ANNUAL REPORT
FOR THE HAMLET OF RANKIN INLET

YEAR BEING REPORTED: 2018

The following information is compiled pursuant to the requirements of Part B, Item 1 of Water License No. **3BM-RAN1520** issued to the **Hamlet of Rankin Inlet**.

i) - iii) tabular summaries of all data generated under the "Monitoring Program"; monthly and annual quantities in cubic metres of freshwater obtained from all sources; monthly and annual quantities in cubic metres of each and all wastes discharged;

Attached are results for Monitoring Station RAN-2.

Month Reported	Quantity of Water Obtained from all sources (m^3)	Quantity of Sewage Waste Discharged (Estimated)
January	none	none
February	none	none
March	none	none
April	none	none
May	none	none
June	none	none
July	none	none
August	none	none
September	none	none
October	none	none
November	none	none
December	none	none
ANNUAL TOTAL	none	none

Note: The purpose of this License is the deposit of waste; there is no authorized water use.

ii) a summary of modifications and/or major maintenance work carried out on the Water Supply and Waste Disposal Facilities, including all associated structures and facilities;

- Batteries are being separated into sea cans and the berm on the south side of the dump is being built up in the fall of 2018. Segregation and clean up at the solid waste site started in early August by the hamlet. The work INAC raised in the 2017 written warning was completed on the south side of the solid waste site outside of the bermed area.

Before work was completed

After work was completed

iv. a list of unauthorized discharges and summary of follow-up action taken;

Spills:

Spill No.	Date	Site Description	Commodity	Quantity
2018193	2017-05-21	N/A	N/A	N/A
2018194	2018-05-25	N/A	N/A	N/A
2018211	2018-06-06	N/A	Petroleum – fuel oil	236 L
2018224	2018-06-13	N/A	Petroleum – fuel oil	N/A
2018281	2018-07-14	N/A	Petroleum – fuel oil	50 L
2018293	2018-07-18	N/A	Petroleum – fuel oil	30 L
2018382	2018-09-17	N/A	Petroleum – fuel oil	189 L
2018403	2018-09-28	N/A	Petroleum – fuel oil	75 L

v. a summary of any abandonment and restoration work completed during the year and an outline of any work anticipated for the next year;

- None

vi. a summary of any studies requested by the Board that relate to waste disposal, water use or reclamation, and a brief description of any future studies planned;

- None

vii. any other details on water use or waste disposal requested by the Board by November 1st of the year being reported; and

- None

viii. Updates or revisions to the approved Operation and Maintenance Plans.

- None

ADDITIONAL INFORMATION THAT THE LICENSEE DEEMS USEFUL:

FOLLOW-UP REGARDING INSPECTION/COMPLIANCE CONCERNS:

- The INAC Inspection took place on July 23rd, 2018. A follow up inspection occurred on August 16th, 2018. A copy of the inspection report can be found in Appendix G.

Appendix A: Weekly Inspections at Monitoring Program Stations – 1 page
Appendix B: Certificate of Analysis June 27, 2018 – 9 pages
Appendix C: Certificate of Analysis July 30, 2018 – 10 pages
Appendix D: Certificate of Analysis August 15, 2018 – 9 pages
Appendix E: Hazardous Materials Spill Database, Rankin Inlet 2018 – 1 page
Appendix F: Rankin Inlet – Hamlet 2018 Sampling Summary – 1 page
Appendix G: INAC Inspection Report – 23 pages

Appendix A

No Weekly Inspections at Monitoring Program Stations Document were recieved by CGS.

Appendix B

Hamlet of Rankin Inlet
ATTN: JUSTIN MERRITT
PO Box 310
Rankin Inlet NU X0C 0G0

Date Received: 29-JUN-18
Report Date: 19-JUL-18 15:12 (MT)
Version: FINAL

Client Phone: 867-645-2895

Certificate of Analysis

Lab Work Order #: L2121527

Project P.O. #: NOT SUBMITTED
Job Reference:
C of C Numbers:
Legal Site Desc:

Hua Wo
Chemistry Laboratory Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2121527-1 RAN-2							
Sampled By: OWEN on 27-JUN-18 @ 09:30							
Matrix: WW							
BTEX plus F1-F4							
BTX plus F1 by GCMS							
Benzene	<0.00050		0.00050	mg/L		05-JUL-18	R4113020
Toluene	<0.0010		0.0010	mg/L		05-JUL-18	R4113020
Ethyl benzene	<0.00050		0.00050	mg/L		05-JUL-18	R4113020
o-Xylene	<0.00050		0.00050	mg/L		05-JUL-18	R4113020
m+p-Xylenes	<0.00040		0.00040	mg/L		05-JUL-18	R4113020
F1 (C6-C10)	<0.10		0.10	mg/L		05-JUL-18	R4113020
Surrogate: 4-Bromofluorobenzene (SS)	91.6		70-130	%		05-JUL-18	R4113020
CCME PHC F2-F4 in Water							
F2 (C10-C16)	0.14		0.10	mg/L	04-JUL-18	05-JUL-18	R4113238
F3 (C16-C34)	0.30		0.25	mg/L	04-JUL-18	05-JUL-18	R4113238
F4 (C34-C50)	<0.25		0.25	mg/L	04-JUL-18	05-JUL-18	R4113238
Surrogate: 2-Bromobenzotrifluoride	90.7		60-140	%	04-JUL-18	05-JUL-18	R4113238
CCME Total Hydrocarbons							
F1-BTEX	<0.10		0.10	mg/L		06-JUL-18	
F2-Naphth	0.14		0.10	mg/L		06-JUL-18	
F3-PAH	0.30		0.25	mg/L		06-JUL-18	
Total Hydrocarbons (C6-C50)	0.45		0.38	mg/L		06-JUL-18	
Sum of Xylene Isomer Concentrations							
Xylenes (Total)	<0.00064		0.00064	mg/L		05-JUL-18	
Polyaromatic Hydrocarbons (PAHs)							
1-Methyl Naphthalene	0.000038		0.000020	mg/L	03-JUL-18	03-JUL-18	R4111391
2-Methyl Naphthalene	0.000028		0.000020	mg/L	03-JUL-18	03-JUL-18	R4111391
Acenaphthene	<0.000020		0.000020	mg/L	03-JUL-18	03-JUL-18	R4111391
Acenaphthylene	<0.000020		0.000020	mg/L	03-JUL-18	03-JUL-18	R4111391
Anthracene	<0.000010		0.000010	mg/L	03-JUL-18	03-JUL-18	R4111391
Acridine	<0.000020		0.000020	mg/L	03-JUL-18	03-JUL-18	R4111391
Benzo(a)anthracene	<0.000010		0.000010	mg/L	03-JUL-18	03-JUL-18	R4111391
Benzo(a)pyrene	<0.0000050		0.0000050	mg/L	03-JUL-18	03-JUL-18	R4111391
Benzo(b&j)fluoranthene	<0.000010		0.000010	mg/L	03-JUL-18	03-JUL-18	R4111391
Benzo(g,h,i)perylene	<0.000020		0.000020	mg/L	03-JUL-18	03-JUL-18	R4111391
Benzo(k)fluoranthene	<0.000010		0.000010	mg/L	03-JUL-18	03-JUL-18	R4111391
Chrysene	<0.000020		0.000020	mg/L	03-JUL-18	03-JUL-18	R4111391
Dibenzo(a,h)anthracene	<0.0000050		0.0000050	mg/L	03-JUL-18	03-JUL-18	R4111391
Fluoranthene	<0.000020		0.000020	mg/L	03-JUL-18	03-JUL-18	R4111391
Fluorene	<0.000020		0.000020	mg/L	03-JUL-18	03-JUL-18	R4111391
Indeno(1,2,3-cd)pyrene	<0.000010		0.000010	mg/L	03-JUL-18	03-JUL-18	R4111391
Naphthalene	<0.000050		0.000050	mg/L	03-JUL-18	03-JUL-18	R4111391
Phenanthrene	<0.000050		0.000050	mg/L	03-JUL-18	03-JUL-18	R4111391
Pyrene	<0.000010		0.000010	mg/L	03-JUL-18	03-JUL-18	R4111391
Quinoline	<0.000020		0.000020	mg/L	03-JUL-18	03-JUL-18	R4111391
B(a)P Total Potency Equivalent	<0.000030		0.000030	mg/L	03-JUL-18	03-JUL-18	R4111391
Surrogate: Acenaphthene d10	83.4		40-130	%	03-JUL-18	03-JUL-18	R4111391
Surrogate: Acridine d9	85.3		40-130	%	03-JUL-18	03-JUL-18	R4111391
Surrogate: Chrysene d12	91.2		40-130	%	03-JUL-18	03-JUL-18	R4111391
Surrogate: Naphthalene d8	77.5		40-130	%	03-JUL-18	03-JUL-18	R4111391
Surrogate: Phenanthrene d10	83.6		40-130	%	03-JUL-18	03-JUL-18	R4111391
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	205		1.2	mg/L		05-JUL-18	
Alkalinity, Carbonate							

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2121527-1 RAN-2							
Sampled By: OWEN on 27-JUN-18 @ 09:30							
Matrix: WW							
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		05-JUL-18	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		05-JUL-18	
Alkalinity, Total (as CaCO3)							
Alkalinity, Total (as CaCO3)	168		1.0	mg/L		04-JUL-18	R4112900
Ammonia by colour							
Ammonia, Total (as N)	3.97		0.10	mg/L		04-JUL-18	R4113377
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	<2.0		2.0	mg/L		29-JUN-18	R4113030
Carbonaceous BOD							
BOD Carbonaceous	3.1		2.0	mg/L		29-JUN-18	R4113030
Chloride in Water by IC							
Chloride (Cl)	70.4		0.50	mg/L		29-JUN-18	R4110152
Conductivity							
Conductivity	753		1.0	umhos/cm		04-JUL-18	R4112900
Fecal coliforms, 1:10 dilution by QT97							
Fecal Coliforms	80	PEHR	10	MPN/100mL		29-JUN-18	R4108351
Hardness Calculated							
Hardness (as CaCO3)	215	HTC	0.20	mg/L		09-JUL-18	
Mercury Total							
Mercury (Hg)-Total	0.0000051		0.0000050	mg/L	05-JUL-18	06-JUL-18	R4116151
Nitrate in Water by IC							
Nitrate (as N)	0.486		0.020	mg/L		29-JUN-18	R4110152
Nitrate+Nitrite							
Nitrate and Nitrite as N	0.549		0.070	mg/L		03-JUL-18	
Nitrite in Water by IC							
Nitrite (as N)	0.064		0.010	mg/L		29-JUN-18	R4110152
Oil & Grease - Gravimetric							
Oil and Grease	<5.0		5.0	mg/L		10-JUL-18	R4120891
Phenol (4AAP)							
Phenols (4AAP)	0.0013		0.0010	mg/L		03-JUL-18	R4112518
Phosphorus, Total							
Phosphorus (P)-Total	0.199		0.0010	mg/L		09-JUL-18	R4116767
Sulfate in Water by IC							
Sulfate (SO4)	115		0.30	mg/L		29-JUN-18	R4110152
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.0199		0.0030	mg/L	05-JUL-18	05-JUL-18	R4115307
Antimony (Sb)-Total	0.00100		0.00010	mg/L	05-JUL-18	05-JUL-18	R4115307
Arsenic (As)-Total	0.00285		0.00010	mg/L	05-JUL-18	05-JUL-18	R4115307
Barium (Ba)-Total	0.0188		0.00010	mg/L	05-JUL-18	05-JUL-18	R4115307
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	05-JUL-18	05-JUL-18	R4115307
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	05-JUL-18	05-JUL-18	R4115307
Boron (B)-Total	0.599		0.010	mg/L	05-JUL-18	05-JUL-18	R4115307
Cadmium (Cd)-Total	0.0000361		0.0000050	mg/L	05-JUL-18	05-JUL-18	R4115307
Calcium (Ca)-Total	60.3		0.050	mg/L	05-JUL-18	05-JUL-18	R4115307
Cesium (Cs)-Total	0.000022		0.000010	mg/L	05-JUL-18	05-JUL-18	R4115307
Chromium (Cr)-Total	0.00079		0.00010	mg/L	05-JUL-18	05-JUL-18	R4115307
Cobalt (Co)-Total	0.00309		0.00010	mg/L	05-JUL-18	05-JUL-18	R4115307
Copper (Cu)-Total	0.0147		0.00050	mg/L	05-JUL-18	05-JUL-18	R4115307
Iron (Fe)-Total	1.62		0.010	mg/L	05-JUL-18	05-JUL-18	R4115307
Lead (Pb)-Total	0.000314		0.000050	mg/L	05-JUL-18	05-JUL-18	R4115307
Lithium (Li)-Total	0.0076		0.0010	mg/L	05-JUL-18	05-JUL-18	R4115307

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2121527-1 RAN-2							
Sampled By: OWEN on 27-JUN-18 @ 09:30							
Matrix: WW							
Total Metals in Water by CRC ICPMS							
Magnesium (Mg)-Total	15.6		0.0050	mg/L	05-JUL-18	05-JUL-18	R4115307
Manganese (Mn)-Total	0.228		0.00010	mg/L	05-JUL-18	05-JUL-18	R4115307
Molybdenum (Mo)-Total	0.00194		0.000050	mg/L	05-JUL-18	05-JUL-18	R4115307
Nickel (Ni)-Total	0.0121		0.00050	mg/L	05-JUL-18	05-JUL-18	R4115307
Potassium (K)-Total	16.1		0.050	mg/L	05-JUL-18	05-JUL-18	R4115307
Phosphorus (P)-Total	0.195		0.050	mg/L	05-JUL-18	05-JUL-18	R4115307
Rubidium (Rb)-Total	0.00400		0.00020	mg/L	05-JUL-18	05-JUL-18	R4115307
Selenium (Se)-Total	0.000286		0.000050	mg/L	05-JUL-18	05-JUL-18	R4115307
Silicon (Si)-Total	1.37		0.10	mg/L	05-JUL-18	05-JUL-18	R4115307
Silver (Ag)-Total	0.000022		0.000010	mg/L	05-JUL-18	05-JUL-18	R4115307
Sodium (Na)-Total	69.0		0.050	mg/L	05-JUL-18	05-JUL-18	R4115307
Strontium (Sr)-Total	0.312		0.00020	mg/L	05-JUL-18	05-JUL-18	R4115307
Sulfur (S)-Total	43.1		0.50	mg/L	05-JUL-18	05-JUL-18	R4115307
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	05-JUL-18	05-JUL-18	R4115307
Thallium (Tl)-Total	<0.000010		0.000010	mg/L	05-JUL-18	05-JUL-18	R4115307
Thorium (Th)-Total	<0.00010		0.00010	mg/L	05-JUL-18	05-JUL-18	R4115307
Tin (Sn)-Total	<0.00010		0.00010	mg/L	05-JUL-18	05-JUL-18	R4115307
Titanium (Ti)-Total	0.00055		0.00030	mg/L	05-JUL-18	05-JUL-18	R4115307
Tungsten (W)-Total	<0.00010		0.00010	mg/L	05-JUL-18	05-JUL-18	R4115307
Uranium (U)-Total	0.000876		0.000010	mg/L	05-JUL-18	05-JUL-18	R4115307
Vanadium (V)-Total	0.00066		0.00050	mg/L	05-JUL-18	05-JUL-18	R4115307
Zinc (Zn)-Total	0.0247		0.0030	mg/L	05-JUL-18	05-JUL-18	R4115307
Zirconium (Zr)-Total	0.000228		0.000060	mg/L	05-JUL-18	05-JUL-18	R4115307
Total Organic Carbon by Combustion							
Total Organic Carbon	23.0		0.50	mg/L		17-JUL-18	R4133027
Total Suspended Solids							
Total Suspended Solids	7.2		2.0	mg/L		04-JUL-18	R4113524
pH							
pH	7.85		0.10	pH units		04-JUL-18	R4112900

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

Reference Information

Sample Parameter Qualifier Key:

Qualifier	Description
HTC	Hardness was calculated from Total Ca and/or Mg concentrations and may be biased high (dissolved Ca/Mg results unavailable).
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
PEHR	Parameter Exceeded Recommended Holding Time On Receipt: Proceed With Analysis As Requested.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-CO3CO3-CALC-WP	Water	Alkalinity, Carbonate	CALCULATION

The Alkalinity of water is a measure of its acid neutralizing capacity.Alkalinity is imparted by bicarbonate, carbonate and hydroxide components of water. The fraction of alkalinity contributed by carbonate is calculated and reported as mg CO3 2-/L.

ALK-HCO3HCO3-CALC-WP	Water	Alkalinity, Bicarbonate	CALCULATION

The Alkalinity of water is a measure of its acid neutralizing capacity.Alkalinity is imparted by bicarbonate, carbonate and hydroxide components of water. The fraction of alkalinity contributed by bicarbonate is calculated and reported as mg HCO3-/L

ALK-OHOH-CALC-WP	Water	Alkalinity, Hydroxide	CALCULATION

The Alkalinity of water is a measure of its acid neutralizing capacity.Alkalinity is imparted by bicarbonate, carbonate and hydroxide components of water. The fraction of alkalinity contributed by hydroxide is calculated and reported as mg OH-/L.

ALK-TITR-WP	Water	Alkalinity, Total (as CaCO3)	APHA 2320B

The Alkalinity of water is a measure of its acid neutralizing capacity. Alkalinity is imparted by bicarbonate, carbonate and hydroxide components of water. Total alkalinity is determined by titration with a strong standard mineral acid to the successive HCO3- and H2CO3 endpoints indicated electrometrically.

BOD-CBOD-WP	Water	Carbonaceous BOD	APHA 5210 B

Samples are diluted and seeded, have TCMP added to inhibit nitrogenous demands, and then are incubated in airtight bottles at 20°C for 5 days. Dissolved oxygen is measured initially and after incubation, and results are computed from the difference between initial and final DO.

BOD-WP	Water	Biochemical Oxygen Demand (BOD)	APHA 5210 B

Samples are diluted and seeded and then incubated in airtight bottles at 20°C for 5 days. Dissolved oxygen is measured initially and after incubation, and results are computed from the difference between initial and final DO.

BTEXS+F1-HSMS-WP	Water	BTX plus F1 by GCMS	EPA 8260C / EPA 5021A

The water sample, with added reagents, is heated in a sealed vial to equilibrium. The headspace from the vial is transfered into a gas chromatograph. Target compound concentrations are measured using mass spectrometry detection.

C-TOC-HTC-WP	Water	Total Organic Carbon by Combustion	APHA 5310 B-WP

Sample is acidified and purged to remove inorganic carbon, then injected into a heated reaction chamber where organic carbon is oxidized to CO2 which is then transported in the carrier gas stream and measured via a non-dispersive infrared analyzer.

CL-IC-N-WP	Water	Chloride in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

EC-WP	Water	Conductivity	APHA 2510B

Conductivity of an aqueous solution refers to its ability to carry an electric current. Conductance of a solution is measured between two spatially fixed and chemically inert electrodes.

F1-F4-CALC-WP	Water	CCME Total Hydrocarbons	CCME CWS-PHC, Pub #1310, Dec 2001-L

Analytical methods used for analysis of CCME Petroleum Hydrocarbons have been validated and comply with the Reference Method for the CWS PHC.

In cases where results for both F4 and F4G are reported, the greater of the two results must be used in any application of the CWS PHC guidelines and the gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.
In samples where BTEX and F1 were analyzed , F1-BTEX represents a value where the sum of Benzene, Toluene, Ethylbenzene and total Xylenes has been subtracted from F1.

In samples where PAHs, F2 and F3 were analyzed, F2-Naphth represents the result where Naphthalene has been subtracted from F2. F3-PAH represents a result where the sum of Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Phenanthrene, and Pyrene has been subtracted from F3.

Unless otherwise qualified, the following quality control criteria have been met for the F1 hydrocarbon range:
1. All extraction and analysis holding times were met.

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**

2. Instrument performance showing response factors for C6 and C10 within 30% of the response factor for toluene.
3. Linearity of gasoline response within 15% throughout the calibration range.

Unless otherwise qualified, the following quality control criteria have been met for the F2-F4 hydrocarbon ranges:
1. All extraction and analysis holding times were met.
2. Instrument performance showing C10, C16 and C34 response factors within 10% of their average.
3. Instrument performance showing the C50 response factor within 30% of the average of the C10, C16 and C34 response factors.
4. Linearity of diesel or motor oil response within 15% throughout the calibration range.

F2-F4-FID-WP	Water	CCME PHC F2-F4 in Water	EPA 3511

Petroleum hydrocarbons in water are determined by liquid-liquid micro-scale solvent extraction using a reciprocal shaker extraction apparatus prior to capillary column gas chromatography with flame ionization detection (GC-FID) analysis.

FC10-QT97-WP	Water	Fecal coliforms, 1:10 dilution by QT97	APHA 9223B QT97

Analysis is carried out using procedures adapted from APHA 9223 "Enzyme Substrate Coliform Test". Fecal (thermotolerant) coliform bacteria are determined by mixing a 1:10 dilution of sample with a product containing hydrolyzable substrates and sealing in a 97-well packet. The packet is incubated at 44.5 – 0.2°C for 18 hours and then the number of wells exhibiting positive responses are counted. The final results are obtained by comparing the number of positive responses to a probability table.

HARDNESS-CALC-WP	Water	Hardness Calculated	APHA 2340B

Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.

HG-T-CVAF-WP	Water	Mercury Total	EPA245.7 V2.0

Mercury in filtered and unfiltered waters is oxidized with Bromine monochloride and analyzed by cold-vapour atomic fluorescence spectrometry.

MET-T-CCMS-WP	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod.)

Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

NH3-COL-WP	Water	Ammonia by colour	APHA 4500 NH3 F

Ammonia in water samples forms indophenol when reacted with hypochlorite and phenol. The intensity is amplified by the addition of sodium nitroprusside and measured colourmetrically.

NO2+NO3-CALC-WP	Water	Nitrate+Nitrite	CALCULATION
NO2-IC-N-WP	Water	Nitrite in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

NO3-IC-N-WP	Water	Nitrate in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

OG-GRAV-WP	Water	Oil & Grease - Gravimetric	EPA 1664 (modified)

Water samples are acidified and extracted with hexane; the hexane extract is collected in a pre-weighed vial. The solvent is evaporated and Total Oil & Grease is determined from the weight of the residue in the vial.

P-T-L-COL-WP	Water	Phosphorus, Total	APHA 4500 P PHOSPHORUS-L

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorous is determined colourimetrically after persulphate digestion of the sample.

PAH,PANH-WP	Water	Polyaromatic Hydrocarbons (PAHs)	EPA SW 846/8270-GC/MS

Water is spiked with a surrogate spike mix and extracted using solvent extraction techniques. Analysis is performed by GC/MS in the selected ion monitoring (SIM) mode.

PH-WP	Water	pH	APHA 4500H

The pH of a sample is the determination of the activity of the hydrogen ions by potentiometric measurement using a standard hydrogen electrode and a reference electrode.

PHENOLS-4AAP-WT	Water	Phenol (4AAP)	EPA 9066

An automated method is used to distill the sample. The distillate is then buffered to pH 9.4 which reacts with 4AAP and potassium ferricyanide to form a red complex which is measured colorimetrically.

SO4-IC-N-WP	Water	Sulfate in Water by IC	EPA 300.1 (mod)

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
SOLIDS-TOTSUS-WP	Water	Total Suspended Solids	APHA 2540 D (modified)
Total suspended solids in aquesous matrices is determined gravimetrically after drying the residue at 103 105°C.			
XYLENES-SUM-CALC-WP	Water	Sum of Xylene Isomer Concentrations	CALCULATED RESULT
Total xylenes represents the sum of o-xylene and m&p-xylene.			

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

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

Laboratory Definition Code	Laboratory Location
WP	ALS ENVIRONMENTAL - WINNIPEG, MANITOBA, CANADA
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA

Chain of Custody Numbers:

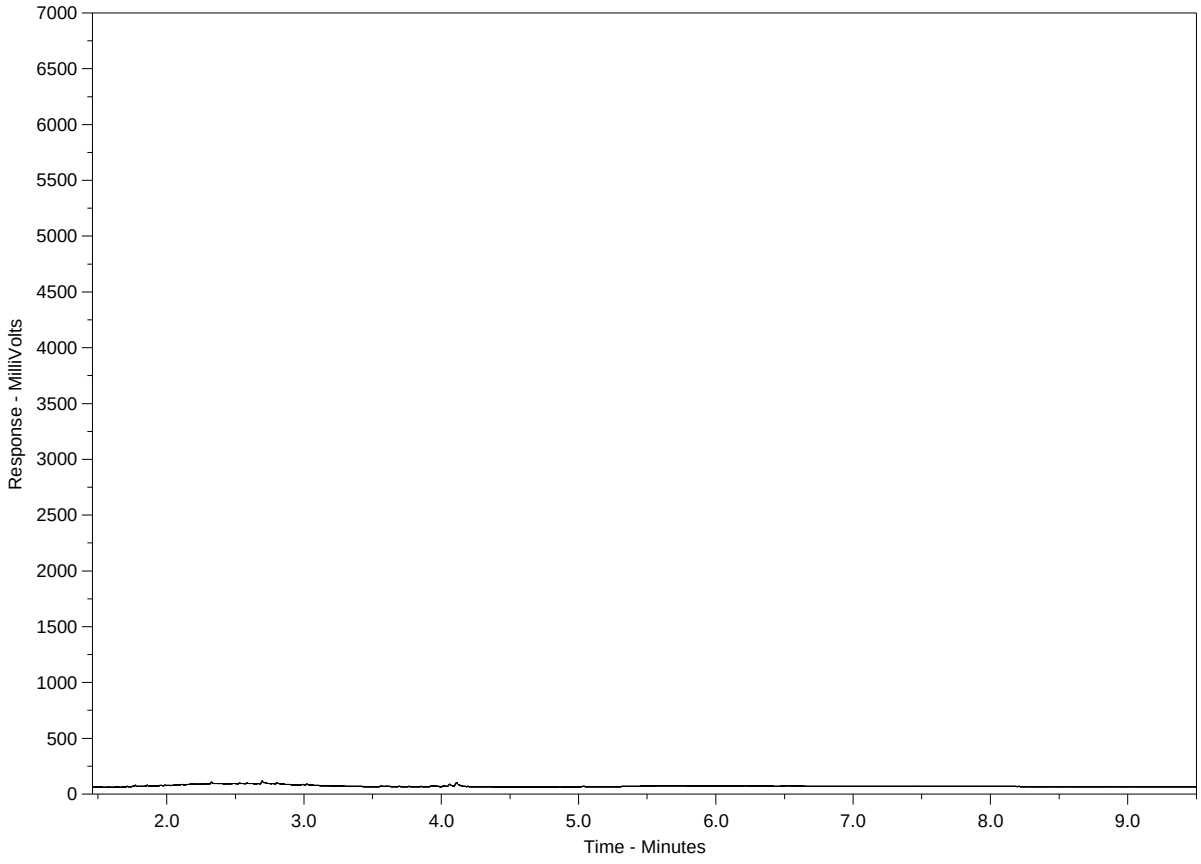
GLOSSARY OF REPORT TERMS

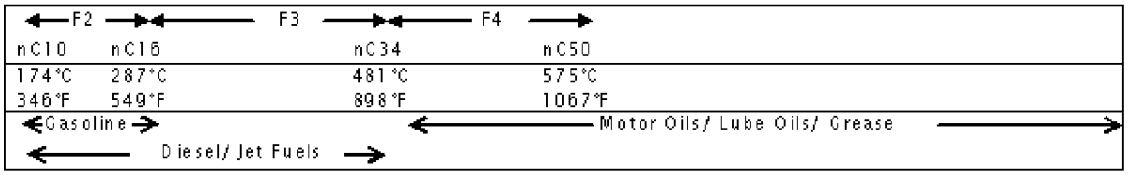
Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.
mg/kg - milligrams per kilogram based on dry weight of sample
mg/kg wwt - milligrams per kilogram based on wet weight of sample
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight
mg/L - unit of concentration based on volume, parts per million.
< - Less than.
D.L. - The reporting limit.
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L2121527-1
Client Sample ID: RAN-2





The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

Chain of Custody (COC) / Analytical Request Form

ALS Environmental
www.alsglobal.com

Canada Toll Free: 1 800 668 9878

L2121527-COFC

COC Number: 14 - 450494

Page 1 of 1

Report To		Report Format / Distribution		Select Turnaround Time (TAT) (Rush Turnaround Time (TAT) is not available for all tests)	
Company:	Hamlet of Rankin Inlet	Select Report Format:	PDF, EXCEL, EDD (DIGITAL)	R	Regular (Standard TAT if received by 3pm)
Contact:	Justin Merrith	Quality Control (QC) Report with Report	Yes / No	P	Priority (2-4 business days if received by 3pm)
Address:	PO Box 310 Rankin Inlet, NU X0C 0G0	Criteria on Report - provide details below if box checked		E	Emergency (1-2 business days if received by 3pm)
Phone:	867-645-2895	Select Distribution:	EMAIL, MAIL, FAX	E2	Same day or weekend emergency if received by 10am – contact ALS for surcharge.
		Email 1 or Fax	sao@rankininlet.ca	Specify Date Required for E2, E or P:	
		Email 2	Cfaulkner@gov.nu.ca		

Invoice To		Invoice Distribution	
	Same as Report To: Yes / No	Select Invoice Distribution:	EMAIL, MAIL, FAX
	Copy of Invoice with Report: Yes / No	Email 1 or Fax	
Company:		Email 2	
Contact:			

Project Information		Oil and Gas Required Fields (client use)	
ALS Quote #:	W10629	Approver ID:	Cost Center:
Job #:		GL Account:	Routing Code:
PO / AFE:		Activity Code:	
LSD:		Location:	
ALS Lab Work Order # (lab use only)		ALS Contact:	Sampler: OWen

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Routine	BOD	Total ME Metals	Total Nutrients	Phenols	Oil + Grease x2	Bacteria	Total Mercury	BTX, F1 x3	F2-F4 x2	PAH x2			Number of Containers
	RAN-2	27-Jun-18	9:30 AM	WW	✓	✓	P	P	P	P	P	P	P	P	P			16

Drinking Water (DW) Samples[1] (client use)	Special Instructions / Specify Criteria to add on report (client Use)
Are samples taken from a Regulated DW System? Yes / No	Nunavut-WW-GRP1-WP
Are samples for human drinking water use? Yes / No	BTX, F1-F4, PAH

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen		SIF Observations	Yes	No	
Ice packs	Yes / No	Custody seal intact	Yes	No	
Cooling Initiated					

INITIAL COOLER TEMPERATURES °C		FINAL COOLER TEMPERATURES °C		
				6.5

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date:	Time:	Received by:	Date:	Time:	Received by:	Date:	Time:
OWEN	27-Jun-18	9:45 AM					JUN 29 2018	1230

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form.**

Appendix C

Hamlet of Rankin Inlet
ATTN: JUSTIN MERRITT
PO Box 310
Rankin Inlet NU X0C 0G0

Date Received: 31-JUL-18
Report Date: 15-AUG-18 15:03 (MT)
Version: FINAL

Client Phone: 867-645-2895

Certificate of Analysis

Lab Work Order #: L2138768

Project P.O. #: NOT SUBMITTED
Job Reference:
C of C Numbers:
Legal Site Desc:

Hua Wo
Chemistry Laboratory Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2138768-1 RAN-2							
Sampled By: CONNER FAULKNER on 30-JUL-18 @ 13:15							
Matrix: WW							
BTEX plus F1-F4							
BTX plus F1 by GCMS							
Benzene	<0.00050		0.00050	mg/L		01-AUG-18	R4157486
Toluene	0.0057		0.0010	mg/L		01-AUG-18	R4157486
Ethyl benzene	0.00336		0.00050	mg/L		01-AUG-18	R4157486
o-Xylene	0.00397		0.00050	mg/L		01-AUG-18	R4157486
m+p-Xylenes	0.00996		0.00040	mg/L		01-AUG-18	R4157486
F1 (C6-C10)	<0.10		0.10	mg/L		01-AUG-18	R4157486
Surrogate: 4-Bromofluorobenzene (SS)	110.2		70-130	%		01-AUG-18	R4157486
CCME PHC F2-F4 in Water							
F2 (C10-C16)	0.78		0.10	mg/L	01-AUG-18	01-AUG-18	R4145716
F3 (C16-C34)	1.09		0.25	mg/L	01-AUG-18	01-AUG-18	R4145716
F4 (C34-C50)	<0.25		0.25	mg/L	01-AUG-18	01-AUG-18	R4145716
Surrogate: 2-Bromobenzotrifluoride	101.4		60-140	%	01-AUG-18	01-AUG-18	R4145716
CCME Total Hydrocarbons							
F1-BTEX	<0.10		0.10	mg/L		14-AUG-18	
F2-Naphth	0.78		0.10	mg/L		14-AUG-18	
F3-PAH	1.09		0.25	mg/L		14-AUG-18	
Total Hydrocarbons (C6-C50)	1.87		0.38	mg/L		14-AUG-18	
Sum of Xylene Isomer Concentrations							
Xylenes (Total)	0.0139		0.00064	mg/L		03-AUG-18	
Polyaromatic Hydrocarbons (PAHs)							
1-Methyl Naphthalene	0.000684	DLM	0.000040	mg/L	03-AUG-18	07-AUG-18	R4166934
2-Methyl Naphthalene	0.000640	DLM	0.000040	mg/L	03-AUG-18	07-AUG-18	R4166934
Acenaphthene	<0.000040	DLM	0.000040	mg/L	03-AUG-18	07-AUG-18	R4166934
Acenaphthylene	<0.000040	DLM	0.000040	mg/L	03-AUG-18	07-AUG-18	R4166934
Anthracene	<0.000020	DLM	0.000020	mg/L	03-AUG-18	07-AUG-18	R4166934
Acridine	<0.000040	DLM	0.000040	mg/L	03-AUG-18	07-AUG-18	R4166934
Benzo(a)anthracene	<0.000020	DLM	0.000020	mg/L	03-AUG-18	07-AUG-18	R4166934
Benzo(a)pyrene	<0.000015	DLM	0.000015	mg/L	03-AUG-18	07-AUG-18	R4166934
Benzo(b&j)fluoranthene	<0.000020	DLM	0.000020	mg/L	03-AUG-18	07-AUG-18	R4166934
Benzo(g,h,i)perylene	<0.000040	DLM	0.000040	mg/L	03-AUG-18	07-AUG-18	R4166934
Benzo(k)fluoranthene	<0.000020	DLM	0.000020	mg/L	03-AUG-18	07-AUG-18	R4166934
Chrysene	<0.000040	DLM	0.000040	mg/L	03-AUG-18	07-AUG-18	R4166934
Dibenzo(a,h)anthracene	<0.000015	DLM	0.000015	mg/L	03-AUG-18	07-AUG-18	R4166934
Fluoranthene	<0.000040	DLM	0.000040	mg/L	03-AUG-18	07-AUG-18	R4166934
Fluorene	0.000056	DLM	0.000040	mg/L	03-AUG-18	07-AUG-18	R4166934
Indeno(1,2,3-cd)pyrene	<0.000020	DLM	0.000020	mg/L	03-AUG-18	07-AUG-18	R4166934
Naphthalene	0.00114	DLM	0.00010	mg/L	03-AUG-18	07-AUG-18	R4166934
Phenanthrene	<0.00010	DLM	0.00010	mg/L	03-AUG-18	07-AUG-18	R4166934
Pyrene	0.000064	DLM	0.000020	mg/L	03-AUG-18	07-AUG-18	R4166934
Quinoline	0.000069	EMPC	0.000040	mg/L	03-AUG-18	07-AUG-18	R4166934
B(a)P Total Potency Equivalent	<0.000030		0.000030	mg/L	03-AUG-18	07-AUG-18	R4166934
Surrogate: Acenaphthene d10	80.7		40-130	%	03-AUG-18	07-AUG-18	R4166934
Surrogate: Acridine d9	89.9		40-130	%	03-AUG-18	07-AUG-18	R4166934
Surrogate: Chrysene d12	148.7	SOL:MI	40-130	%	03-AUG-18	07-AUG-18	R4166934
Surrogate: Naphthalene d8	79.8		40-130	%	03-AUG-18	07-AUG-18	R4166934
Surrogate: Phenanthrene d10	85.6		40-130	%	03-AUG-18	07-AUG-18	R4166934
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	1010		1.2	mg/L		02-AUG-18	
Alkalinity, Carbonate							

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2138768-1 RAN-2							
Sampled By: CONNER FAULKNER on 30-JUL-18 @ 13:15							
Matrix: WW							
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		02-AUG-18	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		02-AUG-18	
Alkalinity, Total (as CaCO3)							
Alkalinity, Total (as CaCO3)	828		1.0	mg/L		01-AUG-18	R4153108
Ammonia by colour							
Ammonia, Total (as N)	53.0		2.0	mg/L		02-AUG-18	R4157882
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	72		50	mg/L		01-AUG-18	R4160198
Carbonaceous BOD							
BOD Carbonaceous	60		50	mg/L		01-AUG-18	R4160198
Chloride in Water by IC							
Chloride (Cl)	340		10	mg/L		31-JUL-18	R4155673
Conductivity							
Conductivity	3220		1.0	umhos/cm		01-AUG-18	R4153108
Fecal coliforms, 1:10 dilution by QT97							
Fecal Coliforms	170		10	MPN/100mL		31-JUL-18	R4152341
Hardness Calculated							
Hardness (as CaCO3)	1010	HTC	0.20	mg/L		13-AUG-18	
Mercury Total							
Mercury (Hg)-Total	0.0000600		0.0000050	mg/L	31-JUL-18	01-AUG-18	R4152869
Nitrate in Water by IC							
Nitrate (as N)	<0.40	DLM	0.40	mg/L		31-JUL-18	R4155673
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.45		0.45	mg/L		03-AUG-18	
Nitrite in Water by IC							
Nitrite (as N)	<0.20	DLM	0.20	mg/L		31-JUL-18	R4155673
Oil & Grease - Gravimetric							
Oil and Grease	<5.0		5.0	mg/L		09-AUG-18	R4163021
Phenol (4AAP)							
Phenols (4AAP)	0.0333		0.0010	mg/L		01-AUG-18	R4153713
Phosphorus, Total							
Phosphorus (P)-Total	0.622		0.020	mg/L		07-AUG-18	R4160161
Sulfate in Water by IC							
Sulfate (SO4)	688		6.0	mg/L		31-JUL-18	R4155673
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.0981		0.0030	mg/L	09-AUG-18	09-AUG-18	R4162579
Arsenic (As)-Total	0.0107		0.00010	mg/L	09-AUG-18	09-AUG-18	R4162579
Cadmium (Cd)-Total	0.000670		0.0000050	mg/L	09-AUG-18	09-AUG-18	R4162579
Calcium (Ca)-Total	297		0.050	mg/L	09-AUG-18	09-AUG-18	R4162579
Chromium (Cr)-Total	0.00718		0.00010	mg/L	09-AUG-18	09-AUG-18	R4162579
Cobalt (Co)-Total	0.0145		0.00010	mg/L	09-AUG-18	09-AUG-18	R4162579
Copper (Cu)-Total	0.121		0.00050	mg/L	09-AUG-18	09-AUG-18	R4162579
Iron (Fe)-Total	11.0		0.010	mg/L	09-AUG-18	09-AUG-18	R4162579
Lead (Pb)-Total	0.00893		0.000050	mg/L	09-AUG-18	09-AUG-18	R4162579
Magnesium (Mg)-Total	64.3		0.0050	mg/L	09-AUG-18	09-AUG-18	R4162579
Manganese (Mn)-Total	2.92		0.010	mg/L	09-AUG-18	10-AUG-18	R4165986
Nickel (Ni)-Total	0.0440		0.00050	mg/L	09-AUG-18	09-AUG-18	R4162579
Potassium (K)-Total	87.4		0.050	mg/L	09-AUG-18	09-AUG-18	R4162579
Sodium (Na)-Total	308		0.050	mg/L	09-AUG-18	09-AUG-18	R4162579
Zinc (Zn)-Total	0.392		0.0030	mg/L	09-AUG-18	09-AUG-18	R4162579
Total Organic Carbon by Combustion							

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2138768-1 RAN-2							
Sampled By: CONNER FAULKNER on 30-JUL-18 @ 13:15							
Matrix: WW							
Total Organic Carbon by Combustion							
Total Organic Carbon	108		5.0	mg/L		13-AUG-18	R4169902
Total Suspended Solids							
Total Suspended Solids	80		10	mg/L		03-AUG-18	R4160642
pH							
pH	7.82		0.10	pH units		01-AUG-18	R4153108

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

Reference Information

Sample Parameter Qualifier Key:

Qualifier	Description
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).
EMPC	Estimated Maximum Possible Concentration. Parameter detected but didn't meet all criteria for positive identification.
HTC	Hardness was calculated from Total Ca and/or Mg concentrations and may be biased high (dissolved Ca/Mg results unavailable).
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
SOL:MI	Surrogate recovery outside acceptable limits due to matrix interference

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-CO3CO3-CALC-WP	Water	Alkalinity, Carbonate	CALCULATION

The Alkalinity of water is a measure of its acid neutralizing capacity.Alkalinity is imparted by bicarbonate, carbonate and hydroxide components of water. The fraction of alkalinity contributed by carbonate is calculated and reported as mg CO3 2-/L.

ALK-HCO3HCO3-CALC-WP	Water	Alkalinity, Bicarbonate	CALCULATION

The Alkalinity of water is a measure of its acid neutralizing capacity.Alkalinity is imparted by bicarbonate, carbonate and hydroxide components of water. The fraction of alkalinity contributed by bicarbonate is calculated and reported as mg HCO3-/L

ALK-OHOH-CALC-WP	Water	Alkalinity, Hydroxide	CALCULATION

The Alkalinity of water is a measure of its acid neutralizing capacity.Alkalinity is imparted by bicarbonate, carbonate and hydroxide components of water. The fraction of alkalinity contributed by hydroxide is calculated and reported as mg OH-/L.

ALK-TITR-WP	Water	Alkalinity, Total (as CaCO3)	APHA 2320B

The Alkalinity of water is a measure of its acid neutralizing capacity. Alkalinity is imparted by bicarbonate, carbonate and hydroxide components of water. Total alkalinity is determined by titration with a strong standard mineral acid to the successive HCO3- and H2CO3 endpoints indicated electrometrically.

BOD-CBOD-WP	Water	Carbonaceous BOD	APHA 5210 B

Samples are diluted and seeded, have TCMP added to inhibit nitrogenous demands, and then are incubated in airtight bottles at 20°C for 5 days. Dissolved oxygen is measured initially and after incubation, and results are computed from the difference between initial and final DO.

BOD-WP	Water	Biochemical Oxygen Demand (BOD)	APHA 5210 B

Samples are diluted and seeded and then incubated in airtight bottles at 20°C for 5 days. Dissolved oxygen is measured initially and after incubation, and results are computed from the difference between initial and final DO.

BTEXS+F1-HSMS-WP	Water	BTX plus F1 by GCMS	EPA 8260C / EPA 5021A

The water sample, with added reagents, is heated in a sealed vial to equilibrium. The headspace from the vial is transfered into a gas chromatograph. Target compound concentrations are measured using mass spectrometry detection.

C-TOC-HTC-WP	Water	Total Organic Carbon by Combustion	APHA 5310 B-WP

Sample is acidified and purged to remove inorganic carbon, then injected into a heated reaction chamber where organic carbon is oxidized to CO2 which is then transported in the carrier gas stream and measured via a non-dispersive infrared analyzer.

CL-IC-N-WP	Water	Chloride in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

EC-WP	Water	Conductivity	APHA 2510B

Conductivity of an aqueous solution refers to its ability to carry an electric current. Conductance of a solution is measured between two spatially fixed and chemically inert electrodes.

F1-F4-CALC-WP	Water	CCME Total Hydrocarbons	CCME CWS-PHC, Pub #1310, Dec 2001-L

Analytical methods used for analysis of CCME Petroleum Hydrocarbons have been validated and comply with the Reference Method for the CWS PHC.

In cases where results for both F4 and F4G are reported, the greater of the two results must be used in any application of the CWS PHC guidelines and the gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.
In samples where BTEX and F1 were analyzed , F1-BTEX represents a value where the sum of Benzene, Toluene, Ethylbenzene and total Xylenes has been subtracted from F1.

In samples where PAHs, F2 and F3 were analyzed, F2-Naphth represents the result where Naphthalene has been subtracted from F2. F3-PAH represents a result where the sum of Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Phenanthrene, and Pyrene has been subtracted from F3.

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**

Unless otherwise qualified, the following quality control criteria have been met for the F1 hydrocarbon range:
1. All extraction and analysis holding times were met.
2. Instrument performance showing response factors for C6 and C10 within 30% of the response factor for toluene.
3. Linearity of gasoline response within 15% throughout the calibration range.

Unless otherwise qualified, the following quality control criteria have been met for the F2-F4 hydrocarbon ranges:
1. All extraction and analysis holding times were met.
2. Instrument performance showing C10, C16 and C34 response factors within 10% of their average.
3. Instrument performance showing the C50 response factor within 30% of the average of the C10, C16 and C34 response factors.
4. Linearity of diesel or motor oil response within 15% throughout the calibration range.

F2-F4-FID-WP	Water	CCME PHC F2-F4 in Water	EPA 3511

Petroleum hydrocarbons in water are determined by liquid-liquid micro-scale solvent extraction using a reciprocal shaker extraction apparatus prior to capillary column gas chromatography with flame ionization detection (GC-FID) analysis.

FC10-QT97-WP	Water	Fecal coliforms, 1:10 dilution by QT97	APHA 9223B QT97

Analysis is carried out using procedures adapted from APHA 9223 "Enzyme Substrate Coliform Test". Fecal (thermotolerant) coliform bacteria are determined by mixing a 1:10 dilution of sample with a product containing hydrolyzable substrates and sealing in a 97-well packet. The packet is incubated at 44.5 – 0.2°C for 18 hours and then the number of wells exhibiting positive responses are counted. The final results are obtained by comparing the number of positive responses to a probability table.

HARDNESS-CALC-WP	Water	Hardness Calculated	APHA 2340B

Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.

HG-T-CVAA-WP	Water	Mercury Total	EPA 1631E (mod)

Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.

MET-T-CCMS-WP	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod.)

Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

NH3-COL-WP	Water	Ammonia by colour	APHA 4500 NH3 F

Ammonia in water samples forms indophenol when reacted with hypochlorite and phenol. The intensity is amplified by the addition of sodium nitroprusside and measured colourmetrically.

NO2+NO3-CALC-WP	Water	Nitrate+Nitrite	CALCULATION
NO2-IC-N-WP	Water	Nitrite in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

NO3-IC-N-WP	Water	Nitrate in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

OG-GRAV-WP	Water	Oil & Grease - Gravimetric	EPA 1664 (modified)

Water samples are acidified and extracted with hexane; the hexane extract is collected in a pre-weighed vial. The solvent is evaporated and Total Oil & Grease is determined from the weight of the residue in the vial.

P-T-L-COL-WP	Water	Phosphorus, Total	APHA 4500 P PHOSPHORUS-L

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorous is determined colourimetrically after persulphate digestion of the sample.

PAH,PANH-WP	Water	Polyaromatic Hydrocarbons (PAHs)	EPA SW 846/8270-GC/MS

Water is spiked with a surrogate spike mix and extracted using solvent extraction techniques. Analysis is performed by GC/MS in the selected ion monitoring (SIM) mode.

PH-WP	Water	pH	APHA 4500H

The pH of a sample is the determination of the activity of the hydrogen ions by potentiometric measurement using a standard hydrogen electrode and a reference electrode.

PHENOLS-4AAP-WT	Water	Phenol (4AAP)	EPA 9066

An automated method is used to distill the sample. The distillate is then buffered to pH 9.4 which reacts with 4AAP and potassium ferricyanide to form a red complex which is measured colorimetrically.

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
SO4-IC-N-WP	Water	Sulfate in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
SOLIDS-TOTSUS-WP	Water	Total Suspended Solids	APHA 2540 D (modified)
Total suspended solids in aquesous matrices is determined gravimetrically after drying the residue at 103 105°C.			
XYLENES-SUM-CALC-WP	Water	Sum of Xylene Isomer Concentrations	CALCULATED RESULT
Total xylenes represents the sum of o-xylene and m&p-xylene.			

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

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

Laboratory Definition Code	Laboratory Location
WP	ALS ENVIRONMENTAL - WINNIPEG, MANITOBA, CANADA
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA

Chain of Custody Numbers:

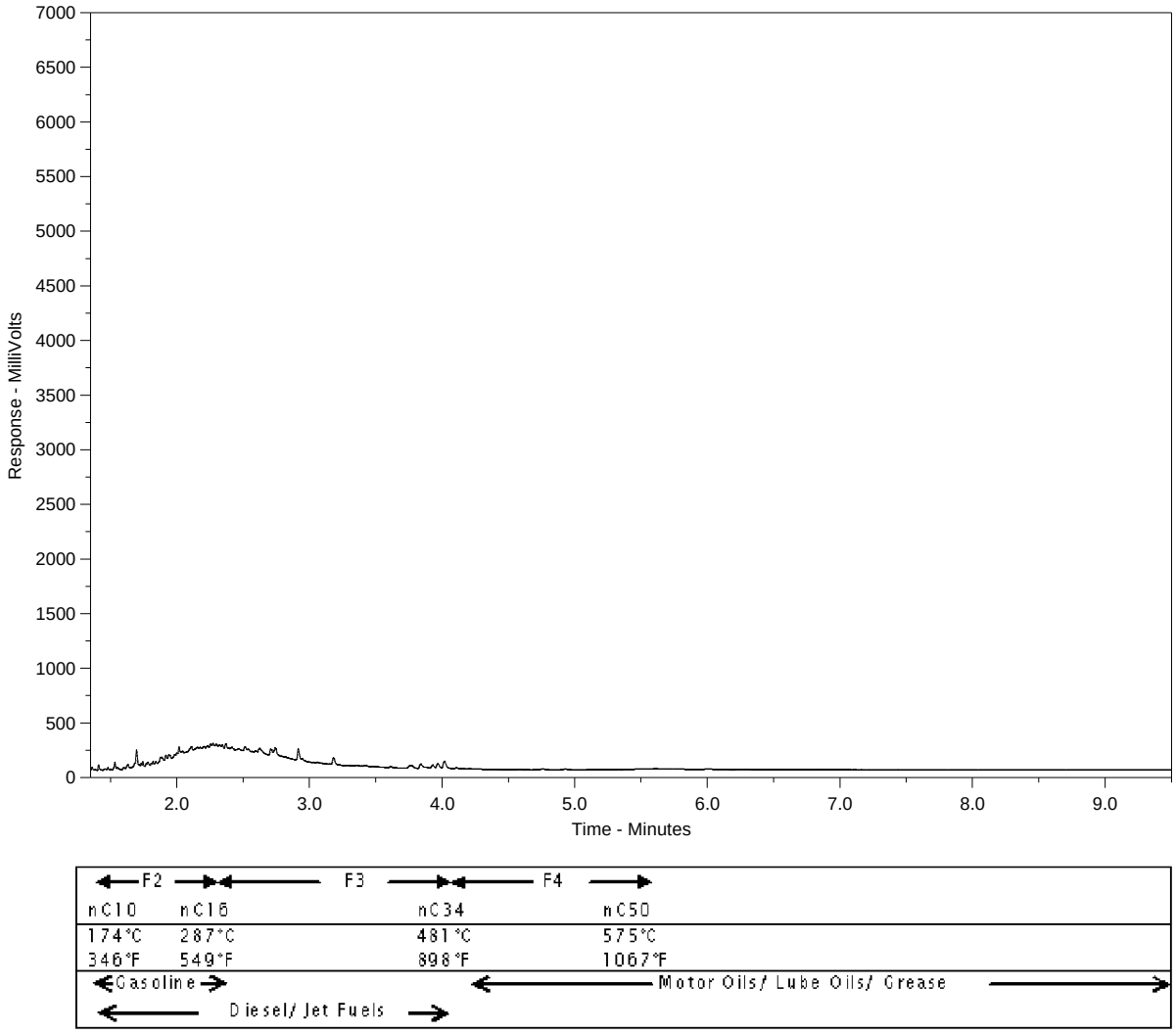
GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.
mg/kg - milligrams per kilogram based on dry weight of sample
mg/kg wwt - milligrams per kilogram based on wet weight of sample
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight
mg/L - unit of concentration based on volume, parts per million.
< - Less than.
D.L. - The reporting limit.
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L2138768-1
Client Sample ID: RAN-2



The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

ALS Environmental
www.alsglobal.com

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

L2138768-COFC

COC Number: 14 - 504283

Page 1 of 1

Report To		Report Format / Distribution	Select Service Level Below (Rush Turnaround Time (TAT) is not available for all tests)
Company:	Hamlet of Rankin Inlet	Select Report Format: ☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)	R ☑ Regular (Standard TAT if received by 3pm)
Contact:	Justin Meraitt	Quality Control (QC) Report with Report ☐ Yes ☐ No	P ☐ Priority (2-4 business days if received by 3pm)
Address:	PO Box 310 Rankin Inlet, NU X0C 0G0	☐ Criteria on Report - provide details below if box checked	E ☐ Emergency (1-2 business days if received by 3pm)
		Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX	E2 ☐ Same day or weekend emergency if received by 10am – contact ALS for surcharge.
Phone:	867-645-2895	Email 1 or Fax: cfaulkner@gov.nu.ca	Specify Date Required for E2, E or P:
		Email 2: sao@rankininlet.ca	

Invoice To		Invoice Distribution	Analysis Request
	Same as Report To ☑ Yes ☐ No	Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX	Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below
	Copy of Invoice with Report ☑ Yes ☐ No		
Company:		Email 1 or Fax: cfaulkner@gov.nu.ca	
Contact:		Email 2: sao@rankininlet.ca	

Project Information		Oil and Gas Required Fields (client use)	
ALS Quote #:	W10629	Approver ID:	Cost Center:
Job #:		GL Account:	Routing Code:
PO / AFE:		Activity Code:	
LSD:		Location:	
ALS Lab Work Order # (lab use only)		ALS Contact:	Sampler: Connor Faulkner

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	BOD	Routine	Total metals	Total Nutrients	Phenols	0:1 + grab x2	Bacteria	Mercury	BTEX-F1 x3	F2-F4 x2	PAH x2	Number of Containers
	RAN-2	30-Jul-18	1:15pm	WW	✓	✓	P	P	P	P	P	P	P	P	P	16

Drinking Water (DW) Samples[1] (client use)	Special Instructions / Specify Criteria to add on report (client Use)	SAMPLE CONDITION AS RECEIVED (lab use only)
Are samples taken from a Regulated DW System? ☐ Yes ☑ No	Nunavut – WW – GRP1 – WP	Frozen ☐ SIF Observations Yes ☐ No ☐
Are samples for human drinking water use? ☐ Yes ☑ No	BTEX – F1, F2-F4, PAH.	Ice packs Yes ☐ No ☐ Custody seal intact Yes ☐ No ☐
		Cooling Initiated ☐
		INITIAL COOLER TEMPERATURES °C / FINAL COOLER TEMPERATURES °C

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date:	Time:	Received by:	Date:	Time:	Received by:	Date:	Time:
	July 30/18	2:00 PM		July 31/18	10:15			

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

NA-FM-0326a v09 Front/04 January 2014

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form**.

ALS Environmental
www.alsglobal.com

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

L2138768-COFC

COC Number: 14 - 504283

Page 1 of 1

Report To		Report Format / Distribution		Select Service Level Below (Rush Turnaround Time (TAT) is not available for all tests)
Company:	Hamlet of Rankin Inlet	Select Report Format:	☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)	R ☑ Regular (Standard TAT if received by 3pm)
Contact:	Justin Merritt	Quality Control (QC) Report with Report	☐ Yes ☐ No	P ☐ Priority (2-4 business days if received by 3pm)
Address:	PO Box 310 Rankin Inlet, NU X0C 0G0	☐ Criteria on Report - provide details below if box checked		E ☐ Emergency (1-2 business days if received by 3pm)
		Select Distribution:	☑ EMAIL ☐ MAIL ☐ FAX	E2 ☐ Same day or weekend emergency if received by 10am – contact ALS for surcharge.
Phone:	867-645-2895	Email 1 or Fax	Cfaulkner@gov.nu.ca	Specify Date Required for E2, E or P:
		Email 2	sao@rankininlet.ca	

Invoice To			Invoice Distribution	
	Same as Report To	☑ Yes ☐ No	Select Invoice Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
	Copy of Invoice with Report	☑ Yes ☐ No	Email 1 or Fax	Cfaulkner@gov.nu.ca
Company:			Email 2	sao@rankininlet.ca
Contact:				

Project Information		Oil and Gas Required Fields (client use)	
ALS Quote #:	W10629	Approver ID:	Cost Center:
Job #:		GL Account:	Routing Code:
PO / AFE:		Activity Code:	
LSD:		Location:	
ALS Lab Work Order # (lab use only)		ALS Contact:	Sampler: Conna Faulkner

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	BOD	Routine	Total metals	Total Nutrients	Phenols	Oil + grease x2	Bacteria	Mercury	BTEX-F1 x3	F2-F4 x2	PAH x2			Number of Containers
	RAN-2	30-Jul-18	1:15pm	WW	✓	✓	P	P	P	P	P	P	P	P	P			16

Drinking Water (DW) Samples[1] (client use)	Special Instructions / Specify Criteria to add on report (client Use)
Are samples taken from a Regulated DW System? ☐ Yes ☑ No	Nunavut - WW - GRP1 - WP
Are samples for human drinking water use? ☐ Yes ☑ No	BTEX - F1, F2-F4, PAH.

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen	☐		SIF Observations	Yes ☐	No ☐	
Ice packs	Yes ☐	No ☐	Custody seal intact	Yes ☐	No ☐	
Cooling Initiated	☐					

INITIAL COOLER TEMPERATURES °C		FINAL COOLER TEMPERATURES °C		

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date:	Time:	Received by:	Date:	Time:	Received by:	Date:	Time:
	July 30/18	2:00 pm		July 31/18	1215			

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

NA-FM-0326a v08 Front/04 January 2014

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form**.

Appendix D

Hamlet of Rankin Inlet
ATTN: JUSTIN MERRITT
PO Box 310
Rankin Inlet NU X0C 0G0

Date Received: 16-AUG-18
Report Date: 30-AUG-18 09:32 (MT)
Version: FINAL

Client Phone: 867-645-2895

Certificate of Analysis

Lab Work Order #: L2148143

Project P.O. #: NOT SUBMITTED
Job Reference:
C of C Numbers:
Legal Site Desc:

Hua Wo
Chemistry Laboratory Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2148143-1 RAN-2							
Sampled By: CONNOR FAULKNER on 15-AUG-18 @ 10:00							
Matrix: WW							
BTEX plus F1-F4							
BTX plus F1 by GCMS							
Benzene	<0.00050		0.00050	mg/L		17-AUG-18	R4175144
Toluene	<0.0010		0.0010	mg/L		17-AUG-18	R4175144
Ethyl benzene	<0.00050		0.00050	mg/L		17-AUG-18	R4175144
o-Xylene	<0.00050		0.00050	mg/L		17-AUG-18	R4175144
m+p-Xylenes	<0.00040		0.00040	mg/L		17-AUG-18	R4175144
F1 (C6-C10)	<0.10		0.10	mg/L		17-AUG-18	R4175144
Surrogate: 4-Bromofluorobenzene (SS)	92.9		70-130	%		17-AUG-18	R4175144
CCME PHC F2-F4 in Water							
F2 (C10-C16)	0.79		0.10	mg/L	20-AUG-18	23-AUG-18	R4181389
F3 (C16-C34)	0.98		0.25	mg/L	20-AUG-18	23-AUG-18	R4181389
F4 (C34-C50)	<0.25		0.25	mg/L	20-AUG-18	23-AUG-18	R4181389
Surrogate: 2-Bromobenzotrifluoride	76.6		60-140	%	20-AUG-18	23-AUG-18	R4181389
CCME Total Hydrocarbons							
F1-BTEX	<0.10		0.10	mg/L		30-AUG-18	
F2-Naphth	0.79		0.10	mg/L		30-AUG-18	
F3-PAH	0.98		0.25	mg/L		30-AUG-18	
Total Hydrocarbons (C6-C50)	1.76		0.38	mg/L		30-AUG-18	
Sum of Xylene Isomer Concentrations							
Xylenes (Total)	<0.00064		0.00064	mg/L		20-AUG-18	
Polyaromatic Hydrocarbons (PAHs)							
1-Methyl Naphthalene	0.000329	DLM	0.000040	mg/L	23-AUG-18	27-AUG-18	R4194126
2-Methyl Naphthalene	0.000128	DLM	0.000040	mg/L	23-AUG-18	27-AUG-18	R4194126
Acenaphthene	<0.000040	DLM	0.000040	mg/L	23-AUG-18	27-AUG-18	R4194126
Acenaphthylene	<0.000040	DLM	0.000040	mg/L	23-AUG-18	27-AUG-18	R4194126
Anthracene	<0.000020	DLM	0.000020	mg/L	23-AUG-18	27-AUG-18	R4194126
Acridine	<0.000040	DLM	0.000040	mg/L	23-AUG-18	27-AUG-18	R4194126
Benzo(a)anthracene	<0.000020	DLM	0.000020	mg/L	23-AUG-18	27-AUG-18	R4194126
Benzo(a)pyrene	<0.000010	DLM	0.000010	mg/L	23-AUG-18	27-AUG-18	R4194126
Benzo(b&j)fluoranthene	<0.000020	DLM	0.000020	mg/L	23-AUG-18	27-AUG-18	R4194126
Benzo(g,h,i)perylene	<0.000040	DLM	0.000040	mg/L	23-AUG-18	27-AUG-18	R4194126
Benzo(k)fluoranthene	<0.000020	DLM	0.000020	mg/L	23-AUG-18	27-AUG-18	R4194126
Chrysene	<0.000040	DLM	0.000040	mg/L	23-AUG-18	27-AUG-18	R4194126
Dibenzo(a,h)anthracene	<0.000010	DLM	0.000010	mg/L	23-AUG-18	27-AUG-18	R4194126
Fluoranthene	<0.000040	DLM	0.000040	mg/L	23-AUG-18	27-AUG-18	R4194126
Fluorene	0.000053	DLM	0.000040	mg/L	23-AUG-18	27-AUG-18	R4194126
Indeno(1,2,3-cd)pyrene	<0.000020	DLM	0.000020	mg/L	23-AUG-18	27-AUG-18	R4194126
Naphthalene	0.00012	DLM	0.00010	mg/L	23-AUG-18	27-AUG-18	R4194126
Phenanthrene	<0.00010	DLM	0.00010	mg/L	23-AUG-18	27-AUG-18	R4194126
Pyrene	0.000029	EMPC	0.000020	mg/L	23-AUG-18	27-AUG-18	R4194126
Quinoline	<0.000040	DLM	0.000040	mg/L	23-AUG-18	27-AUG-18	R4194126
B(a)P Total Potency Equivalent	<0.000030		0.000030	mg/L	23-AUG-18	27-AUG-18	R4194126
Surrogate: Acenaphthene d10	115.8		40-130	%	23-AUG-18	27-AUG-18	R4194126
Surrogate: Acridine d9	117.3		40-130	%	23-AUG-18	27-AUG-18	R4194126
Surrogate: Chrysene d12	112.5		40-130	%	23-AUG-18	27-AUG-18	R4194126
Surrogate: Naphthalene d8	109.4		40-130	%	23-AUG-18	27-AUG-18	R4194126
Surrogate: Phenanthrene d10	113.7		40-130	%	23-AUG-18	27-AUG-18	R4194126
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	845		1.2	mg/L		20-AUG-18	
Alkalinity, Carbonate							

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2148143-1 RAN-2							
Sampled By: CONNOR FAULKNER on 15-AUG-18 @ 10:00							
Matrix: WW							
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		20-AUG-18	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		20-AUG-18	
Alkalinity, Total (as CaCO3)							
Alkalinity, Total (as CaCO3)	692		1.0	mg/L		17-AUG-18	R4176707
Ammonia by colour							
Ammonia, Total (as N)	26.1		1.0	mg/L		21-AUG-18	R4180235
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	18.9		6.0	mg/L		17-AUG-18	R4181361
Carbonaceous BOD							
BOD Carbonaceous	15.0		6.0	mg/L		17-AUG-18	R4181361
Chloride in Water by IC							
Chloride (Cl)	244		10	mg/L		17-AUG-18	R4178564
Conductivity							
Conductivity	2680		1.0	umhos/cm		17-AUG-18	R4176707
Fecal coliforms, 1:10 dilution by QT97							
Fecal Coliforms	200		10	MPN/100mL		16-AUG-18	R4175010
Hardness Calculated							
Hardness (as CaCO3)	773	HTC	0.20	mg/L		29-AUG-18	
Mercury Total							
Mercury (Hg)-Total	0.0000330		0.0000050	mg/L	21-AUG-18	22-AUG-18	R4181094
Nitrate in Water by IC							
Nitrate (as N)	<0.40	DLM	0.40	mg/L		17-AUG-18	R4178564
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.45		0.45	mg/L		21-AUG-18	
Nitrite in Water by IC							
Nitrite (as N)	<0.20	DLM	0.20	mg/L		17-AUG-18	R4178564
Oil & Grease - Gravimetric							
Oil and Grease	<5.0		5.0	mg/L		24-AUG-18	R4182611
Phenol (4AAP)							
Phenols (4AAP)	0.0082		0.0010	mg/L		21-AUG-18	R4180242
Phosphorus, Total							
Phosphorus (P)-Total	0.567		0.0010	mg/L		23-AUG-18	R4182218
Sulfate in Water by IC							
Sulfate (SO4)	466		6.0	mg/L		17-AUG-18	R4178564
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.0703		0.0030	mg/L	27-AUG-18	27-AUG-18	R4186849
Arsenic (As)-Total	0.0113		0.00010	mg/L	27-AUG-18	27-AUG-18	R4186849
Cadmium (Cd)-Total	0.000387		0.0000050	mg/L	27-AUG-18	27-AUG-18	R4186849
Calcium (Ca)-Total	226		0.050	mg/L	27-AUG-18	27-AUG-18	R4186849
Chromium (Cr)-Total	0.00433		0.00010	mg/L	27-AUG-18	27-AUG-18	R4186849
Cobalt (Co)-Total	0.0130		0.00010	mg/L	27-AUG-18	27-AUG-18	R4186849
Copper (Cu)-Total	0.0810		0.00050	mg/L	27-AUG-18	27-AUG-18	R4186849
Iron (Fe)-Total	8.03		0.010	mg/L	27-AUG-18	27-AUG-18	R4186849
Lead (Pb)-Total	0.00430		0.000050	mg/L	27-AUG-18	27-AUG-18	R4186849
Magnesium (Mg)-Total	50.7		0.0050	mg/L	27-AUG-18	27-AUG-18	R4186849
Manganese (Mn)-Total	1.63		0.010	mg/L	27-AUG-18	28-AUG-18	R4190190
Nickel (Ni)-Total	0.0385		0.00050	mg/L	27-AUG-18	27-AUG-18	R4186849
Potassium (K)-Total	64.6		0.050	mg/L	27-AUG-18	27-AUG-18	R4186849
Sodium (Na)-Total	249		0.050	mg/L	27-AUG-18	27-AUG-18	R4186849
Zinc (Zn)-Total	0.0939		0.0030	mg/L	27-AUG-18	27-AUG-18	R4186849
Total Organic Carbon by Combustion							

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2148143-1 RAN-2							
Sampled By: CONNOR FAULKNER on 15-AUG-18 @ 10:00							
Matrix: WW							
Total Organic Carbon by Combustion							
Total Organic Carbon	77.9		5.0	mg/L		22-AUG-18	R4182422
Total Suspended Solids							
Total Suspended Solids	29.7		2.0	mg/L		22-AUG-18	R4181311
pH							
pH	7.97		0.10	pH units		17-AUG-18	R4176707

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

Reference Information

Sample Parameter Qualifier Key:

Qualifier	Description
B	Method Blank exceeds ALS DQO. Associated sample results which are < Limit of Reporting or > 5 times blank level are considered reliable.
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).
EMPC	Estimated Maximum Possible Concentration. Parameter detected but didn't meet all criteria for positive identification.
HTC	Hardness was calculated from Total Ca and/or Mg concentrations and may be biased high (dissolved Ca/Mg results unavailable).
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-CO3CO3-CALC-WP	Water	Alkalinity, Carbonate	CALCULATION

The Alkalinity of water is a measure of its acid neutralizing capacity.Alkalinity is imparted by bicarbonate, carbonate and hydroxide components of water. The fraction of alkalinity contributed by carbonate is calculated and reported as mg CO3 2-/L.

ALK-HCO3HCO3-CALC-WP	Water	Alkalinity, Bicarbonate	CALCULATION

The Alkalinity of water is a measure of its acid neutralizing capacity.Alkalinity is imparted by bicarbonate, carbonate and hydroxide components of water. The fraction of alkalinity contributed by bicarbonate is calculated and reported as mg HCO3-/L

ALK-OHOH-CALC-WP	Water	Alkalinity, Hydroxide	CALCULATION

The Alkalinity of water is a measure of its acid neutralizing capacity.Alkalinity is imparted by bicarbonate, carbonate and hydroxide components of water. The fraction of alkalinity contributed by hydroxide is calculated and reported as mg OH-/L.

ALK-TITR-WP	Water	Alkalinity, Total (as CaCO3)	APHA 2320B

The Alkalinity of water is a measure of its acid neutralizing capacity. Alkalinity is imparted by bicarbonate, carbonate and hydroxide components of water. Total alkalinity is determined by titration with a strong standard mineral acid to the successive HCO3- and H2CO3 endpoints indicated electrometrically.

BOD-CBOD-WP	Water	Carbonaceous BOD	APHA 5210 B

Samples are diluted and seeded, have TCMP added to inhibit nitrogenous demands, and then are incubated in airtight bottles at 20°C for 5 days. Dissolved oxygen is measured initially and after incubation, and results are computed from the difference between initial and final DO.

BOD-WP	Water	Biochemical Oxygen Demand (BOD)	APHA 5210 B

Samples are diluted and seeded and then incubated in airtight bottles at 20°C for 5 days. Dissolved oxygen is measured initially and after incubation, and results are computed from the difference between initial and final DO.

BTEXS+F1-HSMS-WP	Water	BTX plus F1 by GCMS	EPA 8260C / EPA 5021A

The water sample, with added reagents, is heated in a sealed vial to equilibrium. The headspace from the vial is transfered into a gas chromatograph. Target compound concentrations are measured using mass spectrometry detection.

C-TOC-HTC-WP	Water	Total Organic Carbon by Combustion	APHA 5310 B-WP

Sample is acidified and purged to remove inorganic carbon, then injected into a heated reaction chamber where organic carbon is oxidized to CO2 which is then transported in the carrier gas stream and measured via a non-dispersive infrared analyzer.

CL-IC-N-WP	Water	Chloride in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

EC-WP	Water	Conductivity	APHA 2510B

Conductivity of an aqueous solution refers to its ability to carry an electric current. Conductance of a solution is measured between two spatially fixed and chemically inert electrodes.

F1-F4-CALC-WP	Water	CCME Total Hydrocarbons	CCME CWS-PHC, Pub #1310, Dec 2001-L

Analytical methods used for analysis of CCME Petroleum Hydrocarbons have been validated and comply with the Reference Method for the CWS PHC.

In cases where results for both F4 and F4G are reported, the greater of the two results must be used in any application of the CWS PHC guidelines and the gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.
In samples where BTEX and F1 were analyzed , F1-BTEX represents a value where the sum of Benzene, Toluene, Ethylbenzene and total Xylenes has been subtracted from F1.

In samples where PAHs, F2 and F3 were analyzed, F2-Naphth represents the result where Naphthalene has been subtracted from F2. F3-PAH represents a result where the sum of Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene,

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**

Fluoranthene, Indeno(1,2,3-cd)pyrene, Phenanthrene, and Pyrene has been subtracted from F3.

Unless otherwise qualified, the following quality control criteria have been met for the F1 hydrocarbon range:
1. All extraction and analysis holding times were met.
2. Instrument performance showing response factors for C6 and C10 within 30% of the response factor for toluene.
3. Linearity of gasoline response within 15% throughout the calibration range.

Unless otherwise qualified, the following quality control criteria have been met for the F2-F4 hydrocarbon ranges:
1. All extraction and analysis holding times were met.
2. Instrument performance showing C10, C16 and C34 response factors within 10% of their average.
3. Instrument performance showing the C50 response factor within 30% of the average of the C10, C16 and C34 response factors.
4. Linearity of diesel or motor oil response within 15% throughout the calibration range.

F2-F4-FID-WP	Water	CCME PHC F2-F4 in Water	EPA 3511

Petroleum hydrocarbons in water are determined by liquid-liquid micro-scale solvent extraction using a reciprocal shaker extraction apparatus prior to capillary column gas chromatography with flame ionization detection (GC-FID) analysis.

FC10-QT97-WP	Water	Fecal coliforms, 1:10 dilution by QT97	APHA 9223B QT97

Analysis is carried out using procedures adapted from APHA 9223 "Enzyme Substrate Coliform Test". Fecal (thermotolerant) coliform bacteria are determined by mixing a 1:10 dilution of sample with a product containing hydrolyzable substrates and sealing in a 97-well packet. The packet is incubated at 44.5 – 0.2°C for 18 hours and then the number of wells exhibiting positive responses are counted. The final results are obtained by comparing the number of positive responses to a probability table.

HARDNESS-CALC-WP	Water	Hardness Calculated	APHA 2340B

Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.

HG-T-CVAA-WP	Water	Mercury Total	EPA 1631E (mod)

Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.

MET-T-CCMS-WP	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod.)

Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

NH3-COL-WP	Water	Ammonia by colour	APHA 4500 NH3 F

Ammonia in water samples forms indophenol when reacted with hypochlorite and phenol. The intensity is amplified by the addition of sodium nitroprusside and measured colourmetrically.

NO2+NO3-CALC-WP	Water	Nitrate+Nitrite	CALCULATION
NO2-IC-N-WP	Water	Nitrite in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

NO3-IC-N-WP	Water	Nitrate in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

OG-GRAV-WP	Water	Oil & Grease - Gravimetric	EPA 1664 (modified)

Water samples are acidified and extracted with hexane; the hexane extract is collected in a pre-weighed vial. The solvent is evaporated and Total Oil & Grease is determined from the weight of the residue in the vial.

P-T-L-COL-WP	Water	Phosphorus, Total	APHA 4500 P PHOSPHORUS-L

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorous is determined colourimetrically after persulphate digestion of the sample.

PAH,PANH-WP	Water	Polyaromatic Hydrocarbons (PAHs)	EPA SW 846/8270-GC/MS

Water is spiked with a surrogate spike mix and extracted using solvent extraction techniques. Analysis is performed by GC/MS in the selected ion monitoring (SIM) mode.

PH-WP	Water	pH	APHA 4500H

The pH of a sample is the determination of the activity of the hydrogen ions by potentiometric measurement using a standard hydrogen electrode and a reference electrode.

PHENOLS-4AAP-WT	Water	Phenol (4AAP)	EPA 9066

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
		An automated method is used to distill the sample. The distillate is then buffered to pH 9.4 which reacts with 4AAP and potassium ferricyanide to form a red complex which is measured colorimetrically.	
SO4-IC-N-WP	Water	Sulfate in Water by IC	EPA 300.1 (mod)
		Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.	
SOLIDS-TOTSUS-WP	Water	Total Suspended Solids	APHA 2540 D (modified)
		Total suspended solids in aquesous matrices is determined gravimetrically after drying the residue at 103 105°C.	
XYLENES-SUM-CALC-WP	Water	Sum of Xylene Isomer Concentrations	CALCULATED RESULT
		Total xylenes represents the sum of o-xylene and m&p-xylene.	

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

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

Laboratory Definition Code	Laboratory Location
WP	ALS ENVIRONMENTAL - WINNIPEG, MANITOBA, CANADA
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA

Chain of Custody Numbers:

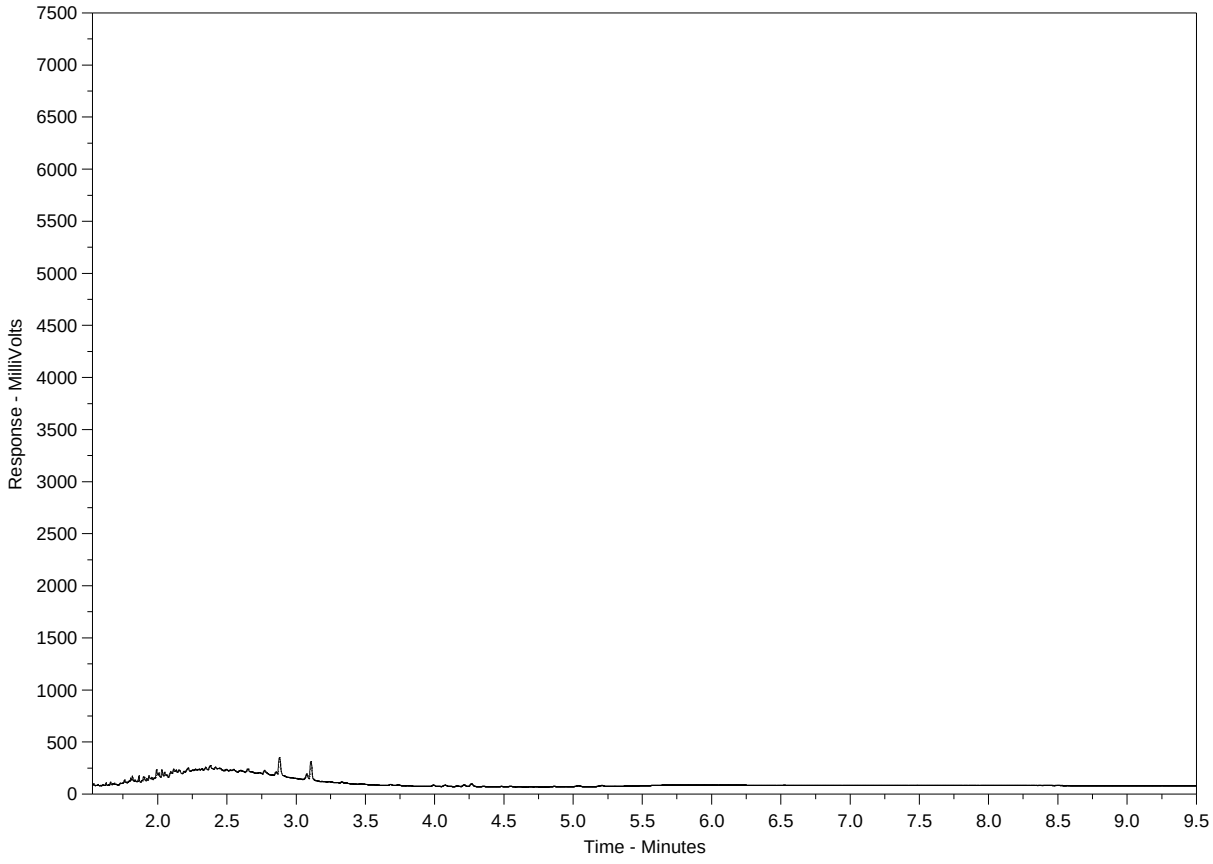
GLOSSARY OF REPORT TERMS

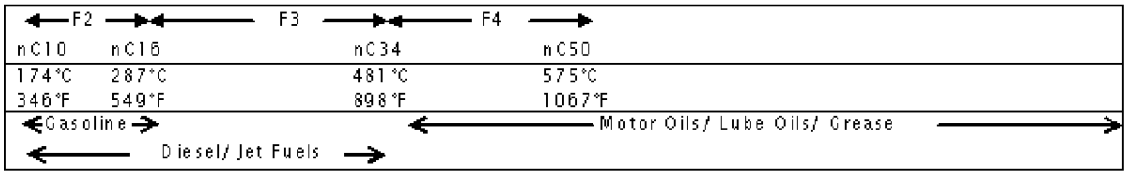
Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.
mg/kg - milligrams per kilogram based on dry weight of sample
mg/kg wwt - milligrams per kilogram based on wet weight of sample
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight
mg/L - unit of concentration based on volume, parts per million.
< - Less than.
D.L. - The reporting limit.
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L2148143-1
Client Sample ID: RAN-2





The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

ALS Environmental
www.alsglobal.com

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

L2148143-COFC

COC Number: 14 - 451864

Page 1 of 1

Report To		Report Format / Distribution		Turnaround Time (TAT) (Rush TAT is not available for all tests)
Company:	Hamlet of Rankin Inlet	Select Report Format:	PDF ☑ EXCEL ☐ EDD (DIGITAL) ☐	R ☑ Regular (Standard TAT if received by 3pm)
Contact:	Justin Merritt	Quality Control (QC) Report with Report	Yes ☐ No ☐	P ☐ Priority (2-4 business days if received by 3pm)
Address:	PO Box 30 Rankin Inlet, NU	☐ Criteria on Report - provide details below if box checked		E ☐ Emergency (1-2 business days if received by 3pm)
Phone:	867-645-2895	Select Distribution:	EMAIL ☑ MAIL ☐ FAX ☐	E2 ☐ Same day or weekend emergency if received by 10am – contact ALS for surcharge.
		Email 1 or Fax	sao@rankininlet.ca	Specify Date Required for E2,E or P:
		Email 2	Cfaulkner@gov.nu.ca	

Invoice To		Invoice Distribution	
	Same as Report To ☑ Yes ☐ No	Select Invoice Distribution:	EMAIL ☑ MAIL ☐ FAX ☐
	Copy of Invoice with Report ☑ Yes ☐ No	Email 1 or Fax	
Company:		Email 2	
Contact:			

Project Information		Oil and Gas Required Fields (client use)	
ALS Quote #:	W10629	Approver ID:	Cost Center:
Job #:		GL Account:	Routing Code:
PO / AFE:		Activity Code:	
LSD:		Location:	
ALS Lab Work Order # (lab use only)		ALS Contact:	Sampler: Connor Faulkner

Analysis Request — Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	BOD	Routine	Total Metals	Total Nutrients	Phenols	Oil + Grease x2	Bacteria	Total Mercury	BTX, F1 x3	F2-F4 x2	PAH x2			Number of Containers
	RAN-2	15-Aug-18	10:00	WW	✓	✓	P	P	P	P	P	P	P	P	P			16

Drinking Water (DW) Samples (client use)	Special Instructions / Specify Criteria to add on report (client Use)
Are samples taken from a Regulated DW System? ☐ Yes ☑ No	Nunavut - WW - GRP1 - WP
Are samples for human drinking water use? ☐ Yes ☑ No	BTX, F1-F4, PAH

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen	☐			SIF Observations	Yes ☐	No ☐	
Ice packs	Yes ☐	No ☐		Custody seal intact	Yes ☐	No ☐	
Cooling Initiated	☐						

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		
					16.4

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date: Aug 15/18	Time: 10:30 AM	Received by: MH	Date: 16/08/14	Time: 16:40	Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form**.

B-30

Appendix E

Spills

Occurance Date

Start date

Jan | 1 | 2018

End date

Dec | 31 | 2018

Spill Region

- Any -

Spill Location

--Rankin Inlet

Spill Location Description

Report Number

Items per page

100

Go | Reset

Spill	Occurance Date	Spill Region	Location	Location Description	Product Spilled	Quantity	Spill Cause	Lead Agency
spill-2018403	September 28, 2018	Keewatin	Rankin Inlet, Community, Nunavut		Petroleum - fuel oil (jet A, diesel, turbo A, heat)	75.00		GN - Government of Nunavut
spill-2018382	September 17, 2018	Keewatin	Rankin Inlet, Community, Nunavut		Petroleum - fuel oil (jet A, diesel, turbo A, heat)	189.00		GN - Government of Nunavut
spill-2018293	July 18, 2018	Keewatin	Rankin Inlet, Community, Nunavut		Petroleum - fuel oil (jet A, diesel, turbo A, heat)	30.00	Overflow Event	GN - Government of Nunavut
spill-2018281	July 14, 2018	Keewatin	Rankin Inlet, Community, Nunavut		Petroleum - fuel oil (jet A, diesel, turbo A, heat)	50.00	Fitting Leak	GN - Government of Nunavut
spill-2018224	June 13, 2018	Keewatin	Rankin Inlet, Community, Nunavut		Petroleum - fuel oil (jet A, diesel, turbo A, heat)	Unknown Quantity	Tank Leak	GN - Government of Nunavut
spill-2018211	June 6, 2018	Keewatin	Rankin Inlet, Community, Nunavut		Petroleum - fuel oil (jet A, diesel, turbo A, heat)	236.00	Tank Leak	GN - Government of Nunavut
spill-2018194	May 25, 2018	Keewatin	Rankin Inlet, Community, Nunavut			Unknown Quantity		GN - Government of Nunavut
spill-2018193	May 21, 2018	Keewatin	Rankin Inlet, Community, Nunavut			Unknown Quantity	Tank Leak	GN - Government of Nunavut

Displaying 1 - 8 of 8

Appendix F

Rankin Inlet-HAMLET
RAN-2

			2018			Statistics		
Parameter	**Unit**	**DL**	**27-Jun-18**	**30-Jul-18**	**15-Aug-18**	**Min**	**Max**	**Average**
Alkalinity								
Bicarbonate (HCO3)	mg/L	1.2	205	1010	845	150	1200	550
Carbonate (CO3)	mg/L	0.60	<0.60	<0.60	<0.60	0.60	0.60	0.60
Hydroxide (OH)	mg/L	0.34	<0.34	<0.34	<0.34	0.34	0.34	0.34
Total (as CaCO3)	mg/L	1.0	168	828	692	123	982	448
Ammonia by Colour								
Total (as N)	mg/L	0.20	3.97	53.0	26.1	1.09	173	43.18
Biochemical Oxygen Demand (BOD)								
Biochemical Oxygen Demand	mg/L	6.0	<2.0	72	18.9	6.7	60	24.9
Carbonaceous BOD								
BOD Carbonaceous	mg/L	6.0	3.1	60	15	8.3	62	27.37
Chloride in Water by IC								
Chloride (Cl)	mg/L	10	70.4	340	244	51.2	408	187.9
Conductivity								
Conductivity	umhos/cm	1.0	753	3220	2680	630	3180	1891.25
Fecal Coliforms								
Fecal Coliforms	MPN/100mL	3	80	170	200	4	4300	633.38
Hardness Calculated								
Hardness (as CaCO3)	mg/L	0.30	215	1010	773	234	936	543.25
Mercury Total								
Mercury (Hg)	mg/L	0.00020	0.0000051	0.0000600	0.0000330	1.48E-05	0.0002	0.00010
Nitrate in Water by IC								
Nitrate (as N)	mg/L	0.40	0.486	<0.40	<0.40	0.054	0.4	0.18
Nitrate + Nitrite								
Nitrate and Nitrite as N	mg/L	0.45	0.549	<0.45	<0.45	0.07	0.45	0.22
Nitrite in Water by IC								
Nitrite (as N)	mg/L	0.20	0.06	<0.20	<0.20	0.02	0.2	0.073
Oil & Grease - Gravimetric								
Oil and Grease	mg/L	5.0	<5.0	<5.0	<5.0	2.0	10.4	4.21
Phenol								
Phenols	mg/L	0.0010	0.0013	0.0333	0.0082	0.0029	0.5	0.067
Phosphorus, Total								
Phosphorus (P)	mg/L	0.010	0.199	0.622	0.567	0.203	1.03	0.55
Sulfate in Water by IC								
Sulfate (SO4)	mg/L	6.0	115	688	466	122	670	338.13
Total Metals by ICP-MS								
Aluminium (Al)	mg/L	0.0050	0.0199	0.0981	0.0703	0.0196	0.229	0.067
Arsenic (As)	mg/L	0.00020	0.00285	0.0107	0.0113	0.00238	0.0186	0.0077
Cadmium (Cd)	mg/L	0.000010	0.00004	0.000670	0.000387	0.00006	0.00071	0.00030
Calcium (Ca)	mg/L	0.10	60.3	297	226	77.2	276	160.26
Chromium (Cr)	mg/L	0.0010	0.00079	0.00718	0.00433	0.001	0.00864	0.0031
Cobalt (Co)	mg/L	0.00020	0.00309	0.0145	0.01300	0.0027	0.0145	0.0074
Copper (Cu)	mg/L	0.00020	0.0147	0.121	0.0810	0.00876	0.191	0.053
Iron (Fe)	mg/L	0.010	1.62	11.0	8.03	2.96	8.14	5.64
Lead (Pb)	mg/L	0.000090	0.000314	0.00893	0.00430	0.000755	0.00563	0.0030
Magnesium (Mg)	mg/L	0.010	15.6	64.3	50.7	9.93	60	34.84
Manganese (Mn)	mg/L	0.00030	0.228	2.92	1.63	0.336	2.69	1.25
Nickel (Ni)	mg/L	0.0020	0.0121	0.0440	0.0385	0.0106	0.0529	0.025
Potassium (K)	mg/L	0.020	16.1	87.4	64.6	12.2	72.2	42.8
Sodium (Na)	mg/L	0.030	69.0	308	249	37.3	358	177.51
Zinc (Zn)	mg/L	0.0020	0.0247	0.392	0.0939	0.002	0.255	0.12
Total Organic Carbon by Combustion								
Total Organic Carbon	mg/L	0.50	23.0	108	77.9	14.1	157	67.6
Total Suspended Solids								
Total Suspended Solids	mg/L	13	7.2	80	29.7	8	310	52.25
pH								
pH	pH Units	0.10	7.85	7.82	7.97	7.53	8.12	7.95
Benzene	mg/L	0.00050	<0.00050	<0.00050	<0.00050	0.0005	0.0005	0.0005
Toluene	mg/L	0.0010	<0.0010	0.0057	<0.0010	0.001	0.0076	0.0032
Ethyl Benzene	mg/L	0.00050	<0.00050	0.00336	<0.00050	0.0005	0.00245	0.0012
o-Xylene	mg/L	0.00050	<0.00050	0.00397	<0.00050	0.0005	0.00457	0.0019
F1 (C6-C10)	mg/L	0.10	<0.10	<0.10	<0.10	0.1	0.1	0.1
F2 (C10-C16)	mg/L	0.25	0.14	0.78	0.79	0.36	0.99	0.64
F3 (C16-C34)	mg/L	0.25	0.30	1.09	0.98	0.62	1.6	1.07
F4 (C34-C50)	mg/L	0.25	<0.25	<0.25	<0.25	0.25	0.25	0.25
Total Hydrocarbons (C6-C50)	mg/L	0.44	0.45	1.87	1.76	0.98	2.59	1.71

Appendix G

WATER LICENCE INSPECTION FORM

☒ Original
☐ Follow-Up Report

Licensee	Licensee Representative
Hamlet of Rankin Inlet	Justin Merritt
Licence No. / Expiry	**Representative's Title**
3BM-RAN1520/ Dec 20/20	Senior Administrative Officer
Land / Other Authorizations	**Land / Other Authorizations**
Date of Inspection	**Inspector**
August 13th 2018	Atuat Shouldice

Activities Inspected

☐ Camp ☐ Drilling ☐ Mining ☐ Construction ☐ Reclamation ☐ Fuel Storage
☐ Roads/Hauling ☒ Other: Waste Disposal Facility ☐ Other:

Conditions: **A- Acceptable** **U-Unacceptable** **C-Concern** **NI-Not Inspected** **NA- Not applicable**

PART:	Item No.*	Condition	Observation No.*
A: SCOPE, DEFINITIONS AND ENFORCEMENT	--	A	--
B: GENERAL CONDITIONS	1,2,5	A,A,A	1,2,3
C: CONDITIONS APPLYING TO WATER USE	--	A	--
D: CONDITIONS APPLYING TO WASTE DISPOSAL	2,4,5	U,A,A	4,5,6
E: CONDITIONS APPLYING TO MODIFICATIONS	---	--	--
F: CONDITIONS APPLYING TO OPERATION AND MAINTENANCE	2,3,4	U,U,C	7,8
G: CONDITIONS APPLYING TO ABANDONMENT, RECLAMATION AND CLOSURE PLANNING	--	NI	--
H: CONDITIONS APPLYING TO MONITORING PROGRAM	2,4,15	A,C,A	9,10,11

**The item number corresponds with specific conditions within the licence and the observation number corresponds with specific comments provided below.*

Samples taken by Inspector:	Location(s): N62° 48.077", W92° 04.431"
☒ Yes ☐ No	

SECTION 1 ☒ **Comments** (s._1_) ☐ **Non-Compliance with Act or Licence** (s.__) ☐ **Action Required** (s.__)

BACKGROUND

Rankin Inlet is located on the Northwestern shore of Hudson Bay, between Chesterfield Inlet and Arviat, it is the regional center for the Kivalliq Region.

Inspector's Statement

On August 13th, 2018, a water licence inspection was conducted at the Hamlet of Rankin Inlet with assistance from Hamlet Foreman, Tommy Sharp and Community and Government Services representative Connor Faulkner.

Licence 3BM-RAN1520 is issued to the Hamlet for the use of water and deposit of waste associated with the Landfill. The Water Treatment Plant and Sewage Treatment Plant are captured under water licence 3AM-GRA1624.

A written warning was delivered to the Hamlet in the fall of 2017, due to elevated parameters found in the sample results for RAN-2 (see appendix 1).

Observation

1. The Annual report is available for review on the Nunavut Water Board FTP website.
2. The Monitoring Program described in part H is being fulfilled by the Hamlet.
3. The Landfill is equipped with signage.
4. On the North-east corner of the Landfill leachate is observed seeping from the containment berm in to the environment.
5. During the summer of 2018, the Landfill was reorganized and proper segregation of hazardous waste was implemented, in accordance with the Operation and Maintenance Plan.
6. The leachate on the North-east corner is pumped back into the containment berm, which addresses the concerns outlined in the 2017 written warning (see appendix 1).
7. A revised Operation and Maintenance and Environmental Emergency Contingency Plan are not available for review Nunavut Water Board FTP website.
8. An engineering report, as required by part F item 4 was not available for review.
9. The requirements for the monitoring program in part H item 2 are being met for RAN-2 (RAN-3 is not being used because the new landfill is not commissioned).
10. The inspector is not clear on which Landfarm is discussed in part H item 4.

11. The 2017 Monitoring Program results were submitted with Annual report.
12. Samples have been collected at RAN-2 by the inspector, pursuant to part H Item 2(see appendix 2).

SECTION 2 ☐ **Comments** ☒ **Non-Compliance with Act or Licence** ☐ **Action Required**

Concerns related to Water Licence no. 3BM-RAN1520

Part D Item 2: The Licensee shall dispose of waste in a manner to prevent deposition of waste in to water.
The Licensee continues to work with the Water Licence Compliance Working Group goals. The seepage at RAN-2 is currently being pumped back in to the containment berm. This action addresses the inspector's concerns temporarily while a long term solution is planned.

Part F Item 2: The Licensee shall submit a revised Operations and Maintenance Plan.
The Licensee has failed to submit the plan as required by this condition. The Licensee will submit a revised plan as required by March 31st 2019 to the Nunavut Water Board.

Part F Item 3: The Licensee shall submit a revised Environmental Emergency Contingency Plan.
The Licensee has failed to submit the plan as required by this condition. The Licensee will submit a revised plan as required by March 31st 2019 to the Nunavut Water Board.

Part F Item 4: The Licensee shall submit an engineer's report annually.
The Licensee will submit to the Nunavut Water Board the report, as required by this condition, with the 2018 Annual report.

Additional Comments

During the inspection the Landfarm was never discussed as part of this licence. An inspection is scheduled of this facility in the summer 2019.

SECTION 3 ☐ **Comments** ☐ **Non-Compliance with Act or Licence** ☒ **Action Required**

The Hamlet of Rankin Inlet is encouraged to continue with the work completed in summer 2018. The Hamlet has implemented the goals of the Water Licence Compliance Group for 2018.

Licensee or Representative	**Inspector's Name**
Justin Merritt	Atuat Shouldice
Signature	**Signature**
	Sent Electronically
Date	**Date**
	January 23rd , 2018

CC: Licensing Department, NWB
Justin Hack, Manager of Field Operations, CIRNAC

Appendix: Appendix 1- Written Warning
Appendix 2- Laboratory Analyses Report

Indigenous and Northern Affairs Canada | Affaires autochtones et du Nord Canada

WRITTEN WARNING

NUNAVUT WATERS AND NUNAVUT SURFACE RIGHTS TRIBUNAL ACT

File: [2017-KIV02-AJS]

November 3rd, 2017

Registered with acknowledgement of receipt

The purpose of this warning is to inform:

Hamlet of Rankin Inlet
PO Box 310
Rankin Inlet, NU
X0C 0G0

C/o Justin Merritt
Senior Administrative Officer
Hamlet of Rankin Inlet
PO Box 310
Rankin Inlet, NU
X0C 0G0

Government of Nunavut
Dept. Community and Government Services
PO Box 490
Rankin Inlet, NU
XOC OGO

C/o Megan Lusty
Municipal Planning Engineer
Government of Nunavut
Dept. Community and Government Services
PO Box 490
Rankin Inlet, NU
XOC OGO

That information collected during an inspection of your facility at the Rankin Inlet Solid Waste Site on August 16th, 2017, as well as information received from the Hamlet of Rankin Inlet and Government of Nunavut, Community and Government Services , by the undersigned Inspector, designated by the Minister of Indigenous and Northern Affairs Canada under the *Nunavut Waters Nunavut Surface Rights Tribunal Act,* gives me reasonable grounds to believe that the Hamlet of Rankin Inlet was in contravention of section 12(1)(b) of the *Nunavut Waters and Nunavut Surface Rights Tribunal Act.*

ALLEGED FACTS

August 16th, 2017 a water licence inspection was conducted of Rankin Inlet Solid Waste Site with Connor Faulkner, Government of Nunavut, Community and Government Services, authorized under water licence no. 3BM-RAN1520. The following samples were collected at monitoring station no. RAN-2.

Canada

- One 1L narrow mouth plastic bottle for parameters of pH, total alkalinity, total hardness, nitrates and nitrites as nitrogen, calcium, chloride, magnesium, sodium, sulphates and potassium, total suspended solids;
- One 1L narrow mouth plastic bottle for parameters of BOD_5, and total ammonia;
- One 250ml narrow mouth bottle for parameter of total metals;
- Three 40ml glass vials for parameter BTEX;
- Two 80ml amber glass vials for parameter F2-F4;
- Two 250ml narrow mouth amber glass for the parameters of oil and grease;
- Two 250ml wide mouth amber glass for parameters total nutrients, total phenols;
- One 250ml narrow mouth sterilized plastic for the parameter of fecal coliforms.

The samples were collected and preserved in accordance with the requirements of the methodology for analysis. All samples were collected with gloves, within a plastic bag, placed in a cooler to maintain proper storage temperatures, and shipped to ALS Laboratories ('ALS'), Winnipeg, Manitoba, using chain of custody form, for analysis.

On August 29th, 2017 I received a copy of the final lab analysis report #L1977793 from ASL Laboratories.

Upon review of the results I noted a number of elevated parameters, well above the guidelines for Protection of Aquatic Life prepared by the Canadian Counsel of Ministers of the Environment.
I requested a review of analysis report # L1977793 by Indigenous and Northern Affairs Canada, Water Management Specialist, Sarah Forte.

On October 16th 2017, I was provided the following information:

- Several parameter concentrations exceed the Canadian Water Quality Guidelines for the Protection of Aquatic Life (PAL) in freshwater. The RAN-2 sample results reported the following; for total ammonia was 72300ug/L, PAL allowable limits are 19ug/L; total iron 6890 ug/L, PAL allowable limits 300ug/L; total copper 64.2ug/L PAL allowable limits 4ug/L;
- The RAN-2 sample results also reported elevations in total Arsenic 11ug/L, PAL allowable limits 5ug/L; total cadmium 0.334ug/L, PAL allowable limits 0.017ug/L; total zinc 82.9ug/L, PAL allowable limits 30ug/L.

Based on the August 16th, 2017 RAN-2 sampling results for total ammonia, iron, and cooper and the information provided to me on October 16th, I believe that the leachate produced by the Rankin Inlet Solid Waste Site would be considered a waste, i.e. a substance that when added to water meets the definition of a waste under the legislation (e.g. *Nunavut Waters and Nunavut Surface Rights Tribunal Act* or the *Canada Water Act*).

I am aware that the Rankin Inlet Solid Waste Site is generally located at N 62° 47.957', W 92° 04.565' in the Kivalliq Region of Nunavut.

Based on my experience as a Water Resource Officer and as an INAC Inspector, I am aware that except in accordance with the conditions of a licence, no person shall permit the deposit of waste into waters, in Nunavut or in any place that may enter water. I am also aware that compliance with the terms and conditions of a licence does not absolve a person from responsibilities for compliance with requirements of all applicable Federal, Territorial and Municipal legislation.

Based on the aforementioned facts, I have reasonable grounds to believe that the Hamlet of Rankin Inlet has deposited or allowed to be deposited, a waste in Nunavut in contravention of subsection 12(1) of the *Nunavut Waters Nunavut Surface Rights Tribunal Act.*

THE LAW

Nunavut Waters and Nunavut Surface Rights Tribunal Act s.c 2002, c. 10

Deposit of waste

12. (1) Subject to subsection (2) and except in accordance with the conditions of a licence, no person shall deposit or permit the deposit of waste

(*a*) in waters in Nunavut; or

(*b*) in any other place in Nunavut under conditions in which the waste, or any other waste that results from the deposit of that waste, may enter waters in Nunavut.

Exceptions

(2) Subsection (1) does not apply in respect of

(*a*) any unlicensed deposit of waste that is authorized by the regulations; or

(*b*) the deposit of waste in a national park.

Duty to report deposits

(3) Where waste is deposited in contravention of this section, every person who owns or has the charge, management or control of the waste, or who caused or contributed to the deposit, shall, subject to the regulations, without delay report the deposit to an inspector.

Principal offences

90. (1) Any person who contravenes subsection 11(1) or section 12, or fails to comply with subsection 11(3) or with a direction given by an inspector under subsection 87(1), is guilty of an offence and liable on summary conviction to a fine not exceeding $100,000 or to imprisonment for a term not exceeding one year, or to both.

Type A licences

(2) A licensee holding a type A licence who

(*a*) contravenes any condition of the licence, where the contravention does not constitute an offence under section 91, or

(*b*) fails, without reasonable excuse, to furnish or maintain security as required under subsection 76(1)

is guilty of an offence and liable on summary conviction to a fine not exceeding $100,000 or to imprisonment for a term not exceeding one year, or to both.

Type B licences

(3) A licensee holding a type B licence who

(*a*) contravenes any condition of the licence, where the contravention does not constitute an offence under section 91, or

(*b*) fails, without reasonable excuse, to furnish or maintain security as required under subsection 76(1)

is guilty of an offence and liable on summary conviction to a fine not exceeding $15,000 or to imprisonment for a term not exceeding six months, or to both.

Continuing offences

(4) Where an offence under this section is committed on or continued for more than one day, it is deemed to be a separate offence for each day on which it is committed or continued.

Other offences

91. Any person is guilty of an offence punishable on summary conviction who

(*a*) contravenes subsection 86(4) or section 88, or any regulations made under paragraph 82(1)(*o*), (*p*) or (*q*); or

(*b*) wilfully obstructs or otherwise interferes with a licensee or any person acting on behalf of a licensee in the exercise of the licensee's rights under this Part, except as authorized under this or any other Act of Parliament.

CONCLUSION

This warning alleges a contravention of section 12(1) of the *Nunavut Waters Nunavut Surface Rights Tribunal Act.* It is intended to bring this matter to your attention in order for you to take the necessary corrective action to ensure compliance with the *Nunavut Waters Nunavut Surface Rights Tribunal Act or* in order for you to exercise due diligence in the future. This document is not finding of guilt or civil liability, and is not an administrative adjudication.

This warning and the circumstances to which it refers will from part of Indigenous and Northern Affairs Canada's (INAC) records of the Hamlet of Rankin Inlet, and will be taken into account in future responses to alleged violations and for internal purposes such as setting the frequency of inspections. INAC will consider taking further action if you do not take all necessary corrective steps to comply or if you do not exercise due diligence in the future.

The complete text of the *Nunavut Waters Nunavut Surface Rights Tribunal Act* is available on canlii website: **https://www.canlii.org/en/ca/laws/stat/sc-2002-c-10/latest/sc-2002-c-10.html**

For more information or to respond to the alleged facts contained in the warning, please call or write the undersigned. Your comments will be considered, and where appropriate, a response provided. Any comments you make, as well as INAC response will be maintained on file with this warning in INAC's records.

Atuat Shouldice
Water Resource Officer

Field Operations, Kivalliq Region Office
Indigenous and Northern Affairs Canada
Ikingutigiit Centre, Suite 1
PO Box 129
Rankin Inlet, Nunavut
XOC 0G0

cc: Erik Allain
Manager, Field Operations
Nunavut Regional Office
Indigenous and Northern Affairs Canada
969 Qimugjuk Bldg. 1st Floor
PO Box 2200
Iqaluit, Nunavut
X0A 0H0

Manager, Licensing
Nunavut Water Board
PO Box 119
Gjoa Haven, Nunavut
X0B 1J0

Indigenous and Northern Affairs Canada
ATTN: ATUAT SHOULDICE
Kivalliq Regional Office
Ikingutigiit Centre Suite 1 PO Box 129
Rankin Inlet Nu XOC 0G0

Date Received: 18-AUG-18
Report Date: 04-SEP-18 07:22 (MT)
Version: FINAL

Client Phone: 867-645-2840

Certificate of Analysis

Lab Work Order #: L2149505

Project P.O. #: NOT SUBMITTED
Job Reference: INAC - WASTEWATER
C of C Numbers:
Legal Site Desc:

Hua Wo
Chemistry Laboratory Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2149505-1 RAN 4							
Sampled By: AS on 16-AUG-18 @ 14:15							
Matrix: WASTE							
BTEX plus F1-F4							
BTX plus F1 by GCMS							
Benzene	<0.00050		0.00050	mg/L		22-AUG-18	R4182305
Toluene	<0.0010		0.0010	mg/L		22-AUG-18	R4182305
Ethyl benzene	<0.00050		0.00050	mg/L		22-AUG-18	R4182305
o-Xylene	<0.00050		0.00050	mg/L		22-AUG-18	R4182305
m+p-Xylenes	<0.00040		0.00040	mg/L		22-AUG-18	R4182305
F1 (C6-C10)	<0.10		0.10	mg/L		22-AUG-18	R4182305
Surrogate: 4-Bromofluorobenzene (SS)	92.8		70-130	%		22-AUG-18	R4182305
CCME PHC F2-F4 in Water							
F2 (C10-C16)	0.66		0.10	mg/L	22-AUG-18	23-AUG-18	R4181389
F3 (C16-C34)	0.74		0.25	mg/L	22-AUG-18	23-AUG-18	R4181389
F4 (C34-C50)	<0.25		0.25	mg/L	22-AUG-18	23-AUG-18	R4181389
Surrogate: 2-Bromobenzotrifluoride	79.2		60-140	%	22-AUG-18	23-AUG-18	R4181389
CCME Total Hydrocarbons							
F1-BTEX	<0.10		0.10	mg/L		30-AUG-18	
F2-Naphth	0.66		0.10	mg/L		30-AUG-18	
F3-PAH	0.74		0.25	mg/L		30-AUG-18	
Total Hydrocarbons (C6-C50)	1.40		0.38	mg/L		30-AUG-18	
Sum of Xylene Isomer Concentrations							
Xylenes (Total)	<0.00064		0.00064	mg/L		24-AUG-18	
Miscellaneous Parameters							
Ammonia, Total (as N)	55.5		5.0	mg/L		23-AUG-18	R4181373
Biochemical Oxygen Demand	14.7		6.0	mg/L		18-AUG-18	R4182361
Fecal Coliforms	261	PEHT	1	MPN/100mL		18-AUG-18	R4177351
Mercury (Hg)-Total	0.0000270		0.0000050	mg/L	21-AUG-18	22-AUG-18	R4181094
Oil and Grease	<5.0		5.0	mg/L		28-AUG-18	R4188291
Phenols (4AAP)	0.0081		0.0010	mg/L		23-AUG-18	R4182489
Total Suspended Solids	36.3		2.0	mg/L		23-AUG-18	R4182366
Polyaromatic Hydrocarbons (PAHs)							
1-Methyl Naphthalene	0.000206		0.000020	mg/L	23-AUG-18	27-AUG-18	R4194126
2-Methyl Naphthalene	0.000138		0.000020	mg/L	23-AUG-18	27-AUG-18	R4194126
Acenaphthene	<0.000020		0.000020	mg/L	23-AUG-18	27-AUG-18	R4194126
Acenaphthylene	<0.000020		0.000020	mg/L	23-AUG-18	27-AUG-18	R4194126
Anthracene	<0.000010		0.000010	mg/L	23-AUG-18	27-AUG-18	R4194126
Acridine	<0.000020		0.000020	mg/L	23-AUG-18	27-AUG-18	R4194126
Benzo(a)anthracene	<0.000010		0.000010	mg/L	23-AUG-18	27-AUG-18	R4194126
Benzo(a)pyrene	<0.0000050		0.0000050	mg/L	23-AUG-18	27-AUG-18	R4194126
Benzo(b&j)fluoranthene	<0.000010		0.000010	mg/L	23-AUG-18	27-AUG-18	R4194126
Benzo(g,h,i)perylene	<0.000020		0.000020	mg/L	23-AUG-18	27-AUG-18	R4194126
Benzo(k)fluoranthene	<0.000010		0.000010	mg/L	23-AUG-18	27-AUG-18	R4194126
Chrysene	<0.000020		0.000020	mg/L	23-AUG-18	27-AUG-18	R4194126
Dibenzo(a,h)anthracene	<0.0000050		0.0000050	mg/L	23-AUG-18	27-AUG-18	R4194126
Fluoranthene	<0.000020		0.000020	mg/L	23-AUG-18	27-AUG-18	R4194126
Fluorene	0.000032		0.000020	mg/L	23-AUG-18	27-AUG-18	R4194126
Indeno(1,2,3-cd)pyrene	<0.000010		0.000010	mg/L	23-AUG-18	27-AUG-18	R4194126
Naphthalene	0.000193	EMPC	0.000050	mg/L	23-AUG-18	27-AUG-18	R4194126
Phenanthrene	<0.000050		0.000050	mg/L	23-AUG-18	27-AUG-18	R4194126
Pyrene	0.000021		0.000010	mg/L	23-AUG-18	27-AUG-18	R4194126
Quinoline	<0.000020		0.000020	mg/L	23-AUG-18	27-AUG-18	R4194126
B(a)P Total Potency Equivalent	<0.000030		0.000030	mg/L	23-AUG-18	27-AUG-18	R4194126
Surrogate: Acenaphthene d10	83.7		40-130	%	23-AUG-18	27-AUG-18	R4194126

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2149505-1 RAN 4							
Sampled By: AS on 16-AUG-18 @ 14:15							
Matrix: WASTE							
Polyaromatic Hydrocarbons (PAHs)							
Surrogate: Acridine d9	96.0		40-130	%	23-AUG-18	27-AUG-18	R4194126
Surrogate: Chrysene d12	91.0		40-130	%	23-AUG-18	27-AUG-18	R4194126
Surrogate: Naphthalene d8	81.0		40-130	%	23-AUG-18	27-AUG-18	R4194126
Surrogate: Phenanthrene d10	92.5		40-130	%	23-AUG-18	27-AUG-18	R4194126
Routine Soluble + Metal scan							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	869		1.2	mg/L		21-AUG-18	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		21-AUG-18	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		21-AUG-18	
Alkalinity, Total (as CaCO3)							
Alkalinity, Total (as CaCO3)	713		1.0	mg/L		20-AUG-18	R4179184
Chloride in Water by IC (Low Level)							
Chloride (Cl)	266		2.0	mg/L		20-AUG-18	R4185220
Conductivity							
Conductivity	2790		1.0	umhos/cm		20-AUG-18	R4179184
Hardness Calculated							
Hardness (as CaCO3)	760	HTC	0.20	mg/L		03-SEP-18	
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	2.73	HTD	0.10	mg/L		20-AUG-18	R4185220
Nitrate+Nitrite							
Nitrate and Nitrite as N	2.86		0.10	mg/L		28-AUG-18	
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	0.127	HTD	0.020	mg/L		20-AUG-18	R4185220
Sulfate in Water by IC							
Sulfate (SO4)	514		6.0	mg/L		20-AUG-18	R4185220
TDS calculated							
TDS (Calculated)	1810		5.0	mg/L		03-SEP-18	
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.0723		0.0030	mg/L	28-AUG-18	30-AUG-18	R4195148
Antimony (Sb)-Total	0.00262		0.00010	mg/L	28-AUG-18	30-AUG-18	R4195148
Arsenic (As)-Total	0.0117		0.00010	mg/L	28-AUG-18	30-AUG-18	R4195148
Barium (Ba)-Total	0.0670		0.00010	mg/L	28-AUG-18	30-AUG-18	R4195148
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	28-AUG-18	30-AUG-18	R4195148
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	28-AUG-18	30-AUG-18	R4195148
Boron (B)-Total	2.44		0.10	mg/L	28-AUG-18	31-AUG-18	R4196480
Cadmium (Cd)-Total	0.000350		0.0000050	mg/L	28-AUG-18	30-AUG-18	R4195148
Calcium (Ca)-Total	226		0.050	mg/L	28-AUG-18	30-AUG-18	R4195148
Cesium (Cs)-Total	0.000062		0.000010	mg/L	28-AUG-18	30-AUG-18	R4195148
Chromium (Cr)-Total	0.00445		0.00010	mg/L	28-AUG-18	30-AUG-18	R4195148
Cobalt (Co)-Total	0.0121		0.00010	mg/L	28-AUG-18	30-AUG-18	R4195148
Copper (Cu)-Total	0.0752		0.00050	mg/L	28-AUG-18	30-AUG-18	R4195148
Iron (Fe)-Total	7.26		0.010	mg/L	28-AUG-18	30-AUG-18	R4195148
Lead (Pb)-Total	0.00438		0.000050	mg/L	28-AUG-18	30-AUG-18	R4195148
Lithium (Li)-Total	0.0289		0.0010	mg/L	28-AUG-18	30-AUG-18	R4195148
Magnesium (Mg)-Total	47.5		0.0050	mg/L	28-AUG-18	30-AUG-18	R4195148
Manganese (Mn)-Total	1.58		0.0010	mg/L	28-AUG-18	31-AUG-18	R4196480
Molybdenum (Mo)-Total	0.00656		0.000050	mg/L	28-AUG-18	30-AUG-18	R4195148
Nickel (Ni)-Total	0.0373		0.00050	mg/L	28-AUG-18	30-AUG-18	R4195148
Potassium (K)-Total	70.1		0.050	mg/L	28-AUG-18	30-AUG-18	R4195148
Phosphorus (P)-Total	0.619		0.050	mg/L	28-AUG-18	30-AUG-18	R4195148

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2149505-1 RAN 4							
Sampled By: AS on 16-AUG-18 @ 14:15							
Matrix: WASTE							
Total Metals in Water by CRC ICPMS							
Rubidium (Rb)-Total	0.0159		0.00020	mg/L	28-AUG-18	30-AUG-18	R4195148
Selenium (Se)-Total	0.000540		0.000050	mg/L	28-AUG-18	30-AUG-18	R4195148
Silicon (Si)-Total	4.94		0.10	mg/L	28-AUG-18	30-AUG-18	R4195148
Silver (Ag)-Total	0.000130		0.000010	mg/L	28-AUG-18	30-AUG-18	R4195148
Sodium (Na)-Total	248		0.050	mg/L	28-AUG-18	30-AUG-18	R4195148
Strontium (Sr)-Total	1.34		0.0020	mg/L	28-AUG-18	31-AUG-18	R4196480
Sulfur (S)-Total	193		0.50	mg/L	28-AUG-18	30-AUG-18	R4195148
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	28-AUG-18	30-AUG-18	R4195148
Thallium (Tl)-Total	0.000018		0.000010	mg/L	28-AUG-18	30-AUG-18	R4195148
Thorium (Th)-Total	<0.00010		0.00010	mg/L	28-AUG-18	30-AUG-18	R4195148
Tin (Sn)-Total	0.00032		0.00010	mg/L	28-AUG-18	30-AUG-18	R4195148
Titanium (Ti)-Total	0.00135		0.00030	mg/L	28-AUG-18	30-AUG-18	R4195148
Tungsten (W)-Total	0.00051		0.00010	mg/L	28-AUG-18	30-AUG-18	R4195148
Uranium (U)-Total	0.00303		0.000010	mg/L	28-AUG-18	30-AUG-18	R4195148
Vanadium (V)-Total	0.00242		0.00050	mg/L	28-AUG-18	30-AUG-18	R4195148
Zinc (Zn)-Total	0.0839		0.0030	mg/L	28-AUG-18	30-AUG-18	R4195148
Zirconium (Zr)-Total	0.00129		0.000060	mg/L	28-AUG-18	30-AUG-18	R4195148
pH							
pH	8.09		0.10	pH units		20-AUG-18	R4179184

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

Reference Information

Sample Parameter Qualifier Key:

Qualifier	Description
EMPC	Estimated Maximum Possible Concentration. Parameter detected but didn't meet all criteria for positive identification.
HTC	Hardness was calculated from Total Ca and/or Mg concentrations and may be biased high (dissolved Ca/Mg results unavailable).
HTD	Hold time exceeded for re-analysis or dilution, but initial testing was conducted within hold time.
PEHT	Parameter Exceeded Recommended Holding Time Prior to Analysis

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-CO3CO3-CALC-WP	Water	Alkalinity, Carbonate	CALCULATION

The Alkalinity of water is a measure of its acid neutralizing capacity.Alkalinity is imparted by bicarbonate, carbonate and hydroxide components of water. The fraction of alkalinity contributed by carbonate is calculated and reported as mg CO3 2-/L.

ALK-HCO3HCO3-CALC-WP	Water	Alkalinity, Bicarbonate	CALCULATION

The Alkalinity of water is a measure of its acid neutralizing capacity.Alkalinity is imparted by bicarbonate, carbonate and hydroxide components of water. The fraction of alkalinity contributed by bicarbonate is calculated and reported as mg HCO3-/L

ALK-OHOH-CALC-WP	Water	Alkalinity, Hydroxide	CALCULATION

The Alkalinity of water is a measure of its acid neutralizing capacity.Alkalinity is imparted by bicarbonate, carbonate and hydroxide components of water. The fraction of alkalinity contributed by hydroxide is calculated and reported as mg OH-/L.

ALK-TITR-WP	Water	Alkalinity, Total (as CaCO3)	APHA 2320B

The Alkalinity of water is a measure of its acid neutralizing capacity. Alkalinity is imparted by bicarbonate, carbonate and hydroxide components of water. Total alkalinity is determined by titration with a strong standard mineral acid to the successive HCO3- and H2CO3 endpoints indicated electrometrically.

BOD-WP	Water	Biochemical Oxygen Demand (BOD)	APHA 5210 B

Samples are diluted and seeded and then incubated in airtight bottles at 20°C for 5 days. Dissolved oxygen is measured initially and after incubation, and results are computed from the difference between initial and final DO.

BTEXS+F1-HSMS-WP	Water	BTX plus F1 by GCMS	EPA 8260C / EPA 5021A

The water sample, with added reagents, is heated in a sealed vial to equilibrium. The headspace from the vial is transfered into a gas chromatograph. Target compound concentrations are measured using mass spectrometry detection.

CL-L-IC-N-WP	Water	Chloride in Water by IC (Low Level)	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

EC-SCREEN-WP	Water	Conductivity Screen (Internal Use Only)	APHA 2510

Qualitative analysis of conductivity where required during preparation of other test eg. IC, TDS, TSS, etc

EC-WP	Water	Conductivity	APHA 2510B

Conductivity of an aqueous solution refers to its ability to carry an electric current. Conductance of a solution is measured between two spatially fixed and chemically inert electrodes.

ETL-SOLIDS-CALC-WP	Water	TDS calculated	CALCULATION
F1-F4-CALC-WP	Water	CCME Total Hydrocarbons	CCME CWS-PHC, Pub #1310, Dec 2001-L

Analytical methods used for analysis of CCME Petroleum Hydrocarbons have been validated and comply with the Reference Method for the CWS PHC.

In cases where results for both F4 and F4G are reported, the greater of the two results must be used in any application of the CWS PHC guidelines and the gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.
In samples where BTEX and F1 were analyzed , F1-BTEX represents a value where the sum of Benzene, Toluene, Ethylbenzene and total Xylenes has been subtracted from F1.

In samples where PAHs, F2 and F3 were analyzed, F2-Naphth represents the result where Naphthalene has been subtracted from F2. F3-PAH represents a result where the sum of Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Phenanthrene, and Pyrene has been subtracted from F3.

Unless otherwise qualified, the following quality control criteria have been met for the F1 hydrocarbon range:
1. All extraction and analysis holding times were met.
2. Instrument performance showing response factors for C6 and C10 within 30% of the response factor for toluene.
3. Linearity of gasoline response within 15% throughout the calibration range.

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**

Unless otherwise qualified, the following quality control criteria have been met for the F2-F4 hydrocarbon ranges:
1. All extraction and analysis holding times were met.
2. Instrument performance showing C10, C16 and C34 response factors within 10% of their average.
3. Instrument performance showing the C50 response factor within 30% of the average of the C10, C16 and C34 response factors.
4. Linearity of diesel or motor oil response within 15% throughout the calibration range.

F2-F4-FID-WP	Water	CCME PHC F2-F4 in Water	EPA 3511

Petroleum hydrocarbons in water are determined by liquid-liquid micro-scale solvent extraction using a reciprocal shaker extraction apparatus prior to capillary column gas chromatography with flame ionization detection (GC-FID) analysis.

FC-QT97-WP	Water	Fecal Coliform by MPN QT97	APHA 9223B QT97

This analysis is carried out using procedures adapted from APHA Method 9223B "Enzyme Substrate Coliform Test". The sample is mixed with a mixture of hydrolyzable substrates and then sealed in a 97-well packet. The packet is incubated at 44.5 – 0.2°C for 18 hours and then the number of wells exhibiting a positive response are counted. The final result is obtained by comparing the number of positive responses to a probability table.

HARDNESS-CALC-WP	Water	Hardness Calculated	APHA 2340B

Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.

HG-T-CVAA-WP	Water	Mercury Total	EPA 1631E (mod)

Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.

IONBALANCE-CALC-WP	Water	Ion Balance Calculation	APHA 1030E

Cation Sum, Anion Sum, and Ion Balance (as % difference) are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Because all aqueous solutions are electrically neutral, the calculated ion balance (% difference of cations minus anions) should be near-zero.

Cation and Anion Sums are the total meq/L concentration of major cations and anions. Dissolved species are used where available. Minor ions are included where data is present. Ion Balance (as % difference) cannot be calculated accurately for waters with very low electrical conductivity (EC), and is reported as "Low EC" where EC < 100 uS/cm (umhos/cm). Ion Balance is calculated as:

Ion Balance (%) = [Cation Sum-Anion Sum] / [Cation Sum+Anion Sum]

MET-T-CCMS-WP	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod.)

Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

NH3-COL-WP	Water	Ammonia by colour	APHA 4500 NH3 F

Ammonia in water samples forms indophenol when reacted with hypochlorite and phenol. The intensity is amplified by the addition of sodium nitroprusside and measured colourmetrically.

NO2+NO3-CALC-L-WP	Water	Nitrate+Nitrite	CALCULATION
NO2-L-IC-N-WP	Water	Nitrite in Water by IC (Low Level)	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

NO3-L-IC-N-WP	Water	Nitrate in Water by IC (Low Level)	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

OG-GRAV-WP	Water	Oil & Grease - Gravimetric	EPA 1664 (modified)

Water samples are acidified and extracted with hexane; the hexane extract is collected in a pre-weighed vial. The solvent is evaporated and Total Oil & Grease is determined from the weight of the residue in the vial.

PAH,PANH-WP	Water	Polyaromatic Hydrocarbons (PAHs)	EPA SW 846/8270-GC/MS

Water is spiked with a surrogate spike mix and extracted using solvent extraction techniques. Analysis is performed by GC/MS in the selected ion monitoring (SIM) mode.

PH-WP	Water	pH	APHA 4500H

The pH of a sample is the determination of the activity of the hydrogen ions by potentiometric measurement using a standard hydrogen electrode and a reference electrode.

PHENOLS-4AAP-WT	Water	Phenol (4AAP)	EPA 9066

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
An automated method is used to distill the sample. The distillate is then buffered to pH 9.4 which reacts with 4AAP and potassium ferricyanide to form a red complex which is measured colorimetrically.			
SO4-IC-N-WP	Water	Sulfate in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
SOLIDS-TOTSUS-WP	Water	Total Suspended Solids	APHA 2540 D (modified)
Total suspended solids in aquesous matrices is determined gravimetrically after drying the residue at 103 105°C.			
XYLENES-SUM-CALC-WP	Water	Sum of Xylene Isomer Concentrations	CALCULATED RESULT
Total xylenes represents the sum of o-xylene and m&p-xylene.			

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

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

Laboratory Definition Code	Laboratory Location
WP	ALS ENVIRONMENTAL - WINNIPEG, MANITOBA, CANADA
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.
mg/kg - milligrams per kilogram based on dry weight of sample
mg/kg wwt - milligrams per kilogram based on wet weight of sample
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight
mg/L - unit of concentration based on volume, parts per million.
< - Less than.
D.L. - The reporting limit.
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Quality Control Report

Client: Indigenous and Northern Affairs Canada
Kivalliq Regional Office Ikingutigiit Centre Suite 1 PO Box 129
Rankin Inlet Nu XOC 0G0
Contact: ATUAT SHOULDICE

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
ALK-TITR-WP	**Water**							
Batch R4179184								
WG2855373-24 LCS								
Alkalinity, Total (as CaCO3)			102.3		%		85-115	20-AUG-18
WG2855373-21 MB								
Alkalinity, Total (as CaCO3)			<1.0		mg/L		1	20-AUG-18
BOD-WP	**Water**							
Batch R4182361								
WG2852955-12 LCS								
Biochemical Oxygen Demand			92.8		%		85-115	18-AUG-18
WG2852955-11 MB								
Biochemical Oxygen Demand			<2.0		mg/L		2	18-AUG-18
BTEXS+F1-HSMS-WP	**Water**							
Batch R4182305								
WG2856798-2 LCS								
Benzene			111.9		%		70-130	22-AUG-18
Toluene			122.2		%		70-130	22-AUG-18
Ethyl benzene			121.4		%		70-130	22-AUG-18
o-Xylene			119.4		%		70-130	22-AUG-18
m+p-Xylenes			106.6		%		70-130	22-AUG-18
WG2856798-3 LCS								
F1 (C6-C10)			112.9		%		70-130	22-AUG-18
WG2856798-1 MB								
Benzene			<0.00050		mg/L		0.0005	22-AUG-18
Toluene			<0.0010		mg/L		0.001	22-AUG-18
Ethyl benzene			<0.00050		mg/L		0.0005	22-AUG-18
o-Xylene			<0.00030		mg/L		0.0003	22-AUG-18
m+p-Xylenes			<0.00040		mg/L		0.0004	22-AUG-18
F1 (C6-C10)			<0.10		mg/L		0.1	22-AUG-18
Surrogate: 4-Bromofluorobenzene (SS)			87.6		%		70-130	22-AUG-18
CL-L-IC-N-WP	**Water**							
Batch R4185220								
WG2854428-2 LCS								
Chloride (Cl)			104.2		%		90-110	20-AUG-18
WG2854428-1 MB								
Chloride (Cl)			<0.10		mg/L		0.1	20-AUG-18
EC-WP	**Water**							

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
EC-WP	**Water**							
Batch R4179184								
WG2855373-23 LCS								
Conductivity			98.9		%		90-110	20-AUG-18
WG2855373-21 MB								
Conductivity			<1.0		umhos/cm		1	20-AUG-18
F2-F4-FID-WP	**Water**							
Batch R4181389								
WG2857428-2 LCS								
F2 (C10-C16)			97.3		%		70-130	23-AUG-18
F3 (C16-C34)			96.1		%		70-130	23-AUG-18
F4 (C34-C50)			108.0		%		70-130	23-AUG-18
WG2857428-1 MB								
F2 (C10-C16)			<0.10		mg/L		0.1	23-AUG-18
F3 (C16-C34)			<0.25		mg/L		0.25	23-AUG-18
F4 (C34-C50)			<0.25		mg/L		0.25	23-AUG-18
Surrogate: 2-Bromobenzotrifluoride			77.8		%		60-140	23-AUG-18
FC-QT97-WP	**Water**							
Batch R4177351								
WG2854212-2 DUP		**L2149505-1**						
Fecal Coliforms		261	236		MPN/100mL	10	65	18-AUG-18
WG2854212-1 MB								
Fecal Coliforms			<1		MPN/100mL		1	18-AUG-18
HG-T-CVAA-WP	**Water**							
Batch R4181094								
WG2857686-2 LCS								
Mercury (Hg)-Total			102.0		%		80-120	22-AUG-18
WG2857686-1 MB								
Mercury (Hg)-Total			<0.000005C		mg/L		0.000005	22-AUG-18
NH3-COL-WP	**Water**							
Batch R4181373								
WG2857943-2 LCS								
Ammonia, Total (as N)			97.0		%		85-115	23-AUG-18
WG2857943-1 MB								
Ammonia, Total (as N)			<0.010		mg/L		0.01	23-AUG-18
NO2-L-IC-N-WP	**Water**							

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
NO2-L-IC-N-WP	**Water**							
Batch R4185220								
WG2854428-2 LCS								
Nitrite (as N)			103.0		%		90-110	20-AUG-18
WG2854428-1 MB								
Nitrite (as N)			<0.0010		mg/L		0.001	20-AUG-18
NO3-L-IC-N-WP	**Water**							
Batch R4185220								
WG2854428-2 LCS								
Nitrate (as N)			103.8		%		90-110	20-AUG-18
WG2854428-1 MB								
Nitrate (as N)			<0.0050		mg/L		0.005	20-AUG-18
OG-GRAV-WP	**Water**							
Batch R4188291								
WG2859418-2 LCS								
Oil and Grease			97.0		%		70-130	28-AUG-18
WG2859418-1 MB								
Oil and Grease			<5.0		mg/L		5	28-AUG-18
PAH,PANH-WP	**Water**							
Batch R4194126								
WG2858282-2 LCS								
1-Methyl Naphthalene			98.0		%		60-130	27-AUG-18
2-Methyl Naphthalene			95.0		%		60-130	27-AUG-18
Acenaphthene			91.2		%		60-130	27-AUG-18
Acenaphthylene			83.5		%		60-130	27-AUG-18
Anthracene			88.8		%		60-130	27-AUG-18
Acridine			87.1		%		60-130	27-AUG-18
Benzo(a)anthracene			90.8		%		60-130	27-AUG-18
Benzo(a)pyrene			85.1		%		60-130	27-AUG-18
Benzo(b&j)fluoranthene			80.5		%		60-130	27-AUG-18
Benzo(g,h,i)perylene			85.4		%		60-130	27-AUG-18
Benzo(k)fluoranthene			118.0		%		60-130	27-AUG-18
Chrysene			96.3		%		60-130	27-AUG-18
Dibenzo(a,h)anthracene			102.0		%		60-130	27-AUG-18
Fluoranthene			92.0		%		60-130	27-AUG-18
Fluorene			90.5		%		60-130	27-AUG-18
Indeno(1,2,3-cd)pyrene			95.8		%		60-130	27-AUG-18
Naphthalene			97.2		%		50-130	27-AUG-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PAH,PANH-WP	**Water**							
Batch R4194126								
WG2858282-2 LCS								
Phenanthrene			95.4		%		60-130	27-AUG-18
Pyrene			83.4		%		60-130	27-AUG-18
Quinoline			121.8		%		60-130	27-AUG-18
WG2858282-1 MB								
1-Methyl Naphthalene			<0.000020		mg/L		0.00002	27-AUG-18
2-Methyl Naphthalene			<0.000020		mg/L		0.00002	27-AUG-18
Acenaphthene			<0.000020		mg/L		0.00002	27-AUG-18
Acenaphthylene			<0.000020		mg/L		0.00002	27-AUG-18
Anthracene			<0.000010		mg/L		0.00001	27-AUG-18
Acridine			<0.000020		mg/L		0.00002	27-AUG-18
Benzo(a)anthracene			<0.000010		mg/L		0.00001	27-AUG-18
Benzo(a)pyrene			<0.000005C		mg/L		0.000005	27-AUG-18
Benzo(b&j)fluoranthene			<0.000010		mg/L		0.00001	27-AUG-18
Benzo(g,h,i)perylene			<0.000020		mg/L		0.00002	27-AUG-18
Benzo(k)fluoranthene			<0.000010		mg/L		0.00001	27-AUG-18
Chrysene			<0.000020		mg/L		0.00002	27-AUG-18
Dibenzo(a,h)anthracene			<0.000005C		mg/L		0.000005	27-AUG-18
Fluoranthene			<0.000020		mg/L		0.00002	27-AUG-18
Fluorene			<0.000020		mg/L		0.00002	27-AUG-18
Indeno(1,2,3-cd)pyrene			<0.000010		mg/L		0.00001	27-AUG-18
Naphthalene			<0.000050		mg/L		0.00005	27-AUG-18
Phenanthrene			<0.000050		mg/L		0.00005	27-AUG-18
Pyrene			<0.000010		mg/L		0.00001	27-AUG-18
Quinoline			<0.000020		mg/L		0.00002	27-AUG-18
Surrogate: Acenaphthene d10			80.1		%		40-130	27-AUG-18
Surrogate: Acridine d9			80.1		%		40-130	27-AUG-18
Surrogate: Chrysene d12			90.0		%		40-130	27-AUG-18
Surrogate: Naphthalene d8			76.8		%		40-130	27-AUG-18
Surrogate: Phenanthrene d10			81.9		%		40-130	27-AUG-18
PH-WP	**Water**							
Batch R4179184								
WG2855373-22 LCS								
pH			7.45		pH units		7.3-7.5	20-AUG-18
PHENOLS-4AAP-WT	**Water**							

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PHENOLS-4AAP-WT	**Water**							
Batch R4182489								
WG2857911-6 LCS								
Phenols (4AAP)			92.2		%		85-115	23-AUG-18
WG2857911-5 MB								
Phenols (4AAP)			<0.0010		mg/L		0.001	23-AUG-18
SO4-IC-N-WP	**Water**							
Batch R4185220								
WG2854428-2 LCS								
Sulfate (SO4)			104.5		%		90-110	20-AUG-18
WG2854428-1 MB								
Sulfate (SO4)			<0.30		mg/L		0.3	20-AUG-18
SOLIDS-TOTSUS-WP	**Water**							
Batch R4182366								
WG2857435-14 LCS								
Total Suspended Solids			96.2		%		85-115	23-AUG-18
WG2857435-13 MB								
Total Suspended Solids			<2.0		mg/L		2	23-AUG-18

Quality Control Report

Legend:

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

Quality Control Report

Hold Time Exceedances:

ALS Product Description	Sample ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
Physical Tests							
pH							
	1	16-AUG-18 14:15	20-AUG-18 12:00	0.25	94	hours	EHTR-FM
Anions and Nutrients							
Nitrate in Water by IC (Low Level)							
	1	16-AUG-18 14:15	20-AUG-18 12:00	3	4	days	EHT
Nitrite in Water by IC (Low Level)							
	1	16-AUG-18 14:15	20-AUG-18 12:00	3	4	days	EHT
Bacteriological Tests							
Fecal Coliform by MPN QT97							
	1	16-AUG-18 14:15	18-AUG-18 15:40	30	49	hours	EHTR

Legend & Qualifier Definitions:

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

Notes*:
Where actual sampling date is not provided to ALS, the date (& time) of receipt is used for calculation purposes.
Where actual sampling time is not provided to ALS, the earlier of 12 noon on the sampling date or the time (& date) of receipt is used for calculation purposes. Samples for L2149505 were received on 18-AUG-18 09:30.

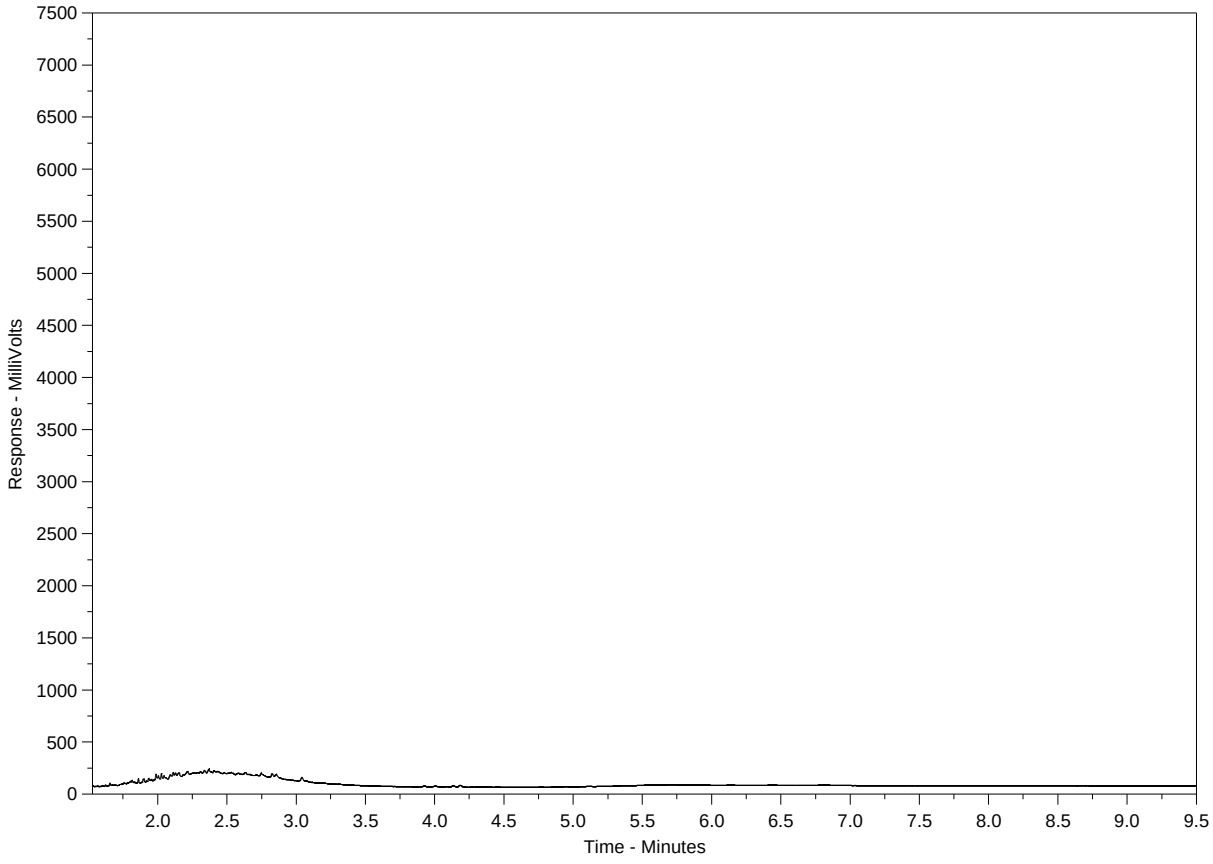
ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where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

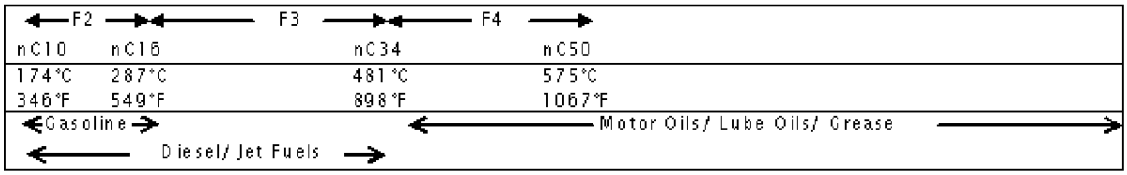
The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide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

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

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L2149505-1
Client Sample ID: RAN 4





The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

ALS Environmental

L2149505-COFC

COC # _____

Page ____ of ____

Report To					
Company:	Indigenous and Northern Affairs Canada (W10787)	☑ PDF	☐ Excel	☐ Digital	☐ Fax
Contact:	ATUAT SHOULDICE	Email 1:	atuat.shouldice@aadnc-aandc.gc.ca		
Address:	Ikingutigit Centre - Suite 1 PO Box 129	Email 2:			
	Rankin Inlet , NU, X0C 0G0	Email 3:			
Phone:	867-645-2840 Cell# : 867-222-5417	**Client / Project Information**			
Invoice To	Same as Report ? ☑ Yes ☐ No	Job #:	INAC - Wastewater		
Hardcopy of Invoice with Report?	☐ Yes ☐ No	**PO / AFE:**			
Company:	(W10787)	LSD:			
Contact:					
Address:					
Phone:	Fax:	Quote #:	**Q57371**		
Lab Work Order # (lab use only)		**ALS Contact:**	Craig Riddell	**Sampled By:**	Atuat Shouldice

Service Requested (Rush for routine analysis subject to availability)

- ◉ Regular (Standard Turnaround Times - Business Days)
- ○ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT
- ○ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT
- ○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT

Analysis Request

Please indicate below Filtered, Preserved or both (F, P, F/P)

Sample #	Sample Identification (This description will appear on the report)	Date Sampled	Time Sampled	Sample Type	BOD-WP	ROU1W+MET-T-L-WP	TSS	NH3-COL-WP	FC-QT97-WP	OG-GRAV-WP	PHENOLS-4AAP-WT	HG-T-CVAA-WP		BTX,F1-F4-WP	PAH,PANH-WP		Number of Containers
	Run 4	Aug 16/18	2:15	Waste	x	x	x	x	x	x	x	x		x	x		16
					x	x	x	x	x	x	x	x		x	x		16

Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

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

By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab.

Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
			LUD	18Aug18	9:30	11 °C				

GENF 18.01 Front