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Leonard DeBastien Executive Director Gwich'in Land and Water Board Box 2018 Inuvik NT XOE 0T0 Philippe Thibert-Leduc Water Resources Officer Environment and Natural Resources PO Box 2749 Inuvik NT XOE 0T0

Project # 60587295

Dear Sirs:

Subject: Town of Inuvik – Water Licence No. G17L3-001 Year End Summary Report, 2018

On behalf of Inuvik, we are pleased to provide the Annual Report for 2018.

WATER DEMANDS, STATION 0036-1

The total volume of water used from the East Channel is listed in Table G17L3-001-1 attached. Water use remained well within the Licence limit throughout the year. It was also at ordinary levels relative to recent times: about 8% more than consumption in 2017, possibly due to changes arising from the new water treatment plant (such as the addition of membranes in 2018). Water Licence G17L3-001 dictated the maximum volume of water that can be withdrawn from the East Channel is 1,000,000 m³ per year. The total water demand in 2018 is approximately 54% of the maximum withdraw volume.

WASTEWATER VOLUMES

Annually, about 97 percent of the wastewater reaching Inuvik's lagoon is distributed and re-collected by the Town's above ground utilidor system. About three percent is distributed from Inuvik's truck fill point and is then re-collected by wastewater trucks.

There is no extraneous inflow, and rarely much loss to leakage. Inuvik will accept in its lagoon wastewater from a source other than the Town's water supply on a fee for service basis, but volumes being received are negligible. There are a few water uses that do not contribute to sewage (such as firefighting, and, in summer, gardening and vehicle washing) but these are so small a portion of total water use that they too can be neglected. For practical purposes, inflow into the lagoon is essentially equal to the Town's metered production of water, reported in Table G17L3-001-1.

It is Inuvik's practice to obtain assurance from waste hauling contractors and waste generators that discharges to the lagoon from trucks will be restricted to wastewater of domestic origin and character, not contaminated by solvents, petroleum products, glycol, drilling fluids, or any other industrial waste of any sort in concentrations exceeding what would ordinarily be expected from domestic activities such as washing of clothes and hands. Inuvik did not accept wastewater from sources outside the Town's boundaries during the year.



SEWAGE EFFLUENT QUANTITIES

Inuvik's lagoon is normally operated at a constant level, with a dyke freeboard of 1.0 m or slightly more. Therefore, in normal operation, monthly quantities of effluent are about equal to monthly water use. Lagoon level was normal and constant throughout 2018.

SOLID WASTE DISPOSAL FACILITY OPERATIONS AND MAINTENANCE

In 2018 Inuvik's solid waste disposal facility was operated routinely. Based on rates from the Municipal Solid Waste Facility O&M Manual, Appendix A, the estimated municipal solid waste generated in 2018 was approximately 5,860 tonnes of Municipal Solid Waste, which used approximately 19,540 m³ of space at the Municipal Solid Waste Facility. Detailed estimates are presented in Table G17L3-001-2, attached.

No other projects were undertaken, beyond routine covering and compaction of completed cells. Typically Inuvik will accept Municipal Solid Waste from outside sources, though the quantities tend to be very low (i.e., between 3 and 20 loads) and this was the case in 2018.

In 2018, no collection event for household hazardous waste was undertaken.

SEWAGE EFFLUENT QUALITY MONITORING, STATION G17L3-0036-3

Lagoon effluent is sampled monthly at Station 0036-3; the secondary cell outlet. Laboratory test results are listed in Table G17L3-001-3, attached. Generally, results are within typical ranges for the time of year. With the exception of oil and grease, for which routine testing was only recently implemented (at licence renewal), running averages of parameters measured in routine monthly samples, and pH measurements (which are not averaged), remained within licence limits during the year.

BOD₅ monitoring was changed to CBOD monitoring in the licence renewal; the limit for CBOD was set at 135 mg/L, compared to 150 mg/L for BOD₅. There were no concerns with either parameter during the year. It is relevant that the full effluent CBOD load in East Channel is not exerted at or close to Inuvik, in a concentrated way. Rather, it is distributed quite thinly far downstream, due to the slow BOD exertion rate in a northern river environment, especially at winter temperatures.

There were no concerns with Suspended Solids of Fecal Coliforms, as both parameters were within normal ranges and well below the licence limits.

The Town does not have a standard for ammonia, but is required to monitor for it. The ammonia levels all appeared to be within normal ranges.

The treatment performance seen in 2018 was typical for a primary-secondary lagoon system operating normally in a high-latitude setting. In summer a good standard of secondary treatment is achieved; in winter there is just primary treatment. To achieve a secondary-level effluent in winter Inuvik would need a mechanical plant or at minimum lagoon aeration, in either case involving major capital investment and significantly increased operating cost.

Prior to the licence renewal in July, there was no quantitative criterion for oil and grease, with testing for the parameter requiring initiation upon discovery of an oil sheen during the monthly sample collection. Testing for oil and grease was not completed in the third or fourth quarters of 2017, but did commence with the February 2018 sample. Note that sample data for July 2018 was collected however it was not tested for oil and grease criteria.

Ref: 60587295



Oil and grease sample results were all higher than the average criteria permitted by the licence. A review of sample collection methodology indicates that operators were collecting samples for oil and grease by skimming the surface. As oil and grease can accumulate at the surface of quiescent waters as a surface film or emulsion, it is the believed that the samples collected are not representative samples. The Town's operators are changing their sampling procedure for oil and grease (effective starting March 2019) to be consistent with the EPA's SESD Operating Procedure – Wastewater Sampling procedure. It is believed that the sampling results will be more consistent with the representative sampling intent for the parameter and that the sampling results will be within licence requirements.

SOLID WASTE DISPOSAL FACILITY RUN-OFF QUALITY MONITORING, STATIONS G06L3-001-4,-5 AND -9

Runoff from the Mt. Baldy solid waste disposal facility is sampled monthly during periods of flow. Station 0036-4 monitors flow westward; Station 0036-5 monitors near-shore water quality in a pond to the east; and SNP 0036-9 was added in the latest licence renewal to monitor potential impacts of the Solid Waste Disposal Facilities on surface water at Boot Creek. Sample results are shown in Tables G17L3-001-4, -5, and -9 respectively.

There are no known concerns arising from test results. As described in earlier reports, very little runoff leaves the facility, owing to topographic advantages.

The samples collected at these SNPs inadvertently were tested for BOD₅ instead of CBOD and oil & grease in instead of TPH in June. TPH was also missed in July.

PONDS AT LAGOON, STATIONS G17L3-001-6 AND -7; CONTROL STATION G17L3-001-8

Sampling of ponds adjacent to the lagoon is done once a year, in September; starting in 2007. The purpose is to monitor for possible evidence of leakage from the lagoon. Samples are tested for the same parameters as lagoon effluent.

"Gate Pond", Station 6, occupies a former small gravel quarry just outside the lagoon system's west dike, adjacent to the west sludge cell. "Far Pond", Station 7, is located just outside the lagoon system's west dike, opposite the middle-north part of the secondary cell, about 800 m northwest of Gate Pond and 250 m direct distance south of the outlet structure. Twin Lake is used as a background benchmark, and its Station 8 is located at the south end of north Twin Lake.

The 2018 sample results for these stations' traditional parameters are shown in Table G17L3-001-6, 7 & 8. They are in line with the patterns of preceding years. Complete data for the stations is presented in the results appendix. Current licence parameters have been reviewed with Exova and the Town's operations personnel.

SOLID WASTE FACILITY FENCING PLAN

The Solid Waste Fencing Plan requirement (Part D, Item 15) was added to the 2017 licence renewal. The Plan is to be submitted in 2019.



SURVEILLANCE NETWORK PROGRAM (SNP) LOCATIONS

A map of the SNP Locations is attached. Active SNP location data is presented in the following table.

SNP #	Description	Purpose	Coordinates
0036-1	Raw Water Intake at the Mackenzie River Water Supply Facilities	To monitor monthly and annual quantity of water withdrawn for municipal purposes.	68°21′10.36″N, 133°43′35.53″ W
0036-3	Decant Structure at Sewage Treatment Facilities	Site of Compliance. To monitor final effluent quality prior to discharge to the receiving environment and in case of an emergency decant.	68°22′20.58″N, 133°45′38.85″ W
0036-4	Run-off below the Solid Waste Disposal Facilities	To monitor potential impacts of the Solid Waste Disposal Facilities on Surface water.	68°21′7″N, 133°41′1.3″ W
0036-5	Run-off to two (2) tundra ponds southwest of Solid Waste Disposal Facilities	To monitor potential impacts of the Solid Waste Disposal Facilities on Surface water.	68°20′36.22″N, 133°40′32.41″ W
0036-6	"Gate Pond" – near SW corner of Sewage Treatment Facility	To monitor potential impacts of the Sewage Lagoon on Surface Water	68°21′51.45″N, 133°44′1.00″ W
0036-7	"Far Pond" – near the NW corner of Sewage Treatment Facility	To monitor potential impacts of the Sewage Lagoon on Surface Water	68°22′15.73″N, 133°45′41.60″ W
0036-8	Twin Lakes at Happy Valley	Control for Sewage Lagoon Sampling	68°21′239.14″N, 133°44′28.10″ W
0036-9	Boot Creek upstream of Boot Lake	To monitor potential impacts of the Solid Waste Disposal Facilities on Surface water.	68°21′13.35″N, 133°41′51.48″ W

SOLIDS REMOVED FROM SEWAGE TREATMENT FACILITY

Sludge that had accumulated in the lagoon's primary cells since their commissioning in 1980 was transferred to the adjacent sludge holding cells in July 1993. A survey done in the fall of 2006 found that that subsequent sludge accumulations were still well below levels requiring the next transfer by dredging. The apparently reduced accumulation rate (relative to 1981-1993) may be due to a lagoon conditioner that Inuvik has been adding to the primary cells since the mid 1990's.

In many years, small amounts of settled and floating solids need to be removed from around ends of pipes passing through primary cell dikes. This is done with a backhoe, the solids being deposited in the sludge holding cells. Routine solids removal as described was done again in 2018.

No sludge measurement was undertaken in 2018; however, Operators have noted that sludge levels in the primary cells have been increasing, and are expecting that sludge removal from the primary cells will be completed in summer 2019.

INSPECTION OF LAGOON EARTHEN CONTAINMENT STRUCTURES

The 2018 inspection of lagoon dikes (Water Licence Condition D8) report is attached in Appendix C. There are no immediate concerns arising from the 2018 lagoon dike inspection. Routine maintenance work was done on the lagoon's earthwork dikes, and all dikes appear to be at or very near to design shapes and levels. Continued longitudinal cracking does indicate that at some point in the future, a major restoration project will be required.



CONSTRUCTION, MODIFICATIONS AND MAJOR MAINTENANCE WORK

No modifications affecting existing processes or existing process facilities were undertaken in 2018. Naturally, routine maintenance work was done as needed.

UNAUTHORIZED DISCHARGES

There were no unauthorized discharges in 2018.

SPILL TRAINING AND COMMUNICATIONS EXERCISES

No additional training was completed. Spill kits and spill containment equipment was purchased in 2017 for implementation of actions identified in the Spill Containment Plan (2017), which was updated and submitted with the 2017 Water Licence renewal application.

ABANDONMENT, CLOSURE, AND RECLAMATION

No such projects were undertaken in 2018. The future of the Lake B – Hidden Lake water supply infrastructure needs to be confirmed, but is expected to be abandoned at a future date.

CURRENT WATER LICENCE RELATED PLANS

Documents currently on file with the Water Board are summarized in the list below.

- Spill Contingency Plan: Revised February 2017 (AECOM)
- O&M Manual for the Solid Waste Disposal Facility: Revised April 2018 (AECOM)
- O&M Manual for the Water Treatment Facility: September, 2018 (Nappaq Design and Construction)
- O&M Manual for the Sewage Treatment Facility: Revised March 2012 (AECOM)

CLOSURE

We trust that this submission fulfills the reporting requirements for the period referred to.

Sincerely, **AECOM Canada Ltd.**

Jordan Hoffart, P.Eng. Project Manager Jordan.hoffart@aecom.com

JH/lw Encl

cc: GLWB – AlecSandra MacDonald, Regulatory Officer Inuvik: Grant Hood, S.A.O.; Rick Campbell; Utilidor Shop Inuvik Public Works Committee





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The attached Report (the "Report") has been prepared by AECOM Canada Ltd. ("AECOM") for the benefit of the Client ("Client") in accordance with the agreement between AECOM and Client, including the scope of work detailed therein (the "Agreement").

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- may be based on information provided to AECOM which has not been independently verified;
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- must be read as a whole and sections thereof should not be read out of such context;
- was prepared for the specific purposes described in the Report and the Agreement; and
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Appendix A

Summary Tables and SNP Map



INUVIK SURVEILLANCE NETWORK PROGRAM

2018

WATER USE ("SNP")

Station 0036-1, Mackenzie River pumphouse.

Measure quantities daily. Report by month.

The total volumes of water used from SNP 0036-1 are listed below.

2018	East				
	Channel				
Month	m³				
January	44,482				
February	42,790				
March	47,342				
April	47,135				
Мау	40,315				
June	43,724				
July	47,386				
August	44,294				
September	44,977				
October	46,308				
November	44,104				
December	45,637				
Total	538,494				

Notes:

1. Water records for May 10, 18, 19, and 20 were not recorded due to maintenance and other causes.

2. Quantities are well within Licence limits. No known concerns.

Solid Waste Generation

The total estimated solid waste generated in 2018 is listed below.

Month	Solid Waste Generated	Solid Waste Deposited		
2018	tonnes	m ³		
January	498	1,659		
February	450	1,499		
March	498	1,659		
April	482	1,606		
May	498	1,659		
June	482	1,606		
July	498	1,659		
August	498	1,659		
September	482	1,606		
October	498	1,659		
November	482	1,606		
December	498	1,659		
Total	5,860	19,535		

Notes:

1. Latest population estimates based on data from GNWT Bureau of Statistics as of July 1, 2017.

2. Solid Waste Generation estimates based on generation rates outlined in 2017 Inuvik Municipal Solid Waste Facility O&M Manual.

INUVIK SURVEILLANCE NETWORK PROGRAM TREATED WASTEWATER EFFLUENT QUALITY

Station 0036-3, Sewage Discharge to Receiving Water.

SNP requirements. Sample monthly. Report parameters tabulated below.

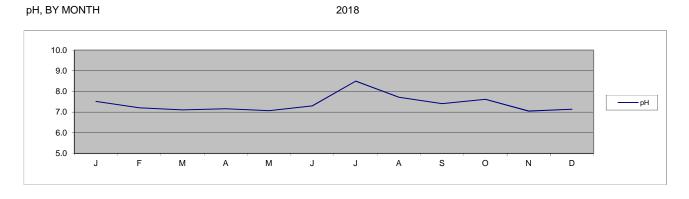
Reports previously due quarterly within thirty days, now only for the calendar year by March 31.

				S	AMPLE RES	ULTS				AMBI	ENT CON	DITIONS
Date			рН	BOD/ CBOD mg/L	SS mg/L	NH3-N mg/L	Un- ionized Ammonia mg/L	Fecal Coli CFU/dL	Oil and Grease mg/L	Temp ° C	Wind km/h	OC/ Prcp
2018	01	17	7.5	62	7	15	0.13	160,000	NR	-18	E 3	Cloudy
2018	02	14	7.2	82	12	18	0.08	220,000	09	-34	NW 3	Clear
2018	03	14	7.1	59	4	18	0.06	250,000	10	-13	ESE 8	Cloudy
2018	04	18	7.2	69	6	20	0.08	500,000	08	-20	N 8	Snow
2018	05	16	7.1	32	8	14	0.05	106,000	06	-2	E 5	Cloudy
2018	06	13	7.3	17	27	13	0.07	12,000	06	2	N 11	Clear
2018	07	NR	8.5	09	46	05	0.41	1,107	NR	11	SW 19	Clear
2018	08	15	7.7	08	22	03	0.04	4,000	59	3	S 16	Clear
2018	09	12	7.4	10	42	01	0.01	9,000	05	-4	E 13	Clear
2018	10	24	7.6	04	9	04	0.05	14,000	07	0	SE 16	Snow
2018 11 14		7.1	07	12	09	0.03	107,000	15	-23	NNE 13	Snow	
2018	12	12	7.1	47	13	11	0.04	300,000	53	-20	NNE 10	Snow

			RUN	NING AVE	RAGES OF	SAMPLE RI	ESULTS		
							Un-		
				BOD/			ionized		
ltem			pН	CBOD	SS	NH3-N	Ammonia	Fecal Coli	Oil and
Unit				mg/L	mg/L	mg/L	mg/L	CFU/dL	Grease
Limit, a	avg. 4	consec.	6-9	150	70	none	none	1,000,000	mg/L
2018	01	17	7.5	25	10	13.7	0.10	17,602	NR
2018	02	14	7.2	44	8	11.6	0.08	67,791	9.00
2018	03	14	7.1	58	8	15.2	0.23	151,586	9.50
2018	04	18	7.2	68	7	17.6	0.23	257,551	9.00
2018	05	16	7.1	61	8	17.5	0.21	232,359	8.25
2018	06	13	7.3	44	11	16.4	0.21	112,292	7.50
2018	07	NR	8.5	32	22	13.1	0.15	28,965	6.67
2018	08	15	7.7	17	26	8.9	0.14	8,662	23.67
2018	09	12	7.4	11	34	5.7	0.13	4,676	23.33
2018	10	24	7.6	8	30	3.5	0.13	4,860	23.67
2018	11	14	7.1	7	21	4.4	0.03	15,239	21.50
2018	12	12	7.1	17	19	6.4	0.03	44,846	20.00

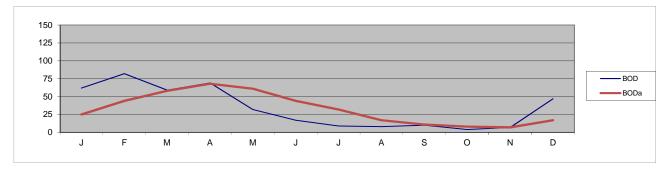
Notes:

- 1 In the table header above, "avg. 4 con" is shorthand for "average of four consecutive samples". There is no average requirement for pH, only an upper and lower limt. Values presented for pH are monthly sample results.
- 2 In the graphs below, the heavier line (coded with suffix "a" in the key) shows the average of four consecutive samples. The thinner line shows individual monthly readings.
- 3 NT is not tested in this sample. NR is not reported.
- 4 Requirements in the new licence took affect July 1, 2017. Average reported for Fecal Coliforms changed from geometric to arithmetic averages at that time. Averages for CBOD were calculated using BOD where CBOD values were unavailable.
- 5 Data for NH3-N and Facal Coli were not avilable in July, average sample results from the past four years of the same month were used.



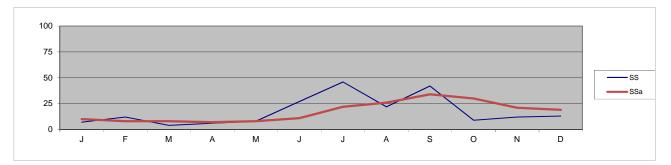


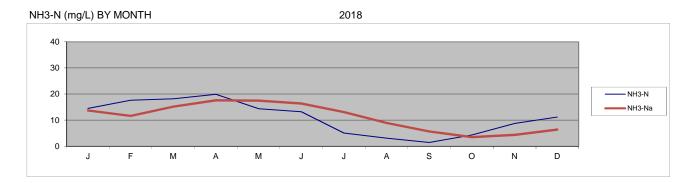




SUSPENDED SOLIDS (mg/L) BY MONTH





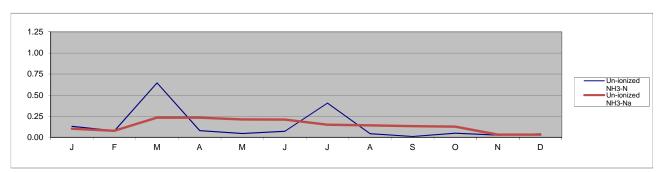


INUVIK SURVEILLANCE NETWORK PROGRAM 2018 TREATED WASTEWATER EFFLUENT QUALITY GRAPHS OF PARAMETERS MEASURED AT LAGOON OUTLET, STATION 0036-3

Un-ionized NH3-N (mg/L) BY MONTH

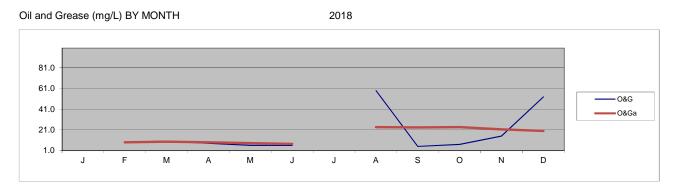
FECAL COLIFORMS (LOG10 CFU/100 mL) BY MONTH

2018





2018



Note: the chart for Fecal Colifirms, above, shows the Log(10) of the measured value.

Note: Data charted are monthly measured values and running averages. Averages are identified by the suffix "a".

INUVIK SURVEILLANCE NETWORK PROGRAM RUNOFF WESTWARD FROM SOLID WASTE SITE

2018

Station 0036-4 Sample monthly when there is flow. Report parameters tabulated below.

SAMPLE DATES	6 & OBS	ERVATIONS	Temp ° C	Wind km/h	Sky	Prcp	
April	ril 2018 Frozen - No Sample Taken						
May		2018		Frozen - No S	Frozen - No Sample Taken		
June	13	2018	2	N 11	Clear	-	
July	18	2018	11	SW 19	Clear	-	
August	15	2018	3	S 16	Partly Cloudy	-	
September	12	2018	-4	E 13	Partly Cloudy	-	
October	October 2018 Frozen - No Sample Taken						

SAMPLE ANALYSIS RESULTS										
ltem			Da	ite						
		Jun 13	Jul 18	Aug 15	Sep 12					
pН	NA	8.10	8.02	8.16	7.96					
Conductivity	uS/cm	2010	2180	2170	2340					
Sodium	mg/L	142.0	150.0	143.0	144.0					
Potassium	mg/L	35.3	33.7	30.1	25.7					
Magnesium	mg/L	107.0	108.0	103.0	123.0					
Calcium	mg/L	235	232	220	266					
Cadmium	mg/L	0.00022	< 0.00002	<0.00002	0.00002					
Chromium	mg/L	0.0020	0.0010	0.0010	<0.001					
Copper	mg/L	0.012	0.003	<0.002	0.002					
Iron	mg/L	5.900	0.77	1.6	1.0					
Lead	mg/L	0.0052	0.0002	0.0003	0.0002					
Mercury	mg/L	< 0.000005	<0.00005	0.00001	0.00001					
Nickel	mg/L	0.0268	0.0110	0.0078	0.0076					
Zinc	mg/L	0.057	0.013	0.005	0.008					
Sulphate	mg/L	599	621	675	845					
Phosphate	mg/L	0.11	0.12	0.08	0.06					
Phenols	mg/L	0.003	0.009	0.002	<0.001					
BOD5	mg/L	4	<4	<4	<4					
Oil & Grease	mg/L	5	NR	NR	NR					
Suspend. Solid	mg/L	83	32	12	6					
TPH	mg/L	NR	NR	<0.2	<0.2					

Notes:

1. "Phosphate" is reported as total P.

2. "NR" denotes Not Reported.

3. TPH value listed is summation of F1 and F2.

INUVIK SURVEILLANCE NETWORK PROGRAM RUNOFF EASTWARD FROM SOLID WASTE SITE

SAMPLE DATE	ES & OB	SERVATIONS	Temp	Wind	Sky	Prcp
			°C	km/h		
April		2018		Frozen - No S		
May		2018		Frozen - No S		
June	13	2018	2	N 11	Clear	-
July	18	2018	11	SW 19	Clear	-
August	15	2018	3	S 16	Partly Cloudy	-
September	12	2018	-4	E 13	Partly Cloudy	-
October		2018		Frozen - No S	Sample Taken	

Station 0036-5. Sample monthly when there is flow. Report parameters tabulated below.

		SAMPLE ANA	ALYSIS RESUL	тѕ		
ltem			Dat	e		
		Jun 13	Jul 18	Aug 15	Sep 12	
pН	NA	7.60	7.71	7.91	7.36	
Conductivity	uS/cm	291	349	350	375	
Sodium	mg/L	14.6	17.7	17.5	18.0	
Potassium	mg/L	3.9	2.6	1.9	2.3	
Magnesium	mg/L	11.8	14.8	14.6	14.8	
Calcium	mg/L	32.6	36.8	34.8	38.7	
Cadmium	mg/L	0.00001	<0.00001	<0.00001	<0.00001	
Chromium	mg/L	0.0006	<0.0005	<0.0005	0.00080	
Copper	mg/L	0.001	0.001	<0.001	0.002	
Iron	mg/L	1.10	0.59	0.55	2.54	
Lead	mg/L	0.0002	0.0001	0.0001	0.0007	
Mercury	mg/L	<0.000005	<0.000005	0.000012	0.000013	
Nickel	mg/L	0.0026	0.0022	0.0021	0.0030	
Zinc	mg/L	0.005	0.002	0.003	0.004	
Sulphate	mg/L	72.8	82.2	90.2	102.0	
Phosphate	mg/L	0.15	0.10	0.07	0.14	
Phenols	mg/L	0.003	0.006	<0.001	0.003	
BOD5 mg/L		<4	<4	<4	<4	
Oil & Grease mg/L		5	NR	NR	NR	
Suspend. Solid me		5	2	<2	23	
TPH	mg/L	NR	NR	<0.2	<0.2	

Notes:

1. "Phosphate" is reported as total P.

2. "NR" denotes Not Reported.

3. TPH value listed is summation of F1 and F2.

INUVIK SURVEILLANCE NETWORK PROGRAM MONITORING OF PONDS NEAR LAGOON

2018

Station 0036-6, "Gate Pond", W dike, SW, near gate. Station 0036-7, "Far Pond", W dike, mid-north. Station 0036-8, control, Twin Lakes at Happy Valley. 68° 21' 51.45" N; 133° 44' 1.00" W 68° 22' 15.73" N; 133° 45' 41.60" W 68° 21' 239.14" N; 133° 44' 28.10" W

SNP requirements. Sample annually. Report parameters tabulated below. Reports are due for the calendar year by March 31.

			SNP		SAN	IPLE RES	JLTS		AMB	IENT CO	ONDITIONS	
Da	Date		Date				DD ₅ SS NH3-N		Fecal Coli	Temp	Wind	Sky
#		#		mg/L	mg/L	mg/L	CFU/dL	°C	km/h			
2018	09	12	6	7.8	<4	1	8.9	1				
2018	09	12	7	8.3	<4	3	<0.025	1	-4	E 13	Partly Cloudy	
2018	09	12	8	8.1	<4	<2	0.5	<1				

Note:	Results from recent earlier years are included below for comparison.
-------	--

			0.15		SAN		JLTS		AMB	IENT CO	NDITIONS
D	ate		SNP #	рН	BOD ₅	SS	NH3-N	Fecal Coli	Temp	Wind	Sky
					mg/L	mg/L	mg/L	CFU/dL	°C	km/h	
2017 2017	09 09	13 13	6 7	7.8 8.0	<4 <4	19 <1	nd nd	2	11	SE 12	Clear
2017 2016	09 09	13 13	8 6	8.0 8.1	<4 <4	10 2	nd 14.1	<1 <1			
2016 2016	09 09	13 13	7 8	8.1 8.1	<4 <4	<1 2	<0.025 3.1	<1 2	0	E 18	Cloudy
2015 2015 2015	09 09 09	08 08 08	6 7 8	7.7 8.4 8.2	<4 <4 <4	3 <7 8	12.8 <0.025 1.6	2 <1 1	1	NW 4	Cloudy
2014 2014 2014	10 10 10	07 07 07	6 7 8	7.7 8.0 8.1	<4 <4 <4	4 4 47	12.4 <0.05 1.9	81 <1 1	-3	NW 30	Snow
2013 2013 2013	09 09 09	24 24 24	6 7 8	7.8 8.1 8.1	<4 <4 <4	<1 15 <2	14.4 <0.05 1.9	2 24 <1	0	NE 5	Cloudy
2012 2012 2012	09 09 09	18 18 18	6 7 8	8.1 8.3 8.2	<4 <4 <4	3 <1 <2	10.4 <0.05 3.4	4 1 2	7	S 10	Clear
2011 2011 2011	09 09 09	19 19 19	6 7 8	8.0 8.3 8.1	<4 <4 <4	<2 <2 6	13.6 <0.05 1.6	<1 <1 <1	0	NE 15	Cloudy
2010 2010 2010	09 09 09	21 21 21	6 7 8	7.8 8.1 8.1	<4 <4 <4	<1 <1 50	14.3 <0.05 2.6	1 <1 <1	1	NW 15	Cloudy
2009 2009 2009	09 09 09	28 28 28	6 7 8	7.1 8.2 7.8	<4 5 <4	3 6 6	11.2 <0.05 2.8	<1 <1 <1	-3	NW 4	Snow
2008 2008 2008	09 09 09	15 15 15	6 7 8	7.7 8.6 8.3	<4 <4 <4	5 3 6	10.0 <0.05 1.3	1 <1 <1	-3	E 12	Clear
2007 2007 2007	11 11 11	14 14 14	6 7 8	7.2 7.3 7.4	<4 14 5	13 303 6	8.9 0.3 4.3	<1 1 <1	-12	SE 07	Snow

INUVIK SURVEILLANCE NETWORK PROGRAM BOOT CREEK UPSTREAM OF BOOT LAKE

2018

Station 0036-9. Sample monthly when there is flow. Report parameters tabulated below - effective for new licence.

SAMPLE DATES & OBSERVATIONS			Temp ° C	Wind km/h	Sky	Prcp		
April	April 2018			Frozen - No S	Sample Taken			
May		2018		Frozen - No S	Frozen - No Sample Taken			
June	13	2018	2	N 11	Clear	-		
July	18	2018	11	SW 19	Clear	-		
August	15	2018	3	S 16	Partly Cloudy	-		
September	12	2018	-4	E 13	E 13 Partly Cloudy			
October		2018		Frozen - No S				

SAMPLE ANALYSIS RESULTS										
Item		Date								
		Jun 13	Jul 18	Aug 15	Sep 12					
pН	NA	7.43	7.61	7.52	7.13					
Conductivity	uS/cm	262	434	317	357					
Sodium	mg/L	11.2	16.6	10.4	11.4					
Potassium	mg/L	1.9	1.6	1.1	1.2					
Magnesium	mg/L	13.0	17.2	13.2	15.4					
Calcium	mg/L	31.8	45.0	31.4	36.6					
Cadmium	mg/L	0.00002	0.00001	0.00002	0.00003					
Chromium	mg/L	< 0.0005	<0.0005	<0.0005	< 0.0005					
Copper	mg/L	0.002	0.002	0.002	0.002					
Iron	mg/L	0.75	0.52	0.97	0.76					
Lead	mg/L	<0.0001	<0.0001	0.0001	<0.0001					
Mercury	mg/L	0.000011	<0.00005	0.00008	0.000012					
Nickel	mg/L	0.0092	0.0074	0.0101	0.0116					
Zinc	mg/L	0.012	0.008	0.011	0.015					
Sulphate	mg/L	109	164	118	134					
Phosphate	mg/L	0.05	<0.05	<0.05	<0.05					
Phenols	mg/L	0.002	0.003	0.003	<0.001					
BOD5	mg/L	<4	<4	<4	<4					
Oil & Grease	mg/L	<5	NR	NR	NR					
Suspend. Solid	mg/L	3	4	3	5					
TPH	mg/L	NR	NR	<0.2	<0.2					

Notes:

1. "Phosphate" is reported as total P.

2. "NR" denotes Not Reported.

3. TPH value listed is summation of F1 and F2.



Appendix **B**

SNP Station Sampling Data

	Testing	Billing Informat	tion:		Copy of	Report To:										RUSH	Priority
Exova	Advising	Company	Town of Inuv	ik	Company	Aeco	om	- Ed	mon	ton						Upon filling out this se	ection, client accepts that
www.exova.com	Assuring	Address Box 1160 2 Firth Street		Address	17203-103rd Avenue						surcharges will be	applied to the analysis					
Project Information	on	Inuvik, NT X0E 0T0			Edmo	ontor	n, AB	T5S	1J4						Date Required		
Project ID	Yearly Samples	Attention	Rick Campbe	ell	Attention	Rich	ard	Feil	lden							As Indicated	All Analysis
Project Name		Phone	(867) 777-86	15	Phone	(780) 48	38-6	800							When "ASAP" is red	uested, turn around will
Project Location	Inuvik	Cell	(867) 678-53	88	Cell												H priority, with pricing and
Legal Location		Fax	(867) 777-86	01	Fax	(780) 48	38-2	121								ch. Please contact the lab ng RUSH samples
PO/AFE#	100104	E-mail	rcampbell	@town.inuvik.nt.ca	E-mail	richa	ard.	feild	en@)aec	om.c	om				phor to submitte	ng ROSH samples
Proj. Acct.Code		Agreement ID	2909		16											Signature	
		Copy of Report			Copy of i	nvoice										Sample Custo	dy (please print)
Report Results	X E-Mail	Online	PDF		QA/QC R	leport										Sampled by: Davis	o Kendi
	Mail X	Fax	Excel		1											Company Tow	vn of Inuvik
Special Instruction from above).	s/Comments (please ir	nclude contact info	ormation inclue	ding ph. # if different	Indicate Re Requiremen		ers										proceed with the work on this form:
Sampler: note we	ather:				requirement		Containers									Date: Aug 15/18	~
							ပိ		-		_		-	-		The second se	or Lab use only
					8		er of									Date/Time stamp:	
Temp <u>3</u> C,	precip, Win	nd dir <u>5</u> v	el <u>16</u>	_km/h		I	Number	THM									
Sample	Identification	Location	Free	Date/Time sample	d Total Res	Sampling method	↓									Indicate below any d condition of samples	
1 Truck Fill	a de la completa de l	1 Navy rd	0,23	Aug 15/18 9:	SOAMO.37	Grab	2	X							T		Were Exova supplies
2				<u> </u>													used?
3																	Was there any damage
4																	to the shipping container?
5																	
6																	Were the containers packaged well?
7																	packaged weil?
8																	
9											_		_	_	_		Were the expected number of samples
10													_				received (document
11											_						below)?
12					6						_						
13			-		- All						_		\perp		_		Are samples within recommended holding
14					No.						_		_		_		times/temp?
15						2000											
	Environmental				1 04: 40	00074	~~	<u> </u>						ping:		# and size of coolers rec	elved:
Card and a state of the local division of th	er completion of this fo	in cost of the second	The rest of the local division of the local	CONTRACTOR DESCRIPTION OF THE OWNER OWNER OF THE OWNER	Lot: 12							_		Y/N			R
Ple	ase indicate any l	potentially ha	zordous sa	imples										er ter			OURTEU
		Control #	#										2.	2		Waybill:	
Page 1	of 1	- ASSANDER NEW YORK														Received by:	UNBZ

Exova	T: +1 (403) 291-2022
Bay #5, 2712-37 Avenue N.E.	F: +1 (403) 291-2021
Calgary, Alberta	E: Calgary@exova.com
Canada, T1Y-5L3	W: www.exova.com

Confirmation of Service Request



Lot ID: 1292071

Number of Samples: 1

Printed Date: Aug 17, 2018

Please verify the following service request. If you have corrections or questions, please contact Client Services. No response to this confirmation of analysis will signify all services listed below are accurate.

Report To:		Invoice To:		Bill Paid by:
Attn: Richard Feilden		Attn: Rick Campbell		Attn: Accounts Payable
AECOM - Edmonton		Town of Inuvik		Town of Inuvik
17203 - 103 Avenue		Box 1160		Box 1160
Edmonton, AB T5S 1J4		2 Firth Street		2 Firth Street
Phone: (780) 488-6800		Inuvik, NT X0E 0T0		Inuvik, NT X0E 0T0
Fax: (780) 488-2121		Phone: (867) 777-8615		Phone: (867) 777-2607
		Fax: (867) 777-8601		Fax: (867) 777-2071
Agreement Id	992		Control Id	
Project Id	Yearly Samples		Report Due Date	Aug 24, 2018
Project Name			Received Date	Aug 16, 2018
Project Location	Inuvik		Sampled By	David Kendi
Legal Location			Sampling Company	Town of Inuvik
PO#	100104		Est. Disposal Date	Sep 23, 2018
Proj. Acct. Code			-	

Service Information

Sample Id	1 6225831	Service DISP	Service Name A Environmental Disposal Fee
Date Sampled Priority	Aug 15, 2018 9:50 Normal	THM	THMs in water
Sample Description	Truck Fill		
Site I.D. Temp: Received	1 Navy Rd 3.2°C		

Service	Count	
Service Name	Service Code	Quantity
Environmental Disposal Fee	DISP	1
THMs in water	THM	1

Notes

If required for invoice approval, please sign and return to the address indicated at the top of the page.

(Signature)



Confirmation of Service Request

Page 2 of 2

Lot ID: 1292071

Number of Samples: 1

Printed Date: Aug 17, 2018

Please verify the following service request. If you have corrections or questions, please contact Client Services. No response to this confirmation of analysis will signify all services listed below are accurate.

Report Delivery Plan

Contact	Company	Address						
Jason Casault	AECOM - Edmonton	101, 18817 Stony Plain Road						
		Edmonton, AB T5S 0C2						
		Phone: (780) 486-7050 Fax: (780) 486-7070						
		Email: Jason.Casault@aecom.com						
Delivery	<u>Format</u>	Deliverables						
Email - Merge Reports	PDF	COA / COC						
Email - Merge Reports	PDF	COC / Test Report						
Richard Feilden	AECOM - Edmonton	17203 - 103 Avenue						
		Edmonton, AB T5S 1J4						
		Phone: (780) 488-6800 Fax: (780) 488-2121						
		Email: richard.feilden@aecom.com						
Delivery	<u>Format</u>	Deliverables						
Email - Merge Reports	PDF	COC / Test Report						
Rick Campbell	Town of Inuvik	Box 1160, 2 Firth Street						
		Inuvik, NT X0E 0T0						
		Phone: (867) 777-8615 Fax: (867) 777-8601						
		Email: rcampbell@town.inuvik.nt.ca						
Delivery	Format	Deliverables						
Email - Merge Reports	PDF	COC / Test Report						

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 E: Calgary@exova.com

 T1Y-5L3, Canada
 W: www.exova.com

Report Transmission Cover Page



Bill To:	Town of Inuvik	Project ID:	Yearly Samples	Lot ID:	1292071
	Box 1160	Project Name:		Control Number:	
	2 Firth Street	Project Location:	Inuvik	Date Received:	Aug 16, 2018
	Inuvik, NT, Canada	LSD:		Date Reported:	Aug 23, 2018
	X0E 0T0	P.O.:	100104	Report Number:	2315077
Attn:	Rick Campbell	Proj. Acct. code:			
Sampled By:	David Kendi				
Company:	Town of Inuvik				

Contact	Company	Address						
Jason Casault	AECOM - Edmonton	101, 18817 Stony Plain Road						
		Edmonton, AB T5S 0C2						
		Phone: (780) 486-7050 Fax: (780) 486-7070						
		Email: Jason.Casault@aecom.com						
Delivery	Format	Deliverables						
Email - Merge Reports	PDF	COC / COA						
Email - Merge Reports	PDF	COC / Test Report						
Kim Wainman	Town of Inuvik	Box 1160, 2 Firth Street						
		Inuvik, NT X0E 0T0						
		Phone: (867) 777-8615 Fax: (867) 777-8601						
		Email: kwainman@town.inuvik.nt.ca						
Delivery	Format	Deliverables						
Email - Single Report	PDF	Invoice						
Richard Feilden	AECOM - Edmonton	17203 - 103 Avenue						
		Edmonton, AB T5S 1J4						
		Phone: (780) 488-6800 Fax: (780) 488-2121						
		Email: richard.feilden@aecom.com						
Delivery	Format	Deliverables						
Email - Merge Reports	PDF	COC / Test Report						
Rick Campbell	Town of Inuvik	Box 1160, 2 Firth Street						
		Inuvik, NT X0E 0T0						
		Phone: (867) 777-8615 Fax: (867) 777-8601						
		Email: rcampbell@town.inuvik.nt.ca						
Delivery	Format	Deliverables						
Email - Merge Reports	PDF	COC / Test Report						
Email - Single Report	PDF	Invoice						
Utilidor	Town of Inuvik	Box 1160, 2 Firth Street						
		Inuvik, NT X0E 0T0						
		Phone: (867) 777-2607 Fax: (867) 777-2071						
		Email: utilidor@town.inuvik.nt.ca						
Delivery	Format	Deliverables						
Email - Single Report	PDF	Invoice						

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Analytical Report



Bill To:	Town of Inuvik	Project ID:	Yearly Samples	Lot ID:	1292071
	Box 1160	Project Name:		Control Number:	
	2 Firth Street	Project Location:	Inuvik	Date Received:	Aug 16, 2018
	Inuvik, NT, Canada	LSD:		Date Reported:	Aug 23, 2018
	X0E 0T0	P.O.:	100104	Report Number:	2315077
Attn:	Rick Campbell	Proj. Acct. code:			
Sampled By:	David Kendi				
Company:	Town of Inuvik				

		Reference Number	1292071-1			
		Sample Date	Aug 15, 2018			
		Sample Time	09:50			
		Sample Location				
		Sample Description	1 Navy Rd / Truck Fill / 3.2°C			
		Matrix	Water			
Analyte		Units	Results	Results	Results	Nominal Detection Limit
Trihalomethanes Screen	- Water					
Chloroform		mg/L	0.089			0.001
Bromodichloromethane		mg/L	0.009			0.001
Dibromochloromethane		mg/L	<0.001			0.001
Bromoform		mg/L	<0.001			0.001
Total Trihalomethanes		mg/L	0.098			0.001
Trihalomethanes - Surrog	ate Recovery					
Dibromofluoromethane	EPA Surrogate	%	132			50-140
Toluene-d8	EPA Surrogate	%	100			50-140
Bromofluorobenzene	EPA Surrogate	%	93			50-140

the fatter

Mike Yohemas, BSc Laboratory Operations Manager

Approved by:

Data have been validated by Analytical Quality Control and Exova's Integrated Data Validation System (IDVS).
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Methodology	y and Notes						
Bill To:	Town of Inuvik Box 1160		Project ID: Project Name:	Yearly Samples	Lot ID: Control Number:	1292071	
	2 Firth Street	F	Project Location:	Inuvik	Date Received:	Aug 16, 2018	
	Inuvik, NT, Canada	L	_SD:		Date Reported:	Aug 23, 2018	
	X0E 0T0	F	P.O.:	100104	Report Number:	2315077	
Attn:	Rick Campbell	F	Proj. Acct. code:				
Sampled By:	David Kendi						
Company:	Town of Inuvik						
Method of A	nalysis						
Method Name		Reference	Met	hod	Date Analysis Started	Location	
THM - Water		US EPA	Pur	atile Organic Compounds by GCMS , ge and Trap for Aqueous Samples, 0B/5030B	/ Aug 17, 2018	Exova Calgary	
			* <i>R</i>	eference Method Modified			

Page 2 of 2

References

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US EPA

US Environmental Protection Agency Test Methods

Please direct any inquiries regarding this report to our Client Services Group or to the Operations Manager at the coordinates indicated at the top left of this page. Results relate only to samples as submitted.

The test report shall not be reproduced except in full, without the written approval of the laboratory.

	Testing	Billing Informat	tion:		Copy of	Report To:										RUSH	Priority
Exova	Advising	Company	Town of Inuv	ik	Company	Aeco	om	- Ed	mon	ton						Upon filling out this se	ection, client accepts that
www.exova.com	Assuring	Address	Box 1160 2 F	Firth Street	Address	1720	03-1	103r	d Av	enu	е					surcharges will be	applied to the analysis
Project Information	on		Inuvik, NT X	0E 0T0		Edmo	ontor	n, AB	T5S	1J4						Date Required	
Project ID	Yearly Samples	Attention	Rick Campbe	ell	Attention	Rich	ard	Feil	lden							As Indicated	All Analysis
Project Name		Phone	(867) 777-86	15	Phone	(780) 48	38-6	800							When "ASAP" is red	uested, turn around will
Project Location	Inuvik	Cell	(867) 678-53	88	Cell												H priority, with pricing and
Legal Location		Fax	(867) 777-86	01	Fax	(780) 48	38-2	121								ch. Please contact the lab ng RUSH samples
PO/AFE#	100104	E-mail	rcampbell	@town.inuvik.nt.ca	E-mail	richa	ard.	feild	en@)aec	om.c	om				phor to submitte	ng ROSH samples
Proj. Acct.Code		Agreement ID	2909		16											Signature	
		Copy of Report			Copy of i	nvoice										Sample Custo	dy (please print)
Report Results	X E-Mail	Online	PDF		QA/QC R	leport										Sampled by: Davis	o Kendi
	Mail X	Fax	Excel		1											Company Tow	vn of Inuvik
Special Instructions/Comments (please include contact information including ph. # if different from above).			Indicate Re Requiremen		ers									그는 그는 것이 아무지 않는 것이 아무지 않는 것을 많이 했다. 것을 모쳐 나왔다.	proceed with the work on this form:		
Sampler: note weather:				requirement		Containers									Date: Aug 15/18	~	
						ပိ		-		_		-	-		The second se	or Lab use only	
			8		er of									Date/Time stamp:			
Temp <u>3</u> C,	precip, Win	nd dir <u>5</u> v	el 16	_km/h		I	Number	THM									
Sample	Identification	Location	Free	Date/Time sample	d Total Res	Sampling method	↓									Indicate below any d condition of samples	
1 Truck Fill	a de la completa de l	1 Navy rd	0,23	Aug 15/18 9:	SOAMO.37	Grab	2	X							T		Were Exova supplies
2				<u> </u>													used?
3																	Was there any damage
4																	to the shipping container?
5																	
6																	Were the containers packaged well?
7																	packaged weil?
8																	
9											_		_	_	_		Were the expected number of samples
10													_				received (document
11											_						below)?
12					6						_						
13			-		- All						_		\perp		_		Are samples within recommended holding
14					No.						_		_		_		times/temp?
15						2000											
	Environmental				1 04: 40	00074	~~	<u> </u>						ping:		# and size of coolers rec	elved:
Card and a state of the local division of th	er completion of this fo	in cost of the second	The rest of the local division of the local	CONTRACTOR DESCRIPTION OF THE OWNER OWNER OF THE OWNER	Lot: 12							_		Y/N			R
Ple	ase indicate any j	potentially ha	zordous sa	imples										er ter			OURTEU
		Control #	#										2.	2		Waybill:	
Page 1	of 1	- ASSANDER NEW YORK														Received by:	UNBZ

Ĺ		Testing	Billing Information:	ion:		Copy of Report To:	sport To:						RUSH	RUSH Priority
Û	-	Advising		Town of Inuvik	ž	Company	Aecor	л - Е(Aecom - Edmonton	u			Upon filling out this se	Upon filling out this section, client accepts that surchardes will be applied to the analysis
Proj	www.exova.com Project Information	uc	Address	Box 1160 2 Firth Street Inuvik. NT X0E 0T0	-irth Street)E 0T0	Address	Edmon	5-103 ton. AE	T / ZU3-TU3rd Avenue Edmonton. AB T5S 1J4	nue 14			Date Required	
Proje	Project ID	Yearly Samples	Attention	Rick Campbell	I.	Attention	Richard Feilden	rd Fe	ilden				As Indicated	All Analysis
Proje	Project Name		Phone	(867) 777-8615	15	Phone	(780) 488-6800	488-6	3800				When "ASAP" is rec	When "ASAP" is requested, turn around will
Proje	c	Inuvik	Cell	(867) 678-5388	88	Cell							default to a 100% RUS	default to a 100% RUSH priority, with pricing and
Lega	ation		Fax	(867) 777-8601	01	Fax	(780) 488-2121	488-2	2121				turn around time to mai	turn around time to match. Please contact the lab
POI		100104	E-mail	rcampbell(rcampbell@town.inuvik.nt.ca	E-mail	richan	d.feilc	<u>len@a</u>	richard.feilden@aecom.com	com			
Proj.	Proj. Acct.Code		Agreement ID	2909									Signature	
			Copy of Report			Copy of invoice	oice						Sample Custo	Sample Custody (please print)
Rep	Report Results	;	Online	PDF		QA/QC Report	port						DAL NAL	HUATUM
Į		Mail	Fax	Excel		1		-					Company Tov	Town of Inuvik
Spec	Special Instructions from above).	Special Instructions/Comments (please include contact information including ph. # if different from above).	iclude contact info	ormation includ	ling ph. # if different	Indicate Regulatory Requirements below		ers					I authorize Exova to indicated	I authorize Exova to proceed with the work indicated on this form:
Sam	Sampler: note weather:	ather:				5	Т	ureiu					Dates Oct 24/18	Initial: Div
							0,-	01 10					This section f	or Lab
Temp	0	C, precip O , Wind dir	d dir SS Vel	16	km/h			LHW Anuper					001 25 AM 6:38	
	Sample I	Sample Identification	Location	Free res	Date/Time sampled	Total Res	Sampling method	-					Indicate below any deficiencies in the condition of samples:	eficiencies in the s:
-	Truck Fill		1 Navy rd	0.62	Of SULIS 9: 770	M A.78	Grab	×	E					Were Exova supplies
2)				-						-nsed?
e														Was there any damage
4														container?
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12				388										
13				-				_						Are samples within
4					-			_						times/temp?
15						_	-		_					
	Note: Drone	Environmental Sample Information Sheet	sample Inform	nation Shee	st Inc	Lot: 1307966 COC	17966	coc			S O	Shipping: COD Y/N	# and size of coolers received	ceived:
	Dioc	to indicate and a									<u>I</u> Ċ	Cooler temp.		· O U K
	Plea	Prease indicate any potentially nazordous samples	otentially naz	zordous sa	mpies) -		Delivery Method:	ver lov
Page	.	of 1	Control #									2.1	Received by:	
		l				and the second se								

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Canada, T1Y-5L3	W: www.exova.com

Confirmation of Service Request



Lot ID: 1307966

Number of Samples: 1

Printed Date: Oct 26, 2018

Please verify the following service request. If you have corrections or questions, please contact Client Services. No response to this confirmation of analysis will signify all services listed below are accurate.

Report To: Attn: Richard Feilden		Invoice To:		Bill Paid by:
AECOM - Edmonton		Attn: Rick Campbell Town of Inuvik		Attn: Accounts Payable Town of Inuvik
17203 - 103 Avenue		Box 1160		Box 1160
Edmonton, AB T5S 1J4		2 Firth Street		2 Firth Street
Phone: (780) 488-6800		Inuvik, NT X0E 0T0		Inuvik, NT X0E 0T0
Fax: (780) 488-2121		Phone: (867) 777-8615		Phone: (867) 777-2607
		Fax: (867) 777-8601		Fax: (867) 777-2071
Agreement Id	992		Control Id	
Project Id	Yearly Samples		Report Due Date	Nov 02, 2018
Project Name			Received Date	Oct 25, 2018
Project Location	Inuvik		Sampled By	Dale Hvatum
Legal Location			Sampling Company	Town of Inuvik
PO#	100104		Est. Disposal Date	Dec 02, 2018
Proj. Acct. Code				

Service Information

Sample Id	1 6329296	Service DISP	Service Name Environmental Disposal Fee
Date Sampled Priority	Oct 24, 2018 9:27 Normal	ТНМ	THMs in water
Sample Description	Truck Fill		
Site I.D. Temp: Received	1 Navy Rd. 11.2°C		

Service	e Count	
Service Name	Service Code	Quantity
Environmental Disposal Fee	DISP	1
THMs in water	ТНМ	1

Notes

If required for invoice approval, please sign and return to the address indicated at the top of the page.

(Signature)



Confirmation of Service Request

Page 2 of 2

Lot ID: 1307966

Number of Samples: 1

Printed Date: Oct 26, 2018

Please verify the following service request. If you have corrections or questions, please contact Client Services. No response to this confirmation of analysis will signify all services listed below are accurate.

Report Delivery Plan

Contact	Company	Address					
Jason Casault	AECOM - Edmonton	101, 18817 Stony Plain Road					
		Edmonton, AB T5S 0C2					
		Phone: (780) 486-7050 Fax: (780) 486-7070					
		Email: Jason.Casault@aecom.com					
Delivery	<u>Format</u>	Deliverables					
Email - Merge Reports	PDF	COA / COC					
Email - Merge Reports	PDF	COC / Test Report					
Richard Feilden	AECOM - Edmonton	17203 - 103 Avenue					
		Edmonton, AB T5S 1J4					
		Phone: (780) 488-6800 Fax: (780) 488-2121					
		Email: richard.feilden@aecom.com					
Delivery	<u>Format</u>	Deliverables					
Email - Merge Reports	PDF	COC / Test Report					
Rick Campbell	Town of Inuvik	Box 1160, 2 Firth Street					
		Inuvik, NT X0E 0T0					
		Phone: (867) 777-8615 Fax: (867) 777-8601					
		Email: rcampbell@town.inuvik.nt.ca					
Delivery	Format	Deliverables					
Email - Merge Reports	PDF	COC / Test Report					

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Report Transmission Cover Page



Bill To:	Town of Inuvik	Project ID:	Yearly Samples	Lot ID:	1307966
	Box 1160	Project Name:		Control Number:	
	2 Firth Street	Project Location:	Inuvik	Date Received:	Oct 25, 2018
	Inuvik, NT, Canada	LSD:		Date Reported:	Nov 1, 2018
	X0E 0T0	P.O.:	100104	Report Number:	2337634
Attn:	Rick Campbell	Proj. Acct. code:			
Sampled By:	Dale Hvatum				
Company:	Town of Inuvik				

Contact	Company	Address
Jason Casault	AECOM - Edmonton	101, 18817 Stony Plain Road
		Edmonton, AB T5S 0C2
		Phone: (780) 486-7050 Fax: (780) 486-7070
		Email: Jason.Casault@aecom.com
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Email - Merge Reports	PDF	COC / Test Report
Kim Wainman	Town of Inuvik	Box 1160, 2 Firth Street
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		Phone: (867) 777-8615 Fax: (867) 777-8601
		Email: kwainman@town.inuvik.nt.ca
Delivery	<u>Format</u>	Deliverables
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Richard Feilden	AECOM - Edmonton	17203 - 103 Avenue
		Edmonton, AB T5S 1J4
		Phone: (780) 488-6800 Fax: (780) 488-2121
		Email: richard.feilden@aecom.com
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Rick Campbell	Town of Inuvik	Box 1160, 2 Firth Street
		Inuvik, NT X0E 0T0
		Phone: (867) 777-8615 Fax: (867) 777-8601
		Email: rcampbell@town.inuvik.nt.ca
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Utilidor	Town of Inuvik	Box 1160, 2 Firth Street
		Inuvik, NT X0E 0T0
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Delivery	Format	Deliverables
Email - Single Report	PDF	Invoice

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Analytical Report



Bill To:	Town of Inuvik	Project ID:	Yearly Samples	Lot ID:	1307966
	Box 1160	Project Name:		Control Number:	
	2 Firth Street	Project Location:	Inuvik	Date Received:	Oct 25, 2018
	Inuvik, NT, Canada	LSD:		Date Reported:	Nov 1, 2018
	X0E 0T0	P.O.:	100104	Report Number:	2337634
Attn:	Rick Campbell	Proj. Acct. code:			
Sampled By:	Dale Hvatum				
Company:	Town of Inuvik				

		Reference Number Sample Date Sample Time Sample Location	1307966-1 Oct 24, 2018 09:27			
		Sample Description	1 Navy Rd. / Truck Fill / 11.2°C			
		Matrix	Water			
Analyte		Units	Results	Results	Results	Nominal Detection Limit
Trihalomethanes Screen	- Water					
Chloroform		mg/L	0.052			0.001
Bromodichloromethane		mg/L	0.007			0.001
Dibromochloromethane		mg/L	<0.001			0.001
Bromoform		mg/L	<0.001			0.001
Total Trihalomethanes		mg/L	0.059			0.001
Trihalomethanes - Surrog	jate Recovery					
Dibromofluoromethane	EPA Surrogate	%	100			50-140
Toluene-d8	EPA Surrogate	%	89			50-140
Bromofluorobenzene	EPA Surrogate	%	107			50-140

the fatter

Mike Yohemas, BSc Laboratory Operations Manager

Approved by:

Bay #5, 2712-37 Aven Calgary, Alberta T1Y-5L3, Canada	ue N.E. F: +1 (403) 291-202 E: Calgary@exova W: www.exova.com	.com				Exova	
Methodology	y and Notes						
Bill To:	Town of Inuvik	Project		Yearly Samples		1307966	
	Box 1160	•	Name:	(Control Number:		
	2 Firth Street	Project	Location:	Inuvik	Date Received:	Oct 25, 2018	
	Inuvik, NT, Canada	LSD:			Date Reported:	Nov 1, 2018	
	X0E 0T0	P.O.:		100104	Report Number:	2337634	
Attn:	Rick Campbell	Proj. A	cct. code:				
Sampled By:	Dale Hvatum						
Company:	Town of Inuvik						
Method of A	nalysis						
Method Name		Reference	Met	hod	Date Analysis Started	Location	
THM - Water		US EPA	Purç	tile Organic Compounds by GCMS / ge and Trap for Aqueous Samples, 0B/5030B	Oct 25, 2018	Exova Calgary	

Page 2 of 2

11.1.1

* Reference Method Modified

References

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.....

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US EPA

US Environmental Protection Agency Test Methods

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Ĺ		Testing	Billing Information:	ion:		Copy of Report To:	sport To:						RUSI	RUSH Priority
Û	-	Advising		Town of Inuvik	× :	Company	Aecol	<u>п</u> -п	Aecom - Edmonton	по			Upon filling out this surcharges will be	Upon filling out this section, client accepts that surcharces will be annied to the analysis
Proj	www.exova.com Project Information	uc	Address	Box 1160 2 Firth Street Inuvik. NT X0E 0T0	-irth Street)E 0T0	Address	Edmon	5-103 ton. Al	T / ZU3-TU3rd Avenue Edmonton. AB T5S 1J4	snue J4			Date Required	
Proje	Project ID	Yearly Samples	Attention	Rick Campbell	31	Attention	Richard Feilden	rd Fe	ilden				As Indicated	All Analysis
Proje	Project Name		Phone	(867) 777-8615	15	Phone	(780) 488-6800	488-(3800				When "ASAP" is re	When "ASAP" is requested, turn around will
Proje	c	Inuvik	Cell	(867) 678-5388	88	Cell							default to a 100% RU	default to a 100% RUSH priority, with pricing and
Lega	ation		Fax	(867) 777-8601	01	Fax	(780) 488-2121	488-	2121				turn around time to mi	turn around time to match. Please contact the lab prior to submitting RUSH samples
POI		100104	E-mail	rcampbell(rcampbell@town.inuvik.nt.ca	E-mail	richar	d.feil	richard.feilden@aecom.com	aecom	.com			
Proj.	Proj. Acct.Code		Agreement ID	2909									Signature	
			Copy of Report			Copy of invoice	oice						Sample Cust	Sample Custody (please print)
Rep	Report Results	j,	Online	PDF		QA/QC Report	port						ov DAL	HUATUM
ļ		Mail	гах	Excel									Company To	Town of Inuvik
Spec	Special Instructions from above).	Special Instructions/Comments (please include contact information including ph. # if different from above).	iclude contact info	irmation includ	ling ph. # if different	Indicate Regulatory Requirements below		ers					I authorize Exova indicate	I authorize Exova to proceed with the work indicated on this form:
Sam	Sampler: note weather:	ather:					Т	nisır					Dates Ort 24/18	Initial: Due
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	Sample	Sample Identification	Location	Free res	Date/Time sampled	Total Res	Sampling method	\rightarrow				÷.,	Indicate below any deficiencies in the condition of samples:	deficiencies in the ss:
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Page	.	of 1	Control #									1.2	Received by	
5						T					1	2	1 I for maximum	

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Bill To:	Town of Inuvik	Project ID:	SNP 0036-3	Lot ID:	1307942
	Box 1160	Project Name:		Control Number:	
	2 Firth Street	Project Location:	Inuvik	Date Received:	Oct 25, 2018
	Inuvik, NT, Canada	LSD:		Date Reported:	Nov 1, 2018
	X0E 0T0	P.O.:	100104	Report Number:	2337603
Attn:	Rick Campbell	Proj. Acct. code:			
Sampled By:	Matt O'Rourke				
Company:	Town of Inuvik				

Contact	Company	Address
Jason Casault	AECOM - Edmonton	101, 18817 Stony Plain Road
		Edmonton, AB T5S 0C2
		Phone: (780) 486-7050 Fax: (780) 486-7070
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		Email: kwainman@town.inuvik.nt.ca
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Rick Campbell	Town of Inuvik	Box 1160, 2 Firth Street
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Notes To Clients:

• Oct 31, 2018 - Sample 1307942-1; 6329108: Sample formed an emulsion during oil and grease extraction. Centrifugation was required in order to complete analysis.

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Analytical Report



Bill To:	Town of Inuvik Box 1160	Project ID: Project Name:	SNP 0036-3	Lot ID: Control Number:	1307942
	2 Firth Street	Project Location:	Inuvik	Date Received:	Oct 25, 2018
	Inuvik, NT, Canada	LSD:		Date Reported:	Nov 1, 2018
	X0E 0T0	P.O.:	100104	Report Number:	2337603
Attn:	Rick Campbell	Proj. Acct. code:			
Sampled By:	Matt O'Rourke				
Company:	Town of Inuvik				

		Reference Number Sample Date Sample Time Sample Location Sample Description	Oct 24, 2018 09:15			
		Matrix	Water			
Analyte		Units	Results	Results	Results	Nominal Detection Limit
Aggregate Organic Const	ituents					
Biochemical Oxygen Demand	Inhibited	mg/L	<4			4
Oil and Grease	Total	mg/L	7			5
pH adjustment	adjustment required		No			
Inorganic Nonmetallic Par	ameters					
Ammonia - N		mg/L	4.35			0.025
Un-ionized Ammonia-N	15 °C	mg/L	0.0494			
Ammonium/Ammonia Preservation Microbiological Analysis			Yes			
Fecal Coliforms	Membrane Filtration	CFU/100 mL	14000			1
Physical and Aggregate P		01 0/100 IIIE	14000			I
Solids	Total Suspended	mg/L	9			2
Routine Water	rotar Odopondou	111g/ E	0			-
pH	15 °C	pH	7.62			
Temperature of observed pH		°C	15			
рН			7.95			
Temperature of observed pH		°C	20.7			

Anthony Neuman

Approved by:

Anthony Neumann, MSc Laboratory Operations Manager

Data have been validated by Analytical Quality Control and Exova's Integrated Data Validation System (IDVS).
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Method of Analysis

Methodology and Notes



Bill To:	Town of Inuvik	Project ID:	SNP 0036-3	Lot ID:	1307942
	Box 1160	Project Name:		Control Number:	
	2 Firth Street	Project Location:	Inuvik	Date Received:	Oct 25, 2018
	Inuvik, NT, Canada	LSD:		Date Reported:	Nov 1, 2018
	X0E 0T0	P.O.:	100104	Report Number:	2337603
Attn:	Rick Campbell	Proj. Acct. code:			
Sampled By:	Matt O'Rourke				
Company:	Town of Inuvik				

Method Name Reference Method Date Analysis Location Started Alkalinity, pH, and EC in water APHA * pH - Electrometric Method, 4500-H+ B Oct 29, 2018 Exova Edmonton Ammonium-N in Water APHA * Automated Phenate Method, 4500-NH3 G Oct 31, 2018 Exova Edmonton APHA * 5 Day, 5210 B BOD (Carbonaceous) in water Oct 25, 2018 Exova Edmonton Coliforms - Membrane Filtration APHA Fecal Coliform Membrane Filter Oct 25, 2018 Exova Calgary Procedure, 9222 D Oil and Grease in water US EPA * n-Hexane Extractable Material and Silica Oct 31, 2018 Exova Edmonton Gel Treated n-Hexane Extractable Material by Extraction and Gravimetry, 1664 pH at 15°C APHA pH - Electrometric Method, 4500-H+ B Oct 26, 2018 Exova Edmonton Solids Suspended (Total, Fixed and Total Suspended Solids Dried at 103-APHA Oct 25, 2018 Exova Edmonton Volatile) 105'C, 2540 D * Reference Method Modified

References

APHA	Standard Methods for the Examination of Water and Wastewater
US EPA	US Environmental Protection Agency Test Methods

Comments:

• Oct 31, 2018 - Sample 1307942-1; 6329108: Sample formed an emulsion during oil and grease extraction. Centrifugation was required in order to complete analysis.

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Project Information	Address	Inuvik, NT X		Addless	Edmo					C					Date Required	
Project ID SNP 0036- 3	Attention	Rick Campb		Attention	Rich										As Indicated	All Analysis
Project Name	Phone	(867) 777-86		Phone	(780											
Project Location Inuvik	Cell	(867) 678-53		Cell	(700	, 40	0 00	000								quested, turn around will SH priority, with pricing and
Legal Location	Fax	(867) 777-86		Fax	(780) 48	8-2	121								tch. Please contact the lab
PO/AFE# 100104	E-mail	· /	@town.inuvik.nt.ca		richa	'			Jaec	om	com	i i			prior to submit	ting RUSH samples
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Special Instructions/Comments (please in	nclude contact info	rmation inclu	ding ph. # if different	Indicate Reg	gulatory	s									I authorize Exova t	o proceed with the work
from above).				Requirement		Containers			s						indicated	on this form:
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Sample Identification	Location	Depth in cm m	Date/Time sample	d Matrix	Sampling method	Ţ									Indicate below any condition of sample	
1 SNP0036-3	Sewage Lagoon		10194/18 915A		Dip	5	х	x	x x	x	x	Ι				Were Exova supplies used?
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13						\square	\vdash	-+			+-					Are samples within recommended holding
14 15																times/temp?
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Environmental S		and the second state of the second state											pping D Y/I		Fand Size Of COURTS TE	Sourveu.
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Page 1 of 1	Control #													2	Waybill:	7
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Bill To:	Town of Inuvik	Project ID:	SNP 00363	Lot ID:	1313570
	Box 1160	Project Name:		Control Number:	
	2 Firth Street	Project Location:	Inuvik	Date Received:	Nov 15, 2018
	Inuvik, NT, Canada	LSD:		Date Reported:	Nov 21, 2018
	X0E 0T0	P.O.:	100104	Report Number:	2348568
Attn:	Rick Campbell	Proj. Acct. code:			
Sampled By:	Dale Huatum				
Company:	Town of Inuvik				

Contact	Company	Address
Jason Casault	AECOM - Edmonton	101, 18817 Stony Plain Road
		Edmonton, AB T5S 0C2
		Phone: (780) 486-7050 Fax: (780) 486-7070
		Email: Jason.Casault@aecom.com
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		Inuvik, NT X0E 0T0
		Phone: (867) 777-8615 Fax: (867) 777-8601
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Richard Feilden	AECOM - Edmonton	17203 - 103 Avenue
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Rick Campbell	Town of Inuvik	Box 1160, 2 Firth Street
		Inuvik, NT X0E 0T0
		Phone: (867) 777-8615 Fax: (867) 777-8601
		Email: rcampbell@town.inuvik.nt.ca
Delivery	<u>Format</u>	<u>Deliverables</u>
Email - Merge Reports	PDF	COC / Test Report
Email - Single Report	PDF	Invoice
Utilidor	Town of Inuvik	Box 1160, 2 Firth Street
		Inuvik, NT X0E 0T0
		Phone: (867) 777-2607 Fax: (867) 777-2071
		Email: utilidor@town.inuvik.nt.ca
Delivery	<u>Format</u>	Deliverables
Email - Single Report	PDF	Invoice

Notes To Clients:

• Nov 15, 2018 - Sample 1313570-1; 6373913: Sample formed an emulsion during oil and grease extraction. Centrifugation was required in order to complete analysis.

T: +1 (780) 438-5522 F: +1 (780) 434-8586 E: Edmonton@exova.com W: www.exova.com

Analytical Report



Bill To:	Town of Inuvik Box 1160	Project ID: Project Name:	SNP 00363	Lot ID: Control Number:	1313570
	2 Firth Street	Project Location:	Inuvik	Date Received:	Nov 15, 2018
	Inuvik, NT, Canada	LSD:		Date Reported:	Nov 21, 2018
	X0E 0T0	P.O.:	100104	Report Number:	2348568
Attn:	Rick Campbell	Proj. Acct. code:			
Sampled By:	Dale Huatum				
Company:	Town of Inuvik				

		Reference Number Sample Date Sample Time Sample Location	1313570-1 Nov 14, 2018 NA			
		Sample Description	Sewage Lagoon / SNP0036-3 / 7.5°C			
		Matrix	Water			
Analyte		Units	Results	Results	Results	Nominal Detection Limit
Aggregate Organic Consti	tuents					
Biochemical Oxygen Demand	Inhibited	mg/L	7			4
Oil and Grease	Total	mg/L	15			5
pH adjustment	adjustment required		No			
Inorganic Nonmetallic Par	ameters					
Ammonia - N		mg/L	8.72			0.025
Un-ionized Ammonia-N	15 °C	mg/L	0.0269			
Ammonium/Ammonia Preservation			Yes			
Microbiological Analysis						
Fecal Coliforms	Membrane Filtration	CFU/100 mL	107000			1
Physical and Aggregate P	roperties					
Solids	Total Suspended	mg/L	12			2
Routine Water						
рН	15 °C	рН	7.05			
Temperature of observed pH		°C	15			
рН			7.64			
Temperature of observed pH		°C	20.6			

Anthony Neuman

Approved by:

Anthony Neumann, MSc Laboratory Operations Manager

Data have been validated by Analytical Quality Control and Exova's Integrated Data Validation System (IDVS). Generation and distribution of the report, and approval by the digitized signature above, are performed through a secure and controlled automatic process.

Method of Analysis

T: +1 (780) 438-5522 F: +1 (780) 434-8586 E: Edmonton@exova.com W: www.exova.com

Methodology and Notes



Bill To:	Town of Inuvik	Project ID:	SNP 00363	Lot ID:	1313570
	Box 1160	Project Name:		Control Number:	
	2 Firth Street	Project Location:	Inuvik	Date Received:	Nov 15, 2018
	Inuvik, NT, Canada	LSD:		Date Reported:	Nov 21, 2018
	X0E 0T0	P.O.:	100104	Report Number:	2348568
Attn:	Rick Campbell	Proj. Acct. code:			
Sampled By:	Dale Huatum				
Company:	Town of Inuvik				

Method Name Reference Method Date Analysis Location Started Alkalinity, pH, and EC in water APHA * pH - Electrometric Method, 4500-H+ B Nov 19, 2018 Exova Edmonton Ammonium-N in Water APHA * Automated Phenate Method, 4500-NH3 G Nov 21, 2018 Exova Edmonton APHA * 5 Day, 5210 B BOD (Carbonaceous) in water Nov 16, 2018 Exova Edmonton Coliforms - Membrane Filtration APHA Fecal Coliform Membrane Filter Nov 16, 2018 Exova Calgary Procedure, 9222 D Oil and Grease in water US EPA * n-Hexane Extractable Material and Silica Nov 15, 2018 Exova Edmonton Gel Treated n-Hexane Extractable Material by Extraction and Gravimetry, 1664 pH at 15°C APHA pH - Electrometric Method, 4500-H+ B Nov 16, 2018 Exova Edmonton Solids Suspended (Total, Fixed and APHA Total Suspended Solids Dried at 103-Nov 16. 2018 Exova Edmonton Volatile) 105'C, 2540 D * Reference Method Modified

References

APHA	Standard Methods for the Examination of Water and Wastewater
US EPA	US Environmental Protection Agency Test Methods

Comments:

• Nov 15, 2018 - Sample 1313570-1; 6373913: Sample formed an emulsion during oil and grease extraction. Centrifugation was required in order to complete analysis.

Please direct any inquiries regarding this report to our Client Services Group or to the Operations Manager at the coordinates indicated at the top left of this page. Results relate only to samples as submitted.

Exova	Advision	Billing Informat	ion:		Copy of	Report To:		1								RUSH	l Priority
	- Propulling	Company	Town of Inuvi		Company												ection, client accepts that applied to the analysis
www.exova.com		Address	Box 1160 2 F		Address												
Project Information	SNP 0036- 3	A.I	Inuvik, NT X0			Edmonton, AB T5S 1J4 Attention Richard Feilden				Date Required							
	SNP 0036- 3	Attention	Rick Campbe		Attention					2						As Indicated	All Analysis
Project Name		Phone	(867) 777-861		Phone	(780) 48	88-6	800)						When "ASAP" is rec	quested, turn around will
	nuvik	Cell	(867) 678-538		Cell												SH priority, with pricing and tch. Please contact the lab
Legal Location		Fax	(867) 777-860		Fax	(780	s										ing RUSH samples
	00104	E-mail		town.inuvik.nt.ca	E-mail	richa	ard.f	eild	en	Daed	com.	.com	1				
Proj. Acct.Code		Agreement ID	2909													Signature	
		Copy of Report			Copy of in		_	1				_	_	_	-	and the second sec	ody (please print)
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Creative lands with a st		Fax	Excel				1									Company Tov	wn of Inuvik
from above).	Comments (please in	clude contact info	rmation includ	ing ph. # if different	Indicate Re		SIS										proceed with the work
Sampler: note weath	bor				Requiremen	IS DEIOW	Containers			ds							on this form: Initial: DH
Sampler. note weat	iller.						ont			Solids	Sm 2					Date: Dou 14/18	
							of			T	alifo	Grease				Date/Time stamp:	for Lab use only
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Temp_ <u>-23</u> C, pr	recip, Wind	d dir <u>UUE</u> Ve	13 km	km/h			Number	H	CBOD5	Suspended	Ammonia Fecal Coliforms	Oil &				NOV 15 PH12:	23
Sample Id	dentification	Location	Depth in cm m	Date/Time sampled	d Matrix	Sampling method	↓			1						Indicate below any c condition of samples	
1 SNP0036-3		Sewage Lagoon				Dip	5	x	x	x >	x	x			T	1	Were Exova supplies
2																	used?
3						-											Was there any damage
4																	to the shipping container?
5																	
6																	Were the containers
7																	packaged well?
8																	
9																	Were the expected
10																	number of samples received (document
11			X						1								below)?
12				1. K													
13									1								Are samples within
14																	recommended holding times/temp?
15		100	/		8												
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Note: Proper	completion of this for	m is required in o	rder to proceed	d with analysis	Lot: 131	3570 ^C	COC						COI	D Y/N			
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Page 1 o	of1	Control #	and and								1			,		Received by:	nK

Report Transmission Cover Page



Bill To:	Town of Inuvik	Project ID:	SNP 0036-3	Lot ID:	1322978
	Box 1160	Project Name:		Control Number:	
	2 Firth Street	Project Location:	Inuvik	Date Received:	Dec 13, 2018
	Inuvik, NT, Canada	LSD:		Date Reported:	Dec 20, 2018
	X0E 0T0	P.O.:	100104	Report Number:	2364729
Attn:	Rick Campbell	Proj. Acct. code:			
Sampled By:	Matt O'Rourke				
Company:	Town of Inuvik				

Contact	Company	Address
Jason Casault	AECOM - Edmonton	101, 18817 Stony Plain Road
		Edmonton, AB T5S 0C2
		Phone: (780) 486-7050 Fax: (780) 486-7070
		Email: Jason.Casault@aecom.com
Delivery	Format	Deliverables
Email - Merge Reports	PDF	COC / COA
Email - Merge Reports	PDF	COC / Test Report
Kim Wainman	Town of Inuvik	Box 1160, 2 Firth Street
		Inuvik, NT X0E 0T0
		Phone: (867) 777-8615 Fax: (867) 777-8601
		Email: kwainman@town.inuvik.nt.ca
Delivery	<u>Format</u>	Deliverables
Email - Single Report	PDF	Invoice
Richard Feilden	AECOM - Edmonton	17203 - 103 Avenue
		Edmonton, AB T5S 1J4
		Phone: (780) 488-6800 Fax: (780) 488-2121
		Email: richard.feilden@aecom.com
Delivery	Format	Deliverables
Email - Merge Reports	PDF	COC / Test Report
Rick Campbell	Town of Inuvik	Box 1160, 2 Firth Street
		Inuvik, NT X0E 0T0
		Phone: (867) 777-8615 Fax: (867) 777-8601
		Email: rcampbell@town.inuvik.nt.ca
Delivery	<u>Format</u>	Deliverables
Email - Merge Reports	PDF	COC / Test Report
Email - Single Report	PDF	Invoice
Utilidor	Town of Inuvik	Box 1160, 2 Firth Street
		Inuvik, NT X0E 0T0
		Phone: (867) 777-2607 Fax: (867) 777-2071
		Email: utilidor@town.inuvik.nt.ca
Delivery	Format	Deliverables
Email - Single Report	PDF	Invoice

Notes To Clients:

• Dec 17, 2018 - Sample 1322978-1; 6422718: Sample formed an emulsion during oil and grease extraction. Centrifugation was required in order to complete analysis.

T: +1 (780) 438-5522 F: +1 (780) 434-8586 E: Edmonton@exova.com W: www.exova.com

Analytical Report



Bill To:	Town of Inuvik	Project ID:	SNP 0036-3	Lot ID:	1322978
	Box 1160	Project Name:		Control Number:	
	2 Firth Street	Project Location:	Inuvik	Date Received:	Dec 13, 2018
	Inuvik, NT, Canada	LSD:		Date Reported:	Dec 20, 2018
	X0E 0T0	P.O.:	100104	Report Number:	2364729
Attn:	Rick Campbell	Proj. Acct. code:			
Sampled By:	Matt O'Rourke				
Company:	Town of Inuvik				

		Reference Number Sample Date Sample Time Sample Location Sample Description	1322978-1 Dec 12, 2018 09:07 Sewage Lagoon /			
		Sample Description	SNP0036-3 / 3.9°C			
		Matrix	Water			
Analyte		Units	Results	Results	Results	Nominal Detection Limit
Aggregate Organic Const	tuents					
Biochemical Oxygen Demand	Inhibited	mg/L	47			4
Oil and Grease	Total	mg/L	53			5
pH adjustment	adjustment required		No			
Inorganic Nonmetallic Par	ameters					
Ammonia - N		mg/L	11.2			0.025
Un-ionized Ammonia-N	15 °C	mg/L	0.0423			
Ammonium/Ammonia Preservation			Yes			
Microbiological Analysis						
Fecal Coliforms	Membrane Filtration	CFU/100 mL	300000			1
Physical and Aggregate P						
Solids	Total Suspended	mg/L	13			2
Routine Water						
рН	15 °C	рН	7.14			
Temperature of observed pH		°C	15			
рН			7.62			
Temperature of observed pH		°C	22.8			

RhSeunem

Approved by:

Randy Neumann, BSc **Division Director**

Data have been validated by Analytical Quality Control and Exova's Integrated Data Validation System (IDVS). Generation and distribution of the report, and approval by the digitized signature above, are performed through a secure and controlled automatic process.

T: +1 (780) 438-5522 W: www.exova.com

Methodology and Notes



Bill To:	Town of Inuvik	Project ID:	SNP 0036-3	Lot ID:	1322978
	Box 1160	Project Name:		Control Number:	
	2 Firth Street	Project Location:	Inuvik	Date Received:	Dec 13, 2018
	Inuvik, NT, Canada	LSD:		Date Reported:	Dec 20, 2018
	X0E 0T0	P.O.:	100104	Report Number:	2364729
Attn:	Rick Campbell	Proj. Acct. code:			
Sampled By:	Matt O'Rourke				
Company:	Town of Inuvik				

Method of Analysis

Method Name	Reference	Method	Date Analysis Started	Location
Alkalinity, pH, and EC in water	APHA	* pH - Electrometric Method, 4500-H+ B	Dec 13, 2018	Exova Edmonton
Ammonium-N in Water	APHA	* Automated Phenate Method, 4500-NH3 G	Dec 19, 2018	Exova Edmonton
BOD (Carbonaceous) in water	APHA	* 5 Day, 5210 B	Dec 13, 2018	Exova Edmonton
Coliforms - Membrane Filtration	APHA	Fecal Coliform Membrane Filter Procedure, 9222 D	Dec 13, 2018	Exova Calgary
Oil and Grease in water	US EPA	 * n-Hexane Extractable Material and Silica Gel Treated n-Hexane Extractable Material by Extraction and Gravimetry, 1664 	Dec 14, 2018	Exova Edmonton
pH at 15°C	APHA	* pH - Electrometric Method, 4500-H+ B	Dec 20, 2018	Exova Edmonton
Solids Suspended (Total, Fixed and Volatile)	APHA	 * Total Suspended Solids Dried at 103- 105'C, 2540 D 	Dec 13, 2018	Exova Edmonton
_		* Reference Method Modified		

References

APHA	Standard Methods for the Examination of Water and Wastewater
US EPA	US Environmental Protection Agency Test Methods

Comments:

• Dec 17, 2018 - Sample 1322978-1; 6422718: Sample formed an emulsion during oil and grease extraction. Centrifugation was required in order to complete analysis.

Please direct any inquiries regarding this report to our Client Services Group or to the Operations Manager at the coordinates indicated at the top left of this page. Results relate only to samples as submitted.

Exercise	Testing	Billing Informat	ion:		Сору	of Report 1	o:										RUS	H Priority
Exova	Advising Assuring	Company	Town of Inuv	ik	Compa	any Ae	com	- E	Edmo	onto	n							section, client accepts that
www.exova.com	- Assuring	Address	Box 1160 2 F	Firth Street	Addres	ss 17	203-	103	3rd A	ver	nue							e applied to the analysis
Project Informati	on	2 M	Inuvik, NT X	0E 0T0	1. an 19.	Edmonton, AB T5S 1J4					Date Required							
Project ID	SNP 0036- 3	Attention	Rick Campbe	ell	Attenti	on Ri	charc	d F	eilde	n							As Indicated	All Analysis
Project Name		Phone	(867) 777-86	15	Phone	(7)	30) 4	88-	-680	0							When "ASAP" is re	equested, turn around will
Project Location	Inuvik	Cell	(867) 678-53	88	Cell												default to a 100% RU	ISH priority, with pricing and
Legal Location		Fax	(867) 777-86		Fax				-212									atch. Please contact the lab tting RUSH samples
PO/AFE#	100104	E-mail		@town.inuvik.nt.ca	E-mail	ric	hard.	.fei	Iden	<u>@a</u>	ecor	n.co	om				11 Page 1	5
Proj. Acct.Code	4	Agreement ID	2909														Signature	
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Special Instruction	Mail X ns/Comments (please in	Fax	Excel	ding ph # if different	Indicate	Desulates	-								-			own of Inuvik
from above).						Regulatory ents below	lers									1	N 1 82	to proceed with the work d on this form:
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		ALIAT	10/10	and the second second			Number		CBOD5	Suspended	Ammonia	cal	Oil & O				DEC 13 AN 7	11
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Sample	Identification	Location	Depth in cm m	Date/Time sample	d Matr	ix Sampli metho	-										Indicate below any condition of sample	
1 SNP0036-3	n fer statistiske og som som en som en som som en som som en som som en som en som som som en som en som en so	Sewage Lagoon		12-12-18 900	1A	Dip	E	5 x	x	x	x	x	x					Were Exova supplies used?
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Page 1	<u>of 1</u>	0011101#	Also, and		<u> </u>							0		0	•)		Received by:	NUNEZ

Report Transmission Cover Page



Bill To:	Town of Inuvik	Project ID:	SNP 0036-4,5&9	Lot ID:	1292125
	Box 1160	Project Name:		Control Number:	
	2 Firth Street	Project Location:	Inuvik	Date Received:	Aug 16, 2018
	Inuvik, NT, Canada	LSD:		Date Reported:	Aug 22, 2018
	X0E 0T0	P.O.:	100104	Report Number:	2315147
Attn:	Rick Campbell	Proj. Acct. code:			
Sampled By:	Matt O'Rourke				
Company:	Town of Inuvik				

Contact	Company	Address
Jason Casault	AECOM - Edmonton	101, 18817 Stony Plain Road
		Edmonton, AB T5S 0C2
		Phone: (780) 486-7050 Fax: (780) 486-7070
		Email: Jason.Casault@aecom.com
Delivery	Format	Deliverables
Email - Merge Reports	PDF	COC / COA
Email - Merge Reports	PDF	COC / Test Report
Kim Wainman	Town of Inuvik	Box 1160, 2 Firth Street
		Inuvik, NT X0E 0T0
		Phone: (867) 777-8615 Fax: (867) 777-8601
		Email: kwainman@town.inuvik.nt.ca
Delivery	Format	Deliverables
Email - Single Report	PDF	Invoice
Rick Campbell	Town of Inuvik	Box 1160, 2 Firth Street
		Inuvik, NT X0E 0T0
		Phone: (867) 777-8615 Fax: (867) 777-8601
		Email: rcampbell@town.inuvik.nt.ca
Delivery	Format	Deliverables
Email - Merge Reports	PDF	COC / Test Report
Email - Single Report	PDF	Invoice
Utilidor	Town of Inuvik	Box 1160, 2 Firth Street
		Inuvik, NT X0E 0T0
		Phone: (867) 777-2607 Fax: (867) 777-2071
		Email: utilidor@town.inuvik.nt.ca
Delivery	<u>Format</u>	Deliverables
Email - Single Report	PDF	Invoice

Notes To Clients:

Exova						
7217 Roper Road NW						
Edmonton, Alberta						
T6B 3J4, Canada						

Analytical Report



	Town of Inuvik Box 1160 2 Firth Street Inuvik, NT, Canada X0E 0T0 Rick Campbell Matt O'Rourke Town of Inuvik	Project Name: Project Location: In LSD:	SNP 0036-4,5&9 nuvik 00104	Control Nu Date Rece Date Rep	eived: Aug 16, 2018	
		Reference Number Sample Date Sample Time Sample Location	Aug 15, 2018	1292125-2 Aug 15, 2018 09:15	1292125-3 Aug 15, 2018 08:30	
		Sample Description	Pit N/W of Dump / SNP0036-4 / 3.2°C	Pond S/E of Dump / SNP0036-5 / 3.2°C	Creek N/W of Dump / SNP0036-9 / 3.2°C	
		Matrix	Water	Water	Water	
Analyte		Units	Results	Results	Results	Nominal Detectior Limit
Aggregate Orga	anic Constituents					Linint
Biochemical Ox Demand		mg/L	<4	<4	<4	4
Phenol		mg/L	0.002	<0.001	0.003	0.001
-	netallic Parameters					
Phosphorus	. Total	mg/L	0.08	0.07	<0.05	0.05
Metals Dissolve	ed					
Subsample			Lab Filtered	Lab Filtered	Lab Filtered	
Metals Total	-	<i>a</i>	0.00	0.00	0.47	0.00
Aluminum	Total	mg/L	0.20	0.06	0.17	0.02
Calcium	Total	mg/L	220	34.8	31.4	0.2
Iron	Total	mg/L	1.6	0.55	0.97	0.05
Magnesium	Total	mg/L	103	14.6	13.2	0.2
Manganese	Total	mg/L	1.03	0.020	0.408	0.005
Potassium	Total	mg/L	30.1	1.9	1.1	0.4
Silicon	Total	mg/L	4.14	0.28	1.41	0.05
Sodium	Total	mg/L	143	17.5	10.4	0.4
Sulfur	Total	mg/L	218	30.7	39.9	0.3
Mercury	Total	mg/L	0.000007	0.000012	0.00008	0.000005
Antimony	Total	mg/L	<0.0004	<0.0002	<0.0002	0.0002
Arsenic	Total	mg/L	0.001	0.0014	0.0008	0.0002
Barium	Total	mg/L	0.081	0.040	0.019	0.001
Beryllium	Total	mg/L	<0.0002	<0.0001	<0.0001	0.0001
Bismuth	Total	mg/L	<0.001	<0.0005	<0.0005	0.0005
Boron	Total	mg/L	0.941	0.018	0.027	0.002
Cadmium	Total	mg/L	<0.00002	<0.00001	0.00002	0.00001
Chromium	Total	mg/L	0.001	<0.0005	<0.0005	0.0005
Cobalt	Total	mg/L	0.001	0.0002	0.0009	0.0001
Copper	Total	mg/L	<0.002	<0.001	0.002	0.001
Lead	Total	mg/L	0.0003	0.0001	0.0001	0.0001
Lithium	Total	mg/L	0.043	0.008	0.010	0.001
Molybdenum	Total	mg/L	< 0.002	<0.001	<0.001	0.001
Nickel	Total	mg/L	0.0078	0.0021	0.0101	0.0005
Selenium	Total	mg/L	0.0002	<0.0002	<0.0002	0.0002
Silver	Total	mg/L	<0.00002	< 0.00001	<0.00001	0.00001
Strontium	Total Total	mg/L mg/L	0.860 <0.0001	0.121 <0.00005	0.106 <0.00005	0.001 0.00005
Thallium						

Terms and Conditions: https://www.exova.com/media/1232/exova-canada-inc-standard-conditions-of-contract-short-form.pdf

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Analytical Report



Bill To: Town of Inuvik Box 1160 2 Firth Street Inuvik, NT, Canada X0E 0T0 Attn: Rick Campbell Sampled By: Matt O'Rourke Company: Town of Inuvik		Project Name: Project Location: LSD:	Project Name: Project Location: Inuvik LSD: P.O.: 100104		Lot ID: 1292125 Control Number: Date Received: Aug 16, 2018 Date Reported: Aug 22, 2018 Report Number: 2315147		
		Reference Number	1292125-1	1292125-2	1292125-3		
		Sample Date Sample Time Sample Location	09:00	Aug 15, 2018 09:15	Aug 15, 2018 08:30		
		Sample Description		Pond S/E of Dump / SNP0036-5 / 3.2°C	Creek N/W of Dump / SNP0036-9 / 3.2°C		
		Matrix	water	Water	Water		
Analyte		Units	Results	Results	Results	Nominal Detection Limit	
Metals Total - Co	ontinued						
Uranium	Total	mg/L	<0.001	<0.0005	<0.0005	0.0005	
Vanadium	Total	mg/L	0.002	0.0017	0.0009	0.0001	
Zinc	Total	mg/L	0.005	0.003	0.011	0.001	
Zirconium	Total	mg/L	<0.002	<0.001	<0.001	0.001	
	gregate Properties						
Solids	Total Suspende	d mg/L	12	<2	3	2	
Routine Water							
рН			8.16	7.91	7.52		
Temperature of o	observed	°C	21.3	21.4	21.4		
pH Electrical Condu	ctivity at 25 °C	µS/cm	2170	350	317	1	
Electrical Condu		dS/m	2.17	0.350	0.317	0.001	
Calcium	Dissolved	meg/L	11.1	1.72	1.56	0.01	
Calcium	Dissolved	mg/L	223	34.4	31.2	0.2	
Magnesium	Dissolved	meg/L	8.79	1.20	1.09	0.01	
Magnesium	Dissolved	mg/L	107	14.6	13.2	0.2	
Sodium	Dissolved	meq/L	6.26	0.75	0.45	0.02	
Sodium	Dissolved	mg/L	144	17.2	10.3	0.4	
Potassium	Dissolved	meq/L	0.75	0.05	0.03	0.01	
Potassium	Dissolved	mg/L	29.5	1.8	1.0	0.4	
Chloride	Dissolved	mg/L	89.8	14.9	4.0	0.4	
Chloride		meq/L	2.53	0.42	0.11	0.01	
Sulfate (SO4)	Dissolved	mg/L	675	90.2	118	0.9	
Sulfate-S		meq/L	14.0	1.88	2.45		
Sulfate-S	Dissolved	mg/L	225	30.1	39.2	0.3	
Total Dissolved	Solids Estimated	mg/L	1390	224	203	1	
SAR	Dissolved		2.0	0.6	0.4		
Mono-Aromatic	Hydrocarbons - Water						
Benzene		mg/L	<0.001	<0.001	<0.001	0.001	
Toluene		mg/L	<0.0004	<0.0004	<0.0004	0.0004	
Ethylbenzene		mg/L	<0.0010	<0.0010	<0.0010	0.0010	
Total Xylenes (m		mg/L	<0.001	<0.001	<0.001	0.001	
	m Hydrocarbons - Water	_					
F1 -BTEX		mg/L	<0.1	<0.1	<0.1	0.1	
F1 C6-C10		mg/L	<0.1	<0.1	<0.1	0.1	
F2 C10-C16		mg/L	<0.1	<0.1	<0.1	0.1	

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Analytical Report

Bill To: Town of Inuvik

Box 1160 2 Firth Street

X0E 0T0

Attn: Rick Campbell

Sampled By: Matt O'Rourke Company: Town of Inuvik

Inuvik, NT, Canada

Project ID: Project Name: Project Location: LSD: P.O.: Proj. Acct. code:

SNP 0036-4,5&9 Inuvik 100104

Lot ID: 1292125 Control Number:

Page 3 of 5

Exova

Date Received: Aug 16, 2018 Date Reported: Aug 22, 2018 Report Number: 2315147

Anthony Weuman

Approved by:

Anthony Neumann, MSc Laboratory Operations Manager

Data have been validated by Analytical Quality Control and Exova's Integrated Data Validation System (IDVS). Generation and distribution of the report, and approval by the digitized signature above, are performed through a secure and controlled automatic process.

Methodology and Notes



Bill To:	Town of Inuvik	Project ID:	SNP 0036-4,5&9	Lot ID:	129212
	Box 1160	Project Name:		Control Number:	
	2 Firth Street	Project Location:	Inuvik	Date Received:	Aug 16, 20
	Inuvik, NT, Canada	LSD:		Date Reported:	Aug 22, 20
	X0E 0T0	P.O.:	100104	Report Number:	2315147
Attn:	Rick Campbell	Proj. Acct. code:			
Sampled By:	Matt O'Rourke				
Company:	Town of Inuvik				

Method of Analysis

25 2018 2018

Mictilou of Analysis				
Method Name	Reference	Method	Date Analysis Started	Location
Alkalinity, pH, and EC in water	APHA	* Conductivity, 2510 B	Aug 17, 2018	Exova Edmonton
Alkalinity, pH, and EC in water	APHA	* pH - Electrometric Method, 4500-H+ B	Aug 17, 2018	Exova Edmonton
BOD (Carbonaceous) in water	APHA	* 5 Day, 5210 B	Aug 21, 2018	Exova Edmonton
BTEX-CCME - Water	US EPA	 Volatile Organic Compounds in Various Sample Matrices Using Equilibrium Headspace Analysis/Gas Chromatography Mass Spectrometry, 5021/8260 	Aug 17, 2018	Exova Calgary
Chloride in Water	APHA	* Automated Ferricyanide Method, 4500-Cl- E	Aug 20, 2018	Exova Edmonton
Mercury (Total) in water	EPA	* Mercury in Water by Cold Vapor Atomic Fluorescence Spectrometry, 245.7	Aug 16, 2018	Exova Edmonton
Mercury (Total) in water	US EPA	* Determination of Hg in Sediment by Cold Vapor Atomic Absorption Spec, 245.5	Aug 16, 2018	Exova Edmonton
Metals ICP-MS (Total) in water	APHA/USEPA	* Metals By Inductively Coupled Plasma/Mass Spectrometry, APHA 3125 B / USEPA 200.2, 200.8	Aug 17, 2018	Exova Edmonton
Metals ICP-MS (Total) in water	US EPA	 Determination of Trace Elements in Waters and Wastes by ICP-MS, 200.8 	Aug 17, 2018	Exova Edmonton
Metals Trace (Dissolved) in water	APHA	 Inductively Coupled Plasma (ICP) Method, 3120 B 	Aug 17, 2018	Exova Edmonton
Metals Trace (Total) in water	APHA	 Inductively Coupled Plasma (ICP) Method, 3120 B 	Aug 17, 2018	Exova Edmonton
Phenol in water	APHA	* Direct Photometric Method, 5530 D	Aug 17, 2018	Exova Edmonton
Phosphorus - Total in Water	APHA	 * Automated Ascorbic Acid Reduction Method, 4500-P F 	Aug 17, 2018	Exova Edmonton
Solids Suspended (Total, Fixed and Volatile)	APHA	 Total Suspended Solids Dried at 103- 105'C, 2540 D 	Aug 17, 2018	Exova Edmonton
		* Reference Method Modified		

References

APHA	Standard Methods for the Examination of Water and Wastewater
APHA/USEPA	Standard Methods For Water/ Environmental Protection Agency
EPA	Environmental Protection Agency Test Methods - US
US EPA	US Environmental Protection Agency Test Methods

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Methodology and Notes

Page 5 of 5 Exova

Bill To:	Town of Inuvik	Project ID:	SNP 0036-4,5&9	Lot ID:	1292125
	Box 1160	Project Name:		Control Number:	
	2 Firth Street	Project Location:	Inuvik	Date Received:	Aug 16, 2018
	Inuvik, NT, Canada	LSD:		Date Reported:	Aug 22, 2018
	X0E 0T0	P.O.:	100104	Report Number:	2315147
Attn:	Rick Campbell	Proj. Acct. code:			
Sampled By:	Matt O'Rourke				
Company:	Town of Inuvik				

Please direct any inquiries regarding this report to our Client Services Group or to the Operations Manager at the coordinates indicated at the top left of this page. Results relate only to samples as submitted.

Exova	Testing	Billing Informat	tion:			Copy of F	Report To:											RUSH	Priority
EXOVU	Advisi	ng Ng Company	Town of Inuv	vik		Company													ction, client accepts that
www.exova.com		Address	Box 1160 2 I	Firth Street		Address	1720)3-1	03r	d Av	/enue	Э							pplied to the analysis
Project Information			Inuvik, NT X	COE OTO		1	Edmo											Date Required	
Project ID	SNP 0036- 4,5 &	9. Attention	Rick Campb	ell		Attention	Rich											As Indicated	All Analysis
Project Name		Phone	(867) 777-86	315		Phone	(780)) 48	8-6	800								When "ASAP" is reau	lested, turn around will
Project Location	Inuvik	Cell	(867) 678-53	388		Cell												default to a 100% RUSH	I priority, with pricing and
Legal Location		Fax	(867) 777-86			Fax	(780)) 48	8-2	121									h. Please contact the lab g RUSH samples
PO/AFE#	100104	E-mail	rcampbell	l@town.inuvik.nt.c	a	E-mail	richa	rd.f	eild	en@	Daec	om.	com						g reer samples
Proj. Acct.Code		Agreement ID	2909														×	Signature	
		Copy of Report				Copy of in	ivoice	_										Restored and the second s	dy (please print)
Report Results	X E-Mail	Online	PDF			QA/QC Re	eport											Sampled by: Mait	O'Route
		X Fax	Excel							Σī								Company Town	n of Inuvik
		ase include contact info ium, Potassium and C		ding ph. # if different		Indicate Reg Requirement		lers		Total Metal+Total mercury									proceed with the work on this form:
Sampler: note we	ather:				-			Number of Containers		otal I		lids	fe				c	Date: 08-13-18	
								Cor	2W	+Tc		Suspended Solids	Total Phosphate		ols	N	S,P,	Construction of the local division of the lo	or Lab use only
								r of	3F1	leta		deo	hos	e	hen	tivit	ed (Date/Time stamp:	
								nbe	CCMEBF12W	al M	pH CBOD5	ber	al P	Sulphate	Total Phenols	Conductivity	Dissolved S,P,		
Temp <u>3</u> C,	precip <u>O</u> ,	Wind dir <u>S</u> V	ell6	km/h				Nur	S	Tot	E B	Sus	Tot	Sul	Tot	S	Dis		
Sample	Identification	Location	Depth in cm m	Date/Time samp	led	Matrix	Sampling method	↓										Indicate below any de condition of samples:	
1 SNP0036-4		Pit N/W of Dump	2	900 A 08-15	-18		Dip	8	x	x	x x	x	x	x	x	х	х	· · · · · · · · · · · · · · · · · · ·	Were Exova supplies
2 SNP0036-5		Pond S/E of Dum		9'SA 03-15-			Dip	8			x x		_	x		_	x		used?
3 SNP0036-9		Creek N/Wof Dun		\$30A 08-15-1		11/21	Dip	_	-	_	x x	_	_	x		x	х		Was there any damage
4											1				3				to the shipping container?
5																			
6				1															Were the containers
7								5											packaged well?
8				1										- 2.6	1				1
9														1					Were the expected
10																			number of samples received (document
11								10						-					below)?
12		et 1 a												1					
13				1				Share.									-		Are samples within
14		11100				13		161											recommended holding times/temp?
15		and the second second	Sector Sector Sector		2		-												1
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Page 1	of 1	Control #)	8		-		Received by:	ZANUL





Bill To:	Town of Inuvik	Project ID:	SNP 0036-4,5 & 9	Lot ID:	1297946
	Box 1160	Project Name:		Control Number:	
	2 Firth Street	Project Location:	Inuvik	Date Received:	Sep 13, 2018
	Inuvik, NT, Canada	LSD:		Date Reported:	Sep 19, 2018
	X0E 0T0	P.O.:	100104	Report Number:	2322893
Attn:	Rick Campbell	Proj. Acct. code:			
Sampled By:	Matt O'Rourke				
Company:	Town of Inuvik				

Contact	Company	Address				
Jason Casault	AECOM - Edmonton	101, 18817 Stony Plain Road				
		Edmonton, AB T5S 0C2				
		Phone: (780) 486-7050 Fax: (780) 486-7070				
		Email: Jason.Casault@aecom.com				
Delivery	Format	Deliverables				
Email - Merge Reports	PDF	COC / COA				
Email - Merge Reports	PDF	COC / Test Report				
Kim Wainman	Town of Inuvik	Box 1160, 2 Firth Street				
		Inuvik, NT X0E 0T0				
		Phone: (867) 777-8615 Fax: (867) 777-8601				
		Email: kwainman@town.inuvik.nt.ca				
Delivery	Format	Deliverables				
Email - Single Report	PDF	Invoice				
Richard Feilden	AECOM - Edmonton	17203 - 103 Avenue				
		Edmonton, AB T5S 1J4				
		Phone: (780) 488-6800 Fax: (780) 488-2121				
		Email: richard.feilden@aecom.com				
Delivery	Format	Deliverables				
Email - Merge Reports	PDF	COC / Test Report				
Rick Campbell	Town of Inuvik	Box 1160, 2 Firth Street				
		Inuvik, NT X0E 0T0				
		Phone: (867) 777-8615 Fax: (867) 777-8601				
		Email: rcampbell@town.inuvik.nt.ca				
Delivery	<u>Format</u>	Deliverables				
Email - Merge Reports	PDF	COC / Test Report				
Email - Single Report	PDF	Invoice				
Utilidor	Town of Inuvik	Box 1160, 2 Firth Street				
		Inuvik, NT X0E 0T0				
		Phone: (867) 777-2607 Fax: (867) 777-2071				
		Email: utilidor@town.inuvik.nt.ca				
Delivery	Format	Deliverables				
Email - Single Report	PDF	Invoice				

Notes To Clients:

• Sep 19, 2018 - Some trace total metal results were less than dissolved metal results for sample #1297946-1. The results were verified and are within expected measurement uncertainty.

Analytical Report

Tin

Titanium



Attn: Sampled By:	Town of Inuvik Box 1160 2 Firth Street Inuvik, NT, Canada X0E 0T0 Rick Campbell Matt O'Rourke Town of Inuvik	Project Name: Project Location: Ir LSD:	Project Name: Project Location: Inuvik LSD: P.O.: 100104		ot ID: 1297946 mber: eived: Sep 13, 2018 orted: Sep 19, 2018 mber: 2322893	
		Reference Number Sample Date	1297946-1 Sep 12, 2018	1297946-2	1297946-3	
		Sample Date Sample Time Sample Location	08:58	Sep 12, 2018 08:37	Sep 12, 2018 09:10	
		Sample Description	Pit N/W of Dump / SNP0036-4 / 1°C	Pond S/E of Dump / SNP0036-5 / 1°C	Creek N/W of Dump / SNP0036-9 / 1°C	
		Matrix	Water	Water	Water	
Analyte		Units	Results	Results	Results	Nominal Detectio
	nic Constituents	••••••				Limit
Biochemical Oxy Demand		mg/L	<4	<4	<4	4
Phenol		mg/L	<0.001	0.003	<0.001	0.001
norganic Nonm	etallic Parameters					
Phosphorus	Total	mg/L	0.06	0.14	<0.05	0.05
Metals Dissolve	d					
Subsample			Lab Filtered	Lab Filtered	Lab Filtered	
Metals Total						
Aluminum	Total	mg/L	0.08	0.34	0.18	0.02
Calcium	Total	mg/L	266	38.7	36.6	0.2
Iron	Total	mg/L	1.0	2.54	0.76	0.05
Magnesium	Total	mg/L	123	14.8	15.4	0.2
Manganese	Total	mg/L	0.919	0.271	0.482	0.005
Potassium	Total	mg/L	25.7	2.3	1.2	0.4
Silicon	Total	mg/L	4.00	1.29	1.67	0.05
Sodium	Total	mg/L	144	18.0	11.4	0.4
Sulfur	Total	mg/L	280	35.0	45.9	0.3
Mercury	Total	mg/L	0.000011	0.000013	0.000012	0.000005
Antimony	Total	mg/L	<0.0004	0.0002	<0.0002	0.0002
Arsenic	Total	mg/L	0.001	0.0029	0.0007	0.0002
Barium	Total	mg/L	0.080	0.075	0.019	0.001
Beryllium	Total	mg/L	<0.0002	<0.0001	<0.0001	0.0001
Bismuth	Total	mg/L	<0.001	<0.0005	<0.0005	0.0005
Boron	Total	mg/L	0.766	0.020	0.026	0.002
Cadmium	Total	mg/L	0.00002	<0.00001	0.00003	0.00001
Chromium	Total	mg/L	<0.001	0.0008	<0.0005	0.0005
Cobalt	Total	mg/L	0.001	0.0005	0.0011	0.0001
Copper	Total	mg/L	0.002	0.002	0.002	0.001
Lead	Total	mg/L	0.0002	0.0007	<0.0001	0.0001
Lithium	Total	mg/L	0.040	0.009	0.011	0.001
Molybdenum	Total	mg/L	< 0.002	<0.001	<0.001	0.001
Nickel	Total	mg/L	0.0076	0.0030	0.0116	0.0005
Selenium	Total	mg/L	<0.0002	0.0002	<0.0002	0.0002
Silver	Total	mg/L	<0.00002	<0.00001	< 0.00001	0.00001
Strontium	Total	mg/L	0.924	0.119	0.108	0.001
Thallium	Total	mg/L	<0.0001	<0.00005	<0.00005	0.00005

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mg/L

mg/L

< 0.002

0.0020

<0.001

0.0031

<0.001

0.0013

0.001

0.0005

Total

Total

Analytical Report



Attn: Sampled By:	Town of Inuvik Box 1160 2 Firth Street Inuvik, NT, Canada X0E 0T0 Rick Campbell Matt O'Rourke Town of Inuvik	Project Name: Project Location: LSD:	SNP 0036-4,5 & 9 Inuvik 100104	Control Nu Date Rece Date Rep		
		Reference Number Sample Date Sample Time	e Sep 12, 2018 e 08:58	1297946-2 Sep 12, 2018 08:37	1297946-3 Sep 12, 2018 09:10	
		Sample Location Sample Description		Pond S/E of Dump / SNP0036-5 / 1°C	Creek N/W of Dump / SNP0036-9 / 1°C	
		Matrix	water	Water	Water	
Analyte		Units	Results	Results	Results	Nominal Detection Limit
Metals Total - Co	ntinued					Linin
Uranium	Total	mg/L	<0.001	<0.0005	<0.0005	0.0005
Vanadium	Total	mg/L	0.0008	0.0029	0.0004	0.0001
Zinc	Total	mg/L	0.008	0.004	0.015	0.001
Zirconium	Total	mg/L	<0.002	<0.001	<0.001	0.001
Physical and Age	gregate Properties					
Solids	Total Suspended	l mg/L	6	23	5	2
Routine Water						
рН			7.96	7.36	7.13	
Temperature of c	bserved	°C	21.7	21.6	21.5	
pH Electrical Conduc	ctivity at 25 °C	µS/cm	2340	375	357	1
Electrical Conduc	•	dS/m	2.34	0.375	0.357	0.001
Calcium	Dissolved	meg/L	13.5	1.88	1.74	0.01
Calcium	Dissolved	mg/L	270	37.6	34.9	0.2
Magnesium	Dissolved	meq/L	10.1	1.20	1.22	0.01
Magnesium	Dissolved	, mg/L	123	14.6	14.9	0.2
Sodium	Dissolved	meq/L	6.31	0.78	0.47	0.02
Sodium	Dissolved	mg/L	145	17.9	10.9	0.4
Potassium	Dissolved	meq/L	0.65	0.06	0.03	0.01
Potassium	Dissolved	mg/L	25.4	2.2	1.1	0.4
Chloride	Dissolved	mg/L	89.5	15.7	4.5	0.4
Chloride		meq/L	2.53	0.44	0.13	0.01
Sulfate (SO4)	Dissolved	mg/L	845	102	134	0.9
Sulfate-S		meq/L	17.6	2.11	2.78	
Sulfate-S	Dissolved	mg/L	282	33.9	44.6	0.3
Total Dissolved S		mg/L	1500	240	228	1
SAR	Dissolved		1.8	0.6	0.4	
	Hydrocarbons - Water					
Benzene		mg/L	< 0.001	< 0.001	<0.001	0.001
Toluene		mg/L	< 0.0004	< 0.0004	< 0.0004	0.0004
Ethylbenzene	2 2)	mg/L	<0.0010	<0.0010	<0.0010	0.0010
Total Xylenes (m		mg/L	<0.001	<0.001	<0.001	0.001
	m Hydrocarbons - Water	~~/l	-0.1	-0.1	-0.1	0.1
F1 -BTEX F1 C6-C10		mg/L	<0.1 <0.1	<0.1 <0.1	<0.1 <0.1	0.1 0.1
F1 C6-C10 F2 C10-C16		mg/L	<0.1	<0.1 <0.1	<0.1 <0.1	0.1
12010-010		mg/L	NU. 1	NU.1	NU.1	0.1

Analytical Report

Company:

Bill To: Town of Inuvik

Box 1160 2 Firth Street

X0E 0T0

Attn: Rick Campbell

Town of Inuvik

Sampled By: Matt O'Rourke

Inuvik, NT, Canada

Project ID: Project Name: Project Location: LSD: P.O.: Proj. Acct. code:

SNP 0036-4,5 & 9 Inuvik 100104

Page 3 of 5 Exovo

Lot ID: 1297946

Control Number: Date Received: Sep 13, 2018 Date Reported: Sep 19, 2018 Report Number: 2322893

Murray Klutz

Senior Agronomist

Approved by:

Data have been validated by Analytical Quality Control and Exova's Integrated Data Validation System (IDVS). Generation and distribution of the report, and approval by the digitized signature above, are performed through a secure and controlled automatic process.

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Methodology and Notes



Lot ID: 1297946 Bill To: Town of Inuvik Project ID: SNP 0036-4,5 & 9 Project Name: Box 1160 Control Number: 2 Firth Street Project Location: Inuvik Date Received: Sep 13, 2018 Inuvik, NT, Canada LSD: Date Reported: Sep 19, 2018 X0E 0T0 P.O.: 100104 Report Number: 2322893 Attn: Rick Campbell Proj. Acct. code: Sampled By: Matt O'Rourke Company: Town of Inuvik

Method of Analysis

Method Name	Reference	Method		Date Analysis Started	Location
Alkalinity, pH, and EC in water	APHA	Conductivity, 2510 B	3	Sep 17, 2018	Exova Edmonton
Alkalinity, pH, and EC in water	APHA	pH - Electrometric M	lethod, 4500-H+ B	Sep 17, 2018	Exova Edmonton
BOD (Carbonaceous) in water	APHA	5 Day, 5210 B		Sep 14, 2018	Exova Edmonton
BTEX-CCME - Water	US EPA	Volatile Organic Col Sample Matrices Us Headspace Analysis Chromatography Ma 5021/8260	s/Gas	Sep 14, 2018	Exova Calgary
Chloride in Water	APHA	Automated Ferricya E	nide Method, 4500-Cl-	Sep 13, 2018	Exova Edmonton
Mercury (Total) in water	EPA	Mercury in Water by Fluorescence Spect	v Cold Vapor Atomic rometry, 245.7	Sep 15, 2018	Exova Edmonton
Mercury (Total) in water	US EPA	Determination of Hg Vapor Atomic Absor	in Sediment by Cold ption Spec, 245.5	Sep 15, 2018	Exova Edmonton
Metals ICP-MS (Total) in water	APHA/USEPA	Metals By Inductive Plasma/Mass Spect B / USEPA 200.2, 2	rometry, APHA 3125	Sep 14, 2018	Exova Edmonton
Metals ICP-MS (Total) in water	US EPA	Determination of Tra Waters and Wastes		Sep 14, 2018	Exova Edmonton
Metals Trace (Dissolved) in water	APHA	Inductively Coupled Method, 3120 B	Plasma (ICP)	Sep 14, 2018	Exova Edmonton
Metals Trace (Total) in water	APHA	Inductively Coupled Method, 3120 B	Plasma (ICP)	Sep 14, 2018	Exova Edmonton
Phenol in water	APHA	Direct Photometric	Method, 5530 D	Sep 18, 2018	Exova Edmonton
Phosphorus - Total in Water	APHA	Automated Ascorbic Method, 4500-P F	Acid Reduction	Sep 18, 2018	Exova Edmonton
Solids Suspended (Total, Fixed and Volatile)	APHA	Total Suspended So 105'C, 2540 D	blids Dried at 103-	Sep 17, 2018	Exova Edmonton
		* Reference Method Mod	lified		

References

APHA	Standard Methods for the Examination of Water and Wastewater
APHA/USEPA	Standard Methods For Water/ Environmental Protection Agency
EPA	Environmental Protection Agency Test Methods - US
US EPA	US Environmental Protection Agency Test Methods

Comments:

• Sep 19, 2018 - Some trace total metal results were less than dissolved metal results for sample #1297946-1. The results were verified and are within expected measurement uncertainty.

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 Edmonton, Alberta
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 W: www.exova.com

Methodology and Notes

Page 5 of 5 Exova

Bill To:	Town of Inuvik	Project ID:	SNP 0036-4,5 & 9	Lot ID:	1297946
	Box 1160	Project Name:		Control Number:	
	2 Firth Street	Project Location:	Inuvik	Date Received:	Sep 13, 2018
	Inuvik, NT, Canada	LSD:		Date Reported:	Sep 19, 2018
	X0E 0T0	P.O.:	100104	Report Number:	2322893
Attn:	Rick Campbell	Proj. Acct. code:			
Sampled By:	Matt O'Rourke				
Company:	Town of Inuvik				

Please direct any inquiries regarding this report to our Client Services Group or to the Operations Manager at the coordinates indicated at the top left of this page. Results relate only to samples as submitted.

Testing	10 Billing Information:	tion:	Conv of Report To:	port To:								RUSH	RUSH Priority
		Town of lowely	- Company	Accom Edmonton	1	dmo	ton						fanon i
www.exova.com		Box 1160 2 Firth Street	Address	17203-103rd Avenue	3-103		enue					Upon filling out this see surcharges will be a	Upon filling out this section, client accepts that surcharges will be applied to the analysis
Project Information		Inuvik, NT X0E 0T0		Edmonton, AB T5S 1J4	iton, A	B T5S	1J4					Date Required	
Project ID SNP 0036- 4,5 & 9.	& 9. Attention	Rick Campbell	Attention	Richard Feilden	Ird Fe	eilden						As Indicated	All Analysis
Project Name	Phone	(867) 777-8615	Phone	(780) 488-6800	488-	6800						When "ASAP" is red	When "ASAD" is requested turn around will
Project Location Inuvik	Cell	(867) 678-5388	Cell									default to a 100% RUSH	default to a 100% RUSH priority, with pricing and
ation	Fax	(867) 777-8601	Fax	(780) 488-2121	488-	2121						turn around time to matc	turn around time to match. Please contact the lab
PO/AFE# 100104	E-mail	npbell@town.inuvik.nt	.ca E-mail	richard.feilden@aecom.com	d.feil	den (c	(aeco	m.co	E				
Proj. Acct.Code	Agreement ID	2909	A									Signature	
- [Copy of Report		Copy of invoice	ice								Sample Custoo	Sample Custody (please print)
Report Results X E-Mail	Т	PDF	QA/QC Report	ort	_							Sampled by: Matt	OROUTRE
Mail	X Fax	Excel				ιιλ			-			Company Towi	Town of Inuvik
Special Instructions/Comments (please include contact information including ph. # if differen from above). Dissolved S,P,C is Sodium, Potassium and Calcium.	sase include contact info odium, Potassium and C	ormation including ph. # if different alcium.	Indicate Regulatory Requirements below	atory below	sıəı	mercu						I authorize Exova to indicated c	I authorize Exova to proceed with the work indicated on this form:
Sampler: note weather:						leto			əte		0.0	Date: - 1.	Initial: 120
					er of Co NS12N	T+lst9N	g	S pəpu	ate Phospha	slonad	ved S,P	Ď	This section for Lab use only ate/Time stamp:
TempL_C, precip	. Wind dir E V	Vel 1 3 km/h					CBOD bH		Fotal F	Total F	ubnoJ	20:1 HH CT 035	I nd er je st
Sample Identification	Location	Depth Date/Time sampled in cm m	Matrix	Sampling method	\rightarrow							Indicate below any deficiencies in the condition of samples:	ficiencies in the
1 SNP0036-4	Pit N/W of Dump	4 858 / SI-CI-60 d	4	Dip	× ∞	×	××	×	××	×	××		Were Exova supplies
2 SNP0036-5	Pond S/E of Dum	1 SI-CI-bo		Dip	8 8	×	××	×	××	×	××		- nseq.
3 SNP0036-9	Creek N/Wof Dump	Hatb /SI-CI-be du	t	Dip	× 8	×	××	×	××	×	××		Was there any damage
4					-		$\left \right $				\vdash		to the shipping container?
5													
6					_								Were the containers
7					_		_						packaged well?
8					\square								6
0			2		_		_		_		-		Were the expected
10			10		_		_		_				received (document
11			643		-				_		_		below)?
12													
13					111								Are samples within
14					-		-		-				times/temp?
15					-		-						
Environmen	Environmental Sample Information Sheet	Environmental Sample Information Sheet	Indi Lot: 1297946 COC	7946	000				5 0	Shipping:		# and size of coolers received	eived:
Place indicato										Coolar tamp.			
	riease indicate any potentially nazorgous samples	zordous samples							5		d III	Delivery Method:	and a
Page 1 of 1	Control #	#								_		Waybill: Received hv:	5 22
-													

Report Transmission Cover Page



Bill To:	Town of Inuvik	Project ID:	SNP 0036-4	Lot ID:	1286104
	Box 1160	Project Name:		Control Number:	
	2 Firth Street	Project Location:	Pit NW of Dump	Date Received:	Jul 20, 2018
	Inuvik, NT, Canada	LSD:		Date Reported:	Jul 27, 2018
	X0E 0T0	P.O.:		Report Number:	2307013
Attn:	Accounts Payable	Proj. Acct. code:			
Sampled By:	M. O'Rourke				
Company:	Tol				

Contact	Company	Address
Jason Casault	AECOM - Edmonton	101, 18817 Stony Plain Road
		Edmonton, AB T5S 0C2
		Phone: (780) 486-7050 Fax: (780) 486-7070
		Email: Jason.Casault@aecom.com
Delivery	<u>Format</u>	Deliverables
Email - Merge Reports	PDF	COC / COA
Email - Merge Reports	PDF	COC / Test Report
Kim Wainman	Town of Inuvik	Box 1160, 2 Firth Street
		Inuvik, NT X0E 0T0
		Phone: (867) 777-8615 Fax: (867) 777-8601
		Email: kwainman@town.inuvik.nt.ca
Delivery	<u>Format</u>	Deliverables
Email - Single Report	PDF	Invoice
Richard Feilden	AECOM - Edmonton	17203 - 103 Avenue
		Edmonton, AB T5S 1J4
		Phone: (780) 488-6800 Fax: (780) 488-2121
		Email: richard.feilden@aecom.com
Delivery	Format	Deliverables
Email - Merge Reports	PDF	COC / Test Report
Rick Campbell	Town of Inuvik	Box 1160, 2 Firth Street
		Inuvik, NT X0E 0T0
		Phone: (867) 777-8615 Fax: (867) 777-8601
		Email: rcampbell@town.inuvik.nt.ca
Delivery	<u>Format</u>	Deliverables
Email - Merge Reports	PDF	COC / Test Report
Email - Single Report	PDF	Invoice
Utilidor	Town of Inuvik	Box 1160, 2 Firth Street
		Inuvik, NT X0E 0T0
		Phone: (867) 777-2607 Fax: (867) 777-2071
		Email: utilidor@town.inuvik.nt.ca
Delivery	Format	Deliverables
Email - Single Report	PDF	Invoice

Notes To Clients:

• Jul 24, 2018 - Sample 1286104-1; 6193277: Some trace total metal results were less than dissolved metal results for sample 1286104-1. The results were verified and are within expected measurement uncertainty.

T: +1 (780) 438-5522 F: +1 (780) 434-8586 E: Edmonton@exova.com W: www.exova.com

Analytical Report



Bill To:	Town of Inuvik	Project ID:	SNP 0036-4	Lot ID:	1286104
	Box 1160	Project Name:		Control Number:	
	2 Firth Street	Project Location:	Pit NW of Dump	Date Received:	Jul 20, 2018
	Inuvik, NT, Canada	LSD:		Date Reported:	Jul 27, 2018
	X0E 0T0	P.O.:		Report Number:	2307013
Attn:	Accounts Payable	Proj. Acct. code:			
Sampled By:	M. O'Rourke				
Company:	Tol				

Reference Number 1286104-1 Sample Date Jul 18, 2018 Sample Time 09:50 Sample Location SNP0036-4 / 8.1°C

Analyta		Matrix	Water	Deaulte	Desults	Nominal Detection
Analyte		Units	Results	Results	Results	Limit
Aggregate Organic Cons						
Biochemical Oxygen Demand	Inhibited	mg/L	<4			4
Phenol		mg/L	0.009			0.001
Inorganic Nonmetallic P						
Phosphorus	Total	mg/L	0.12			0.05
Metals Dissolved						
Subsample			Field Filtered			
Metals Total						
Aluminum	Total	mg/L	0.2			0.02
Calcium	Total	mg/L	232			0.2
Iron	Total	mg/L	0.77			0.05
Magnesium	Total	mg/L	108			0.2
Manganese	Total	mg/L	0.824			0.005
Potassium	Total	mg/L	33.7			0.4
Silicon	Total	mg/L	4.72			0.05
Sodium	Total	mg/L	150			0.4
Sulfur	Total	mg/L	210			0.3
Mercury	Total	mg/L	<0.00005			0.000005
Antimony	Total	mg/L	<0.0004			0.0002
Arsenic	Total	mg/L	0.002			0.0002
Barium	Total	mg/L	0.106			0.001
Beryllium	Total	mg/L	<0.0002			0.0001
Bismuth	Total	mg/L	<0.001			0.0005
Boron	Total	mg/L	1.18			0.002
Cadmium	Total	mg/L	<0.00002			0.00001
Chromium	Total	mg/L	0.001			0.0005
Cobalt	Total	mg/L	0.001			0.0001
Copper	Total	mg/L	0.003			0.001
Lead	Total	mg/L	0.0002			0.0001
Lithium	Total	mg/L	0.053			0.001
Molybdenum	Total	mg/L	<0.002			0.001
Nickel	Total	mg/L	0.011			0.0005
Selenium	Total	mg/L	0.0003			0.0002
Silver	Total	mg/L	<0.00002			0.00001
Strontium	Total	mg/L	0.854			0.001
Thallium	Total	mg/L	<0.0001			0.00005
Tin	Total	mg/L	<0.002			0.001
Titanium	Total	mg/L	0.0022			0.0005

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Analytical Report



Bill To:	Town of Inuvik	Project ID:	SNP 0036-4	Lot ID:	1286104
	Box 1160	Project Name:		Control Number:	
	2 Firth Street	Project Location:	Pit NW of Dump	Date Received:	Jul 20, 2018
	Inuvik, NT, Canada	LSD:		Date Reported:	Jul 27, 2018
	X0E 0T0	P.O.:		Report Number:	2307013
Attn:	Accounts Payable	Proj. Acct. code:			
Sampled By:	M. O'Rourke				
Company:	Tol				

Reference Number 1286104-1 Sample Date Jul 18, 2018 Sample Time 09:50 Sample Location Sample Description SNP0036-4 / 8.1°C

		Matrix	Water			
Analyte		Units	Results	Results	Results	Nominal Detection Limit
Metals Total - Continued						
Uranium	Total	mg/L	0.001			0.0005
Vanadium	Total	mg/L	0.002			0.0001
Zinc	Total	mg/L	0.013			0.001
Zirconium	Total	mg/L	<0.002			0.001
Physical and Aggregate I	Properties					
Solids	Total Suspended	mg/L	32			2
Routine Water						
pН			8.02			
Temperature of observed pH		°C	18.0			
Electrical Conductivity	at 25 °C	µS/cm	2180			1
Electrical Conductivity	at 25 °C	dS/m	2.18			0.001
Calcium	Dissolved	meq/L	11.7			0.01
Calcium	Dissolved	mg/L	234			0.2
Magnesium	Dissolved	meq/L	9.17			0.01
Magnesium	Dissolved	mg/L	111			0.2
Sodium	Dissolved	meq/L	6.69			0.02
Sodium	Dissolved	mg/L	154			0.4
Potassium	Dissolved	meq/L	0.89			0.01
Potassium	Dissolved	mg/L	34.7			0.4
Chloride	Dissolved	mg/L	100			0.4
Chloride		meq/L	2.83			0.01
Sulfate (SO4)	Dissolved	mg/L	621			0.9
Sulfate-S		meq/L	12.9			
Sulfate-S	Dissolved	mg/L	207			0.3
Total Dissolved Solids	Estimated	mg/L	1400			1
SAR	Dissolved		2.1			

Anthony Weuman

Approved by:

Anthony Neumann, MSc Laboratory Operations Manager

Data have been validated by Analytical Quality Control and Exova's Integrated Data Validation System (IDVS). Generation and distribution of the report, and approval by the digitized signature above, are performed through a secure and controlled automatic process.

Terms and Conditions: https://www.exova.com/media/1232/exova-canada-inc-standard-conditions-of-contract-short-form.pdf

T: +1 (780) 438-5522 F: +1 (780) 434-8586 E: Edmonton@exova.com W: www.exova.com

Methodology and Notes

Page 3 of 4

Bill To:	Town of Inuvik	Project ID:	SNP 0036-4	Lot I
	Box 1160	Project Name:		Control Numb
	2 Firth Street	Project Location:	Pit NW of Dump	Date Receive
	Inuvik, NT, Canada	LSD:		Date Reporte
	X0E 0T0	P.O.:		Report Numb
Attn:	Accounts Payable	Proj. Acct. code:		
Sampled By:	M. O'Rourke			
Company:	Tol			

Method of Analysis

Lot ID: **1286104** ontrol Number: Date Received: Jul 20, 2018 Date Reported: Jul 27, 2018 Report Number: 2307013

Method Name	Reference	Method	Date Analysis Started	Location
Alkalinity, pH, and EC in water	APHA	* Conductivity, 2510 B	Jul 23, 2018	Exova Edmonton
Alkalinity, pH, and EC in water	APHA	* pH - Electrometric Method, 4500-H+ B	Jul 23, 2018	Exova Edmonton
BOD (Carbonaceous) in water	APHA	* 5 Day, 5210 B	Jul 20, 2018	Exova Edmonton
Chloride in Water	APHA	* Automated Ferricyanide Method, 4500-CI- E	Jul 20, 2018	Exova Edmonton
Mercury (Total) in water	EPA	* Mercury in Water by Cold Vapor Atomic Fluorescence Spectrometry, 245.7	Jul 20, 2018	Exova Edmonton
Mercury (Total) in water	US EPA	* Determination of Hg in Sediment by Cold Vapor Atomic Absorption Spec, 245.5	Jul 20, 2018	Exova Edmonton
Metals ICP-MS (Total) in water	APHA/USEPA	* Metals By Inductively Coupled Plasma/Mass Spectrometry, APHA 3125 B / USEPA 200.2, 200.8	Jul 23, 2018	Exova Edmonton
Metals ICP-MS (Total) in water	US EPA	 Determination of Trace Elements in Waters and Wastes by ICP-MS, 200.8 	Jul 23, 2018	Exova Edmonton
Metals Trace (Dissolved) in water	APHA	 Inductively Coupled Plasma (ICP) Method, 3120 B 	Jul 23, 2018	Exova Edmonton
Metals Trace (Total) in water	APHA	 Inductively Coupled Plasma (ICP) Method, 3120 B 	Jul 23, 2018	Exova Edmonton
Phenol in water	APHA	* Direct Photometric Method, 5530 D	Jul 24, 2018	Exova Edmonton
Phosphorus - Total in Water	APHA	 * Automated Ascorbic Acid Reduction Method, 4500-P F 	Jul 22, 2018	Exova Edmonton
Solids Suspended (Total, Fixed and Volatile)	APHA	 * Total Suspended Solids Dried at 103- 105'C, 2540 D 	Jul 24, 2018	Exova Edmonton
		* Reference Method Modified		

References

APHA	Standard Methods for the Examination of Water and Wastewater
APHA/USEPA	Standard Methods For Water/ Environmental Protection Agency
EPA	Environmental Protection Agency Test Methods - US
US EPA	US Environmental Protection Agency Test Methods

Comments:

• Jul 24, 2018 - Sample 1286104-1; 6193277: Some trace total metal results were less than dissolved metal results for sample 1286104-1. The results were verified and are within expected measurement uncertainty.

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Methodology and Notes

Bill To: Town of Inuvik Box 1160 2 Firth Street Inuvik, NT, Canada X0E 0T0 Attn: Accounts Payable Sampled By: M. O'Rourke Company: Tol

Project ID: SNP 0036-4 Project Name: Project Location: LSD: P.O.: Proj. Acct. code:

Pit NW of Dump

Exova

Page 4 of 4

4000404

1286104
Jul 20, 2018
Jul 27, 2018
2307013

Please direct any inquiries regarding this report to our Client Services Group or to the Operations Manager at the coordinates indicated at the top left of this page. Results relate only to samples as submitted.

Exova	Testing	Billing Informat	ion:		Co	py of R	Report To:										RUS	H Priority
EXUVU	Advising	Company	Town of Inuv	ik	Cor	mpany	Aeco	om -	Edr	nont	on	1						section, client accepts that
www.exova.com	1.	Address	Box 1160 2 F	Firth Street	Add	dress	1720	3-10	03rd	Ave	enue					surc	narges will be	e applied to the analysis
Project Information	on		Inuvik, NT X	DE OTO			Edmo	nton,	, AB ⁻	T5S 1	J4					Date F	equired	いるが
Project ID	SNP 0036- 4	Attention	Rick Campbe	ell	Atte	ention	Rich	ard	Feild	den						As Ind	cated	All Analysis
Project Name		Phone	(867) 777-86	15	Pho	one	(780) 48	8-68	00						Milhon		
Project Location	Pit NW of dump	Cell	(867) 678-53	88	Cel	I .												equested, turn around will SH priority, with pricing and
Legal Location		Fax	(867) 777-86	01	Fax	c	(780) 48	8-21	21						turn arou	nd time to ma	atch. Please contact the lab
PO/AFE#	100104	E-mail	rcampbell	@town.inuvik.nt.ca	E-m	nail	richa	rd.fe	eilde	en@a	aeco	m.cc	m			p	nor to submi	tting RUSH samples
Proj. Acct.Code		Agreement ID	2909													Signat	ure	44
		Copy of Report			Cop	by of in	voice									Sa	mple Cust	ody (please print)
Report Results	X E-Mail	Online	PDF		QA	/QC Re	eport	Π					T	T	TT	Sampled	by: N	latt O'Rourke
Report Results	Mail X	Fax	Excel													Company	то	own of Inuvik
Special Instruction from above).	s/Comments (please in	nclude contact info	ormation includ	ling ph. # if different			ulatory s below	Containers								l auth		to proceed with the work d on this form:
Sampler: Circle Pr	oject ID Below and not	e weather:						ntai								18-Jul-18		M.O
	NP4 Mt.B W - SNP5 Mt															This	section	for Lab use only
SNP6 GatePond -	SNP7 FarPond - SNP8	3 TwinL						er o								Date/Tir	ne stamp:	
Temp 11 C, precip	69, Wind dir SW Vel	19 km/h						Number of								beend beend	20 AM 6	.:24
Sample	Identification	Location	Depth in cm m	Date/Time sample	d M	latrix	Sampling method	Ţ									below any of sample	deficiencies in the es:
1 B.O.D.		SNP0036-4		July 18, 2018-9:5	50a		Dip	1	Τ	Т	Τ		Τ	Τ				Were Exova supplies
2 Oil & Greas	е	11					u	1										used?
3 Microbiolog	у	"		U			"	1										Was there any damage
4 Routine		"		II			u	1										to the shipping container?
5 Nutrients							"	1										
6 Metals		"		11			"	1		1								Were the containers
7 Phenol		u -		"			"	1					-					packaged well?
8													÷.					
9														1				Were the expected
10		1. B																 number of samples received (document
11		22	1											de				below)?
12					1									(P)				
13	y.1	1	-											- 1				Are samples within
14			t			4												recommended holding times/temp?
15	12											1		100				
Note: Prop	Environmental S er completion of this fo			et ad with analysis	Lot:	128	6104	coc						nippin OD Y		# and size	of coolers re	eceived:
	ase indicate any												C	oler	temp:	Delivery	Method:	Bac
		19725											1	5	1	Waybill:	5	
Page 1	of 1	Control #											ar.	Y	. 1	Receive	d by: //	

Report Transmission Cover Page



Bill To:	Town of Inuvik	Project ID:	SNP 0036-4,5&9	Lot ID:	1292125
	Box 1160	Project Name:		Control Number:	
	2 Firth Street	Project Location:	Inuvik	Date Received:	Aug 16, 2018
	Inuvik, NT, Canada	LSD:		Date Reported:	Aug 22, 2018
	X0E 0T0	P.O.:	100104	Report Number:	2315147
Attn:	Rick Campbell	Proj. Acct. code:			
Sampled By:	Matt O'Rourke				
Company:	Town of Inuvik				

Contact	Company	Address
Jason Casault	AECOM - Edmonton	101, 18817 Stony Plain Road
		Edmonton, AB T5S 0C2
		Phone: (780) 486-7050 Fax: (780) 486-7070
		Email: Jason.Casault@aecom.com
Delivery	Format	Deliverables
Email - Merge Reports	PDF	COC / COA
Email - Merge Reports	PDF	COC / Test Report
Kim Wainman	Town of Inuvik	Box 1160, 2 Firth Street
		Inuvik, NT X0E 0T0
		Phone: (867) 777-8615 Fax: (867) 777-8601
		Email: kwainman@town.inuvik.nt.ca
Delivery	Format	Deliverables
Email - Single Report	PDF	Invoice
Rick Campbell	Town of Inuvik	Box 1160, 2 Firth Street
		Inuvik, NT X0E 0T0
		Phone: (867) 777-8615 Fax: (867) 777-8601
		Email: rcampbell@town.inuvik.nt.ca
Delivery	Format	Deliverables
Email - Merge Reports	PDF	COC / Test Report
Email - Single Report	PDF	Invoice
Utilidor	Town of Inuvik	Box 1160, 2 Firth Street
		Inuvik, NT X0E 0T0
		Phone: (867) 777-2607 Fax: (867) 777-2071
		Email: utilidor@town.inuvik.nt.ca
Delivery	<u>Format</u>	Deliverables
Email - Single Report	PDF	Invoice

Notes To Clients:

Exova
7217 Roper Road NW
Edmonton, Alberta
T6B 3J4, Canada

Analytical Report



Bill To: Town of Inuvik Box 1160 2 Firth Street Inuvik, NT, Canada X0E 0T0 Attn: Rick Campbell Sampled By: Matt O'Rourke Company: Town of Inuvik		Project Name: Project Location: In LSD:	SNP 0036-4,5&9 nuvik 00104	Control Nu Date Rece Date Rep	eived: Aug 16, 2018	
		Reference Number Sample Date Sample Time Sample Location	Aug 15, 2018	1292125-2 Aug 15, 2018 09:15	1292125-3 Aug 15, 2018 08:30	
		Sample Description	Pit N/W of Dump / SNP0036-4 / 3.2°C	Pond S/E of Dump / SNP0036-5 / 3.2°C	Creek N/W of Dump / SNP0036-9 / 3.2°C	
		Matrix	Water	Water	Water	
Analyte		Units	Results	Results	Results	Nominal Detectior Limit
Aggregate Orga	anic Constituents					Linint
Biochemical Ox Demand		mg/L	<4	<4	<4	4
Phenol		mg/L	0.002	<0.001	0.003	0.001
-	netallic Parameters					
Phosphorus	. Total	mg/L	0.08	0.07	<0.05	0.05
Metals Dissolve	ed					
Subsample			Lab Filtered	Lab Filtered	Lab Filtered	
Metals Total	-	<i>a</i>	0.00	0.00	0.47	0.00
Aluminum	Total	mg/L	0.20	0.06	0.17	0.02
Calcium	Total	mg/L	220	34.8	31.4	0.2
Iron	Total	mg/L	1.6	0.55	0.97	0.05
Magnesium	Total	mg/L	103	14.6	13.2	0.2
Manganese	Total	mg/L	1.03	0.020	0.408	0.005
Potassium	Total	mg/L	30.1	1.9	1.1	0.4
Silicon	Total	mg/L	4.14	0.28	1.41	0.05
Sodium	Total	mg/L	143	17.5	10.4	0.4
Sulfur	Total	mg/L	218	30.7	39.9	0.3
Mercury	Total	mg/L	0.000007	0.000012	0.00008	0.000005
Antimony	Total	mg/L	<0.0004	<0.0002	<0.0002	0.0002
Arsenic	Total	mg/L	0.001	0.0014	0.0008	0.0002
Barium	Total	mg/L	0.081	0.040	0.019	0.001
Beryllium	Total	mg/L	<0.0002	<0.0001	<0.0001	0.0001
Bismuth	Total	mg/L	<0.001	<0.0005	<0.0005	0.0005
Boron	Total	mg/L	0.941	0.018	0.027	0.002
Cadmium	Total	mg/L	<0.00002	<0.00001	0.00002	0.00001
Chromium	Total	mg/L	0.001	<0.0005	<0.0005	0.0005
Cobalt	Total	mg/L	0.001	0.0002	0.0009	0.0001
Copper	Total	mg/L	<0.002	<0.001	0.002	0.001
Lead	Total	mg/L	0.0003	0.0001	0.0001	0.0001
Lithium	Total	mg/L	0.043	0.008	0.010	0.001
Molybdenum	Total	mg/L	< 0.002	<0.001	<0.001	0.001
Nickel	Total	mg/L	0.0078	0.0021	0.0101	0.0005
Selenium	Total	mg/L	0.0002	<0.0002	<0.0002	0.0002
Silver	Total	mg/L	<0.00002	< 0.00001	<0.00001	0.00001
Strontium	Total Total	mg/L mg/L	0.860 <0.0001	0.121 <0.00005	0.106 <0.00005	0.001 0.00005
Thallium						

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mg/L

mg/L

< 0.002

0.0081

<0.001

< 0.0005

<0.001

0.0023

0.001

0.0005

Total

Total

Tin

Titanium

Analytical Report



Attn: Sampled By:	Town of Inuvik Box 1160 2 Firth Street Inuvik, NT, Canada X0E 0T0 Rick Campbell Matt O'Rourke Town of Inuvik	Project Location: Inuvik LSD:		Control Nu Date Rece Date Rep	ot ID: 1292125 mber: eived: Aug 16, 2018 orted: Aug 22, 2018 mber: 2315147	
		Reference Number	1292125-1	1292125-2	1292125-3	
		Sample Date Sample Time Sample Location	09:00	Aug 15, 2018 09:15	Aug 15, 2018 08:30	
		Sample Description		Pond S/E of Dump / SNP0036-5 / 3.2°C	Creek N/W of Dump / SNP0036-9 / 3.2°C	
		Matrix	Water	Water	Water	
Analyte		Units	Results	Results	Results	Nominal Detection Limit
Metals Total - Co	ontinued					
Uranium	Total	mg/L	<0.001	<0.0005	<0.0005	0.0005
Vanadium	Total	mg/L	0.002	0.0017	0.0009	0.0001
Zinc	Total	mg/L	0.005	0.003	0.011	0.001
Zirconium	Total	mg/L	<0.002	<0.001	<0.001	0.001
	gregate Properties					
Solids	Total Suspende	ed mg/L	12	<2	3	2
Routine Water						
рН			8.16	7.91	7.52	
Temperature of o	observed	°C	21.3	21.4	21.4	
pH Electrical Condu	ctivity at 25 °C	µS/cm	2170	350	317	1
Electrical Condu		dS/m	2.17	0.350	0.317	0.001
Calcium	Dissolved	meg/L	11.1	1.72	1.56	0.01
Calcium	Dissolved	mg/L	223	34.4	31.2	0.2
Magnesium	Dissolved	meg/L	8.79	1.20	1.09	0.01
Magnesium	Dissolved	mg/L	107	14.6	13.2	0.2
Sodium	Dissolved	meq/L	6.26	0.75	0.45	0.02
Sodium	Dissolved	mg/L	144	17.2	10.3	0.4
Potassium	Dissolved	meq/L	0.75	0.05	0.03	0.01
Potassium	Dissolved	mg/L	29.5	1.8	1.0	0.4
Chloride	Dissolved	mg/L	89.8	14.9	4.0	0.4
Chloride		meq/L	2.53	0.42	0.11	0.01
Sulfate (SO4)	Dissolved	mg/L	675	90.2	118	0.9
Sulfate-S		meq/L	14.0	1.88	2.45	
Sulfate-S	Dissolved	mg/L	225	30.1	39.2	0.3
Total Dissolved	Solids Estimated	mg/L	1390	224	203	1
SAR	Dissolved		2.0	0.6	0.4	
Mono-Aromatic	Hydrocarbons - Water					
Benzene		mg/L	<0.001	<0.001	<0.001	0.001
Toluene		mg/L	<0.0004	<0.0004	<0.0004	0.0004
Ethylbenzene		mg/L	<0.0010	<0.0010	<0.0010	0.0010
Total Xylenes (m		mg/L	<0.001	<0.001	<0.001	0.001
	m Hydrocarbons - Water					
F1 -BTEX		mg/L	<0.1	<0.1	<0.1	0.1
F1 C6-C10		mg/L	<0.1	<0.1	<0.1	0.1
F2 C10-C16		mg/L	<0.1	<0.1	<0.1	0.1

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Analytical Report

Bill To: Town of Inuvik

Box 1160 2 Firth Street

X0E 0T0

Attn: Rick Campbell

Sampled By: Matt O'Rourke Company: Town of Inuvik

Inuvik, NT, Canada

Project ID: Project Name: Project Location: LSD: P.O.: Proj. Acct. code:

SNP 0036-4,5&9 Inuvik 100104

Lot ID: 1292125 Control Number:

Page 3 of 5

Exova

Date Received: Aug 16, 2018 Date Reported: Aug 22, 2018 Report Number: 2315147

Anthony Weuman

Approved by:

Anthony Neumann, MSc Laboratory Operations Manager

Data have been validated by Analytical Quality Control and Exova's Integrated Data Validation System (IDVS). Generation and distribution of the report, and approval by the digitized signature above, are performed through a secure and controlled automatic process.

Methodology and Notes



Bill To:	Town of Inuvik	Project ID:	SNP 0036-4,5&9	Lot ID:	129212
	Box 1160	Project Name:		Control Number:	
	2 Firth Street	Project Location:	Inuvik	Date Received:	Aug 16, 20
	Inuvik, NT, Canada	LSD:		Date Reported:	Aug 22, 20
	X0E 0T0	P.O.:	100104	Report Number:	2315147
Attn:	Rick Campbell	Proj. Acct. code:			
Sampled By:	Matt O'Rourke				
Company:	Town of Inuvik				

Method of Analysis

25 2018 2018

Mictilou of Analysis				
Method Name	Reference	Method	Date Analysis Started	Location
Alkalinity, pH, and EC in water	APHA	* Conductivity, 2510 B	Aug 17, 2018	Exova Edmonton
Alkalinity, pH, and EC in water	APHA	* pH - Electrometric Method, 4500-H+ B	Aug 17, 2018	Exova Edmonton
BOD (Carbonaceous) in water	APHA	* 5 Day, 5210 B	Aug 21, 2018	Exova Edmonton
BTEX-CCME - Water	US EPA	 Volatile Organic Compounds in Various Sample Matrices Using Equilibrium Headspace Analysis/Gas Chromatography Mass Spectrometry, 5021/8260 	Aug 17, 2018	Exova Calgary
Chloride in Water	APHA	* Automated Ferricyanide Method, 4500-CI- E	Aug 20, 2018	Exova Edmonton
Mercury (Total) in water	EPA	* Mercury in Water by Cold Vapor Atomic Fluorescence Spectrometry, 245.7	Aug 16, 2018	Exova Edmonton
Mercury (Total) in water	US EPA	* Determination of Hg in Sediment by Cold Vapor Atomic Absorption Spec, 245.5	Aug 16, 2018	Exova Edmonton
Metals ICP-MS (Total) in water	APHA/USEPA	 Metals By Inductively Coupled Plasma/Mass Spectrometry, APHA 3125 B / USEPA 200.2, 200.8 	Aug 17, 2018	Exova Edmonton
Metals ICP-MS (Total) in water	US EPA	 Determination of Trace Elements in Waters and Wastes by ICP-MS, 200.8 	Aug 17, 2018	Exova Edmonton
Metals Trace (Dissolved) in water	APHA	 Inductively Coupled Plasma (ICP) Method, 3120 B 	Aug 17, 2018	Exova Edmonton
Metals Trace (Total) in water	APHA	 Inductively Coupled Plasma (ICP) Method, 3120 B 	Aug 17, 2018	Exova Edmonton
Phenol in water	APHA	* Direct Photometric Method, 5530 D	Aug 17, 2018	Exova Edmonton
Phosphorus - Total in Water	APHA	 * Automated Ascorbic Acid Reduction Method, 4500-P F 	Aug 17, 2018	Exova Edmonton
Solids Suspended (Total, Fixed and Volatile)	APHA	 Total Suspended Solids Dried at 103- 105'C, 2540 D 	Aug 17, 2018	Exova Edmonton
		* Reference Method Modified		

References

APHA	Standard Methods for the Examination of Water and Wastewater
APHA/USEPA	Standard Methods For Water/ Environmental Protection Agency
EPA	Environmental Protection Agency Test Methods - US
US EPA	US Environmental Protection Agency Test Methods

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Methodology and Notes

Page 5 of 5 Exova

Bill To:	Town of Inuvik	Project ID:	SNP 0036-4,5&9	Lot ID:	1292125
	Box 1160	Project Name:		Control Number:	
	2 Firth Street	Project Location:	Inuvik	Date Received:	Aug 16, 2018
	Inuvik, NT, Canada	LSD:		Date Reported:	Aug 22, 2018
	X0E 0T0	P.O.:	100104	Report Number:	2315147
Attn:	Rick Campbell	Proj. Acct. code:			
Sampled By:	Matt O'Rourke				
Company:	Town of Inuvik				

Please direct any inquiries regarding this report to our Client Services Group or to the Operations Manager at the coordinates indicated at the top left of this page. Results relate only to samples as submitted.

Exova	Testing	Billing Informat	tion:			Copy of F	Report To:											RUSH	Priority
EXOVU	Advisi	Company	Town of Inuv	vik		Company													ction, client accepts that
www.exova.com		Address	Box 1160 2	Firth Street		Address	1720)3-1	03r	d Av	/enue	Э							pplied to the analysis
Project Information			Inuvik, NT X	KOE OTO		1	Edmo											Date Required	
Project ID	SNP 0036- 4,5 &	9. Attention	Rick Campb	bell		Attention	Rich											As Indicated	All Analysis
Project Name		Phone	(867) 777-86	615		Phone	(780) 48	8-6	800								When "ASAP" is reau	lested, turn around will
Project Location	Inuvik	Cell	(867) 678-53	388		Cell												default to a 100% RUSH	I priority, with pricing and
Legal Location		Fax	(867) 777-86			Fax	(780) 48	8-2	121									 Please contact the lab g RUSH samples
PO/AFE#	100104	E-mail	rcampbell	l@town.inuvik.nt.c	a	E-mail	richa	ard.f	eild	en@	Daec	om.	com						groonsampise
Proj. Acct.Code		Agreement ID	2909														× 1	Signature	
		Copy of Report				Copy of in	ivoice											Restored and the second second second second second	dy (please print)
Report Results	X E-Mail	Online	PDF			QA/QC R	eport											Sampled by: Mult	O'Route
		X Fax	Excel							Σī								Company Tow	n of Inuvik
		ase include contact info lium, Potassium and C		iding ph. # if different		ndicate Reg leguirement		Number of Containers		Total Metal+Total mercury								[] · · · · · · · · · · · · · · · · · · ·	proceed with the work on this form:
Sampler: note we	ather:							ntair		otal		Suspended Solids	fe				U,	Date: 08-13-18	
								Col	2W	Ľ±		So	Total Phosphate		slo		Dissolved S,P,	The second se	or Lab use only
								r of	BF1	leta		dec	hos	e	hen	ctivi	ed	Date/Time stamp:	
~		6	11					mbe	CCMEBF12W	al N	pH CBOD5	sper	al P	Sulphate	Total Phenols	Conductivity	solv		
Temp <u> 5 </u> C,	precip	, Wind dir <u>S</u> Ve	əl <i>16</i>	km/h				NU	8	Tot	E E	Sus	Tot	Sul	Tot	õ	Dis		
Sample	Identification	Location	Depth in cm m	Date/Time sampl	ed	Matrix	Sampling method	↓										Indicate below any de condition of samples:	
1 SNP0036-4		Pit N/W of Dump	2	900 A 08-15	-18	1.28	Dip	8	x	x	x x	x	x	x	x	x	х	<u> </u>	Were Exova supplies
2 SNP0036-5		Pond S/E of Dum	1	915A 03-15-		10	Dip	8			x x		_	x			х		used?
3 SNP0036-9		Creek N/Wof Durr		\$30A 08-15-1		29.5	Dip	8	х	x	x x	x	x	x	x	х	х		Was there any damage
4					-										3				to the shipping container?
5																			
6															1				Were the containers
7				T.		10.00													packaged well?
8				1		NU.		in the						2.5	1				
9																			Were the expected
10						-24			1										number of samples received (document
11								1						i.		2			below)?
12																			
13								Sec.											Are samples within
14		1	1	30	Ļ	13								2					recommended holding times/temp?
15											1	T.							
	Environmen	tal Sample Inforn	nation She	et	1									Shi	pping	g: .		# and size of coolers reco	eived:
Note: Prop	er completion of th	nis form is required in o	order to procee	ed with analysis	Lo	ot: 129	2125	.00						co	D Y/I	N		CA CA	_
Plea	ase indicate a	ny potentially ha	zordous sa	amples											oler te			Delivery Method:	OURSER
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Page 1	of 1	Control #)	8	<i>J</i> .			Received by:	JUNEZ





Bill To:	Town of Inuvik	Project ID:	SNP 0036-4,5 & 9	Lot ID:	1297946
	Box 1160	Project Name:		Control Number:	
	2 Firth Street	Project Location:	Inuvik	Date Received:	Sep 13, 2018
	Inuvik, NT, Canada	LSD:		Date Reported:	Sep 19, 2018
	X0E 0T0	P.O.:	100104	Report Number:	2322893
Attn:	Rick Campbell	Proj. Acct. code:			
Sampled By:	Matt O'Rourke				
Company:	Town of Inuvik				

Contact	Company	Address				
Jason Casault	AECOM - Edmonton	101, 18817 Stony Plain Road				
		Edmonton, AB T5S 0C2				
		Phone: (780) 486-7050 Fax: (780) 486-7070				
		Email: Jason.Casault@aecom.com				
Delivery	Format	Deliverables				
Email - Merge Reports	PDF	COC / COA				
Email - Merge Reports	PDF	COC / Test Report				
Kim Wainman	Town of Inuvik	Box 1160, 2 Firth Street				
		Inuvik, NT X0E 0T0				
		Phone: (867) 777-8615 Fax: (867) 777-8601				
		Email: kwainman@town.inuvik.nt.ca				
Delivery	Format	Deliverables				
Email - Single Report	PDF	Invoice				
Richard Feilden	AECOM - Edmonton	17203 - 103 Avenue				
		Edmonton, AB T5S 1J4				
		Phone: (780) 488-6800 Fax: (780) 488-2121				
		Email: richard.feilden@aecom.com				
Delivery	Format	Deliverables				
Email - Merge Reports	PDF	COC / Test Report				
Rick Campbell	Town of Inuvik	Box 1160, 2 Firth Street				
		Inuvik, NT X0E 0T0				
		Phone: (867) 777-8615 Fax: (867) 777-8601				
		Email: rcampbell@town.inuvik.nt.ca				
Delivery	<u>Format</u>	Deliverables				
Email - Merge Reports	PDF	COC / Test Report				
Email - Single Report	PDF	Invoice				
Utilidor	Town of Inuvik	Box 1160, 2 Firth Street				
		Inuvik, NT X0E 0T0				
		Phone: (867) 777-2607 Fax: (867) 777-2071				
		Email: utilidor@town.inuvik.nt.ca				
Delivery	Format	Deliverables				
Email - Single Report	PDF	Invoice				

Notes To Clients:

• Sep 19, 2018 - Some trace total metal results were less than dissolved metal results for sample #1297946-1. The results were verified and are within expected measurement uncertainty.

Analytical Report

Tin

Titanium



Bill To: Town of Inuvik Box 1160 2 Firth Street Inuvik, NT, Canada X0E 0T0 Attn: Rick Campbell Sampled By: Matt O'Rourke Company: Town of Inuvik		Project Name: Project Location: Ir LSD:	SNP 0036-4,5 & 9 nuvik 00104	Control Nu Date Rece Date Rep	eived: Sep 13, 2018	
		Reference Number Sample Date	1297946-1 Sep 12, 2018	1297946-2	1297946-3	
		Sample Date Sample Time Sample Location	08:58	Sep 12, 2018 08:37	Sep 12, 2018 09:10	
		Sample Description	Pit N/W of Dump / SNP0036-4 / 1°C	Pond S/E of Dump / SNP0036-5 / 1°C	Creek N/W of Dump / SNP0036-9 / 1°C	
		Matrix	Water	Water	Water	
Analyte		Units	Results	Results	Results	Nominal Detectio
	nic Constituents	••••••				Limit
Biochemical Oxy Demand		mg/L	<4	<4	<4	4
Phenol		mg/L	<0.001	0.003	<0.001	0.001
norganic Nonm	etallic Parameters					
Phosphorus	Total	mg/L	0.06	0.14	<0.05	0.05
Metals Dissolve	d					
Subsample			Lab Filtered	Lab Filtered	Lab Filtered	
Metals Total						
Aluminum	Total	mg/L	0.08	0.34	0.18	0.02
Calcium	Total	mg/L	266	38.7	36.6	0.2
Iron	Total	mg/L	1.0	2.54	0.76	0.05
Magnesium	Total	mg/L	123	14.8	15.4	0.2
Manganese	Total	mg/L	0.919	0.271	0.482	0.005
Potassium	Total	mg/L	25.7	2.3	1.2	0.4
Silicon	Total	mg/L	4.00	1.29	1.67	0.05
Sodium	Total	mg/L	144	18.0	11.4	0.4
Sulfur	Total	mg/L	280	35.0	45.9	0.3
Mercury	Total	mg/L	0.000011	0.000013	0.000012	0.000005
Antimony	Total	mg/L	<0.0004	0.0002	<0.0002	0.0002
Arsenic	Total	mg/L	0.001	0.0029	0.0007	0.0002
Barium	Total	mg/L	0.080	0.075	0.019	0.001
Beryllium	Total	mg/L	<0.0002	<0.0001	<0.0001	0.0001
Bismuth	Total	mg/L	<0.001	<0.0005	<0.0005	0.0005
Boron	Total	mg/L	0.766	0.020	0.026	0.002
Cadmium	Total	mg/L	0.00002	<0.00001	0.00003	0.00001
Chromium	Total	mg/L	<0.001	0.0008	<0.0005	0.0005
Cobalt	Total	mg/L	0.001	0.0005	0.0011	0.0001
Copper	Total	mg/L	0.002	0.002	0.002	0.001
Lead	Total	mg/L	0.0002	0.0007	<0.0001	0.0001
Lithium	Total	mg/L	0.040	0.009	0.011	0.001
Molybdenum Nickol	Total	mg/L	< 0.002	<0.001	<0.001	0.001
Nickel	Total	mg/L	0.0076	0.0030	0.0116	0.0005
Selenium	Total	mg/L	<0.0002	0.0002	<0.0002	0.0002
Silver	Total	mg/L	<0.00002	<0.00001	< 0.00001	0.00001
Strontium	Total	mg/L	0.924	0.119	0.108	0.001
Thallium	Total	mg/L	<0.0001	<0.00005	<0.00005	0.00005

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mg/L

mg/L

< 0.002

0.0020

<0.001

0.0031

<0.001

0.0013

0.001

0.0005

Total

Total

Analytical Report



Attn: Sampled By:	Town of Inuvik Box 1160 2 Firth Street Inuvik, NT, Canada X0E 0T0 Rick Campbell Matt O'Rourke Town of Inuvik	Project Name: Project Location: LSD:	SNP 0036-4,5 & 9 Inuvik 100104	Control Nu Date Rece Date Rep		
		Reference Number Sample Date Sample Time	e Sep 12, 2018 e 08:58	1297946-2 Sep 12, 2018 08:37	1297946-3 Sep 12, 2018 09:10	
		Sample Location Sample Description		Pond S/E of Dump / SNP0036-5 / 1°C	Creek N/W of Dump / SNP0036-9 / 1°C	
		Matrix	water	Water	Water	
Analyte		Units	Results	Results	Results	Nominal Detection Limit
Metals Total - Co	ntinued					Linin
Uranium	Total	mg/L	<0.001	<0.0005	<0.0005	0.0005
Vanadium	Total	mg/L	0.0008	0.0029	0.0004	0.0001
Zinc	Total	mg/L	0.008	0.004	0.015	0.001
Zirconium	Total	mg/L	<0.002	<0.001	<0.001	0.001
Physical and Age	gregate Properties					
Solids	Total Suspended	l mg/L	6	23	5	2
Routine Water						
рН			7.96	7.36	7.13	
Temperature of c	bserved	°C	21.7	21.6	21.5	
pH Electrical Conduc	ctivity at 25 °C	µS/cm	2340	375	357	1
Electrical Conduc	•	dS/m	2.34	0.375	0.357	0.001
Calcium	Dissolved	meg/L	13.5	1.88	1.74	0.01
Calcium	Dissolved	mg/L	270	37.6	34.9	0.2
Magnesium	Dissolved	meq/L	10.1	1.20	1.22	0.01
Magnesium	Dissolved	, mg/L	123	14.6	14.9	0.2
Sodium	Dissolved	meq/L	6.31	0.78	0.47	0.02
Sodium	Dissolved	mg/L	145	17.9	10.9	0.4
Potassium	Dissolved	meq/L	0.65	0.06	0.03	0.01
Potassium	Dissolved	mg/L	25.4	2.2	1.1	0.4
Chloride	Dissolved	mg/L	89.5	15.7	4.5	0.4
Chloride		meq/L	2.53	0.44	0.13	0.01
Sulfate (SO4)	Dissolved	mg/L	845	102	134	0.9
Sulfate-S		meq/L	17.6	2.11	2.78	
Sulfate-S	Dissolved	mg/L	282	33.9	44.6	0.3
Total Dissolved S		mg/L	1500	240	228	1
SAR	Dissolved		1.8	0.6	0.4	
	Hydrocarbons - Water					
Benzene		mg/L	< 0.001	<0.001	<0.001	0.001
Toluene		mg/L	< 0.0004	< 0.0004	< 0.0004	0.0004
Ethylbenzene	2 2)	mg/L	<0.0010	<0.0010	<0.0010	0.0010
Total Xylenes (m		mg/L	<0.001	<0.001	<0.001	0.001
	m Hydrocarbons - Water	~~/l	-0.1	-0.1	-0.1	0.1
F1 -BTEX F1 C6-C10		mg/L	<0.1 <0.1	<0.1 <0.1	<0.1 <0.1	0.1 0.1
F1 C6-C10 F2 C10-C16		mg/L	<0.1	<0.1 <0.1	<0.1 <0.1	0.1
12010-010		mg/L	NO. 1	NU.1	NU.1	0.1

Analytical Report

Company:

Bill To: Town of Inuvik

Box 1160 2 Firth Street

X0E 0T0

Attn: Rick Campbell

Town of Inuvik

Sampled By: Matt O'Rourke

Inuvik, NT, Canada

Project ID: Project Name: Project Location: LSD: P.O.: Proj. Acct. code:

SNP 0036-4,5 & 9 Inuvik 100104

Page 3 of 5 Exovo

Lot ID: 1297946

Control Number: Date Received: Sep 13, 2018 Date Reported: Sep 19, 2018 Report Number: 2322893

Murray Klutz

Senior Agronomist

Approved by:

Data have been validated by Analytical Quality Control and Exova's Integrated Data Validation System (IDVS). Generation and distribution of the report, and approval by the digitized signature above, are performed through a secure and controlled automatic process.

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Methodology and Notes



Lot ID: 1297946 Bill To: Town of Inuvik Project ID: SNP 0036-4,5 & 9 Project Name: Box 1160 Control Number: 2 Firth Street Project Location: Inuvik Date Received: Sep 13, 2018 Inuvik, NT, Canada LSD: Date Reported: Sep 19, 2018 X0E 0T0 P.O.: 100104 Report Number: 2322893 Attn: Rick Campbell Proj. Acct. code: Sampled By: Matt O'Rourke Company: Town of Inuvik

Method of Analysis

Method Name	Reference	Method		Date Analysis Started	Location
Alkalinity, pH, and EC in water	APHA	Conductivity, 2510 B	3	Sep 17, 2018	Exova Edmonton
Alkalinity, pH, and EC in water	APHA	pH - Electrometric M	lethod, 4500-H+ B	Sep 17, 2018	Exova Edmonton
BOD (Carbonaceous) in water	APHA	5 Day, 5210 B		Sep 14, 2018	Exova Edmonton
BTEX-CCME - Water	US EPA	Volatile Organic Col Sample Matrices Us Headspace Analysis Chromatography Ma 5021/8260	s/Gas	Sep 14, 2018	Exova Calgary
Chloride in Water	APHA	Automated Ferricya E	nide Method, 4500-Cl-	Sep 13, 2018	Exova Edmonton
Mercury (Total) in water	EPA	Mercury in Water by Fluorescence Spect	v Cold Vapor Atomic rometry, 245.7	Sep 15, 2018	Exova Edmonton
Mercury (Total) in water	US EPA	Determination of Hg Vapor Atomic Absor	in Sediment by Cold ption Spec, 245.5	Sep 15, 2018	Exova Edmonton
Metals ICP-MS (Total) in water	APHA/USEPA	Metals By Inductive Plasma/Mass Spect B / USEPA 200.2, 2	rometry, APHA 3125	Sep 14, 2018	Exova Edmonton
Metals ICP-MS (Total) in water	US EPA	Determination of Tra Waters and Wastes		Sep 14, 2018	Exova Edmonton
Metals Trace (Dissolved) in water	APHA	Inductively Coupled Method, 3120 B	Plasma (ICP)	Sep 14, 2018	Exova Edmonton
Metals Trace (Total) in water	APHA	Inductively Coupled Method, 3120 B	Plasma (ICP)	Sep 14, 2018	Exova Edmonton
Phenol in water	APHA	Direct Photometric	Method, 5530 D	Sep 18, 2018	Exova Edmonton
Phosphorus - Total in Water	APHA	Automated Ascorbic Method, 4500-P F	Acid Reduction	Sep 18, 2018	Exova Edmonton
Solids Suspended (Total, Fixed and Volatile)	APHA	Total Suspended So 105'C, 2540 D	blids Dried at 103-	Sep 17, 2018	Exova Edmonton
		* Reference Method Mod	lified		

References

APHA	Standard Methods for the Examination of Water and Wastewater
APHA/USEPA	Standard Methods For Water/ Environmental Protection Agency
EPA	Environmental Protection Agency Test Methods - US
US EPA	US Environmental Protection Agency Test Methods

Comments:

• Sep 19, 2018 - Some trace total metal results were less than dissolved metal results for sample #1297946-1. The results were verified and are within expected measurement uncertainty.

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Methodology and Notes

Page 5 of 5 Exova

Bill To:	Town of Inuvik	Project ID:	SNP 0036-4,5 & 9	Lot ID:	1297946
	Box 1160	Project Name:		Control Number:	
	2 Firth Street	Project Location:	Inuvik	Date Received:	Sep 13, 2018
	Inuvik, NT, Canada	LSD:		Date Reported:	Sep 19, 2018
	X0E 0T0	P.O.:	100104	Report Number:	2322893
Attn:	Rick Campbell	Proj. Acct. code:			
Sampled By:	Matt O'Rourke				
Company:	Town of Inuvik				

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Testing	10 Billing Information:	tion:	Conv of Report To:	port To:								RUSH	RUSH Priority
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www.exova.com		Box 1160 2 Firth Street	Address	17203-103rd Avenue	3-103		enue					Upon filling out this see surcharges will be a	Upon filling out this section, client accepts that surcharges will be applied to the analysis
Project Information		Inuvik, NT X0E 0T0		Edmonton, AB T5S 1J4	iton, A	B T5S	1J4					Date Required	
Project ID SNP 0036- 4,5 & 9.	& 9. Attention	Rick Campbell	Attention	Richard Feilden	Ird Fe	eilden						As Indicated	All Analysis
Project Name	Phone	(867) 777-8615	Phone	(780) 488-6800	488-	6800						When "ASAP" is red	When "ASAD" is requested turn around will
Project Location Inuvik	Cell	(867) 678-5388	Cell									default to a 100% RUSH	default to a 100% RUSH priority, with pricing and
ation	Fax	(867) 777-8601	Fax	(780) 488-2121	488-	2121						turn around time to matc	turn around time to match. Please contact the lab
PO/AFE# 100104	E-mail	npbell@town.inuvik.nt	.ca E-mail	richard.feilden@aecom.com	d.feil	den (c	(aeco	m.co	E				
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Mail	X Fax	Excel				ιιλ			-			Company Towi	Town of Inuvik
Special Instructions/Comments (please include contact information including ph. # if differen from above). Dissolved S,P,C is Sodium, Potassium and Calcium.	sase include contact info odium, Potassium and C	ormation including ph. # if different alcium.	Indicate Regulatory Requirements below	atory below	sıəı	mercu						I authorize Exova to indicated c	I authorize Exova to proceed with the work indicated on this form:
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Sample Identification	Location	Depth Date/Time sampled in cm m	Matrix	Sampling method	\rightarrow							Indicate below any deficiencies in the condition of samples:	ficiencies in the
1 SNP0036-4	Pit N/W of Dump	4 858 / SI-CI-60 d	4	Dip	× ∞	×	××	×	××	×	××		Were Exova supplies
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3 SNP0036-9	Creek N/Wof Dump	Hatb /SI-CI-be du	t	Dip	× 8	×	××	×	××	×	××		Was there any damage
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Page 1 of 1	Control #	#								_		Waybill: Received hv:	5 22
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Report Transmission Cover Page



Bill To:	Town of Inuvik	Project ID:	SNP 0036-5	Lot ID:	1286096
	Box 1160	Project Name:		Control Number:	
	2 Firth Street	Project Location:	Pond SE of Dump	Date Received:	Jul 20, 2018
	Inuvik, NT, Canada	LSD:		Date Reported:	Jul 27, 2018
	X0E 0T0	P.O.:	100104	Report Number:	2307002
Attn:	Accounts Payable	Proj. Acct. code:			
Sampled By:	M. O'Rourke				
Company:	Tol				

Contact	Company	Address
Jason Casault	AECOM - Edmonton	101, 18817 Stony Plain Road
		Edmonton, AB T5S 0C2
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		Email: Jason.Casault@aecom.com
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		Email: kwainman@town.inuvik.nt.ca
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Email - Single Report	PDF	Invoice
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		Email: richard.feilden@aecom.com
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Rick Campbell	Town of Inuvik	Box 1160, 2 Firth Street
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		Email: rcampbell@town.inuvik.nt.ca
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Email - Single Report	PDF	Invoice
Utilidor	Town of Inuvik	Box 1160, 2 Firth Street
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		Email: utilidor@town.inuvik.nt.ca
Delivery	Format	Deliverables
Email - Single Report	PDF	Invoice

Notes To Clients:

• Jul 24, 2018 - Some trace total metal results were less than dissolved metal results for sample 1286002-1, 1285596-1. The results were verified and are within expected measurement uncertainty.

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Analytical Report



Bill To:	Town of Inuvik Box 1160	Project ID: Project Name:	SNP 0036-5	Lot ID: Control Number:	1286096
	2 Firth Street	Project Location:	Pond SE of Dump	Date Received:	Jul 20, 2018
	Inuvik, NT, Canada	LSD:		Date Reported:	Jul 27, 2018
	X0E 0T0	P.O.:	100104	Report Number:	2307002
Attn:	Accounts Payable	Proj. Acct. code:			
Sampled By:	M. O'Rourke				
Company:	Tol				

Reference Number 1286096-1 Sample Date Jul 18, 2018 Sample Time 09:30 Sample Location SNP0036-5 / 8.1°C

		Matrix	Water			
Analyte		Units	Results	Results	Results	Nominal Detection Limit
Aggregate Organic Con	stituents					
Biochemical Oxygen	Inhibited	mg/L	<4			4
Demand						
Phenol		mg/L	0.006			0.001
Inorganic Nonmetallic P						
Phosphorus	Total	mg/L	0.10			0.05
Metals Dissolved						
Subsample			Lab Filtered			
Metals Total						
Aluminum	Total	mg/L	0.05			0.02
Calcium	Total	mg/L	36.8			0.2
Iron	Total	mg/L	0.59			0.05
Magnesium	Total	mg/L	14.8			0.2
Manganese	Total	mg/L	0.055			0.005
Potassium	Total	mg/L	2.6			0.4
Silicon	Total	mg/L	0.34			0.05
Sodium	Total	mg/L	17.7			0.4
Sulfur	Total	mg/L	29.1			0.3
Mercury	Total	mg/L	<0.00005			0.000005
Antimony	Total	mg/L	<0.0002			0.0002
Arsenic	Total	mg/L	0.0017			0.0002
Barium	Total	mg/L	0.050			0.001
Beryllium	Total	mg/L	<0.0001			0.0001
Bismuth	Total	mg/L	<0.0005			0.0005
Boron	Total	mg/L	0.017			0.002
Cadmium	Total	mg/L	<0.00001			0.00001
Chromium	Total	mg/L	<0.0005			0.0005
Cobalt	Total	mg/L	0.0002			0.0001
Copper	Total	mg/L	0.001			0.001
Lead	Total	mg/L	0.0001			0.0001
Lithium	Total	mg/L	0.007			0.001
Molybdenum	Total	mg/L	<0.001			0.001
Nickel	Total	mg/L	0.0022			0.0005
Selenium	Total	mg/L	< 0.0002			0.0002
Silver	Total	mg/L	<0.00001			0.00001
Strontium	Total	mg/L	0.124			0.001
Thallium	Total	mg/L	<0.00005			0.00005
Tin	Total	mg/L	<0.001			0.001
Titanium	Total	mg/L	<0.0005			0.0005
manium	i Ulai	iiig/∟	NO.0000			0.0005

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Analytical Report



Bill To:	Town of Inuvik Box 1160	Project ID: Project Name:	SNP 0036-5	Lot ID: Control Number:	1286096
	2 Firth Street	Project Location:	Pond SE of Dump	Date Received:	Jul 20, 2018
	Inuvik, NT, Canada	LSD:		Date Reported:	Jul 27, 2018
	X0E 0T0	P.O.:	100104	Report Number:	2307002
Attn:	Accounts Payable	Proj. Acct. code:			
Sampled By:	M. O'Rourke				
Company:	Tol				

Reference Number 1286096-1 Sample Date Jul 18, 2018 Sample Time 09:30 Sample Location Sample Description SNP0036-5 / 8.1°C

		Matrix	Water			
Analyte		Units	Results	Results	Results	Nominal Detection Limit
Metals Total - Continued						
Uranium	Total	mg/L	<0.0005			0.0005
Vanadium	Total	mg/L	0.0011			0.0001
Zinc	Total	mg/L	0.002			0.001
Zirconium	Total	mg/L	<0.001			0.001
Physical and Aggregate F	Properties					
Solids	Total Suspended	mg/L	2			2
Routine Water						
pН			7.71			
Temperature of observed pH		°C	18.1			
Electrical Conductivity	at 25 °C	µS/cm	349			1
Electrical Conductivity	at 25 °C	dS/m	0.349			0.001
Calcium	Dissolved	meq/L	1.77			0.01
Calcium	Dissolved	mg/L	35.5			0.2
Magnesium	Dissolved	meq/L	1.17			0.01
Magnesium	Dissolved	mg/L	14.3			0.2
Sodium	Dissolved	meq/L	0.72			0.02
Sodium	Dissolved	mg/L	16.5			0.4
Potassium	Dissolved	meq/L	0.06			0.01
Potassium	Dissolved	mg/L	2.4			0.4
Chloride	Dissolved	mg/L	14.1			0.4
Chloride		meq/L	0.40			0.01
Sulfate (SO4)	Dissolved	mg/L	82.2			0.9
Sulfate-S		meq/L	1.71			
Sulfate-S	Dissolved	mg/L	27.4			0.3
Total Dissolved Solids	Estimated	mg/L	223			1
SAR	Dissolved		0.6			

RhSeunem

Randy Neumann, BSc **Division Director**

Approved by:

Data have been validated by Analytical Quality Control and Exova's Integrated Data Validation System (IDVS). Generation and distribution of the report, and approval by the digitized signature above, are performed through a secure and controlled automatic process.

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Methodology and Notes

Method of Analysis

Page 3 of 4

Bill To:	Town of Inuvik	Project ID:	SNP 0036-5	Lot ID:	1286096
	Box 1160	Project Name:		Control Number:	
	2 Firth Street	Project Location:	Pond SE of Dump	Date Received:	Jul 20, 2018
	Inuvik, NT, Canada	LSD:		Date Reported:	Jul 27, 2018
	X0E 0T0	P.O.:	100104	Report Number:	2307002
Attn:	Accounts Payable	Proj. Acct. code:			
Sampled By:	M. O'Rourke				
Company:	Tol				

Method Name	Reference	Method	Date Analysis Started	Location
Alkalinity, pH, and EC in water	APHA	* Conductivity, 2510 B	Jul 23, 2018	Exova Edmonton
Alkalinity, pH, and EC in water	APHA	* pH - Electrometric Method, 4500-H+ B	Jul 23, 2018	Exova Edmonton
BOD (Carbonaceous) in water	APHA	* 5 Day, 5210 B	Jul 20, 2018	Exova Edmonton
Chloride in Water	APHA	* Automated Ferricyanide Method, 4500-Cl- E	Jul 20, 2018	Exova Edmonton
Mercury (Total) in water	EPA	* Mercury in Water by Cold Vapor Atomic Fluorescence Spectrometry, 245.7	Jul 20, 2018	Exova Edmonton
Mercury (Total) in water	US EPA	* Determination of Hg in Sediment by Cold Vapor Atomic Absorption Spec, 245.5	Jul 20, 2018	Exova Edmonton
Metals ICP-MS (Total) in water	APHA/USEPA	* Metals By Inductively Coupled Plasma/Mass Spectrometry, APHA 3125 B / USEPA 200.2, 200.8	Jul 20, 2018	Exova Edmonton
Metals ICP-MS (Total) in water	US EPA	 Determination of Trace Elements in Waters and Wastes by ICP-MS, 200.8 	Jul 20, 2018	Exova Edmonton
Metals Trace (Dissolved) in water	АРНА	 Inductively Coupled Plasma (ICP) Method, 3120 B 	Jul 23, 2018	Exova Edmonton
Metals Trace (Total) in water	APHA	 Inductively Coupled Plasma (ICP) Method, 3120 B 	Jul 20, 2018	Exova Edmonton
Phenol in water	APHA	* Direct Photometric Method, 5530 D	Jul 24, 2018	Exova Edmonton
Phosphorus - Total in Water	APHA	 * Automated Ascorbic Acid Reduction Method, 4500-P F 	Jul 22, 2018	Exova Edmonton
Solids Suspended (Total, Fixed and Volatile)	АРНА	* Total Suspended Solids Dried at 103- 105'C, 2540 D	Jul 24, 2018	Exova Edmonton
References		* Reference Method Modified		

References

APHA	Standard Methods for the Examination of Water and Wastewater
APHA/USEPA	Standard Methods For Water/ Environmental Protection Agency
EPA	Environmental Protection Agency Test Methods - US
US EPA	US Environmental Protection Agency Test Methods

Comments:

• Jul 24, 2018 - Some trace total metal results were less than dissolved metal results for sample 1286002-1, 1285596-1. The results were verified and are within expected measurement uncertainty.

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Methodology and Notes

Page 4 of 4

Lot ID: 1286096 Project ID: Bill To: Town of Inuvik SNP 0036-5 Project Name: Box 1160 Control Number: 2 Firth Street Project Location: Pond SE of Dump Date Received: Jul 20, 2018 Inuvik, NT, Canada LSD: Date Reported: Jul 27, 2018 100104 X0E 0T0 P.O.: Report Number: 2307002 Attn: Accounts Payable Proj. Acct. code: Sampled By: M. O'Rourke Company: Tol

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www.exova.com	Assumg	Address	Box 1160 2 F	Firth Street	Add	ress	1720	3-10	03rd A	Avenu	Je						applied to the analysis
Project Information	on		Inuvik, NT X	DE OTO			Edmo	nton,	AB T5	S 1J4						Date Required	2
Project ID	SNP 0036- 5	Attention	Rick Campbe	ell	Atte	Attention Richard Feilden								As Indicated	All Analysis		
Project Name		Phone	(867) 777-86	15	Pho	ne	(780) 48	8-680	0							
Project Location	Pond SE of Dump	Cell	(867) 678-53	88	Cell		21										uested, turn around will H priority, with pricing and
Legal Location		Fax	(867) 777-86	01	Fax		(780) 48	8-212	1							ch. Please contact the lab
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Report Results	X E-Mail	Online	PDF		QA/	QC Re	port									Sampled by: Ma	att O'Rourke
	Mail X	Fax	Excel													Company Tow	n of Inuvik
Special Instruction from above).	s/Comments (please ir	clude contact info	ormation includ	ling ph. # if different	Indicat	-		SIS									proceed with the work
	oject ID Below and not	e weather:			Require	ements	Delow	Containers								and the second second	on this form:
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	SNP7 FarPond - SNP8							of (or Lab use only
Raw Water								lber								Date/Time stamp: JUL 20 AM 5:	24
Temp 11 C, precip	69%, Wind dir SW Vel	19km/h						Number of									
Sampla	Identification	Logation	Depth	Date/Time sample			Sampling									Indicate below any de	eficiencies in the
Gample	Identification	Location	in cm m	Date/Time sample		atrix	method	\downarrow								condition of samples	To Ang
1 B.O.D.		SNP0036-5		July 18, 2018-9:3	30A		Dip	1									Were Exova supplies
2 Oil & Greas	e + presevs.			н	- 	6	"	1									used?
3 Microbiolog	y				a series	3	"	1									Was there any damage to the shipping
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6 Metals + pr		"		"			"	1	_								Were the containers packaged well?
7 Phenol + p	resevs.	"		"			"	1	_	\square		_					
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10									_	+		_			_	-	received (document
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13									_	++		_					Are samples within recommended holding
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Bill To:	Town of Inuvik	Project ID:	SNP 0036-6,7&8	Lot ID:	1297937
	Box 1160	Project Name:		Control Number:	
	2 Firth Street	Project Location:	Inuvik	Date Received:	Sep 13, 2018
	Inuvik, NT, Canada	LSD:		Date Reported:	Sep 20, 2018
	X0E 0T0	P.O.:	100104	Report Number:	2322878
Attn:	Rick Campbell	Proj. Acct. code:			
Sampled By:	David Kandi				
Company:	Town of Inuvik				

Contact	Company	Address
Jason Casault	AECOM - Edmonton	101, 18817 Stony Plain Road
		Edmonton, AB T5S 0C2
		Phone: (780) 486-7050 Fax: (780) 486-7070
		Email: Jason.Casault@aecom.com
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Kim Wainman	Town of Inuvik	Box 1160, 2 Firth Street
		Inuvik, NT X0E 0T0
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		Email: kwainman@town.inuvik.nt.ca
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Analytical Report



Bill To:	Town of Inuvik	Project ID:	SNP 0036-6,7&8	Lot ID:	1297937
	Box 1160	Project Name:		Control Number:	
	2 Firth Street	Project Location:	Inuvik	Date Received:	Sep 13, 2018
	Inuvik, NT, Canada	LSD:		Date Reported:	Sep 20, 2018
	X0E 0T0	P.O.:	100104	Report Number:	2322878
Attn:	Rick Campbell	Proj. Acct. code:			
Sampled By:	David Kandi				
Company:	Town of Inuvik				

		Reference Number Sample Date Sample Time Sample Location	1297937-1 Sep 12, 2018 08:35	1297937-2 Sep 12, 2018 08:25	1297937-3 Sep 12, 2018 08:50	
		Sample Description	Gate Pond / SNP0036-6 / 1C	Far Pond / SNP0036-7 / 1C	Twin Lakes / SNP0036-8 / 1C	
		Matrix	Water	Water	Water	
Analyte		Units	Results	Results	Results	Nominal Detection Limit
Aggregate Organic Const	tituents					
Biochemical Oxygen Demand	Inhibited	mg/L	<4	<4	<4	4
Inorganic Nonmetallic Pa	rameters					
Ammonia - N		mg/L	8.87	<0.025	0.507	0.025
Un-ionized Ammonia-N	15 °C	mg/L	0.155	<0.0012	0.0178	
Ammonium/Ammonia Preservation			Yes	Yes	Yes	
Microbiological Analysis						
Fecal Coliforms	Membrane Filtration	CFU/100 mL	1	1	<1	1
Physical and Aggregate F	Properties					
Solids	Total Suspended	mg/L	1	3	<2	2
Routine Water						
рН	15 °C	pН	7.81	8.27	8.12	
Temperature of observed pH		C°	15	15	15	
рН			7.84	8.15	8.05	
Temperature of observed pH		C°	21.6	21.4	21.4	

Anthony Neuman

Approved by:

Anthony Neumann, MSc Laboratory Operations Manager

Data have been validated by Analytical Quality Control and Exova's Integrated Data Validation System (IDVS).
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Methodology and Notes

Method of Analysis



Bill To:	Town of Inuvik	Project ID:	SNP 0036-6,7&8	Lot ID:	1297937
	Box 1160	Project Name:		Control Number:	
	2 Firth Street	Project Location:	Inuvik	Date Received:	Sep 13, 2018
	Inuvik, NT, Canada	LSD:		Date Reported:	Sep 20, 2018
	X0E 0T0	P.O.:	100104	Report Number:	2322878
Attn:	Rick Campbell	Proj. Acct. code:			
Sampled By:	David Kandi				
Company:	Town of Inuvik				

Method Name Reference Method Date Analysis Location Started Alkalinity, pH, and EC in water APHA * pH - Electrometric Method, 4500-H+ B Sep 17, 2018 Exova Edmonton Ammonium-N in Water APHA * Automated Phenate Method, 4500-NH3 G Sep 20, 2018 Exova Edmonton APHA * 5 Day, 5210 B BOD (Carbonaceous) in water Sep 14, 2018 Exova Edmonton Coliforms - Membrane Filtration APHA Sep 14, 2018 Fecal Coliform Membrane Filter Exova Calgary Procedure, 9222 D * pH - Electrometric Method, 4500-H+ B pH at 15°C APHA Sep 18, 2018 Exova Edmonton Solids Suspended (Total, Fixed and APHA * Total Suspended Solids Dried at 103-Sep 17, 2018 Exova Edmonton Volatile) 105'C, 2540 D

* Reference Method Modified

References

APHA

Standard Methods for the Examination of Water and Wastewater

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Page 1 of 1	Contro	Please indicate any potentially hazordous samples	Note: Proper completion of this form is required in order to proceed with analysis	Environmental Sample Information Sheet	15	14	13	12	11	10	9	00	7	6	СЛ	4	3 SNP0036-8 Twin Lakes	2 SNP0036-7 Far Pond	1 SNP0036-6 Gate Pond	Sample Identification Location	Temp \sim C, precip O , Wind dir C	Complete mother	Special Instructions/Comments (please include contact information including ph. # if different	Report Results Mail X Fax	X E-Mail		Proi Acrt Code Acreement ID	ation	Project Location Inuvik Cell	Project Name Phone	Project ID SNP 0036- 6,7 & 8 Attention	9	MMW.exova.com
+	and the second se			n														08-12-18 8:25 An	07-12.18 825 Am	in cm m Date/Time sampled	Vel <u>{3</u> km/h			Excel	PDF		Campbell@town.Inuvlk.nt.ca	(867) 777-8601	(867) 678-5388	(867) 777-8615	Rick Campbell	Inuvik, NT XOE OTO	Box 1160 2 Firth Street
		Cooler temp:		1													Dip 4 x x x x		Dip 4 x x x x x 1	Matrix Sampling method	Number of Cont pH CBOD5 Suspended Solid Ammonia Fecal Coliforms	ā			QA/QC Report	Copy of invoice	E-mail richard.teilden@aecom.com			Phone (780) 488-6800	Attention Richard Feilden		Address 17203-103rd Avenue
d by: N	Waybill:	Delivery Method		# and size of coolers received:		times/temp?	Are samples within		below)?	received (document	Were the expected		packaged well?	Were the containers		container?	Was there any damage	used	Were Exova supplies	Indicate below any deficiencies in the condition of samples:	Date:)ext /2/18 Initia: (//~ This section for Lab use only Date/Time stamp: SEP 13 FH 1:07	indicated on this form:	I authorize Exova to proceed with the work	~	Sampled by	Sample Custody (please print)		turn around time to match. Please contact the lab prior to submitting RUSH samples	When "ASAP" is requested, turn around will default to a 100% RUSH priority, with pricing and		As Indicated All Analysis	Date Required	surcharges will be applied to the analysis

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Report Transmission Cover Page



Bill To:	Town of Inuvik	Project ID:	SNP 0036-9	Lot ID:	1286111
	Box 1160	Project Name:		Control Number:	
	2 Firth Street	Project Location:	Creek NW of Dump	Date Received:	Jul 20, 2018
	Inuvik, NT, Canada	LSD:		Date Reported:	Jul 27, 2018
	X0E 0T0	P.O.:	100104	Report Number:	2307024
Attn:	Accounts Payable	Proj. Acct. code:			
Sampled By:	M. O'Rourke				
Company:	Tol				

Contact	Company	Address
Jason Casault	AECOM - Edmonton	101, 18817 Stony Plain Road
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Email - Merge Reports	PDF	COC / COA
Email - Merge Reports	PDF	COC / Test Report
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Email - Single Report	PDF	Invoice
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		Phone: (867) 777-2607 Fax: (867) 777-2071
		Email: utilidor@town.inuvik.nt.ca
Delivery	Format	Deliverables
Email - Single Report	PDF	Invoice

Notes To Clients:

• Jul 24, 2018 - Sample 1286111-1; 6193325: Some trace total metal results were less than dissolved metal results for sample 1286111-1. The results were verified and are within expected measurement uncertainty.

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Analytical Report



Bill To:	Town of Inuvik Box 1160	Project ID: Project Name:	SNP 0036-9	Lot ID: Control Number:	1286111
	2 Firth Street	Project Location:	Creek NW of Dump	Date Received:	Jul 20, 2018
	Inuvik, NT, Canada	LSD:		Date Reported:	Jul 27, 2018
	X0E 0T0	P.O.:	100104	Report Number:	2307024
Attn:	Accounts Payable	Proj. Acct. code:			
Sampled By:	M. O'Rourke				
Company:	Tol				

Reference Number1286111-1Sample DateJul 18, 2018Sample Time09:10Sample LocationSNP0036-9 / 8.1°C

		Matrix	Water			
Analyte		Units	Results	Results	Results	Nominal Detectior Limit
Aggregate Organic Cons	stituents					
Biochemical Oxygen Demand	Inhibited	mg/L	<4			4
Phenol		mg/L	0.003			0.001
Inorganic Nonmetallic P	arameters					
Phosphorus	Total	mg/L	<0.05			0.05
Metals Dissolved						
Subsample			Lab Filtered			
Metals Total						
Aluminum	Total	mg/L	0.06			0.02
Calcium	Total	mg/L	45.0			0.2
Iron	Total	mg/L	0.52			0.05
Magnesium	Total	mg/L	17.2			0.2
Manganese	Total	mg/L	0.173			0.005
Potassium	Total	mg/L	1.6			0.4
Silicon	Total	mg/L	1.17			0.05
Sodium	Total	mg/L	16.6			0.4
Sulfur	Total	mg/L	54.4			0.3
Mercury	Total	mg/L	<0.000005			0.000005
Antimony	Total	mg/L	<0.0002			0.0002
Arsenic	Total	mg/L	0.0008			0.0002
Barium	Total	mg/L	0.016			0.001
Beryllium	Total	mg/L	<0.0001			0.0001
Bismuth	Total	mg/L	<0.0005			0.0005
Boron	Total	mg/L	0.039			0.002
Cadmium	Total	mg/L	0.00001			0.00001
Chromium	Total	mg/L	<0.0005			0.0005
Cobalt	Total	mg/L	0.0003			0.0001
Copper	Total	mg/L	0.002			0.001
Lead	Total	mg/L	<0.0001			0.0001
Lithium	Total	mg/L	0.013			0.001
Molybdenum	Total	mg/L	<0.001			0.001
Nickel	Total	mg/L	0.0074			0.0005
Selenium	Total	mg/L	0.0002			0.0002
Silver	Total	mg/L	<0.00001			0.00001
Strontium	Total	mg/L	0.152			0.001
Thallium	Total	mg/L	<0.00005			0.00005
Tin	Total	mg/L	<0.001			0.001
Titanium	Total	mg/L	0.0006			0.0005

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Analytical Report



Bill To:	Town of Inuvik Box 1160	Project ID: Project Name:	SNP 0036-9	Lot ID: Control Number:	1286111
	2 Firth Street	Project Location:	Creek NW of Dump	Date Received:	Jul 20, 2018
	Inuvik, NT, Canada	LSD:		Date Reported:	Jul 27, 2018
	X0E 0T0	P.O.:	100104	Report Number:	2307024
Attn:	Accounts Payable	Proj. Acct. code:			
Sampled By:	M. O'Rourke				
Company:	Tol				

Reference Number 1286111-1 Sample Date Jul 18, 2018 Sample Time 09:10 Sample Location Sample Description SNP0036-9 / 8.1°C

		Matrix	Water			
Analyte		Units	Results	Results	Results	Nominal Detection Limit
Metals Total - Continued						
Uranium	Total	mg/L	<0.0005			0.0005
Vanadium	Total	mg/L	0.0005			0.0001
Zinc	Total	mg/L	0.008			0.001
Zirconium	Total	mg/L	<0.001			0.001
Physical and Aggregate F	Properties					
Solids	Total Suspended	mg/L	4			2
Routine Water						
рН			7.61			
Temperature of observed pH		°C	17.7			
Electrical Conductivity	at 25 °C	µS/cm	434			1
Electrical Conductivity	at 25 °C	dS/m	0.434			0.001
Calcium	Dissolved	meq/L	2.22			0.01
Calcium	Dissolved	mg/L	44.4			0.2
Magnesium	Dissolved	meq/L	1.44			0.01
Magnesium	Dissolved	mg/L	17.5			0.2
Sodium	Dissolved	meq/L	0.76			0.02
Sodium	Dissolved	mg/L	17.4			0.4
Potassium	Dissolved	meq/L	0.04			0.01
Potassium	Dissolved	mg/L	1.5			0.4
Chloride	Dissolved	mg/L	7.2			0.4
Chloride		meq/L	0.20			0.01
Sulfate (SO4)	Dissolved	mg/L	164			0.9
Sulfate-S		meq/L	3.41			
Sulfate-S	Dissolved	mg/L	54.6			0.3
Total Dissolved Solids	Estimated	mg/L	278			1
SAR	Dissolved		0.6			

RhSeunem

Randy Neumann, BSc **Division Director**

Approved by:

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Methodology and Notes

Method of Analysis

Page 3 of 4

Bill To:	Town of Inuvik	Project ID:	SNP 0036-9	Lot ID:	1286111
	Box 1160	Project Name:		Control Number:	
	2 Firth Street	Project Location:	Creek NW of Dump	Date Received:	Jul 20, 2018
	Inuvik, NT, Canada	LSD:		Date Reported:	Jul 27, 2018
	X0E 0T0	P.O.:	100104	Report Number:	2307024
Attn:	Accounts Payable	Proj. Acct. code:			
Sampled By:	M. O'Rourke				
Company:	Tol				

Method Name	Reference	Method	Date Analysis Started	Location	
Alkalinity, pH, and EC in water	APHA	* Conductivity, 2510 B	Jul 23, 2018	Exova Edmonton	
Alkalinity, pH, and EC in water	APHA	* pH - Electrometric Method, 4500-H+ B	Jul 23, 2018	Exova Edmonton	
BOD (Carbonaceous) in water	APHA	* 5 Day, 5210 B	Jul 20, 2018	Exova Edmonton	
Chloride in Water	APHA	* Automated Ferricyanide Method, 4500-Cl- E	Jul 20, 2018	Exova Edmonton	
Mercury (Total) in water	EPA	* Mercury in Water by Cold Vapor Atomic Fluorescence Spectrometry, 245.7	Jul 20, 2018	Exova Edmonton	
Mercury (Total) in water	US EPA	* Determination of Hg in Sediment by Cold Vapor Atomic Absorption Spec, 245.5	Jul 20, 2018	Exova Edmonton	
Metals ICP-MS (Total) in water	APHA/USEPA	 Metals By Inductively Coupled Plasma/Mass Spectrometry, APHA 3125 B / USEPA 200.2, 200.8 	Jul 23, 2018	Exova Edmonton	
Metals ICP-MS (Total) in water	US EPA	 * Determination of Trace Elements in Waters and Wastes by ICP-MS, 200.8 	Jul 23, 2018	Exova Edmonton	
Metals Trace (Dissolved) in water	APHA	 Inductively Coupled Plasma (ICP) Method, 3120 B 	Jul 23, 2018	Exova Edmonton	
Metals Trace (Total) in water	APHA	 Inductively Coupled Plasma (ICP) Method, 3120 B 	Jul 23, 2018	Exova Edmonton	
Phenol in water	APHA	* Direct Photometric Method, 5530 D	Jul 24, 2018	Exova Edmonton	
Phosphorus - Total in Water	APHA	 * Automated Ascorbic Acid Reduction Method, 4500-P F 	Jul 22, 2018	Exova Edmonton	
Solids Suspended (Total, Fixed an Volatile)	d APHA	 * Total Suspended Solids Dried at 103- 105'C, 2540 D 	Jul 24, 2018	Exova Edmonton	
References		* Reference Method Modified			
RUIUIONCOS					

References

APHA	Standard Methods for the Examination of Water and Wastewater
APHA/USEPA	Standard Methods For Water/ Environmental Protection Agency
EPA	Environmental Protection Agency Test Methods - US
US EPA	US Environmental Protection Agency Test Methods

Comments:

• Jul 24, 2018 - Sample 1286111-1; 6193325: Some trace total metal results were less than dissolved metal results for sample 1286111-1. The results were verified and are within expected measurement uncertainty.

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Methodology and Notes

Page 4 of 4 Exova

Bill To:	Town of Inuvik	Project ID:	SNP 0036-9	Lot ID:	1286111
	Box 1160	Project Name:		Control Number:	
	2 Firth Street	Project Location:	Creek NW of Dump	Date Received:	Jul 20, 2018
	Inuvik, NT, Canada	LSD:		Date Reported:	Jul 27, 2018
	X0E 0T0	P.O.:	100104	Report Number:	2307024
Attn:	Accounts Payable	Proj. Acct. code:			
Sampled By:	M. O'Rourke				
Company:	Tol				

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www.exova.com		Address	Box 1160 2 F	Firth Street		Address	1720)3-1(03rc	d Ave	enue					surcharges will be	e applied to the analysis	
Project Information	on		Inuvik, NT X	0E 0T0	/		Edmo	onton	, AB	T5S 1	J4					Date Required		
Project ID	SNP 0036- 9	Attention	Rick Campbe	ell	1	Attention	Rich	ard	Feil	den						As Indicated	All Analysis	
Project Name		Phone	(867) 777-86	<i>j</i> 15	!	Phone	(780) 48	8-68	800						When "ASAP" is n	equested, turn around will	
Project Location	Creek NW of dump	Cell	(867) 678-53	.88		Cell										default to a 100% RU	JSH priority, with pricing and	
Legal Location		Fax	(867) 777-86	01،	ļ	Fax	(780) 48	8-21	121						turn around time to m	atch. Please contact the lab	
PO/AFE#	100104	E-mail	rcampbell(@town.inuvik.nt.ca	<u>a</u>	E-mail	richa	ard.fe	eilde	en@a	aeco	m.coi	m			phor to submi	itting RUSH samples	
Proj. Acct.Code		Agreement ID	2909		- I											Signature		
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Special Instruction from above).	ns/Comments (please in	iclude contact into	rmation includ	ling ph. # if different		idicate Reg equirement		lers									to proceed with the work ed on this form:	
Sampler: Circle Pr	roject ID Below and note	e weather:		· · · · · · · · · · · · · · · · · · ·	\vdash			Containers								18-Jul-18	M.O	
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Temp 11 C, precip	p 69 %, Wind dir SW Ve	el 19km/h		/				Nur										
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1 B.O.D.		SNP0036-9	· · · · · · · · · · · · · · · · · · ·	July18, 2018-9:1	10A		Dip	1	Ι	L			Τ	ТТ			Were Exova supplies	
2 Oil & Grease	,e	"	<u> </u>	u			"	1									used?	
3 Microbiology	<u>y</u>	"	<u> </u>	U			"	1									Was there any damage	
4 Routine		"	<u> </u>	"			"	1			T						to the shipping container?	
5 Nutrients			<u> </u>				"	1										
6 Metals		"	<u> </u>	п			"	1				\Box					Were the containers	
7 Phenol		"		"			"	1									packaged well?	
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	Box 1160	Project Name:		Control Number:	
	2 Firth Street	Project Location:	Inuvik	Date Received:	Aug 16, 2018
	Inuvik, NT, Canada	LSD:		Date Reported:	Aug 22, 2018
	X0E 0T0	P.O.:	100104	Report Number:	2315147
Attn:	Rick Campbell	Proj. Acct. code:			
Sampled By:	Matt O'Rourke				
Company:	Town of Inuvik				

Contact	Company	Address
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Kim Wainman	Town of Inuvik	Box 1160, 2 Firth Street
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		Phone: (867) 777-8615 Fax: (867) 777-8601
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Rick Campbell	Town of Inuvik	Box 1160, 2 Firth Street
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T6B 3J4, Canada

Analytical Report



Bill To: Town of Inuvik Box 1160 2 Firth Street Inuvik, NT, Canada X0E 0T0 Attn: Rick Campbell Sampled By: Matt O'Rourke Company: Town of Inuvik		Project Name: Project Location: In LSD:	Project Name: Project Location: Inuvik LSD: P.O.: 100104		ot ID: 1292125 mber: eived: Aug 16, 2018 orted: Aug 22, 2018 mber: 2315147	
		Reference Number Sample Date Sample Time Sample Location	Aug 15, 2018	1292125-2 Aug 15, 2018 09:15	1292125-3 Aug 15, 2018 08:30	
		Sample Description	Pit N/W of Dump / SNP0036-4 / 3.2°C	Pond S/E of Dump / SNP0036-5 / 3.2°C	Creek N/W of Dump / SNP0036-9 / 3.2°C	
		Matrix	Water	Water	Water	
Analyte		Units	Results	Results	Results	Nominal Detectior Limit
Aggregate Orga	anic Constituents					Linint
Biochemical Ox Demand		mg/L	<4	<4	<4	4
Phenol		mg/L	0.002	<0.001	0.003	0.001
-	netallic Parameters					
Phosphorus	. Total	mg/L	0.08	0.07	<0.05	0.05
Metals Dissolve	ed					
Subsample			Lab Filtered	Lab Filtered	Lab Filtered	
Metals Total	-	<i>a</i>	0.00	0.00	0.47	0.00
Aluminum	Total	mg/L	0.20	0.06	0.17	0.02
Calcium	Total	mg/L	220	34.8	31.4	0.2
Iron	Total	mg/L	1.6	0.55	0.97	0.05
Magnesium	Total	mg/L	103	14.6	13.2	0.2
Manganese	Total	mg/L	1.03	0.020	0.408	0.005
Potassium	Total	mg/L	30.1	1.9	1.1	0.4
Silicon	Total	mg/L	4.14	0.28	1.41	0.05
Sodium	Total	mg/L	143	17.5	10.4	0.4
Sulfur	Total	mg/L	218	30.7	39.9	0.3
Mercury	Total	mg/L	0.000007	0.000012	0.00008	0.000005
Antimony	Total	mg/L	<0.0004	<0.0002	<0.0002	0.0002
Arsenic	Total	mg/L	0.001	0.0014	0.0008	0.0002
Barium	Total	mg/L	0.081	0.040	0.019	0.001
Beryllium	Total	mg/L	<0.0002	<0.0001	<0.0001	0.0001
Bismuth	Total	mg/L	<0.001	<0.0005	<0.0005	0.0005
Boron	Total	mg/L	0.941	0.018	0.027	0.002
Cadmium	Total	mg/L	<0.00002	<0.00001	0.00002	0.00001
Chromium	Total	mg/L	0.001	<0.0005	<0.0005	0.0005
Cobalt	Total	mg/L	0.001	0.0002	0.0009	0.0001
Copper	Total	mg/L	<0.002	<0.001	0.002	0.001
Lead	Total	mg/L	0.0003	0.0001	0.0001	0.0001
Lithium	Total	mg/L	0.043	0.008	0.010	0.001
Molybdenum	Total	mg/L	< 0.002	<0.001	<0.001	0.001
Nickel	Total	mg/L	0.0078	0.0021	0.0101	0.0005
Selenium	Total	mg/L	0.0002	<0.0002	<0.0002	0.0002
Silver	Total	mg/L	<0.00002	< 0.00001	<0.00001	0.00001
Strontium	Total Total	mg/L mg/L	0.860 <0.0001	0.121 <0.00005	0.106 <0.00005	0.001 0.00005
Thallium						

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mg/L

mg/L

< 0.002

0.0081

<0.001

< 0.0005

<0.001

0.0023

0.001

0.0005

Total

Total

Tin

Titanium

Analytical Report



Attn: Sampled By:			Project ID: SNP 0036-4,5&9 Project Name: Project Location: Inuvik LSD: P.O.: 100104 Proj. Acct. code:		Lot ID: 1292125 Control Number: Date Received: Aug 16, 2018 Date Reported: Aug 22, 2018 Report Number: 2315147		
		Reference Number	1292125-1	1292125-2	1292125-3		
		Sample Date Sample Time Sample Location	09:00	Aug 15, 2018 09:15	Aug 15, 2018 08:30		
		Sample Description		Pond S/E of Dump / SNP0036-5 / 3.2°C	Creek N/W of Dump / SNP0036-9 / 3.2°C		
		Matrix	water	Water	Water		
Analyte		Units	Results	Results	Results	Nominal Detection Limit	
Metals Total - Co	ontinued						
Uranium	Total	mg/L	<0.001	<0.0005	<0.0005	0.0005	
Vanadium	Total	mg/L	0.002	0.0017	0.0009	0.0001	
Zinc	Total	mg/L	0.005	0.003	0.011	0.001	
Zirconium	Total	mg/L	<0.002	<0.001	<0.001	0.001	
	gregate Properties						
Solids	Total Suspende	d mg/L	12	<2	3	2	
Routine Water							
рН			8.16	7.91	7.52		
Temperature of o	observed	°C	21.3	21.4	21.4		
pH Electrical Condu	ctivity at 25 °C	µS/cm	2170	350	317	1	
Electrical Condu		dS/m	2.17	0.350	0.317	0.001	
Calcium	Dissolved	meg/L	11.1	1.72	1.56	0.01	
Calcium	Dissolved	mg/L	223	34.4	31.2	0.2	
Magnesium	Dissolved	meg/L	8.79	1.20	1.09	0.01	
Magnesium	Dissolved	mg/L	107	14.6	13.2	0.2	
Sodium	Dissolved	meq/L	6.26	0.75	0.45	0.02	
Sodium	Dissolved	mg/L	144	17.2	10.3	0.4	
Potassium	Dissolved	meq/L	0.75	0.05	0.03	0.01	
Potassium	Dissolved	mg/L	29.5	1.8	1.0	0.4	
Chloride	Dissolved	mg/L	89.8	14.9	4.0	0.4	
Chloride		meq/L	2.53	0.42	0.11	0.01	
Sulfate (SO4)	Dissolved	mg/L	675	90.2	118	0.9	
Sulfate-S		meq/L	14.0	1.88	2.45		
Sulfate-S	Dissolved	mg/L	225	30.1	39.2	0.3	
Total Dissolved	Solids Estimated	mg/L	1390	224	203	1	
SAR	Dissolved		2.0	0.6	0.4		
Mono-Aromatic	Hydrocarbons - Water						
Benzene		mg/L	<0.001	<0.001	<0.001	0.001	
Toluene		mg/L	<0.0004	<0.0004	<0.0004	0.0004	
Ethylbenzene		mg/L	<0.0010	<0.0010	<0.0010	0.0010	
Total Xylenes (m		mg/L	<0.001	<0.001	<0.001	0.001	
	m Hydrocarbons - Water	_					
F1 -BTEX		mg/L	<0.1	<0.1	<0.1	0.1	
F1 C6-C10		mg/L	<0.1	<0.1	<0.1	0.1	
F2 C10-C16		mg/L	<0.1	<0.1	<0.1	0.1	

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Analytical Report

Bill To: Town of Inuvik

Box 1160 2 Firth Street

X0E 0T0

Attn: Rick Campbell

Sampled By: Matt O'Rourke Company: Town of Inuvik

Inuvik, NT, Canada

Project ID: Project Name: Project Location: LSD: P.O.: Proj. Acct. code:

SNP 0036-4,5&9 Inuvik 100104

Lot ID: 1292125 Control Number:

Page 3 of 5

Exova

Date Received: Aug 16, 2018 Date Reported: Aug 22, 2018 Report Number: 2315147

Anthony Weuman

Approved by:

Anthony Neumann, MSc Laboratory Operations Manager

Data have been validated by Analytical Quality Control and Exova's Integrated Data Validation System (IDVS). Generation and distribution of the report, and approval by the digitized signature above, are performed through a secure and controlled automatic process.

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Methodology and Notes



Bill To:	Town of Inuvik	Project ID:	SNP 0036-4,5&9	Lot ID:	129212
	Box 1160	Project Name:		Control Number:	
	2 Firth Street	Project Location:	Inuvik	Date Received:	Aug 16, 20
	Inuvik, NT, Canada	LSD:		Date Reported:	Aug 22, 20
	X0E 0T0	P.O.:	100104	Report Number:	2315147
Attn:	Rick Campbell	Proj. Acct. code:			
Sampled By:	Matt O'Rourke				
Company:	Town of Inuvik				

Method of Analysis

25 2018 2018

Mictilou of Analysis				
Method Name	Reference	Method	Date Analysis Started	Location
Alkalinity, pH, and EC in water	APHA	* Conductivity, 2510 B	Aug 17, 2018	Exova Edmonton
Alkalinity, pH, and EC in water	APHA	* pH - Electrometric Method, 4500-H+ B	Aug 17, 2018	Exova Edmonton
BOD (Carbonaceous) in water	APHA	* 5 Day, 5210 B	Aug 21, 2018	Exova Edmonton
BTEX-CCME - Water	US EPA	 Volatile Organic Compounds in Various Sample Matrices Using Equilibrium Headspace Analysis/Gas Chromatography Mass Spectrometry, 5021/8260 	Aug 17, 2018	Exova Calgary
Chloride in Water	APHA	* Automated Ferricyanide Method, 4500-Cl- E	Aug 20, 2018	Exova Edmonton
Mercury (Total) in water	EPA	* Mercury in Water by Cold Vapor Atomic Fluorescence Spectrometry, 245.7	Aug 16, 2018	Exova Edmonton
Mercury (Total) in water	US EPA	* Determination of Hg in Sediment by Cold Vapor Atomic Absorption Spec, 245.5	Aug 16, 2018	Exova Edmonton
Metals ICP-MS (Total) in water	APHA/USEPA	* Metals By Inductively Coupled Plasma/Mass Spectrometry, APHA 3125 B / USEPA 200.2, 200.8	Aug 17, 2018	Exova Edmonton
Metals ICP-MS (Total) in water	US EPA	 Determination of Trace Elements in Waters and Wastes by ICP-MS, 200.8 	Aug 17, 2018	Exova Edmonton
Metals Trace (Dissolved) in water	APHA	 Inductively Coupled Plasma (ICP) Method, 3120 B 	Aug 17, 2018	Exova Edmonton
Metals Trace (Total) in water	APHA	 Inductively Coupled Plasma (ICP) Method, 3120 B 	Aug 17, 2018	Exova Edmonton
Phenol in water	APHA	* Direct Photometric Method, 5530 D	Aug 17, 2018	Exova Edmonton
Phosphorus - Total in Water	APHA	 * Automated Ascorbic Acid Reduction Method, 4500-P F 	Aug 17, 2018	Exova Edmonton
Solids Suspended (Total, Fixed and Volatile)	APHA	 Total Suspended Solids Dried at 103- 105'C, 2540 D 	Aug 17, 2018	Exova Edmonton
		* Reference Method Modified		

References

APHA	Standard Methods for the Examination of Water and Wastewater
APHA/USEPA	Standard Methods For Water/ Environmental Protection Agency
EPA	Environmental Protection Agency Test Methods - US
US EPA	US Environmental Protection Agency Test Methods

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Methodology and Notes

Page 5 of 5 Exova

Bill To:	Town of Inuvik	Project ID:	SNP 0036-4,5&9	Lot ID:	1292125
	Box 1160	Project Name:		Control Number:	
	2 Firth Street	Project Location:	Inuvik	Date Received:	Aug 16, 2018
	Inuvik, NT, Canada	LSD:		Date Reported:	Aug 22, 2018
	X0E 0T0	P.O.:	100104	Report Number:	2315147
Attn:	Rick Campbell	Proj. Acct. code:			
Sampled By:	Matt O'Rourke				
Company:	Town of Inuvik				

Please direct any inquiries regarding this report to our Client Services Group or to the Operations Manager at the coordinates indicated at the top left of this page. Results relate only to samples as submitted.

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Exova	Testing	Billing Informat	tion:			Copy of F	Report To:											RUSH	Priority
EXOVU	Advisi	ng Ng Company	Town of Inuv	vik		Company													ction, client accepts that
www.exova.com		Address	Box 1160 2 I	Firth Street		Address	1720)3-1	03r	d Av	/enue	Э							pplied to the analysis
Project Information			Inuvik, NT X	COE OTO		1	Edmo											Date Required	
Project ID	SNP 0036- 4,5 &	9. Attention	Rick Campb	ell		Attention	Rich											As Indicated	All Analysis
Project Name		Phone	(867) 777-86	315		Phone	(780)) 48	8-6	800								When "ASAP" is reau	lested, turn around will
Project Location	Inuvik	Cell	(867) 678-53	388		Cell												default to a 100% RUSH	I priority, with pricing and
Legal Location		Fax	(867) 777-86			Fax	(780)) 48	8-2	121									h. Please contact the lab g RUSH samples
PO/AFE#	100104	E-mail	rcampbell	l@town.inuvik.nt.c	a	E-mail	richa	rd.f	eild	en@	Daec	om.	com						g reer samples
Proj. Acct.Code		Agreement ID	2909														×	Signature	
		Copy of Report				Copy of in	ivoice	_										Restored and the second s	dy (please print)
Report Results	X E-Mail	Online	PDF			QA/QC Re	eport											Sampled by: Mait	O'Route
		X Fax	Excel							Σī								Company Town	n of Inuvik
		ase include contact info ium, Potassium and C		ding ph. # if different		Indicate Reg Requirement		lers		Total Metal+Total mercury									proceed with the work on this form:
Sampler: note we	ather:				-			Number of Containers		otal I		lids	fe				c	Date: 08-13-18	
								Cor	2W	+Tc		Suspended Solids	Total Phosphate		ols	N	S,P,	Construction of the local division of the lo	or Lab use only
								r of	3F1	leta		deo	hos	e	hen	tivit	ed (Date/Time stamp:	
								nbe	CCMEBF12W	al M	pH CBOD5	ber	al P	Sulphate	Total Phenols	Conductivity	Dissolved S,P,		
Temp <u>3</u> C,	precip <u>O</u> ,	Wind dir <u>S</u> V	ell6	km/h				Nur	S	Tot	E B	Sus	Tot	Sul	Tot	S	Dis		
Sample	Identification	Location	Depth in cm m	Date/Time samp	led	Matrix	Sampling method	↓										Indicate below any de condition of samples:	
1 SNP0036-4		Pit N/W of Dump	2	900 A 08-15	-18		Dip	8	x	x	x x	x	x	x	x	х	х		Were Exova supplies
2 SNP0036-5		Pond S/E of Dum		9'SA 03-15-			Dip	8			x x		_	x		_	x		used?
3 SNP0036-9		Creek N/Wof Dun		\$30A 08-15-1		11/21	Dip	_	-		x x	_	_	x		x	х		Was there any damage
4											1				3				to the shipping container?
5																			
6				1															Were the containers
7								5											packaged well?
8				1										- 2.6	1				1
9														1					Were the expected
10																			number of samples received (document
11								10						-		2			below)?
12		et 1 a												1					
13				1				Share.									-		Are samples within
14		11100				13		161											recommended holding times/temp?
15		and the second second	Sector Sector Sector		4		-												1
	Environment	tal Sample Inforn	hation She	et	1									Shi	pping	j: .		# and size of coolers rece	eived:
Note: Prope	er completion of th	is form is required in c	rder to procee	ed with analysis		ot: 129	2125 ^C	:00						co	D Y/I	N		~	6
Plea	ase indicate a	ny potentially ha	zordous sa	amples										Cod	oler te	emp	:	Delivery Method:	OURJER
1.1.1.P		Control #			1									-0	3.	2	5	Waybill:	
Page 1	of 1	Control #)	8		-		Received by:	ZANUL

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Bill To:	Town of Inuvik	Project ID:	SNP 0036-4,5 & 9	Lot ID:	1297946
	Box 1160	Project Name:		Control Number:	
	2 Firth Street	Project Location:	Inuvik	Date Received:	Sep 13, 2018
	Inuvik, NT, Canada	LSD:		Date Reported:	Sep 19, 2018
	X0E 0T0	P.O.:	100104	Report Number:	2322893
Attn:	Rick Campbell	Proj. Acct. code:			
Sampled By:	Matt O'Rourke				
Company:	Town of Inuvik				

Contact	Company	Address
Jason Casault	AECOM - Edmonton	101, 18817 Stony Plain Road
		Edmonton, AB T5S 0C2
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		Email: Jason.Casault@aecom.com
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Email - Merge Reports	PDF	COC / Test Report
Kim Wainman	Town of Inuvik	Box 1160, 2 Firth Street
		Inuvik, NT X0E 0T0
		Phone: (867) 777-8615 Fax: (867) 777-8601
		Email: kwainman@town.inuvik.nt.ca
Delivery	Format	Deliverables
Email - Single Report	PDF	Invoice
Richard Feilden	AECOM - Edmonton	17203 - 103 Avenue
		Edmonton, AB T5S 1J4
		Phone: (780) 488-6800 Fax: (780) 488-2121
		Email: richard.feilden@aecom.com
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Rick Campbell	Town of Inuvik	Box 1160, 2 Firth Street
		Inuvik, NT X0E 0T0
		Phone: (867) 777-8615 Fax: (867) 777-8601
		Email: rcampbell@town.inuvik.nt.ca
Delivery	<u>Format</u>	Deliverables
Email - Merge Reports	PDF	COC / Test Report
Email - Single Report	PDF	Invoice
Utilidor	Town of Inuvik	Box 1160, 2 Firth Street
		Inuvik, NT X0E 0T0
		Phone: (867) 777-2607 Fax: (867) 777-2071
		Email: utilidor@town.inuvik.nt.ca
Delivery	Format	Deliverables
Email - Single Report	PDF	Invoice

Notes To Clients:

• Sep 19, 2018 - Some trace total metal results were less than dissolved metal results for sample #1297946-1. The results were verified and are within expected measurement uncertainty.

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Analytical Report

Tin

Titanium



Bill To: Town of Inuvik Box 1160 2 Firth Street Inuvik, NT, Canada X0E 0T0 Attn: Rick Campbell Sampled By: Matt O'Rourke Company: Town of Inuvik		Project Name: Project Location: Ir LSD:	SNP 0036-4,5 & 9 nuvik 00104	Control Nu Date Rece Date Rep	eived: Sep 13, 2018	
		Reference Number Sample Date	1297946-1 Sep 12, 2018	1297946-2	1297946-3	
		Sample Date Sample Time Sample Location	08:58	Sep 12, 2018 08:37	Sep 12, 2018 09:10	
		Sample Description	Pit N/W of Dump / SNP0036-4 / 1°C	Pond S/E of Dump / SNP0036-5 / 1°C	Creek N/W of Dump / SNP0036-9 / 1°C	
		Matrix	Water	Water	Water	
Analyte		Units	Results	Results	Results	Nominal Detectio
	nic Constituents	••••••				Limit
Biochemical Oxy Demand		mg/L	<4	<4	<4	4
Phenol		mg/L	<0.001	0.003	<0.001	0.001
norganic Nonm	etallic Parameters					
Phosphorus	Total	mg/L	0.06	0.14	<0.05	0.05
Metals Dissolve	d					
Subsample			Lab Filtered	Lab Filtered	Lab Filtered	
Metals Total						
Aluminum	Total	mg/L	0.08	0.34	0.18	0.02
Calcium	Total	mg/L	266	38.7	36.6	0.2
Iron	Total	mg/L	1.0	2.54	0.76	0.05
Magnesium	Total	mg/L	123	14.8	15.4	0.2
Manganese	Total	mg/L	0.919	0.271	0.482	0.005
Potassium	Total	mg/L	25.7	2.3	1.2	0.4
Silicon	Total	mg/L	4.00	1.29	1.67	0.05
Sodium	Total	mg/L	144	18.0	11.4	0.4
Sulfur	Total	mg/L	280	35.0	45.9	0.3
Mercury	Total	mg/L	0.000011	0.000013	0.000012	0.000005
Antimony	Total	mg/L	<0.0004	0.0002	<0.0002	0.0002
Arsenic	Total	mg/L	0.001	0.0029	0.0007	0.0002
Barium	Total	mg/L	0.080	0.075	0.019	0.001
Beryllium	Total	mg/L	<0.0002	<0.0001	<0.0001	0.0001
Bismuth	Total	mg/L	<0.001	<0.0005	<0.0005	0.0005
Boron	Total	mg/L	0.766	0.020	0.026	0.002
Cadmium	Total	mg/L	0.00002	<0.00001	0.00003	0.00001
Chromium	Total	mg/L	<0.001	0.0008	<0.0005	0.0005
Cobalt	Total	mg/L	0.001	0.0005	0.0011	0.0001
Copper	Total	mg/L	0.002	0.002	0.002	0.001
Lead	Total	mg/L	0.0002	0.0007	<0.0001	0.0001
Lithium	Total	mg/L	0.040	0.009	0.011	0.001
Molybdenum	Total	mg/L	< 0.002	<0.001	<0.001	0.001
Nickel	Total	mg/L	0.0076	0.0030	0.0116	0.0005
Selenium	Total	mg/L	<0.0002	0.0002	<0.0002	0.0002
Silver	Total	mg/L	<0.00002	<0.00001	< 0.00001	0.00001
Strontium	Total	mg/L	0.924	0.119	0.108	0.001
Thallium	Total	mg/L	<0.0001	<0.00005	<0.00005	0.00005

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mg/L

mg/L

< 0.002

0.0020

<0.001

0.0031

<0.001

0.0013

0.001

0.0005

Total

Total

Analytical Report



Attn: Sampled By:	Bill To: Town of Inuvik Box 1160 2 Firth Street Inuvik, NT, Canada X0E 0T0 Attn: Rick Campbell Sampled By: Matt O'Rourke Company: Town of Inuvik		Project ID:SNP 0036-4,5 & 9Project Name:Project Location:Project Location:InuvikLSD:100104Proj. Acct. code:Inuvik		Lot ID: 1297946 Control Number: Date Received: Sep 13, 2018 Date Reported: Sep 19, 2018 Report Number: 2322893		
		Reference Number Sample Date Sample Time	e Sep 12, 2018 e 08:58	1297946-2 Sep 12, 2018 08:37	1297946-3 Sep 12, 2018 09:10		
		Sample Location Sample Description		Pond S/E of Dump / SNP0036-5 / 1°C	Creek N/W of Dump / SNP0036-9 / 1°C		
		Matrix	water	Water	Water		
Analyte		Units	Results	Results	Results	Nominal Detection Limit	
Metals Total - Co	ntinued					Linin	
Uranium	Total	mg/L	<0.001	<0.0005	<0.0005	0.0005	
Vanadium	Total	mg/L	0.0008	0.0029	0.0004	0.0001	
Zinc	Total	mg/L	0.008	0.004	0.015	0.001	
Zirconium	Total	mg/L	<0.002	<0.001	<0.001	0.001	
Physical and Age	gregate Properties						
Solids	Total Suspended	l mg/L	6	23	5	2	
Routine Water							
рН			7.96	7.36	7.13		
Temperature of c	bserved	°C	21.7	21.6	21.5		
pH Electrical Conduc	ctivity at 25 °C	µS/cm	2340	375	357	1	
Electrical Conduc	•	dS/m	2.34	0.375	0.357	0.001	
Calcium	Dissolved	meg/L	13.5	1.88	1.74	0.01	
Calcium	Dissolved	mg/L	270	37.6	34.9	0.2	
Magnesium	Dissolved	meq/L	10.1	1.20	1.22	0.01	
Magnesium	Dissolved	, mg/L	123	14.6	14.9	0.2	
Sodium	Dissolved	meq/L	6.31	0.78	0.47	0.02	
Sodium	Dissolved	mg/L	145	17.9	10.9	0.4	
Potassium	Dissolved	meq/L	0.65	0.06	0.03	0.01	
Potassium	Dissolved	mg/L	25.4	2.2	1.1	0.4	
Chloride	Dissolved	mg/L	89.5	15.7	4.5	0.4	
Chloride		meq/L	2.53	0.44	0.13	0.01	
Sulfate (SO4)	Dissolved	mg/L	845	102	134	0.9	
Sulfate-S		meq/L	17.6	2.11	2.78		
Sulfate-S	Dissolved	mg/L	282	33.9	44.6	0.3	
Total Dissolved S		mg/L	1500	240	228	1	
SAR	Dissolved		1.8	0.6	0.4		
	Hydrocarbons - Water						
Benzene		mg/L	< 0.001	<0.001	<0.001	0.001	
Toluene		mg/L	< 0.0004	< 0.0004	< 0.0004	0.0004	
Ethylbenzene	2 2)	mg/L	<0.0010	<0.0010	<0.0010	0.0010	
Total Xylenes (m		mg/L	<0.001	<0.001	<0.001	0.001	
	m Hydrocarbons - Water	~~/l	-0.1	-0.1	-0.1	0.1	
F1 -BTEX F1 C6-C10		mg/L	<0.1 <0.1	<0.1 <0.1	<0.1 <0.1	0.1 0.1	
F1 C6-C10 F2 C10-C16		mg/L	<0.1	<0.1 <0.1	<0.1 <0.1	0.1	
12010-010		mg/L	NO. 1	NU.1	NU.1	0.1	

Analytical Report

Company:

Bill To: Town of Inuvik

Box 1160 2 Firth Street

X0E 0T0

Attn: Rick Campbell

Town of Inuvik

Sampled By: Matt O'Rourke

Inuvik, NT, Canada

Project ID: Project Name: Project Location: LSD: P.O.: Proj. Acct. code:

SNP 0036-4,5 & 9 Inuvik 100104

Page 3 of 5 Exovo

Lot ID: 1297946

Control Number: Date Received: Sep 13, 2018 Date Reported: Sep 19, 2018 Report Number: 2322893

Murray Klutz

Senior Agronomist

Approved by:

Data have been validated by Analytical Quality Control and Exova's Integrated Data Validation System (IDVS). Generation and distribution of the report, and approval by the digitized signature above, are performed through a secure and controlled automatic process.

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Methodology and Notes



Lot ID: 1297946 Bill To: Town of Inuvik Project ID: SNP 0036-4,5 & 9 Project Name: Box 1160 Control Number: 2 Firth Street Project Location: Inuvik Date Received: Sep 13, 2018 Inuvik, NT, Canada LSD: Date Reported: Sep 19, 2018 X0E 0T0 P.O.: 100104 Report Number: 2322893 Attn: Rick Campbell Proj. Acct. code: Sampled By: Matt O'Rourke Company: Town of Inuvik

Method of Analysis

Method Name	Reference			Date Analysis Started	Location
Alkalinity, pH, and EC in water	APHA	Conductivity, 2510 B	3	Sep 17, 2018	Exova Edmonton
Alkalinity, pH, and EC in water	APHA	pH - Electrometric M	lethod, 4500-H+ B	Sep 17, 2018	Exova Edmonton
BOD (Carbonaceous) in water	APHA	5 Day, 5210 B		Sep 14, 2018	Exova Edmonton
BTEX-CCME - Water	US EPA	Volatile Organic Col Sample Matrices Us Headspace Analysis Chromatography Ma 5021/8260	s/Gas	Sep 14, 2018	Exova Calgary
Chloride in Water	APHA	Automated Ferricya E	nide Method, 4500-Cl-	Sep 13, 2018	Exova Edmonton
Mercury (Total) in water	EPA	Mercury in Water by Fluorescence Spect	v Cold Vapor Atomic rometry, 245.7	Sep 15, 2018	Exova Edmonton
Mercury (Total) in water	US EPA	Determination of Hg Vapor Atomic Absor	in Sediment by Cold ption Spec, 245.5	Sep 15, 2018	Exova Edmonton
Metals ICP-MS (Total) in water	APHA/USEPA	Metals By Inductive Plasma/Mass Spect B / USEPA 200.2, 2	rometry, APHA 3125	Sep 14, 2018	Exova Edmonton
Metals ICP-MS (Total) in water	US EPA	Determination of Tra Waters and Wastes		Sep 14, 2018	Exova Edmonton
Metals Trace (Dissolved) in water	APHA	Inductively Coupled Method, 3120 B	Plasma (ICP)	Sep 14, 2018	Exova Edmonton
Metals Trace (Total) in water	APHA	Inductively Coupled Method, 3120 B	Plasma (ICP)	Sep 14, 2018	Exova Edmonton
Phenol in water	APHA	Direct Photometric	Method, 5530 D	Sep 18, 2018	Exova Edmonton
Phosphorus - Total in Water	APHA	Automated Ascorbic Method, 4500-P F	Acid Reduction	Sep 18, 2018	Exova Edmonton
Solids Suspended (Total, Fixed and Volatile)	APHA	Total Suspended So 105'C, 2540 D	blids Dried at 103-	Sep 17, 2018	Exova Edmonton
		* Reference Method Mod	lified		

References

APHA	Standard Methods for the Examination of Water and Wastewater
APHA/USEPA	Standard Methods For Water/ Environmental Protection Agency
EPA	Environmental Protection Agency Test Methods - US
US EPA	US Environmental Protection Agency Test Methods

Comments:

• Sep 19, 2018 - Some trace total metal results were less than dissolved metal results for sample #1297946-1. The results were verified and are within expected measurement uncertainty.

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Methodology and Notes

Page 5 of 5 Exova

Bill To:	Town of Inuvik	Project ID:	SNP 0036-4,5 & 9	Lot ID:	1297946
	Box 1160	Project Name:		Control Number:	
	2 Firth Street	Project Location:	Inuvik	Date Received:	Sep 13, 2018
	Inuvik, NT, Canada	LSD:		Date Reported:	Sep 19, 2018
	X0E 0T0	P.O.:	100104	Report Number:	2322893
Attn:	Rick Campbell	Proj. Acct. code:			
Sampled By:	Matt O'Rourke				
Company:	Town of Inuvik				

Please direct any inquiries regarding this report to our Client Services Group or to the Operations Manager at the coordinates indicated at the top left of this page. Results relate only to samples as submitted.

The test report shall not be reproduced except in full, without the written approval of the laboratory.

Testing	Ind Billing Information:	tion:	Conv of Report To:	nort To:								RIISH	RUSH Priority
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www.exova.com		Box 1160 2 Firth Street	Company Address	1720	3-103	17203-103rd Avenue	/enue					Upon filling out this sec surcharges will be a	Upon filling out this section, client accepts that surcharges will be applied to the analysis
Project Information		Inuvik, NT X0E 0T0		Edmo	nton, A	Edmonton, AB T5S 1J4	1J4					Date Required	
Project ID SNP 0036- 4,5 & 9.	8 8. Attention	Rick Campbell	Attention	Richa	ard F	Richard Feilden						As Indicated	All Analysis
Project Name	Phone	(867) 777-8615	Phone	(780)	488-	(780) 488-6800						When "ASAD" is redu	When "ASAD" is requested from around will
Project Location Inuvik	Cell	(867) 678-5388	Cell									default to a 100% RUSH	default to a 100% RUSH priority, with pricing and
Legal Location	Fax	(867) 777-8601	Fax	(180)	488-	(780) 488-2121						turn around time to matc	turn around time to match. Please contact the lab
PO/AFE# 100104	E-mail	rcampbell@town.inuvik.nt	.ca E-mail	richard.feilden@aecom.com	rd.fei	Iden(Daec	om.co	E				
Proj. Acct.Code	Agreement ID	2909	A									Signature	
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Special Instructions/Comments (please include contact information from above). Dissolved S,P,C is Sodium, Potassium and Calcium.	elease include contact info sodium, Potassium and C	Special Instructions/Comments (please include contact information including ph. # if differen from above). Dissolved S,P,C is Sodium, Potassium and Calcium.	t Indicate Regulatory Requirements below	latory below	sıəı	mercu						I authorize Exova to I indicated o	I authorize Exova to proceed with the work indicated on this form:
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Sample Identification	Location	Depth Date/Time sampled in cm m	Matrix	Sampling method	\rightarrow							Indicate below any deficiencies in the condition of samples:	ficiencies in the
1 SNP0036-4	Pit N/W of Dump	4 858 / SI-CI-BC d	(b)	Dip	8 8	×	××	×	××	×	××		Were Exova supplies
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3 SNP0036-9	Creek N/Wof Dump	Hatb /SI-CI-be du	A A	Dip	8 8	×	××	×	××	×	××		Was there any damage
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Appendix C

Lagoon Berm Inspection Report



AECOM 4916 47th Street, Floor 3 GoGa Cho Building (PO Box 1259) Yellowknife, NT, Canada X1A 2N9 www.aecom.com

867 873 6316 tel 867 873 6407 fax

February 15, 2019

Mr. Leonard DeBastien Executive Director Gwich'in Land and Water Board Box 2018 Inuvik, N.W.T. X0E 0T0 Mr. Rolland Malegana Regional Environmental Assessment Coordinator Energy and Natural Resources Box 2749 Inuvik, N.T. X0E 0T0

Dear Sir:

Project No: 60589867

Regarding: Town of Inuvik - Water Licence No. G17L3-001 Licence Condition D8, Lagoon Earthen Water Retaining Structures

On behalf of Inuvik, we wish to respond to Water License Condition D8 for year 2018.

Water Licence Condition D8 states, "The dams, dykes and other engineered earth structures designed to contain waste within the Sewage Disposal facilities shall be inspected annually by a professional engineer to determine the stability of the structures". In Water Licence A2, Definitions, "Professional Engineer – a person registered with the Northwest Territories and Nunavut Association of Professional Engineers and Geoscientist, and whose principal field of specialization is appropriate to address the components of the undertaking at hand".

The lagoon's west dyke was built on native permafrost soils in the late 1950's. The interior dykes forming the sludge cells and primary lagoon cells were added in 1981. The west dyke was rebuilt at the same time. In 1987-88, initial settlement of the new interior dikes and further erosion of the west dike were restored in a major re-grading project. In 2003, subsidence and erosion of the inner face of the west dike was again repaired, and the inner face was armored with geotextile and blast rock. In 2006, subsidence of the interior dikes was repaired by raising the dike crests back to designed level. In 2015, subsidence of the dike along the north end of the lagoon was repaired by raising the dike crests back to designed level.

Inuvik has the dikes inspected by its engineers, AECOM, at least annually.

Gradual uneven settlement of the dikes has been ongoing since they were first built. Settlement is believed to be due primarily to thawing of the permafrost under the dykes, and subsequent consolidation of the soils. Historically, slow subsidence has not threatened the integrity or water tightness of the dikes and it is not expected to do so as long as it is countered by periodic restoration.

In some years significant thaw-subsidence occurs in the portion of the lagoon system's west dike that runs between the west sludge cell and "Gate Pond" (as named in the SNP program). Gate Pond was formed early in Inuvik's history by gravel borrowing, and is thought to have been deepened (and probably enlarged) by subsequent thaw-subsidence. Gate pond probably is the main heat source



causing the recurrent dike thaw-subsidence in the vicinity. Routinely, the dike is restored to designed levels and lines whenever significant thaw-subsidence has occurred.

Undercutting and sloughing of inner faces has also been ongoing since the dikes were first built, caused by soft subsoils and the flat slopes that the dike soils trend toward under water. Permafrost thaw subsidence and seasonal freeze-thaw may contribute locally. Sloughing narrows the crest. From time to time, dikes need to be restored to designed width in order to maintain water tightness, stability, and safe vehicle access along the crests. Sloughing affects all dikes, and major restoration projects have been needed roughly every ten to fifteen years. The 2003 armoring work was intended to reduce sloughing of the inner face of the west dike. Dikes around the smaller cells have not been armored.

Over the years the two karst ponds just outside the west dike, toward its downstream end, have shown a tendency to grow. There has been some undercutting and sloughing of the outer face of the west dike along the pond shorelines. Fill was added to slope toes in the fall of 2006 and again in 2007 and 2009. It is reasonably certain similar restoration work will be needed in future at these locations, probably in most years.

In late 2010 the dykes separating the inner ponds were rebuilt and the west dyke was graded to fill all the cracks. During summer 2015, the north dyke was raised about 0.5 metre to restore grade, and the surface of all other dykes was graded.

During spring of 2016, the Town of Inuvik hired a local contractor to drill test holes along the lagoon dykes and obtain soils samples at various depths. The samples were sent to AECOM for laboratory testing. According to the results the soil beneath the dykes generally consists of ice rich clays, silts and sands.

The 2018 annual inspection was carried out on September 26, 2018. All dykes were found to be in satisfactory condition. No unusual longitudinal cracks or fissures were noted. Maintenance activities carried out in 2018 included grading of all the dykes to fill longitudinal cracks. Construction was underway south of the primary cells to rehabilitate the discharge pipe and to add a truck dumping station.

The longitudinal cracking that occurs on an annual basis confirms that subsidence and undercutting continue to occur at a slow rate, and in some future year major restoration work will be required. This underscores the need for continued maintenance. Nevertheless all dikes appear to remain at or very near to designed shapes and levels, and on that basis we believe that all of the dikes in Inuvik's lagoon at this time are safe and adequate water retaining structures.



We trust that this submission fulfills the requirements of the Town of Inuvik water license Condition D8 for year 2018.

Sincerely, **AECOM Canada Ltd.**

Matt

Michel Lanteigne, P.Eng. Manager, Northwest Territories Michel.lanteigne@aecom.com

ML:sw

cc: Mr. Rick Campbell, Town of Inuvik Mr. Grant Hood, S.A.O., Town of Inuvik Inuvik Utilidor Crew Foreman Inuvik Public Works Committee Reviewed by

Jordan Hollart

Jordan Hoffart, P.Eng. Project Engineer, Municipal Infrastructure jordan.hoffart@aecom.com

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