0.00005	<0.0005	<0.00005	<0.00005		<0.0002	<0,04 ug/L	0,005		0,005	0,005
Chromium	0,0001	<0.0001	<0.0001	0,0002		<0.002	0,2 ug/L	0,05		0,1	0,1
Cobalt	0,0005	<0.0001	<0.0001	<0.0001		<0.0005	<0.1 ug/L				
Copper	0,101	0,0447	0,0709	0,104		0,0661	153 ug/L		<1.0		1,3
Iron	0,008	0,023	0,009	0,011		<0.1	38 ug/L		<0.3	0,3	
Lead	<0.0001	<0.0001	<0.0001	<0.0001		<0.001	0,2 ug/L	0,01		0,015	0
Lithium	0,0421	0,0013	0,0026	0,0571		0,0027	3,4 ug/L				
Manganese	0,0188	0,0018	0,0012	0,0008		<0.001	0,3 ug/L		<0.05	0,05	
Molybdenum	0,0003	0,0006	0,0007	0,0007		<0.0005	0,2 ug/L				
Nickel	0,0037	0,0009	0,0003	0,0007		<0.002	0,8 ug/L				
Selenium	0,0018	0,0007	0,0026	0,0029		<0.005	1,0 ug/L				
Silver	<0.0001	0,0005	<0.0001	<0.0001		<0.001	<0.1 ug/L			0,1	
Strontium	0,363	0,0041	0,003	0,0467		0,0116	4,9 ug/L				
Thallium	<0.0001	<0.0001	<0.0001	<0.0001		<0.005	<0.1 ug/L				
Titanium	0,0004	0,0032	0,0001	<0.0001		<0.001	<0.1 ug/L				
Uranium	0,0015	0,001	0,0018	0,0021		0,00132	0,3 ug/L				
Vanadium	<0.0001	0,0005	<0.0001	<0.0001		<0.002	<0.1 ug/L				
Zinc	0,0549	0,009	0,0222	0,0178		<0.02	26,5 ug/L		<5.0	5	
Bromodicholormethane	n/a	<0.005	0,005	<0.005		0,0529	0,068 mg/L	0,016			
Bromoform	n/a	0,036	0,183	0,126		0,11	0,051 mg/L				
Dibromochloromethane	n/a	0,02	0,038	0,026		0,125	0,092 mg/L				
Trihalomethanes	n/a	0,062	0,227	0,155		0,328	0,296 mg/L	0,1		0,08	

*Subcontracted organics are in concentrations less than detectable levels except for those listed immediately above

¹Guidelines for Canadian Drinking Water Quality Summary Table, May 2008
http://www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/sum_guide-res_recom/chemical-chimiques-eng.php#tbl6

²US Environmental Protection Agency Drinking Water Standards
<http://www.epa.gov/safewater/contaminants/index.html>

³Maxiumum Acceptable Concentration

⁴Aesthetic Objectives

⁵Operational Guidance Values

⁶Maximum Contaminant Level

⁷Maximum Contaminant Level Goal

Appendix C
Quality of Tap Water



Taiga Environmental Laboratory
4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9
Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.:
180077

- CERTIFICATE OF ANALYSIS -

Client Sample ID: EUTAP Taiga Sample ID: 003

Client Project:
Sample Type: TAP - Wx Office
Received Date: 20-Feb-18
Sampling Date: 19-Feb-18
Sampling Time: 16:30
Location: Lagoon/Reverse Osmosis/Tap
Report Status: Final

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
<u>Inorganics - Nutrients</u>						
Organic Carbon, Total	2.8	0.5	mg/L	20-Feb-18	SM5310:B	
<u>Inorganics - Physicals</u>						
Solids, Total Dissolved	1190	10	mg/L	20-Feb-18	SM2540:C	
Turbidity	0.26	0.05	NTU	20-Feb-18	SM2130:B	
<u>Major Ions</u>						
Calcium	1.9	0.1	mg/L	23-Feb-18	SM4110:B	
Hardness	7.1	0.7	mg/L	23-Feb-18	SM4110:B	
Magnesium	0.6	0.1	mg/L	23-Feb-18	SM4110:B	
Sodium	413	0.1	mg/L	23-Feb-18	SM4110:B	
<u>Microbiology</u>						
Coliforms, Total	< 1.0	1.0	MPN/100ml	20-Feb-18	SM9223:B	
Escherichia coli	< 1.0	1.0	MPN/100ml	20-Feb-18	SM9223:B	
<u>Organics</u>						
Bromodichloromethane	0.068	0.005	mg/L	23-Feb-18	EPA8260B	
Bromoform	0.051	0.005	mg/L	23-Feb-18	EPA8260B	
Chloroform	0.085	0.005	mg/L	23-Feb-18	EPA8260B	

ReportDate: Friday, March 02, 2018
Print Date: Friday, March 02, 2018

Appendix C
Quality of Tap Water



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Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.:
180077

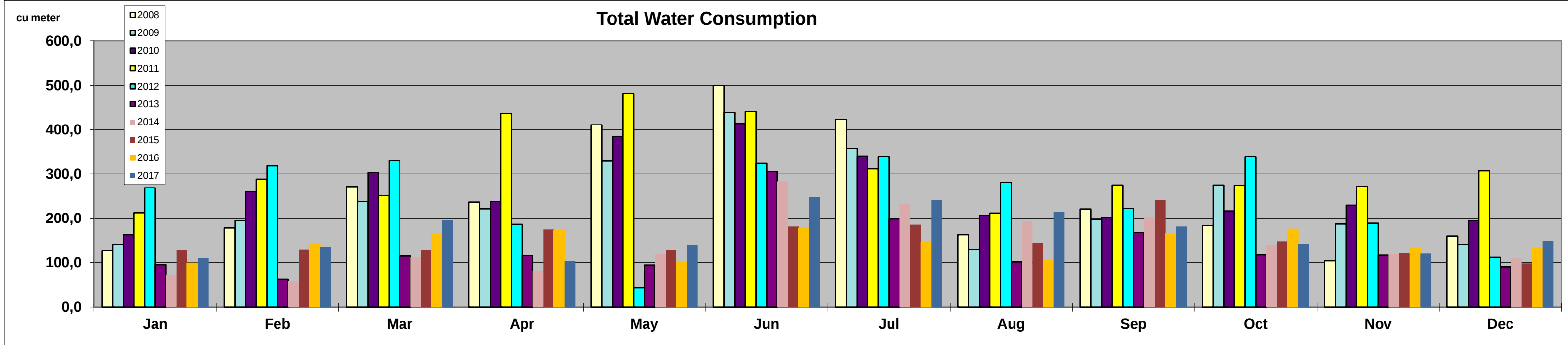
- CERTIFICATE OF ANALYSIS -

Client Sample ID: EUTAP			Taiga Sample ID: 003		
Dibromochloromethane	0.092	0.005	mg/L	23-Feb-18	EPA8260B
Trihalomethanes, Total	0.296	0.005	mg/L	23-Feb-18	EPA8260B
<u>Trace Metals, Total</u>					
Aluminum	2.7	0.6	µg/L	28-Feb-18	EPA200.8
Antimony	< 0.1	0.1	µg/L	28-Feb-18	EPA200.8
Arsenic	< 0.2	0.2	µg/L	28-Feb-18	EPA200.8
Barium	0.2	0.1	µg/L	28-Feb-18	EPA200.8
Beryllium	< 0.1	0.1	µg/L	28-Feb-18	EPA200.8
Cadmium	< 0.04	0.04	µg/L	28-Feb-18	EPA200.8
Cesium	< 0.1	0.1	µg/L	28-Feb-18	EPA200.8
Chromium	0.2	0.1	µg/L	28-Feb-18	EPA200.8
Cobalt	< 0.1	0.1	µg/L	28-Feb-18	EPA200.8
Copper	153	0.2	µg/L	28-Feb-18	EPA200.8
Iron	38	5	ug/L	28-Feb-18	EPA200.8
Lead	0.2	0.1	µg/L	28-Feb-18	EPA200.8
Lithium	3.4	0.2	µg/L	28-Feb-18	EPA200.8
Manganese	0.3	0.1	µg/L	28-Feb-18	EPA200.8
Molybdenum	0.2	0.1	µg/L	28-Feb-18	EPA200.8
Nickel	0.8	0.1	µg/L	28-Feb-18	EPA200.8
Rubidium	0.8	0.1	µg/L	28-Feb-18	EPA200.8
Selenium	1.0	0.3	µg/L	28-Feb-18	EPA200.8
Silver	< 0.1	0.1	µg/L	28-Feb-18	EPA200.8
Strontium	4.9	0.1	µg/L	28-Feb-18	EPA200.8
Thallium	< 0.1	0.1	µg/L	28-Feb-18	EPA200.8
Titanium	< 0.1	0.1	µg/L	28-Feb-18	EPA200.8

ReportDate: Friday, March 02, 2018
Print Date: Friday, March 02, 2018

APPENDIX D
QUANTITY OF DRINKING WATER

2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	
57,8	43,8	91,7	104,0	104,9	22,0	131,9	126,9	140,9	162,7	212,5	268,6	95,0	72,4	128,9	98,7	109,6	Jan
117,5	90,0	60,6	116,7	117,0	137,9	106,3	178,0	194,9	260,0	288,2	318,2	63,1	59,3	130,0	142,1	135,7	Feb
113,0	79,2	160,6	121,2	188,2	103,5	222,6	271,4	237,7	302,9	251,4	330,1	114,9	112,5	129,7	165,5	196,0	Mar
84,1	186,8	111,7	160,1	63,7	73,6	209,2	236,3	221,5	237,5	436,6	186,3	115,6	81,7	174,8	172,6	103,6	Apr
261,8	233,8	280,3	203,7	273,9	322,8	273,8	410,7	328,8	384,5	481,3	43,1	94,6	119,4	128,3	101,2	140,3	May
335,3	287,9	432,5	418,2	489,0	495,7	325,6	499,7	438,7	413,7	440,6	323,9	305,7	283,4	181,4	177,7	248,0	Jun
438,0	354,8	369,1	427,6	501,8	379,6	319,3	423,3	357,6	340,4	311,4	339,4	199,5	232,6	185,3	146,5	240,6	Jul
238,5	160,6	260,3	247,4	236,3	111,3	167,7	163,0	130,0	206,9	211,6	281,2	101,3	193,4	144,7	104,0	214,6	Aug
114,5	77,1	59,4	180,3	237,8	77,8	153,9	221,1	197,2	202,0	274,9	222,4	167,9	203,3	241,4	165,4	181,4	Sep
103,1	79,6	165,3	70,8	71,5	107,4	142,6	183,1	275,1	216,5	274,4	339,1	117,4	140,2	147,9	175,5	142,6	Oct
83,5	94,6	61,5	104,6	71,5	106,4	89,2	103,9	187,0	229,6	272,4	188,8	116,5	118,3	121,5	134,7	120,3	Nov
141,5	85,5	149,5	144,2	78,1	108,6	163,6	159,9	141,0	195,3	307,0	111,9	90,3	109,3	98,0	133,4	148,7	Dec
2088,6	1773,7	2202,5	2298,8	2433,7	2046,6	2305,7	2977,3	2850,4	3152,0	3762,3	2953,0	1581,8	1725,8	1811,9	1717,3	1981,4	Total (cu M)
174,1	147,8	183,5	191,6	202,8	170,6	192,1	248,1	237,5	262,7	313,5	246,1	131,8	143,8	151,0	143,1	165,1	Monthly Avg



Appendix E
Quality of Drinking Water Consumed
EUREKA WATER ANALYSIS 2011-2017 - REVERSE OSMOSIS

								GUIDELINES (mg/l)			
Parameter	2011	2012	2013	2014	2015	2016	2017	CANADIAN ¹		US EPA ^{II}	
								MAC ⁺	OG ⁺ /AO ⁺	MCL ⁺	MCLG ⁺
TDS	40	<10	18	83	Please refer to 2015 lab results	53	<10 mg/L				
Organic Carbon	<0.5	<0.5	<0.5	0,7		<0.5	<0.5 mg/L				
Hardness	3,2	<0.7	0,0027	5,3		<0.54	0,9 mg/L				
Coliforms, Total	<1.0	<1.0	<1.0	<1.0		0	<1.0 MPN/100ml	0/100 ml		100/100ml	0
Escherichia coli	<1.0	<1.0	<1.0	<1.0		0	<1.0 MPN/100ml	0/100 ml			0
Aluminum	<0.6	<0.0005	<0.0006	0,0017		<0.02	<0,6 ug/L		0,2	0.05-0.2	
Antimony	<0.0001	<0.0001	<0.0001	<0.0001		<0.01	<0,1 ug/L				
Arsenic	<0.0002	<0.0002	<0.0002	<0.0002		<0.01	<0,2 ug/L				
Barium	<0.0001	<0.0001	<0.0001	0,0002		<0.0005	<0,1 ug/L	1		2	2
Beryllium	<0.0001	<0.0001	<0.0001	<0.0001		<0.001	<0,1 ug/L			0,004	
Boron						0,124		5			
Cadmium	<0.00005	<0.0005	<0.00005	<0.00005		<0.0002	<0.04 ug/L	0,005		0,005	0,005
Chromium	<0.0001	<0.0001	<0.0001	<0.0001		<0.002	<0,1 ug/L	0,05		0,1	0,1
Cobalt	<0.0001	<0.0001	<0.0001	<0.0001		<0.0005	<0,1 ug/L				
Copper	0,0026	0,0072	0,0335	0,0299		0,0272	75,8 ug/L		<1.0		1,3
Iron	<0.005	<0.005	<0.005	0,006		<0.10	< 5 ug/L		<0.3	0,3	
Lead	<0.0001	0,0003	0,0003	<0.0001		<0.0010	1,1 ug/L	0,01		0,015	0
Lithium	0,0014	<0.0002	0,0002	0,0093		<0.0020	< 0,2 ug/L				
Manganese	<0.0001	<0.0001	<0.0001	0,0004		<0.0010	<0,1 ug/L		<0.05	0,05	
Molybdenum	<0.0001	0,0001	<0.0001	0,0002		<0.0005	<0,1 ug/L				
Nickel	0,0002	0,0002	0,0002	0,0005		0,0059	1,2 ug/L				
Selenium	<0.0003	<0.0005	<0.0003	0,0009		<0.005	<0,3 ug/L				
Silver	<0.0001	<0.0001	<0.0001	<0.0001		<0.0010	<0,1 ug/L			0,1	
Strontium	0,0015	0,0001	0,0002	0,0039		<0.0005	<0,1 ug/L				
Thallium	<0.0001	<0.0001	<0.0001	<0.0001		<0.005	<0,1 ug/L				
Titanium	<0.0001	<0.0001	<0.0001	<0.0001		<0.0010	<0,1 ug/L				
Uranium	<0.0001	<0.0001	<0.0001	0,0002		<0.0005	<0,1 ug/L				
Vanadium	<0.0001	<0.0001	<0.0001	<0.0001		<0.0020	<0,1 ug/L				
Zinc	0,0175	0,111	0,123	0,0796		0,091	349 ug/L		<5.0	5	
*Bromodicholormethane	n/a	<0.005	0,002	n/a		0,00912	0,007 mg/L	0,016			
Bromoform	n/a	<0.005	0,012	n/a		0,00208	<0,005 mg/L				
Dibromochloromethane	n/a	<0.005	0,006	<0.005		0,005	<0,005 mg/L				
Trihalomethanes	n/a	0,012	0,02	<0.005		0,0304	0,023 mg/L	0,1		0,08	

*Subcontracted organics are in concentrations less than detectable levels except for those listed immediately above

ⁱGuidelines for Canadian Drinking Water Quality Summary Table, May 2008
http://www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/sum_guide-res_recom/chemical-chimiques-eng.php#tbl6

ⁱⁱUS Environmental Protection Agency Drinking Water Standards
<http://www.epa.gov/safewater/contaminants/index.html>

⁺Maximum Acceptable Concentration

⁺Aesthetic Objectives

⁺Operational Guidance Values

⁺Maximum Contaminant Level

⁺Maximum Contaminant Level Goal

Appendix E
Quality of Drinking Water Consumed



Taiga Environmental Laboratory
4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9
Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.:
180077

- CERTIFICATE OF ANALYSIS -

Client Sample ID: EURO

Taiga Sample ID: 002

Client Project:
Sample Type: Reverse Osmosis
Received Date: 20-Feb-18
Sampling Date: 19-Feb-18
Sampling Time: 16:40
Location: Lagoon/Reverse Osmosis/Tap
Report Status: Final

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
<u>Inorganics - Nutrients</u>						
Organic Carbon, Total	< 0.5	0.5	mg/L	20-Feb-18	SM5310:B	
<u>Inorganics - Physicals</u>						
Solids, Total Dissolved	< 10	10	mg/L	20-Feb-18	SM2540:C	
Turbidity	0.11	0.05	NTU	20-Feb-18	SM2130:B	
<u>Major Ions</u>						
Calcium	0.3	0.1	mg/L	23-Feb-18	SM4110:B	
Hardness	0.9	0.7	mg/L	23-Feb-18	SM4110:B	
Magnesium	< 0.1	0.1	mg/L	23-Feb-18	SM4110:B	
Sodium	3.0	0.1	mg/L	23-Feb-18	SM4110:B	
<u>Microbiology</u>						
Coliforms, Total	< 1.0	1.0	MPN/100ml	20-Feb-18	SM9223:B	
Escherichia coli	< 1.0	1.0	MPN/100ml	20-Feb-18	SM9223:B	
<u>Organics</u>						
Bromodichloromethane	0.007	0.005	mg/L	23-Feb-18	EPA8260B	
Bromoform	< 0.005	0.005	mg/L	23-Feb-18	EPA8260B	
Chloroform	0.013	0.005	mg/L	23-Feb-18	EPA8260B	

ReportDate: Friday, March 02, 2018
Print Date: Friday, March 02, 2018

Appendix E
Quality of Drinking Water Consumed



Taiga Environmental Laboratory
4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9
Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.:
180077

- CERTIFICATE OF ANALYSIS -

Client Sample ID: EURO			Taiga Sample ID: 002		
Dibromochloromethane	< 0.005	0.005	mg/L	23-Feb-18	EPA8260B
Trihalomethanes, Total	0.023	0.005	mg/L	23-Feb-18	EPA8260B
<u>Trace Metals, Total</u>					
Aluminum	< 0.6	0.6	µg/L	28-Feb-18	EPA200.8
Antimony	< 0.1	0.1	µg/L	28-Feb-18	EPA200.8
Arsenic	< 0.2	0.2	µg/L	28-Feb-18	EPA200.8
Barium	< 0.1	0.1	µg/L	28-Feb-18	EPA200.8
Beryllium	< 0.1	0.1	µg/L	28-Feb-18	EPA200.8
Cadmium	< 0.04	0.04	µg/L	28-Feb-18	EPA200.8
Cesium	< 0.1	0.1	µg/L	28-Feb-18	EPA200.8
Chromium	< 0.1	0.1	µg/L	28-Feb-18	EPA200.8
Cobalt	< 0.1	0.1	µg/L	28-Feb-18	EPA200.8
Copper	75.8	0.2	µg/L	28-Feb-18	EPA200.8
Iron	< 5	5	ug/L	28-Feb-18	EPA200.8
Lead	1.1	0.1	µg/L	28-Feb-18	EPA200.8
Lithium	< 0.2	0.2	µg/L	28-Feb-18	EPA200.8
Manganese	< 0.1	0.1	µg/L	28-Feb-18	EPA200.8
Molybdenum	< 0.1	0.1	µg/L	28-Feb-18	EPA200.8
Nickel	1.2	0.1	µg/L	28-Feb-18	EPA200.8
Rubidium	0.1	0.1	µg/L	28-Feb-18	EPA200.8
Selenium	< 0.3	0.3	µg/L	28-Feb-18	EPA200.8
Silver	< 0.1	0.1	µg/L	28-Feb-18	EPA200.8
Strontium	< 0.1	0.1	µg/L	28-Feb-18	EPA200.8
Thallium	< 0.1	0.1	µg/L	28-Feb-18	EPA200.8
Titanium	< 0.1	0.1	µg/L	28-Feb-18	EPA200.8

ReportDate: Friday, March 02, 2018
Print Date: Friday, March 02, 2018

Appendix E
Quality of Drinking Water Consumed



Taiga Environmental Laboratory
4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9
Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.:
180077

- CERTIFICATE OF ANALYSIS -

Client Sample ID: EURO			Taiga Sample ID: 002		
Uranium	< 0.1	0.1	µg/L	28-Feb-18	EPA200.8
Vanadium	< 0.1	0.1	µg/L	28-Feb-18	EPA200.8
Zinc	349	0.4	µg/L	28-Feb-18	EPA200.8

Appendix F
Quantity of Waste Water Discharged

QUANTITIES OF
WASTE WATER DISCHARGED

Eureka 2017

Waste Water: Sewage Lagoon

Pump: Monarch Pump Model TT30 Type E with attached hose approx. 150
gal/minute

First decant June 25 to June 26 58.5 hrs x 60 min x 150
526,500 gal 2390 cubic metres

Total 2390 cubic metres

This summer there were numerous decants, there was a large amount of ice
under the liquid. Stopped decanting after liquid gone. Large amount in the
lagoon, same as fresh water, larger snow pack this year. Decanted further, prior
to freeze up.

Appendix G

Quality of Waste Water Discharged

ANALYSIS OF EUREKA SEWAGE PARAMETERS

Wastewater effluent at Eureka is governed by two guidelines: CCME's Canada-wide Strategy for the Management of Municipal Wastewater Effluent, 2009; and Guidelines for the Discharge of Municipal Wastewater in the Northwest Territories (NWT), 1992. The CCME guidelines address municipal wastewater facilities (owned by municipalities, communities, federal and other government entities, and facilities on federal and aboriginal lands) discharging effluent into surface water, including combined and sanitary sewer overflows. The NWT guidelines are also applicable to the Eureka lagoon. Under Eureka's water licence with the Nunavut Water Board, the NWT guidelines are referenced as the criteria to be used to assess compliance.

The Eureka wastewater lagoon effluent was sampled 2008 through to 2017 in order to determine the level of compliance with CCME and NWT guidelines for wastewater. This report discusses the exceeding parameters, their potential causes of exceedances, and identifies corrective solutions if applicable.

Effluent exceedances

1. Iron (Fe)

Effluent iron averaged between 0.56 to 0.67 mg/L which is slightly above the Territorial guidelines. The possible sources of iron (Fe) are²:

- a. Natural sources (land, water)
- b. Iron sediments or deposits in the lagoon which are being dissolved; and
- c. Holding tank prior to evacuation to the lagoon.

Source 1.a noted above concerning natural sources is reinforced by the Franz Environmental report of 2012 entitled "2012 Supplemental Investigation Eureka High Arctic Weather Station, Nunavut" (Included with this Annual Report). Specifically as follows:

"...Chemical analysis of background surface water samples indicated naturally elevated concentrations of aluminum, cadmium, copper, lead, iron, manganese, and zinc in surface water..."

The Sewage Treatment System Recapitalization Project design phase is now complete. Project is currently suspended.

Additional Parameters for Analysis

Both monitoring stations EUR2 (Landfill Solid Waste Disposal Area) and EUR4 (Landfarm area), as per the Nunavut Water Board recommendations, is to be analyzed for the same parameters currently being analyzed for EUR3 (Sewage Lagoon). Additional sampling for EUR2, EUR3, and EUR4 is to include analysis for Chloride, Total Hardness, Total Mercury, Total Alkalinity, and Total Organic Carbon. In addition, effluent discharge from EUR 4 is to be analyzed for Benzene, Toluene, and Ethylbenzene, as stated in the Water License Agreement.

¹Richard, Michael. Microbiological and Chemical Testing for Troubleshooting lagoons. 2003

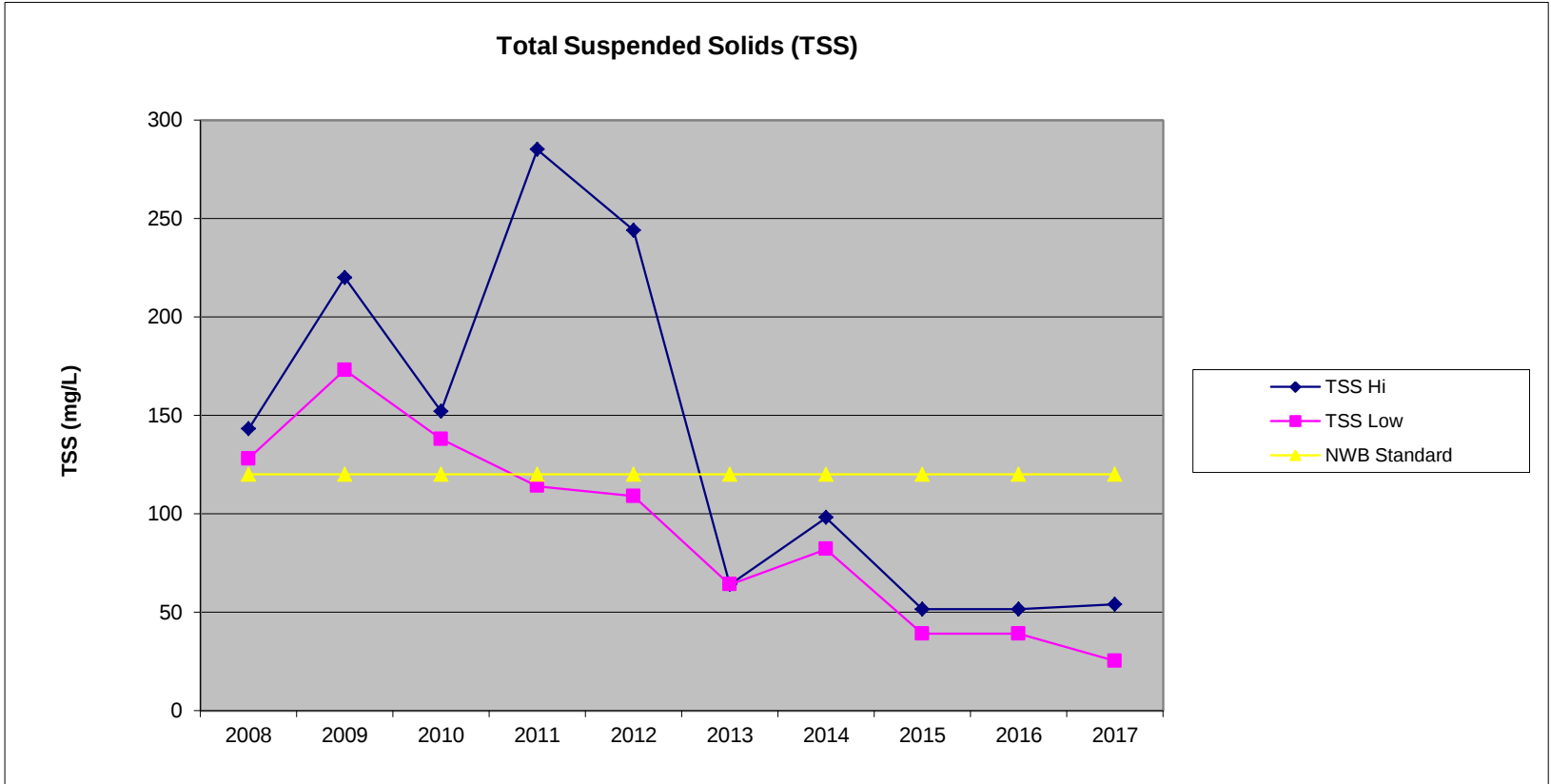
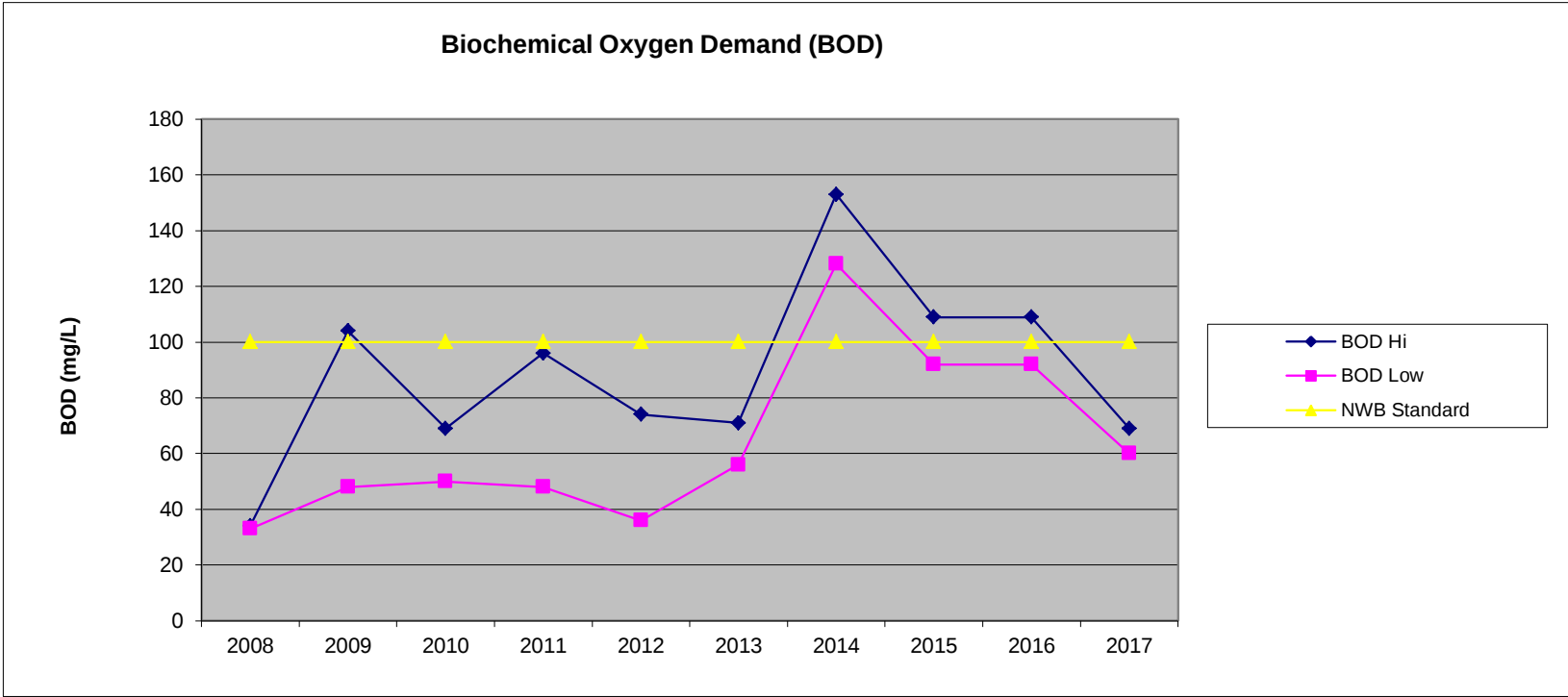
²Tillman, Glenn. Wastewater Treatment: Troubleshooting and Problem Solving.

³Connecticut Department of Public Health. Fact Sheet: Manganese in Drinking Water. 2001

Appendix G
Quality of Waste Water Discharged

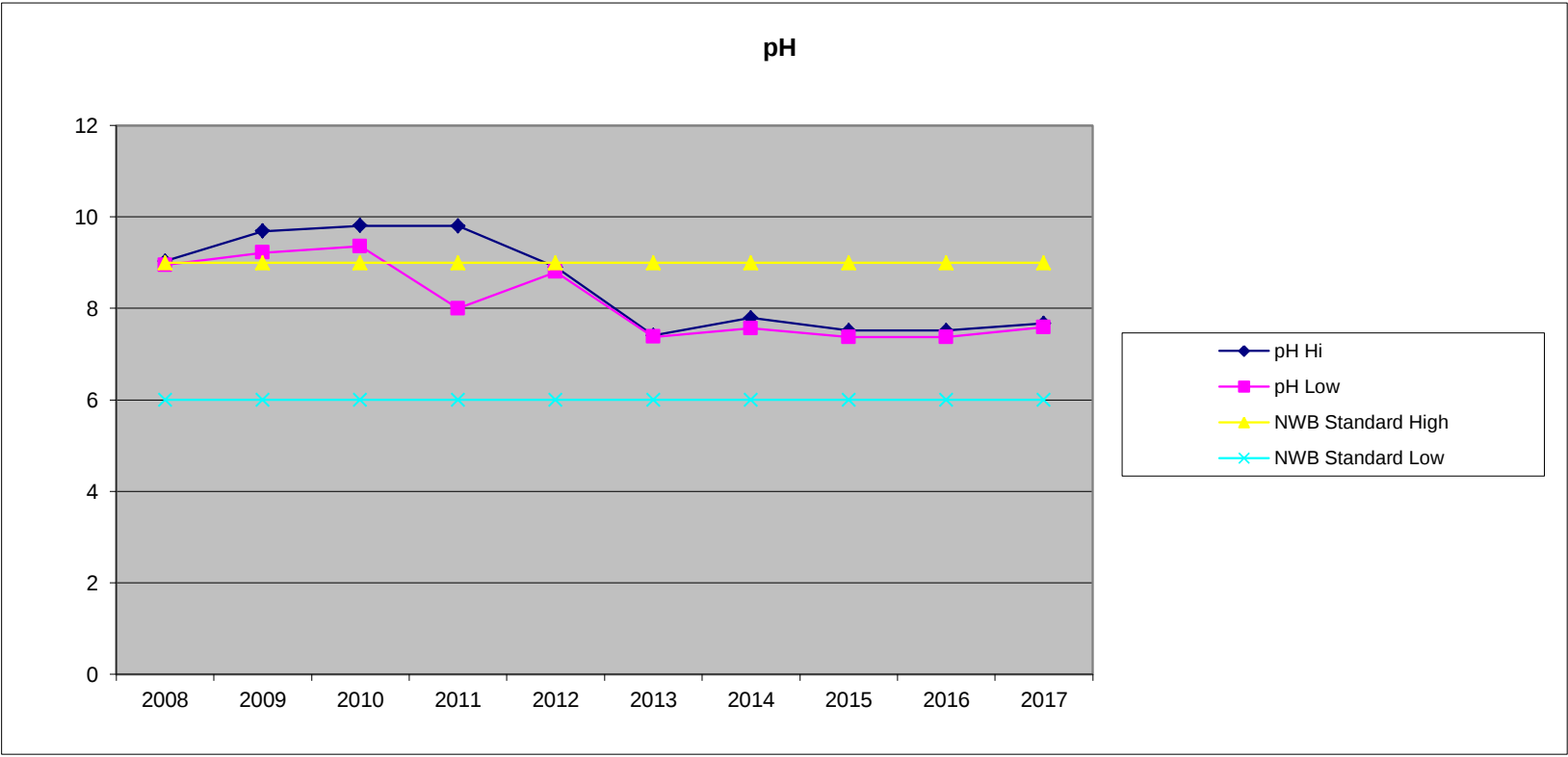
BOD Results for Eureka Wastewater Lagoon Effluent

BOD

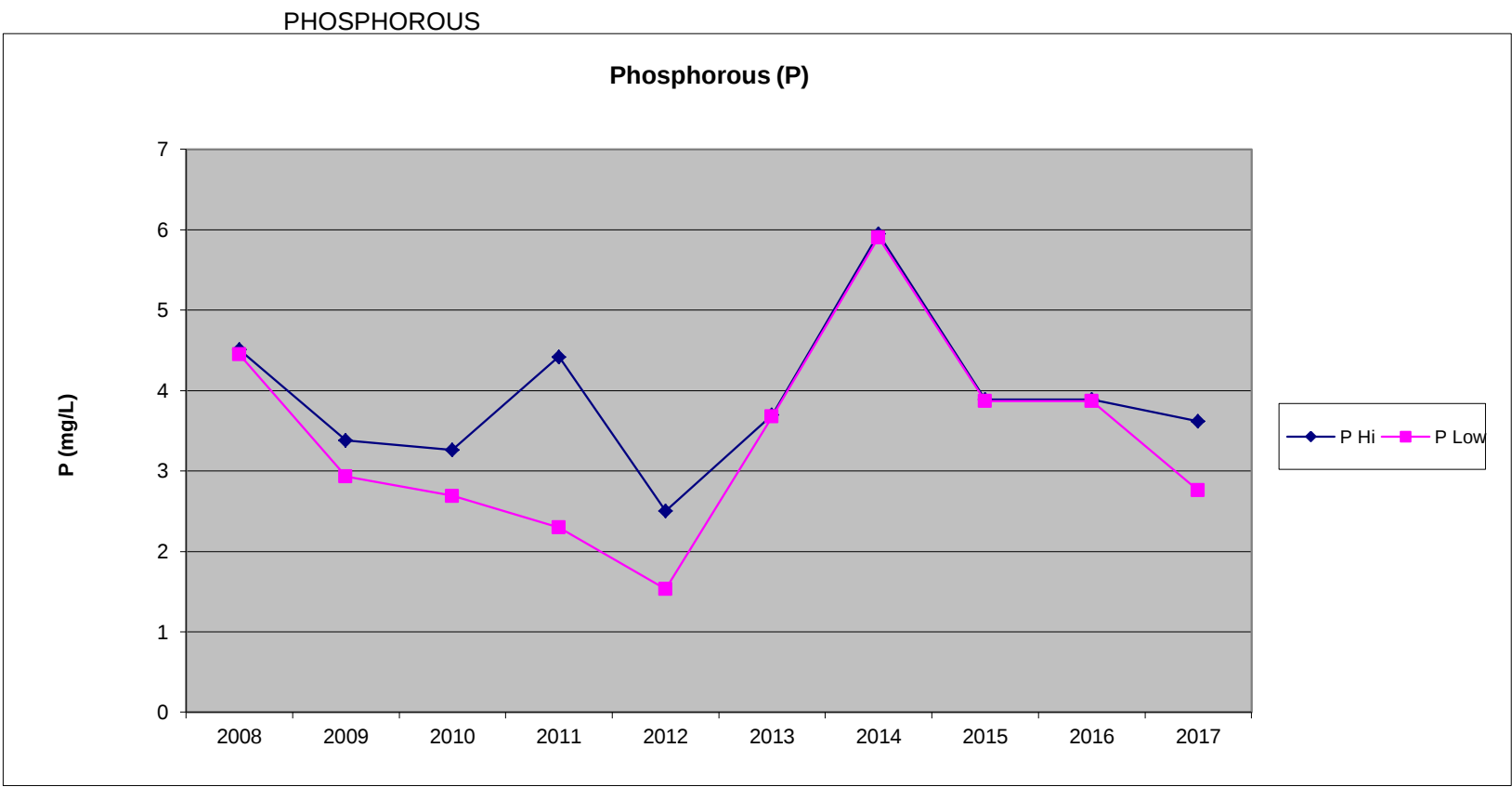


Appendix G
Quality of Waste Water Discharged

pH Results for Eureka Wastewater Lagoon Effluent

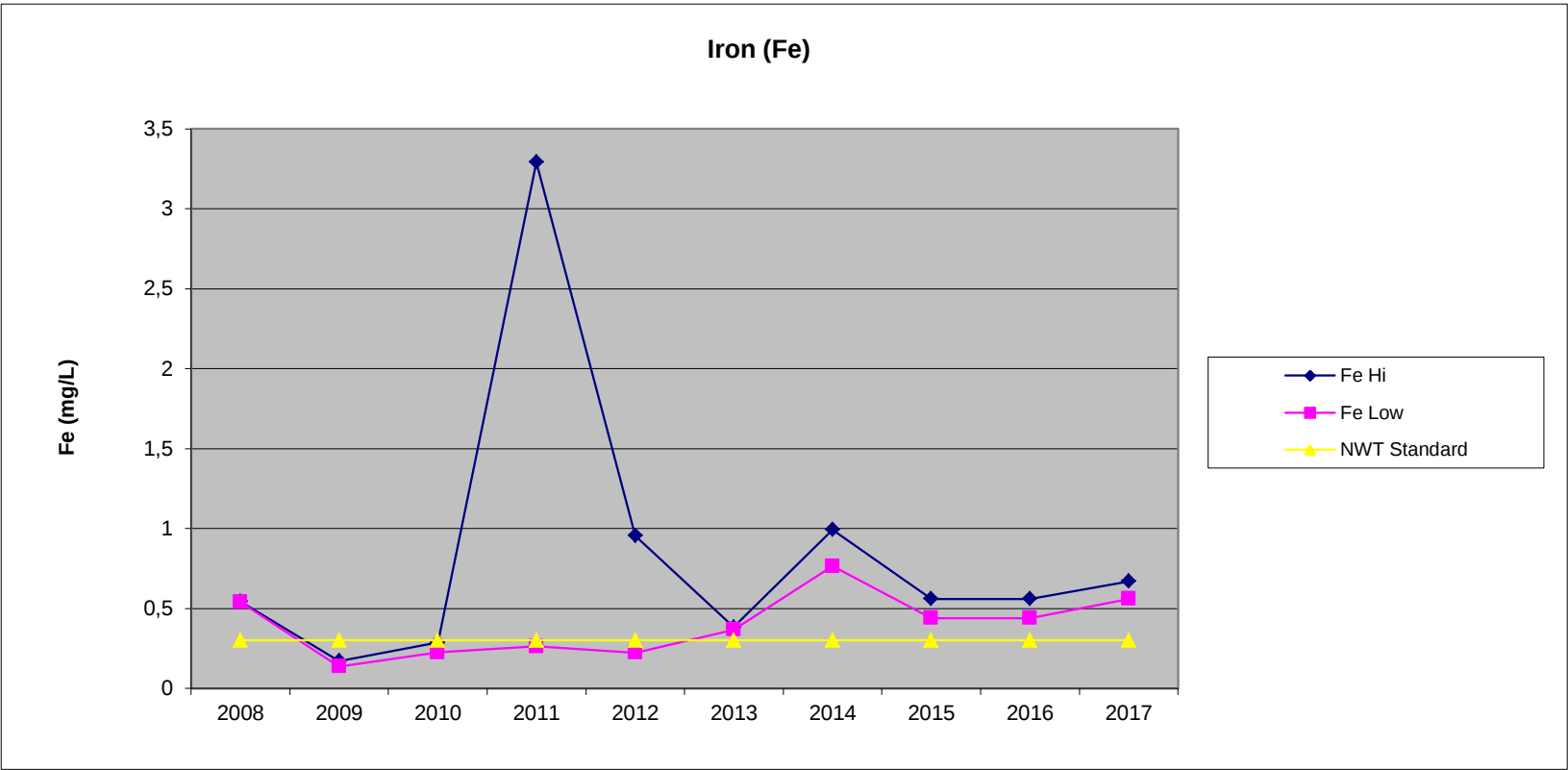


Phosphorous Results for Eureka Wastewater Lagoon Effluent

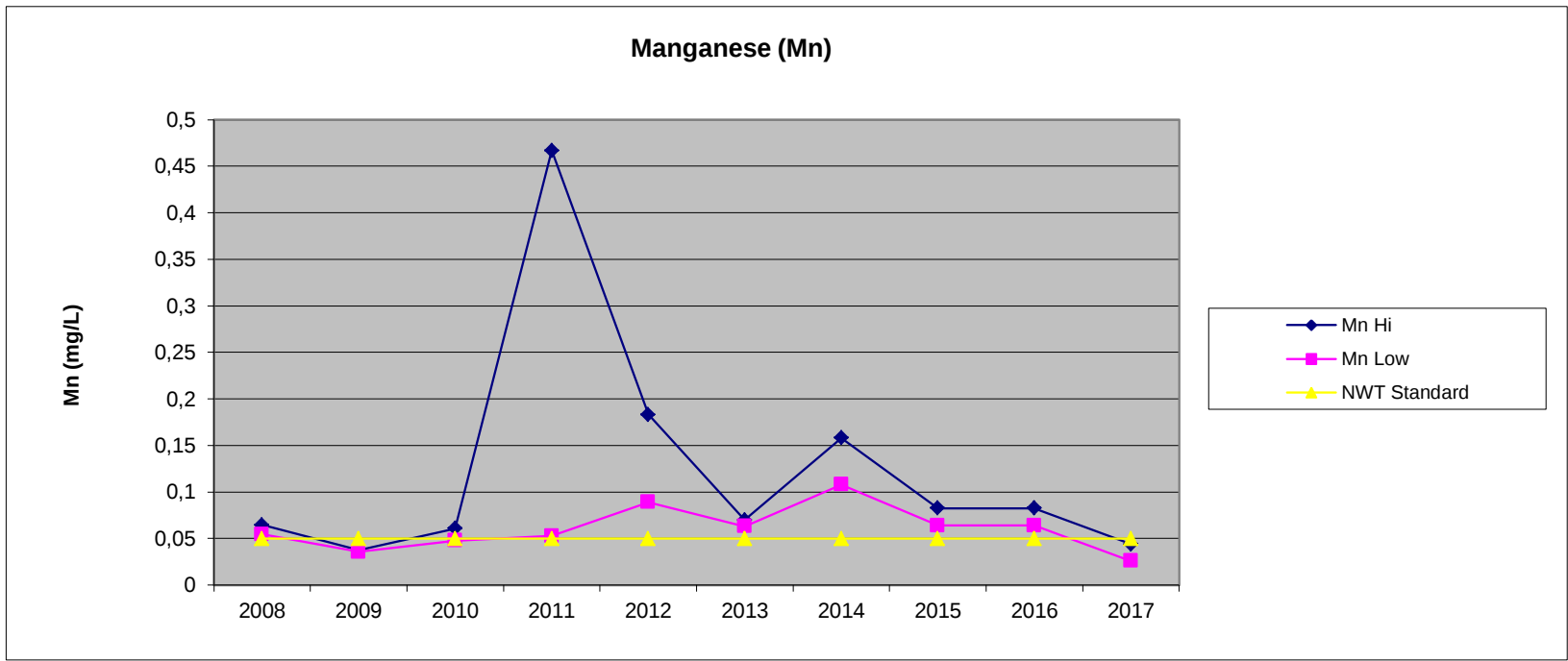


Appendix G
Quality of Waste Water Discharged

Iron Results for Eureka Wastewater Lagoon Effluent



Manganese Results for Eureka Wastewater Lagoon Effluent



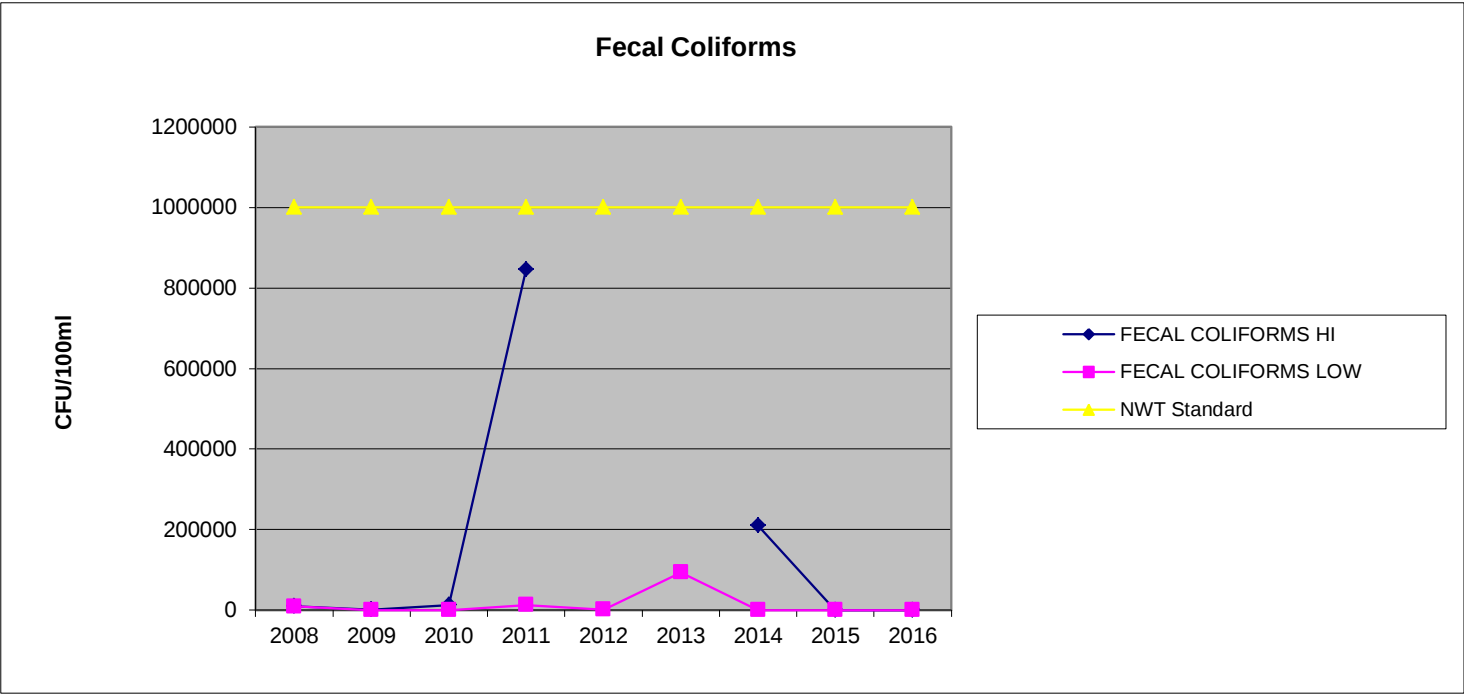
Appendix G
Quality of Waste Water Discharged

Fecal Coliform Results for Eureka Wastewater Lagoon Effluent

	FECAL COLIFOR MS									
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
FECAL COLIFOR MS HI	10200	900	13000	845195			210000	0	0	
FECAL COLIFOR MS LOW	9200	0	200	13000	1265	93000	1	0	0	> 2420 MPN/100ml
NWT Standard	1000000	1000000	1000000	1000000	1000000	1000000	1000000	1000000	1000000	1000000

See Laboratory results for 2016 as they are smaller than 110 000.

Note: CFU/100ml = Colony Forming Units/100ml



Appendix G
Quality of Waste Water Discharged



Environment Canada
ATTN: JOHN MACIVER
Eureka Weather Station
Eureka NU

Date Received: 26- JUN- 17
Report Date: 11- JUL- 17 06:52 (MT)
Version: FINAL

Client Phone: 613-945-3145

Certificate of Analysis

Lab Work Order #: L1948893

Project P.O. #: NOT SUBMITTED

Job Reference: EUREKA WEATHER STATION

C of C Numbers:

Legal Site Desc:

A handwritten signature in blue ink, appearing to read 'Hua Wo', is positioned above a horizontal line.

Hua Wo
Chemistry Laboratory Manager

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

ADDRESS: 1329 Niakwa Road East, Unit 12, Winnipeg, MB R2J3T4 Canada | Phone: +1 204 255 9720 | Fax: +1 204 255 9721
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Appendix G
Quality of Waste Water Discharged

EUREKA WEATHER STATION

L1948893 CONTD....
PAGE 2 of 8
Version: FINAL

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1948893-1 WASTE WATER 1							
Sampled By: CLIENT on 24-JUN-17 @ 16:15							
Matrix: WASTE							
Alkalinity species as HCO3, CO3, OH							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	221		1.2	mg/L		28-JUN-17	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		28-JUN-17	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		28-JUN-17	
Alkalinity, Total (as CaCO3)							
Alkalinity, Total (as CaCO3)	181		1.0	mg/L		27-JUN-17	R3757513
Miscellaneous Parameters							
Ammonia, Total (as N)	13.8		1.0	mg/L		05-JUL-17	R3766088
Biochemical Oxygen Demand	60		20	mg/L		28-JUN-17	R3765045
Chloride (Cl)	874		10	mg/L		29-JUN-17	R3759649
Conductivity	3390		1.0	umhos/cm		27-JUN-17	R3757513
Hardness (as CaCO3)	442	HTC	0.54	mg/L		29-JUN-17	
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L	30-JUN-17	05-JUL-17	R3766324
Oil and Grease	20.4		5.0	mg/L		05-JUL-17	R3764984
Phenols (4AAP)	0.0237		0.0010	mg/L		09-JUL-17	R3768925
Phosphorus (P)-Total	1.98		0.10	mg/L		04-JUL-17	R3762963
Phosphorus (P)-Total Dissolved	1.71		0.050	mg/L		05-JUL-17	R3765590
Phosphorus (P)-Total Reactive	1.19		0.050	mg/L		28-JUN-17	R3758449
Sulfate (SO4)	341		6.0	mg/L		29-JUN-17	R3759649
Total Organic Carbon	43.7		0.50	mg/L		06-JUL-17	R3768082
Total Suspended Solids	25.3		6.7	mg/L		29-JUN-17	R3759619
pH	7.59		0.10	pH units		27-JUN-17	R3757513
Total Metals by ICP-MS							
Aluminum (Al)-Total	0.548		0.020	mg/L	28-JUN-17	28-JUN-17	R3758350
Antimony (Sb)-Total	<0.0010		0.0010	mg/L	28-JUN-17	28-JUN-17	R3758350
Arsenic (As)-Total	<0.0010		0.0010	mg/L	28-JUN-17	28-JUN-17	R3758350
Barium (Ba)-Total	0.0181		0.00050	mg/L	28-JUN-17	28-JUN-17	R3758350
Beryllium (Be)-Total	<0.0010		0.0010	mg/L	28-JUN-17	28-JUN-17	R3758350
Bismuth (Bi)-Total	<0.00050		0.00050	mg/L	28-JUN-17	28-JUN-17	R3758350
Boron (B)-Total	0.148		0.030	mg/L	28-JUN-17	28-JUN-17	R3758350
Cadmium (Cd)-Total	<0.00020		0.00020	mg/L	28-JUN-17	28-JUN-17	R3758350
Calcium (Ca)-Total	101		0.20	mg/L	28-JUN-17	28-JUN-17	R3758350
Cesium (Cs)-Total	<0.00050		0.00050	mg/L	28-JUN-17	28-JUN-17	R3758350
Chromium (Cr)-Total	<0.0020		0.0020	mg/L	28-JUN-17	28-JUN-17	R3758350
Cobalt (Co)-Total	0.00060		0.00050	mg/L	28-JUN-17	28-JUN-17	R3758350
Copper (Cu)-Total	0.0781		0.0020	mg/L	28-JUN-17	28-JUN-17	R3758350
Iron (Fe)-Total	0.56		0.10	mg/L	28-JUN-17	28-JUN-17	R3758350
Lead (Pb)-Total	0.0015		0.0010	mg/L	28-JUN-17	28-JUN-17	R3758350
Lithium (Li)-Total	0.0213		0.0020	mg/L	28-JUN-17	28-JUN-17	R3758350
Magnesium (Mg)-Total	45.9		0.050	mg/L	28-JUN-17	28-JUN-17	R3758350
Manganese (Mn)-Total	0.0260		0.0010	mg/L	28-JUN-17	28-JUN-17	R3758350
Molybdenum (Mo)-Total	<0.00050		0.00050	mg/L	28-JUN-17	28-JUN-17	R3758350
Nickel (Ni)-Total	0.0039		0.0020	mg/L	28-JUN-17	28-JUN-17	R3758350
Phosphorus (P)-Total	2.76		0.50	mg/L	28-JUN-17	28-JUN-17	R3758350
Potassium (K)-Total	13.2		0.10	mg/L	28-JUN-17	28-JUN-17	R3758350
Rubidium (Rb)-Total	0.00768		0.00050	mg/L	28-JUN-17	28-JUN-17	R3758350
Selenium (Se)-Total	<0.0050		0.0050	mg/L	28-JUN-17	28-JUN-17	R3758350
Silicon (Si)-Total	1.87		0.30	mg/L	28-JUN-17	28-JUN-17	R3758350

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Appendix G

Quality of Waste Water Discharged

EUREKA WEATHER STATION

L1948893 CONTD....

PAGE 3 of 8

Version: FINAL

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1948893-1	WASTE WATER 1							
Sampled By: CLIENT on 24-JUN-17 @ 16:15								
Matrix: WASTE								
Total Metals by ICP-MS								
Silver (Ag)-Total		<0.0010		0.0010	mg/L	28-JUN-17	28-JUN-17	R3758350
Sodium (Na)-Total		686		0.050	mg/L	28-JUN-17	28-JUN-17	R3758350
Strontium (Sr)-Total		0.411		0.00050	mg/L	28-JUN-17	28-JUN-17	R3758350
Tellurium (Te)-Total		<0.0010		0.0010	mg/L	28-JUN-17	28-JUN-17	R3758350
Thallium (Tl)-Total		<0.0050		0.0050	mg/L	28-JUN-17	28-JUN-17	R3758350
Thorium (Th)-Total		<0.0010		0.0010	mg/L	28-JUN-17	28-JUN-17	R3758350
Tin (Sn)-Total		0.00422		0.00060	mg/L	28-JUN-17	28-JUN-17	R3758350
Titanium (Ti)-Total		0.0152		0.0010	mg/L	28-JUN-17	28-JUN-17	R3758350
Tungsten (W)-Total		<0.0020		0.0020	mg/L	28-JUN-17	28-JUN-17	R3758350
Uranium (U)-Total		0.00074		0.00050	mg/L	28-JUN-17	28-JUN-17	R3758350
Vanadium (V)-Total		<0.0020		0.0020	mg/L	28-JUN-17	28-JUN-17	R3758350
Zinc (Zn)-Total		0.083		0.020	mg/L	28-JUN-17	28-JUN-17	R3758350
Zirconium (Zr)-Total		0.0013		0.0010	mg/L	28-JUN-17	28-JUN-17	R3758350
Nitrogen Total								
Nitrate in Water by IC								
Nitrate (as N)		<0.40	DLM	0.40	mg/L		29-JUN-17	R3759649
Nitrate+Nitrite								
Nitrate and Nitrite as N		<0.45		0.45	mg/L		30-JUN-17	
Nitrite in Water by IC								
Nitrite (as N)		<0.20	DLM	0.20	mg/L		29-JUN-17	R3759649
Total Kjeldahl Nitrogen								
Total Kjeldahl Nitrogen		20.1		4.0	mg/L	07-JUL-17	10-JUL-17	R3768543
Total Nitrogen Calculated								
Total Nitrogen		20.1		4.0	mg/L		10-JUL-17	
L1948893-2	WASTE WATER 2							
Sampled By: CLIENT on 25-JUN-17 @ 07:15								
Matrix: WASTE								
Alkalinity species as HCO3, CO3, OH								
Alkalinity, Bicarbonate								
Bicarbonate (HCO3)		301		1.2	mg/L		28-JUN-17	
Alkalinity, Carbonate								
Carbonate (CO3)		<0.60		0.60	mg/L		28-JUN-17	
Alkalinity, Hydroxide								
Hydroxide (OH)		<0.34		0.34	mg/L		28-JUN-17	
Alkalinity, Total (as CaCO3)								
Alkalinity, Total (as CaCO3)		247		1.0	mg/L		27-JUN-17	R3757513
E.Coli by Quanti-tray 97								
Total Coliform and E.coli by MPN QT97								
Escherichia Coli		>2420	MBHT	1	MPN/100mL		26-JUN-17	R3758429
Miscellaneous Parameters								
Ammonia, Total (as N)		14.9		1.0	mg/L		05-JUL-17	R3766088
Biochemical Oxygen Demand		69		20	mg/L		28-JUN-17	R3765045
Chloride (Cl)		1030		10	mg/L		29-JUN-17	R3759649
Conductivity		4080		1.0	umhos/cm		27-JUN-17	R3757513
Hardness (as CaCO3)		688	HTC	0.54	mg/L		29-JUN-17	
Mercury (Hg)-Total		0.0000094		0.0000050	mg/L	30-JUN-17	05-JUL-17	R3766324
Oil and Grease		14.0		5.0	mg/L		05-JUL-17	R3764984
Phenols (4AAP)		0.0303		0.0010	mg/L		09-JUL-17	R3768925
Phosphorus (P)-Total		3.10		0.10	mg/L		04-JUL-17	R3762963
Phosphorus (P)-Total Dissolved		1.69		0.050	mg/L		05-JUL-17	R3765590

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Appendix G
Quality of Waste Water Discharged

EUREKA WEATHER STATION

L1948893 CONTD....
PAGE 4 of 8
Version: FINAL

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1948893-2 WASTE WATER 2							
Sampled By: CLIENT on 25-JUN-17 @ 07:15							
Matrix: WASTE							
Phosphorus (P)-Total Reactive	1.39		0.050	mg/L		28-JUN-17	R3758449
Sulfate (SO4)	558		6.0	mg/L		29-JUN-17	R3759649
Total Coliforms	>2420	MBHT	1	MPN/100mL		26-JUN-17	R3757878
Total Organic Carbon	55.4		0.50	mg/L		06-JUL-17	R3768082
Total Suspended Solids	54.0		5.0	mg/L		29-JUN-17	R3759619
pH	7.67		0.10	pH units		27-JUN-17	R3757513
Total Metals by ICP-MS							
Aluminum (Al)-Total	0.527		0.020	mg/L	28-JUN-17	28-JUN-17	R3758350
Antimony (Sb)-Total	<0.0010		0.0010	mg/L	28-JUN-17	28-JUN-17	R3758350
Arsenic (As)-Total	<0.0010		0.0010	mg/L	28-JUN-17	28-JUN-17	R3758350
Barium (Ba)-Total	0.0267		0.00050	mg/L	28-JUN-17	28-JUN-17	R3758350
Beryllium (Be)-Total	<0.0010		0.0010	mg/L	28-JUN-17	28-JUN-17	R3758350
Bismuth (Bi)-Total	<0.00050		0.00050	mg/L	28-JUN-17	28-JUN-17	R3758350
Boron (B)-Total	0.195		0.030	mg/L	28-JUN-17	28-JUN-17	R3758350
Cadmium (Cd)-Total	<0.00020		0.00020	mg/L	28-JUN-17	28-JUN-17	R3758350
Calcium (Ca)-Total	159		0.20	mg/L	28-JUN-17	28-JUN-17	R3758350
Cesium (Cs)-Total	<0.00050		0.00050	mg/L	28-JUN-17	28-JUN-17	R3758350
Chromium (Cr)-Total	0.0021		0.0020	mg/L	28-JUN-17	28-JUN-17	R3758350
Cobalt (Co)-Total	0.00075		0.00050	mg/L	28-JUN-17	28-JUN-17	R3758350
Copper (Cu)-Total	0.120		0.0020	mg/L	28-JUN-17	28-JUN-17	R3758350
Iron (Fe)-Total	0.67		0.10	mg/L	28-JUN-17	28-JUN-17	R3758350
Lead (Pb)-Total	0.0019		0.0010	mg/L	28-JUN-17	28-JUN-17	R3758350
Lithium (Li)-Total	0.0313		0.0020	mg/L	28-JUN-17	28-JUN-17	R3758350
Magnesium (Mg)-Total	70.6		0.050	mg/L	28-JUN-17	28-JUN-17	R3758350
Manganese (Mn)-Total	0.0441		0.0010	mg/L	28-JUN-17	28-JUN-17	R3758350
Molybdenum (Mo)-Total	<0.00050		0.00050	mg/L	28-JUN-17	28-JUN-17	R3758350
Nickel (Ni)-Total	0.0047		0.0020	mg/L	28-JUN-17	28-JUN-17	R3758350
Phosphorus (P)-Total	3.62		0.50	mg/L	28-JUN-17	28-JUN-17	R3758350
Potassium (K)-Total	16.1		0.10	mg/L	28-JUN-17	28-JUN-17	R3758350
Rubidium (Rb)-Total	0.00883		0.00050	mg/L	28-JUN-17	28-JUN-17	R3758350
Selenium (Se)-Total	<0.0050		0.0050	mg/L	28-JUN-17	28-JUN-17	R3758350
Silicon (Si)-Total	2.09		0.30	mg/L	28-JUN-17	28-JUN-17	R3758350
Silver (Ag)-Total	<0.0010		0.0010	mg/L	28-JUN-17	28-JUN-17	R3758350
Sodium (Na)-Total	796		0.050	mg/L	28-JUN-17	28-JUN-17	R3758350
Strontium (Sr)-Total	0.641		0.00050	mg/L	28-JUN-17	28-JUN-17	R3758350
Tellurium (Te)-Total	<0.0010		0.0010	mg/L	28-JUN-17	28-JUN-17	R3758350
Thallium (Tl)-Total	<0.0050		0.0050	mg/L	28-JUN-17	28-JUN-17	R3758350
Thorium (Th)-Total	<0.0010		0.0010	mg/L	28-JUN-17	28-JUN-17	R3758350
Tin (Sn)-Total	0.00501		0.00060	mg/L	28-JUN-17	28-JUN-17	R3758350
Titanium (Ti)-Total	0.0154		0.0010	mg/L	28-JUN-17	28-JUN-17	R3758350
Tungsten (W)-Total	<0.0020		0.0020	mg/L	28-JUN-17	28-JUN-17	R3758350
Uranium (U)-Total	0.00117		0.00050	mg/L	28-JUN-17	28-JUN-17	R3758350
Vanadium (V)-Total	<0.0020		0.0020	mg/L	28-JUN-17	28-JUN-17	R3758350
Zinc (Zn)-Total	0.102		0.020	mg/L	28-JUN-17	28-JUN-17	R3758350
Zirconium (Zr)-Total	0.0031		0.0010	mg/L	28-JUN-17	28-JUN-17	R3758350
Nitrogen Total							
Nitrate in Water by IC							
Nitrate (as N)	<0.40	DLM	0.40	mg/L		29-JUN-17	R3759649
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.45		0.45	mg/L		30-JUN-17	
Nitrite in Water by IC							
Nitrite (as N)	<0.20	DLM	0.20	mg/L		29-JUN-17	R3759649

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Appendix G

Quality of Waste Water Discharged

EUREKA WEATHER STATION

L1948893 CONTD.
PAGE 5 of 8
Version: FINAL

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1948893-2 WASTE WATER 2 Sampled By: CLIENT on 25-JUN-17 @ 07:15 Matrix: WASTE Total Kjeldahl Nitrogen Total Kjeldahl Nitrogen Total Nitrogen Calculated Total Nitrogen	 23.8 23.8		 1.0 1.0	 mg/L mg/L	 07-JUL-17 	 09-JUL-17 10-JUL-17	 R3768543

* Refer to Referenced Information for Qualifiers (if any) and Methodology

Appendix G
Quality of Waste Water Discharged

EUREKA WEATHER STATION

L1948893 CONTD....

PAGE 6 of 8
Version: FINAL

Reference Information

Sample Parameter Qualifier Key:			
Qualifier	Description		
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).		
HTC	Hardness was calculated from Total Ca and/or Mg concentrations and may be biased high (dissolved Ca/Mg results unavailable).		
MBHT	The APHA 30 hour hold time was exceeded for microbiological testing. Samples processed within 48 hours from time of sampling may be valid in some cases (refer to Health Canada guidance).		
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.		
PEHR	Parameter Exceeded Recommended Holding Time On Receipt: Proceed With Analysis As Requested.		
Test Method References:			
ALS Test Code	Matrix	Test Description	Method Reference**
ALK-CO3CO3-CALC-WP	Water	Alkalinity, Carbonate	CALCULATION
The Alkalinity of water is a measure of its acid neutralizing capacity. Alkalinity is imparted by bicarbonate, carbonate and hydroxide components of water. The fraction of alkalinity contributed by carbonate is calculated and reported as mg CO3 2-/L.			
ALK-HCO3HCO3-CALC-WP	Water	Alkalinity, Bicarbonate	CALCULATION
The Alkalinity of water is a measure of its acid neutralizing capacity. Alkalinity is imparted by bicarbonate, carbonate and hydroxide components of water. The fraction of alkalinity contributed by bicarbonate is calculated and reported as mg HCO3-/L			
ALK-OHOH-CALC-WP	Water	Alkalinity, Hydroxide	CALCULATION
The Alkalinity of water is a measure of its acid neutralizing capacity. Alkalinity is imparted by bicarbonate, carbonate and hydroxide components of water. The fraction of alkalinity contributed by hydroxide is calculated and reported as mg OH-/L.			
ALK-TITR-WP	Water	Alkalinity, Total (as CaCO3)	APHA 2320B
The Alkalinity of water is a measure of its acid neutralizing capacity. Alkalinity is imparted by bicarbonate, carbonate and hydroxide components of water. Total alkalinity is determined by titration with a strong standard mineral acid to the successive HCO3- and H2CO3 endpoints indicated electrometrically.			
BOD-WP	Water	Biochemical Oxygen Demand (BOD)	APHA 5210 B
Samples are diluted and seeded and then incubated in airtight bottles at 20 C for 5 days. Dissolved oxygen is measured initially and after incubation, and results are computed from the difference between initial and final DO.			
C-TOC-HTC-WP	Water	Total Organic Carbon by Combustion	APHA 5310 B-WP
Sample is acidified and purged to remove inorganic carbon, then injected into a heated reaction chamber where organic carbon is oxidized to CO2 which is then transported in the carrier gas stream and measured via a non-dispersive infrared analyzer.			
CL-IC-N-WP	Water	Chloride in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
EC-WP	Water	Conductivity	APHA 2510B
Conductivity of an aqueous solution refers to its ability to carry an electric current. Conductance of a solution is measured between two spatially fixed and chemically inert electrodes.			
ETL-N-TOT-ANY-WP	Water	Total Nitrogen Calculated	Calculated
HARDNESS-CALC-WP	Water	Hardness Calculated	APHA 2340B
Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.			
HG-T-CVAF-WP	Water	Mercury Total	EPA245.7 V2.0
Mercury in filtered and unfiltered waters is oxidized with Bromine monochloride and analyzed by cold-vapour atomic fluorescence spectrometry.			
MET-T-MS-WP	Water	Total Metals by ICP-MS	APHA 3030E/EPA 6020A-T
This analysis involves preliminary sample treatment by hotblock acid digestion (APHA 3030E). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).			
N-TOTKJ-WP	Water	Total Kjeldahl Nitrogen	APHA 4500 NorgD (modified)
Aqueous samples are digested in a block digester with sulfuric acid and copper sulfate as a catalyst. Total Kjeldahl Nitrogen is then analyzed using a discrete analyzer with colorimetric detection.			
NH3-COL-WP	Water	Ammonia by colour	APHA 4500 NH3 F

Appendix G
Quality of Waste Water Discharged

EUREKA WEATHER STATION

L1948893 CONTD....

PAGE 7 of 8
Version: FINAL

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
Ammonia in water samples forms indophenol when reacted with hypochlorite and phenol. The intensity is amplified by the addition of sodium nitroprusside and measured colourmetrically.			
NO2+NO3-CALC-WP	Water	Nitrate+Nitrite	CALCULATION
NO2-IC-N-WP	Water	Nitrite in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
NO3-IC-N-WP	Water	Nitrate in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
OG-GRAV-WP	Water	Oil & Grease - Gravimetric	EPA 1664 (modified)
Water samples are acidified and extracted with hexane; the hexane extract is collected in a pre-weighed vial. The solvent is evaporated and Total Oil & Grease is determined from the weight of the residue in the vial.			
P-T-COL-WP	Water	Phosphorus, Total	APHA 4500 P PHOSPHORUS
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.			
P-TD-COL-WP	Water	Phosphorus, Total Dissolved	APHA 4500 P PHOSPHORUS
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Dissolved Phosphorus is determined colourimetrically after persulphate digestion of a sample that has been lab or field filtered through a 0.45 micron membrane filter.			
P-TR-COL-WP	Water	Phosphorus, Total Reactive in Water	APHA 4500 P PHOSPHORUS
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Reactive Phosphorus is determined colourimetrically.			
PH-WP	Water	pH	APHA 4500H
The pH of a sample is the determination of the activity of the hydrogen ions by potentiometric measurement using a standard hydrogen electrode and a reference electrode.			
PHENOLS-4AAP-WT	Water	Phenol (4AAP)	EPA 9066
An automated method is used to distill the sample. The distillate is then buffered to pH 9.4 which reacts with 4AAP and potassium ferricyanide to form a red complex which is measured colorimetrically.			
SO4-IC-N-WP	Water	Sulfate in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
SOLIDS-TOTSUS-WP	Water	Total Suspended Solids	APHA 2540 D (modified)
Total suspended solids in aqueous matrices is determined gravimetrically after drying the residue at 103 105 C.			
TC,EC-QT97-WP	Water	Total Coliform and E.coli by MPN QT97	APHA 9223B QT97
This analysis is carried out using procedures adapted from APHA Method 9223B "Enzyme Substrate Coliform Test". E. coli and Total Coliform are determined simultaneously. The sample is mixed with a mixture of hydrolyzable substrates and then sealed in a 97-well packet. The packet is incubated at 35.0 – 0.5 C for 18 or 24 hours and then the number of wells exhibiting positive responses are counted. The final results are obtained by comparing the number of positive responses to a probability table.			
TC-QT97-WP	Water	Total Coliforms by QT97	APHA 9223B QT97
This analysis is carried out using procedures adapted from APHA 9223 "Enzyme Substrate Coliform Test". Coliform bacteria are determined by mixing sample with a product containing hydrolyzable substrates and sealing in a 97-well packet. The packet is incubated at 35.0 – 0.5 C for 18 or 24 hours and then the number of wells exhibiting positive responses are counted. The final results are obtained by comparing the number of positive responses to a probability table.			
** ALS test methods may incorporate modifications from specified reference methods to improve performance.			

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

Laboratory Definition Code	Laboratory Location
WP	ALS ENVIRONMENTAL - WINNIPEG, MANITOBA, CANADA
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA
Chain of Custody Numbers:	

Appendix G
Quality of Waste Water Discharged

EUREKA WEATHER STATION

L1948893 CONTD....
PAGE 8 of 8
Version: FINAL

Reference Information

Test Method References:			
ALS Test Code	Matrix	Test Description	Method Reference**
GLOSSARY OF REPORT TERMS			
<i>Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.</i>			
<i>mg/kg - milligrams per kilogram based on dry weight of sample</i>			
<i>mg/kg wwt - milligrams per kilogram based on wet weight of sample</i>			
<i>mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight</i>			
<i>mg/L - unit of concentration based on volume, parts per million.</i>			
<i>< - Less than.</i>			
<i>D.L. - The reporting limit.</i>			
<i>N/A - Result not available. Refer to qualifier code and definition for explanation.</i>			
 <i>Test results reported relate only to the samples as received by the laboratory.</i>			
<i>UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.</i>			
<i>Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.</i>			

Workorder: L1948893

Page 1 of 8

Contact: JOHN MACIVER

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
ALK-TITR-WP		Water						
Batch	R3757513							
WG2558589-14	LCS							
Alkalinity, Total (as CaCO3)			103.1		%		85-115	27-JUN-17
WG2558589-11	MB							
Alkalinity, Total (as CaCO3)			<1.0		mg/L		1	27-JUN-17
BOD-WP		Water						
Batch	R3765045							
WG2558653-2	LCS							
Biochemical Oxygen Demand			91.0		%		85-115	28-JUN-17
WG2558653-1	MB							
Biochemical Oxygen Demand			<2.0		mg/L		2	28-JUN-17
C-TOC-HTC-WP		Water						
Batch	R3768082							
WG2566062-2	LCS							
Total Organic Carbon			94.4		%		80-120	06-JUL-17
WG2566062-1	MB							
Total Organic Carbon			<0.50		mg/L		0.5	06-JUL-17
CL-IC-N-WP		Water						
Batch	R3759649							
WG2559954-2	LCS							
Chloride (Cl)			99.8		%		90-110	29-JUN-17
WG2559954-1	MB							
Chloride (Cl)			<0.50		mg/L		0.5	29-JUN-17
EC-WP		Water						
Batch	R3757513							
WG2558589-13	LCS							
Conductivity			100.6		%		90-110	27-JUN-17
WG2558589-11	MB							
Conductivity			<1.0		umhos/cm		1	27-JUN-17
HG-T-CVAF-WP		Water						
Batch	R3766324							
WG2564208-2	LCS							
Mercury (Hg)-Total			84.0		%		80-120	05-JUL-17
WG2564208-1	MB							
Mercury (Hg)-Total			<0.0000050		mg/L		0.000005	05-JUL-17
MET-T-MS-WP		Water						

Appendix G
Quality of Waste Water Discharged



Quality Control Report

Workorder: L1948893 Report Date: 11-JUL-17 Page 2 of 8

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-MS-WP		Water						
Batch		R3758350						
WG2558857-2		LCS						
Aluminum (Al)-Total			110.1		%		80-120	28-JUN-17
Antimony (Sb)-Total			102.0		%		80-120	28-JUN-17
Arsenic (As)-Total			105.5		%		80-120	28-JUN-17
Barium (Ba)-Total			105.6		%		80-120	28-JUN-17
Beryllium (Be)-Total			106.8		%		80-120	28-JUN-17
Bismuth (Bi)-Total			104.5		%		80-120	28-JUN-17
Boron (B)-Total			110.4		%		80-120	28-JUN-17
Cadmium (Cd)-Total			104.0		%		80-120	28-JUN-17
Calcium (Ca)-Total			106.9		%		80-120	28-JUN-17
Cesium (Cs)-Total			105.4		%		80-120	28-JUN-17
Chromium (Cr)-Total			105.8		%		80-120	28-JUN-17
Cobalt (Co)-Total			108.0		%		80-120	28-JUN-17
Copper (Cu)-Total			104.3		%		80-120	28-JUN-17
Iron (Fe)-Total			109.4		%		80-120	28-JUN-17
Lead (Pb)-Total			95.3		%		80-120	28-JUN-17
Lithium (Li)-Total			107.3		%		80-120	28-JUN-17
Magnesium (Mg)-Total			107.0		%		80-120	28-JUN-17
Manganese (Mn)-Total			110.9		%		80-120	28-JUN-17
Molybdenum (Mo)-Total			107.3		%		80-120	28-JUN-17
Nickel (Ni)-Total			106.8		%		80-120	28-JUN-17
Phosphorus (P)-Total			111.1		%		80-120	28-JUN-17
Potassium (K)-Total			100.4		%		80-120	28-JUN-17
Rubidium (Rb)-Total			104.2		%		80-120	28-JUN-17
Selenium (Se)-Total			98.5		%		80-120	28-JUN-17
Silicon (Si)-Total			108.6		%		80-120	28-JUN-17
Silver (Ag)-Total			106.0		%		80-120	28-JUN-17
Sodium (Na)-Total			109.2		%		80-120	28-JUN-17
Strontium (Sr)-Total			102.3		%		80-120	28-JUN-17
Tellurium (Te)-Total			100.4		%		80-120	28-JUN-17
Thallium (Tl)-Total			94.8		%		80-120	28-JUN-17
Thorium (Th)-Total			108.8		%		80-120	28-JUN-17
Tin (Sn)-Total			106.7		%		80-120	28-JUN-17
Titanium (Ti)-Total			102.5		%		80-120	28-JUN-17
Tungsten (W)-Total			103.3		%		80-120	28-JUN-17

Appendix G
Quality of Waste Water Discharged



Quality Control Report

Workorder: L1948893 Report Date: 11-JUL-17 Page 3 of 8

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-MS-WP		Water						
Batch		R3758350						
WG2558857-2		LCS						
Uranium (U)-Total			100.6		%		80-120	28-JUN-17
Vanadium (V)-Total			107.7		%		80-120	28-JUN-17
Zinc (Zn)-Total			99.3		%		80-120	28-JUN-17
Zirconium (Zr)-Total			102.6		%		80-120	28-JUN-17
WG2558857-1		MB						
Aluminum (Al)-Total			<0.020		mg/L		0.02	28-JUN-17
Antimony (Sb)-Total			<0.0010		mg/L		0.001	28-JUN-17
Arsenic (As)-Total			<0.0010		mg/L		0.001	28-JUN-17
Barium (Ba)-Total			<0.00050		mg/L		0.0005	28-JUN-17
Beryllium (Be)-Total			<0.0010		mg/L		0.001	28-JUN-17
Bismuth (Bi)-Total			<0.00050		mg/L		0.0005	28-JUN-17
Boron (B)-Total			<0.030		mg/L		0.03	28-JUN-17
Cadmium (Cd)-Total			<0.00020		mg/L		0.0002	28-JUN-17
Calcium (Ca)-Total			<0.20		mg/L		0.2	28-JUN-17
Cesium (Cs)-Total			<0.00050		mg/L		0.0005	28-JUN-17
Chromium (Cr)-Total			<0.0020		mg/L		0.002	28-JUN-17
Cobalt (Co)-Total			<0.00050		mg/L		0.0005	28-JUN-17
Copper (Cu)-Total			<0.0020		mg/L		0.002	28-JUN-17
Iron (Fe)-Total			<0.10		mg/L		0.1	28-JUN-17
Lead (Pb)-Total			<0.0010		mg/L		0.001	28-JUN-17
Lithium (Li)-Total			<0.0020		mg/L		0.002	28-JUN-17
Magnesium (Mg)-Total			<0.050		mg/L		0.05	28-JUN-17
Manganese (Mn)-Total			<0.0010		mg/L		0.001	28-JUN-17
Molybdenum (Mo)-Total			<0.00050		mg/L		0.0005	28-JUN-17
Nickel (Ni)-Total			<0.0020		mg/L		0.002	28-JUN-17
Phosphorus (P)-Total			<0.50		mg/L		0.5	28-JUN-17
Potassium (K)-Total			<0.10		mg/L		0.1	28-JUN-17
Rubidium (Rb)-Total			<0.00050		mg/L		0.0005	28-JUN-17
Selenium (Se)-Total			<0.0050		mg/L		0.005	28-JUN-17
Silicon (Si)-Total			<0.30		mg/L		0.3	28-JUN-17
Silver (Ag)-Total			<0.0010		mg/L		0.001	28-JUN-17
Sodium (Na)-Total			<0.050		mg/L		0.05	28-JUN-17
Strontium (Sr)-Total			<0.00050		mg/L		0.0005	28-JUN-17
Tellurium (Te)-Total			<0.0010		mg/L		0.001	28-JUN-17

Workorder: L1948893

Report Date: 11-JUL-17

Page 4 of 8

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-MS-WP		Water						
Batch	R3758350							
WG2558857-1	MB							
Thallium (Tl)-Total			<0.0050		mg/L		0.005	28-JUN-17
Thorium (Th)-Total			<0.0010		mg/L		0.001	28-JUN-17
Tin (Sn)-Total			<0.00060		mg/L		0.0006	28-JUN-17
Titanium (Ti)-Total			<0.0010		mg/L		0.001	28-JUN-17
Tungsten (W)-Total			<0.0020		mg/L		0.002	28-JUN-17
Uranium (U)-Total			<0.00050		mg/L		0.0005	28-JUN-17
Vanadium (V)-Total			<0.0020		mg/L		0.002	28-JUN-17
Zinc (Zn)-Total			<0.020		mg/L		0.02	28-JUN-17
Zirconium (Zr)-Total			<0.0010		mg/L		0.001	28-JUN-17
N-TOTKJ-WP		Water						
Batch	R3768543							
WG2565193-10	LCS							
Total Kjeldahl Nitrogen			100.4		%		75-125	09-JUL-17
WG2565193-9	MB							
Total Kjeldahl Nitrogen			<0.20		mg/L		0.2	09-JUL-17
NH3-COL-WP		Water						
Batch	R3766088							
WG2563477-6	LCS							
Ammonia, Total (as N)			100.2		%		85-115	05-JUL-17
WG2563477-5	MB							
Ammonia, Total (as N)			<0.010		mg/L		0.01	05-JUL-17
NO2-IC-N-WP		Water						
Batch	R3759649							
WG2559954-2	LCS							
Nitrite (as N)			99.8		%		90-110	29-JUN-17
WG2559954-1	MB							
Nitrite (as N)			<0.010		mg/L		0.01	29-JUN-17
NO3-IC-N-WP		Water						
Batch	R3759649							
WG2559954-2	LCS							
Nitrate (as N)			99.0		%		90-110	29-JUN-17
WG2559954-1	MB							
Nitrate (as N)			<0.020		mg/L		0.02	29-JUN-17
OG-GRAV-WP		Water						

Workorder: L1948893

Report Date: 11-JUL-17

Page 5 of 8

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
OG-GRAV-WP		Water						
Batch	R3764984							
WG2560186-2	LCS							
Oil and Grease			97.2		%		70-130	05-JUL-17
WG2560186-1	MB							
Oil and Grease			<5.0		mg/L		5	05-JUL-17
P-T-COL-WP		Water						
Batch	R3762963							
WG2562050-2	LCS							
Phosphorus (P)-Total			87.8		%		80-120	04-JUL-17
WG2562050-1	MB							
Phosphorus (P)-Total			<0.010		mg/L		0.01	04-JUL-17
P-TD-COL-WP		Water						
Batch	R3765590							
WG2562562-2	LCS							
Phosphorus (P)-Total	Dissolved		87.4		%		80-120	05-JUL-17
WG2562562-6	LCS							
Phosphorus (P)-Total	Dissolved		90.0		%		80-120	05-JUL-17
WG2562562-1	MB							
Phosphorus (P)-Total	Dissolved		<0.010		mg/L		0.01	05-JUL-17
WG2562562-5	MB							
Phosphorus (P)-Total	Dissolved		<0.010		mg/L		0.01	05-JUL-17
P-TR-COL-WP		Water						
Batch	R3758449							
WG2558862-3	DUP	L1948893-1						
Phosphorus (P)-Total	Reactive	1.19	1.07		mg/L	11	20	28-JUN-17
WG2558862-2	LCS							
Phosphorus (P)-Total	Reactive		98.4		%		80-120	28-JUN-17
WG2558862-1	MB							
Phosphorus (P)-Total	Reactive		<0.010		mg/L		0.01	28-JUN-17
WG2558862-4	MS	L1948893-2						
Phosphorus (P)-Total	Reactive		N/A	MS-B	%		-	28-JUN-17
PH-WP		Water						
Batch	R3757513							
WG2558589-12	LCS							
pH			7.41		pH units		7.3-7.5	27-JUN-17
PHENOLS-4AAP-WT		Water						

Appendix G
Quality of Waste Water Discharged



Quality Control Report

Workorder: L1948893 Report Date: 11-JUL-17 Page 6 of 8

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PHENOLS-4AAP-WT								
Water								
Batch R3768925								
WG2566259-2	LCS							
Phenols (4AAP)			108.3		%		85-115	09-JUL-17
WG2566259-1	MB							
Phenols (4AAP)			<0.0010		mg/L		0.001	09-JUL-17
SO4-IC-N-WP								
Water								
Batch R3759649								
WG2559954-2	LCS							
Sulfate (SO4)			100.4		%		90-110	29-JUN-17
WG2559954-1	MB							
Sulfate (SO4)			<0.30		mg/L		0.3	29-JUN-17
SOLIDS-TOTSUS-WP								
Water								
Batch R3759619								
WG2559928-18	LCS							
Total Suspended Solids			99.3		%		85-115	29-JUN-17
WG2559928-17	MB							
Total Suspended Solids			<5.0		mg/L		5	29-JUN-17
TC,EC-QT97-WP								
Water								
Batch R3758429								
WG2559608-1	MB							
Escherichia Coli			<1		MPN/100mL		1	26-JUN-17
TC-QT97-WP								
Water								
Batch R3757878								
WG2558221-1	MB							
Total Coliforms			<1		MPN/100mL		1	26-JUN-17

Appendix G
Quality of Waste Water Discharged

Quality Control Report

Workorder: L1948893 Report Date: 11-JUL-17 Page 7 of 8

Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Appendix G
Quality of Waste Water Discharged

Quality Control Report

Workorder: L1948893 Report Date: 11-JUL-17 Page 8 of 8

Hold Time Exceedances:

ALS Product Description	Sample ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
Physical Tests							
pH	1	24-JUN-17 16:15	27-JUN-17 12:00	0.25	68	hours	EHTR-FM
	2	25-JUN-17 07:15	27-JUN-17 12:00	0.25	53	hours	EHTR-FM
Anions and Nutrients							
Nitrate in Water by IC	1	24-JUN-17 16:15	29-JUN-17 12:00	3	5	days	EHTL
	2	25-JUN-17 07:15	29-JUN-17 12:00	3	4	days	EHT
Nitrite in Water by IC	1	24-JUN-17 16:15	29-JUN-17 12:00	3	5	days	EHTL
	2	25-JUN-17 07:15	29-JUN-17 12:00	3	4	days	EHT
Phosphorus, Total Reactive in Water	1	24-JUN-17 16:15	28-JUN-17 09:19	3	4	days	EHTL
Bacteriological Tests							
Total Coliform and E.coli by MPN QT97	2	25-JUN-17 07:15	26-JUN-17 18:05	30	35	hours	EHTR
Total Coliforms by QT97	2	25-JUN-17 07:15	26-JUN-17 18:05	30	35	hours	EHTR
Aggregate Organics							
Biochemical Oxygen Demand (BOD)	1	24-JUN-17 16:15	28-JUN-17 07:00	48	87	hours	EHTR
	2	25-JUN-17 07:15	28-JUN-17 07:00	48	72	hours	EHTL

Legend & Qualifier Definitions:

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended.
EHTR: Exceeded ALS recommended hold time prior to sample receipt.
EHTL: Exceeded ALS recommended hold time prior to analysis. Sample was received less than 24 hours prior to expiry.
EHT: Exceeded ALS recommended hold time prior to analysis.
Rec. HT: ALS recommended hold time (see units).

Notes*:
Where actual sampling date is not provided to ALS, the date (& time) of receipt is used for calculation purposes.
Where actual sampling time is not provided to ALS, the earlier of 12 noon on the sampling date or the time (& date) of receipt is used for calculation purposes. Samples for L1948893 were received on 26-JUN-17 17:35.

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

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

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

COC #

Page - - - of

Report To			Report Format / Distribution			Service Requested (Rush for routine analysis, subject to availability)											
Company: Environment Canada W5335			☒ Standard ☐ Other			☒ Regular ☐ Priority ☐ Emerg ☐ Same D											
Contact: JOHN MACIVER			☒ PDF ☐ Excel ☐ Digital ☒ Fax			 L1948893-COFC											
Address: Eureka Weather Station			Email 1: john.maciver@canada.ca														
613-945-3145 ext. 4460			Email 2: mall.aitchison@canada.ca														
Phone: _____ Fax: _____			Email 3: _____														
Invoice To: Same as Report? ☐ Yes ☐ No			Client / Project Information			Please indicate below Filtered, Preserved or both (F, P, F/P)											
Hardcopy of Invoice with Report? ☐ Yes ☐ No			Job #: Eureka Weather Station														
Company: Environment Canada W5335			PO / AFE: _____														
Contact: mall.aitchison@canada.ca			LSD: _____														
Address: _____			Quote #: Q55002														
Phone: _____ Fax: _____																	
Lab Work Order #			ALS														
(lab use only)			Contact: _____														
			Sampler: _____														
Sample	Sample Identification		Date	Time	Sample Type	MET-T-MS-WP	ETL-HARDNESS-TOT-WP	TURBIDITY-WP	TDS-WP	C-TOC-HTC-WP	THM-HS-WP	TC-EC-QT51-WP					Number of Containers
#	(This description will appear on the report)		(dd-mm-yy)	(hh:mm)													
	Waste Water 1	<i>(pH waste water 1 extra bottle)</i>	24-Jun-17	16:15	Waste	X	X	X	X	X	X	X				10	
	Waste Water 2	<i>(pH waste water 2 extra bottle)</i>	25-Jun-17	17:15	Waste	X	X	X	X	X	X	X				10	
<i>MC / 26 June 17</i> <i>- client also sent extra bottles for of Waste Water 1 & 2 for QT51 (MC/26 June 17)</i>																	
Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details																	
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 provided on a separate Excel tab. Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.																	
SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)										
Released by:	Date (dd-mm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF							
			<i>MC</i>	<i>26 June 17</i>	<i>17:35</i>	<i>5.7 °C</i>											

Appendix H

GPS Coordinates

GPS Coordinates for water sources utilized

Source Description	Latitude			Longitude		
	Deg °	Min ,	Sec "	Deg °	Min ,	Sec "
Station Creek	79	59	21	85	57	4
Water Lagoon	79	59	20	85	56	46

GPS Locations of areas of waste disposal

Location Description (type)	Latitude			Longitude		
	Deg °	Min ,	Sec "	Deg °	Min ,	Sec "
Sewage Lagoon	79	59	23	85	50	11
East Landfill	79	59	29	85	46	20
Asbestos Landfill	79	59	17	85	46	50
Crushed Barrel Landfill	79	59	38	85	49	38
Ash Landfill	79	59	32	85	47	52
Contaminated Soil Pit	79	59	40	85	49	34
Land Farm	79	59	40	85	50	11
DND Sewage Lagoon	79	59	23	85	50	11

EUREKA WATER ANALYSIS 2016: Landfill EUR3 and Landfarm EUR4

Parameter	SAMPLE ANALYSIS (mg/L)		GUIDELINES (mg/L)
	LANDFILL EUR 2 2016*	LANDFARM EUR 4 2014**	NWB Guidelines for EUR 4
Conductivity (microS/cm)	500	956	NV
TDS	n/a	594	
PH (PH units)	7,88	7,79	
BOD	n/a	6	
Amonia as Nitrogen	0.035	<0.005	
Nitrate + Nitrite as Nitrogen	0.099	0,03	
Hardness	161	N/A	
Total Organic Carbon	3,78	N/A	
Total Alkalinity	52	N/A	
Calcium	39	74,1	
Chloride	n/a	N/A	
Potassium	5,97	N/A	
Sodium	48.7	70,4	
Sulphate	68.8	247	
Coliforms, Fecal (CFU/100ml)	n/a	<1	
Oil and Grease	<1.0	NV	
Aluminum	9750	0,346	
Arsenic	8.04	0,0005	
Cadmium	0.108	<0,0001	
Chromium	21.2	0,0015	
Cobalt	10.3	0,0005	
Copper	23.2	0,0006	
Iron	25500	0,944	0,001
Lead	10.9	0,0005	
Manganese	225	0,305	
Nickel	23.5	0,0016	
Zinc	73.4	0,0062	
Total Mercury	0.030	N/A	0,02
Total Phenols	0.0025	0,0065	
Benzene	Not required	Not required	0,37
Toluene	Not required	Not required	0,002
Ethylbenzene	Not required	Not required	0,09

TNTC: Too numerous to count. Unable to repeat analysis at higher dilution. Holding time exceeded
N/A: Parameter analysis not available

* Latest sampling was received by ECCC on July 13, 2016
** Data not available for 2017. Latest data available is from 2014

*Subcontracted organics are in concentrations less than detectable levels except for those listed immediately above

ⁱGuidelines for Canadian Drinking Water Quality Summary Table, May 2008
http://www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/sum_guide-res_recom/chemical-chimiques-eng.php#tbl6

ⁱⁱUS Environmental Protection Agency Drinking Water Standards
<http://www.epa.gov/safewater/contaminants/index.html>

¹Maxiumum Acceptable Concentration

²Aesthetic Objectives

³Operational Guidance Values

⁴Maximum Contaminant Level

⁵Maximum Contaminant Level Goal

Site Location: EUREKA, NV

Attention: **MATT AITCHISON**
ENVIRONMENT CANADA
WINNIPEG, MB
Canada R3C4W2

Report Date: **2016/07/11**
Report #: R2213104
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: **B651848**
Received: **2016/06/27, 08:00**
Sample Matrix: Water
Samples Received: 1

Analyses	Date		Laboratory Method	Analytical Method
	Quantity	Date Extracted	Date Analyzed	
Alkalinity in Water by PC Titrator	1	N/A	2016/06/29 WIN SOP-00063	Based on SM-2320B
BTEX/F1 in Water by HS GC/MS	1	N/A	2016/06/29 WINSOP-00054 WINSOP-00055	EPA8260C/CCME PHCCWS
Chloride by Automated Colourimetry (1)	1	N/A	2016/06/28 BBY6SOP-00011	SM 22 4500-Cl- E m
Conductivity in Water by PC Titrator	1	N/A	2016/06/29 WIN SOP-00063	Based on SM-2510B
CCME Hydrocarbons (F2-F4 in water)	1	2016/06/28	2016/06/29 WINSOP-00056	CCME PHC-CWS
Hardness Total (calculated as CaCO3) (1)	1	N/A	2016/06/29 BBY WI-00033	Auto Calc
Mercury (Total) by CVAf (1)	1	2016/07/11	2016/07/11 BBY7SOP-00015	BCMOE BCLM Oct2013 m
Na, K, Ca, Mg, S by CRC ICPMS (total) (1)	1	2016/06/27	2016/06/29 BBY7SOP-00002	EPA 6020A R1 m
Elements by CRC ICPMS (total) (1)	1	2016/06/28	2016/06/28 BBY7SOP-00003,	BCLM2005,EPA6020bR2m
Nitrogen (Total) (1)	1	2016/06/30	2016/07/05 BBY6SOP-00016	SM 22 4500-N C m
Ammonia-N (Preserved) (1)	1	N/A	2016/06/28 BBY6SOP-00009	SM 22 4500-NH3- G m
Nitrate + Nitrite (N) - Preserved (1)	1	N/A	2016/06/29 BBY6SOP-00010	SM 22 4500-NO3- I m
pH in Water by PC Titrator (2)	1	N/A	2016/06/29 WIN SOP-00063	SM4500 H+B
Phenols (4-AAP) (1)	1	N/A	2016/06/29 BBY6SOP-00008	SM 22 5530 D m
Sulphate by Automated Colourimetry (1)	1	N/A	2016/06/29 BBY6SOP-00017	SM 22 4500-SO42- E m
Carbon (Total Organic) (1, 3)	1	N/A	2016/06/29 BBY6SOP-00003	SM 22 5310 C m
Total Oil and Grease (1)	1	N/A	2016/06/29 BBY8SOP-00004	BCMOE BCLM Sep2011 m
Total Suspended Solids	1	N/A	2016/06/29 WIN SOP-00042	Based on SM2540 D

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) This test was performed by Maxxam Vancouver
(2) The APHA Standard Method requires pH to be analysed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the APHA Standard Method holding time.
(3) TOC present in the sample should be considered as non-purgeable TOC.



Site Location: EUREKA, NV

Attention:MATT AITCHISON
ENVIRONMENT CANADA
WINNIPEG, MB
Canada R3C4W2

Report Date: 2016/07/11
Report #: R2213104
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B651848
Received: 2016/06/27, 08:00

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Amanda Hung, B.Sc., Project Manager
Email: AHung@maxxam.ca
Phone# (204)772-7276 Ext:2215

=====

This report has been generated and distributed using a secure automated process.
Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.



Maxxam Job #: B651848
Report Date: 2016/07/11

Success Through Science®

ENVIRONMENT CANADA
Site Location: EUREKA, NV

BTEX/F1-F4 IN WATER (WATER)				
Maxxam ID		OX5883		
Sampling Date				
	UNITS	EUR-2	RDL	QC Batch
Ext. Pet. Hydrocarbon				
F2 (C10-C16 Hydrocarbons)	mg/L	<0.15	0.15	8313009
F3 (C16-C34 Hydrocarbons)	mg/L	<0.15	0.15	8313009
F4 (C34-C50 Hydrocarbons)	mg/L	<0.15	0.15	8313009
Volatiles				
Benzene	ug/L	<0.40	0.40	8313308
Toluene	ug/L	<0.40	0.40	8313308
Ethylbenzene	ug/L	<0.40	0.40	8313308
o-Xylene	ug/L	<0.40	0.40	8313308
m & p-Xylene	ug/L	<0.80	0.80	8313308
Xylenes (Total)	ug/L	<0.80	0.80	8313308
Methyl-tert-butylether (MTBE)	ug/L	<4.0	4.0	8313308
F1 (C6-C10) - BTEX	ug/L	<300	300	8313308
F1 (C6-C10)	ug/L	<300	300	8313308
Surrogate Recovery (%)				
4-Bromofluorobenzene (sur.)	%	100		8313308
D4-1,2-Dichloroethane (sur.)	%	113		8313308
D8-TOLUENE (sur.)	%	100		8313308
O-TERPHENYL (sur.)	%	117		8313009
RDL = Reportable Detection Limit				



Maxxam Job #: B651848
Report Date: 2016/07/11

ENVIRONMENT CANADA
Site Location: EUREKA, NV

Success Through Science®

RESULTS OF CHEMICAL ANALYSES OF WATER				
Maxxam ID		OX5883		
Sampling Date				
	UNITS	EUR-2	RDL	QC Batch
Misc. Inorganics				
Alkalinity (Total as CaCO3)	mg/L	52.0	0.50	8312886
Conductivity	uS/cm	500	1.0	8312883
Total Organic Carbon (C)	mg/L	3.78	0.50	8314628
pH	pH	7.88		8312874
Bicarbonate (HCO3)	mg/L	63.4	0.50	8312886
Carbonate (CO3)	mg/L	<0.50	0.50	8312886
Hydroxide (OH)	mg/L	<0.50	0.50	8312886
Anions				
Dissolved Sulphate (SO4)	mg/L	68.8	0.50	8315352
Dissolved Chloride (Cl)	mg/L	70	0.50	8313674
Nutrients				
Total Ammonia (N)	mg/L	0.035	0.0050	8313959
Nitrate plus Nitrite (N)	mg/L	0.099	0.020	8315488
Total Nitrogen (N)	mg/L	0.356	0.020	8316497
OIL & GREASE				
Total Oil and grease	mg/L	<1.0	1.0	8314350
Misc. Organics				
Phenols	mg/L	0.0025	0.0010	8314844
Physical Properties				
Total Suspended Solids	mg/L	899	16	8314287
RDL = Reportable Detection Limit				



Maxxam Job #: B651848
Report Date: 2016/07/11

ENVIRONMENT CANADA
Site Location: EUREKA, NV

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CCME TOTAL METALS IN WATER (WATER)

Maxxam ID		OX5883		
Sampling Date				
	UNITS	EUR-2	RDL	QC Batch
Calculated Parameters				
Total Hardness (CaCO3)	mg/L	161	0.50	8311596
Elements				
Total Mercury (Hg)	ug/L	0.030	0.010	8325607
Total Metals by ICPMS				
Total Aluminum (Al)	ug/L	9750	3.0	8313471
Total Antimony (Sb)	ug/L	<0.50	0.50	8313471
Total Arsenic (As)	ug/L	8.04	0.10	8313471
Total Barium (Ba)	ug/L	88.4	1.0	8313471
Total Beryllium (Be)	ug/L	0.94	0.10	8313471
Total Bismuth (Bi)	ug/L	<1.0	1.0	8313471
Total Boron (B)	ug/L	203	50	8313471
Total Cadmium (Cd)	ug/L	0.108	0.010	8313471
Total Chromium (Cr)	ug/L	21.2	1.0	8313471
Total Cobalt (Co)	ug/L	10.3	0.50	8313471
Total Copper (Cu)	ug/L	23.2	0.50	8313471
Total Iron (Fe)	ug/L	25500	10	8313471
Total Lead (Pb)	ug/L	10.9	0.20	8313471
Total Lithium (Li)	ug/L	29.8	5.0	8313471
Total Manganese (Mn)	ug/L	225	1.0	8313471
Total Molybdenum (Mo)	ug/L	<1.0	1.0	8313471
Total Nickel (Ni)	ug/L	23.5	1.0	8313471
Total Selenium (Se)	ug/L	0.50	0.10	8313471
Total Silicon (Si)	ug/L	17200	100	8313471
Total Silver (Ag)	ug/L	0.050	0.020	8313471
Total Strontium (Sr)	ug/L	221	1.0	8313471
Total Thallium (Tl)	ug/L	0.126	0.050	8313471
Total Tin (Sn)	ug/L	<5.0	5.0	8313471
Total Titanium (Ti)	ug/L	209	5.0	8313471
Total Uranium (U)	ug/L	1.55	0.10	8313471
Total Vanadium (V)	ug/L	44.2	5.0	8313471
Total Zinc (Zn)	ug/L	73.4	5.0	8313471
Total Zirconium (Zr)	ug/L	3.61	0.50	8313471
Total Calcium (Ca)	mg/L	39.0	0.050	8311599
Total Magnesium (Mg)	mg/L	15.4	0.050	8311599
Total Potassium (K)	mg/L	5.97	0.050	8311599
RDL = Reportable Detection Limit				



Maxxam Job #: B651848
Report Date: 2016/07/11

ENVIRONMENT CANADA
Site Location: EUREKA, NV

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CCME TOTAL METALS IN WATER (WATER)

Maxxam ID		OX5883		
Sampling Date				
	UNITS	EUR-2	RDL	QC Batch
Total Sodium (Na)	mg/L	48.7	0.050	8311599
Total Sulphur (S)	mg/L	24.8	3.0	8311599
RDL = Reportable Detection Limit				

Maxxam Job #: B651848
Report Date: 2016/07/11

ENVIRONMENT CANADA
Site Location: EUREKA, NV

GENERAL COMMENTS

Sample OX5883-01 : Due to the presence of higher than normal particulate levels, the sample was filtered to prevent interference during analysis for the following: pH, Conductivity and Alkalinity.

Results relate only to the items tested.

QUALITY ASSURANCE REPORT

ENVIRONMENT CANADA
Site Location: EUREKA, NV

QC Batch	Parameter	Date	Matrix Spike		Spiked Blank		Method Blank		RPD	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
8313009	O-TERPHENYL (sur.)	2016/06/28	106	50 - 130	126	50 - 130	118	%		
8313308	4-Bromofluorobenzene (sur.)	2016/06/29	103	60 - 140	104	60 - 140	100	%		
8313308	D4-1,2-Dichloroethane (sur.)	2016/06/29	111	60 - 140	104	60 - 140	117	%		
8313308	D8-TOLUENE (sur.)	2016/06/29	98	60 - 140	98	60 - 140	98	%		
8312883	Conductivity	2016/06/29			101	90 - 110	<1.0	uS/cm	0.69	20
8312886	Alkalinity (Total as CaCO3)	2016/06/29			96	80 - 120	<0.50	mg/L	NC	20
8312886	Bicarbonate (HCO3)	2016/06/29					<0.50	mg/L	NC	20
8312886	Carbonate (CO3)	2016/06/29					<0.50	mg/L	NC	20
8312886	Hydroxide (OH)	2016/06/29					<0.50	mg/L	NC	20
8313009	F2 (C10-C16 Hydrocarbons)	2016/06/30	94	50 - 130	102	70 - 130	<0.15	mg/L	NC	40
8313009	F3 (C16-C34 Hydrocarbons)	2016/06/30	123	50 - 130	118	70 - 130	<0.15	mg/L	NC	40
8313009	F4 (C34-C50 Hydrocarbons)	2016/06/30	90	50 - 130	99	70 - 130	<0.15	mg/L	NC	40
8313308	Benzene	2016/06/29	90	70 - 130	94	70 - 130	<0.40	ug/L	NC	40
8313308	Ethylbenzene	2016/06/29	97	70 - 130	97	70 - 130	<0.40	ug/L	NC	40
8313308	F1 (C6-C10) - BTEX	2016/06/29					<300	ug/L	NC	40
8313308	F1 (C6-C10)	2016/06/29	85	70 - 130	99	70 - 130	<300	ug/L	NC	40
8313308	m & p-Xylene	2016/06/29	98	70 - 130	99	70 - 130	<0.80	ug/L	NC	40
8313308	Methyl-tert-butylether (MTBE)	2016/06/29	116	70 - 130	120	70 - 130	<4.0	ug/L	NC	40
8313308	o-Xylene	2016/06/29	102	70 - 130	104	70 - 130	<0.40	ug/L	NC	40
8313308	Toluene	2016/06/29	90	70 - 130	92	70 - 130	<0.40	ug/L	NC	40
8313308	Xylenes (Total)	2016/06/29					<0.80	ug/L	NC	40
8313471	Total Aluminum (Al)	2016/06/28	98	80 - 120	107	80 - 120	3.7, RDL=3.0	ug/L		
8313471	Total Antimony (Sb)	2016/06/28	99	80 - 120	99	80 - 120	<0.50	ug/L		
8313471	Total Arsenic (As)	2016/06/28	NC	80 - 120	100	80 - 120	<0.10	ug/L	1.7	20
8313471	Total Barium (Ba)	2016/06/28	94	80 - 120	98	80 - 120	<1.0	ug/L		
8313471	Total Beryllium (Be)	2016/06/28	96	80 - 120	102	80 - 120	<0.10	ug/L		
8313471	Total Bismuth (Bi)	2016/06/28	94	80 - 120	94	80 - 120	<1.0	ug/L		
8313471	Total Boron (B)	2016/06/28	NC	80 - 120	98	80 - 120	<50	ug/L		
8313471	Total Cadmium (Cd)	2016/06/28	98	80 - 120	101	80 - 120	<0.010	ug/L		
8313471	Total Chromium (Cr)	2016/06/28	99	80 - 120	101	80 - 120	<1.0	ug/L		
8313471	Total Cobalt (Co)	2016/06/28	98	80 - 120	100	80 - 120	<0.50	ug/L		
8313471	Total Copper (Cu)	2016/06/28	99	80 - 120	102	80 - 120	<0.50	ug/L		

Maxxam Job #: B651848
Report Date: 2016/07/11

QUALITY ASSURANCE REPORT(CONT'D)

ENVIRONMENT CANADA
Site Location: EUREKA, NV

QC Batch	Parameter	Date	Matrix Spike		Spiked Blank		Method Blank		RPD	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
8313471	Total Iron (Fe)	2016/06/28	111	80 - 120	109	80 - 120	<10	ug/L		
8313471	Total Lead (Pb)	2016/06/28	92	80 - 120	94	80 - 120	<0.20	ug/L		
8313471	Total Lithium (Li)	2016/06/28	NC	80 - 120	97	80 - 120	<5.0	ug/L		
8313471	Total Manganese (Mn)	2016/06/28	101	80 - 120	98	80 - 120	<1.0	ug/L		
8313471	Total Molybdenum (Mo)	2016/06/28	100	80 - 120	95	80 - 120	<1.0	ug/L		
8313471	Total Nickel (Ni)	2016/06/28	97	80 - 120	102	80 - 120	<1.0	ug/L		
8313471	Total Selenium (Se)	2016/06/28	94	80 - 120	101	80 - 120	<0.10	ug/L		
8313471	Total Silicon (Si)	2016/06/28					<100	ug/L		
8313471	Total Silver (Ag)	2016/06/28	104	80 - 120	99	80 - 120	<0.020	ug/L		
8313471	Total Strontium (Sr)	2016/06/28	NC	80 - 120	100	80 - 120	<1.0	ug/L		
8313471	Total Thallium (Tl)	2016/06/28	94	80 - 120	93	80 - 120	<0.050	ug/L		
8313471	Total Tin (Sn)	2016/06/28	98	80 - 120	105	80 - 120	<5.0	ug/L		
8313471	Total Titanium (Ti)	2016/06/28	109	80 - 120	104	80 - 120	<5.0	ug/L		
8313471	Total Uranium (U)	2016/06/28	93	80 - 120	95	80 - 120	<0.10	ug/L		
8313471	Total Vanadium (V)	2016/06/28	94	80 - 120	101	80 - 120	<5.0	ug/L		
8313471	Total Zinc (Zn)	2016/06/28	NC	80 - 120	115	80 - 120	<5.0	ug/L		
8313471	Total Zirconium (Zr)	2016/06/28					<0.50	ug/L		
8313674	Dissolved Chloride (Cl)	2016/06/28			100	80 - 120	<0.50	mg/L		
8313959	Total Ammonia (N)	2016/06/28	101	80 - 120	99	80 - 120	<0.0050	mg/L	1.6	20
8314287	Total Suspended Solids	2016/06/29			99	80 - 120	<4.0	mg/L	NC	20
8314350	Total Oil and grease	2016/06/29			95	70 - 130	<1.0	mg/L		
8314628	Total Organic Carbon (C)	2016/06/29	NC	80 - 120	113	80 - 120	<0.50	mg/L	NC	20
8314844	Phenols	2016/06/29	95	80 - 120	93	80 - 120	<0.0010	mg/L	NC	20
8315352	Dissolved Sulphate (SO4)	2016/06/29			96	80 - 120	0.51, RDL=0.50	mg/L		
8315488	Nitrate plus Nitrite (N)	2016/06/29	91	80 - 120	105	80 - 120	<0.020	mg/L	NC	25
8316497	Total Nitrogen (N)	2016/07/05	94	80 - 120	98	80 - 120	<0.020	mg/L	NC	20

QUALITY ASSURANCE REPORT(CONT'D)

ENVIRONMENT CANADA
Site Location: EUREKA, NV

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QC Batch	Parameter	Date	Matrix Spike		Spiked Blank		Method Blank		RPD	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
8325607	Total Mercury (Hg)	2016/07/11	99	80 - 120	103	80 - 120	<0.010	ug/L	NC	20
Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement. Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference. Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy. Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination. Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency. NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration). NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).										

ENVIRONMENT CANADA
Site Location: EUREKA, NV

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VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



Andy Lu, Ph.D., P.Chem., Scientific Specialist