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Building Nunavut Together
Nunavu liuqatigiingniq
Bâtir le Nunavut ensemble

May 17, 2021

Nunavut Water Board
P.O. Box 119
Gjoa Haven, NU X0B 1L0

Attention: Richard Dwyer, Manager of Licensing

Dear Richard,

The Hamlet of Rankin Inlet is pleased to submit the 2020 Annual Report for disposal of solid waste as required under the 3BM-RAN 2025 water license from January 1-December 31, 2020. The new license was issued December 21, 2020.

Sampling of the landfill runoff at point RAN-2 was tested at the ALS Laboratory in Winnipeg.

Thank you for your consideration. Please do not hesitate to contact me with any questions or concerns.

Regards,

Sarah Collins, P. Eng.
Municipal Planning Engineer
Government of Nunavut
Community and Government Services
Phone: 867-975-5478
Email: scollins@gov.nu.ca

ANNUAL REPORT
FOR THE HAMLET OF RANKIN INLET

YEAR BEING REPORTED: 2020

The following information is compiled pursuant to the requirements of Part B, Item 1 of Water License No. 3BM-RAN2025 issued to the Hamlet of Rankin Inlet.

a) **Tabular summaries of all data generated under the Monitoring Program;**
b) **the monthly and annual quantities in cubic metres of Water obtained from all sources;**
c) **the monthly and annual quantities in cubic metres of each and all Waste discharged; including the Hazardous and non-hazardous Waste accepted at the Waste Disposal Facilities;**

Attached is the estimated discharge of sewage waste based on water quantities used.

Month Reported	Quantity of Water Obtained from all sources (m^3)	Quantity of Sewage Waste Discharged (Estimated, m^3)
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 solid waste; there is no authorized water use or sewage disposal.

d) a summary of modifications and/or major maintenance work and/or investigations carried out on the Waste Disposal Facilities (Old Landfill, New Landfill, and Landfarm), including all associated structures and facilities;

- The water pooled at compliance point RAN-2 was pumped back into the Solid Waste Site in June, hence why no samples were taken in the months of June or July.
- Batteries have been crated and stacked, as well as stored in a sea can which is now at full capacity.
- Segregation and clean-up of the wood and metals area has been completed by the Hamlet in the summer of 2020.
- A landfill coordinator was hired during the summer of 2020 to direct the public and contractors on where to dump, as well as clean up and segregate the site.

e) A list of unauthorized discharges and summary of follow-up action taken;

Spill No.	Date	Site Description	Commodity	Quantity (L)
2020103	04/17/20	Maani Ulujuk Ilinniarvik	Petroleum-fuel oil (jet A, diesel, turbo A, heat)	18,400.00
2020186	05/19/20	21-21 Titiganiaq Street	Petroleum-fuel oil (jet A, diesel, turbo A, heat)	200.00
2020183	06/16/20	209-69 Pukkinniq (69th) Street	Petroleum-fuel oil (jet A, diesel, turbo A, heat)	20.00
2020320	09/06/20	Rankin Inlet Housing Asso. PO Box 160 Rankin Inlet	Petroleum-fuel oil (jet A, diesel, turbo A, heat)	302.00
2020372	10/01/20	N/A	Petroleum-fuel oil (jet A, diesel, turbo A, heat)	75.00
2020414	10/22/20	Lot 2, plan 603 Rankin Inlet	Petroleum-waste oil (slops, sludge)	150.00
2020434	11/01/20	Rankin Inlet – Calm Air Airport	Chemicals (including transformer oils)	Unknown
202440	11/17/20	Meladine Gold Project	Petroleum-fuel oil (jet A, diesel, turbo A, heat)	Unknown

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

- None

g) Any updates or revisions for all manuals and plans *(i.e., Operations and Maintenance, Abandonment and Restoration, QA/QC, etc.*) as required by changes in operation and/or technology;

- Updates to current plans will be updated and submitted to NWB in 2021.

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

- The initial planning contract for the solid waste project will be completed in 2021. The cost estimates have indicated that the current funding cannot support constructing a state-of-the-art 20-year landfill. The focus of the project will shift to improving the current site. A second planning contract to assess the cost of the improvements needed at the current site and a construction plan will be undertaken in 2021/22.

i) any other details on Water use or Waste disposal requested by the Board by November 1st of the year being reported.

- None

ADDITIONAL INFORMATION THAT THE LICENSEE DEEMS USEFUL:

- The renewal application package was submitted on September 16th, 2020, by CGS to the Nunavut Water Board for municipal water license 3BM-RAN1520. The 3BM-RAN2025 was issue on December 21, 2020.

FOLLOW-UP REGARDING INSPECTION/COMPLIANCE CONCERNS:

- A copy of the CIRNAC report from the August 26th inspection has not been received at the time of this submission.

List of Appendices

Appendix A: Weekly Inspections at Monitoring Program Station RAN-2 - 1 page
Appendix B: Laboratory Certificate of Analysis

- **Certificate of Analysis June 25, 2020 – 24 pages**
- **Certificate of Analysis August 28, 2020 – 9 pages**
- **Certificate of Analysis October 20, 2020 – 8 pages**

Appendix C: Hazardous Materials Spill Database, Rankin Inlet 2020 – 1 page
Appendix D: Rankin Inlet 2020 Sampling Summary – 1 pages
Appendix E: CIRNAC Inspection Report - 1 pages
Appendix F: Licencee Representative Annual Inspection Report - 1 pages

Appendix A: Weekly Inspections at Monitoring Program Station RAN-2

Weekly inspection of monitoring station RAN-2 was not received by CGS.

Appendix B: Laboratory Certificate of Analysis

Nunavut Community & Government
Services - Rankin Inlet
ATTN: CONNOR FAULKNER (Rankin Inlet)
P.O. Box 490
Rankin Inlet NU X0C 0G0

Date Received: 27-JUN-20
Report Date: 10-JUL-20 15:58 (MT)
Version: FINAL

Client Phone: 867-645-8113

Certificate of Analysis

Lab Work Order #: L2467001

Project P.O. #: NOT SUBMITTED
Job Reference: RANKIN INLET NU, WWTP
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
L2467001-1 GRA-7							
Sampled By: CF on 25-JUN-20 @ 13:56							
Matrix: WW							
Miscellaneous Parameters							
Xylenes (Total)	<0.00064		0.00064	mg/L		07-JUL-20	
BTX plus F1 by GCMS							
Benzene	<0.00050		0.00050	mg/L		02-JUL-20	R5139615
Toluene	<0.0010		0.0010	mg/L		02-JUL-20	R5139615
Ethyl benzene	<0.00050		0.00050	mg/L		02-JUL-20	R5139615
o-Xylene	<0.00050		0.00050	mg/L		02-JUL-20	R5139615
m+p-Xylenes	<0.00040		0.00040	mg/L		02-JUL-20	R5139615
F1 (C6-C10)	<0.10		0.10	mg/L		02-JUL-20	R5139615
Surrogate: 4-Bromofluorobenzene (SS)	98.9		70-130	%		02-JUL-20	R5139615
CCME PHC F2-F4 in Water							
F2 (C10-C16)	<0.10		0.10	mg/L	06-JUL-20	07-JUL-20	R5144916
F3 (C16-C34)	<0.25		0.25	mg/L	06-JUL-20	07-JUL-20	R5144916
F4 (C34-C50)	<0.25		0.25	mg/L	06-JUL-20	07-JUL-20	R5144916
Surrogate: 2-Bromobenzotrifluoride	101.0		60-140	%	06-JUL-20	07-JUL-20	R5144916
Polyaromatic Hydrocarbons (PAHs)							
Acenaphthene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Acenaphthylene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Anthracene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Benzo(a)anthracene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Benzo(a)pyrene	<0.0050		0.0050	ug/L	02-JUL-20	06-JUL-20	R5142687
Benzo(b)fluoranthene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Benzo(g,h,i)perylene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Benzo(k)fluoranthene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Chrysene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Dibenzo(ah)anthracene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Fluoranthene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Fluorene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Indeno(1,2,3-cd)pyrene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Naphthalene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Phenanthrene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Pyrene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Surrogate: d8-Naphthalene	100.6		60-140	%	02-JUL-20	06-JUL-20	R5142687
Surrogate: d10-Phenanthrene	106.5		60-140	%	02-JUL-20	06-JUL-20	R5142687
Surrogate: d12-Chrysene	83.1		60-140	%	02-JUL-20	06-JUL-20	R5142687
Surrogate: d10-Acenaphthene	101.2		60-140	%	02-JUL-20	06-JUL-20	R5142687
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	13.4		1.2	mg/L		02-JUL-20	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		02-JUL-20	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		02-JUL-20	
Alkalinity, Total (as CaCO3)							
Alkalinity, Total (as CaCO3)	11.0		1.0	mg/L		30-JUN-20	R5139310
Ammonia by colour							
Ammonia, Total (as N)	<0.010		0.010	mg/L		02-JUL-20	R5139559
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	<2.0		2.0	mg/L		27-JUN-20	R5139611
Carbonaceous BOD							
BOD Carbonaceous	<2.0		2.0	mg/L		27-JUN-20	R5139611
Chloride in Water by IC							
Chloride (Cl)	6.04		0.50	mg/L		27-JUN-20	R5139839

* 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
L2467001-1 GRA-7							
Sampled By: CF on 25-JUN-20 @ 13:56							
Matrix: WW							
Conductivity							
Conductivity	48.2		1.0	umhos/cm		30-JUN-20	R5139310
Fecal coliforms, 1:10 dilution by QT97							
Fecal Coliforms	<10	PEHT	10	MPN/100mL		27-JUN-20	R5135420
Hardness Calculated							
Hardness (as CaCO3)	13.9	HTC	0.20	mg/L		08-JUL-20	
Mercury Total							
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L	03-JUL-20	06-JUL-20	R5143030
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		27-JUN-20	R5139839
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		03-JUL-20	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		27-JUN-20	R5139839
Oil & Grease - Gravimetric							
Oil and Grease	<5.0		5.0	mg/L		03-JUL-20	R5142932
Phenol (4AAP)							
Phenols (4AAP)	<0.0010		0.0010	mg/L		30-JUN-20	R5139701
Phosphorus, Total							
Phosphorus (P)-Total	0.0100		0.0030	mg/L		03-JUL-20	R5140958
Sulfate in Water by IC							
Sulfate (SO4)	1.83		0.30	mg/L		27-JUN-20	R5139839
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.0198		0.0030	mg/L	03-JUL-20	03-JUL-20	R5142914
Arsenic (As)-Total	0.00041		0.00010	mg/L	03-JUL-20	03-JUL-20	R5142914
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L	03-JUL-20	03-JUL-20	R5142914
Calcium (Ca)-Total	4.26		0.050	mg/L	03-JUL-20	03-JUL-20	R5142914
Chromium (Cr)-Total	<0.00010		0.00010	mg/L	03-JUL-20	03-JUL-20	R5142914
Cobalt (Co)-Total	<0.00010		0.00010	mg/L	03-JUL-20	03-JUL-20	R5142914
Copper (Cu)-Total	0.00066		0.00050	mg/L	03-JUL-20	03-JUL-20	R5142914
Iron (Fe)-Total	0.082		0.010	mg/L	03-JUL-20	03-JUL-20	R5142914
Lead (Pb)-Total	<0.000050		0.000050	mg/L	03-JUL-20	03-JUL-20	R5142914
Magnesium (Mg)-Total	0.779		0.0050	mg/L	03-JUL-20	03-JUL-20	R5142914
Manganese (Mn)-Total	0.00686		0.00010	mg/L	03-JUL-20	03-JUL-20	R5142914
Nickel (Ni)-Total	<0.00050		0.00050	mg/L	03-JUL-20	03-JUL-20	R5142914
Potassium (K)-Total	0.738		0.050	mg/L	03-JUL-20	03-JUL-20	R5142914
Sodium (Na)-Total	3.13		0.050	mg/L	03-JUL-20	03-JUL-20	R5142914
Zinc (Zn)-Total	<0.0030		0.0030	mg/L	03-JUL-20	03-JUL-20	R5142914
Total Organic Carbon by Combustion							
Total Organic Carbon	3.03		0.50	mg/L		09-JUL-20	R5147924
Total Suspended Solids							
Total Suspended Solids	<3.0		3.0	mg/L		02-JUL-20	R5147267
pH							
pH	7.33		0.10	pH units		30-JUN-20	R5139310
L2467001-2 GRA-6							
Sampled By: CF on 25-JUN-20 @ 14:16							
Matrix: WW							
Miscellaneous Parameters							
Xylenes (Total)	<0.00064		0.00064	mg/L		07-JUL-20	
BTX plus F1 by GCMS							
Benzene	<0.00050		0.00050	mg/L		02-JUL-20	R5139615
Toluene	<0.0010		0.0010	mg/L		02-JUL-20	R5139615
Ethyl benzene	<0.00050		0.00050	mg/L		02-JUL-20	R5139615

* 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
L2467001-2 GRA-6							
Sampled By: CF on 25-JUN-20 @ 14:16							
Matrix: WW							
BTX plus F1 by GCMS							
o-Xylene	<0.00050		0.00050	mg/L		02-JUL-20	R5139615
m+p-Xylenes	<0.00040		0.00040	mg/L		02-JUL-20	R5139615
F1 (C6-C10)	<0.10		0.10	mg/L		02-JUL-20	R5139615
Surrogate: 4-Bromofluorobenzene (SS)	101.7		70-130	%		02-JUL-20	R5139615
CCME PHC F2-F4 in Water							
F2 (C10-C16)	<0.10		0.10	mg/L	06-JUL-20	07-JUL-20	R5144916
F3 (C16-C34)	<0.25		0.25	mg/L	06-JUL-20	07-JUL-20	R5144916
F4 (C34-C50)	<0.25		0.25	mg/L	06-JUL-20	07-JUL-20	R5144916
Surrogate: 2-Bromobenzotrifluoride	100.6		60-140	%	06-JUL-20	07-JUL-20	R5144916
Polyaromatic Hydrocarbons (PAHs)							
Acenaphthene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Acenaphthylene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Anthracene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Benzo(a)anthracene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Benzo(a)pyrene	<0.0050		0.0050	ug/L	02-JUL-20	06-JUL-20	R5142687
Benzo(b)fluoranthene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Benzo(g,h,i)perylene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Benzo(k)fluoranthene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Chrysene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Dibenzo(ah)anthracene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Fluoranthene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Fluorene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Indeno(1,2,3-cd)pyrene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Naphthalene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Phenanthrene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Pyrene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Surrogate: d8-Naphthalene	94.2		60-140	%	02-JUL-20	06-JUL-20	R5142687
Surrogate: d10-Phenanthrene	101.8		60-140	%	02-JUL-20	06-JUL-20	R5142687
Surrogate: d12-Chrysene	77.5		60-140	%	02-JUL-20	06-JUL-20	R5142687
Surrogate: d10-Acenaphthene	96.4		60-140	%	02-JUL-20	06-JUL-20	R5142687
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	14.4		1.2	mg/L		03-JUL-20	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		03-JUL-20	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		03-JUL-20	
Alkalinity, Total (as CaCO3)							
Alkalinity, Total (as CaCO3)	11.8		1.0	mg/L		02-JUL-20	R5140817
Ammonia by colour							
Ammonia, Total (as N)	<0.010		0.010	mg/L		02-JUL-20	R5139559
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	<2.0		2.0	mg/L		27-JUN-20	R5139611
Carbonaceous BOD							
BOD Carbonaceous	<2.0		2.0	mg/L		27-JUN-20	R5139611
Chloride in Water by IC							
Chloride (Cl)	6.59		0.50	mg/L		27-JUN-20	R5139839
Conductivity							
Conductivity	52.9		1.0	umhos/cm		02-JUL-20	R5140817
Fecal coliforms, 1:10 dilution by QT97							
Fecal Coliforms	<10	PEHT	10	MPN/100mL		27-JUN-20	R5135420
Hardness Calculated							

* 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
L2467001-2 GRA-6							
Sampled By: CF on 25-JUN-20 @ 14:16							
Matrix: WW							
Hardness Calculated							
Hardness (as CaCO3)	15.0	HTC	0.20	mg/L		08-JUL-20	
Mercury Total							
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L	03-JUL-20	06-JUL-20	R5143030
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		27-JUN-20	R5139839
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		03-JUL-20	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		27-JUN-20	R5139839
Oil & Grease - Gravimetric							
Oil and Grease	<5.0		5.0	mg/L		03-JUL-20	R5142932
Phenol (4AAP)							
Phenols (4AAP)	<0.0010		0.0010	mg/L		30-JUN-20	R5139701
Phosphorus, Total							
Phosphorus (P)-Total	0.0087		0.0030	mg/L		03-JUL-20	R5140958
Sulfate in Water by IC							
Sulfate (SO4)	2.02		0.30	mg/L		27-JUN-20	R5139839
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.0162		0.0030	mg/L	03-JUL-20	03-JUL-20	R5142914
Arsenic (As)-Total	0.00042		0.00010	mg/L	03-JUL-20	03-JUL-20	R5142914
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L	03-JUL-20	03-JUL-20	R5142914
Calcium (Ca)-Total	4.63		0.050	mg/L	03-JUL-20	03-JUL-20	R5142914
Chromium (Cr)-Total	<0.00010		0.00010	mg/L	03-JUL-20	03-JUL-20	R5142914
Cobalt (Co)-Total	<0.00010		0.00010	mg/L	03-JUL-20	03-JUL-20	R5142914
Copper (Cu)-Total	0.00070		0.00050	mg/L	03-JUL-20	03-JUL-20	R5142914
Iron (Fe)-Total	0.081		0.010	mg/L	03-JUL-20	03-JUL-20	R5142914
Lead (Pb)-Total	<0.000050		0.000050	mg/L	03-JUL-20	03-JUL-20	R5142914
Magnesium (Mg)-Total	0.834		0.0050	mg/L	03-JUL-20	03-JUL-20	R5142914
Manganese (Mn)-Total	0.00640		0.00010	mg/L	03-JUL-20	03-JUL-20	R5142914
Nickel (Ni)-Total	0.00053		0.00050	mg/L	03-JUL-20	03-JUL-20	R5142914
Potassium (K)-Total	0.782		0.050	mg/L	03-JUL-20	03-JUL-20	R5142914
Sodium (Na)-Total	3.15		0.050	mg/L	03-JUL-20	03-JUL-20	R5142914
Zinc (Zn)-Total	<0.0030		0.0030	mg/L	03-JUL-20	03-JUL-20	R5142914
Total Organic Carbon by Combustion							
Total Organic Carbon	3.48		0.50	mg/L		09-JUL-20	R5147924
Total Suspended Solids							
Total Suspended Solids	<3.0		3.0	mg/L		02-JUL-20	R5147267
pH							
pH	7.15		0.10	pH units		02-JUL-20	R5140817
L2467001-3 GRA-1							
Sampled By: CF on 25-JUN-20 @ 14:42							
Matrix: WW							
Miscellaneous Parameters							
Xylenes (Total)	<0.00064		0.00064	mg/L		07-JUL-20	
BTX plus F1 by GCMS							
Benzene	<0.00050		0.00050	mg/L		02-JUL-20	R5139615
Toluene	<0.0010		0.0010	mg/L		02-JUL-20	R5139615
Ethyl benzene	<0.00050		0.00050	mg/L		02-JUL-20	R5139615
o-Xylene	<0.00050		0.00050	mg/L		02-JUL-20	R5139615
m+p-Xylenes	<0.00040		0.00040	mg/L		02-JUL-20	R5139615
F1 (C6-C10)	<0.10		0.10	mg/L		02-JUL-20	R5139615

* 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
L2467001-3 GRA-1							
Sampled By: CF on 25-JUN-20 @ 14:42							
Matrix: WW							
BTX plus F1 by GCMS							
Surrogate: 4-Bromofluorobenzene (SS)	100.5		70-130	%		02-JUL-20	R5139615
CCME PHC F2-F4 in Water							
F2 (C10-C16)	<0.10		0.10	mg/L	06-JUL-20	07-JUL-20	R5144916
F3 (C16-C34)	<0.25		0.25	mg/L	06-JUL-20	07-JUL-20	R5144916
F4 (C34-C50)	<0.25		0.25	mg/L	06-JUL-20	07-JUL-20	R5144916
Surrogate: 2-Bromobenzotrifluoride	101.3		60-140	%	06-JUL-20	07-JUL-20	R5144916
Polyaromatic Hydrocarbons (PAHs)							
Acenaphthene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Acenaphthylene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Anthracene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Benzo(a)anthracene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Benzo(a)pyrene	<0.0050		0.0050	ug/L	02-JUL-20	06-JUL-20	R5142687
Benzo(b)fluoranthene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Benzo(g,h,i)perylene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Benzo(k)fluoranthene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Chrysene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Dibenzo(ah)anthracene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Fluoranthene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Fluorene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Indeno(1,2,3-cd)pyrene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Naphthalene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Phenanthrene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Pyrene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Surrogate: d8-Naphthalene	94.6		60-140	%	02-JUL-20	06-JUL-20	R5142687
Surrogate: d10-Phenanthrene	101.2		60-140	%	02-JUL-20	06-JUL-20	R5142687
Surrogate: d12-Chrysene	76.5		60-140	%	02-JUL-20	06-JUL-20	R5142687
Surrogate: d10-Acenaphthene	96.3		60-140	%	02-JUL-20	06-JUL-20	R5142687
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	35.9		1.2	mg/L		03-JUL-20	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		03-JUL-20	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		03-JUL-20	
Alkalinity, Total (as CaCO3)							
Alkalinity, Total (as CaCO3)	29.4		1.0	mg/L		02-JUL-20	R5140817
Ammonia by colour							
Ammonia, Total (as N)	0.047		0.010	mg/L		02-JUL-20	R5139559
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	<2.0		2.0	mg/L		27-JUN-20	R5139611
Carbonaceous BOD							
BOD Carbonaceous	<2.0		2.0	mg/L		27-JUN-20	R5139611
Chloride in Water by IC							
Chloride (Cl)	19.0		0.50	mg/L		27-JUN-20	R5139839
Conductivity							
Conductivity	143		1.0	umhos/cm		02-JUL-20	R5140817
Fecal coliforms, 1:10 dilution by QT97							
Fecal Coliforms	<10	PEHT	10	MPN/100mL		27-JUN-20	R5135420
Hardness Calculated							
Hardness (as CaCO3)	42.4	HTC	0.20	mg/L		06-JUL-20	
Mercury Total							
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L	03-JUL-20	06-JUL-20	R5143030

* 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
L2467001-3 GRA-1							
Sampled By: CF on 25-JUN-20 @ 14:42							
Matrix: WW							
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		27-JUN-20	R5139839
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		03-JUL-20	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		27-JUN-20	R5139839
Oil & Grease - Gravimetric							
Oil and Grease	<5.0		5.0	mg/L		03-JUL-20	R5142932
Phenol (4AAP)							
Phenols (4AAP)	<0.0010		0.0010	mg/L		30-JUN-20	R5139701
Phosphorus, Total							
Phosphorus (P)-Total	0.0123		0.0030	mg/L		03-JUL-20	R5140958
Sulfate in Water by IC							
Sulfate (SO4)	10.1		0.30	mg/L		27-JUN-20	R5139839
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.0301		0.0030	mg/L	03-JUL-20	03-JUL-20	R5142914
Arsenic (As)-Total	0.00086		0.00010	mg/L	03-JUL-20	03-JUL-20	R5142914
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L	03-JUL-20	03-JUL-20	R5142914
Calcium (Ca)-Total	13.1		0.050	mg/L	03-JUL-20	03-JUL-20	R5142914
Chromium (Cr)-Total	0.00016		0.00010	mg/L	03-JUL-20	03-JUL-20	R5142914
Cobalt (Co)-Total	0.00012		0.00010	mg/L	03-JUL-20	03-JUL-20	R5142914
Copper (Cu)-Total	0.00096		0.00050	mg/L	03-JUL-20	03-JUL-20	R5142914
Iron (Fe)-Total	0.062		0.010	mg/L	03-JUL-20	03-JUL-20	R5142914
Lead (Pb)-Total	0.000105		0.000050	mg/L	03-JUL-20	03-JUL-20	R5142914
Magnesium (Mg)-Total	2.38		0.0050	mg/L	03-JUL-20	03-JUL-20	R5142914
Manganese (Mn)-Total	0.0315		0.00010	mg/L	03-JUL-20	03-JUL-20	R5142914
Nickel (Ni)-Total	0.00253		0.00050	mg/L	03-JUL-20	03-JUL-20	R5142914
Potassium (K)-Total	1.37		0.050	mg/L	03-JUL-20	03-JUL-20	R5142914
Sodium (Na)-Total	9.83		0.050	mg/L	03-JUL-20	03-JUL-20	R5142914
Zinc (Zn)-Total	<0.0030		0.0030	mg/L	03-JUL-20	03-JUL-20	R5142914
Total Organic Carbon by Combustion							
Total Organic Carbon	4.28		0.50	mg/L		09-JUL-20	R5147924
Total Suspended Solids							
Total Suspended Solids	<3.0		3.0	mg/L		02-JUL-20	R5147267
pH							
pH	7.43		0.10	pH units		02-JUL-20	R5140817

* 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.
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-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.

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 degrees 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.

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
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 200.2/6020B (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-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 Phosphorus is determined colourmetrically after persulphate digestion of the sample.			
PAH-WT	Water	Polyaromatic Hydrocarbons (PAHs)	SW846 8270
Aqueous samples, fortified with surrogates, are extracted using liquid/liquid extraction technique. The sample extracts are concentrated and then analyzed using GC/MS. Results for benzo(b) fluoranthene may include contributions from benzo(j)fluoranthene, if also present in the sample.			
PH-WP	Water	pH	APHA 4500H
The pH of a sample is the determination of the activity of the hydrogen ions by potentiometric measurement using a standard hydrogen electrode and a reference electrode.			
PHENOLS-4AAP-WT	Water	Phenol (4AAP)	EPA 9066
An automated method is used to distill the sample. The distillate is then buffered to pH 9.4 which reacts with 4AAP and potassium ferricyanide to form a red complex which is measured colorimetrically.			
SO4-IC-N-WP	Water	Sulfate in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
SOLIDS-TOTSUS-WP	Water	Total Suspended Solids	APHA 2540 D (modified)
Total suspended solids in 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:

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**

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

Workorder: L2467001 Report Date: 10-JUL-20

Client: Nunavut Community & Government Services - Rankin Inlet
P.O. Box 490
Rankin Inlet NU X0C 0G0

Contact: CONNOR FAULKNER (Rankin Inlet)

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
ALK-TITR-WP	Water							
Batch R5139310								
WG3353886-25 DUP		**L2467001-1**						
Alkalinity, Total (as CaCO3)		11.0	11.2		mg/L	1.8	20	30-JUN-20
WG3353886-24 LCS								
Alkalinity, Total (as CaCO3)			102.9		%		85-115	30-JUN-20
WG3353886-21 MB								
Alkalinity, Total (as CaCO3)			<1.0		mg/L		1	30-JUN-20
Batch R5140817								
WG3354954-5 DUP		**L2467001-2**						
Alkalinity, Total (as CaCO3)		11.8	11.7		mg/L	0.9	20	02-JUL-20
WG3354954-4 LCS								
Alkalinity, Total (as CaCO3)			101.6		%		85-115	02-JUL-20
WG3354954-1 MB								
Alkalinity, Total (as CaCO3)			<1.0		mg/L		1	02-JUL-20
BOD-CBOD-WP	Water							
Batch R5139611								
WG3351387-2 LCS								
BOD Carbonaceous			106.5		%		85-115	27-JUN-20
WG3351387-1 MB								
BOD Carbonaceous			<2.0		mg/L		2	27-JUN-20
BOD-WP	Water							
Batch R5139611								
WG3351387-2 LCS								
Biochemical Oxygen Demand			107.0		%		85-115	27-JUN-20
WG3351387-1 MB								
Biochemical Oxygen Demand			<2.0		mg/L		2	27-JUN-20
BTEXS+F1-HSMS-WP	Water							
Batch R5139615								
WG3351994-2 LCS								
Benzene			103.0		%		70-130	29-JUN-20
Toluene			104.3		%		70-130	29-JUN-20
Ethyl benzene			107.4		%		70-130	29-JUN-20
o-Xylene			109.5		%		70-130	29-JUN-20
m+p-Xylenes			111.6		%		70-130	29-JUN-20
WG3351994-3 LCS								
F1 (C6-C10)			111.6		%		70-130	29-JUN-20
WG3351994-1 MB								
Benzene			<0.00050		mg/L		0.0005	29-JUN-20

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
BTEXS+F1-HSMS-WP	Water							
Batch R5139615								
WG3351994-1 MB								
Toluene			<0.0010		mg/L		0.001	29-JUN-20
Ethyl benzene			<0.00050		mg/L		0.0005	29-JUN-20
o-Xylene			<0.00050		mg/L		0.0005	29-JUN-20
m+p-Xylenes			<0.00040		mg/L		0.0004	29-JUN-20
F1 (C6-C10)			<0.10		mg/L		0.1	29-JUN-20
Surrogate: 4-Bromofluorobenzene (SS)			108.7		%		70-130	29-JUN-20
C-TOC-HTC-WP	Water							
Batch R5147924								
WG3359692-2 LCS								
Total Organic Carbon			101.3		%		80-120	09-JUL-20
WG3359692-1 MB								
Total Organic Carbon			<0.50		mg/L		0.5	09-JUL-20
CL-IC-N-WP	Water							
Batch R5139839								
WG3351429-6 LCS								
Chloride (Cl)			99.7		%		90-110	27-JUN-20
WG3351429-5 MB								
Chloride (Cl)			<0.50		mg/L		0.5	27-JUN-20
EC-WP	Water							
Batch R5139310								
WG3353886-25 DUP		**L2467001-1**						
Conductivity		48.2	49.4		umhos/cm	2.5	10	30-JUN-20
WG3353886-23 LCS								
Conductivity			96.3		%		90-110	30-JUN-20
WG3353886-21 MB								
Conductivity			<1.0		umhos/cm		1	30-JUN-20
Batch R5140817								
WG3354954-5 DUP		**L2467001-2**						
Conductivity		52.9	51.8		umhos/cm	2.1	10	02-JUL-20
WG3354954-3 LCS								
Conductivity			99.3		%		90-110	02-JUL-20
WG3354954-1 MB								
Conductivity			<1.0		umhos/cm		1	02-JUL-20
F2-F4-FID-WP	Water							

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
F2-F4-FID-WP	Water							
Batch R5144916								
WG3356399-2 LCS								
F2 (C10-C16)			87.6		%		70-130	07-JUL-20
F3 (C16-C34)			82.7		%		70-130	07-JUL-20
F4 (C34-C50)			80.4		%		70-130	07-JUL-20
WG3356399-1 MB								
F2 (C10-C16)			<0.10		mg/L		0.1	07-JUL-20
F3 (C16-C34)			<0.25		mg/L		0.25	07-JUL-20
F4 (C34-C50)			<0.25		mg/L		0.25	07-JUL-20
Surrogate: 2-Bromobenzotrifluoride			99.8		%		60-140	07-JUL-20
FC10-QT97-WP	Water							
Batch R5135420								
WG3351613-1 MB								
Fecal Coliforms			<1		MPN/100mL		1	27-JUN-20
HG-T-CVAA-WP	Water							
Batch R5143030								
WG3356391-2 LCS								
Mercury (Hg)-Total			110.0		%		80-120	06-JUL-20
WG3356391-1 MB								
Mercury (Hg)-Total			<0.000005C		mg/L		0.000005	06-JUL-20
MET-T-CCMS-WP	Water							
Batch R5142914								
WG3354517-2 LCS								
Aluminum (Al)-Total			103.1		%		80-120	03-JUL-20
Arsenic (As)-Total			100.6		%		80-120	03-JUL-20
Cadmium (Cd)-Total			99.5		%		80-120	03-JUL-20
Calcium (Ca)-Total			100.4		%		80-120	03-JUL-20
Chromium (Cr)-Total			100.5		%		80-120	03-JUL-20
Cobalt (Co)-Total			100.7		%		80-120	03-JUL-20
Copper (Cu)-Total			100.0		%		80-120	03-JUL-20
Iron (Fe)-Total			98.4		%		80-120	03-JUL-20
Lead (Pb)-Total			105.9		%		80-120	03-JUL-20
Magnesium (Mg)-Total			98.2		%		80-120	03-JUL-20
Manganese (Mn)-Total			99.8		%		80-120	03-JUL-20
Nickel (Ni)-Total			99.3		%		80-120	03-JUL-20
Potassium (K)-Total			101.1		%		80-120	03-JUL-20

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WP	Water							
Batch R5142914								
WG3354517-2 LCS								
Sodium (Na)-Total			99.1		%		80-120	03-JUL-20
Zinc (Zn)-Total			102.2		%		80-120	03-JUL-20
WG3354517-1 MB								
Aluminum (Al)-Total			<0.0030		mg/L		0.003	03-JUL-20
Arsenic (As)-Total			<0.00010		mg/L		0.0001	03-JUL-20
Cadmium (Cd)-Total			<0.000005C		mg/L		0.000005	03-JUL-20
Calcium (Ca)-Total			<0.050		mg/L		0.05	03-JUL-20
Chromium (Cr)-Total			<0.00010		mg/L		0.0001	03-JUL-20
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	03-JUL-20
Copper (Cu)-Total			<0.00050		mg/L		0.0005	03-JUL-20
Iron (Fe)-Total			<0.010		mg/L		0.01	03-JUL-20
Lead (Pb)-Total			<0.000050		mg/L		0.00005	03-JUL-20
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	03-JUL-20
Manganese (Mn)-Total			<0.00010		mg/L		0.0001	03-JUL-20
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	03-JUL-20
Potassium (K)-Total			<0.050		mg/L		0.05	03-JUL-20
Sodium (Na)-Total			<0.050		mg/L		0.05	03-JUL-20
Zinc (Zn)-Total			<0.0030		mg/L		0.003	03-JUL-20
NH3-COL-WP	Water							
Batch R5139559								
WG3354179-18 LCS								
Ammonia, Total (as N)			101.6		%		85-115	02-JUL-20
WG3354179-17 MB								
Ammonia, Total (as N)			<0.010		mg/L		0.01	02-JUL-20
NO2-IC-N-WP	Water							
Batch R5139839								
WG3351429-6 LCS								
Nitrite (as N)			103.3		%		90-110	27-JUN-20
WG3351429-5 MB								
Nitrite (as N)			<0.010		mg/L		0.01	27-JUN-20
NO3-IC-N-WP	Water							
Batch R5139839								
WG3351429-6 LCS								
Nitrate (as N)			100.9		%		90-110	27-JUN-20
WG3351429-5 MB								

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
NO3-IC-N-WP	Water							
Batch R5139839								
WG3351429-5 MB								
Nitrate (as N)			<0.020		mg/L		0.02	27-JUN-20
OG-GRAV-WP	Water							
Batch R5142932								
WG3354784-2 LCS								
Oil and Grease			97.8		%		70-130	03-JUL-20
WG3354784-1 MB								
Oil and Grease			<5.0		mg/L		5	03-JUL-20
P-T-COL-WP	Water							
Batch R5140958								
WG3354450-22 LCS								
Phosphorus (P)-Total			90.9		%		80-120	03-JUL-20
WG3354450-21 MB								
Phosphorus (P)-Total			<0.0030		mg/L		0.003	03-JUL-20
PAH-WT	Water							
Batch R5142687								
WG3354601-2 LCS								
Acenaphthene			96.6		%		50-140	06-JUL-20
Acenaphthylene			101.1		%		50-140	06-JUL-20
Anthracene			102.6		%		50-140	06-JUL-20
Benzo(a)anthracene			97.2		%		50-140	06-JUL-20
Benzo(a)pyrene			88.4		%		60-130	06-JUL-20
Benzo(b)fluoranthene			104.1		%		50-140	06-JUL-20
Benzo(g,h,i)perylene			109.6		%		50-140	06-JUL-20
Benzo(k)fluoranthene			102.9		%		50-140	06-JUL-20
Chrysene			94.0		%		50-140	06-JUL-20
Dibenzo(ah)anthracene			102.2		%		50-140	06-JUL-20
Fluoranthene			105.8		%		50-140	06-JUL-20
Fluorene			101.9		%		50-140	06-JUL-20
Indeno(1,2,3-cd)pyrene			113.8		%		50-140	06-JUL-20
Naphthalene			87.5		%		50-130	06-JUL-20
Phenanthrene			106.7		%		50-140	06-JUL-20
Pyrene			106.9		%		50-140	06-JUL-20
WG3354601-1 MB								
Acenaphthene			<0.020		ug/L		0.02	06-JUL-20

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PAH-WT	Water							
Batch R5142687								
WG3354601-1 MB								
Acenaphthylene			<0.020		ug/L		0.02	06-JUL-20
Anthracene			<0.020		ug/L		0.02	06-JUL-20
Benzo(a)anthracene			<0.020		ug/L		0.02	06-JUL-20
Benzo(a)pyrene			<0.0050		ug/L		0.005	06-JUL-20
Benzo(b)fluoranthene			<0.020		ug/L		0.02	06-JUL-20
Benzo(g,h,i)perylene			<0.020		ug/L		0.02	06-JUL-20
Benzo(k)fluoranthene			<0.020		ug/L		0.02	06-JUL-20
Chrysene			<0.020		ug/L		0.02	06-JUL-20
Dibenzo(ah)anthracene			<0.020		ug/L		0.02	06-JUL-20
Fluoranthene			<0.020		ug/L		0.02	06-JUL-20
Fluorene			<0.020		ug/L		0.02	06-JUL-20
Indeno(1,2,3-cd)pyrene			<0.020		ug/L		0.02	06-JUL-20
Naphthalene			<0.020		ug/L		0.02	06-JUL-20
Phenanthrene			<0.020		ug/L		0.02	06-JUL-20
Pyrene			<0.020		ug/L		0.02	06-JUL-20
Surrogate: d8-Naphthalene			100.9		%		60-140	06-JUL-20
Surrogate: d10-Phenanthrene			108.5		%		60-140	06-JUL-20
Surrogate: d12-Chrysene			85.2		%		60-140	06-JUL-20
Surrogate: d10-Acenaphthene			103.2		%		60-140	06-JUL-20
PH-WP	Water							
Batch R5139310								
WG3353886-25 DUP		**L2467001-1**						
pH		7.33	7.34	J	pH units	0.01	0.2	30-JUN-20
WG3353886-22 LCS								
pH			7.38		pH units		7.3-7.5	30-JUN-20
Batch R5140817								
WG3354954-5 DUP		**L2467001-2**						
pH		7.15	7.14	J	pH units	0.01	0.2	02-JUL-20
WG3354954-2 LCS								
pH			7.35		pH units		7.3-7.5	02-JUL-20
PHENOLS-4AAP-WT	Water							
Batch R5139701								
WG3353291-2 LCS								
Phenols (4AAP)			104.9		%		85-115	30-JUN-20
WG3353291-1 MB								

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PHENOLS-4AAP-WT	Water							
Batch R5139701								
WG3353291-1 MB								
Phenols (4AAP)			<0.0010		mg/L		0.001	30-JUN-20
SO4-IC-N-WP	Water							
Batch R5139839								
WG3351429-6 LCS								
Sulfate (SO4)			101.5		%		90-110	27-JUN-20
WG3351429-5 MB								
Sulfate (SO4)			<0.30		mg/L		0.3	27-JUN-20
SOLIDS-TOTSUS-WP	Water							
Batch R5147267								
WG3354056-9 DUP		**L2467001-2**						
Total Suspended Solids		<3.0	<3.0	RPD-NA	mg/L	N/A	20	02-JUL-20
WG3354056-5 LCS								
Total Suspended Solids			91.8		%		85-115	02-JUL-20
WG3354056-8 LCS								
Total Suspended Solids			95.2		%		85-115	02-JUL-20
WG3354056-4 MB								
Total Suspended Solids			<3.0		mg/L		3	02-JUL-20
WG3354056-7 MB								
Total Suspended Solids			<3.0		mg/L		3	02-JUL-20

Legend:

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

Sample Parameter Qualifier Definitions:

Qualifier	Description
J	Duplicate results and limits are expressed in terms of absolute difference.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Hold Time Exceedances:

ALS Product Description	Sample ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
Physical Tests							
pH							
	1	25-JUN-20 13:56	30-JUN-20 12:00	0.25	118	hours	EHTR-FM
	2	25-JUN-20 14:16	02-JUL-20 12:00	0.25	166	hours	EHTR-FM
	3	25-JUN-20 14:42	02-JUL-20 12:00	0.25	165	hours	EHTR-FM
Bacteriological Tests							
Fecal coliforms, 1:10 dilution by QT97							
	1	25-JUN-20 13:56	27-JUN-20 14:55	30	49	hours	EHTR
	2	25-JUN-20 14:16	27-JUN-20 14:55	30	49	hours	EHTR
	3	25-JUN-20 14:42	27-JUN-20 14:55	30	48	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 L2467001 were received on 27-JUN-20 09:35.

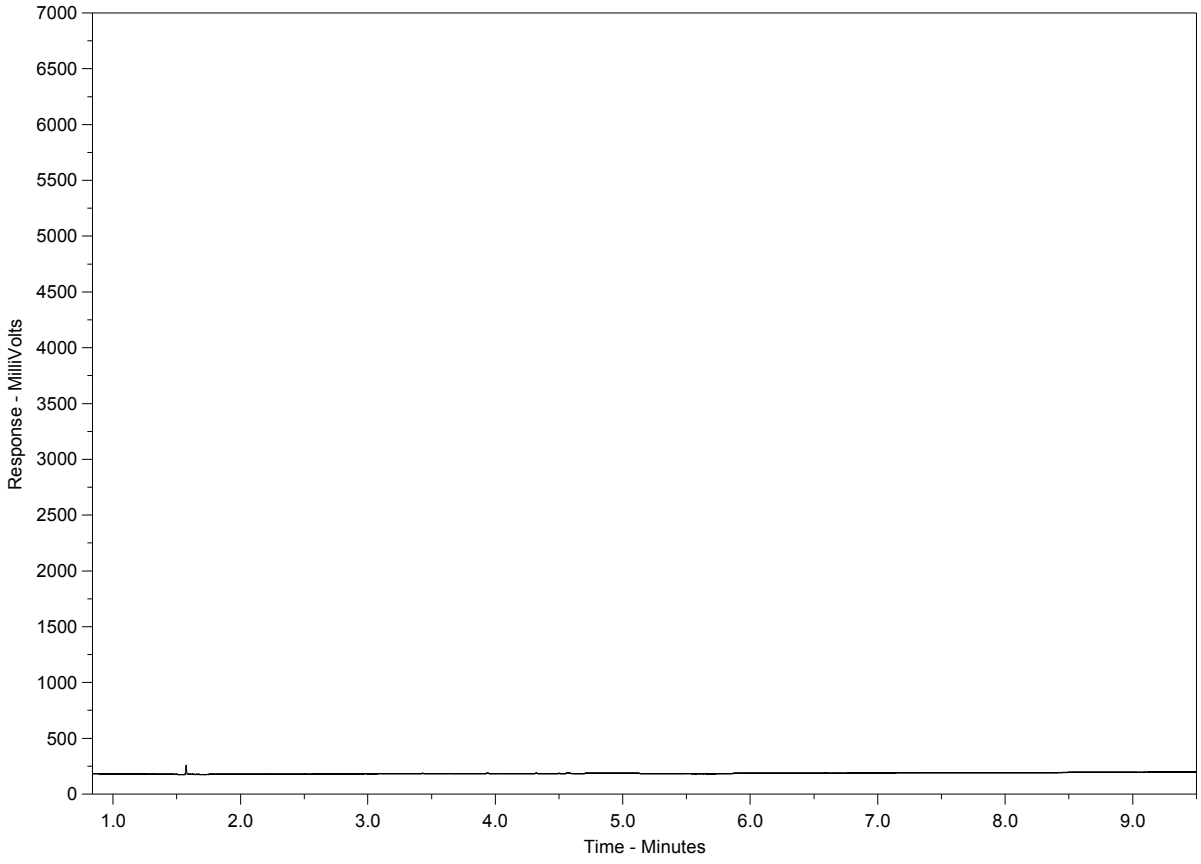
ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where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

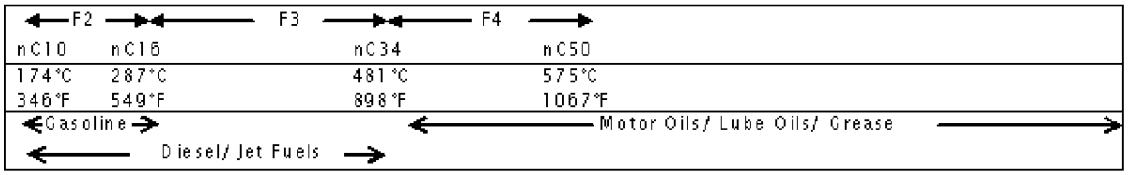
The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide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

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

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L2467001-1
Client Sample ID: GRA-7





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

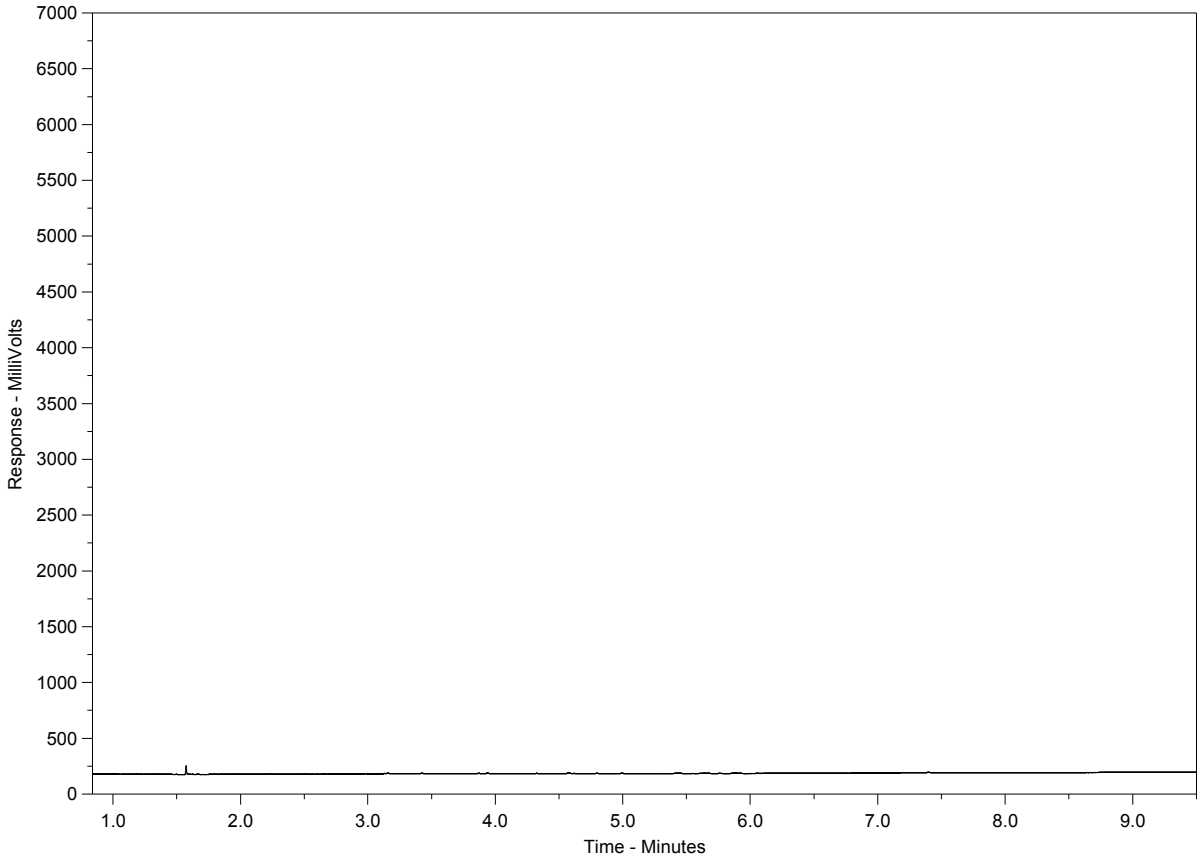
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

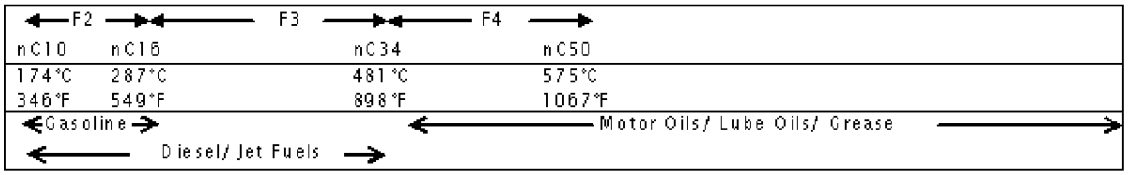
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

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.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L2467001-2
Client Sample ID: GRA-6





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

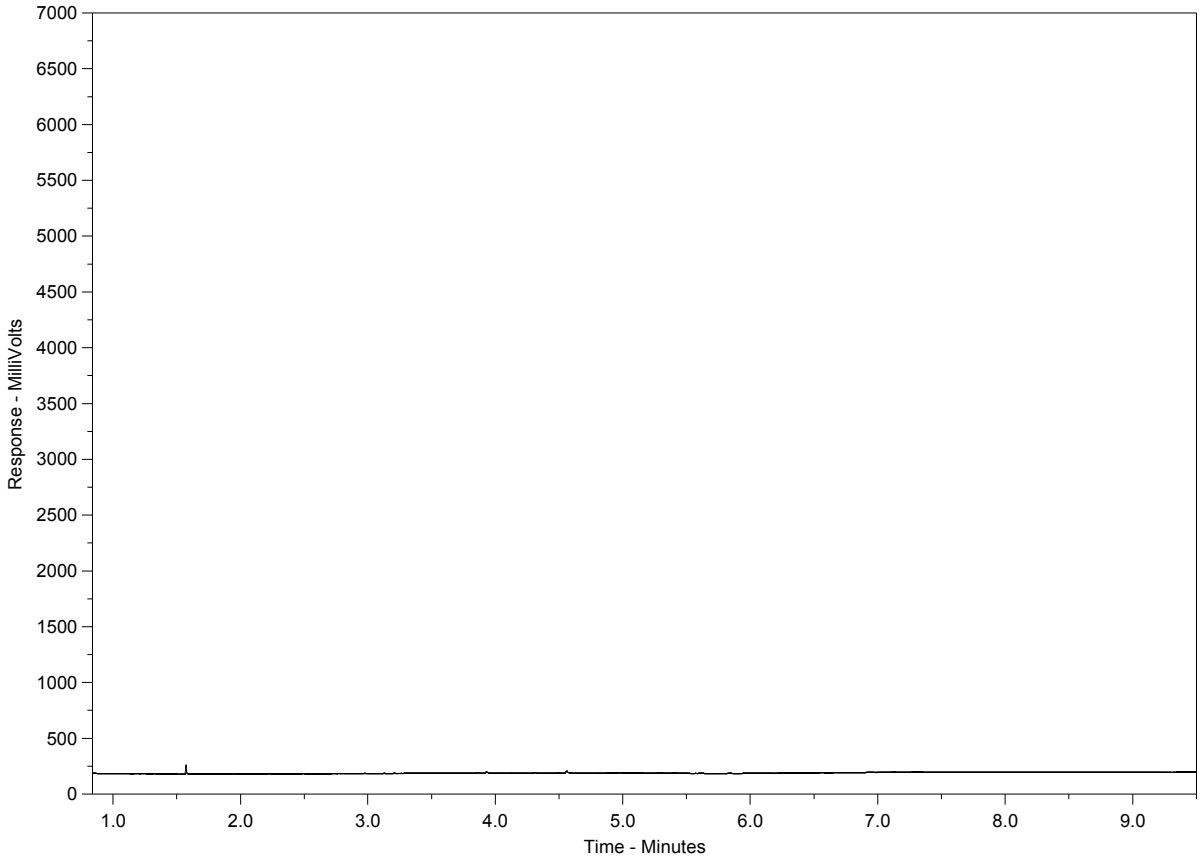
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

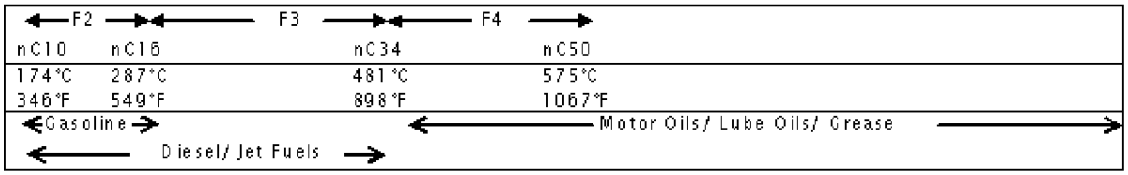
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

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.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L2467001-3
Client Sample ID: GRA-1





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

L2467001-COFC

COC Number: 17 - 751078

Page 1 of 1

Report To	Contact and company name below will appear on the final report	Report Format / Distribution		Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)	
Company:	GN - CGS - Rankin Inlet	Select Report Format:	☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)	Regular [R]	☑ Standard TAT if received by 3 pm - business days - no surcharges apply
Contact:	Connor Faulkner	Quality Control (QC) Report with Report	☐ YES ☐ NO	PRIORITY (Business Days) 4 day [P4-20%]	☐ EMERGENCY 1 Business day [E - 100%] ☐
Phone:	867-645-8113	☐ Compare Results to Criteria on Report - provide details below if box checked		3 day [P3-25%] ☐	Same Day, Weekend or Statutory holiday [E2 -200% (Laboratory opening fees may apply)] ☐
	Company address below will appear on the final report	Select Distribution:	☑ EMAIL ☐ MAIL ☐ FAX	2 day [P2-50%] ☐	
Street:	PO Box 490	Email 1 or Fax	CFaulkner@gov.nu.ca	Date and Time Required for all E&P TATs:	dd-mmm-yy hh:mm
City/Province:	Rankin Inlet, NU	Email 2	SCollins@gov.nu.ca	For tests that can not be performed according to the service level selected, you will be contacted.	
Postal Code:	X0C 0G0	Email 3	hwhitel@gov.nu.ca		
Invoice To	Same as Report To ☑ YES ☐ NO	**Invoice Distribution**		**Analysis Request**	
	Copy of Invoice with Report ☑ YES ☐ NO	Select Invoice Distribution:	☐ EMAIL ☐ MAIL ☐ FAX		
Company:		Email 1 or Fax			
Contact:		Email 2			

Project Information		Oil and Gas Required Fields (client use)	
ALS Account # / Quote #:	WB133	AFE/Cost Center:	PO#
Job #:		Major/Minor Code:	Routing Code:
PO / AFE:		Requisitioner:	
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	NUMBER OF CONTAINERS	BOD	Redline	CBOD	Metals	Mercury	Nutrients/Phenols (x2)	Bacteria	Oil Grease (x2)	BTEX-F1 (x3)	F2-F4 (x2)	PAH (x2)	SAMPLES ON HOLD	SUSPECTED HAZARD (see Special Instructions)
	GRA-7	25-Jun-20	13:56	WW	17	✓	✓	✓	P	P	P	P	P	P	P	P		
	GRA-6	25-Jun-20	14:16	WW	17	✓	✓	✓	P	P	P	P	P	P	P	P		
	GRA-1		14:42	WW	17	✓	✓	✓	P	P	P	P	P	P	P	P		

Drinking Water (DW) Samples[1] (client use)	Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)
Are samples taken from a Regulated DW System? ☑ YES ☑ NO	Nunavut - WW - GRP1 - WP
Are samples for human consumption/ use? ☑ YES ☑ NO	BTX, F1-F4, PAH.

SAMPLE CONDITION AS RECEIVED (lab use only)

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

INITIAL COOLER TEMPERATURES °C				FINAL COOLER TEMPERATURES °C			
				6.3 °C			

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date: 25-Jun-20	Time: 15:00	Received by:	Date: 27 JUN 20	Time: 09:35	Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

JUNE 2018 FRONT

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

L2467001-COFC

COC Number: 17 - 751078

Page 1 of 1

Report To	Contact and company name below will appear on the final report
Company:	GN - CGS - Rankin Inlet
Contact:	Connor Faulkner
Phone:	867-645-6113
Company address below will appear on the final report	
Street:	PO Box 490
City/Province:	Rankin Inlet, NU
Postal Code:	X0C 0G0
Invoice To	Same as Report To: YES ☑ NO ☐
	Copy of Invoice with Report: YES ☑ NO ☐
Company:	
Contact:	

Report Format / Distribution	
Select Report Format:	PDF ☑ EXCEL ☑ EDD (DIGITAL) ☐
Quality Control (QC) Report with Report	YES ☐ NO ☐
Compare Results to Criteria on Report - provide details below if box checked	☐
Select Distribution:	EMAIL ☑ MAIL ☐ FAX ☐
Email 1 or Fax	CFaulkner@gov.nu.ca
Email 2	SCollins@gov.nu.ca
Email 3	hwhitel@gov.nu.ca
Invoice Distribution	
Select Invoice Distribution:	EMAIL ☐ MAIL ☐ FAX ☐
Email 1 or Fax	
Email 2	

Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)	
Regular [R]	☑ Standard TAT if received by 3 pm - business days - no surcharges apply
PRIORITY (Business Days): 4 day [P4-20%] ☐	EMERGENCY: 1 Business day [E - 100%] ☐
3 day [P3-25%] ☐	Same Day, Weekend or Statutory holiday [E2 -200% (Laboratory opening fees may apply)] ☐
2 day [P2-50%] ☐	
Date and Time Required for all E&P TATs:	dd-mmm-yy hh:mm
For tests that can not be performed according to the service level selected, you will be contacted.	

Project Information		Oil and Gas Required Fields (client use)	
ALS Account # / Quote #:	WB133	AFE/Cost Center:	PO#:
Job #:		Major/Minor Code:	Routing Code:
PO / AFE:		Requisitioner:	
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	NUMBER OF CONTAINERS	BOD	Routine	CBOD	Metals	Mercury	Nutrients/Phenols (x2)	Bacteria	Oil Grease (x2)	BTEX-F1 (x2)	F2-F4 (x2)	PAH (x2)	SAMPLES ON HOLD	SUSPECTED HAZARD (see Special Instructions)
					Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below													
	GRA-7	25-Jun-20	13:56	WW	17	✓	✓	✓	P	P	P	P	P	P	P	P		
	GRA-6	25-Jun-20	14:16	WW	17	✓	✓	✓	P	P	P	P	P	P	P	P		
	GRA-1		14:42	WW	17	✓	✓	✓	P	P	P	P	P	P	P	P		

Drinking Water (DW) Samples[1] (client use)	Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)
Are samples taken from a Regulated DW System? YES ☐ NO ☑	Nunavut - WW - GRP1 - WP
Are samples for human consumption/ use? YES ☐ NO ☑	BTX, F1-F4, PAH.

SAMPLE CONDITION AS RECEIVED (lab use only)			
Frozen ☐	SIF Observations	Yes ☐	No ☐
Ice Packs ☐ Ice Cubes ☐	Custody seal intact	Yes ☐	No ☐
Cooling Initiated ☐			
INITIAL COOLER TEMPERATURES °C		FINAL COOLER TEMPERATURES °C	
		6.3 °C	

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date: 25-Jun-20	Time: 15:00	Received by: MIGM	Date: 27 JUN 20	Time: 09:35	Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

JUNE 2018 FRONT

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

Hamlet of Rankin Inlet
ATTN: TOMMY SHARP
PO Box 310
Rankin Inlet NU X0C 0G0

Date Received: 29-AUG-20
Report Date: 10-SEP-20 15:25 (MT)
Version: FINAL

Client Phone: 867-645-6467

Certificate of Analysis

Lab Work Order #: L2496174
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
L2496174-1 RAN-2							
Sampled By: CLIENT on 28-AUG-20 @ 10:15							
Matrix: EFFLUENT							
BTEX plus F1-F4							
BTX plus F1 by GCMS							
Benzene	<0.00050		0.00050	mg/L		02-SEP-20	R5214080
Toluene	<0.0010		0.0010	mg/L		02-SEP-20	R5214080
Ethyl benzene	<0.00050		0.00050	mg/L		02-SEP-20	R5214080
o-Xylene	<0.00050		0.00050	mg/L		02-SEP-20	R5214080
m+p-Xylenes	<0.00040		0.00040	mg/L		02-SEP-20	R5214080
F1 (C6-C10)	<0.10		0.10	mg/L		02-SEP-20	R5214080
Surrogate: 4-Bromofluorobenzene (SS)	85.6		70-130	%		02-SEP-20	R5214080
CCME PHC F2-F4 in Water							
F2 (C10-C16)	<0.10		0.10	mg/L	02-SEP-20	02-SEP-20	R5209346
F3 (C16-C34)	<0.25		0.25	mg/L	02-SEP-20	02-SEP-20	R5209346
F4 (C34-C50)	<0.25		0.25	mg/L	02-SEP-20	02-SEP-20	R5209346
Surrogate: 2-Bromobenzotrifluoride	96.9		60-140	%	02-SEP-20	02-SEP-20	R5209346
CCME Total Hydrocarbons							
F1-BTEX	<0.10		0.10	mg/L		10-SEP-20	
F2-Naphth	<0.10		0.10	mg/L		10-SEP-20	
F3-PAH	<0.25		0.25	mg/L		10-SEP-20	
Total Hydrocarbons (C6-C50)	<0.38		0.38	mg/L		10-SEP-20	
Sum of Xylene Isomer Concentrations							
Xylenes (Total)	<0.00064		0.00064	mg/L		08-SEP-20	
CCME PAHs in mg/L							
1-Methyl Naphthalene	<0.000020		0.000020	mg/L	08-SEP-20	10-SEP-20	R5221476
2-Methyl Naphthalene	<0.000020		0.000020	mg/L	08-SEP-20	10-SEP-20	R5221476
Acenaphthene	<0.000020		0.000020	mg/L	08-SEP-20	10-SEP-20	R5221476
Acenaphthylene	<0.000020		0.000020	mg/L	08-SEP-20	10-SEP-20	R5221476
Anthracene	<0.000010		0.000010	mg/L	08-SEP-20	10-SEP-20	R5221476
Acridine	<0.000020		0.000020	mg/L	08-SEP-20	10-SEP-20	R5221476
Benzo(a)anthracene	<0.000010		0.000010	mg/L	08-SEP-20	10-SEP-20	R5221476
Benzo(a)pyrene	<0.0000050		0.0000050	mg/L	08-SEP-20	10-SEP-20	R5221476
Benzo(b&j)fluoranthene	<0.000010		0.000010	mg/L	08-SEP-20	10-SEP-20	R5221476
Benzo(g,h,i)perylene	<0.000020		0.000020	mg/L	08-SEP-20	10-SEP-20	R5221476
Benzo(k)fluoranthene	<0.000010		0.000010	mg/L	08-SEP-20	10-SEP-20	R5221476
Chrysene	<0.000020		0.000020	mg/L	08-SEP-20	10-SEP-20	R5221476
Dibenzo(a,h)anthracene	<0.0000050		0.0000050	mg/L	08-SEP-20	10-SEP-20	R5221476
Fluoranthene	<0.000020		0.000020	mg/L	08-SEP-20	10-SEP-20	R5221476
Fluorene	<0.000020		0.000020	mg/L	08-SEP-20	10-SEP-20	R5221476
Indeno(1,2,3-cd)pyrene	<0.000010		0.000010	mg/L	08-SEP-20	10-SEP-20	R5221476
Naphthalene	<0.000050		0.000050	mg/L	08-SEP-20	10-SEP-20	R5221476
Phenanthrene	<0.000050		0.000050	mg/L	08-SEP-20	10-SEP-20	R5221476
Pyrene	<0.000010		0.000010	mg/L	08-SEP-20	10-SEP-20	R5221476
Quinoline	<0.000020		0.000020	mg/L	08-SEP-20	10-SEP-20	R5221476
B(a)P Total Potency Equivalent	<0.000030		0.000030	mg/L	08-SEP-20	10-SEP-20	R5221476
Surrogate: d8-Naphthalene	95.5		50-150	%	08-SEP-20	10-SEP-20	R5221476
Surrogate: d10-Phenanthrene	100.3		50-150	%	08-SEP-20	10-SEP-20	R5221476
Surrogate: d12-Chrysene	83.3		50-150	%	08-SEP-20	10-SEP-20	R5221476
Surrogate: d10-Acenaphthene	97.2		50-150	%	08-SEP-20	10-SEP-20	R5221476
Surrogate: d9-Acridine (SS)	83.3		50-150	%	08-SEP-20	10-SEP-20	R5221476
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	209		1.2	mg/L		01-SEP-20	
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
L2496174-1 RAN-2							
Sampled By: CLIENT on 28-AUG-20 @ 10:15							
Matrix: EFFLUENT							
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		01-SEP-20	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		01-SEP-20	
Alkalinity, Total (as CaCO3)							
Alkalinity, Total (as CaCO3)	171		1.0	mg/L		31-AUG-20	R5207259
Ammonia by colour							
Ammonia, Total (as N)	2.04		0.10	mg/L		01-SEP-20	R5208683
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	11.4		2.0	mg/L		29-AUG-20	R5210115
Carbonaceous BOD							
BOD Carbonaceous	<2.0		2.0	mg/L		29-AUG-20	R5210115
Chloride in Water by IC							
Chloride (Cl)	48.1		1.0	mg/L		29-AUG-20	R5208927
Conductivity							
Conductivity	1030		1.0	umhos/cm		31-AUG-20	R5207259
Fecal coliforms, 1:10 dilution by QT97							
Fecal Coliforms	<10	PEHT	10	MPN/100mL		31-AUG-20	R5207993
Note: USC qualifier added - Unknown Sample Container. Sample received in container not provided by ALS.							
Hardness Calculated							
Hardness (as CaCO3)	405	HTC	0.20	mg/L		03-SEP-20	
Mercury Total							
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L	08-SEP-20	08-SEP-20	R5215541
Nitrate in Water by IC							
Nitrate (as N)	7.85		0.040	mg/L		29-AUG-20	R5208927
Nitrate+Nitrite							
Nitrate and Nitrite as N	7.96		0.070	mg/L		02-SEP-20	
Nitrite in Water by IC							
Nitrite (as N)	0.104		0.020	mg/L		29-AUG-20	R5208927
Oil & Grease - Gravimetric							
Oil and Grease	<5.0		5.0	mg/L		04-SEP-20	R5210465
Phenol (4AAP)							
Phenols (4AAP)	<0.0010		0.0010	mg/L		02-SEP-20	R5209613
Phosphorus, Total							
Phosphorus (P)-Total	0.0420		0.0030	mg/L		02-SEP-20	R5208817
Sulfate in Water by IC							
Sulfate (SO4)	270		0.60	mg/L		29-AUG-20	R5208927
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.0284		0.0030	mg/L	02-SEP-20	02-SEP-20	R5209405
Arsenic (As)-Total	0.00184		0.00010	mg/L	02-SEP-20	02-SEP-20	R5209405
Cadmium (Cd)-Total	0.0000651		0.0000050	mg/L	02-SEP-20	02-SEP-20	R5209405
Calcium (Ca)-Total	127		0.050	mg/L	02-SEP-20	02-SEP-20	R5209405
Chromium (Cr)-Total	0.00052		0.00010	mg/L	02-SEP-20	02-SEP-20	R5209405
Cobalt (Co)-Total	0.00503		0.00010	mg/L	02-SEP-20	02-SEP-20	R5209405
Copper (Cu)-Total	0.0219		0.00050	mg/L	02-SEP-20	02-SEP-20	R5209405
Iron (Fe)-Total	0.711		0.010	mg/L	02-SEP-20	02-SEP-20	R5209405
Lead (Pb)-Total	0.000702		0.000050	mg/L	02-SEP-20	02-SEP-20	R5209405
Magnesium (Mg)-Total	21.5		0.0050	mg/L	02-SEP-20	02-SEP-20	R5209405
Manganese (Mn)-Total	0.808		0.00010	mg/L	02-SEP-20	02-SEP-20	R5209405
Nickel (Ni)-Total	0.0222		0.00050	mg/L	02-SEP-20	02-SEP-20	R5209405
Potassium (K)-Total	20.8		0.050	mg/L	02-SEP-20	02-SEP-20	R5209405
Sodium (Na)-Total	57.8		0.050	mg/L	02-SEP-20	02-SEP-20	R5209405

* 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
L2496174-1 RAN-2							
Sampled By: CLIENT on 28-AUG-20 @ 10:15							
Matrix: EFFLUENT							
Total Metals in Water by CRC ICPMS							
Zinc (Zn)-Total	0.0454		0.0030	mg/L	02-SEP-20	02-SEP-20	R5209405
Total Organic Carbon by Combustion							
Total Organic Carbon	12.0		0.50	mg/L		02-SEP-20	R5209758
Total Suspended Solids							
Total Suspended Solids	24.5		3.0	mg/L		01-SEP-20	R5208618
pH							
pH	7.83		0.10	pH units		31-AUG-20	R5207259

* 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.
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-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 degrees 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 200.2/6020B (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-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 Phosphorus is determined colourmetrically after persulphate digestion of the sample.

PAH-CCME-PPM-WT	Water	CCME PAHs in mg/L	EPA 3511/8270D (mod)

PAHs are extracted from water using a hexane micro-extraction technique, with analysis by GC/MS. Because the two isomers cannot be readily separated chromatographically, benzo(j)fluoranthene is reported as part of the benzo(b)fluoranthene parameter.

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:

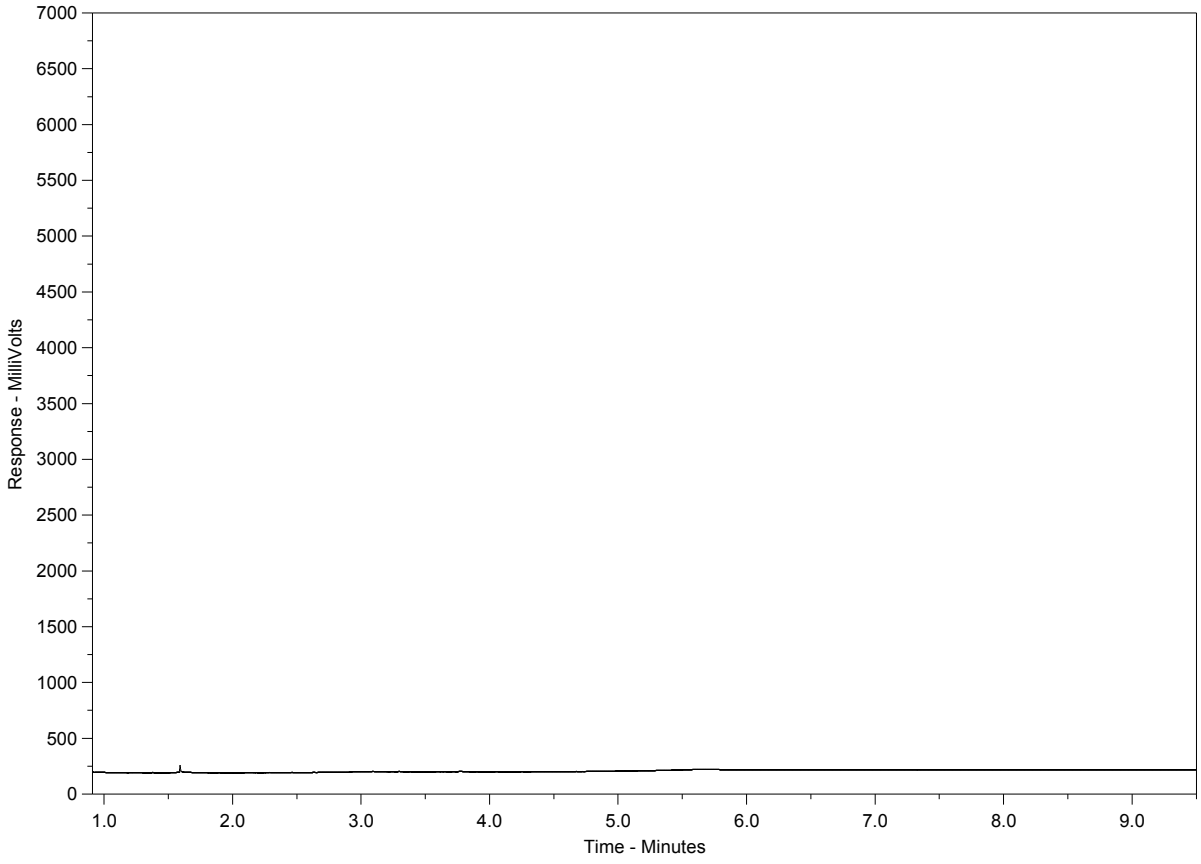
GLOSSARY OF REPORT TERMS

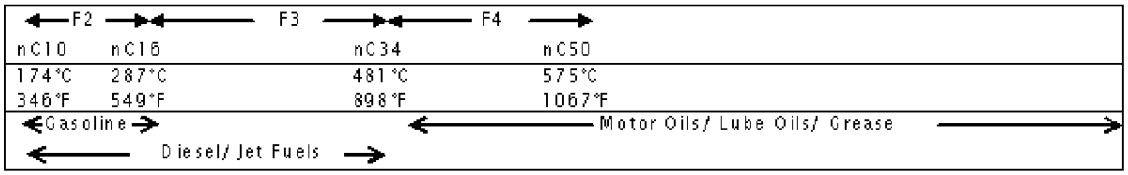
Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates 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: L2496174-1
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

L2496174-COFC

COC Number: 15 -

Page 1 of 1

Report To	Contact and company name below will appear on the final report	Report Format / Distribution	Turnaround Time (TAT) Requested - Please confirm all E&P TATs with your AM - surcharges will apply
Company:	Hamlet of Rankin Inlet	Select Report Format: ☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)	Regular [R] ☑ Standard TAT if received by 3 pm - business days - no surcharges apply
Contact:	Tommy Sharp	Quality Control (QC) Report with Report ☐ YES ☐ NO	PRIORITY (Business Days): 4 day [P4] ☐ / 3 day [P3] ☐ / 2 day [P2] ☐ — EMERGENCY: 1 Business day [E1] ☐ / Same Day, Weekend or Statutory holiday [E0] ☐
Phone:	867-645-6467	☐ Compare Results to Criteria on Report - provide details below if box checked	
	Company address below will appear on the final report	Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX	
Street:	PO Bag 310	Email 1 or Fax: works@rankininlet.ca	Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm
City/Province:	Rankin Inlet, NU	Email 2: cfaulkner@gov.nu.ca	For tests that can not be performed according to the service level selected, you will be contacted.
Postal Code:	X0C 0G0	Email 3: scollins@gov.nu.ca	
Invoice To	Same as Report To ☑ YES ☐ NO	Invoice Distribution	Analysis Request
	Copy of Invoice with Report ☑ YES ☐ NO	Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX	Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below
Company:		Email 1 or Fax	
Contact:		Email 2	

Project Information		Oil and Gas Required Fields (client use)	
ALS Account # / Quote #:	W10629	AFE/Cost Center:	PO#:
Job #:		Major/Minor Code:	Routing Code:
PO / AFE:		Requisitioner:	
LSD:		Location:	
ALS Lab Work Order # (lab use only)		ALS Contact:	Sampler: Connor / Matt

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	CBOD	Total Metals	Total Mercury	Nutrients/Phenols (x2)	[illegible]	Oil & Grease (x2)	BTEX-F1 (x3)	F2-F4 (x2)	PAH (x2)			Number of Containers
	RAN-2	28-Aug-20	10:15 PM	Effluent	R	R	R	R	R	R		R	R	R	R			17

Drinking Water (DW) Samples[1] (client use)	Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)
Are samples taken from a Regulated DW System? ☐ YES ☑ NO	NUNAVUT-WW-GRP1-WP, BTEX, F1-F4, PAH
Are samples for human drinking water use? ☐ YES ☑ NO	

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐ SIF Observations Yes ☐ No ☐

Ice Packs ☐ Ice Cubes ☐ Custody seal intact Yes ☐ No ☐

Cooling Initiated ☐

INITIAL COOLER TEMPERATURES °C		FINAL COOLER TEMPERATURES °C		
15.5				

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date: Aug 28/20	Time: 10:15PM	Received by:	Date: 29 Aug 20	Time: 12:50	Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

OCTOBER 2015 FRONT

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.

Hamlet of Rankin Inlet
ATTN: TOMMY SHARPE
PO Box 310
Rankin Inlet NU X0C 0G0

Date Received: 05-OCT-20
Report Date: 20-OCT-20 10:43 (MT)
Version: FINAL

Client Phone: 867-645-6467

Certificate of Analysis

Lab Work Order #: L2512024

Project P.O. #: NOT SUBMITTED
Job Reference: HAMLET OF RANKIN INLET - WASTE WATER
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
L2512024-1 RAN 2 (RANKIN INLET)							
Sampled By: Tommy Sharpe on 02-OCT-20 @ 14:00							
Matrix: Waste Water							
Miscellaneous Parameters							
Xylenes (Total)	0.00140		0.00064	mg/L		08-OCT-20	
BTX plus F1 by GCMS							
Benzene	<0.00050		0.00050	mg/L		06-OCT-20	R5251471
Toluene	<0.0010		0.0010	mg/L		06-OCT-20	R5251471
Ethyl benzene	0.00083		0.00050	mg/L		06-OCT-20	R5251471
o-Xylene	<0.00050		0.00050	mg/L		06-OCT-20	R5251471
m+p-Xylenes	0.00140		0.00040	mg/L		06-OCT-20	R5251471
F1 (C6-C10)	<0.10		0.10	mg/L		06-OCT-20	R5251471
Surrogate: 4-Bromofluorobenzene (SS)	80.2		70-130	%		06-OCT-20	R5251471
Surrogate: 3,4-Dichlorotoluene (SS)	122.1		70-130	%		06-OCT-20	R5251471
F2-F4 reported in ppm							
F2 (C10-C16)	<0.10		0.10	mg/L	09-OCT-20	13-OCT-20	R5253375
F3 (C16-C34)	<0.25		0.25	mg/L	09-OCT-20	13-OCT-20	R5253375
F4 (C34-C50)	<0.25		0.25	mg/L	09-OCT-20	13-OCT-20	R5253375
Chrom. to baseline at nC50	YES				09-OCT-20	13-OCT-20	R5253375
Surrogate: 2-Bromobenzotrifluoride	90.7		60-140	%	09-OCT-20	13-OCT-20	R5253375
CCME PAHs in mg/L							
1-Methyl Naphthalene	0.000336		0.000020	mg/L	09-OCT-20	15-OCT-20	R5254696
2-Methyl Naphthalene	0.000223		0.000020	mg/L	09-OCT-20	15-OCT-20	R5254696
Acenaphthene	<0.000020		0.000020	mg/L	09-OCT-20	15-OCT-20	R5254696
Acenaphthylene	<0.000020		0.000020	mg/L	09-OCT-20	15-OCT-20	R5254696
Anthracene	<0.000010		0.000010	mg/L	09-OCT-20	15-OCT-20	R5254696
Acridine	<0.000020		0.000020	mg/L	09-OCT-20	15-OCT-20	R5254696
Benzo(a)anthracene	<0.000010		0.000010	mg/L	09-OCT-20	15-OCT-20	R5254696
Benzo(a)pyrene	<0.0000050		0.0000050	mg/L	09-OCT-20	15-OCT-20	R5254696
Benzo(b&j)fluoranthene	<0.000010		0.000010	mg/L	09-OCT-20	15-OCT-20	R5254696
Benzo(g,h,i)perylene	<0.000020		0.000020	mg/L	09-OCT-20	15-OCT-20	R5254696
Benzo(k)fluoranthene	<0.000010		0.000010	mg/L	09-OCT-20	15-OCT-20	R5254696
Chrysene	<0.000020		0.000020	mg/L	09-OCT-20	15-OCT-20	R5254696
Dibenzo(a,h)anthracene	<0.0000050		0.0000050	mg/L	09-OCT-20	15-OCT-20	R5254696
Fluoranthene	<0.000020		0.000020	mg/L	09-OCT-20	15-OCT-20	R5254696
Fluorene	<0.000020		0.000020	mg/L	09-OCT-20	15-OCT-20	R5254696
Indeno(1,2,3-cd)pyrene	<0.000010		0.000010	mg/L	09-OCT-20	15-OCT-20	R5254696
Naphthalene	0.000363		0.000050	mg/L	09-OCT-20	15-OCT-20	R5254696
Phenanthrene	<0.000050		0.000050	mg/L	09-OCT-20	15-OCT-20	R5254696
Pyrene	<0.000010		0.000010	mg/L	09-OCT-20	15-OCT-20	R5254696
Quinoline	0.000113		0.000020	mg/L	09-OCT-20	15-OCT-20	R5254696
B(a)P Total Potency Equivalent	<0.000030		0.000030	mg/L	09-OCT-20	15-OCT-20	R5254696
Surrogate: d8-Naphthalene	102.8		50-150	%	09-OCT-20	15-OCT-20	R5254696
Surrogate: d10-Phenanthrene	99.2		50-150	%	09-OCT-20	15-OCT-20	R5254696
Surrogate: d12-Chrysene	74.7		50-150	%	09-OCT-20	15-OCT-20	R5254696
Surrogate: d10-Acenaphthene	96.7		50-150	%	09-OCT-20	15-OCT-20	R5254696
Surrogate: d9-Acridine (SS)	102.0		50-150	%	09-OCT-20	15-OCT-20	R5254696
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	311		1.2	mg/L		20-OCT-20	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		20-OCT-20	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		20-OCT-20	
Alkalinity, Total (as CaCO3)							
Alkalinity, Total (as CaCO3)	255		1.0	mg/L		15-OCT-20	R5257498

* 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
L2512024-1 RAN 2 (RANKIN INLET)							
Sampled By: Tommy Sharpe on 02-OCT-20 @ 14:00							
Matrix: Waste Water							
Ammonia by colour							
Ammonia, Total (as N)	10.8		0.50	mg/L		06-OCT-20	R5250940
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	11.7		2.0	mg/L		05-OCT-20	R5253128
Carbonaceous BOD							
BOD Carbonaceous	9.1		2.0	mg/L		05-OCT-20	R5253128
Chloride in Water by IC							
Chloride (Cl)	169		5.0	mg/L		05-OCT-20	R5248679
Conductivity							
Conductivity	2430		1.0	umhos/cm		15-OCT-20	R5257498
Fecal coliforms, 1:10 dilution by QT97							
Fecal Coliforms	110		10	MPN/100mL		05-OCT-20	R5247479
Hardness Calculated							
Hardness (as CaCO3)	987	HTC	0.20	mg/L		13-OCT-20	
Mercury Total							
Mercury (Hg)-Total	0.0000097		0.0000050	mg/L	15-OCT-20	15-OCT-20	R5255800
Nitrate in Water by IC							
Nitrate (as N)	0.23		0.20	mg/L		05-OCT-20	R5248679
Nitrate+Nitrite							
Nitrate and Nitrite as N	0.23		0.22	mg/L		06-OCT-20	
Nitrite in Water by IC							
Nitrite (as N)	<0.10	DLM	0.10	mg/L		05-OCT-20	R5248679
Oil & Grease - Gravimetric							
Oil and Grease	<5.0		5.0	mg/L		08-OCT-20	R5252255
Phenol (4AAP)							
Phenols (4AAP)	0.0019		0.0010	mg/L		07-OCT-20	R5251523
Phosphorus, Total							
Phosphorus (P)-Total	0.190		0.0030	mg/L		08-OCT-20	R5251642
Sulfate in Water by IC							
Sulfate (SO4)	871		3.0	mg/L		05-OCT-20	R5248679
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.0975		0.0030	mg/L	08-OCT-20	09-OCT-20	R5252425
Arsenic (As)-Total	0.00365		0.00010	mg/L	08-OCT-20	09-OCT-20	R5252425
Cadmium (Cd)-Total	0.000134		0.0000050	mg/L	08-OCT-20	09-OCT-20	R5252425
Calcium (Ca)-Total	310		0.050	mg/L	08-OCT-20	09-OCT-20	R5252425
Chromium (Cr)-Total	0.00111		0.00010	mg/L	08-OCT-20	09-OCT-20	R5252425
Cobalt (Co)-Total	0.0266		0.00010	mg/L	08-OCT-20	09-OCT-20	R5252425
Copper (Cu)-Total	0.0115		0.00050	mg/L	08-OCT-20	09-OCT-20	R5252425
Iron (Fe)-Total	4.63		0.010	mg/L	08-OCT-20	09-OCT-20	R5252425
Lead (Pb)-Total	0.000483		0.000050	mg/L	08-OCT-20	09-OCT-20	R5252425
Magnesium (Mg)-Total	51.5		0.0050	mg/L	08-OCT-20	09-OCT-20	R5252425
Manganese (Mn)-Total	3.87		0.00010	mg/L	08-OCT-20	09-OCT-20	R5252425
Nickel (Ni)-Total	0.0621		0.00050	mg/L	08-OCT-20	09-OCT-20	R5252425
Potassium (K)-Total	43.2		0.050	mg/L	08-OCT-20	09-OCT-20	R5252425
Sodium (Na)-Total	195		0.050	mg/L	08-OCT-20	09-OCT-20	R5252425
Zinc (Zn)-Total	0.197		0.0030	mg/L	08-OCT-20	09-OCT-20	R5252425
Total Organic Carbon by Combustion							
Total Organic Carbon	30.4		0.50	mg/L		08-OCT-20	R5252178
Total Suspended Solids							
Total Suspended Solids	40.0		3.0	mg/L		06-OCT-20	R5250823
pH							
pH	8.23		0.10	pH units		15-OCT-20	R5257498

* 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).
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.

F2-F4-PPM-WT	Water	F2-F4 reported in ppm	MOE DECPH-E3421/CCME TIER 1

Petroleum Hydrocarbons (F2-F4 fractions) are extracted from water using a hexane micro-extraction technique. Instrumental analysis is by GC-FID, as per the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil, Tier 1 Method, CCME, 2001.

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 degrees 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.

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
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 200.2/6020B (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-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 Phosphorus is determined colourmetrically after persulphate digestion of the sample.			
PAH-CCME-PPM-WT	Water	CCME PAHs in mg/L	EPA 3511/8270D (mod)
PAHs are extracted from water using a hexane micro-extraction technique, with analysis by GC/MS. Because the two isomers cannot be readily separated chromatographically, benzo(j)fluoranthene is reported as part of the benzo(b)fluoranthene parameter.			
PH-WP	Water	pH	APHA 4500H
The pH of a sample is the determination of the activity of the hydrogen ions by potentiometric measurement using a standard hydrogen electrode and a reference electrode.			
PHENOLS-4AAP-WT	Water	Phenol (4AAP)	EPA 9066
An automated method is used to distill the sample. The distillate is then buffered to pH 9.4 which reacts with 4AAP and potassium ferricyanide to form a red complex which is measured colorimetrically.			
SO4-IC-N-WP	Water	Sulfate in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
SOLIDS-TOTSUS-WP	Water	Total Suspended Solids	APHA 2540 D (modified)
Total suspended solids in 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:

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**

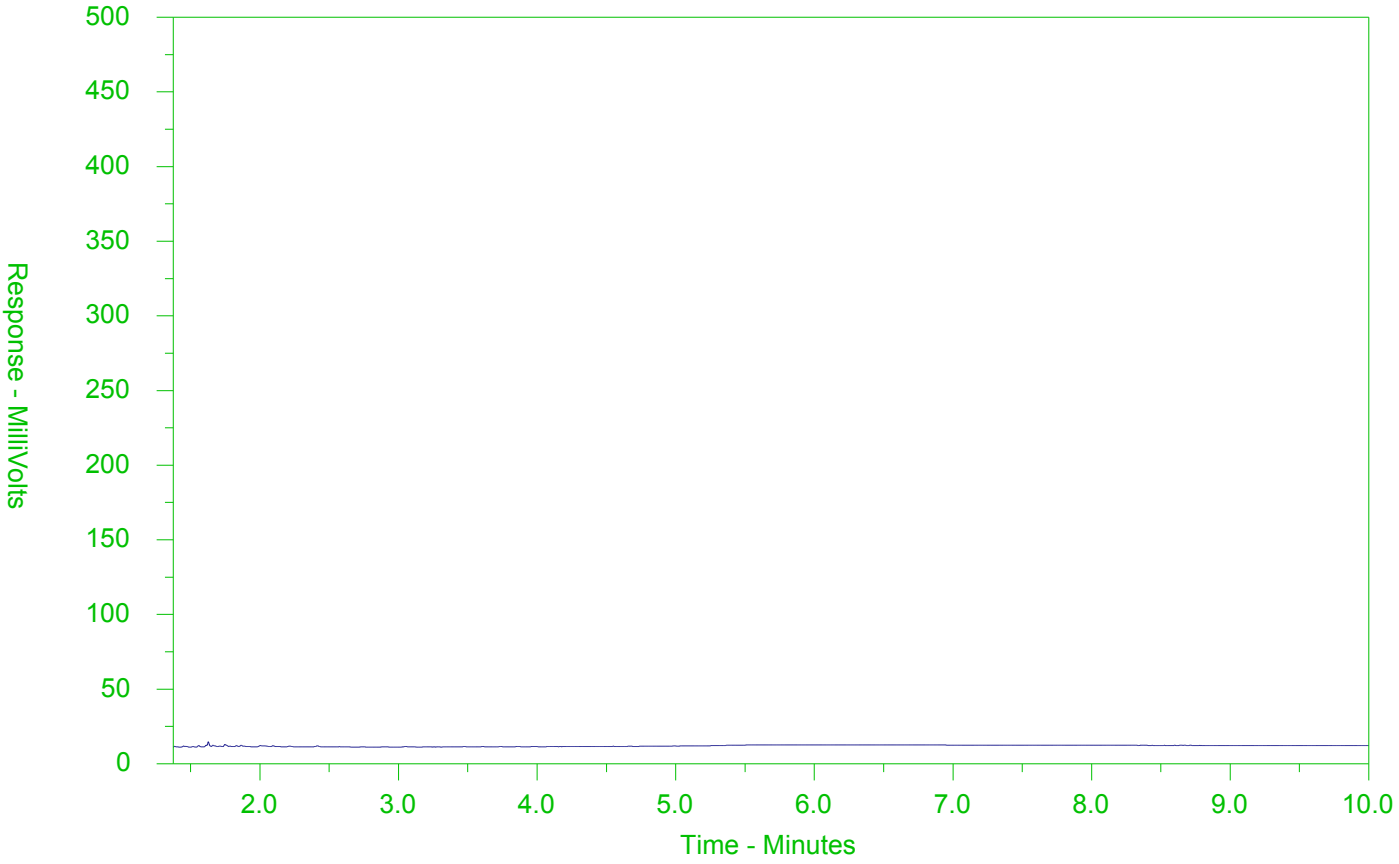
GLOSSARY OF REPORT TERMS

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: L2512024-1
Client Sample ID: RAN 2 (RANKIN INLET)



←F2→	←F3→	←F4→	
nC10	nC16	nC34	nC50
174°C	287°C	481°C	575°C
346°F	549°F	898°F	1067°F
Gasoline →	← Motor Oils/Lube Oils/Grease →		
← Diesel/Jet Fuels →			

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 the 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

L2512024-COFC

COC Number: 17 - 781481

Page of

Report To	Contact and company name below will appear on the final report
Company:	Hamlet of Rankin Inlet
Contact:	Tommy Sharpe
Phone:	867-645-6467
	Company address below will appear on the final report
Street:	
City/Province:	Rankin Inlet Nunavut
Postal Code:	X0C 0G0

Report Format / Distribution	
Select Report Format:	PDF EXCEL EDD (DIGITAL)
Quality Control (QC) Report with Report	YES NO
Compare Results to Criteria on Report - provide details below if box checked	
Select Distribution:	EMAIL MAIL FAX
Email 1 or Fax	
Email 2	
Email 3	

Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)	
Regular [R]	Standard TAT if received by 3 pm - business days - no surcharges apply
PRIORITY (Business Days) 4 day [P4-20%]	EMERGENCY 1 Business day [E - 100%]
3 day [P3-25%]	Same Day, Weekend or Statutory holiday [E2 -200% (Laboratory opening fees may apply)]
2 day [P2-50%]	
Date and Time Required for all E&P TATs:	dd-mmm-yy hh:mm
For tests that can not be performed according to the service level selected, you will be contacted.	

Invoice To		
	Same as Report To	YES NO
	Copy of Invoice with Report	YES NO
Company:		
Contact:		

Invoice Distribution	
Select Invoice Distribution:	EMAIL MAIL FAX
Email 1 or Fax	
Email 2	

Project Information		Oil and Gas Required Fields (client use)	
ALS Account # / Quote #:		AFE/Cost Center:	PO#
Job #:		Major/Minor Code:	Routing Code:
PO / AFE:		Requisitioner:	
LSD:		Location:	
ALS Lab Work Order # (lab use only):		ALS Contact:	Sampler:

Analysis Request

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

NUMBER OF CONTAINERS

SAMPLES ON HOLD

SUSPECTED HAZARD (see Special Instructions)

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

Drinking Water (DW) Samples[1] (client use)	Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)
Are samples taken from a Regulated DW System? YES [X] NO	
Are samples for human consumption/ use? YES [X] NO	

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen		SIF Observations	Yes	No	
Ice Packs	Ice Cubes	Custody seal intact	Yes	No	
Cooling Initiated					

INITIAL COOLER TEMPERATURES °C				FINAL COOLER TEMPERATURES °C			
10.3							

SHIPMENT RELEASE (client use)		
Released by:	Date:	Time:

INITIAL SHIPMENT RECEPTION (lab use only)		
Received by:	Date: 25 Oct	Time: 11:10

FINAL SHIPMENT RECEPTION (lab use only)		
Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

JUNE 2018 FRONT

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

Appendix C: Hazardous Materials Spill Database, Rankin Inlet 2020

Spill	Occurance Date	Spill Region	Location	Location Description	Product Spilled	Quantity	Measurement	Spill Cause	Lead Agency
spill-2020440	November 17, 2020	Keewatin	Rankin Inlet, Community, Nunavut	Meliadine Gold Project	Petroleum - fuel oil (jet A, diesel, turbo A, heat)	Unknown Quantity		Other	CIRNAC - Crown-Indigenous Relations and Northern Affairs Canada
spill-2020434	November 1, 2020	Keewatin	Rankin Inlet, Community, Nunavut	Rankin Inlet - Calm Air Airport	Chemicals (including transformer oils)	Unknown Quantity		Other	GN - Government of Nunavut
spill-2020414	October 22, 2020	Keewatin	Rankin Inlet, Community, Nunavut	lot 2, plan 603 Rankin Inlet	Petroleum - waste oil (slops, sludge)	150.00	Litres	Collision or Crash	GN - Government of Nunavut
spill-2020372	October 1, 2020	Keewatin	Rankin Inlet, Community, Nunavut	N/A	Petroleum - fuel oil (jet A, diesel, turbo A, heat)	75.00	Litres	Other	GN - Government of Nunavut
spill-2020320	September 6, 2020	Keewatin	Rankin Inlet, Community, Nunavut	Rankin Inlet Housing Asso PO box 160 Rankin Inlet	Petroleum - fuel oil (jet A, diesel, turbo A, heat)	302.00	Litres	Tank Leak	GN - Government of Nunavut
spill-2020183	June 16, 2020	Keewatin	Rankin Inlet, Community, Nunavut	209-69 Pukkinniq (69th) Street	Petroleum - fuel oil (jet A, diesel, turbo A, heat)	20.00	Litres	Breakage	GN - Government of Nunavut
spill-2020186	May 19, 2020	Keewatin	Rankin Inlet, Community, Nunavut	21-21 Titiganiaq Street	Petroleum - fuel oil (jet A, diesel, turbo A, heat)	200.00	Litres	Pipe Leaks	GN - Government of Nunavut
spill-2020103	April 17, 2020	Keewatin	Rankin Inlet, Community, Nunavut	Maani Ulujuk Ilinniarvik	Petroleum - fuel oil (jet A, diesel, turbo A, heat)	18400.00	Litres	Overflow Event	GN - Government of Nunavut

Appendix D: Rankin Inlet 2020 Sampling Summary

Rankin Inlet-HAMLET
RAN-2

			2020	
Parameter	**Unit**	**DL**	**28-Aug-20**	**02-Oct-20**
Alkalinity				
Bicarbonate (HCO3)	mg/L	1.2	209	311
Carbonate (CO3)	mg/L	0.60	<0.60	<0.60
Hydroxide (OH)	mg/L	0.34	<0.34	<0.34
Total (as CaCO3)	mg/L	1.0	171	255
Ammonia by Colour				
Total (as N)	mg/L	0.20	2.04	10.8
Biochemical Oxygen Demand (BOD)				
Biochemical Oxygen Demand	mg/L	6.0	11.4	11.7
Carbonaceous BOD				
BOD Carbonaceous	mg/L	6.0	<2.0	9.1
Chloride in Water by IC				
Chloride (Cl)	mg/L	10	48.1	169.0
Conductivity				
Conductivity	umhos/cm	1.0	1030	2430
Fecal Coliforms				
Fecal Coliforms	MPN/100mL	3	<10	110
Hardness Calculated				
Hardness (as CaCO3)	mg/L	0.30	405	987
Mercury Total				
Mercury (Hg)	mg/L	0.00020	<0.0000050	0.0000097
Nitrate in Water by IC				
Nitrate (as N)	mg/L	0.40	7.85	0.23
Nitrate + Nitrite				
Nitrate and Nitrite as N	mg/L	0.45	7.96	0.23
Nitrite in Water by IC				
Nitrite (as N)	mg/L	0.20	0.104	<0.10
Oil & Grease - Gravimetric				
Oil and Grease	mg/L	5.0	<5.0	<5.0
Phenol				
Phenols	mg/L	0.0010	<0.0010	0.0019
Phosphorus, Total				
Phosphorus (P)	mg/L	0.010	0.042	0.190
Sulfate in Water by IC				
Sulfate (SO4)	mg/L	6.0	270	871
Total Metals by ICP-MS				
Aluminium (Al)	mg/L	0.0050	0.0284	0.0975
Arsenic (As)	mg/L	0.00020	0.00184	0.00365
Cadmium (Cd)	mg/L	0.000010	0.0000651	0.0001340
Calcium (Ca)	mg/L	0.10	127	310
Chromium (Cr)	mg/L	0.0010	0.00052	0.00111
Cobalt (Co)	mg/L	0.00020	0.00503	0.02660
Copper (Cu)	mg/L	0.00020	0.0219	0.0115
Iron (Fe)	mg/L	0.010	0.711	4.63
Lead (Pb)	mg/L	0.000090	0.000702	0.000483
Magnesium (Mg)	mg/L	0.010	21.5	51.5
Manganese (Mn)	mg/L	0.00030	0.808	3.87
Nickel (Ni)	mg/L	0.0020	0.0222	0.0621
Potassium (K)	mg/L	0.020	20.8	43.2
Sodium (Na)	mg/L	0.030	57.8	195
Zinc (Zn)	mg/L	0.0020	0.0454	0.197
Total Organic Carbon by Combustion				
Total Organic Carbon	mg/L	0.50	12	30.4
Total Suspended Solids				
Total Suspended Solids	mg/L	13	24.5	40.0
pH				
pH	pH Units	0.10	7.83	8.23
Benzene	mg/L	0.00050	<0.00050	<0.00050
Toluene	mg/L	0.0010	<0.0010	<0.0010
Ethyl Benzene	mg/L	0.00050	<0.00050	0.00083
o-Xylene	mg/L	0.00050	<0.00050	<0.00050
F1 (C6-C10)	mg/L	0.10	<0.10	<0.10
F2 (C10-C16)	mg/L	0.10	<0.10	<0.10
F3 (C16-C34)	mg/L	0.25	<0.25	<0.25
F4 (C34-C50)	mg/L	0.25	<0.25	<0.25
Total Hydrocarbons (C6-C50)	mg/L	0.38	<0.38	N/A

Appendix E: CIRNAC Inspection Report

The CIRNAC inspection report was not received by CGS.

Appendix F: Licencee Representative Annual Inspection Report

August 28, 2020

2020 Municipal Water Licence Inspection – Rankin Inlet-Hamlet

The inspection took place on Wednesday August 26th with Tommy Sharp (Hamlet Foreman), Atuat Shouldice (CIRNAC Inspector), Sarah Collins (CGS representative), and Connor Faulkner (CGS representative) present. Wastewater samples were taken at compliance point RAN-2 on Friday August 28th. Some points brought forth by the inspector were:

- Fencing around the site needs to be repaired and installed once the Hamlet secures funding for the project. The Hamlet is currently waiting on quotes from several sources.
- Capacity is being reached very quickly. Due to this, proper segregation and dumping needs to occur within the site to prolong the life of the site until a new one is chosen.
- Palleting and strapping on waste oil drums in one location within the hazardous waste area.
- Continue to collect batteries in lined crates and propane tanks in the designated sea can.
- A solid waste coordinator was hired and is now at the site full-time. His duties include directing contractor and residents to the correct areas for dumping, and keeps track of the dumping to collect tipping fees at the end of the month.