
APPENDIX A

Sample Results for July 2009

SAMPLING RESULTS – July 9, 2009

The analytical results of the samples collected from the Kugaaruk Sewage Lagoon and Wetland Treatment System are summarized in Table 1. Based on these results, the parameters that exceeded the set guidelines are shown in bold in the attached table.

PEL-3-1 was a sample taken from within the secondary cell, prior to being discharged to the wetland. PEL-3-2 was a sample taken from effluent discharging from the secondary containment berm into the wetland. PEL-4 is the discharge point from the wetland into the ocean. PEL-5 is a sample taken within the ocean, approximately 5m from the PEL-4 sampling station.

Table 1. Water Quality Results of Lagoon Effluent and Wetland Effluent

Test Parameter	Units	Water Board Requirements	PEL-3-1	PEL-3-2	PEL-4	PEL-5
<u>Inorganics - Physicals</u>						
Alkalinity, Total (as CaCO ₃)	mg/L		330	322	329	214
Conductivity, Specific (@ 25°C)	µS/cm		950	930	903	1810
pH	pH units	6 - 9	7.5	7.27	7.52	7.46
Solids, Total Suspended	mg/L	180 / 45 ¹	44	144	26	32
<u>Inorganics - Nutrients</u>						
Ammonia as Nitrogen	mg/L		64.9	59.8	57.8	39
Biochemical Oxygen Demand	mg/L	120 / 45 ²	178	159	94	58
CBOD	mg/L		164	135	86	59
Nitrate + Nitrite as Nitrogen	mg/L		<0.01	<0.01	<0.01	<0.01
Organic Carbon, Total	mg/L		122	83.7	77.1	47.5
Phosphorous, Total	mg/L		6.35	3.89	5.58	3.51
<u>Subcontracted Nutrients</u>						
Kjeldahl Nitrogen, Total	mg/L		68.4	63.2	61.2	40.3
<u>Major Ions</u>						
Calcium	mg/L		32.6	45.2	33.9	37.4
Chloride	mg/L		75.3	73.4	73.4	442
Hardness	mg/L		133	158	134	236
Magnesium	mg/L		12.6	11	12	34.7
Nitrate	mg/L	3.6*	<0.01	<0.01	<0.01	<0.01
Nitrite	mg/L		<0.01	<0.01	<0.01	<0.01
Potassium	mg/L		14.3	16.1	13.5	17.5
Sodium	mg/L		60.4	61.6	60.9	249
Sulphate	mg/L		14	37	15	65

<u>Microbiology</u>						
Coliforms, Fecal	CFU/100mL	1 x 10 ⁴	Too numerous to count	22900	Too numerous to count	18500
<i>Escherichia coli</i>	MPN/100mL		>2419.6	>2419.6	>2419.6	1730
<u>Organics</u>						
Oil and Grease, visible		No visible sheen	Non-visual	Non-visual	Non-visual	Non-visual
Test Parameter	Units	Water Board Requirements	PEL-3-1	PEL-3-2	PEL-4	PEL-5
<u>Trace Metals, Total</u>						
Aluminum	µg/L		310	126	108	223
Arsenic	µg/L	12.5*	0.7	2.5	1.9	1.4
Cadmium	µg/L	0.12*	<0.1	0.1	<0.1	<0.1
Chromium	µg/L	56/1.5* ³	1	0.7	0.5	0.7
Cobalt	µg/L		0.6	3.6	1.9	1.3
Copper	µg/L		51	35.2	34.1	21.1
Iron	µg/L		414	544	870	772
Lead	µg/L		0.9	2.8	1.6	1.3
Manganese	µg/L		162	441	470	347
Mercury	µg/L	0.016*	0.02	0.02	0.02	0.02
Nickel	µg/L		2.4	4.4	3.8	2.6
Zinc	µg/L		45	27	26	17
<u>Subcontracted Organics</u>						
Phenols, Total	mg/L		0.24	0.18	0.18	0.14

* CCME Guidelines (Canadian Water Quality Guidelines for the Protection of Aquatic Life, December 2007)

¹ Discharge criteria for Total Suspended Solids for PEL-3-1/PEL-3-2 is 180 mg/L. Discharge criteria for PEL-4 is 45 mg/L.

² Discharge criteria for Biochemical Oxygen Demand for PEL-3-1/PEL-3-2 is 120 mg/L. Discharge criteria for PEL-4 is 45 mg/L.

³ Trivalent chromium (Cr(III))/Hexavalent chromium (Cr(VI))

SUMMARY

As Table 1 indicates, the only parameters that were exceeded based on the guidelines set in the water licence were biochemical oxygen demand and fecal coliforms. Based on the CCME guidelines, the mercury levels also exceeded the acceptable concentration. Since these samples were taken during early July, it was expected that not all parameters would meet the water licence guidelines. Although some vegetation was present, the wetland vegetation had not yet been completely established for the summer treatment period.



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Taiga Batch No.:
290376

- FINAL REPORT -

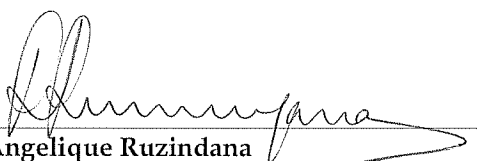
Prepared For: Dillon Consulting Ltd.

Address: Suite 303 - 4920 47 St.
Box 1409
Yellowknife, NT
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Attn: Jennifer Spencer

Facsimile: (867) 873-3328

Final report has been reviewed and approved by:


Angelique Ruzindana
Quality Assurance Officer

NOTES:

- Test methods and data are validated by the laboratory's Quality Assurance Program. Taiga Environmental Laboratory is accredited by the Canadian Association of Environmental Analytical Laboratories (CAEAL) as a testing laboratory for specific tests registered with CAEAL.
- Routine methods are based on recognized procedures from sources such as
 - Standard Methods for the Examination of Water and Wastewater APHA AWWA WEF;
 - Environment Canada
 - USEPA
- Samples shall be kept for thirty (30) days after the final report is issued. All microbiological samples shall be disposed of immediately upon completion of analysis to minimize biohazardous risks to laboratory personnel. Please contact the laboratory if you have any special requirements.
- Final results are based on the specific tests at the time of analysis and do not represent the conditions during sampling.

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Taiga Batch No.:
290376

- CERTIFICATE OF ANALYSIS -

Client Sample ID: PEL-5

Taiga Sample ID: 001

Client Project: 05-4755
Sample Type: Sewage
Received Date: 09-Jul-09
Sampling Date: 09-Jul-09
Sampling Time: 8:30
Location: Kugaaruk Sewage Lagoon
Report Status: Final

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifier
<u>Inorganics - Physicals</u>						
Alkalinity, Total (as CaCO ₃)	214	0.4	mg/L	10-Jul-09	SM2320:B	
Conductivity, Specific (@ 25°C)	1810	0.4	µS/cm	10-Jul-09	SM2510:B	
pH	7.46		pH units	10-Jul-09	SM4500-H:B	
Solids, Total Suspended	32	3	mg/L	14-Jul-09	SM2540:D	
<u>Inorganics - Nutrients</u>						
Ammonia as Nitrogen	39.0	0.01	mg/L	10-Jul-09	SM4500-NH3:	
Biochemical Oxygen Demand	58	2	mg/L	10-Jul-09	SM5210:B	
CBOD	59	2	mg/L	10-Jul-09	SM5210:B	
Nitrate+Nitrite as Nitrogen	< 0.01	0.01	mg/L	10-Jul-09	SM4110:B	
Organic Carbon, Total	47.5	0.5	mg/L	15-Jul-09	SM5310:B	
Phosphorous, Total	3.51	0.01	mg/L	21-Jul-09	SM4500-P:D	
<u>Subcontracted Nutrients</u>						
Kjeldahl Nitrogen, Total	40.3	0.06	mg/L	14-Jul-09	ISO 11905-2	
<u>Major Ions</u>						

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Taiga Sample ID: 001

Calcium	37.4	0.1	mg/L	10-Jul-09	SM4110:B
Chloride	442	0.7	mg/L	10-Jul-09	SM4110:B
Hardness	236	0.7	mg/L	10-Jul-09	SM2340:B
Magnesium	34.7	0.1	mg/L	10-Jul-09	SM4110:B
Nitrate	< 0.01	0.01	mg/L	10-Jul-09	SM4110:B
Nitrite	< 0.01	0.01	mg/L	10-Jul-09	SM4110:B
Potassium	17.5	0.1	mg/L	10-Jul-09	SM4110:B
Sodium	249	0.1	mg/L	10-Jul-09	SM4110:B
Sulphate	65	1	mg/L	10-Jul-09	SM4110:B

Microbiology

Coliforms, Fecal	18500	100	CFU/100mL	09-Jul-09	SM9222:D
Escherichia coli	1730	1.0	MPN/100mL	09-Jul-09	SM9223:B

Organics

Oil and Grease, visible	non-visual			10-Jul-09	Visual Exam
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Trace Metals, Total

Aluminum	223	5	µg/L	21-Jul-09	EPA200.8
Arsenic	1.4	0.2	µg/L	21-Jul-09	EPA200.8
Cadmium	< 0.1	0.1	µg/L	21-Jul-09	EPA200.8
Chromium	0.7	0.1	µg/L	21-Jul-09	EPA200.8
Cobalt	1.3	0.1	µg/L	21-Jul-09	EPA200.8
Copper	21.1	0.2	µg/L	21-Jul-09	EPA200.8
Iron	772	5	µg/L	21-Jul-09	EPA200.8
Lead	1.3	0.1	µg/L	21-Jul-09	EPA200.8
Manganese	347	0.1	µg/L	21-Jul-09	EPA200.8

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Client Sample ID: PEL-5

Taiga Sample ID: 001

Mercury	0.02	0.01	µg/L	21-Jul-09	EPA200.8
Nickel	2.6	0.1	µg/L	21-Jul-09	EPA200.8
Zinc	17	5	µg/L	21-Jul-09	EPA200.8

Subcontracted Organics

Phenols, Total	0.140	0.001	mg/L	16-Jul-09	APHA 5530D
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Taiga Batch No.:
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- CERTIFICATE OF ANALYSIS -

Client Sample ID: PEL-4

Taiga Sample ID: 002

Client Project: 05-4755
Sample Type: Sewage
Received Date: 09-Jul-09
Sampling Date: 09-Jul-09
Sampling Time: 8:30
Location: Kugaaruk Sewage Lagoon
Report Status: Final

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifier
<u>Inorganics - Physicals</u>						
Alkalinity, Total (as CaCO ₃)	329	0.4	mg/L	10-Jul-09	SM2320:B	
Conductivity, Specific (@ 25°C)	903	0.4	µS/cm	10-Jul-09	SM2510:B	
pH	7.52		pH units	10-Jul-09	SM4500-H:B	
Solids, Total Suspended	26	3	mg/L	14-Jul-09	SM2540:D	
<u>Inorganics - Nutrients</u>						
Ammonia as Nitrogen	57.8	0.01	mg/L	10-Jul-09	SM4500-NH3:	
Biochemical Oxygen Demand	94	2	mg/L	10-Jul-09	SM5210:B	
CBOD	86	2	mg/L	10-Jul-09	SM5210:B	
Nitrate+Nitrite as Nitrogen	< 0.01	0.01	mg/L	10-Jul-09	SM4110:B	
Organic Carbon, Total	77.1	0.5	mg/L	15-Jul-09	SM5310:B	
Phosphorous, Total	5.58	0.01	mg/L	21-Jul-09	SM4500-P:D	
<u>Subcontracted Nutrients</u>						
Kjeldahl Nitrogen, Total	61.2	0.06	mg/L	14-Jul-09	ISO 11905-2	
<u>Major Ions</u>						

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Client Sample ID: PEL-4

Taiga Sample ID: 002

Calcium	33.9	0.1	mg/L	10-Jul-09	SM4110:B
Chloride	73.4	0.7	mg/L	10-Jul-09	SM4110:B
Hardness	134	0.7	mg/L	10-Jul-09	SM2340:B
Magnesium	12.0	0.1	mg/L	10-Jul-09	SM4110:B
Nitrate	< 0.01	0.01	mg/L	10-Jul-09	SM4110:B
Nitrite	< 0.01	0.01	mg/L	10-Jul-09	SM4110:B
Potassium	13.5	0.1	mg/L	10-Jul-09	SM4110:B
Sodium	60.9	0.1	mg/L	10-Jul-09	SM4110:B
Sulphate	15	1	mg/L	10-Jul-09	SM4110:B

Microbiology

Coliforms, Fecal		100	CFU/100mL	09-Jul-09	SM9222:D	86
Escherichia coli	>2419.6	1.0	MPN/100mL	09-Jul-09	SM9223:B	74

Organics

Oil and Grease, visible	non-visual			10-Jul-09	Visual Exam
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Trace Metals, Total

Aluminum	108	5	µg/L	21-Jul-09	EPA200.8
Arsenic	1.9	0.2	µg/L	21-Jul-09	EPA200.8
Cadmium	< 0.1	0.1	µg/L	21-Jul-09	EPA200.8
Chromium	0.5	0.1	µg/L	21-Jul-09	EPA200.8
Cobalt	1.9	0.1	µg/L	21-Jul-09	EPA200.8
Copper	34.1	0.2	µg/L	21-Jul-09	EPA200.8
Iron	870	5	µg/L	21-Jul-09	EPA200.8
Lead	1.6	0.1	µg/L	21-Jul-09	EPA200.8
Manganese	470	0.1	µg/L	21-Jul-09	EPA200.8

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Client Sample ID: PEL-4

Taiga Sample ID: 002

Mercury	0.02	0.01	µg/L	21-Jul-09	EPA200.8
Nickel	3.8	0.1	µg/L	21-Jul-09	EPA200.8
Zinc	26	5	µg/L	21-Jul-09	EPA200.8

Subcontracted Organics

Phenols, Total	0.180	0.001	mg/L	16-Jul-09	APHA 5530D
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Taiga Batch No.:
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- CERTIFICATE OF ANALYSIS -

Client Sample ID: PEL-3-2

Taiga Sample ID: 003

Client Project: 05-4755
Sample Type: Sewage
Received Date: 09-Jul-09
Sampling Date: 09-Jul-09
Sampling Time: 8:30
Location: Kugaaruk Sewage Lagoon
Report Status: Final

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifier
<u>Inorganics - Physicals</u>						
Alkalinity, Total (as CaCO ₃)	322	0.4	mg/L	10-Jul-09	SM2320:B	
Conductivity, Specific (@ 25°C)	930	0.4	µS/cm	10-Jul-09	SM2510:B	
pH	7.27		pH units	10-Jul-09	SM4500-H:B	
Solids, Total Suspended	144	3	mg/L	14-Jul-09	SM2540:D	
<u>Inorganics - Nutrients</u>						
Ammonia as Nitrogen	59.8	0.01	mg/L	10-Jul-09	SM4500-NH3:	
Biochemical Oxygen Demand	159	2	mg/L	10-Jul-09	SM5210:B	
CBOD	135	2	mg/L	10-Jul-09	SM5210:B	
Nitrate+Nitrite as Nitrogen	< 0.01	0.01	mg/L	10-Jul-09	SM4110:B	
Organic Carbon, Total	83.7	0.5	mg/L	15-Jul-09	SM5310:B	
Phosphorous, Total	3.89	0.01	mg/L	21-Jul-09	SM4500-P:D	
<u>Subcontracted Nutrients</u>						
Kjeldahl Nitrogen, Total	63.2	0.06	mg/L	14-Jul-09	ISO 11905-2	
<u>Major Ions</u>						

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- CERTIFICATE OF ANALYSIS -

Client Sample ID: PEL-3-2

Taiga Sample ID: 003

Calcium	45.2	0.1	mg/L	10-Jul-09	SM4110:B
Chloride	73.4	0.7	mg/L	10-Jul-09	SM4110:B
Hardness	158	0.7	mg/L	10-Jul-09	SM2340:B
Magnesium	11.0	0.1	mg/L	10-Jul-09	SM4110:B
Nitrate	< 0.01	0.01	mg/L	10-Jul-09	SM4110:B
Nitrite	< 0.01	0.01	mg/L	10-Jul-09	SM4110:B
Potassium	16.1	0.1	mg/L	10-Jul-09	SM4110:B
Sodium	61.6	0.1	mg/L	10-Jul-09	SM4110:B
Sulphate	37	1	mg/L	10-Jul-09	SM4110:B

Microbiology

Coliforms, Fecal	22900	100	CFU/100mL	09-Jul-09	SM9222:D
Escherichia coli	>2419.6	1.0	MPN/100mL	09-Jul-09	SM9223:B

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Organics

Oil and Grease, visible	non-visual			10-Jul-09	Visual Exam
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Trace Metals, Total

Aluminum	126	5	µg/L	21-Jul-09	EPA200.8
Arsenic	2.5	0.2	µg/L	21-Jul-09	EPA200.8
Cadmium	0.1	0.1	µg/L	21-Jul-09	EPA200.8
Chromium	0.7	0.1	µg/L	21-Jul-09	EPA200.8
Cobalt	3.6	0.1	µg/L	21-Jul-09	EPA200.8
Copper	35.2	0.2	µg/L	21-Jul-09	EPA200.8
Iron	544	5	µg/L	21-Jul-09	EPA200.8
Lead	2.8	0.1	µg/L	21-Jul-09	EPA200.8
Manganese	441	0.1	µg/L	21-Jul-09	EPA200.8

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Client Sample ID: PEL-3-2

Taiga Sample ID: 003

Mercury	0.02	0.01	µg/L	21-Jul-09	EPA200.8
Nickel	4.4	0.1	µg/L	21-Jul-09	EPA200.8
Zinc	27	5	µg/L	21-Jul-09	EPA200.8

Subcontracted Organics

Phenols, Total	0.180	0.001	mg/L	16-Jul-09	APHA 5530D
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Taiga Batch No.:
290376

- CERTIFICATE OF ANALYSIS -

Client Sample ID: PEL-3-1

Taiga Sample ID: 004

Client Project: 05-4755
Sample Type: Sewage
Received Date: 09-Jul-09
Sampling Date: 09-Jul-09
Sampling Time: 8:30
Location: Kugaaruk Sewage Lagoon
Report Status: Final

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifier
<u>Inorganics - Physicals</u>						
Alkalinity, Total (as CaCO ₃)	330	0.4	mg/L	10-Jul-09	SM2320:B	
Conductivity, Specific (@ 25°C)	950	0.4	µS/cm	10-Jul-09	SM2510:B	
pH	7.50		pH units	10-Jul-09	SM4500-H:B	
Solids, Total Suspended	44	3	mg/L	14-Jul-09	SM2540:D	
<u>Inorganics - Nutrients</u>						
Ammonia as Nitrogen	64.9	0.01	mg/L	10-Jul-09	SM4500-NH ₃ :	
Biochemical Oxygen Demand	178	2	mg/L	10-Jul-09	SM5210:B	
CBOD	164	2	mg/L	10-Jul-09	SM5210:B	
Nitrate+Nitrite as Nitrogen	< 0.01	0.01	mg/L	10-Jul-09	SM4110:B	
Organic Carbon, Total	122	0.5	mg/L	15-Jul-09	SM5310:B	
Phosphorous, Total	6.35	0.01	mg/L	21-Jul-09	SM4500-P:D	
<u>Subcontracted Nutrients</u>						
Kjeldahl Nitrogen, Total	68.4	0.06	mg/L	14-Jul-09	ISO 11905-2	
<u>Major Ions</u>						

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Tel: (867)-669-2788 Fax: (867)-669-2718

Taiga Batch No.:
290376

- CERTIFICATE OF ANALYSIS -

Client Sample ID: PEL-3-1

Taiga Sample ID: 004

Calcium	32.6	0.1	mg/L	10-Jul-09	SM4110:B
Chloride	75.3	0.7	mg/L	10-Jul-09	SM4110:B
Hardness	133	0.7	mg/L	10-Jul-09	SM2340:B
Magnesium	12.6	0.1	mg/L	10-Jul-09	SM4110:B
Nitrate	< 0.01	0.01	mg/L	10-Jul-09	SM4110:B
Nitrite	< 0.01	0.01	mg/L	10-Jul-09	SM4110:B
Potassium	14.3	0.1	mg/L	10-Jul-09	SM4110:B
Sodium	60.4	0.1	mg/L	10-Jul-09	SM4110:B
Sulphate	14	1	mg/L	10-Jul-09	SM4110:B

Microbiology

Coliforms, Fecal		100	CFU/100mL	09-Jul-09	SM9222:D	86
Escherichia coli	>24196	10.0	MPN/100mL	09-Jul-09	SM9223:B	74

Organics

Oil and Grease, visible	non-visual			10-Jul-09	Visual Exam
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Trace Metals, Total

Aluminum	310	5	µg/L	21-Jul-09	EPA200.8
Arsenic	0.7	0.2	µg/L	21-Jul-09	EPA200.8
Cadmium	< 0.1	0.1	µg/L	21-Jul-09	EPA200.8
Chromium	1.0	0.1	µg/L	21-Jul-09	EPA200.8
Cobalt	0.6	0.1	µg/L	21-Jul-09	EPA200.8
Copper	51.0	0.2	µg/L	21-Jul-09	EPA200.8
Iron	414	5	µg/L	21-Jul-09	EPA200.8
Lead	0.9	0.1	µg/L	21-Jul-09	EPA200.8
Manganese	162	0.1	µg/L	21-Jul-09	EPA200.8

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Tel: (867)-669-2788 Fax: (867)-669-2718

Taiga Batch No.:
290376

- CERTIFICATE OF ANALYSIS -

Client Sample ID: PEL-3-1

Taiga Sample ID: 004

Mercury	0.02	0.01	µg/L	21-Jul-09	EPA200.8
Nickel	2.4	0.1	µg/L	21-Jul-09	EPA200.8
Zinc	45	5	µg/L	21-Jul-09	EPA200.8

Subcontracted Organics

Phenols, Total	0.240	0.001	mg/L	16-Jul-09	APHA 5530D
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Taiga Batch No.:
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- CERTIFICATE OF ANALYSIS -

Client Sample ID: FL-1

Taiga Sample ID: 005

Client Project: 05-4755

Sample Type: Sewage

Received Date: 09-Jul-09

Sampling Date: 09-Jul-09

Sampling Time: 8:30

Location: Kugaaruk Sewage Lagoon

Report Status: Final

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
<u>Microbiology</u>						
Coliforms, Fecal		100	CFU/100mL	09-Jul-09	SM9222:D	86
Escherichia coli	>24196	10.0	MPN/100mL	09-Jul-09	SM9223:B	74

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Taiga Batch No.:
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- CERTIFICATE OF ANALYSIS -

Client Sample ID: FL-2

Taiga Sample ID: 006

Client Project: 05-4755
Sample Type: Sewage
Received Date: 09-Jul-09
Sampling Date: 09-Jul-09
Sampling Time: 8:30
Location: Kugaaruk Sewage Lagoon
Report Status: Final

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
<u>Microbiology</u>						
Coliforms, Fecal	17	1	CFU/100mL	09-Jul-09	SM9222:D	
Escherichia coli	68.3	1.0	MPN/100mL	09-Jul-09	SM9223:B	

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Taiga Batch No.:
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- CERTIFICATE OF ANALYSIS -

Client Sample ID: FL-3

Taiga Sample ID: 007

Client Project: 05-4755

Sample Type: Sewage

Received Date: 09-Jul-09

Sampling Date: 09-Jul-09

Sampling Time: 8:30

Location: Kugaaruk Sewage Lagoon

Report Status: Final

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Microbiology						
Coliforms, Fecal	1	1	CFU/100mL	09-Jul-09	SM9222:D	
Escherichia coli	< 1.0	1.0	MPN/100mL	09-Jul-09	SM9223:B	

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Taiga Batch No.:
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- CERTIFICATE OF ANALYSIS -

Client Sample ID: FL-4

Taiga Sample ID: 008

Client Project: 05-4755
Sample Type: Sewage
Received Date: 09-Jul-09
Sampling Date: 09-Jul-09
Sampling Time: 8:30
Location: Kugaaruk Sewage Lagoon
Report Status: Final

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Microbiology						
Coliforms, Fecal		1	CFU/100mL	09-Jul-09	SM9222:D	86
Escherichia coli	>2419.6	1.0	MPN/100mL	09-Jul-09	SM9223:B	74

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Taiga Batch No.:
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- CERTIFICATE OF ANALYSIS -

Client Sample ID: FL-5

Taiga Sample ID: 009

Client Project: 05-4755
Sample Type: Sewage
Received Date: 09-Jul-09
Sampling Date: 09-Jul-09
Sampling Time: 8:30
Location: Kugaaruk Sewage Lagoon
Report Status: Final

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Microbiology						
Coliforms, Fecal	< 1	1	CFU/100mL	09-Jul-09	SM9222:D	
Escherichia coli	2.0	1.0	MPN/100mL	09-Jul-09	SM9223:B	

ReportDate: Monday, July 27, 2009
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Taiga Batch No.:
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- CERTIFICATE OF ANALYSIS -

Client Sample ID: FL-6

Taiga Sample ID: 010

Client Project: 05-4755
Sample Type: Sewage
Received Date: 09-Jul-09
Sampling Date: 09-Jul-09
Sampling Time: 8:30
Location: Kugaaruk Sewage Lagoon
Report Status: Final

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
<u>Microbiology</u>						
Coliforms, Fecal	< 1	1	CFU/100mL	09-Jul-09	SM9222:D	
Escherichia coli	< 1.0	1.0	MPN/100mL	09-Jul-09	SM9223:B	

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Taiga Batch No.:
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- CERTIFICATE OF ANALYSIS -

Client Sample ID: FL-7

Taiga Sample ID: 011

Client Project: 05-4755
Sample Type: Sewage
Received Date: 09-Jul-09
Sampling Date: 09-Jul-09
Sampling Time: 8:30
Location: Kugaaruk Sewage Lagoon
Report Status: Final

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Microbiology						
Coliforms, Fecal	1	1	CFU/100mL	09-Jul-09	SM9222:D	
Escherichia coli	< 1.0	1.0	MPN/100mL	09-Jul-09	SM9223:B	

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Taiga Batch No.:
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- CERTIFICATE OF ANALYSIS -

Client Sample ID: Landfarm Pond

Taiga Sample ID: 012

Client Project: 05-4755

Sample Type: Leachate

Received Date: 09-Jul-09

Sampling Date: 09-Jul-09

Sampling Time: 8:30

Location: Kugaaruk Sewage Lagoon

Report Status: Final

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
<u>Organics</u>						
Hydrocarbons, Total Extractable	< 0.05	0.05	mg/L	22-Jul-09	EPA8015B	

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Taiga Batch No.:
290376

- CERTIFICATE OF ANALYSIS -

Client Sample ID: TB

Taiga Sample ID: 013

Client Project: 05-4755
Sample Type: Water
Received Date: 09-Jul-09
Sampling Date: 09-Jul-09
Sampling Time: 8:30
Location: Kugaaruk Sewage Lagoon
Report Status: Final

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifier
<u>Inorganics - Physicals</u>						
Alkalinity, Total (as CaCO ₃)	< 0.4	0.4	mg/L	10-Jul-09	SM2320:B	
Conductivity, Specific (@ 25°C)	< 0.4	0.4	µS/cm	10-Jul-09	SM2510:B	
pH	5.85		pH units	10-Jul-09	SM4500-H:B	
Solids, Total Suspended	< 3	3	mg/L	14-Jul-09	SM2540:D	
<u>Inorganics - Nutrients</u>						
Ammonia as Nitrogen	< 0.01	0.01	mg/L	10-Jul-09	SM4500-NH ₃ :	
Nitrate+Nitrite as Nitrogen	< 0.01	0.01	mg/L	10-Jul-09	SM4110:B	
Organic Carbon, Total	< 0.5	0.5	mg/L	15-Jul-09	SM5310:B	
Phosphorous, Total	< 0.01	0.01	mg/L	21-Jul-09	SM4500-P:D	
<u>Subcontracted Nutrients</u>						
Kjeldahl Nitrogen, Total	0.20	0.06	mg/L	14-Jul-09	ISO 11905-2	
<u>Major Ions</u>						
Calcium	1.7	0.1	mg/L	10-Jul-09	SM4110:B	
Chloride	< 0.7	0.7	mg/L	10-Jul-09	SM4110:B	

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Taiga Batch No.:
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- CERTIFICATE OF ANALYSIS -

Client Sample ID: TB

Taiga Sample ID: 013

Hardness	5.5	0.7	mg/L	10-Jul-09	SM2340:B
Magnesium	0.3	0.1	mg/L	10-Jul-09	SM4110:B
Nitrate	< 0.01	0.01	mg/L	10-Jul-09	SM4110:B
Nitrite	< 0.01	0.01	mg/L	10-Jul-09	SM4110:B
Potassium	< 0.1	0.1	mg/L	10-Jul-09	SM4110:B
Sodium	< 0.1	0.1	mg/L	10-Jul-09	SM4110:B
Sulphate	< 1	1	mg/L	10-Jul-09	SM4110:B

Organics

Oil and Grease, visible	non-visual			10-Jul-09	Visual Exam
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Trace Metals, Total

Aluminum	< 0.6	0.6	µg/L	21-Jul-09	EPA200.8
Arsenic	< 0.2	0.2	µg/L	21-Jul-09	EPA200.8
Cadmium	< 0.05	0.05	µg/L	21-Jul-09	EPA200.8
Chromium	< 0.1	0.1	µg/L	21-Jul-09	EPA200.8
Cobalt	< 0.1	0.1	µg/L	21-Jul-09	EPA200.8
Copper	0.7	0.2	µg/L	21-Jul-09	EPA200.8
Iron	< 5	5	µg/L	21-Jul-09	EPA200.8
Lead	< 0.1	0.1	µg/L	21-Jul-09	EPA200.8
Manganese	0.1	0.1	µg/L	21-Jul-09	EPA200.8
Mercury	< 0.01	0.01	µg/L	21-Jul-09	EPA200.8
Nickel	< 0.1	0.1	µg/L	21-Jul-09	EPA200.8
Zinc	< 0.4	0.4	µg/L	21-Jul-09	EPA200.8

Subcontracted Organics

Phenols, Total	0.004	0.001	mg/L	16-Jul-09	APHA 5530D
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Taiga Batch No.:
290376

- CERTIFICATE OF ANALYSIS -

Client Sample ID: FB

Taiga Sample ID: 014

Client Project: 05-4755
Sample Type: Water
Received Date: 09-Jul-09
Sampling Date: 09-Jul-09
Sampling Time: 8:30
Location: Kugaaruk Sewage Lagoon
Report Status: Final

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
<u>Inorganics - Physicals</u>						
Alkalinity, Total (as CaCO ₃)	< 0.4	0.4	mg/L	10-Jul-09	SM2320:B	
Conductivity, Specific (@ 25°C)	< 0.4	0.4	µS/cm	10-Jul-09	SM2510:B	
pH	5.69		pH units	10-Jul-09	SM4500-H:B	
Solids, Total Suspended	< 3	3	mg/L	14-Jul-09	SM2540:D	
<u>Inorganics - Nutrients</u>						
Ammonia as Nitrogen	< 0.01	0.01	mg/L	10-Jul-09	SM4500-NH3:	
Nitrate+Nitrite as Nitrogen	< 0.01	0.01	mg/L	10-Jul-09	SM4110:B	
Organic Carbon, Total	< 0.5	0.5	mg/L	15-Jul-09	SM5310:B	
Phosphorous, Total	< 0.01	0.01	mg/L	21-Jul-09	SM4500-P:D	
<u>Subcontracted Nutrients</u>						
Kjeldahl Nitrogen, Total	< 0.06	0.06	mg/L	14-Jul-09	ISO 11905-2	
<u>Major Ions</u>						
Calcium	0.9	0.1	mg/L	10-Jul-09	SM4110:B	
Chloride	< 0.7	0.7	mg/L	10-Jul-09	SM4110:B	

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Taiga Batch No.:
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- CERTIFICATE OF ANALYSIS -

Client Sample ID: FB

Taiga Sample ID: 014

Hardness	2.6	0.7	mg/L	10-Jul-09	SM2340:B
Magnesium	< 0.1	0.1	mg/L	10-Jul-09	SM4110:B
Nitrate	< 0.01	0.01	mg/L	10-Jul-09	SM4110:B
Nitrite	< 0.01	0.01	mg/L	10-Jul-09	SM4110:B
Potassium	< 0.1	0.1	mg/L	10-Jul-09	SM4110:B
Sodium	< 0.1	0.1	mg/L	10-Jul-09	SM4110:B
Sulphate	< 1	1	mg/L	10-Jul-09	SM4110:B

Organics

Oil and Grease, visible	non-visual			10-Jul-09	Visual Exam
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Trace Metals, Total

Aluminum	< 0.6	0.6	µg/L	21-Jul-09	EPA200.8
Arsenic	< 0.2	0.2	µg/L	21-Jul-09	EPA200.8
Cadmium	< 0.05	0.05	µg/L	21-Jul-09	EPA200.8
Chromium	< 0.1	0.1	µg/L	21-Jul-09	EPA200.8
Cobalt	< 0.1	0.1	µg/L	21-Jul-09	EPA200.8
Copper	0.4	0.2	µg/L	21-Jul-09	EPA200.8
Iron	< 5	5	µg/L	21-Jul-09	EPA200.8
Lead	< 0.1	0.1	µg/L	21-Jul-09	EPA200.8
Manganese	< 0.1	0.1	µg/L	21-Jul-09	EPA200.8
Mercury	< 0.01	0.01	µg/L	21-Jul-09	EPA200.8
Nickel	< 0.1	0.1	µg/L	21-Jul-09	EPA200.8
Zinc	< 0.4	0.4	µg/L	21-Jul-09	EPA200.8

Subcontracted Organics

Phenols, Total	0.004	0.001	mg/L	16-Jul-09	APHA 5530D
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Client Sample ID: FB

Taiga Sample ID: 014

- DATA QUALIFIERS -

Data Qualifier Descriptions:

- 74 *Unable to repeat analysis at higher dilution. Holding time exceeded.*
- 86 *Too numerous to count.*

*** Taiga analytical methods are based on the following standard analytical methods**

SM - Standard Methods for the Examination of Water and Wastewater

EPA - United States Environmental Protection Agency