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March 31, 2020

Project # 60600398

Leonard DeBastien Executive Director Gwich'in Land and Water Board Box 2018 Inuvik NT XOE 0T0

Dear Sir:

Subject: Town of Inuvik – Water Licence No. G17L3-001

2019 Summary Report

On behalf of Inuvik, we are pleased to provide the Annual Report for 2019.

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 1% more than consumption 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 Water Licence G17L3-001 dictated the maximum volume of water that can be withdrawn from the East Channel is 1,000,000 m³ per year.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 2019 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 a very small portion of the total water usage that they 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 this year.

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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 consistent throughout 2019, other than during the sludge removal period.

Information on the Town's sludge removal activities can be found in the relevant section below.

SOLID WASTE DISPOSAL FACILITY OPERATIONS AND MAINTENANCE

In 2019, 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 2019 was approximately 6,299 tonnes of Municipal Solid Waste, which used approximately 20,997 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 lnuvik will accept Municipal Solid Waste from outside sources, though the quantities tend to be very low. 34 loads of out of Town ordinary garbage was received from the ESSO clean up project in Tuktoyaktuk, however no hazardous waste was accepted from outside sources in 2019.

In 2019, no collection event for household hazardous waste was undertaken.

It should be noted that The Town of Inuvik has sent the Solid Waste Disposal Facility Operator and Town employee to a Solid Waste Site Course in Norman Wells.

SEWAGE EFFLUENT QUALITY MONITORING, STATION G17L3-0036-3

Lagoon effluent is sampled monthly, except in August and September 2019 at Station 0036-3 due to the decanting work related to secondary cell desludging. 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.

 BOD_5 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 BOD_5 . 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 2019 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 lnuvik would need a mechanical plant or at



minimum lagoon aeration, in either case involving major capital investment and significantly increased operating cost.

Oil and grease sample results were higher than the average criteria permitted by the licence, for the majority of the testing samples. In March 2019, 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 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 that future results will be more consistent with the representative sampling intent for the parameter and that the sampling results will be within licence requirements.

High levels of oil and grease detected in November and December 2019 is believed to be the result of prolonged oil and grease build up in the secondary cell after the decanting process (and subsequent sludge removal) was performed in the summer.

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.

Five tests were taken at each SNP station in 2019, during months of flow (May to September).

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 2019 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.

SOLID WASTE FACILITY FENCING PLAN

The Solid Waste Fencing Plan requirement (Part D, Item 15) was added to the 2017 licence renewal. The Plan was submitted on May 21, 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 not done in 2019 as the larger scope sludge removal was performed.

Sludge removal was performed in the summer of 2019 (July 2nd to Aug 3rd). In total, 14,235 cubic meters of sludge was removed from the lagoon. The sludge was dewatered utilizing geotubes. It was estimated roughly 724 dry tonnes of sludge was removed from the cells. The Lagoon sludge removal report is included in Appendix D.

INSPECTION OF LAGOON EARTHEN CONTAINMENT STRUCTURES

The 2019 inspection of lagoon dikes (Water Licence Condition D8) report is attached in Appendix C. There are no immediate concerns arising from the 2019 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

In 2019, pipes connecting the primary cells, the secondary cell were replaced. Naturally, routine maintenance work was done as needed.

UNAUTHORIZED DISCHARGES

There were no unauthorized discharges in 2019.

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 2019. 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 (Nappag Design and Construction)
- O&M Manual for the Sewage Treatment Facility: Revised June 2019 (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

Ref: 60600398



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- may be based on information provided to AECOM which has not been independently verified;
- has not been updated since the date of issuance of the Report and its accuracy is limited to the time period and circumstances in which it was collected, processed, made or issued;
- 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
- in the case of subsurface, environmental or geotechnical conditions, may be based on limited testing and on the assumption that such conditions are uniform and not variable either geographically or over time.

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Appendix A

Summary Tables and SNP Map



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.

2019	Intake from the East Channel
Month	m ³
January	45,035
February	46,398
March	48,505
April	49,789
May	49,338
June	38,030
July	44,171
August	41,764
September	40,231
October	42,126
November	48,959
December	49,628
Total	543,974

^{1.} Quantities are well within Licence limits. No known concerns.

The total estimated solid waste generated is listed below.

Month	Solid Waste Generated	Solid Waste Deposited
2019	tonnes	m^3
January	535	1,783
February	483	1,611
March	535	1,783
April	518	1,726
May	535	1,783
June	518	1,726
July	535	1,783
August	535	1,783
September	518	1,726
October	535	1,783
November	518	1,726
December	535	1,783
Total	6,299	20,997

- 1. Latest population estimates based on data from GNWT Bureau of Statistics as of July 1, 2019.
- 2. Solid Waste Generation estimates based on generation rates outlined in 2017 Inuvik Municipal Solid Waste Facility O&M Manual.

Station 0036-3, Sewage Discharge to Receiving Water.

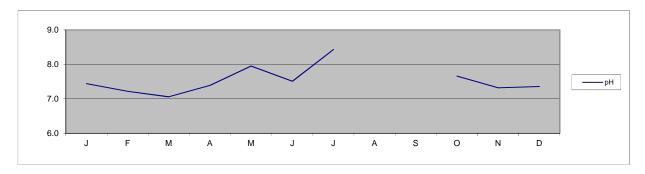
SNP requirements. Sample monthly. Report parameters tabulated below.

					SAMPLE	RESULTS				AME	BIENT COI	NDITIONS
	Date			BOD/			Un- ionized		Oil and			
			pН	CBOD	SS	NH3-N	Ammonia	Fecal Coli	Grease	Temp	Wind	OC/
YYYY	MM	DD		mg/L	mg/L	mg/L	mg/L	CFU/dL	mg/L	° C	km/h	Prcp
2019	01	16	7.4	04	12	14	0.11	106,000	5	-21	ENE 26	Cloudy
2019	02	13	7.2	96	49	16	0.07	170,000	97	-19	SE 19	Clear
2019	03	13	7.1	45	5	18	0.06	174,000	32	-22	ENE 17	Light Snow
2019	04	17	7.4	73	23	20	0.14	6,000	8	-6	E 19	Cloudy
2019	05	15	8.0	87	8	16	0.39	53,000	5	5	E 24	Clear
2019	06	06	7.5	04	48	00	0.00	60	7	13	SE 22	Cloudy
2019	06	12	7.8	11	25	12	0.23	4,000	5	8	N 28	Drizzle
2019	06	25	8.6	17	43	06	0.68	600	7	5	NW 28	Cloudy
2019	07	02	8.4	25	65	03	0.21	600	6	12	WNW 20	Cloudy
2019	07	17	8.5	16	43	04	0.30	3,100	6	18	NNE 17	Cloudy
2019	08				No To	eting Porfor	mod during 9	Sludge Remov	al Pariod			
2019	09				NO TE	sung Fenon	med during c	bludge Remov	ai Fellou			
2019	10	16	7.7	04	1	14	0.18	10	5	-5	ENE 26	Clear
2019	11	13	7.3	12	17	18	0.10	6,000	40	-21	NW 19	Light Snow
2019	12	10	7.4	47	13	11	0.07	6,000	23	-22	E 24	Light Snow
2019	12	12	7.1	26	17	19	0.07	300,000	53	-27	E 20	Clear

				RUNNING A	VERAGES	OF SAMPLI	E RESULTS		
		BOD/		NIIIO NI	Un- ionized	Facal Cali	Oil and		
	Item Unit		рН	CBOD mg/L	SS mg/L	NH3-N mg/L	Ammonia mg/L	Fecal Coli CFU/dL	Grease
Limit, a	_	onsec.	6-9	150	70	none	none	1,000,000	mg/L
2019	01	16	7.4	16	12	9.6	0.06	83,078	20.00
2019	02	13	7.2	39	22	12.6	0.06	155,083	42.50
2019	03	13	7.1	48	20	15.0	0.07	175,128	46.75
2019	04	17	7.4	55	22	17.3	0.09	65,859	35.50
2019	05	15	8.0	75	21	17.8	0.16	55,380	35.50
2019	06	06	7.5	52	21	13.7	0.15	7,591	13.00
2019	06	12	7.8	44	26	12.3	0.19	2,956	6.25
2019	06	25	8.6	30	31	8.8	0.32	1,662	6.00
2019	07	02	8.4	14	45	5.4	0.28	542	6.25
2019	07	17	8.5	17	44	6.4	0.35	1,454	6.00
2019	80			No Test	ina Performa	ad during Sli	ıdge Remov	al Period	
2019	09			NO Test	ing r enomie	ed during Sic	auge Remov	ai i eilou	
2019	10	16	7.7	16	38	6.8	0.34	325	6.00
2019	11	13	7.3	14	32	9.7	0.20	578	14.25
2019	12	10	7.4	20	19	11.7	0.16	1,028	18.50
2019	12	12	7.1	22	12	15.5	0.10	3,224	30.25

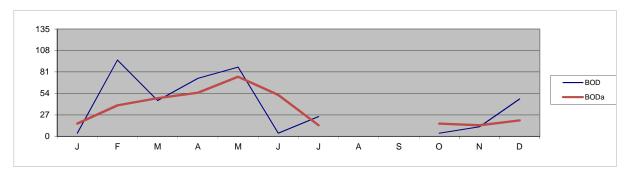
- 1 In the table header above, "avg. 4 con" is shorthand for "average of four consecutive samples". There is no average requirement for pH, only an upper and lower limt. Values presented for pH are monthly sample results.
- In the graphs below, the red line (coded with suffix "a" in the key) shows the average of four consecutive samples. The thinner line shows individual monthly readings.
- 3 NT repersents not tested in this sample. NR repersents not reported.
- 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 Extra tests conducted in June and July were part of the decenting process.

pH, BY MONTH 2019



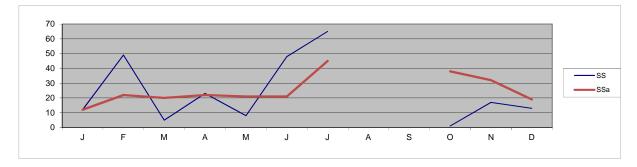
BOD5 / CBOD (mg/L), BY MONTH

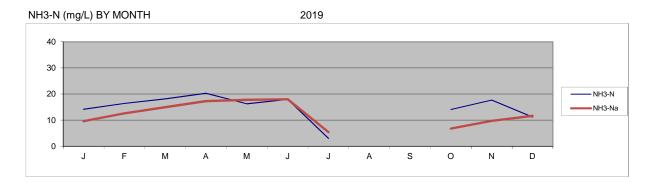
2019



SUSPENDED SOLIDS (mg/L) BY MONTH

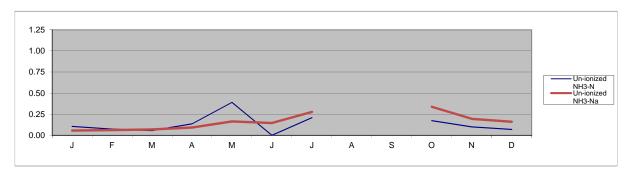
2019





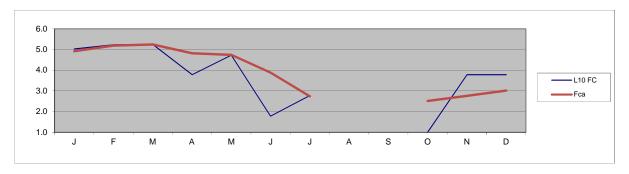
Un-ionized NH3-N (mg/L) BY MONTH

2019



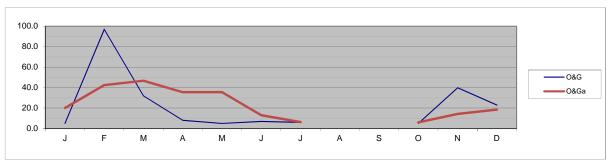
FECAL COLIFORMS (LOG10 CFU/100 mL) BY MOI

2019



Oil and Grease (mg/L) BY MONTH

2019



Note: the chart for Fecal Colifirms, 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".

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

SAMPLE DATES	S & OBS	ERVATIONS	Temp	Wind	Sky	Prcp
			° C	km/h		
April				Frozen - No S	Sample Taken	
May	22	2019	20	E 26	Cloudy	-
June	12	2019	12	N 30	Cloudy	-
July	17	2019	25	NE 17	Partly Cloudy	ı
August	14	2019	13	WNW 45	Cloudy	ı
September	11	2019	17	WNW 17	Partly Cloudy	-
October				Frozen - No S	Sample Taken	

		SAMPL	E ANALYSIS F	RESULTS		
Item				Date		
		May 22	June 12	July 17	Aug 14	Sept 11
рН	NA	8.15	8.15	7.79	7.71	7.89
Conductivity	uS/cm	1640	2310	2210	2010	2260
Sodium	mg/L	94.8	162.0	170.0	161.0	174.0
Potassium	mg/L	18.7	38.5	37.1	31.0	32.8
Magnesium	mg/L	80.8	122.0	115.0	100.0	118.0
Calcium	mg/L	166	218	226	207	233
Cadmium	mg/L	0.00025	0.00003	< 0.00002	0.00030	< 0.00002
Chromium	mg/L	0.0016	0.0015	< 0.001	0.0196	< 0.001
Copper	mg/L	0.021	0.002	< 0.002	0.032	< 0.002
Iron	mg/L	2.4400	2.6300	0.3700	31.8000	1.3
Lead	mg/L	0.002300	0.000400	< 0.0002	0.010500	0.0004
Mercury	mg/L	0.000024	0.000015	0.00001	0.000072	0.00002
Nickel	mg/L	0.0127	0.0103	0.0095	0.0491	0.0088
Zinc	mg/L	0.067	0.009	0.006	0.117	0.007
Sulphate	mg/L	518	606	539	592	717
Phosphate	mg/L	0.13	0.07	0.07	1.11	0.12
Phenols	mg/L	0.003	0.001	0.002	0.006	0.001
BOD5	mg/L	<4	<4	<4	<4	<4
Oil & Grease	mg/L	NR	NR	NR	NR	NR
Suspend. Solid	mg/L	22	11	7	764	19
TPH	mg/L	<0.2	<0.2	<0.2	<0.2	<0.2

- 1. "Phosphate" is reported as total P.
- 2. "NR" denotes Not Reported.
- 3. TPH value listed is summation of F1 and F2.

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

SAMPLE DATE	S & OB	SERVATIONS	Temp	Wind	Sky	Prcp
			° C	km/h		
April				Frozen - No S	Sample Taken	
May	22	2019	20	E 26	Cloudy	-
June	12	2019	12	N 30	Cloudy	-
July	17	2019	25	NE 17	Partly Cloudy	-
August	14	2019	13	WNW 45	Cloudy	-
September	11	2019	17	WNW 17	Partly Cloudy	-
October				Frozen - No S	Sample Taken	

		SAME	PLE ANALYSIS	RESULTS							
Item		Date									
		May 22	June 12	July 17	Aug 14	Sept 11					
рН	NA	7.37	7.78	7.47	7.97	7.39					
Conductivity	uS/cm	177	287	331	318	380					
Sodium	mg/L	7.0	14.1	16.1	18.0	19.6					
Potassium	mg/L	3.5	4.1	3.5	3.0	4.2					
Magnesium	mg/L	6.2	11.3	13.4	13.9	15.2					
Calcium	mg/L	16.8	29.4	33.5	33.5	39.2					
Cadmium	mg/L	0.00050	< 0.00001	< 0.00001	0.00006	<0.00001					
Chromium	mg/L	<0.0005	0.00060	<0.0005	<0.0005	<0.0005					
Copper	mg/L	0.001	0.001	<0.001	<0.001	<0.001					
Iron	mg/L	0.88	0.77	0.61	0.43	1.47					
Lead	mg/L	0.0002	0.0001	0.0001	0.0001	0.0003					
Mercury	mg/L	0.000015	0.000016	0.000022	0.000016	0.000017					
Nickel	mg/L	0.0016	0.0022	0.0020	0.0020	0.0018					
Zinc	mg/L	0.011	0.003	0.002	0.001	0.002					
Sulphate	mg/L	32.4	57.9	68.4	69.3	81.0					
Phosphate	mg/L	0.25	0.13	0.23	0.07	0.12					
Phenols	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001					
BOD5	mg/L	<4	<4	10	<4	<4					
Oil & Grease	mg/L	NR	NR	NR	NR	NR					
Suspend. Solid	mg/L	3	6	17	4	3					
TPH	mg/L	<0.2	<0.2	<0.2	<0.2	<0.2					

- 1. "Phosphate" is reported as total P.
- 2. "NR" denotes Not Reported.
- 3. TPH value listed is summation of F1 and F2.

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.

5-1-		SNP		SAN	IPLE RES	JLTS		AMB	IENT CC	NDITIONS		
	Date		# pH		BOD ₅	BOD ₅ SS NH3-N		Fecal Coli	Temp	Wind	Sky	
				#		mg/L	mg/L	mg/L	CFU/dL	°C	km/h	
	2019	09	11	6	7.9	<4	<2	12.1	<10		WNW	Partly
	2019	09	11	7	8.1	<4	3	< 0.025	<10	17	17	Cloudy
	2019	09	11	8	8.2	<4	<2	1.5	20		17	Cioudy

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

			SNP		SAI	MPL	E RES	JLTS		AMB	IENT CC	NDITIONS
D	ate			pН	BOD ₅		SS	NH3-N	Fecal Coli	Temp	Wind	Sky
			#	•	mg/L	n	ng/L	mg/L	CFU/dL	° C	km/h	-
2018	09	12	6	7.8	<4		1	8.9	1			Partly
2018	09	12	7	8.3	<4		3	< 0.025	1	-4	E 13	Cloudy
2018	09	12	8	8.1	<4	<2		0.5	<1			Cloudy
2017	09	13	6	7.8	<4		19	nd	2			
2017	09	13	7	8.0	<4	<1		nd	2	11	SE 12	Clear
2017	09	13	8	8.0	<4		10	nd	<1			
2016	09	13	6	8.1	<4		2	14.1	<1			
2016	09	13	7	8.1	<4	<1		< 0.025	<1	0	E 18	Cloudy
2016	09	13	8	8.1	<4		2	3.1	2			
2015	09	80	6	7.7	<4		3	12.8	2			
2015	09	80	7	8.4	<4	<7		< 0.025	<1	1	NW 4	Cloudy
2015	09	80	8	8.2	<4		8	1.6	1			
2014	10	07	6	7.7	<4		4	12.4	81			
2014	10	07	7	8.0	<4		4	< 0.05	<1	-3	NW 30	Snow
2014	10	07	8	8.1	<4		47	1.9	1			
2013	09	24	6	7.8	<4		<1	14.4	2			
2013	09	24	7	8.1	<4		15	< 0.05	24	0	NE 5	Cloudy
2013	09	24	8	8.1	<4	<2		1.9	<1			
2012	09	18	6	8.1	<4		3	10.4	4			
2012	09	18	7	8.3	<4	<1		< 0.05	1	7	S 10	Clear
2012	09	18	8	8.2	<4	<2		3.4	2			
2011	09	19	6	8.0	<4		<2	13.6	<1			
2011	09	19	7	8.3	<4	<2		< 0.05	<1	0	NE 15	Cloudy
2011	09	19	8	8.1	<4		6	1.6	<1			
2010	09	21	6	7.8	<4		<1	14.3	1			
2010	09	21	7	8.1	<4	<1		< 0.05	<1	1	NW 15	Cloudy
2010	09	21	8	8.1	<4		50	2.6	<1			
2009	09	28	6	7.1	<4		3	11.2	<1			
2009	09	28	7	8.2	5		6	< 0.05	<1	-3	NW 4	Snow
2009	09	28	8	7.8	<4		6	2.8	<1			
2008	09	15	6	7.7	<4		5	10.0	1			
2008	09	15	7	8.6	<4		3	<0.05	<1	-3	E 12	Clear
2008	09	15	8	8.3	<4		6	1.3	<1			
2007	11	14	6	7.2	<4		13	8.9	<1			
2007	11	14	7	7.3	14		303	0.3	1	-12	SE 07	Snow
2007	11	14	8	7.4	5		6	4.3	<1			

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

SAMPLE DATE	S & OBS	ERVATIONS	Temp ° C	Wind km/h	Sky	Prcp
April				Frozen - No S	Sample Taken	
May	22	2019	20	E 26	Cloudy	-
June	12	2019	12	N 30	Cloudy	-
July	17	2019	25	NE 17	Partly Cloudy	-
August	14	2019	13	WNW 45	Cloudy	-
September	11	2019	17	WNW 17	-	
October				Frozen - No S	Sample Taken	

		SAMPL	E ANALYSIS R	RESULTS		
Item				Date		
		May 22	June 12	July 17	Aug 14	Sept 11
рН	NA	6.96	7.81	7.77	7.67	7.24
Conductivity	uS/cm	139	1020	1720	1960	412
Sodium	mg/L	4.0	46.0	100.0	127.0	15.9
Potassium	mg/L	1.7	3.3	4.1	4.9	1.6
Magnesium	mg/L	5.6	41.2	77.6	91.2	19.2
Calcium	mg/L	13.4	114.0	221.0	254.0	38.1
Cadmium	mg/L	0.00040	0.00001	< 0.00001	< 0.00001	0.00002
Chromium	mg/L	0.0009	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Copper	mg/L	0.003	0.002	< 0.001	< 0.001	0.002
Iron	mg/L	1.50	0.40	0.71	0.73	1.10
Lead	mg/L	0.0003	< 0.0001	< 0.0001	< 0.0001	0.0002
Mercury	mg/L	0.000019	0.000012	0.000017	0.000014	0.000018
Nickel	mg/L	0.0077	0.0062	0.0042	0.0040	0.0080
Zinc	mg/L	0.012	0.007	0.010	0.019	0.011
Sulphate	mg/L	43	438	793	964	158
Phosphate	mg/L	0.09	< 0.05	< 0.05	< 0.05	< 0.05
Phenols	mg/L	0.001	< 0.001	< 0.001	< 0.001	0.004
BOD5	mg/L	<4	<4	<4	<4	<4
Oil & Grease	mg/L	NR	NR	NR	NR	NR
Suspend. Solid	mg/L	11	<2	3	8	5
TPH	mg/L	<0.2	<0.2	<0.2	<0.2	<0.2

- 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



Report Transmission Cover Page

Bill To: Town of Inuvik Project ID: SNP 0036-3 Lot ID: 1328137

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: Inuvik Date Received: Jan 17, 2019
Inuvik, NT, Canada LSD: Date Reported: Jan 23, 2019

X0E 0T0 P.O.: 100104 Report Number: 2372242

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Matt

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	<u>Format</u>	<u>Deliverables</u>
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>	<u>Deliverables</u>
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	<u>Format</u>	<u>Deliverables</u>
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
<u>Delivery</u>	<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>	<u>Deliverables</u>
Email - Single Report	PDF	Invoice

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Page 1 of 2

Analytical Report

Bill To: Town of Inuvik Project ID: SNP 0036-3 Lot ID: 1328137

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: Inuvik Date Received: Jan 17, 2019

Inuvik, NT, Canada LSD: Date Reported: Jan 23, 2019 X0E 0T0 P.O.: 100104 Report Number: 2372242

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Matt

Company: Town of Inuvik

 Reference Number
 1328137-1

 Sample Date
 Jan 16, 2019

 Sample Time
 09:50

Sample Location

Sample Description Sewage Lagoon /

SNP0036-3 / 0.9°C

		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	<5			5
pH adjustment	adjustment required		No			
Inorganic Nonmetallic Par	rameters					
Ammonia - N		mg/L	14.2			0.025
Un-ionized Ammonia-N	15 °C	mg/L	0.107			
Ammonium/Ammonia Preservation			Yes			
Microbiological Analysis						
Fecal Coliforms	Membrane Filtration	CFU/100 mL	106000			1
Physical and Aggregate P	roperties					
Solids	Total Suspended	mg/L	12			2
Routine Water						
рН	15 °C	pН	7.44			
Temperature of observed pH		°C	15			
рН			7.71			
Temperature of observed pH		°C	19.6			

Approved by:

Murray Klutz Senior Agronomist 7217 Roper Road NW Edmonton, Alberta T6B 3J4, Canada

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



Methodology and Notes

Bill To: Town of Inuvik Project ID: SNP 0036-3 Lot ID: 1328137

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: Inuvik Date Received: Jan 17, 2019
Inuvik, NT, Canada LSD: Date Reported: Jan 23, 2019

X0E 0T0 P.O.: 100104 Report Number: 2372242

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Matt

Company: Town of Inuvik

Method of Analysis		
Method Name	Reference	Method Date Analysis Location Started
Alkalinity, pH, and EC in water	APHA	* pH - Electrometric Method, 4500-H+ B Jan 17, 2019 Exova Edmonton
Ammonium-N in Water	APHA	* Automated Phenate Method, 4500-NH3 G Jan 23, 2019 Exova Edmonton
BOD (Carbonaceous) in water	APHA	* 5 Day, 5210 B Jan 22, 2019 Exova Edmonton
Coliforms - Membrane Filtration	APHA	Fecal Coliform Membrane Filter Jan 17, 2019 Exova Calgary Procedure, 9222 D
Oil and Grease in water	US EPA	 * n-Hexane Extractable Material and Silica Jan 18, 2019 Exova Edmonton Gel Treated n-Hexane Extractable Material by Extraction and Gravimetry, 1664
pH at 15°C	APHA	* pH - Electrometric Method, 4500-H+ B Jan 18, 2019 Exova Edmonton
Solids Suspended (Total, Fixed and Volatile)	АРНА	* Total Suspended Solids Dried at 103- Jan 22, 2019 Exova Edmonton 105'C, 2540 D
		* Deference Mathed Madified

^{*} Reference Method Modified

References

APHA Standard Methods for the Examination of Water and Wastewater

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.

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LACVG	Assuring	Company	Town of Inuv	vik	Company	Aeco	om .	- Edi	non	ton							s section, client accepts that	
www.exova.com		Address	Box 1160 2 F	Firth Street	Address	1720)3-1	03rc	l Ave	enue	•					surcharges will l	be applied to the analysis	
Project Informati	ion		Inuvik, NT X	0E 0T0		Edmonton, AB T5S 1J4									Date Required			
Project ID	SNP 0036- 3	Attention	Rick Campb	ell	Attention	Attention Richard Feilden										As Indicated	All Analysis	
Project Name		Phone	(867) 777-86	315	Phone	Phone (780) 488-6800										When "ASAP" is requested, turn around will		
Project Location	Inuvik	Cell	(867) 678-53	888	Cell	Cell											USH priority, with pricing and	
Legal Location			(867) 777-86		Fax	Fax (780) 488-2121										turn around time to match. Please contact the lab		
PO/AFE#	100104	E-mail		@town.inuvik.nt.ca	E-mail		•			aec	om.c	om				prior to subn	nitting RUSH samples	
Proj. Acct.Code			2909			E-mail <u>richard.feilden@aecom.com</u>										Signature		
	2	Copy of Report		Copy of i	nvoice										Sample Cus	stody (please print)		
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Report Results	Mail X	Fax													Town of Inuvik			
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Page 1	of 1			A STATE OF THE PARTY OF THE PAR												Received by:	10000	



Report Transmission Cover Page

Bill To: Town of Inuvik Project ID: SNP 0036-3 Lot ID: 1333250

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: Inuvik Date Received: Feb 14, 2019
Inuvik, NT, Canada LSD: Date Reported: Feb 22, 2019

X0E 0T0 P.O.: 100104 Report Number: 2379588

Attn: Rick Campbell Proj. Acct. code:

Sampled By: M. 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	<u>Format</u>	<u>Deliverables</u>
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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	<u>Format</u>	<u>Deliverables</u>
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	<u>Format</u>	<u>Deliverables</u>
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>	<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>	<u>Deliverables</u>
Email - Single Report	PDF	Invoice

Notes To Clients:

• Feb 20, 2019 - Sample 1333250-1; 6492076: Sample formed an emulsion during oil and grease extraction. Centrifugation was required in order to complete analysis.

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2

Analytical Report

Bill To: Town of Inuvik Project ID: SNP 0036-3 Lot ID: 1333250

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: Inuvik Date Received: Feb 14, 2019
Inuvik, NT, Canada LSD: Date Reported: Feb 22, 2019

X0E 0T0 P.O.: 100104 Report Number: 2379588

Attn: Rick Campbell Proj. Acct. code:

Sampled By: M. O'Rourke Company: Town of Inuvik

 Reference Number
 1333250-1

 Sample Date
 Feb 13, 2019

 Sample Time
 09:05

Sample Location

Sample Description Sewage Lagoon / SNP0036-3 / -0.9°C

Water Matrix Nominal Detection **Units** Results Analyte Results Results Limit **Aggregate Organic Constituents** Biochemical Oxygen Inhibited 96 mg/L 4 Demand Oil and Grease Total 97 5 mg/L pH adjustment adjustment required No **Inorganic Nonmetallic Parameters** Ammonia - N mg/L 16.4 0.025 0.0744 Un-ionized Ammonia-N 15 °C mg/L

49

22.6

Ammonium/Ammonia Yes

Preservation

Microbiological Analysis

Fecal Coliforms Membrane Filtration CFU/100 mL 170000 1

Physical and Aggregate Properties

mg/L

°C

Routine Water

pH 15 °C pH 7.22

Temperature of observed °C 15
pH
pH 7.35

Total Suspended

Temperature of observed pH

Solids

Approved by:

Darlene Lintott, MSc Consulting Scientist

Page 2 of 2 **EXOVA**

Methodology and Notes

Bill To: Town of Inuvik Project ID: SNP 0036-3 Lot ID: 1333250

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: Inuvik Date Received: Feb 14, 2019
Inuvik, NT, Canada LSD: Date Reported: Feb 22, 2019

X0E 0T0 P.O.: 100104 Report Number: 2379588

Attn: Rick Campbell Proj. Acct. code:

Sampled By: M. O'Rourke Company: Town of Inuvik

Method of Analysis		
Method Name	Reference	Method Date Analysis Location Started
Alkalinity, pH, and EC in water	APHA	* pH - Electrometric Method, 4500-H+ B Feb 14, 2019 Exova Edmonton
Ammonium-N in Water	APHA	* Automated Phenate Method, 4500-NH3 G Feb 14, 2019 Exova Edmonton
BOD (Carbonaceous) in water	APHA	* 5 Day, 5210 B Feb 14, 2019 Exova Edmonton
Coliforms - Membrane Filtration	APHA	Fecal Coliform Membrane Filter Feb 14, 2019 Exova Calgary Procedure, 9222 D
Oil and Grease in water	US EPA	 * n-Hexane Extractable Material and Silica Feb 19, 2019 Exova Edmonton Gel Treated n-Hexane Extractable Material by Extraction and Gravimetry, 1664
pH at 15°C	APHA	* pH - Electrometric Method, 4500-H+ B Feb 20, 2019 Exova Edmonton
Solids Suspended (Total, Fixed and Volatile)	APHA	 * Total Suspended Solids Dried at 103- Feb 14, 2019 Exova Edmonton 105'C, 2540 D
		* Potorono Mothad Modified

^{*} Reference Method Modified

References

APHA Standard Methods for the Examination of Water and Wastewater

US EPA US Environmental Protection Agency Test Methods

Comments:

• Feb 20, 2019 - Sample 1333250-1; 6492076: Sample formed an emulsion during oil and grease extraction. Centrifugation was required in order to complete analysis.

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	Testing	Billing Informa	ion:			Copy of	Report To:										RUSI	H Priority	
Exova	Advising	Company	Town of Inu	vik	STATE OF THE STATE	Company			Edn	non	ton					Upon filling out this section, client accepts that			
www.exova.com	Masumi	Address	Box 1160 2	Firth Street		Address		3-1	03rd	Av	enue						surcharges will be	e applied to the analysis	
Project Information	on		Inuvik, NT X	(OE 0T0			Edmo	nton	AB 7	T5S	1J4						Date Required		
Project ID	SNP 0036- 3	Attention	Rick Campb	ell	1	Attention Richard Feilden											As Indicated	All Analysis	
Project Name		Phone	(867) 777-86	315	F	Phone (780) 488-6800										When the CART is required the second will			
Project Location	Inuvik	Cell	(867) 678-53	388	(Cell											When "ASAP" is requested, turn around will default to a 100% RUSH priority, with pricing and		
Legal Location		Fax	(867) 777-86	501	F	Fax (780) 488-2121											turn around time to match. Please contact the late prior to submitting RUSH samples		
PO/AFE#	100104	E-mail	rcampbell	@town.inuvik.nt.ca	<u>a</u> F	E-mail	richa	ard.fe	eilde	n@	aeco	m.c	com						
Proj. Acct.Code		Agreement ID	2909														Signature		
		Copy of Report			_	Copy of ir	and the second second	-		-			-	_				ody (please print)	
Report Results	X E-Mail	Online	PDF		(QA/QC R	eport	П									Sampled by: Mail	O'Rourke	
	Mail X	Fax	Excel		$oxed{oxed}$	1		11									,	own of Inuvik	
from above).	s/Comments (please	include contact info	ormation inclu	ding ph. # if different		dicate Reg		SrS										to proceed with the work d on this form:	
Sampler: note we	ather:				Ked	quirement	is below	Containers		1.5	2						8000 000		
Campier. Hote wes	attier.							Con		3	Spilos	Fecal Coliforms	Φ				Date: 03 -13 -14	for Lab use only	
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Sample	Identification	Location	Depth in cm m	Date/Time sample	∌d	Matrix	Sampling method							95			Indicate below any condition of sample		
1 SNP0036-3	THE CONTRACTOR STATEMENT OF THE CONTRACTOR OF TH	Sewage Lagoor	-	02-13-19 9"5A	-		Dip	5	x x	(X	x	x	х	П		T		Were Exova supplies	
2								П										used?	
3								П										Was there any damage	
4						W.		П										to the shipping container?	
5																			
6						190												Were the containers packaged well?	
7																		packaged well?	
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10						3		Ш					_					received (document	
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Page 1	of 1				111							1					Received by:	NUNCZ	



Report Transmission Cover Page

Bill To: Town of Inuvik Project ID: SNP 0036-3 Lot ID: 1338374

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: Inuvik Date Received: Mar 14, 2019
Inuvik, NT, Canada LSD: Date Reported: Mar 21, 2019

X0E 0T0 P.O.: 100104 Report Number: 2386793

Attn: Rick Campbell Proj. Acct. code:

Sampled By: M. O'Rouke 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	<u>Format</u>	<u>Deliverables</u>
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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>	<u>Deliverables</u>
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
<u>Delivery</u>	<u>Format</u>	<u>Deliverables</u>
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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
<u>Delivery</u>	<u>Format</u>	<u>Deliverables</u>
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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>	<u>Deliverables</u>
Email - Single Report	PDF	Invoice

Notes To Clients:

• Mar 21, 2019 - Sample 1338374-1; 6536671: 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 Project ID: SNP 0036-3 Lot ID: 1338374

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: Inuvik Date Received: Mar 14, 2019
Inuvik, NT, Canada LSD: Date Reported: Mar 21, 2019

X0E 0T0 P.O.: 100104 Report Number: 2386793

Attn: Rick Campbell Proj. Acct. code:

Sampled By: M. O'Rouke Company: Town of Inuvik

 Reference Number
 1338374-1

 Sample Date
 Mar 13, 2019

 Sample Time
 09:30

Sample Location

Sample Description Sewage Lagoon / SNP0036-3 / 2.8°C

MatrixWaterUnitsResultsResultsResults

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Aggregate Organic Const	ituents					
Biochemical Oxygen Demand	Inhibited	mg/L	45			4
Oil and Grease	Total	mg/L	32			5
pH adjustment	adjustment required		No			
Inorganic Nonmetallic Par	rameters					
Ammonia - N		mg/L	18.2			0.025
Un-ionized Ammonia-N	15 °C	mg/L	0.0573			
Ammonium/Ammonia Preservation			Yes			
Microbiological Analysis						
Fecal Coliforms	Membrane Filtration	CFU/100 mL	174000			1
Physical and Aggregate P	roperties					
Solids	Total Suspended	mg/L	5			2
Routine Water						
рН	15 °C	рН	7.06			
Temperature of observed pH		°C	15			
рН			7.59			
Temperature of observed pH		°C	22.0			

Approved by:

Darlene Lintott, MSc Consulting Scientist



Methodology and Notes

Bill To: Town of Inuvik Project ID: SNP 0036-3 Lot ID: 1338374

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: Inuvik Date Received: Mar 14, 2019
Inuvik, NT, Canada LSD: Date Reported: Mar 21, 2019

X0E 0T0 P.O.: 100104 Report Number: 2386793

Attn: Rick Campbell Proj. Acct. code:

Sampled By: M. O'Rouke Company: Town of Inuvik

Method of Analysis		
Method Name	Reference	Method Date Analysis Location Started
Alkalinity, pH, and EC in water	APHA	* pH - Electrometric Method, 4500-H+ B Mar 14, 2019 Exova Edmonton
Ammonium-N in Water	APHA	* Automated Phenate Method, 4500-NH3 G Mar 18, 2019 Exova Edmonton
BOD (Carbonaceous) in water	APHA	* 5 Day, 5210 B Mar 14, 2019 Exova Edmonton
Coliforms - Membrane Filtration	APHA	Fecal Coliform Membrane Filter Mar 14, 2019 Exova Calgary Procedure, 9222 D
Oil and Grease in water	US EPA	* n-Hexane Extractable Material and Silica Mar 19, 2019 Exova Edmonton Gel Treated n-Hexane Extractable Material by Extraction and Gravimetry, 1664
pH at 15°C	APHA	* pH - Electrometric Method, 4500-H+ B Mar 15, 2019 Exova Edmonton
Solids Suspended (Total, Fixed and Volatile)	APHA	* Total Suspended Solids Dried at 103- Mar 15, 2019 Exova Edmonton 105'C, 2540 D
		* Peference Method Modified

^{*} Reference Method Modified

References

APHA Standard Methods for the Examination of Water and Wastewater

US EPA US Environmental Protection Agency Test Methods

Comments:

• Mar 21, 2019 - Sample 1338374-1; 6536671: 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.

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Exova	Testing	Billing Informat	ion:		Сору о	f Report To	:										RUSI	l Priority
EXOVG	Assuri	Company	Town of Inuv	<i>i</i> ik	Compa	5												section, client accepts that
www.exova.com		Address	Box 1160 2 I	Firth Street	Address	1720	03-1	03r	rd A	ven	ue						surcharges will be	applied to the analysis
Project Information	on		Inuvik, NT X	0E 0T0		Edm	ontor	n, AE	3 T5	S 1J	4						Date Required	
Project ID	SNP 0036-3	Attention	Rick Campb	ell	Attentio	n Rich	nard	Fe	ilde	n							As Indicated	All Analysis
Project Name		Phone	(867) 777-86	315	Phone	(780) 48	38-6	800)							When "ASAP" is requested, turn around will default to a 100% RUSH priority, with pricing and	
Project Location	Inuvik	Cell	(867) 678-53	388	Cell													
Legal Location		Fax	(867) 777-86	601	Fax	Fax (780) 488-2121								turn around time to match. Please contact the lab prior to submitting RUSH samples				
PO/AFE#	100104	E-mail	rcampbell	@town.inuvik.nt.ca	E-mail	richa	ard.f	feild	den(@ae	cor	n.cc	m				phor to submit	ung recorr samples
Proj. Acct.Code		Agreement ID	2909		1 1												Signature	
		Copy of Report			Copy of	invoice											Sample Cust	ody (please print)
Report Results	X E-Mail	Online	PDF		QA/QC	Report	Γ						T		Т		Sampled by: Mark	Orowhe
		X Fax	Excel					l									Company To	wn of Inuvik
Special Instruction from above).	s/Comments (plea	ase include contact info	rmation inclu	ding ph. # if different	Indicate R Requireme		ers											o proceed with the work d on this form:
Sampler: note we	ather:						tain			Solids		,,					Date: 03-13 -14	ACTION CONTRACTOR INTO THE ST
							Containers			So		Fecal Coliforms	ا پو				Contract of the Contract of th	for Lab use only
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Sample	Identification	Location	Depth in cm m	Date/Time sample	d Matrix	Sampling method		Γ									Indicate below any condition of sample	
1 SNP0036-3		Sewage Lagoon	CONTRACTOR	05-13-19 9x A		Dip	¥ 5	X	V	х	x	x >	7		$\overline{}$	_	<u> </u>	Were Exova supplies
2		Jewage Lagoon		03-13-17 1 11		Dip	۲	<u> </u>	<u>^</u>	^	^	^ 	+	+	+	+		used?
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14					41		T	Г			\neg	\neg	\top	\top	\top			recommended holding times/temp?
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	Environmen	tal Sample Inform	ation She	et	Indicate lot nu	mber or affi	x lot	labe	l her	e:	-	-	- 5	Shipp	ing:		# and size of coolers re	eceived:
Note: Prop	AND THE PERSON NAMED IN CONTRACTOR OF TH	nis form is required in o	Department of the section of	ed with analysis								1		COD	Y/N		-	^
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Page 1	of 1	Control #												2	. 0		Received by: \	
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SNP 0036-3

T: +1 (780) 438-5522 F: +1 (780) 434-8586

Control Number:

Date Received:

E: info.Edmonton@element.com

Lot ID: 1345336

Date Reported: Apr 25, 2019

Report Number: 2397498

Apr 18, 2019

W: element.com

Report Transmission Cover Page

Town of Inuvik

Company:

Project ID: Bill To: Town of Inuvik

> Project Name: Box 1160

Project Location: Inuvik 2 Firth Street

LSD: Inuvik, NT, Canada

P.O.: 100104 X0E 0T0

Proj. Acct. code: Attn: Rick Campbell

Sampled By: Matt O'Rourke

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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Kim Wainman	Town of Inuvik	Box 1160, 2 Firth Street				
		Inuvik, NT X0E 0T0				
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Richard Feilden	AECOM - Edmonton	17203 - 103 Avenue				
		Edmonton, AB T5S 1J4				
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		Email: richard.feilden@aecom.com				
Delivery	<u>Format</u>	<u>Deliverables</u>				
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Rick Campbell	Town of Inuvik	Box 1160, 2 Firth Street				
		Inuvik, NT X0E 0T0				
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		Email: rcampbell@town.inuvik.nt.ca				
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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:

- Apr 18, 2019 Sample received over temperature for micro analysis.
- Apr 23, 2019 Sample 1345336-1; 6572482: 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

2 Firth Street

Inuvik, NT, Canada

X0E 0T0

Attn: Rick Campbell

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

Project ID: SNP 0036-3

Project Name:

Project Location: Inuvik

LSD: P.O.:

100104

Proj. Acct. code:

Lot ID: 1345336

Control Number:

Date Received: Apr 18, 2019

Date Reported: Apr 25, 2019 Report Number: 2397498

Reference Number

1345336-1

Sample Date Sample Time

Apr 17, 2019 09:00

Sample Location

Sewage Lagoon

Sample Description SNP0036-3 / 11.7°C

Mator Matrix

		Matrix	vvater			
Analyte		Units	Results	Results	Results	Nominal Detection Limit
Aggregate Organic Const	ituents					
Biochemical Oxygen Demand	Inhibited	mg/L	73			4
Oil and Grease	Total	mg/L	8			5
pH adjustment	adjustment required		No			
Inorganic Nonmetallic Par	ameters					
Ammonia - N		mg/L	20.3			0.025
Ammonium/Ammonia			Yes			
Preservation						
Microbiological Analysis						
Fecal Coliforms	Membrane Filtration	CFU/100 mL	6000			1
Physical and Aggregate P	roperties					
Solids	Total Suspended	mg/L	23			2
Routine Water						
рН			7.39			
Temperature of observed pH		°C	21.7			

Approved by:

Anthony Neumann, MSc Laboratory Operations Manager

Anthony Weuman



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

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Methodology and Notes

Project ID: SNP 0036-3 Bill To: Town of Inuvik

> Project Name: Box 1160

Project Location: Inuvik 2 Firth Street

LSD: Inuvik, NT, Canada

P.O.: 100104 X0E 0T0

Attn: Rick Campbell

Sampled By: Matt O'Rourke

Proj. Acct. code:

Lot ID: 1345336

Control Number:

Date Received: Apr 18, 2019

Date Reported: Apr 25, 2019

Report Number: 2397498

Method	of	Ana	lysis
--------	----	-----	-------

Company: Town of Inuvik

Method Name	Reference	Method	Date Analysis Started	Location
Alkalinity, pH, and EC in water	APHA	* pH - Electrometric Method, 4500-H+ B	Apr 18, 2019	Element Edmonton - Roper Road
Ammonium-N in Water	APHA	* Automated Phenate Method, 4500-NH3 G	Apr 18, 2019	Element Edmonton - Roper Road
BOD (Carbonaceous) in water	APHA	* 5 Day, 5210 B	Apr 18, 2019	Element Edmonton - Roper Road
Coliforms - Membrane Filtration	APHA	Fecal Coliform Membrane Filter Procedure, 9222 D	Apr 18, 2019	Element 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 	Apr 22, 2019	Element Edmonton - Roper Road
Solids Suspended (Total, Fixed and Volatile)	АРНА	* Total Suspended Solids Dried at 103- 105'C, 2540 D	Apr 23, 2019	Element Edmonton - Roper Road

^{*} Reference Method Modified

References

APHA Standard Methods for the Examination of Water and Wastewater

US EPA US Environmental Protection Agency Test Methods

Comments:

- Apr 18, 2019 Sample received over temperature for micro analysis.
- Apr 23, 2019 Sample 1345336-1; 6572482: Sample formed an emulsion during oil and grease extraction. Centrifugation was required in order to complete analysis.

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2 Firth Street

Inuvik, NT, Canada

Project ID: SNP 0036-3

Project Name:

Inuvik Project Location:

LSD:

P.O.:

100104

Lot ID: 1351102

Control Number:

Date Received: May 18, 2019

Date Reported: May 28, 2019 Report Number: 2406285

Proj. Acct. code: Attn: Rick Campbell

Sampled By: Dale Huatum 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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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>	<u>Deliverables</u>				
Email - Single Report	PDF	Invoice				
Richard Feilden	AECOM - Edmonton	17203 - 103 Avenue				
		Edmonton, AB T5S 1J4				
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		Email: richard.feilden@aecom.com				
<u>Delivery</u>	<u>Format</u>	<u>Deliverables</u>				
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>	<u>Deliverables</u>				
Email - Merge Reports	PDF	COC / Test Report				
Email - Single Report	PDF	Invoice				
Steven Pickle	AECOM - Edmonton	101-18817 Stony Plain Road NW				
		Edmonton, AB T5S 0C2				
		Phone: (780) 732-9439 Fax:				
		Email: steven.pickle@aecom.com				
Delivery	<u>Format</u>	<u>Deliverables</u>				
Email - Merge Reports	PDF	COC / Test Report				
Email - Single Report	Legacy Crosstab in CSV	Test Report				
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				
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Report Transmission Cover Page

Bill To: Town of Inuvik

Box 1160

2 Firth Street

Inuvik, NT, Canada

X0E 0T0

Attn: Rick Campbell

Sampled By: Dale Huatum
Company: Town of Inuvik

Project ID: SNP 0036-3

Project Name:

Project Location: Inuvik

LSD: P.O.:

100104

Proj. Acct. code:

Lot ID: 1351102

Control Number:

Date Received: May 18, 2019

Date Reported: May 28, 2019

Report Number: 2406285



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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: Dale Huatum Town of Inuvik Company:

Project ID: SNP 0036-3

Project Name:

Proj. Acct. code:

Project Location: Inuvik

LSD: P.O.:

100104

Lot ID: 1351102

Control Number:

May 18, 2019 Date Received:

Date Reported: May 28, 2019 2406285 Report Number:

Reference Number Sample Date

1351102-1 May 15, 2019

Sample Time

09:40

Sample Location Sample Description

Sewage Lagoon SNP0036-3 / 8.8C

Matrix Water

		Watiix	vvator			
Analyte		Units	Results	Results	Results	Nominal Detection Limit
Aggregate Organic Const	ituents					
Biochemical Oxygen Demand	Inhibited	mg/L	87			4
Oil and Grease	Total	mg/L	5			5
pH adjustment	adjustment required		No			
Inorganic Nonmetallic Par	ameters					
Ammonia - N		mg/L	16.3			0.025
Ammonium/Ammonia Preservation			Yes			
Microbiological Analysis						
Fecal Coliforms	Membrane Filtration	CFU/100 mL	53000			1
Physical and Aggregate P	roperties					
Solids	Total Suspended	mg/L	8			2
Routine Water						
рН			7.95			
Temperature of observed pH		°C	21.0			



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Methodology and Notes

Bill To: Town of Inuvik Project ID: SNP 0036-3 Lot ID: 1351102

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: Inuvik Date Received: May 18, 2019
Inuvik NT Canada LSD: Date Received: May 18, 2019

 Inuvik, NT, Canada
 LSD:
 Date Reported:
 May 28, 2019

 X0E 0T0
 P.O.:
 100104
 Report Number:
 2406285

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Dale Huatum

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	May 16, 2019	Element Edmonton - Roper Road
Ammonium-N in Water	APHA	* Automated Phenate Method, 4500-NH3 G	May 28, 2019	Element Edmonton - Roper Road
BOD (Carbonaceous) in water	APHA	* 5 Day, 5210 B	May 16, 2019	Element Edmonton - Roper Road
Coliforms - Membrane Filtration	APHA	Fecal Coliform Membrane Filter Procedure, 9222 D	May 16, 2019	Element 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 	May 23, 2019	Element Edmonton - Roper Road
Solids Suspended (Total, Fixed and Volatile)	APHA	* Total Suspended Solids Dried at 103- 105'C, 2540 D	May 21, 2019	Element Edmonton - Roper Road

References

APHA Standard Methods for the Examination of Water and Wastewater

US EPA US Environmental Protection Agency Test Methods

Please direct any inquiries regarding this report to our Client Services group.

Results relate only to samples as submitted.



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Report Transmission Cover Page

Bill To: Town of Inuvik

Project ID: SNP 0036-3

Lot ID: 1355758

Box 1160

Project Name:

Control Number:

2 Firth Street

Project Location: Inuvik

100104

Date Received: Jun 7, 2019

Inuvik, NT, Canada X0E 0T0

LSD:

Date Reported: Jun 17, 2019

P.O.:

Report Number: 2412741

Attn: Rick Campbell

Company: Town of Inuvik

Sampled By: D. Kerd

Proj. Acct. code:

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>	<u>Deliverables</u>					
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					
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		Email: kwainman@town.inuvik.nt.ca					
Delivery	<u>Format</u>	<u>Deliverables</u>					
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					
<u>Delivery</u>	<u>Format</u>	<u>Deliverables</u>					
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>	<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>	<u>Deliverables</u>					
Email - Single Report	PDF	Invoice					

Notes To Clients:

• Jun 12, 2019 - Sample 1355758-1; 6626141: 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

2 Firth Street

Inuvik, NT, Canada

Terms and Conditions: https://www.element.com/terms/terms-and-conditions

X0E 0T0

Attn: Rick Campbell

Sampled By: D. Kerd Company: Town of Inuvik Project ID: SNP 0036-3

Project Name:

Project Location: Inuvik

LSD: P.O.:

100104

Control Number:

Lot ID: 1355758

Date Received:

Jun 7, 2019 Date Reported: Jun 17, 2019

Report Number: 2412741

Proj. Acct. code:

Reference Number

1355758-1

Sample Date Sample Time

Jun 06, 2019 09:10

Sample Location

Sewage Lagoon

Sample Description SNP0036-3 / 4.8°C

> Matrix Water

		matrix	· · · ator			
Analyte		Units	Results	Results	Results	Nominal Detection Limit
Aggregate Organic Const	ituents					
Biochemical Oxygen	Inhibited	mg/L	<4			4
Demand						
Oil and Grease	Total	mg/L	7			5
pH adjustment	adjustment required		No			
Inorganic Nonmetallic Pa	rameters					
Ammonia - N		mg/L	0.054			0.025
Ammonium/Ammonia			Yes			
Preservation						
Microbiological Analysis						
Fecal Coliforms	Membrane Filtration	CFU/100 mL	60			1
Physical and Aggregate F	Properties					
Solids	Total Suspended	mg/L	49			2
Routine Water						
рН			7.51			
Temperature of observed pH		°C	20.1			



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Methodology and Notes

Bill To: Town of Inuvik Project ID: SNP 0036-3 Lot ID: 1355758

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: Inuvik Date Received: Jun 7, 2019

Inuvik, NT, Canada LSD: Date Reported: Jun 17, 2019

X0E 0T0 P.O.: 100104 Report Number: 2412741

Attn: Rick Campbell Proj. Acct. code:

Attn: Rick Campbell Proj. Acct. code

Sampled By: D. Kerd
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	Jun 10, 2019	Element Edmonton - Roper Road
Ammonium-N in Water	APHA	* Automated Phenate Method, 4500-NH3 G	Jun 14, 2019	Element Edmonton - Roper Road
BOD (Carbonaceous) in water	APHA	* 5 Day, 5210 B	Jun 12, 2019	Element Edmonton - Roper Road
Coliforms - Membrane Filtration	APHA	Fecal Coliform Membrane Filter Procedure, 9222 D	Jun 8, 2019	Element 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 	Jun 10, 2019	Element Edmonton - Roper Road
Solids Suspended (Total, Fixed and Volatile)	АРНА	 * Total Suspended Solids Dried at 103- 105'C, 2540 D 	Jun 17, 2019	Element Edmonton - Roper Road
		* Reference Method Modified		

^{*} Reference Method Mod

References

APHA Standard Methods for the Examination of Water and Wastewater

US EPA US Environmental Protection Agency Test Methods

Comments:

• Jun 12, 2019 - Sample 1355758-1; 6626141: 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.

Results relate only to samples as submitted.



SNP 0036-3

100104

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Report Transmission Cover Page

Company: Towmn of Inuvik

Project ID: Bill To: Town of Inuvik

> Project Name: Box 1160

Project Location: Inuvik 2 Firth Street

LSD: Inuvik, NT, Canada

P.O.: X0E 0T0

Attn: Rick Campbell

Sampled By: Matt O'Rourke

Proj. Acct. code:

Lot ID: 1356837

Control Number:

Date Received: Jun 13, 2019

Date Reported: Jun 20, 2019

Report Number: 2414256

Contact	Company	Address
Kim Wainman	Town of Inuvik	Box 1160, 2 Firth Street
		Inuvik, NT X0E 0T0
		Phone: (867) 777-8615 Fax: (867) 777-8601
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Email - Single Report	PDF	Invoice
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		Email: utilidor@town.inuvik.nt.ca
Delivery	<u>Format</u>	<u>Deliverables</u>
Email - Single Report	PDF	Invoice

Notes To Clients:

• Jun 14, 2019 - Sample 1356837-1; 6631804: 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

2 Firth Street

Inuvik, NT, Canada

X0E 0T0

Attn: Rick Campbell

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

Project ID: SNP 0036-3

Project Name:

Project Location: Inuvik

LSD: P.O.:

100104

Proj. Acct. code:

Lot ID: 1356837

Control Number:

Date Received: Jun 13, 2019

Date Reported: Jun 20, 2019

Report Number: 2414256

Reference Number

1356837-1

Sample Date Sample Time Jun 12, 2019 10:00

Sample Location

Sample Description Sewage Lagoon / SNP0036-3 / 9.6°C

Matrix

Water

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Aggregate Organic Consti	ituents					
Biochemical Oxygen Demand	Inhibited	mg/L	11			4
Oil and Grease	Total	mg/L	5			5
pH adjustment	adjustment required		No			
Inorganic Nonmetallic Par	ameters					
Ammonia - N		mg/L	12.4			0.025
Un-ionized Ammonia-N	15 °C	mg/L	0.226			
Ammonium/Ammonia Preservation			Yes			
Microbiological Analysis						
Fecal Coliforms	Membrane Filtration	CFU/100 mL	4000			1
Physical and Aggregate P	roperties					
Solids	Total Suspended	mg/L	25			2
Routine Water						
рН	15 °C	рН	7.83			
Temperature of observed pH		°C	16			
рH			7.82			
Temperature of observed pH		°C	20.0			

Approved by:

Anthony Neumann, MSc

Anthony Weuman

Lot ID: 1356837



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Methodology and Notes

Bill To: Town of Inuvik Project ID: SNP 0036-3

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: Inuvik Date Received: Jun 13, 2019
Inuvik, NT, Canada LSD: Date Reported: Jun 20, 2019

 Inuvik, NT, Canada
 LSD:
 Date Reported:
 Jun 20, 2019

 X0E 0T0
 P.O.:
 100104
 Report Number:
 2414256

Attn: Rick Campbell Proj. Acct. code:

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

Method of Analysis				
Method Name	Reference	Method	Date Analysis Started	Location
Alkalinity, pH, and EC in water	АРНА	* pH - Electrometric Method, 4500-H+ B	Jun 13, 2019	Element Edmonton - Roper Road
Ammonium-N in Water	APHA	* Automated Phenate Method, 4500-NH3 G	Jun 18, 2019	Element Edmonton - Roper Road
BOD (Carbonaceous) in water	APHA	* 5 Day, 5210 B	Jun 13, 2019	Element Edmonton - Roper Road
Coliforms - Membrane Filtration	APHA	Fecal Coliform Membrane Filter Procedure, 9222 D	Jun 13, 2019	Element 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 	Jun 13, 2019	Element Edmonton - Roper Road
pH at 15°C	APHA	* pH - Electrometric Method, 4500-H+ B	Jun 20, 2019	Element Edmonton - Roper Road
Solids Suspended (Total, Fixed and Volatile)	APHA	 * Total Suspended Solids Dried at 103- 105'C, 2540 D 	Jun 18, 2019	Element Edmonton - Roper Road
		* Reference Method Modified		

^{*} Reference Method Modifie

References

APHA Standard Methods for the Examination of Water and Wastewater

US EPA US Environmental Protection Agency Test Methods

Comments:

• Jun 14, 2019 - Sample 1356837-1; 6631804: 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.

Results relate only to samples as submitted.



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Report Transmission Cover Page

Box 1160

Project ID: Bill To: Town of Inuvik

Project Name:

SNP 0036-3 Lot ID: 1359871

Control Number:

2 Firth Street

Project Location: Inuvik

Date Received:

Inuvik, NT, Canada

LSD:

100104

Jun 26, 2019 Date Reported: Jul 3, 2019

X0E 0T0

P.O.:

Report Number: 2418387

Attn: Rick Campbell Sampled By:

Company: Town of Inuvik

Matt O'Rourke

Proj. Acct. code:

Contact	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>	<u>Deliverables</u>					
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>	<u>Deliverables</u>					
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	<u>Format</u>	<u>Deliverables</u>					
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>	<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>	<u>Deliverables</u>					
Email - Single Report	PDF	Invoice					

Notes To Clients:

• Jun 27, 2019 - Sample 1359871-1; 6648767: 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

2 Firth Street

Inuvik, NT, Canada

X0E 0T0

Attn: Rick Campbell
Sampled By: Matt O'Rourke
Company: Town of Inuvik

Project ID: SNP 0036-3

Project Name:

Project Location: Inuvik

LSD: P.O.:

100104

Proj. Acct. code:

Lot ID: 1359871

Control Number:

Date Received: Jun 26, 2019

Date Reported: Jul 3, 2019 Report Number: 2418387

Reference Number

1359871-1

Sample Date Sample Time

Jun 25, 2019 09:00

Sample Location

Sample Description Sewage Lagoon / SNP0036-3 / 6.1°C

Matrix Water

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Aggregate Organic Const	ituents					
Biochemical Oxygen Demand	Inhibited	mg/L	17			4
Oil and Grease	Total	mg/L	7			5
pH adjustment	adjustment required		No			
Inorganic Nonmetallic Par	ameters					
Ammonia - N		mg/L	6.29			0.025
Un-ionized Ammonia-N	15 °C	mg/L	0.675			
Ammonium/Ammonia Preservation			Yes			
Microbiological Analysis						
Fecal Coliforms	Membrane Filtration	CFU/100 mL	600			1
Physical and Aggregate P	roperties					
Solids	Total Suspended	mg/L	43			2
Routine Water						
рН	15 °C	рН	8.64			
Temperature of observed pH		°C	15			
pН			7.80			
Temperature of observed pH		°C	19.4			

Approved by:

Murray Klutz Senior Agronomist

Lot ID: 1359871

Jun 26, 2019

Jul 3, 2019



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

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Control Number:

Date Received:

Date Reported:

Report Number: 2418387

T: +1 (780) 438-5522

Methodology and Notes

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

Project ID: SNP 0036-3 Bill To: Town of Inuvik

> Project Name: Box 1160

Project Location: Inuvik 2 Firth Street

LSD: Inuvik, NT, Canada

P.O.: 100104 X0E 0T0

Proj. Acct. code: Attn: Rick Campbell

Method of Analysis

Method Name	Reference	Method	Date Analysis Started	Location
Alkalinity, pH, and EC in water	АРНА	* pH - Electrometric Method, 4500-H+ B	Jun 26, 2019	Element Edmonton - Roper Road
Ammonium-N in Water	APHA	* Automated Phenate Method, 4500-NH3 G	Jul 2, 2019	Element Edmonton - Roper Road
BOD (Carbonaceous) in water	APHA	* 5 Day, 5210 B	Jun 27, 2019	Element Edmonton - Roper Road
Coliforms - Membrane Filtration	APHA	Fecal Coliform Membrane Filter Procedure, 9222 D	Jun 26, 2019	Element 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 	Jun 26, 2019	Element Edmonton - Roper Road
pH at 15°C	APHA	* pH - Electrometric Method, 4500-H+ B	Jun 27, 2019	Element Edmonton - Roper Road
Solids Suspended (Total, Fixed and Volatile)	АРНА	* Total Suspended Solids Dried at 103- 105'C, 2540 D	Jun 27, 2019	Element Edmonton - Roper Road

Reference Method Modified

References

APHA Standard Methods for the Examination of Water and Wastewater

US EPA US Environmental Protection Agency Test Methods

Comments:

• Jun 27, 2019 - Sample 1359871-1; 6648767: 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. Results relate only to samples as submitted.



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W: element.com

Report Transmission Cover Page

Bill To: Town of Inuvik

Project Name: Box 1160

Project Location: 2 Firth Street

Inuvik, NT, Canada

X0E 0T0

Attn: Rick Campbell

Sampled By: Dale Huatua Company: Town of Inuvik Project ID: SNP 0036-3

Inuvik

LSD: P.O.:

100104

Proj. Acct. code:

Lot ID: 1361261

Control Number:

Date Received: Jul 3, 2019

Date Reported: Jul 9, 2019 Report Number: 2420288

Contact	Company	Address				
Kim Wainman	Town of Inuvik	Box 1160, 2 Firth Street				
		Inuvik, NT X0E 0T0				
		Phone: (867) 777-8615 Fax: (867) 777-				
		Email: kwainman@town.inuvik.nt.ca				
Delivery	<u>Format</u>	<u>Deliverables</u>				
Email - Single Report	PDF	Invoice				
Richard Feilden	AECOM - Edmonton	17203 - 103 Avenue				
		Edmonton, AB T5S 1J4				
		Phone: (780) 488-6800 Fax: (780) 488-				
		Email: richard.feilden@aecom.com				
Delivery	<u>Format</u>	<u>Deliverables</u>				
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-				
		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-				
		Email: utilidor@town.inuvik.nt.ca				
Delivery	<u>Format</u>	<u>Deliverables</u>				
Email - Single Report	PDF	Invoice				

Notes To Clients:



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W: element.com

Analytical Report

Bill To: Town of Inuvik

Box 1160

2 Firth Street

Inuvik, NT, Canada

X0E 0T0

Attn: Rick Campbell

Sampled By: Dale Huatua Company: Town of Inuvik Project ID: SNP 0036-3

Project Name:

Project Location: Inuvik

LSD: P.O.:

100104

Proj. Acct. code:

Lot ID: 1361261

Control Number:

Date Received: Jul 3, 2019

Date Reported: Jul 9, 2019 Report Number: 2420288

report runnber

Reference Number

1361261-1

Sample Date Sample Time Jul 02, 2019 09:00

Sample Location

Sample Description SNP0036-3 / 9.4C /

Sewage Lagoon

Matrix Water

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Aggregate Organic Const	ituents					
Biochemical Oxygen Demand	Inhibited	mg/L	16			4
Oil and Grease	Total	mg/L	6			5
pH adjustment	adjustment required		No			
Inorganic Nonmetallic Par	rameters					
Ammonia - N		mg/L	3.81			0.025
Un-ionized Ammonia-N	15 °C	mg/L	0.299			
Ammonium/Ammonia Preservation			Yes			
Microbiological Analysis						
Fecal Coliforms	Membrane Filtration	CFU/100 mL	3100			1
Physical and Aggregate P	roperties					
Solids	Total Suspended	mg/L	43			2
Routine Water						
рН	15 °C	рН	8.49			
Temperature of observed		°C	15			
рН						
рН			8.58			
Temperature of observed pH		°C	19.7			

Approved by:

Anthony Neumann, MSc General Manager

Anthony Weuman



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Methodology and Notes

Bill To: Town of Inuvik

Box 1160

2 Firth Street Inuvik, NT, Canada

X0E 0T0

Attn: Rick Campbell

Sampled By: Dale Huatua Company: Town of Inuvik

Method of Analysis

Project ID: SNP 0036-3

Project Name:

Project Location: Inuvik

LSD:

100104

P.O.: Proj. Acct. code: Lot ID: 1361261

Control Number:

Jul 8, 2019

Jul 4, 2019

Element Edmonton - Roper

Element Edmonton - Roper

Road

Road

Date Received: Jul 3, 2019

Jul 9, 2019 Date Reported:

Report Number: 2420288

,				
Method Name	Reference	Method	Date Analysis Started	Location
Alkalinity, pH, and EC in water	APHA	* pH - Electrometric Method, 4500-H+ B	Jul 3, 2019	Element Edmonton - Roper Road
Ammonium-N in Water	APHA	* Automated Phenate Method, 4500-NH3 G	Jul 5, 2019	Element Edmonton - Roper Road
BOD (Carbonaceous) in water	APHA	* 5 Day, 5210 B	Jul 3, 2019	Element Edmonton - Roper Road
Coliforms - Membrane Filtration	APHA	Fecal Coliform Membrane Filter Procedure, 9222 D	Jul 3, 2019	Element Calgary
Oil and Grease in water	US EPA	 n-Hexane Extractable Material and Silica Gel Treated n-Hexane Extractable Material by Extraction and Gravimetry, 	Jul 3, 2019	Element Edmonton - Roper Road

105'C. 2540 D

* pH - Electrometric Method, 4500-H+ B

* Total Suspended Solids Dried at 103-

References

Solids Suspended (Total, Fixed and

pH at 15°C

Volatile)

APHA Standard Methods for the Examination of Water and Wastewater

US EPA US Environmental Protection Agency Test Methods

APHA

APHA

Please direct any inquiries regarding this report to our Client Services group. Results relate only to samples as submitted.

^{*} Reference Method Modified



SNP 0036-3

100104

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W: element.com

Report Transmission Cover Page

Bill To: Town of Inuvik

Lot ID: 1364588

Box 1160

Project ID: Project Name:

Control Number:

2 Firth Street

Project Location: Inuvik

Date Received: Jul 18, 2019

Inuvik, NT, Canada X0E 0T0

LSD:

Date Reported: Jul 25, 2019

Attn: Rick Campbell

Town of Inuvik

P.O.: Proj. Acct. code:

Report Number: 2424882

Sampled By: David Kendi

Company:

Comtont	Commons	Address			
Contact	Company	Address			
Kim Wainman	Town of Inuvik	Box 1160, 2 Firth Street			
		Inuvik, NT X0E 0T0			
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		Email: richard.feilden@aecom.com			
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Rick Campbell	Town of Inuvik	Box 1160, 2 Firth Street			
		Inuvik, NT X0E 0T0			
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		Email: rcampbell@town.inuvik.nt.ca			
Delivery	<u>Format</u>	<u>Deliverables</u>			
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Email - Single Report	PDF	Invoice			
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		Email: utilidor@town.inuvik.nt.ca			
<u>Delivery</u>	<u>Format</u>	<u>Deliverables</u>			

Invoice

Notes To Clients:

Email - Single Report

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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: David Kendi Company: Town of Inuvik Project ID: SNP 0036-3

Project Name:

Project Location: Inuvik

LSD: P.O.:

100104

Proj. Acct. code:

Lot ID: 1364588

Control Number:

Date Received: Jul 18, 2019

Date Reported: Jul 25, 2019 Report Number: 2424882

Reference Number

1364588-1

Sample Date Sample Time Jul 17, 2019 09:55

Sample Location

Sample Description

Sewage Lagoon / SNP0036-3 / 6.6°C

Matrix Water

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Aggregate Organic Const	ituents					
Biochemical Oxygen Demand	Inhibited	mg/L	25			4
Oil and Grease	Total	mg/L	6			5
pH adjustment	adjustment required		No			
Inorganic Nonmetallic Pa	rameters					
Ammonia - N		mg/L	3.01			0.025
Un-ionized Ammonia-N	15 °C	mg/L	0.208			
Ammonium/Ammonia Preservation			Yes			
Microbiological Analysis						
Fecal Coliforms	Membrane Filtration	CFU/100 mL	600			1
Physical and Aggregate F	Properties					
Solids	Total Suspended	mg/L	65			2
Routine Water						
рН	15 °C	рН	8.43			
Temperature of observed pH		°C	15			
рН			7.79			
Temperature of observed pH		°C	21.6			

Approved by:

Anthony Neumann, MSc General Manager

Anthony Weuman



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W: element.com

Methodology and Notes

Company: Town of Inuvik

Bill To: Town of Inuvik Project ID: SNP 0036-3 Lot ID: 1364588

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: Inuvik Date Received: Jul 18, 2019
Inuvik, NT, Canada LSD: Date Reported: Jul 25, 2019

X0E 0T0 P.O.: 100104 Report Number: 2424882

Attn: Rick Campbell Proj. Acct. code:

Attn: Rick Campbell Proj. Acct. code
Sampled By: David Kendi

Method of Analysis Method Name Reference Method Date Analysis Location Started Alkalinity, pH, and EC in water APHA pH - Electrometric Method, 4500-H+ B Jul 22, 2019 Element Edmonton - Roper * Automated Phenate Method, 4500-NH3 G Ammonium-N in Water **APHA** Jul 23, 2019 Element Edmonton - Roper Road BOD (Carbonaceous) in water **APHA** * 5 Day, 5210 B Jul 18, 2019 Element Edmonton - Roper Coliforms - Membrane Filtration **APHA** Fecal Coliform Membrane Filter Jul 19, 2019 **Element Calgary** Procedure, 9222 D Jul 22, 2019 Oil and Grease in water **US EPA** n-Hexane Extractable Material and Silica Element Edmonton - Roper Gel Treated n-Hexane Extractable Road Material by Extraction and Gravimetry, pH at 15°C **APHA** * pH - Electrometric Method, 4500-H+ B Element Edmonton - Roper Jul 19, 2019 Road Solids Suspended (Total, Fixed and **APHA** Total Suspended Solids Dried at 103-Jul 22, 2019 Element Edmonton - Roper Volatile) 105'C. 2540 D Road

References

APHA Standard Methods for the Examination of Water and Wastewater

US EPA US Environmental Protection Agency Test Methods

Please direct any inquiries regarding this report to our Client Services group.

Results relate only to samples as submitted.

^{*} Reference Method Modified



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Report Transmission Cover Page

Bill To: Town of Inuvik

Project ID:

Proj. Acct. code:

Lot ID: 1384264

Box 1160

Project Name:

Control Number:

2 Firth Street

Project Location: Inuvik

SNP 0036-3

100104

Date Received: Oct 17, 2019

Inuvik, NT, Canada

LSD:

Date Reported: Oct 25, 2019

X0E 0T0

P.O.:

Report Number: 2452649

Attn: Rick Campbell

Sampled By: Matt O'Rourke

Company: Town of Inuvik

Contact	Company	Address				
Kim Wainman	Town of Inuvik	Box 1160, 2 Firth Street				
		Inuvik, NT X0E 0T0				
		Phone: (867) 777-8615 Fax: (867) 777-8601				
		Email: kwainman@inuvik.ca				
Delivery	<u>Format</u>	<u>Deliverables</u>				
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				
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Email - Single Report	PDF	Invoice				
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Delivery	<u>Format</u>	<u>Deliverables</u>				
Email - Single Report	PDF	Invoice				

Notes To Clients:

• Oct 25, 2019 - Sample 1384264-1; 6799827: Sample formed an emulsion during oil and grease extraction. Centrifugation was required in order to complete analysis.



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Analytical Report

Company:

Bill To: Town of Inuvik

Box 1160

2 Firth Street

Town of Inuvik

Inuvik, NT, Canada

X0E 0T0

Attn: Rick Campbell Sampled By: Matt O'Rourke

Project ID: SNP 0036-3

Project Name:

Project Location: Inuvik

LSD: P.O.:

100104

Proj. Acct. code:

Lot ID: 1384264

Control Number:

Date Received: Oct 17, 2019

Date Reported: Oct 25, 2019 Report Number: 2452649

Reference Number

1384264-1

Sample Date Sample Time

Oct 16, 2019 09:10

Sample Location

Sample Description SNP0036-3

Matrix Water

		Mutin	vvalor			
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	5			5
pH adjustment	adjustment required		No			
Inorganic Nonmetallic Pa	rameters					
Ammonia - N		mg/L	14.1			0.025
Un-ionized Ammonia-N	15 °C	mg/L	0.175			
Ammonium/Ammonia Preservation			Yes			
Microbiological Analysis						
Fecal Coliforms	Membrane Filtration	CFU/100 mL	<10			1
Physical and Aggregate F	Properties					
Solids	Total Suspended	mg/L	<1			2
Routine Water						
рН	15 °C	рН	7.66			
Temperature of observed pH		°C	15			
pH		20	7.98			
Temperature of observed pH		°C	19.6			

Approved by:

Darlene Lintott, MSc Consulting Scientist



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Methodology and Notes

Project ID: SNP 0036-3 Bill To: Town of Inuvik Lot ID: 1384264

Project Name: Box 1160 Control Number: Project Location: Inuvik

2 Firth Street Date Received: Oct 17, 2019 LSD: Inuvik, NT, Canada Date Reported: Oct 25, 2019

P.O.: 100104 X0E 0T0 Report Number: 2452649 Proj. Acct. code:

Attn: Rick Campbell

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

Method of Analysis							
Method Name	Reference	Method	Date Analysis Started	Location			
Alkalinity, pH, and EC in water	APHA	* pH - Electrometric Method, 4500-H+ B	Oct 17, 2019	Element Edmonton - Roper Road			
Ammonium-N in Water	APHA	* Automated Phenate Method, 4500-NH3 G	Oct 23, 2019	Element Edmonton - Roper Road			
BOD (Carbonaceous) in water	APHA	* 5 Day, 5210 B	Oct 17, 2019	Element Edmonton - Roper Road			
Coliforms - Membrane Filtration	APHA	Fecal Coliform Membrane Filter Procedure, 9222 D	Oct 17, 2019	Element 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 	Oct 24, 2019	Element Edmonton - Roper Road			
pH at 15°C	APHA	* pH - Electrometric Method, 4500-H+ B	Oct 21, 2019	Element Edmonton - Roper Road			
Solids Suspended (Total, Fixed and Volatile)	АРНА	* Total Suspended Solids Dried at 103- 105'C, 2540 D	Oct 22, 2019	Element Edmonton - Roper Road			
Volatile)		105°C, 2540 D * Reference Method Modified		Road			

References

APHA Standard Methods for the Examination of Water and Wastewater

US EPA US Environmental Protection Agency Test Methods

Comments:

• Oct 25, 2019 - Sample 1384264-1; 6799827: 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. Results relate only to samples as submitted.



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Lot ID: 1391323

W: element.com

Report Transmission Cover Page

Project ID: SNP 0036-3 Bill To: Town of Inuvik

Project Name: Box 1160 Control Number: Project Location: Inuvik

2 Firth Street Date Received: Nov 14, 2019 LSD: Inuvik, NT, Canada

Date Reported: Nov 22, 2019 P.O.: 100104 X0E 0T0 Report Number: 2465415

Proj. Acct. code: Attn: Rick Campbell

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

Contact	Company	Address				
Kim Wainman	Town of Inuvik	Box 1160, 2 Firth Street				
		Inuvik, NT X0E 0T0				
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		Email: kwainman@inuvik.ca				
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Email - Single Report	PDF	Invoice				
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		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				
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		Email: rcampbell@inuvik.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				
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		Email: utilidor@inuvik.ca				
Delivery	<u>Format</u>	<u>Deliverables</u>				
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Notes To Clients:

• Nov 22, 2019 - Sample 1391323-1; 6854289: 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

2 Firth Street

Inuvik, NT, Canada

Terms and Conditions: https://www.element.com/terms/terms-and-conditions

X0E 0T0

Attn: Rick Campbell

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

Project ID: SNP 0036-3

Project Name:

Project Location: Inuvik

LSD:

P.O.: 100104

Proj. Acct. code:

Lot ID: 1391323

Control Number:

Date Received: Nov 14, 2019

Date Reported: Nov 22, 2019 Report Number: 2465415

., . . .

Reference Number

1391323-1

Sample Date Sample Time

Nov 13, 2019 09:30

Sample Location

Sample Description Sewage Lagoon / SNP0036-3 / 5.9C

Matrix Water

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Aggregate Organic Const	ituents					
Biochemical Oxygen Demand	Inhibited	mg/L	12			4
Oil and Grease	Total	mg/L	40			5
pH adjustment	adjustment required		No			
Inorganic Nonmetallic Par	ameters					
Ammonia - N		mg/L	17.7			0.025
Un-ionized Ammonia-N	15 °C	mg/L	0.101			
Ammonium/Ammonia Preservation			No			
Microbiological Analysis						
Fecal Coliforms	Membrane Filtration	CFU/100 mL	>6000			1
Physical and Aggregate P	roperties					
Solids	Total Suspended	mg/L	17			2
Routine Water						
рН	15 °C	рН	7.32			
Temperature of observed pH		°C	15			
рH			4.75			
Temperature of observed pH		°C	20.2			

Approved by:

Randy Neumann, BSc Division Director

RhDeunson



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Methodology and Notes

Project ID: SNP 0036-3 Bill To: Town of Inuvik Lot ID: 1391323

Project Name: Box 1160 Control Number: Project Location: Inuvik

2 Firth Street Date Received: Nov 14, 2019 LSD: Inuvik, NT, Canada

Date Reported: Nov 22, 2019 P.O.: 100104 X0E 0T0 Report Number: 2465415

Proj. Acct. code: Attn: Rick Campbell

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

Method of Analysis				
Method Name	Reference	Method	Date Analysis Started	Location
Alkalinity, pH, and EC in water	APHA	* pH - Electrometric Method, 4500-H+ B	Nov 15, 2019	Element Edmonton - Roper Road
Ammonium-N in Water	APHA	* Automated Phenate Method, 4500-NH3 G	Nov 19, 2019	Element Edmonton - Roper Road
BOD (Carbonaceous) in water	APHA	* 5 Day, 5210 B	Nov 15, 2019	Element Edmonton - Roper Road
Coliforms - Membrane Filtration	APHA	Fecal Coliform Membrane Filter Procedure, 9222 D	Nov 15, 2019	Element 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 	Nov 22, 2019	Element Edmonton - Roper Road
pH at 15°C	APHA	* pH - Electrometric Method, 4500-H+ B	Nov 21, 2019	Element Edmonton - Roper Road
Solids Suspended (Total, Fixed and Volatile)	APHA	 * Total Suspended Solids Dried at 103- 105'C, 2540 D 	Nov 20, 2019	Element Edmonton - Roper Road
		* Reference Method Modified		

References

APHA Standard Methods for the Examination of Water and Wastewater

US EPA US Environmental Protection Agency Test Methods

Comments:

• Nov 22, 2019 - Sample 1391323-1; 6854289: 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. Results relate only to samples as submitted.



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Report Transmission Cover Page

Bill To: Town of Inuvik

Project Name: 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 0036-3

Project Location: Inuvik

LSD:

P.O.: 100104

Proj. Acct. code:

Lot ID: 1397239

Control Number:

Date Received: Dec 11, 2019

Date Reported: Jan 2, 2020

Report Number: 2475089

Contact	Company	Address		
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		Inuvik, NT X0E 0T0		
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Li Wang	AECOM - Edmonton	101-18817 Stony Plain Road NW		
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		Phone: (780) 453-0710	Fax:	
		Email: li.wang@aecom.com		
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Email - Single Report	Legacy Crosstab in CSV	Test Report		
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		Email: richard.feilden@aecom.com		
Delivery	<u>Format</u>	<u>Deliverables</u>		
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Rick Campbell	Town of Inuvik	Box 1160, 2 Firth Street		
		Inuvik, NT X0E 0T0		
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Email - Single Report	PDF	Invoice		
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		Email: utilidor@inuvik.ca		
<u>Delivery</u>	<u>Format</u>	<u>Deliverables</u>		
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W: element.com

Analytical Report

Company:

Bill To: Town of Inuvik

Box 1160

2 Firth Street

Inuvik, NT, Canada

X0E 0T0

Attn: Rick Campbell Sampled By: Matt O'Rourke Town of Inuvik

Project ID: SNP 0036-3

Project Name:

Inuvik Project Location:

LSD:

P.O.:

100104

Lot ID: 1397239

Control Number:

Date Received: Dec 11, 2019

Date Reported: Jan 2, 2020

Report Number: 2475089

Reference Number

Proj. Acct. code:

Sample Date Sample Time

1397239-1 Nov 10, 2019 * 09:00

Water

Dec 10, 2019 - See transit sheet

Sample Location Sample Description

Sewage Lagoon / SNP0036-3 / 1.1 °C

Matrix

		Matrix	vvalci			
Analyte		Units	Results	Results	Results	Nominal Detection Limit
Aggregate Organic Const	ituents					
Biochemical Oxygen Demand	Inhibited	mg/L	26			4
Oil and Grease	Total	mg/L	23			2
pH adjustment	required prior to O&G extraction		No			
Inorganic Nonmetallic Pa	rameters					
Ammonia - N		mg/L	19.1			0.025
Un-ionized Ammonia-N	15 °C	mg/L	0.120			
Ammonium/Ammonia Preservation			Yes			
Microbiological Analysis						
Fecal Coliforms	Membrane Filtration	CFU/100 mL	>6000			1
Physical and Aggregate F	Properties					
Solids	Total Suspended	mg/L	17			2
Routine Water						
pH	15 °C	рН	7.36			
Temperature of observed pH		°C	15			
рН			7.58			
Temperature of observed pH		°C	21.2			

Approved by:

Benjamin Morris, B.Sc

Operations Manager



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Methodology and Notes

Bill To: Town of Inuvik Project ID: SNP 0036-3 Lot ID: 1397239

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: Inuvik Date Received: Dec 11, 2019
Inuvik, NT, Canada LSD: Date Reported: Jan 2, 2020

Inuvik, NT, Canada LSD: Date Reported: Jan 2, 2020 X0E 0T0 P.O.: 100104 Report Number: 2475089

Attn: Rick Campbell Proj. Acct. code:

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

Method of Analysis								
Reference	Method	Date Analysis Started	Location					
APHA	* pH - Electrometric Method, 4500-H+ B	Dec 12, 2019	Element Edmonton - Roper Road					
APHA	* Automated Phenate Method, 4500-NH3 G	Dec 16, 2019	Element Edmonton - Roper Road					
APHA	* 5 Day, 5210 B	Dec 11, 2019	Element Edmonton - Roper Road					
APHA	Fecal Coliform Membrane Filter Procedure, 9222 D	Dec 12, 2019	Element Calgary					
BCELM	 Oil & Grease in Water - Direct Hexane Extraction, Oil & Grease 	Dec 24, 2019	Element Vancouver					
APHA	* pH - Electrometric Method, 4500-H+ B	Dec 16, 2019	Element Edmonton - Roper Road					
АРНА	 * Total Suspended Solids Dried at 103- 105'C, 2540 D 	Dec 12, 2019	Element Edmonton - Roper Road					
	APHA APHA APHA BCELM APHA	APHA * pH - Electrometric Method, 4500-H+ B APHA * Automated Phenate Method, 4500-NH3 G APHA * 5 Day, 5210 B APHA Fecal Coliform Membrane Filter Procedure, 9222 D BCELM * Oil & Grease in Water - Direct Hexane Extraction, Oil & Grease APHA * pH - Electrometric Method, 4500-H+ B APHA * Total Suspended Solids Dried at 103-	APHA * PH - Electrometric Method, 4500-H+ B Dec 12, 2019 APHA * Automated Phenate Method, 4500-NH3 G Dec 16, 2019 APHA * 5 Day, 5210 B Dec 11, 2019 APHA Fecal Coliform Membrane Filter Dec 12, 2019 Procedure, 9222 D BCELM * Oil & Grease in Water - Direct Hexane Extraction, Oil & Grease APHA * pH - Electrometric Method, 4500-H+ B Dec 16, 2019 APHA * Total Suspended Solids Dried at 103- 105'C, 2540 D					

^{*} Reference Method Modified

References

APHA Standard Methods for the Examination of Water and Wastewater

BCELM B.C. Environmental Laboratory Manual

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Results relate only to samples as submitted.

Evova	Testing	Billing Informat	ion:			Copy of I	Report To:	STOR COS									RUSH	l Priority	
Exova	Advising	Company	pany Town of Inuvik Company Aecom - Edmonton							ection, client accepts that									
www.exova.com	Masumg	Address	Box 1160 2 I	Firth Street		Address	1720	3-1	03rd	Ave	enue						surcharges will be	applied to the analysis	
Project Information	on		Inuvik, NT X	0E 0T0			Edmo	nton	AB	T5S	J4						Date Required		
Project ID	SNP 0036- 3	Attention	Rick Campb	ell		Attention Richard Feilden									As Indicated	All Analysis			
Project Name		Phone		Phone (780) 488-6800									When "ASAB" is rea	supered turn around will					
Project Location	Inuvik	Cell		Cell										When "ASAP" is requested, turn around will default to a 100% RUSH priority, with pricing and					
Legal Location		Fax	(867) 777-86		Fax (780) 488-2121											turn around time to match. Please contact the late			
PO/AFE#	100104	E-mail	rcampbell	@town.inuvik.nt.ca	a	E-mail richard.feilden@aecom.com							prior to submitti	ng ROSH samples					
Proj. Acct.Code		Agreement ID	2909														Signature		
		Copy of Report				Copy of in	rvoice										Sample Custo	ody (please print)	
Report Results	X E-Mail	Online	PDF			QA/QC Report				Sampled by: MaH O'Rourke									
·	Mail X	Fax `	Excel														Company Tov	wn of Inuvik	
The state of the s	ns/Comments (please i	nclude contact info	rmation inclu	ding ph. # if different		ndicate Reg		Sī.		-							I authorize Exova to proceed with the work		
from above).					R	equiremen	ts below	Containers		٤	3						indicated on this form:		
Sampler: note we	eather:				The state of the s			ont		Solido		ms					Date: 12-10-19 Initial: 100		
					l			₽		3	8 8	olifo	Grease				Date/Time stamp:	for Lab use only	
								Number	1	5 2	Suspende Ammonia	Fecal Coliforms	Gre				Date/Time Stamp.	. ex6:59	
Temp - 22 C.	CBOD5 Suspended Ammonia Recal Colifo																		
			Depth				Sampling Indicate below a					Indicate below any d	y deficiencies in the						
Sample	Identification	Location	in cm m	Date/Time sample	ed	Matrix	method	\downarrow									condition of samples		
1 SNP0036-3		Sewage Lagoon		12-10-19 9=A		A*	Dip	5	x >	< x	х	X	х					Were Exova supplies used?	
2																			
3													Was there any damage to the shipping						
4																		container?	
5																			
6								Ш										Were the containers packaged well?	
7								Ш										packaged well:	
8																			
9								Ш										Were the expected number of samples	
10								Ш		_								received (document	
11																		below)?	
12								Ш											
13								Ш										Are samples within recommended holding	
14								Ш	\perp	\perp		_			\Box			times/temp?	
15			BASA O SOUR				1					Ι,			oxed				
Environmental Sample Information Sheet						2 N	A # 0 0 0							112	ping				
	Note: Proper completion of this form is required in order to proceed with analysis						97239	,							O Y/N			Basic	
Ple	ase indicate any	potentially ha	zordous sa	amples	4							Ш		1000	ler te	inp:	Delivery Method:	BOK	
Control #					1	Cooler temp.								Waybill:					
Page 1 of 1							Received by:	JU NEZ											



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	<u>Format</u>	<u>Deliverables</u>
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>	<u>Deliverables</u>
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	<u>Format</u>	<u>Deliverables</u>
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>	<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>	<u>Deliverables</u>
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.



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
 1322978-1

 Sample Date
 Dec 12, 2018

 Sample Time
 09:07

Sample Location

Sample Description Sewage Lagoon / SNP0036-3 / 3.9°C

Matrix Water

		Matrix	Water			
Analyte		Units	Results	Results	Results	Nominal Detection Limit
Aggregate Organic Const	ituents					
Biochemical Oxygen	Inhibited	mg/L	47			4
Demand						
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			Yes			
Preservation						
Microbiological Analysis						
Fecal Coliforms	Membrane Filtration	CFU/100 mL	300000			1
Physical and Aggregate P	roperties					
Solids	Total Suspended	mg/L	13			2
Routine Water						
рН	15 °C	рН	7.14			
Temperature of observed		°C	15			
рН						
рН			7.62			
Temperature of observed		°C	22.8			
pН						

Approved by:

Randy Neumann, BSc Division Director

RhDeunson



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 Location Started
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 Dec 13, 2018 Exova Calgary Procedure, 9222 D
Oil and Grease in water	US EPA	 * n-Hexane Extractable Material and Silica Dec 14, 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 Dec 20, 2018 Exova Edmonton
Solids Suspended (Total, Fixed and Volatile)	APHA	 * Total Suspended Solids Dried at 103- Dec 13, 2018 Exova Edmonton 105'C, 2540 D
		* Deference Method Medified

^{*} 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.

EXOVO Testi	ng Billing Inform					Copy of Report To:										RUSH Priority		
Aciv	arring .					Company Aecom - Edmonton Address 17203-103rd Avenue								Upon filling out this section, client a				
www.exova.com	Address	Box 1160 2		Address												applied to the analysis		
Project Information		Inuvik, NT X0E 0T0 Attention Rick Campbell Phone (867) 777-8615 Cell (867) 678-5388				Edmonton, AB T5S 1J4								Date Requ		A.II.A		
Project ID SNP 0036- 3	Table 1				Attention Richard Feilden									As Indicate	ed	All Analysis		
Project Name					Phone (780) 488-6800 Cell									When "ASAP" is requested, turn a default to a 100% RUSH priority, with turn around time to match. Please co				
Project Location Inuvik																		
egal Location	Fax	(867) 777-86			Fax (780) 488-2121 E-mail richard.feilden@aecom.com				prior to submitting RUSH samples									
PO/AFE# 100104 Proj. Acct.Code	E-mail Agreement ID		@town.inuvik.nt.ca	E-mail					Cignoture	Signature								
Floj. Acct.Code				Conv. of in	voice									Sample Custody (please print)				
X E-Mail	Copy of Repo Online	PDF		Copy of in	NAME OF TAXABLE PARTY.	Т	_	_			T	ТТ	\top					
Report Results Mail	X Fax	Excel		QA/QC KE	port											O Rourke		
Special Instructions/Comments (p			ding ph. # if different	Indicate Reg	ulatory	1								Company		1.000 1 - 7		
rom above).				Requirements		Containers				S						proceed with the work on this form:		
Sampler: note weather:				7		ntair	l		Suspended Solids		2			Date: 12 -12	-18	Initial: MD		
	9								d Sc	Ammonia Fecal Coliforns	Se				THE RESIDENCE OF THE PERSON NAMED IN	or Lab use only		
						r of		100	nde	nia ji	Grease			Date/Time st	amp:			
" 3 0	ALIAT	100	1	- 0		Number		CBOD5	sbe	Ammonia Fecal Col	Oil & C			DEC 18	AN 7:1	11		
TempC, precip	, Wind dir_/V/NE	Vel_10 KA	km/h			ž	핍	S	Su	A P	Ö							
Sample Identification	Location	Depth in cm m	Date/Time sample	ed Matrix	Sampling method	1								Indicate belo		eficiencies in the ::		
1 SNP0036-3	Sewage Lago	on	17-12-18 90	7/7	Dip	5	х	х	х	хх	х					Were Exova supplies		
2			1	2.00			L											
3				1 1		上	L									Was there any dama to the shipping		
4						L	L								4). 	container?		
5						上	<u>_</u>					\perp						
6						\perp	_					\perp	\perp			Were the containers packaged well?		
7							L			-		\vdash						
8	-					_	_			_		1				Notes the second of		
9						_	_	_			_		\perp			Were the expected number of samples		
10				8.		_	_				_	\vdash	+		0	received (document		
11						_	_				_	++	_ 10			below)?		
12				- 92		_	_				_	1	+			Are camples within		
13				122		_	_				1	\vdash	+			Are samples within recommended holdi		
14	ri _n			305		-	_				-	+-+	+			times/temp?		
						1	1	I				Chin	ina	# and size of a	oolors re-	coived:		
	ntal Sample Info	THE RESERVE OF THE PARTY OF	the state of the same of the s	Lot: 132	2978	COC						Shipp	0.575	# and size of c	Jouers re	ceiveu.		
Note: Proper completion of				5000000								COD				1302		
Please indicate	any potentially h	azordous sa	amples					Ш		Ш			er temp	Delivery Wick	thod:	1007		
1000 1 -f 1	Contro	#		****								3	.9	Waybill:	-	ZZKUU		
age 1 of 1													,	Received by	: ~ 1	001002		



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

T: +1 (780) 438-5522 F: +1 (780) 434-8586 E: info.Edmonton@element.com

Control Number:

Date Received:

Date Reported:

Report Number:

Fax:

Lot ID: 1352596

May 23, 2019

May 30, 2019

(867) 777-8601

2408230

W: element.com

Report Transmission Cover Page

Bill To: Town of Inuvik

Matt O'Rourke

Sampled By:

Contact

Project ID: SNP 0036-4.5 & 9

100104

Box 1160 Project Name:

Project Location: Inuvik 2 Firth Street

LSD: Inuvik, NT, Canada

P.O.: X0E 0T0

Proj. Acct. code: Attn: Rick Campbell

Town of Inuvik Company: Company Address Kim Wainman Town of Inuvik Box 1160, 2 Firth Street Inuvik, NT X0E 0T0

> Email: kwainman@town.inuvik.nt.ca

Delivery **Format** Deliverables Email - Single Report PDF Invoice

17203 - 103 Avenue Richard Feilden **AECOM - Edmonton**

Edmonton, AB T5S 1J4

Phone: (867) 777-8615

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 Box 1160, 2 Firth Street Town of Inuvik

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

utilidor@town.inuvik.nt.ca Email:

Delivery **Format Deliverables** PDF Email - Single Report Invoice

Notes To Clients:

• May 30, 2019 - Some trace total metal results were less than dissolved metal results for sample 1352596-1 to -3. The results were verified and are within expected measurement uncertainty.



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W: element.com

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 Town of Inuvik Company:

Project ID: SNP 0036-4,5 & 9

Project Name:

Project Location: Inuvik

LSD: P.O.:

100104

Proj. Acct. code:

Lot ID: 1352596

Control Number:

Date Received: May 23, 2019

May 30, 2019 Date Reported:

Report Number: 2408230

Reference Number Sample Date Sample Time

1352596-1 May 22, 2019

1352596-2 May 22, 2019

1352596-3 May 22, 2019

09:30

09:13

09:42

Sample Location **Sample Description**

Pit N/W of Dump / SNP0036-4 / 3.6°C

Pond S/E of Dump / Creek N/W of Dump SNP0036-5 / 3.6°C / SNP0036-9 / 3.6°C

Matrix Water Water Water Nominal Detection Units Results Results Results Analyte Limit **Aggregate Organic Constituents** Biochemical Oxygen Inhibited <4 mg/L <4 <4 4 Demand 0.003 < 0.001 0.001 0.001 Phenol mg/L **Inorganic Nonmetallic Parameters** 0.25 **Phosphorus** Total 0.13 0.09 0.05 mg/L **Metals Dissolved** Lab Filtered Subsample Lab Filtered Lab Filtered **Metals Total** Aluminum Total 0.31 0.09 0.42 0.02 mg/L Calcium Total mg/L 166 16.8 13.4 0.2 0.88 0.05 Iron Total mg/L 2.44 1.50 Magnesium Total mg/L 80.8 6.2 5.6 0.2 Manganese Total mg/L 1.52 0.184 0.999 0.005 Potassium Total 18.7 mg/L 3.5 1.7 0.4 Silicon Total 3.58 0.82 1.43 0.05 mg/L 7.0 Sodium Total 94.8 4.0 0.4 mg/L Sulfur Total mg/L 176 11.2 14.9 0.3 0.000005 Mercury Total 0.000024 0.000015 0.000019 mg/L 0.0007 < 0.0002 < 0.0002 0.0002 **Antimony** Total mg/L Arsenic Total 0.0017 0.0012 0.0010 0.0002 mg/L Barium Total mg/L 0.040 0.027 0.022 0.001 Beryllium Total mg/L < 0.0001 < 0.0001 < 0.0001 0.0001 **Bismuth** Total < 0.0005 < 0.0005 < 0.0005 0.0005 mg/L Boron Total mg/L 0.643 0.028 0.017 0.002 Total 0.00004 Cadmium mg/L 0.00025 0.00005 0.00001 Chromium Total 0.0016 < 0.0005 0.0009 0.0005 mg/L Cobalt Total mg/L 0.0031 0.0004 0.0022 0.0001 Total 0.021 0.001 0.003 0.001 Copper mg/L 0.0003 Lead Total 0.0023 0.0002 0.0001 mg/L Lithium Total mg/L 0.028 0.003 0.005 0.001 Molybdenum Total 0.001 <0.001 <0.001 0.001 mg/L Nickel Total mg/L 0.0127 0.0016 0.0077 0.0005 Selenium Total mg/L 0.0005 < 0.0002 < 0.0002 0.0002 Silver Total 0.00005 < 0.00001 < 0.00001 0.00001 mg/L Strontium Total mg/L 0.654 0.049 0.043 0.001 Thallium Total mg/L < 0.00005 < 0.00005 0.00005 < 0.00005 Tin Total mg/L < 0.001 <0.001 <0.001 0.001 0.0038 0.0055 0.0006 0.0005 Titanium Total mg/L



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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 ID: SNP 0036-4,5 & 9

Project Name:

Project Location: Inuvik

LSD: P.O.:

100104

Proj. Acct. code:

Sample Location

Lot ID: 1352596

Control Number:

Date Received: May 23, 2019

Date Reported: May 30, 2019

Report Number: 2408230

 Reference Number
 1352596-1
 1352596-2
 1352596-3

 Sample Date
 May 22, 2019
 May 22, 2019
 May 22, 2019

 Sample Time
 09:30
 09:13
 09:42

Sample Description Pit N/W of Dump /

Pit N/W of Dump / Pond S/E of Dump / Creek N/W of Dump SNP0036-4 / 3.6°C SNP0036-5 / 3.6°C / SNP0036-9 / 3.6°C

Matrix Water Water Water Nominal Detection Analyte Units Results Results Results Limit **Metals Total - Continued** <0.0005 Uranium Total mg/L 0.0008 < 0.0005 0.0005 Vanadium Total mg/L 0.0020 0.0011 0.0018 0.0001 Zinc Total 0.011 0.012 mg/L 0.067 0.001 Zirconium Total mg/L < 0.001 <0.001 <0.001 0.001 **Physical and Aggregate Properties** Total Suspended 22 3 11 2 mg/L **Routine Water** 8.15 7.37 6.96 pН Temperature of observed ٥С 21.2 21.1 21.3 **Electrical Conductivity** at 25 °C 1640 177 139 µS/cm 1 at 25 °C 0.001 **Electrical Conductivity** dS/m 1.64 0.177 0.139 Calcium Dissolved meq/L 8.47 0.81 0.65 0.01 170 Calcium Dissolved mg/L 16.3 13.0 0.2 Magnesium Dissolved 6.52 0.49 0.44 0.01 meq/L Magnesium Dissolved mg/L 79.2 5.9 5.3 0.2 Sodium Dissolved 4.13 0.31 0.18 0.02 meq/L Sodium Dissolved mg/L 94.9 7.1 4.2 0.4 Potassium Dissolved 0.50 0.09 0.04 0.01 meq/L Potassium Dissolved 19.5 3.7 0.4 mg/L 1.7 Chloride Dissolved 55.1 7.9 2.5 0.4 mg/L Chloride 0.22 0.07 0.01 meq/L 1.55 43.2 Sulfate (SO4) Dissolved 518 32.4 0.9 mg/L 0.899 Sulfate-S meq/L 10.8 0.673 Sulfate-S Dissolved 173 10.8 mg/L 14.4 0.3 **Total Dissolved Solids** Estimated 1050 113 89 1 mg/L SAR Dissolved 1.5 0.4 0.2 Mono-Aromatic Hydrocarbons - Water Benzene mg/L < 0.001 < 0.001 < 0.001 0.001 Toluene < 0.0004 < 0.0004 < 0.0004 0.0004 mg/L Ethylbenzene <0.0010 <0.0010 <0.0010 0.0010 mg/L < 0.001 < 0.001 Total Xylenes (m,p,o) mg/L < 0.001 0.001 Volatile Petroleum Hydrocarbons - Water F1 -BTEX 0.1 < 0.1 < 0.1 < 0.1 mg/L 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

Company:

Bill To: Town of Inuvik

Box 1160

2 Firth Street

Town of Inuvik

Inuvik, NT, Canada

X0E 0T0

Attn: Rick Campbell Sampled By: Matt O'Rourke

Project ID: SNP 0036-4,5 & 9

Project Name:

Project Location: Inuvik

LSD: P.O.:

100104

Proj. Acct. code:

Lot ID: 1352596

Control Number:

Date Received: May 23, 2019

Date Reported: May 30, 2019 Report Number: 2408230

Approved by:

Randy Neumann, BSc Division Director

RhDeunson



Lot ID: 1352596



Element 7217 Roper Road NW Edmonton, Alberta T6B 3J4, Canada T: +1 (780) 438-5522 F: +1 (780) 434-8586 F: info Edmonton@eleme

E: info.Edmonton@element.com W: element.com

Methodology and Notes

Bill To: Town of Inuvik Project ID: SNP 0036-4,5 & 9

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: Inuvik Date Received: May 23, 2019
Inuvik NT Canada LSD: Date Reported: May 23, 2019

 Inuvik, NT, Canada
 LSD:
 Date Reported:
 May 30, 2019

 X0E 0T0
 P.O.:
 100104
 Report Number:
 2408230

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	АРНА	* Conductivity, 2510 B	May 24, 2019	Element Edmonton - Roper Road		
Alkalinity, pH, and EC in water	APHA	* pH - Electrometric Method, 4500-H+ B	May 24, 2019	Element Edmonton - Roper Road		
BOD (Carbonaceous) in water	APHA	* 5 Day, 5210 B	May 24, 2019	Element Edmonton - Roper Road		
BTEX-CCME - Water	US EPA	 Volatile Organic Compounds in Various Sample Matrices Using Equilibrium Headspace Analysis/Gas Chromatography Mass Spectrometry, 5021/8260 	May 24, 2019	Element Calgary		
Chloride in Water	APHA	* Automated Ferricyanide Method, 4500-CI-E	May 28, 2019	Element Edmonton - Roper Road		
Mercury (Total) in water	EPA	 Mercury in Water by Cold Vapor Atomic Fluorescence Spectrometry, 245.7 	May 23, 2019	Element Edmonton - Roper Road		
Mercury (Total) in water	US EPA	 Determination of Hg in Sediment by Cold Vapor Atomic Absorption Spec, 245.5 	May 23, 2019	Element Edmonton - Roper Road		
Metals ICP-MS (Total) in water	APHA/USEPA	 Metals By Inductively Coupled Plasma/Mass Spectrometry, APHA 3125 B / USEPA 200.2, 200.8 	May 24, 2019	Element Edmonton - Roper Road		
Metals ICP-MS (Total) in water	US EPA	 Determination of Trace Elements in Waters and Wastes by ICP-MS, 200.8 	May 24, 2019	Element Edmonton - Roper Road		
Metals Trace (Dissolved) in water	APHA	 * Inductively Coupled Plasma (ICP) Method, 3120 B 	May 25, 2019	Element Edmonton - Roper Road		
Metals Trace (Total) in water	APHA	 * Inductively Coupled Plasma (ICP) Method, 3120 B 	May 24, 2019	Element Edmonton - Roper Road		
Phenol in water	APHA	* Direct Photometric Method, 5530 D	May 30, 2019	Element Edmonton - Roper Road		
Phosphorus - Total in Water	APHA	 * Automated Ascorbic Acid Reduction Method, 4500-P F 	May 24, 2019	Element Edmonton - Roper Road		
Solids Suspended (Total, Fixed and Volatile)	АРНА	* Total Suspended Solids Dried at 103- 105'C, 2540 D * Reference Method Modified	May 24, 2019	Element Edmonton - Roper Road		

^{*} Reference Method Modified

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:

References

• May 30, 2019 - Some trace total metal results were less than dissolved metal results for sample 1352596-1 to -3. 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: Rick Campbell

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

Project ID: SNP 0036-4,5 & 9

Project Name:

Project Location: Inuvik

LSD: P.O.:

100104

Proj. Acct. code:

Lot ID: 1352596

Control Number:

Date Received: May 23, 2019

Date Reported: May 30, 2019

Report Number: 2408230

Please direct any inquiries regarding this report to our Client Services group.

Results relate only to samples as submitted.



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Report Transmission Cover Page

Matt O'Rourke Town of Inuvik

Bill To: Town of Inuvik

Sampled By:

Company:

Project ID: SNP 0036-4,5 & 9

100104

Project Name: Box 1160

Project Location: 2 Firth Street

LSD: Inuvik, NT, Canada

P.O.: X0E 0T0

Proj. Acct. code: Attn: Rick Campbell

Control Number: Inuvik

Date Received:

Date Reported: Jun 27, 2019

Lot ID: 1356870

Jun 13, 2019

Report Number: 2414309

Contact	Company	Address
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Email - Single Report	PDF	Invoice
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Email - Single Report	PDF	Invoice
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Delivery	<u>Format</u>	<u>Deliverables</u>
Email - Single Report	PDF	Invoice

Notes To Clients:

• Jun 19, 2019 - Some trace total metal results were less than dissolved metal results for sample 1356870-1, -2, and -3. The results were verified and are within expected measurement uncertainty.

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Analytical Report

Bill To: Town of Inuvik

Box 1160

2 Firth Street

Inuvik, NT, Canada

X0E 0T0

Rick Campbell

Attn: Sampled By: Matt O'Rourke

Town of Inuvik Company:

Project ID: SNP 0036-4,5 & 9

Project Name:

Project Location: Inuvik

LSD: P.O.:

100104

Proj. Acct. code:

Lot ID: 1356870

Control Number:

Date Received: Jun 13, 2019

Date Reported: Jun 27, 2019

Report Number: 2414309

Reference Number 1356870-1 1356870-2 1356870-3 Sample Date Jun 12, 2019 Jun 12, 2019 Jun 12, 2019 Sample Time 09:35 09:15 09:50 Sample Location

Sample Description

SNP0036-4

SNP0036-5 SNP0036-9

Matrix Water Water Water Nominal Detection Units Analyte Results Results Results Limit **Aggregate Organic Constituents** Biochemical Oxygen Inhibited <4 4 mg/L <4 <4 Demand 0.001 Phenol mg/L 0.001 < 0.001 < 0.001 **Inorganic Nonmetallic Parameters Phosphorus** Total 0.07 0.13 < 0.05 0.05 mg/L **Metals Dissolved** Lab Filtered Lab Filtered Lab Filtered Subsample **Metals Total** Aluminum Total 0.36 0.06 0.04 0.02 mg/L Calcium Total 218 29.4 114 0.2 mg/L 0.05 Iron Total mg/L 2.63 0.77 0.40 Magnesium Total mg/L 122 11.3 41.2 0.2 Manganese Total mg/L 1.35 0.072 0.441 0.005 Potassium Total 38.5 4.1 3.3 0.4 mg/L Silicon Total mg/L 5.80 0.41 1.46 0.05 Sodium Total 162 14.1 46.0 0.4 mg/L Sulfur Total mg/L 211 20.1 145 0.3 0.000015 0.000016 0.000005 Mercury Total mg/L 0.000012 Antimony Total 0.0003 < 0.0002 < 0.0002 0.0002 mg/L Total 0.0019 0.0016 0.0007 0.0002 Arsenic mg/L Barium 0.066 0.039 0.027 Total mg/L 0.001 Beryllium Total mg/L < 0.0001 < 0.0001 < 0.0001 0.0001 **Bismuth** Total mg/L < 0.0005 < 0.0005 < 0.0005 0.0005 0.086 Boron Total mg/L 0.897 0.033 0.002 Cadmium Total 0.00003 < 0.00001 0.00001 0.00001 mg/L Chromium Total mg/L 0.0015 0.0006 < 0.0005 0.0005 Cobalt Total 0.0019 0.0002 0.0004 0.0001 mg/L Copper Total mg/L 0.002 0.001 0.002 0.001 Lead Total 0.0004 0.0001 < 0.0001 0.0001 mg/L Lithium Total 0.041 0.005 0.021 0.001 mg/L Total 0.001 Molybdenum mg/L < 0.001 < 0.001 < 0.001 Nickel Total 0.0103 0.0022 0.0062 0.0005 mg/L Selenium Total mg/L 0.0002 < 0.0002 < 0.0002 0.0002 Silver Total mg/L < 0.00001 < 0.00001 < 0.00001 0.00001 Strontium 0.803 0.380 Total mg/L 0.092 0.001 Thallium Total mg/L < 0.00005 < 0.00005 < 0.00005 0.00005 Tin Total mg/L < 0.001 < 0.001 < 0.001 0.001 Titanium Total mg/L 0.0043 < 0.0005 < 0.0005 0.0005



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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 ID: SNP 0036-4,5 & 9

Project Name:

Project Location: Inuvik

LSD: P.O.:

100104

Proj. Acct. code:

Lot ID: 1356870

Control Number:

Date Received: Jun 13, 2019

Date Reported: Jun 27, 2019 Report Number: 2414309

Keport Nullii

 Reference Number
 1356870-1
 1356870-2
 1356870-3

 Sample Date
 Jun 12, 2019
 Jun 12, 2019
 Jun 12, 2019

 Sample Time
 09:35
 09:15
 09:50

Sample Location

Sample Description SNP0036-4 SNP0036-5 SNP0036-9

		Matrix	Water	Water	Water	
Analyte		Units	Results	Results	Results	Nominal Detection Limit
Metals Total - Continued						
Uranium	Total	mg/L	0.0008	< 0.0005	0.0009	0.0005
Vanadium	Total	mg/L	0.0019	0.0015	0.0003	0.0001
Zinc	Total	mg/L	0.009	0.003	0.007	0.001
Zirconium	Total	mg/L	< 0.001	<0.001	<0.001	0.001
Physical and Aggregate	Properties					
Solids	Total Suspended	mg/L	11	6	<2	2
Routine Water						
рН			8.15	7.78	7.81	
Temperature of observed		°C	19.4	19.4	19.3	
pH	-1.05.00	0/	0040	007	4000	4
Electrical Conductivity	at 25 °C	μS/cm	2310	287	1020	1
Electrical Conductivity	at 25 °C	dS/m	2.31	0.287	1.02	0.001
Calcium	Dissolved	meq/L	11.7	1.48	5.82	0.01
Calcium	Dissolved	mg/L	234	29.6	117	0.2
Magnesium	Dissolved	meq/L	10.0	0.90	3.36	0.01
Magnesium	Dissolved	mg/L	122	11.0	40.8	0.2
Sodium	Dissolved	meq/L	7.31	0.62	2.03	0.02
Sodium	Dissolved	mg/L	168	14.2	46.7	0.4
Potassium	Dissolved	meq/L	1.00	0.10	0.08	0.01
Potassium	Dissolved	mg/L	39.0	4.0	3.2	0.4
Chloride	Dissolved	mg/L	108	13.0	17.8	0.4
Chloride		meq/L	3.06	0.37	0.50	0.01
Sulfate (SO4)	Dissolved	mg/L	606	57.9	438	0.9
Sulfate-S		meq/L	12.6	1.20	9.11	
Sulfate-S	Dissolved	mg/L	202	19.3	146	0.3
Total Dissolved Solids	Estimated	mg/L	1480	184	656	1
SAR	Dissolved		2.2	0.6	0.9	
Mono-Aromatic Hydroca	rbons - 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,p,o)		mg/L	<0.001	<0.001	< 0.001	0.001
Volatile Petroleum Hydro	ocarbons - 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

Inuvik, NT, Canada

X0E 0T0

Attn: Rick Campbell Sampled By: Matt O'Rourke

Company: Town of Inuvik

Project ID: SNP 0036-4,5 & 9

Project Name:

Project Location: Inuvik

LSD: P.O.:

100104

Proj. Acct. code:

Lot ID: 1356870

Control Number:

Date Received: Jun 13, 2019

Date Reported: Jun 27, 2019 Report Number: 2414309

Approved by:

Chris Swyngedouw, PhD, PChem

C. Sujugeslower.

Consulting Scientist





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Methodology and Notes

Bill To: Town of Inuvik Project ID: SNP 0036-4,5 & 9 Lot ID: **1356870**

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: Inuvik Date Received: Jun 13, 2019
Inuvik NT Canada LSD: Date Received: Jun 27, 2010

 Inuvik, NT, Canada
 LSD:
 Date Reported:
 Jun 27, 2019

 X0E 0T0
 P.O.:
 100104
 Report Number:
 2414309

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	Jun 13, 2019	Element Edmonton - Roper Road
Alkalinity, pH, and EC in water	APHA	* pH - Electrometric Method, 4500-H+ B	Jun 13, 2019	Element Edmonton - Roper Road
BOD (Carbonaceous) in water	APHA	* 5 Day, 5210 B	Jun 13, 2019	Element Edmonton - Roper Road
BTEX-CCME - Water	US EPA	 Volatile Organic Compounds in Various Sample Matrices Using Equilibrium Headspace Analysis/Gas Chromatography Mass Spectrometry, 5021/8260 	Jun 23, 2019	Element Calgary
Chloride in Water	APHA	* Automated Ferricyanide Method, 4500-CI-E	Jun 17, 2019	Element Edmonton - Roper Road
Mercury (Total) in water	EPA	 Mercury in Water by Cold Vapor Atomic Fluorescence Spectrometry, 245.7 	Jun 14, 2019	Element Edmonton - Roper Road
Mercury (Total) in water	US EPA	 Determination of Hg in Sediment by Cold Vapor Atomic Absorption Spec, 245.5 	Jun 14, 2019	Element Edmonton - Roper Road
Metals ICP-MS (Total) in water	APHA/USEPA	* Metals By Inductively Coupled Plasma/Mass Spectrometry, APHA 3125 B / USEPA 200.2, 200.8	Jun 13, 2019	Element Edmonton - Roper Road
Metals ICP-MS (Total) in water	US EPA	 Determination of Trace Elements in Waters and Wastes by ICP-MS, 200.8 	Jun 13, 2019	Element Edmonton - Roper Road
Metals Trace (Dissolved) in water	APHA	 * Inductively Coupled Plasma (ICP) Method, 3120 B 	Jun 17, 2019	Element Edmonton - Roper Road
Metals Trace (Total) in water	APHA	 * Inductively Coupled Plasma (ICP) Method, 3120 B 	Jun 13, 2019	Element Edmonton - Roper Road
Phenol in water	APHA	* Direct Photometric Method, 5530 D	Jun 13, 2019	Element Edmonton - Roper Road
Phosphorus - Total in Water	APHA	 * Automated Ascorbic Acid Reduction Method, 4500-P F 	Jun 14, 2019	Element Edmonton - Roper Road
Solids Suspended (Total, Fixed and Volatile)	АРНА	* Total Suspended Solids Dried at 103- 105'C, 2540 D	Jun 18, 2019	Element Edmonton - Roper Road

^{*} Reference Method Modified

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:

References

• Jun 19, 2019 - Some trace total metal results were less than dissolved metal results for sample 1356870-1, -2, and -3. The results were verified and are within expected measurement uncertainty.





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Methodology and Notes

Bill To: Town of Inuvik

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Inuvik, NT, Canada

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Attn: Rick Campbell

Sampled By: Matt O'Rourke Company: Town of Inuvik Project ID: SNP 0036-4,5 & 9

Project Name:

Project Location: Inuvik

LSD:

P.O.:

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Proj. Acct. code:

Lot ID: 1356870

Control Number:

Date Received: Jun 13, 2019

Date Reported: Jun 27, 2019

Report Number: 2414309

Please direct any inquiries regarding this report to our Client Services group. Results relate only to samples as submitted.



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Report Transmission Cover Page

Bill To: Town of Inuvik

Project ID:

SNP 0036-4, 5 & 9

Lot ID: 1364617

Box 1160 2 Firth Street Project Name: Project Location:

Proj. Acct. code:

Control Number:

Inuvik, NT, Canada

: Inuvik

100104

Date Received: Jul 18, 2019

X0E 0T0

LSD:

Date Reported: Jul 25, 2019

XUE UTU

P.O.:

Report Number: 2424933

Attn: Rick Campbell

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

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Email - Single Report	PDF	Invoice
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Delivery	<u>Format</u>	<u>Deliverables</u>
Email - Single Report	PDF	Invoice

Notes To Clients:

• Jul 24, 2019 - Some trace total metal results were less than dissolved metal results for sample 1364617-2 and -3. The results were verified and are within expected measurement uncertainty.

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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 Town of Inuvik Company:

Project ID: SNP 0036-4. 5 & 9

Project Name:

Project Location: Inuvik

LSD: P.O.:

100104

Proj. Acct. code:

Lot ID: 1364617

1364617-3

Jul 17, 2019

/ SNP0036-6 / 6.6°C

Water

Control Number:

Date Received: Jul 18, 2019

Jul 25, 2019 Date Reported: Report Number: 2424933

Reference Number 1364617-1 1364617-2 Sample Date Jul 17, 2019 Jul 17, 2019 Sample Time 09:15

Sample Location

Matrix

Sample Description Pit N/W of Dump / Pond S/E of Dump / SNP0036-4 / 6.6°C SNP0036-5 / 6.6°C

Water

08:30 09:30 Creek N/W of Dump

Water

Nominal Detection Units Results Results Results Analyte Limit **Aggregate Organic Constituents** Biochemical Oxygen Inhibited <4 10 mg/L <4 4 Demand 0.002 < 0.001 < 0.001 0.001 Phenol mg/L **Inorganic Nonmetallic Parameters** 0.07 0.23 **Phosphorus** Total < 0.05 0.05 mg/L **Metals Dissolved** Subsample Lab Filtered Lab Filtered Lab Filtered **Metals Total** Aluminum Total 0.06 0.05 0.07 0.02 mg/L Calcium Total mg/L 226 33.5 221 0.2 0.05 Iron Total mg/L 0.37 0.61 0.71 Magnesium Total mg/L 115 13.4 77.6 0.2 Manganese Total mg/L 0.616 0.041 0.629 0.005 Potassium Total 37.1 mg/L 3.5 4 1 0.4 Silicon Total 4.39 0.11 1.96 0.05 mg/L 170 100.0 Sodium Total 16.1 0.4 mg/L Sulfur Total mg/L 219 22.6 281 0.3 0.000005 Mercury Total 0.000013 0.000022 0.000017 mg/L < 0.0004 < 0.0002 < 0.0002 0.0002 **Antimony** Total mg/L Arsenic Total 0.001 0.0016 0.0008 0.0002 mg/L Barium Total mg/L 0.073 0.041 0.023 0.001 Beryllium Total mg/L < 0.0002 < 0.0001 < 0.0001 0.0001 **Bismuth** Total < 0.001 < 0.0005 < 0.0005 0.0005 mg/L Boron Total mg/L 1.18 0.022 0.154 0.002 Total Cadmium mg/L < 0.00002 < 0.00001 < 0.00001 0.00001 Chromium Total < 0.001 < 0.0005 < 0.0005 0.0005 mg/L Cobalt Total mg/L 0.0010 0.0002 0.0005 0.0001 Total < 0.002 < 0.001 < 0.001 0.001 Copper mg/L Lead Total < 0.0002 0.0001 < 0.0001 0.0001 mg/L 0.045 Lithium Total mg/L 0.006 0.035 0.001 Molybdenum < 0.002 0.001 Total mg/L <0.001 < 0.001 Nickel Total mg/L 0.0095 0.0020 0.0042 0.0005 Selenium Total mg/L 0.0002 < 0.0002 < 0.0002 0.0002 Silver Total < 0.00002 < 0.00001 < 0.00001 0.00001 mg/L Strontium Total mg/L 0.796 0.102 0.757 0.001 Thallium Total mg/L < 0.0001 < 0.00005 < 0.00005 0.00005 Tin Total mg/L < 0.002 <0.001 <0.001 0.001 < 0.001 < 0.0005 0.0010 0.0005 Titanium Total mg/L



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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 ID: SNP 0036-4, 5 & 9

Project Name:

Project Location: Inuvik

LSD: P.O.:

100104

Proj. Acct. code:

Lot ID: 1364617

Control Number:

Date Received: Jul 18, 2019

Date Reported: Jul 25, 2019

Report Number: 2424933

Reference Number 1364617-1 1364617-2 1364617-3 Sample Date Jul 17, 2019 Jul 17, 2019 Jul 17, 2019 Sample Time 09:15 08:30 09:30

Sample Location

Pit N/W of Dump / **Sample Description** Pond S/E of Dump / Creek N/W of Dump

SNP0036-4 / 6.6°C SNP0036-5 / 6.6°C / SNP0036-6 / 6.6°C

Metals Total - Continued mg/L <0.001			Matrix	Water	Water	Water	
Metals Total - Continued	Analyte		Units	Results	Results	Results	Nominal Detection
Vanadium Total mg/L 0.0004 0.0014 0.0004 0.0010 0.001 Zinc Total mg/L 0.0002 0.001 0.001 0.001 Zirconium Total mg/L 0.0002 0.001 0.001 0.001 Properties Solida Total Suspended mg/L 7 7 3 2 Routine Water PPH 7.79 7.47 7.77 7 7.77 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	Metals Total - Continued						Liiii
Zinco Total mg/L 0.006 0.002 0.010 0.001 Zirconium Total mg/L <0.002	Uranium	Total	mg/L	<0.001	< 0.0005	0.0017	0.0005
Zirconium Total mg/L <0.002 <0.001 <0.001 0.001 Physical and Aggregate Properties Solids Total Suspended mg/L 7 17 3 2 Routine Water PH 7.79 7.47 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 9.01 4.1 7.77 9.01 4.1 9.01 4.1 9.01 4.1 9.01 4.1 9.01 4.1 9.01 4.1 9.01 4.0 9.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.02 0.02 0.02 0.02 0.02 0.02	Vanadium	Total	mg/L	0.0004	0.0014	0.0004	0.0001
Physical and Aggregate Properties Solids Total Suspended mg/L 7 17 3 2 Routine Water pH 7.79 7.47 7.77 Temperature of observed pH °C 21.5 21.8 22.1 February Electrical Conductivity at 25 °C dS/m 22.10 33.1 1720 1 Electrical Conductivity at 25 °C dS/m 22.10 33.1 1720 1 Electrical Conductivity at 25 °C dS/m 2.21 0.33 1.02 1 Electrical Conductivity at 25 °C dS/m 2.21 0.33 1.02 1 Electrical Conductivity at 25 °C dS/m 2.21 0.33 1.04 0.01 Calcium Dissolved mg/L 9.47 1.69 10.4 0.02 Calcium Dissolved meq/L 1.00 1.61 95.1	Zinc	Total	mg/L	0.006	0.002	0.010	0.001
Solidis Total Suspended mg/L 7 17 3 2 Routine Water 7.79 7.47 7.77 PH 7.79 7.47 7.77 Temperature of observed pH °C 21.5 21.8 22.1 Electrical Conductivity at 25 °C dS/m 2.21 0.331 1.72 0.001 Electrical Conductivity at 25 °C dS/m 2.21 0.331 1.72 0.001 Calcium Dissolved meq/L 9.47 1.69 10.4 0.01 Calcium Dissolved mg/L 19.0 33.9 208 0.2 Magnesium Dissolved mg/L 8.24 1.16 6.39 0.01 Magnesium Dissolved mg/L 5.67 0.70 4.14 0.02 Sodium Dissolved mg/L 5.67 0.70 4.14 0.02 Sodium Dissolved mg/L 0.33 0.09 0.10 0.01	Zirconium	Total	mg/L	<0.002	<0.001	<0.001	0.001
Routine Water pH 7.79 7.47 7.77 Temperature of observed of cobserved pH °C 21.5 21.8 22.1 Electrical Conductivity at 25 °C µS/cm 22.0 331 1720 0.001 Electrical Conductivity at 25 °C dS/m 2.21 0.331 1.72 0.001 Calcium Dissolved meq/L 9.47 1.69 10.4 0.01 Calcium Dissolved mg/L 190 33.9 208 0.2 Magnesium Dissolved mg/L 190 3.9 208 0.2 Magnesium Dissolved mg/L 100 14.1 77.7 0.2 Sodium Dissolved mg/L 130 16.1 95.1 0.4 Potassium Dissolved mg/L 130 16.1 95.1 0.4 Potassium Dissolved mg/L 115 15.1 38.6 0.4 Chloride Dissolved <td>Physical and Aggregate</td> <td>Properties</td> <td></td> <td></td> <td></td> <td></td> <td></td>	Physical and Aggregate	Properties					
PH 1.00 7.79 7.47 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77 7.77	Solids	Total Suspended	mg/L	7	17	3	2
Temperature of observed pH	Routine Water						
pH Electrical Conductivity at 25 °C µS/cm 2210 331 1720 1 Electrical Conductivity at 25 °C dS/m 2.21 0.331 1.72 0.001 Calcium Dissolved meq/L 9.47 1.69 10.4 0.01 Calcium Dissolved mg/L 190 33.9 208 0.2 Magnesium Dissolved meq/L 8.24 1.16 6.39 0.01 Magnesium Dissolved mg/L 100 14.1 77.7 0.2 Sodium Dissolved mg/L 130 16.1 95.1 0.0 Sodium Dissolved mg/L 130 16.1 95.1 0.4 Potassium Dissolved mg/L 28.5 3.5 4.0 0.4 Chloride Dissolved mg/L 3.25 0.43 1.09 0.01 Sulfate (SO4) Dissolved mg/L 11.2 14.2 16.5 Sulfate-S	рН			7.79	7.47	7.77	
Electrical Conductivity at 25 °C dS/m 2.21 0.331 1.72 0.001 Calcium Dissolved meq/L 9.47 1.69 10.4 0.01 Calcium Dissolved mg/L 190 33.9 208 0.2 Magnesium Dissolved mg/L 100 14.1 77.7 0.2 Sodium Dissolved mg/L 100 14.1 77.7 0.2 Sodium Dissolved mg/L 15.67 0.70 4.14 0.02 Sodium Dissolved mg/L 130 16.1 95.1 0.4 Potassium Dissolved mg/L 0.73 0.09 0.10 0.4 Potassium Dissolved mg/L 28.5 3.5 4.0 0.4 Chloride Dissolved mg/L 3.25 0.43 1.09 0.01 Sulfate-S Dissolved mg/L 11.2 1.42 16.5 1.2 Sulfate-S	•		°C	21.5	21.8	22.1	
Calcium Dissolved meq/L 9.47 1.69 10.4 0.01 Calcium Dissolved mg/L 190 33.9 208 0.2 Magnesium Dissolved meq/L 8.24 1.16 6.39 0.01 Magnesium Dissolved mg/L 100 14.1 77.7 0.2 Sodium Dissolved meq/L 5.67 0.70 4.14 0.02 Sodium Dissolved mg/L 130 16.1 95.1 0.4 Potassium Dissolved meq/L 0.73 0.09 0.10 0.01 Potassium Dissolved mg/L 28.5 3.5 4.0 0.4 Chloride Dissolved mg/L 115 15.1 38.6 0.4 Chloride Dissolved mg/L 3.25 0.43 1.09 0.01 Sulfate (SO4) Dissolved mg/L 180 22.8 264 0.3 Sulfate-S D	Electrical Conductivity	at 25 °C	μS/cm	2210	331	1720	1
Calcium Dissolved mg/L 190 33.9 208 0.2 Magnesium Dissolved meq/L 8.24 1.16 6.39 0.01 Magnesium Dissolved mg/L 100 14.1 77.7 0.2 Sodium Dissolved meq/L 5.67 0.70 4.14 0.02 Sodium Dissolved mg/L 130 16.1 95.1 0.4 Potassium Dissolved meq/L 0.73 0.09 0.10 0.01 Potassium Dissolved mg/L 28.5 3.5 4.0 0.4 Chloride Dissolved mg/L 115 15.1 38.6 0.4 Chloride Dissolved mg/L 3.25 0.43 1.09 0.01 Sulfate (SO4) Dissolved mg/L 11.2 1.42 16.5 Sulfate-S Dissolved mg/L 1410 212 1100 1 SAR Dissolved mg	Electrical Conductivity	at 25 °C	dS/m	2.21	0.331	1.72	0.001
Magnesium Dissolved meq/L 8.24 1.16 6.39 0.01 Magnesium Dissolved mg/L 100 14.1 77.7 0.2 Sodium Dissolved meq/L 5.67 0.70 4.14 0.02 Sodium Dissolved mg/L 130 16.1 95.1 0.4 Potassium Dissolved meq/L 0.73 0.09 0.10 0.01 Potassium Dissolved mg/L 28.5 3.5 4.0 0.4 Chloride Dissolved mg/L 115 15.1 38.6 0.4 Chloride Dissolved mg/L 3.25 0.43 1.09 0.01 Sulfate (SO4) Dissolved mg/L 539 68.4 793 0.9 Sulfate-S Dissolved mg/L 110 21.4 16.5 Sulfate-S Dissolved mg/L 1410 21.2 1100 1 SAR Dissolved	Calcium	Dissolved	meq/L	9.47	1.69	10.4	0.01
Magnesium Dissolved mg/L 100 14.1 77.7 0.2 Sodium Dissolved meq/L 5.67 0.70 4.14 0.02 Sodium Dissolved mg/L 130 16.1 95.1 0.4 Potassium Dissolved mg/L 0.73 0.09 0.10 0.01 Potassium Dissolved mg/L 28.5 3.5 4.0 0.4 Chloride Dissolved mg/L 115 15.1 38.6 0.4 Chloride Dissolved mg/L 3.25 0.43 1.09 0.01 Sulfate (SO4) Dissolved mg/L 539 68.4 793 0.9 Sulfate-S Dissolved mg/L 180 22.8 264 0.3 Total Dissolved Solids Estimated mg/L 1410 212 1100 1 SAR Dissolved mg/L <0.001	Calcium	Dissolved	mg/L	190	33.9	208	0.2
Sodium Dissolved meq/L 5.67 0.70 4.14 0.02 Sodium Dissolved mg/L 130 16.1 95.1 0.4 Potassium Dissolved meq/L 0.73 0.09 0.10 0.01 Potassium Dissolved mg/L 28.5 3.5 4.0 0.4 Chloride Dissolved mg/L 115 15.1 38.6 0.4 Chloride Dissolved mg/L 3.25 0.43 1.09 0.01 Sulfate (SO4) Dissolved mg/L 539 68.4 793 0.9 Sulfate-S Dissolved mg/L 180 22.8 264 0.3 Total Dissolved Solids Estimated mg/L 1410 212 1100 1 SAR Dissolved mg/L <0.001	Magnesium	Dissolved	meq/L	8.24	1.16	6.39	0.01
Sodium Dissolved mg/L 130 16.1 95.1 0.4 Potassium Dissolved meq/L 0.73 0.09 0.10 0.01 Potassium Dissolved mg/L 28.5 3.5 4.0 0.4 Chloride Dissolved mg/L 115 15.1 38.6 0.4 Chloride meq/L 3.25 0.43 1.09 0.01 Sulfate (SO4) Dissolved mg/L 539 68.4 793 0.9 Sulfate-S Dissolved mg/L 180 22.8 264 0.3 Total Dissolved Solids Estimated mg/L 1410 212 1100 1 SAR Dissolved mg/L 4.00 212 1100 1 SAR Dissolved Solids Estimated mg/L <0.001	Magnesium	Dissolved	mg/L	100	14.1	77.7	0.2
Potassium Dissolved meq/L 0.73 0.09 0.10 0.01 Potassium Dissolved mg/L 28.5 3.5 4.0 0.4 Chloride Dissolved mg/L 115 15.1 38.6 0.4 Chloride meq/L 3.25 0.43 1.09 0.01 Sulfate (SO4) Dissolved mg/L 539 68.4 793 0.9 Sulfate-S Dissolved mg/L 11.2 1.42 16.5 1.65 Sulfate-S Dissolved mg/L 180 22.8 264 0.3 Total Dissolved Solids Estimated mg/L 1.9 0.6 1.4 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0	Sodium	Dissolved	meq/L	5.67	0.70	4.14	0.02
Potassium Dissolved mg/L 28.5 3.5 4.0 0.4 Chloride Dissolved mg/L 115 15.1 38.6 0.4 Chloride meq/L 3.25 0.43 1.09 0.01 Sulfate (SO4) Dissolved mg/L 539 68.4 793 0.9 Sulfate-S Dissolved mg/L 11.2 1.42 16.5 Sulfate-S Dissolved mg/L 180 22.8 264 0.3 Total Dissolved Solids Estimated mg/L 1410 212 1100 1 SAR Dissolved mg/L 4.00 2.2 1.0 1.4 Mono-Aromatic Hydrocarbors - Water Benzene mg/L <0.001	Sodium	Dissolved	mg/L	130	16.1	95.1	0.4
Chloride Dissolved mg/L 115 15.1 38.6 0.4 Chloride meq/L 3.25 0.43 1.09 0.01 Sulfate (SO4) Dissolved mg/L 539 68.4 793 0.9 Sulfate-S meq/L 11.2 1.42 16.5 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0	Potassium	Dissolved	meq/L	0.73	0.09	0.10	0.01
Chloride meq/L 3.25 0.43 1.09 0.01 Sulfate (SO4) Dissolved mg/L 539 68.4 793 0.9 Sulfate-S meq/L 11.2 1.42 16.5 Sulfate-S Dissolved mg/L 180 22.8 264 0.3 Total Dissolved Solids Estimated mg/L 1410 212 1100 1 SAR Dissolved mg/L 1.9 0.6 1.4 0.00 1.4 Mono-Aromatic Hydrocarbors - Water Benzene mg/L <0.001	Potassium	Dissolved	mg/L	28.5	3.5	4.0	0.4
Sulfate (SO4) Dissolved mg/L 539 68.4 793 0.9 Sulfate-S meq/L 11.2 1.42 16.5 Sulfate-S Dissolved mg/L 180 22.8 264 0.3 Total Dissolved Solids Estimated mg/L 1410 212 1100 1 SAR Dissolved 1.9 0.6 1.4 Mono-Aromatic Hydrocarbons - Water Water Water Water 0.001 <0.001	Chloride	Dissolved	mg/L	115	15.1	38.6	0.4
Sulfate-S meq/L 11.2 1.42 16.5 Sulfate-S Dissolved mg/L 180 22.8 264 0.3 Total Dissolved Solids Estimated mg/L 1410 212 1100 1 SAR Dissolved 1.9 0.6 1.4 Mono-Aromatic Hydrocarbons - Water Benzene mg/L <0.001	Chloride		meq/L	3.25	0.43	1.09	0.01
Sulfate-S Dissolved mg/L 180 22.8 264 0.3 Total Dissolved Solids Estimated mg/L 1410 212 1100 1 SAR Dissolved 1.9 0.6 1.4 Mono-Aromatic Hydrocarbons - Water Benzene mg/L <0.001	Sulfate (SO4)	Dissolved	mg/L	539	68.4	793	0.9
Total Dissolved Solids Estimated mg/L 1410 212 1100 1 SAR Dissolved 1.9 0.6 1.4 Mono-Aromatic Hydrocarbons - Water Benzene mg/L <0.001	Sulfate-S		meq/L	11.2	1.42	16.5	
SAR Dissolved 1.9 0.6 1.4 Mono-Aromatic Hydrocarbons - Water Benzene mg/L <0.001	Sulfate-S	Dissolved	mg/L	180	22.8	264	0.3
Mono-Aromatic Hydrocarbons - Water Benzene mg/L <0.001	Total Dissolved Solids	Estimated	mg/L	1410	212	1100	1
Benzene mg/L <0.001 <0.001 <0.001 0.001 Toluene mg/L <0.0004	SAR	Dissolved		1.9	0.6	1.4	
Toluene mg/L <0.0004 <0.0004 <0.0004 0.0004 Ethylbenzene mg/L <0.0010	Mono-Aromatic Hydroca	rbons - Water					
Ethylbenzene mg/L <0.0010 <0.0010 <0.0010 0.0010 Total Xylenes (m,p,o) mg/L <0.001	Benzene		mg/L	<0.001	<0.001	<0.001	0.001
Total Xylenes (m,p,o) mg/L <0.001 <0.001 <0.001 0.001 Volatile Petroleum Hydrocarbons - Water mg/L <0.1 <0.1 <0.1 0.1 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	Toluene		mg/L	<0.0004	< 0.0004	<0.0004	0.0004
Volatile Petroleum Hydrocarbons - Water F1 -BTEX mg/L <0.1	Ethylbenzene		mg/L	<0.0010	<0.0010	<0.0010	0.0010
F1 -BTEX mg/L <0.1 <0.1 0.1 F1 C6-C10 mg/L <0.1 <0.1 <0.1 0.1	Total Xylenes (m,p,o)		mg/L	<0.001	<0.001	<0.001	0.001
F1 C6-C10 mg/L <0.1 <0.1 0.1	Volatile Petroleum Hydro	ocarbons - Water					
	F1 -BTEX		mg/L	<0.1	<0.1	<0.1	0.1
F2 C10-C16 mg/L <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

Inuvik, NT, Canada

X0E 0T0

Attn: Rick Campbell

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

Project ID: SNP 0036-4, 5 & 9

Project Name:

Project Location: Inuvik

LSD: P.O.:

100104

Proj. Acct. code:

Lot ID: 1364617

Control Number:

Date Received: Jul 18, 2019

Date Reported: Jul 25, 2019 Report Number: 2424933

Approved by:

Anthony Neumann, MSc General Manager

Anthony Weuman





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W: element.com

Methodology and Notes

Bill To: Town of Inuvik Project ID: SNP 0036-4, 5 & 9 Lot ID: **1364617**

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: Inuvik Date Received: Jul 18, 2019

 Inuvik, NT, Canada
 LSD:
 Date Reported:
 Jul 25, 2019

 X0E 0T0
 P.O.:
 100104
 Report Number:
 2424933

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	Jul 22, 2019	Element Edmonton - Roper Road
Alkalinity, pH, and EC in water	APHA	* pH - Electrometric Method, 4500-H+ B	Jul 22, 2019	Element Edmonton - Roper Road
BOD (Carbonaceous) in water	APHA	* 5 Day, 5210 B	Jul 18, 2019	Element Edmonton - Roper Road
BTEX-CCME - Water	US EPA	 Volatile Organic Compounds in Various Sample Matrices Using Equilibrium Headspace Analysis/Gas Chromatography Mass Spectrometry, 5021/8260 	Jul 19, 2019	Element Calgary
Chloride in Water	APHA	* Automated Ferricyanide Method, 4500-CI-E	Jul 23, 2019	Element Edmonton - Roper Road
Mercury (Total) in water	EPA	* Mercury in Water by Cold Vapor Atomic Fluorescence Spectrometry, 245.7	Jul 19, 2019	Element Edmonton - Roper Road
Mercury (Total) in water	US EPA	 Determination of Hg in Sediment by Cold Vapor Atomic Absorption Spec, 245.5 	Jul 19, 2019	Element Edmonton - Roper Road
Metals ICP-MS (Total) in water	APHA/USEPA	* Metals By Inductively Coupled Plasma/Mass Spectrometry, APHA 3125 B / USEPA 200.2, 200.8	Jul 18, 2019	Element Edmonton - Roper Road
Metals ICP-MS (Total) in water	US EPA	 Determination of Trace Elements in Waters and Wastes by ICP-MS, 200.8 	Jul 18, 2019	Element Edmonton - Roper Road
Metals Trace (Dissolved) in water	APHA	 * Inductively Coupled Plasma (ICP) Method, 3120 B 	Jul 23, 2019	Element Edmonton - Roper Road
Metals Trace (Total) in water	APHA	 * Inductively Coupled Plasma (ICP) Method, 3120 B 	Jul 18, 2019	Element Edmonton - Roper Road
Phenol in water	APHA	* Direct Photometric Method, 5530 D	Jul 24, 2019	Element Edmonton - Roper Road
Phosphorus - Total in Water	APHA	 * Automated Ascorbic Acid Reduction Method, 4500-P F 	Jul 22, 2019	Element Edmonton - Roper Road
Solids Suspended (Total, Fixed and Volatile)	АРНА	* Total Suspended Solids Dried at 103- 105'C, 2540 D	Jul 22, 2019	Element Edmonton - Roper Road

* Reference Method Modified

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:

References

• Jul 24, 2019 - Some trace total metal results were less than dissolved metal results for sample 1364617-2 and -3. 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: Rick Campbell mpled By: Matt O'Rourke

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

Project ID: SNP 0036-4, 5 & 9

Project Name:

Project Location: Inuvik

LSD:

P.O.: 100104

Proj. Acct. code:

Lot ID: 1364617

Control Number:

Date Received: Jul 18, 2019 Date Reported: Jul 25, 2019

Report Number: 2424933

Please direct any inquiries regarding this report to our Client Services group.

Results relate only to samples as submitted.



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Report Transmission Cover Page

2 Firth Street

X0E 0T0

Attn: Rick Campbell

Inuvik, NT, Canada

Bill To: Town of Inuvik Box 1160

Project ID: SNP 0036-4,5 & 9

Project Name:

Project Location: Inuvik

LSD: P.O.:

100104

Lot ID: 1370319

Control Number:

Date Received: Aug 15, 2019

Date Reported: Aug 20, 2019 Report Number: 2432614

Proj. Acct. code:

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

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Email - Single Report	PDF	Invoice
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Delivery	<u>Format</u>	<u>Deliverables</u>
Email - Merge Reports	PDF	COC / Test Report
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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
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		Email: utilidor@town.inuvik.nt.ca
Delivery	<u>Format</u>	<u>Deliverables</u>
Email - Single Report	PDF	Invoice

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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 ID: SNP 0036-4,5 & 9

Project Name:

Project Location: Inuvik

LSD: P.O.:

100104

Proj. Acct. code:

Lot ID: 1370319

Control Number:

Date Received: Aug 15, 2019

Date Reported: Aug 20, 2019

Report Number: 2432614

 Reference Number
 1370319-1
 1370319-2
 1370319-3

 Sample Date
 Aug 14, 2019
 Aug 14, 2019
 Aug 14, 2019

 Sample Time
 08:45
 09:10
 08:30

 Sample Location

Sample Description SNP0036-4 / 6.9C SNP0036-5 / 6.9C SNP0036-9 / 6.9C

		Matrix	Water	Water	Water	
Analyte		Units	Results	Results	Results	Nominal Detection Limit
Aggregate Organic Cons	stituents					
Biochemical Oxygen Demand	Inhibited	mg/L	<4	<4	<4	4
Phenol		mg/L	0.006	<0.001	<0.001	0.001
Inorganic Nonmetallic P	arameters					
Phosphorus	Total	mg/L	1.11	0.07	< 0.05	0.05
Metals Dissolved						
Subsample			Lab Filtered	Lab Filtered	Lab Filtered	
Metals Total						
Aluminum	Total	mg/L	7.31	0.04	0.04	0.02
Calcium	Total	mg/L	207	33.5	254	0.2
Iron	Total	mg/L	31.8	0.43	0.73	0.05
Magnesium	Total	mg/L	100	13.9	91.2	0.2
Manganese	Total	mg/L	1.27	0.014	1.09	0.005
Potassium	Total	mg/L	31.0	3.0	4.9	0.4
Silicon	Total	mg/L	13.9	0.08	2.90	0.05
Sodium	Total	mg/L	161	18.0	127	0.4
Sulfur	Total	mg/L	202	23.9	329	0.3
Mercury	Total	mg/L	0.000072	0.000016	0.000014	0.000005
Antimony	Total	mg/L	0.0007	<0.0002	<0.0002	0.0002
Arsenic	Total	mg/L	0.0263	0.0016	0.0006	0.0002
Barium	Total	mg/L	0.309	0.042	0.021	0.001
Beryllium	Total	mg/L	0.0005	<0.0001	<0.0001	0.0001
Bismuth	Total	mg/L	< 0.0005	< 0.0005	< 0.0005	0.0005
Boron	Total	mg/L	0.735	0.017	0.196	0.002
Cadmium	Total	mg/L	0.00030	0.00006	< 0.00001	0.00001
Chromium	Total	mg/L	0.0196	< 0.0005	< 0.0005	0.0005
Cobalt	Total	mg/L	0.0153	0.0002	0.0006	0.0001
Copper	Total	mg/L	0.032	<0.001	<0.001	0.001
Lead	Total	mg/L	0.0105	0.0001	< 0.0001	0.0001
Lithium	Total	mg/L	0.059	0.007	0.044	0.001
Molybdenum	Total	mg/L	0.003	<0.001	<0.001	0.001
Nickel	Total	mg/L	0.0491	0.0020	0.0040	0.0005
Selenium	Total	mg/L	0.0013	<0.0002	< 0.0002	0.0002
Silver	Total	mg/L	0.00020	<0.00001	<0.0001	0.00001
Strontium	Total	mg/L	0.754	0.116	0.961	0.001
Thallium	Total	mg/L	0.00013	< 0.00005	<0.00005	0.00005
Tin	Total	mg/L	<0.001	<0.001	<0.001	0.001
Titanium	Total	mg/L	0.0547	< 0.0005	<0.0005	0.0005



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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 ID: SNP 0036-4,5 & 9

Project Name:

Project Location: Inuvik

LSD: P.O.:

100104

Proj. Acct. code:

Lot ID: 1370319

1370319-3

Aug 14, 2019

08:30

Control Number:

Date Received: Aug 15, 2019

Date Reported: Aug 20, 2019 Report Number: 2432614

Sample Location

1370319-2 **Reference Number** 1370319-1 Sample Date Aug 14, 2019 Aug 14, 2019 Sample Time 08:45 09:10

Sample Description SNP0036-4 / 6.9C SNP0036-5 / 6.9C

SNP0036-9 / 6.9C

		Matrix	Water	Water	Water	
Analyte		Units	Results	Results	Results	Nominal Detection Limit
Metals Total - Continued						
Uranium	Total	mg/L	0.0014	< 0.0005	0.0021	0.0005
Vanadium	Total	mg/L	0.0461	0.0017	0.0003	0.0001
Zinc	Total	mg/L	0.117	0.001	0.019	0.001
Zirconium	Total	mg/L	0.003	<0.001	< 0.001	0.001
Physical and Aggregate	Properties					
Solids	Total Suspended	mg/L	764	4	8	2
Routine Water						
рН			7.71	7.97	7.67	
Temperature of observed pH		°C	21.4	21.5	21.6	
Electrical Conductivity	at 25 °C	μS/cm	2010	318	1960	1
Electrical Conductivity	at 25 °C	dS/m	2.01	0.318	1.96	0.001
Calcium	Dissolved	meq/L	9.45	1.64	12.4	0.01
Calcium	Dissolved	mg/L	189	32.9	249	0.2
Magnesium	Dissolved	meq/L	7.52	1.14	7.35	0.01
Magnesium	Dissolved	mg/L	91.5	13.8	89.4	0.2
Sodium	Dissolved	meq/L	6.58	0.75	5.31	0.02
Sodium	Dissolved	mg/L	151	17.2	122	0.4
Potassium	Dissolved	meq/L	0.70	0.07	0.12	0.01
Potassium	Dissolved	mg/L	27.6	2.9	4.7	0.4
Chloride	Dissolved	mg/L	124	16.0	48.5	0.4
Chloride		meq/L	3.49	0.45	1.37	0.01
Sulfate (SO4)	Dissolved	mg/L	592	69.3	964	0.9
Sulfate-S		meq/L	12.3	1.44	20.0	
Sulfate-S	Dissolved	mg/L	197	23.1	321	0.3
Total Dissolved Solids	Estimated	mg/L	1290	204	1260	1
SAR	Dissolved		2.3	0.6	1.7	
Mono-Aromatic Hydroca	rbons - 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,p,o)		mg/L	<0.001	<0.001	<0.001	0.001
Volatile Petroleum Hydro	ocarbons - 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

Inuvik, NT, Canada

X0E 0T0

Attn: Rick Campbell Matt O'Rourke

Sampled By: Company: Town of Inuvik Project ID: SNP 0036-4,5 & 9

Project Name:

Project Location: Inuvik

LSD: P.O.:

100104

Proj. Acct. code:

Lot ID: 1370319

Control Number:

Date Received: Aug 15, 2019

Date Reported: Aug 20, 2019

Report Number: 2432614

Approved by:

Darlene Lintott, MSc Consulting Scientist





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Methodology and Notes

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 & 9

Project Name:

Proj. Acct. code:

Project Location: Inuvik

LSD: P.O.:

100104

Lot ID: 1370319

Control Number:

Date Received: Aug 15, 2019 Date Reported: Aug 20, 2019

Report Number: 2432614

Method of Analysis

Method Name	Reference	Method	Date Analysis Started	Location
Alkalinity, pH, and EC in water	APHA	* Conductivity, 2510 B	Aug 15, 2019	Element Edmonton - Roper Road
Alkalinity, pH, and EC in water	APHA	* pH - Electrometric Method, 4500-H+ B	Aug 15, 2019	Element Edmonton - Roper Road
BOD (Carbonaceous) in water	APHA	* 5 Day, 5210 B	Aug 15, 2019	Element Edmonton - Roper Road
BTEX-CCME - Water	US EPA	 Volatile Organic Compounds in Various Sample Matrices Using Equilibrium Headspace Analysis/Gas Chromatography Mass Spectrometry, 5021/8260 	Aug 16, 2019	Element Calgary
Chloride in Water	APHA	 * Automated Ferricyanide Method, 4500-CI- E 	Aug 19, 2019	Element Edmonton - Roper Road
Mercury (Total) in water	EPA	 Mercury in Water by Cold Vapor Atomic Fluorescence Spectrometry, 245.7 	Aug 19, 2019	Element Edmonton - Roper Road
Mercury (Total) in water	US EPA	 Determination of Hg in Sediment by Cold Vapor Atomic Absorption Spec, 245.5 	Aug 19, 2019	Element Edmonton - Roper Road
Metals ICP-MS (Total) in water	APHA/USEPA	 Metals By Inductively Coupled Plasma/Mass Spectrometry, APHA 3125 B / USEPA 200.2, 200.8 	Aug 15, 2019	Element Edmonton - Roper Road
Metals ICP-MS (Total) in water	US EPA	 Determination of Trace Elements in Waters and Wastes by ICP-MS, 200.8 	Aug 15, 2019	Element Edmonton - Roper Road
Metals Trace (Dissolved) in water	APHA	 * Inductively Coupled Plasma (ICP) Method, 3120 B 	Aug 19, 2019	Element Edmonton - Roper Road
Metals Trace (Total) in water	APHA	 * Inductively Coupled Plasma (ICP) Method, 3120 B 	Aug 15, 2019	Element Edmonton - Roper Road
Phenol in water	APHA	* Direct Photometric Method, 5530 D	Aug 15, 2019	Element Edmonton - Roper Road
Phosphorus - Total in Water	APHA	 * Automated Ascorbic Acid Reduction Method, 4500-P F 	Aug 19, 2019	Element Edmonton - Roper Road
Solids Suspended (Total, Fixed and Volatile)	APHA	 * Total Suspended Solids Dried at 103- 105'C, 2540 D 	Aug 15, 2019	Element Edmonton - Roper Road
		* 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

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Inuvik, NT, Canada

X0E 0T0

Attn: Rick Campbell

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

Project ID: SNP 0036-4,5 & 9

Project Name:

Project Location: Inuvik

LSD:

P.O.: 100104

Proj. Acct. code:

Lot ID: 1370319

Control Number:

Date Received: Aug 15, 2019

Date Reported: Aug 20, 2019

Report Number: 2432614

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Bill To: Town of Inuvik

Project ID: SNP 0036-4,5&9

Lot ID: 1376392

Box 1160 2 Firth Street Project Name:

Control Number:

Inuvik, NT, Canada

Project Location: Inuvik

100104

Date Received: Sep 12, 2019

X0E 0T0

LSD:

Date Reported: Sep 19, 2019

Attn: Rick Campbell

P.O.: Proj. Acct. code:

Report Number: 2440850

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

Contact	Company	Address		
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Delivery	<u>Format</u>	<u>Deliverables</u>		
Email - Merge Reports	PDF	COC / COA		
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Richard Feilden	AECOM - Edmonton	17203 - 103 Avenue		
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Delivery	<u>Format</u>	<u>Deliverables</u>		
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@inuvik.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
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Report Transmission Cover Page

Bill To: Town of Inuvik

Box 1160

2 Firth Street

Inuvik, NT, Canada

X0E 0T0

Attn: Rick Campbell

Sampled By: Matt D'Rourke Company: Town of Inuvik Project ID: SNP 0036-4,5&9

Project Name:

Project Location: Inuvik

LSD:

P.O.: 100104

Proj. Acct. code:

Lot ID: 1376392

Control Number:

Date Received: Sep 12, 2019

Date Reported: Sep 19, 2019

Report Number: 2440850

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Analytical Report

Company:

Bill To: Town of Inuvik

Box 1160

2 Firth Street

Inuvik, NT, Canada

X0E 0T0

Attn: Rick Campbell

Town of Inuvik

Sampled By: Matt D'Rourke

Project Location: Inuvik

LSD: P.O.:

Project ID:

Project Name:

100104

SNP 0036-4,5&9

Proj. Acct. code:

Lot ID: 1376392

Control Number:

Date Received: Sep 12, 2019

Sep 19, 2019 Date Reported:

Report Number: 2440850

Reference Number Sample Date Sample Time

1376392-1 Sep 11, 2019 09:15

1376392-2 Sep 11, 2019 08:35

1376392-3 Sep 11, 2019 09:35

Sample Location

Sample Description Pit N/W of Dump / SNP0036-4 / 6.2C Pond S/E of Dump / Creek N/W of Dump SNP0036-5 / 6.2C / SNP0036-9 / 6.2C

Matrix Water Water Water Nominal Detection Units Results Results Results Analyte Limit **Aggregate Organic Constituents** Biochemical Oxygen Inhibited <4 mg/L <4 <4 4 Demand 0.001 < 0.001 0.004 0.001 Phenol mg/L **Inorganic Nonmetallic Parameters Phosphorus** Total 0.12 0.12 < 0.05 0.05 mg/L **Metals Dissolved** Subsample Lab Filtered Lab Filtered Lab Filtered **Metals Total** Aluminum Total 0.28 0.11 0.33 0.02 mg/L Calcium Total mg/L 233 39.2 38.1 0.2 0.05 Iron Total mg/L 1.3 1.47 1.10 Magnesium Total mg/L 118 15.2 19.2 0.2 Manganese Total mg/L 0.758 0.162 0.320 0.005 Potassium Total mg/L 32.8 4.2 1.6 0.4 Silicon Total 4.21 0.42 2.06 0.05 mg/L 174 Sodium Total 19.6 15.9 0.4 mg/L Sulfur Total mg/L 262 28.5 53.5 0.3 0.000005 Mercury Total 0.000016 0.000017 0.000018 mg/L < 0.0004 < 0.0002 < 0.0002 0.0002 **Antimony** Total mg/L Arsenic Total 0.002 0.0027 0.0008 0.0002 mg/L Barium Total mg/L 0.106 0.068 0.024 0.001 Beryllium Total mg/L < 0.0002 < 0.0001 < 0.0001 0.0001 **Bismuth** Total < 0.001 < 0.0005 < 0.0005 0.0005 mg/L Boron Total mg/L 0.865 0.026 0.031 0.002 Total Cadmium mg/L < 0.00002 < 0.00001 0.00002 0.00001 Chromium Total < 0.001 < 0.0005 < 0.0005 0.0005 mg/L Cobalt Total mg/L 0.001 0.0003 0.0007 0.0001 Total < 0.002 < 0.001 0.002 0.001 Copper mg/L 0.0004 0.0002 Lead Total 0.0003 0.0001 mg/L 0.049 0.013 Lithium Total mg/L 0.008 0.001 Molybdenum < 0.002 <0.001 0.001 Total mg/L <0.001 Nickel Total mg/L 0.0088 0.0018 0.0080 0.0005 Selenium Total mg/L < 0.0002 < 0.0002 < 0.0002 0.0002 Silver Total < 0.00002 < 0.00001 < 0.00001 0.00001 mg/L Strontium Total mg/L 0.835 0.135 0.132 0.001 Thallium Total mg/L < 0.00005 0.00005 < 0.0001 < 0.00005 Tin Total mg/L < 0.002 <0.001 <0.001 0.001 0.0040 0.0017 0.0015 0.0005 Titanium Total mg/L

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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 D'Rourke Company: Town of Inuvik Project ID: SNP 0036-4.5&9

Project Name:

Project Location: Inuvik

LSD: P.O.:

100104

Proj. Acct. code:

Sample Location

Lot ID: 1376392

Control Number:

Date Received: Sep 12, 2019

Date Reported: Sep 19, 2019

Report Number: 2440850

Reference Number 1376392-1 1376392-2 1376392-3 Sample Date Sep 11, 2019 Sep 11, 2019 Sep 11, 2019 Sample Time 09:15 08:35 09:35

Sample Description

Pit N/W of Dump / Pond S/E of Dump / Creek N/W of Dump SNP0036-4 / 6.2C SNP0036-5 / 6.2C / SNP0036-9 / 6.2C

Water Water Matrix Water Nominal Detection Analyte Units Results Results Results Limit **Metals Total - Continued** < 0.001 <0.0005 Uranium Total mg/L < 0.0005 0.0005 Vanadium Total mg/L 0.002 0.0022 0.0010 0.0001 Zinc Total 0.007 0.002 0.011 mg/L 0.001 Zirconium Total mg/L < 0.002 <0.001 <0.001 0.001 **Physical and Aggregate Properties** Total Suspended 19 3 5 2 mg/L **Routine Water** 7.89 7.39 7.24 pН Temperature of observed ٥С 19.2 19.2 19.2 **Electrical Conductivity** at 25 °C 2260 380 412 µS/cm 1 at 25 °C 0.001 **Electrical Conductivity** dS/m 2.26 0.380 0.412 Calcium Dissolved meq/L 10.9 1.86 1.85 0.01 217 Calcium Dissolved mg/L 37.2 37.1 0.2 Magnesium Dissolved 9.00 1.19 1.55 0.01 meq/L Magnesium Dissolved mg/L 109 14.5 18.8 0.2 Sodium Dissolved 6.76 0.79 0.66 0.02 meq/L Sodium Dissolved mg/L 155 18.2 15.1 0.4 Potassium Dissolved 0.75 0.10 0.03 0.01 meq/L Potassium Dissolved 29 3.7 1.3 0.4 mg/L Chloride Dissolved 110 19.0 5.9 0.4 mg/L Chloride 0.17 0.01 meq/L 3.11 0.54 Sulfate (SO4) Dissolved 717 81.0 158 0.9 mg/L Sulfate-S meq/L 14.9 1.68 3.28 Sulfate-S Dissolved 239 52.5 mg/L 27.0 0.3 **Total Dissolved Solids** Estimated 1450 243 264 1 mg/L SAR Dissolved 2.1 0.6 0.5 Mono-Aromatic Hydrocarbons - Water Benzene mg/L < 0.001 < 0.001 < 0.001 0.001 Toluene < 0.0004 < 0.0004 < 0.0004 0.0004 mg/L Ethylbenzene <0.0010 <0.0010 <0.0010 0.0010 mg/L < 0.001 < 0.001 Total Xylenes (m,p,o) mg/L < 0.001 0.001 Volatile Petroleum Hydrocarbons - Water F1 -BTEX 0.1 < 0.1 < 0.1 < 0.1 mg/L 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

Inuvik, NT, Canada

X0E 0T0

Attn: Rick Campbell

Sampled By: Matt D'Rourke Company: Town of Inuvik Project ID: SNP 0036-4,5&9

Project Name:

Project Location: Inuvik

LSD: P.O.:

100104

Proj. Acct. code:

Lot ID: 1376392

Control Number:

Date Received: Sep 12, 2019

Date Reported: Sep 19, 2019

Report Number: 2440850

Approved by:

Darlene Lintott, MSc Consulting Scientist



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Methodology and Notes

Bill To: Town of Inuvik Project ID: SNP 0036-4,5&9 Lot ID: **1376392**

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: Inuvik

2 Firth Street Project Location: Inuvik Date Received: Sep 12, 2019
Inuvik, NT, Canada LSD: Date Reported: Sep 19, 2019

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Matt D'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	Sep 13, 2019	Element Edmonton - Roper Road
Alkalinity, pH, and EC in water	APHA	* pH - Electrometric Method, 4500-H+ B	Sep 13, 2019	Element Edmonton - Roper Road
BOD (Carbonaceous) in water	APHA	* 5 Day, 5210 B	Sep 12, 2019	Element Edmonton - Roper Road
BTEX-CCME - Water	US EPA	 Volatile Organic Compounds in Various Sample Matrices Using Equilibrium Headspace Analysis/Gas Chromatography Mass Spectrometry, 5021/8260 	Sep 13, 2019	Element Calgary
Chloride in Water	APHA	* Automated Ferricyanide Method, 4500-Cl	Sep 16, 2019	Element Edmonton - Roper Road
Mercury (Total) in water	EPA	* Mercury in Water by Cold Vapor Atomic Fluorescence Spectrometry, 245.7	Sep 13, 2019	Element Edmonton - Roper Road
Mercury (Total) in water	US EPA	 Determination of Hg in Sediment by Cold Vapor Atomic Absorption Spec, 245.5 	Sep 13, 2019	Element Edmonton - Roper Road
Metals ICP-MS (Total) in water	APHA/USEPA	 Metals By Inductively Coupled Plasma/Mass Spectrometry, APHA 3125 B / USEPA 200.2, 200.8 	Sep 13, 2019	Element Edmonton - Roper Road
Metals ICP-MS (Total) in water	US EPA	* Determination of Trace Elements in Waters and Wastes by ICP-MS, 200.8	Sep 13, 2019	Element Edmonton - Roper Road
Metals Trace (Dissolved) in water	APHA	 * Inductively Coupled Plasma (ICP) Method, 3120 B 	Sep 13, 2019	Element Edmonton - Roper Road
Metals Trace (Total) in water	APHA	 * Inductively Coupled Plasma (ICP) Method, 3120 B 	Sep 13, 2019	Element Edmonton - Roper Road
Phenol in water	APHA	* Direct Photometric Method, 5530 D	Sep 12, 2019	Element Edmonton - Roper Road
Phosphorus - Total in Water	APHA	 * Automated Ascorbic Acid Reduction Method, 4500-P F 	Sep 13, 2019	Element Edmonton - Roper Road
Solids Suspended (Total, Fixed and Volatile)	АРНА	 * Total Suspended Solids Dried at 103- 105'C, 2540 D 	Sep 12, 2019	Element Edmonton - Roper Road

* 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

Bill To: Town of Inuvik

Box 1160

2 Firth Street

Inuvik, NT, Canada

X0E 0T0

Attn: Rick Campbell

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

Project ID: SNP 0036-4,5&9

Project Name:

Project Location: Inuvik

LSD:

P.O.: 100104

Proj. Acct. code:

Lot ID: 1376392

Control Number:

Date Received: Sep 12, 2019

Date Reported: Sep 19, 2019

Report Number: 2440850

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www.exova.com	Address	Box 1160 2 I	Firth Street	Į.	Address	1720	03-1	103	rd A	veni	ue						surcharges will be ap	oplied to the analysis
Project Information		Inuvik, NT X	0E 0T0			Edmo	ntor	n, Al	B T58	3 1J4							Date Required	
Project ID SNP 0036- 4,5 & 9.	Attention	Rick Campb	ell		Attention	Rich	ard	Fe	ilder	1							As Indicated	All Analysis
Project Name	Phone	(867) 777-86	S15	ı	Phone	(780) 48	38-6	3800								When "ASAP" is requ	ooted turn around will
Project Location Inuvik	Cell	(867) 678-53	388		Cell	•											default to a 100% RUSH	
Legal Location	Fax	(867) 777-86	501		Fax	(780) 48	38-2	2121								turn around time to match	n. Please contact the lab
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Page 1 of 1				T ,,			:	une fitt li	. m. 1 ml								Received by:	<u>v</u>



T: +1 (780) 438-5522 F: +1 (780) 434-8586 E: info.Edmonton@element.com

W: element.com

Report Transmission Cover Page

Bill To: Town of Inuvik

Inuvik, NT, Canada

2 Firth Street

X0E 0T0

Project Name: Box 1160

Project ID:

Project Location: Inuvik

LSD: P.O.:

100104

SNP 0036-6,7&8

Control Number:

Date Received: Sep 12, 2019

Lot ID: 1376386

Date Reported: Sep 19, 2019 Report Number: 2440847

Proj. Acct. code: Attn: Rick Campbell

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) 48	36-7070
		Email: Jason.Casault@aecom.com	
Delivery	<u>Format</u>	<u>Deliverables</u>	
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) 77	77-8601
		Email: kwainman@inuvik.ca	
Delivery	<u>Format</u>	<u>Deliverables</u>	
Email - Single Report	PDF	Invoice	
Li Wang	AECOM - Edmonton	101-18817 Stony Plain Road NW	
		Edmonton, AB T5S 0C2	
		Phone: (780) 453-0710 Fax:	
		Email: li.wang@aecom.com	
Delivery	<u>Format</u>	<u>Deliverables</u>	
Email - Merge Reports	PDF	COC / Test Report	
Email - Single Report	Legacy Crosstab in CSV	Test Report	
Richard Feilden	AECOM - Edmonton	17203 - 103 Avenue	
		Edmonton, AB T5S 1J4	
		Phone: (780) 488-6800 Fax: (780) 48	38-2121
		Email: richard.feilden@aecom.com	
Delivery	<u>Format</u>	<u>Deliverables</u>	
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) 77	77-8601
		Email: rcampbell@inuvik.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) 77	77-2071
		Email: utilidor@inuvik.ca	
Delivery	<u>Format</u>	<u>Deliverables</u>	
Email - Single Report	PDF	Invoice	

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W: element.com

Report Transmission Cover Page

Bill To: Town of Inuvik

Box 1160 2 Firth Street

Inuvik, NT, Canada

X0E 0T0

Attn: Rick Campbell

Sampled By: David Kendi Company: Town of Inuvik Project ID: SNP 0036-6,7&8

Project Name:

Project Location: Inuvik

LSD:

100104

P.O.: Proj. Acct. code: Lot ID: 1376386

Control Number:

Date Received: Sep 12, 2019

Date Reported: Sep 19, 2019

Report Number: 2440847

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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: David Kendi Town of Inuvik Company:

Project ID: SNP 0036-6,7&8

Project Name:

Inuvik Project Location:

LSD: P.O.:

100104

Proj. Acct. code:

Lot ID: 1376386

Control Number:

Date Received: Sep 12, 2019

Date Reported: Sep 19, 2019

Report Number: 2440847

Reference Number Sample Date

1376386-1 Sep 11, 2019

1376386-2 Sep 11, 2019

1376386-3 Sep 11, 2019

Sample Time **Sample Location**

08:35

08:45

08:55

Sample Description

Gate Pond /

Far Pond /

Twin Lakes /

SNP0036-6 / 6.2C SNP0036-7 / 6.2C SNP0036-8 / 6.2C

		Matrix	Water	Water	Water		
Analyte		Units	Results	Results	Results	Nominal Detection Limit	
Aggregate Organic Const	ituents						
Biochemical Oxygen Demand	Inhibited	mg/L	<4	<4	<4	4	
Inorganic Nonmetallic Par	rameters						
Ammonia - N		mg/L	12.1	< 0.025	1.50	0.025	
Un-ionized Ammonia-N	15 °C	mg/L	0.278	<0.00086	0.0612		
Ammonium/Ammonia Preservation Microbiological Analysis			Yes	Yes	Yes		
Fecal Coliforms	Membrane Filtration	CFU/100 mL	<10	<10	20	1	
Physical and Aggregate F	Properties						
Solids	Total Suspended	mg/L	<2	3	<2	2	
Routine Water							
рН	15 °C	рН	7.93	8.11	8.19		
Temperature of observed pH		°C	15	15	15		
рН			7.30	7.76	7.89		
Temperature of observed pH		°C	18.8	19.0	19.2		

Approved by:

Darlene Lintott, MSc **Consulting Scientist**



F: +1 (780) 434-8586 E: info.Edmonton@element.com

W: element.com

T: +1 (780) 438-5522

Methodology and Notes

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: Inuvik Date Received: Sep 12, 2019
Inuvik, NT, Canada LSD: Date Reported: Sep 19, 2019

 Inuvik, NT, Canada
 LSD:
 Date Reported:
 Sep 19, 2019

 X0E 0T0
 P.O.:
 100104
 Report Number:
 2440847

Attn: Rick Campbell Proj. Acct. code:

Sampled By: David Kendi 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	Sep 13, 2019	Element Edmonton - Roper Road
Ammonium-N in Water	APHA	* Automated Phenate Method, 4500-NH3 G	Sep 17, 2019	Element Edmonton - Roper Road
BOD (Carbonaceous) in water	APHA	* 5 Day, 5210 B	Sep 12, 2019	Element Edmonton - Roper Road
Coliforms - Membrane Filtration	APHA	Fecal Coliform Membrane Filter Procedure, 9222 D	Sep 13, 2019	Element Calgary
pH at 15°C	APHA	* pH - Electrometric Method, 4500-H+ B	Sep 17, 2019	Element Edmonton - Roper Road
Solids Suspended (Total, Fixed and Volatile)	АРНА	* Total Suspended Solids Dried at 103- 105'C, 2540 D	Sep 12, 2019	Element Edmonton - Roper Road
		* Peferance Method Medified		

* Reference Method Modified

References

APHA Standard Methods for the Examination of Water and Wastewater

Please direct any inquiries regarding this report to our Client Services group.

Results relate only to samples as submitted.

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

EVOVO	Testing	Billing Informat	ion:			Copy of F	Report To:											RUSH	Priority	
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www.exova.com	Assaning	Address	Box 1160 2 F	Firth Street		Address	1720	3-1	03	rd A	ven	ue						surcharges will be a	pplied to the analysis	
Project Information	on	400 M	Inuvik, NT X	0E 0T0			Edmo	lmonton, AB T5S 1J4				Date Required								
Project ID	SNP 0036- 6,7 & 8	Attention	Rick Campbe	ell		Attention	Rich	ard	Fe	ilder	ilden							As Indicated	All Analysis	
Project Name		Phone	(867) 777-86	15		Phone	(780) 48	38-6	3800)							When "ASAP" is requ	uested, turn around will	
Project Location	Inuvik	Cell	(867) 678-53	88		Cell												default to a 100% RUSH priority, with pricing an turn around time to match. Please contact the laprior to submitting RUSH samples		
Legal Location		Fax	(867) 777-86	01		Fax	(780) 48	38-2	2121										
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Proj. Acct.Code		Agreement ID	2909			į į												Signature		
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TempC,	precip, Win	d dirVe	el	_km/h				Number of	핌	CBOD5	SpepuedsnS	Ammonia	Fecal					JEF 13	2m5:39	
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Appendix C

Lagoon Berm Inspection Report



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

T: 867 873 6316 F: 867 873 6407 www.aecom.com

January 6, 2020

Project # 60616280

Mr. Leonard DeBastien
Executive Director
Gwich'in Land and Water Board
Box 2018
Inuvik NT X0E 0T0

Dear Sir:

Subject: Town of Inuvik - Water Licence No. G17L3-001

Licence Condition D8, Lagoon Earthen Water Retaining Structure

On behalf of Inuvik, we wish to respond to Water License Condition D8 for year 2019.

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

L-Debastien-60616280-2020-01-06.Docx 1 of 3



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 2019 annual inspection was carried out on October 16, 2019. All dykes were found to be in satisfactory condition. No unusual longitudinal cracks or fissures were noted. Maintenance activities carried out in 2019 included grading of all the dykes to fill longitudinal cracks.

It was noted that the outer slope of the west dike along the karst pond shorelines has increased. It is recommended that a bathymetric survey be carried out along the west dyke in the affected area during summer 2020 in order to determine the depth of the ponds, the slope of the dyke underwater and to prepare a plan to restore the slope of the west dyke in the vicinity of the two karst ponds.

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 the dikes around 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 2019.

Sincerely,

AECOM Canada Ltd.

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

ML:blb

cc: Mr. Rolland Malegana, Energy and Natural Resources Mr. Rick Campbell, Town of Inuvik Mr. Grant Hood, S.A.O., Town of Inuvik Inuvik Utilidor Crew Foreman Inuvik Public Works Committee

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

Jordan Hoffart



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- may be based on information provided to AECOM which has not been independently verified;
- has not been updated since the date of issuance of the Report and its accuracy is limited to the time period and circumstances in which it was collected, processed, made or issued;
- 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
- in the case of subsurface, environmental or geotechnical conditions, may be based on limited testing and on the assumption that such conditions are uniform and not variable either geographically or over time.

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AECOM: 2015-04-13

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Appendix D

Lagoon Sludge Removal Report



August 8, 2019

Town of Inuvik Final Report

Please find the following project data summary for the Town of Inuvik desludging and dewatering project.

Project Data

Project data and volumes were determined by using a certified 6" Krohne flowmeter and dry down samples collected periodically throughout the day to derive the percent solids of the sludge slurry. An average of the dry down samples are determined and then multiplied by the volume of slurry pumped resulting in the Dry Tonnes (DT) removed for the day. A summary of the data collected and totals for the project are displayed in the table below.

	m³ removed	Dry Tonnes (DT) removed	Bags of Polymer Used						
TOTALS	14,234.32	732.57	154						
2-Jul-19									
3-Jul-19]								
4-Jul-19]								
5-Jul-19	Mobilization ar	nd set up. Pumpir	ng supernatant.						
6-Jul-19]	Mixing cell.							
7-Jul-19]								
8-Jul-19]								
9-Jul-19]								
10-Jul-19	693.70	17.69	3						
11-Jul-19	725.54	24.16	5						
12-Jul-19	518.00	34.55	5						
13-Jul-19	730.76	61.96	8						
14-Jul-19		Off							
15-Jul-19	1042.46	74.95	9						
16-Jul-19	852.90	67.96	8						
17-Jul-19	976.10	77.89	13						
18-Jul-19									
19-Jul-19	Fixed Houles and equipment maintenance.								
20-Jul-19	Pumping	g supernatant. Mi	xing cell.						
21-Jul-19									
22-Jul-19	548.32	9.40	1						

497.91	9.49	4							
948.56	34.33	8							
809.39	35.91	8							
978.89	51.37	13							
703.43	39.04	10							
Off									
1064.97	48.24	13							
1085.86	45.17	12							
998.77	47.64	16							
1004.37	48.10	16							
Received approval from the Town of Inuvik that the project is complete.									
54.39	4.72	2							
Top up bags, tear down and pack up.									
3-Aug-19 Demob. Crew flown back to Red Deer.									
	948.56 809.39 978.89 703.43 1064.97 1085.86 998.77 1004.37 proval from the To comp 54.39 op up bags, tear	948.56 34.33 809.39 35.91 978.89 51.37 703.43 39.04 Off 1064.97 48.24 1085.86 45.17 998.77 47.64 1004.37 48.10 Proval from the Town of Inuvik that complete. 54.39 4.72 op up bags, tear down and pack up							

Summary

The project spanned 32 days total:

- 7 Mobilization, set up and mix
- 18 production
- 2 Demob
- 3 scheduled off
- 2 maintenance/repairs

	Estimated (Original Proposal)	Survey	Actual
m³	12,000	15,000	14,234.32
Dry Tonnes (DT)	720		*723.57
Days on site	+/- 40 days		32

^{*}Dry down samples average 5% solids for the duration of the project.

Geotube Maintenance

After operations, the rate at which the Geotubes dewater decreases and will continue to slowly dewater over time. In general, the longer the Geotubes are left in place to dewater the better the dewatering result. In order to properly manage the laydown yard and optimal dewatering of the Geotubes ensuring proper drainage and filtrate management is key with the following:

1) Monitor the laydown yard regularly. This can be factored into regular rounds and inspections for public works personnel. Inspect for but not limited to:

- o Pooling especially after larger precipitation events.
- o Blocked or clogged Geotubes to ensure the filtering mesh is able to pass water.
- o Damage to the Geotubes (ie. leaks, punctures, abnormalities).
- 2) Discharge any excess or undrained water back to the cells if there is water pooling in the laydown yard around the Geotubes.
- 3) If possible, regrade or fix any blockages in drainage channels within the yard and downstream.

Closing

I trust this provides you with the information you require. If you have any questions please do not hesitate to contact me.

Yours truly,

Lambourne Environmental Ltd.

David Linsley,

General Manager