ANNUAL REPORT
FOR THE HAMLET OF ARVIAT

YEAR BEING REPORTED: 2021

The following information is compiled pursuant to the requirements of Part B, Item 1 of Water Licence No. **3AM-ARV1016** issued to the **Hamlet of Arviat**.

Below are tabular summaries of all data generated under the "Monitoring Program".

I. Monthly and annual quantities of freshwater obtained by daily logs for all freshwater sources and estimated sewage waste discharged.

Table 1: Summary of water obtained from three raw water cells combined and estimated sewage water discharge in m^3

Month Reported	Quantity of Water Obtained from all sources (m^3)	Quantity of Sewage Waste Discharged (m^3)
January	8,495.571	Same
February	7,892.425	Same
March	8,920.453	Same
April	8,453.011	Same
May	8,276.803	Same
June	8,468.756	Same
July	9,484.897	Same
August	9,406.926	Same
September	9,217.250	Same
October	9,090.845	Same
November	9,097.885	Same
December	8,836.291	Same
ANNUAL TOTAL	105,641.291	Same

Note: No meter exists to measure the sewage discharge volumes, therefore Sewage discharge volumes are considered equal to the water consumption volumes.

Table 2: Summary of water obtained from Wolf Creek to Raw Water Cells in m^3

Month Reported	Estimated Water Transferred from Wolf Creek to Raw Water Cells (m^3)
July	33,128
August	59,679
September	34,758
TOTAL	**127,565**

Pumping from Wolf Creek River began on July 14, 2021 and ended on September 19, 2021. An estimated total of 127,565 m^3 was pumped to raw water cells in 2021.

II. A summary of modifications and/or major maintenance work carried out on the Water Supply and Waste Disposal Facilities, including all associated structures and facilities:

- Segregation continues to improve the Solid Waste and Bulky Metals Site, including hazardous material. Crushed materials are being trucked to Solid Waste Site where they are disposed and are used as fire barriers. Heavy equipment is at the Solid Waste Site during summer months organizing the site.

III. A list of unauthorized discharges and summary of follow-up action taken:

- No unauthorized discharges for the infrastructure under licence 3AM-ARV1016 occurred in 2021.

IV. A summary of any abandonment and restoration work completed during the year and an outline of any work anticipated for the next year:

- There was no abandonment and restoration work completed during 2021. There is no abandonment and restoration work anticipated for 2022. Reuse of the old sewage lagoon cells, adjacent to the solid waste site, are being considered in the planning contract to assess and prioritize improvements to the solid waste site. If this assessment determines that the old lagoon cells cannot be reused as part of the solid waste site, an abandonment and restoration plan and timeline for the old lagoon cells will be submitted to the NWB.

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

- The initial planning study for a new solid waste site was completed in fiscal year 2020/21. The cost estimates have indicated that the current funding cannot support the construction of a new state-of-the-art 20-year landfill. The focus of the project will shift to making improvements to the current site. A second planning contract to assess and prioritize the improvements to the current site with the available funding is expected to begin in 2022.
- GN hired Associated Engineering to perform a process review of the Arviat Water Treatment Plant to seek recommendations on improving UVT (Ultraviolet Transmittance) during winter months and lowering seasonally elevated DBPs. The assessment report in anticipated summer 2022. Any process changes to the water treatment plant will be approved by the GN Department of Health, with notice of modification provided to the NWB. Modifications will not impact water withdrawal/waste disposal authorizations.
- The design contract for the sewage lagoon upgrade is expected to commence in spring 2022, with completion spring 2023. Pending funding approval, construction will then begin.

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

- None

VII. updates or revisions to the approved Operation and Maintenance Plans:

- None

ADDITIONAL INFORMATION THAT THE LICENSEE DEEMS USEFUL:

- Licence amendment/renewal is currently ongoing. The Technical Meeting/Pre-Hearing Conference took place February 22 and 23, 2022. The Public Hearing is scheduled to take place during the week of May 30 to June 3, 2022.

Water Licensing Sampling Points:

ARV- 2a: Effluent discharge from the Discharge Point of the Solid Waste Disposal Facility
ARV- 4: Effluent from the discharge point of the Sewage Disposal Facility (End of wetland)
ARV- 5: Discharge from the Bulky Metal Waste Area
ARV- 6: Discharge from the Hazardous Waste Storage Area

FOLLOW-UP REGARDING INSPECTION/COMPLIANCE CONCERNS:

- CGS will support the municipality to restart the collection of batteries in a seacan in 2022. The municipality hires summer staff to clean up the landfill each year Additionally, an assessment of the Arviat solid waste site is expected to take place in summer 2022. It will evaluate and recommend an approach to improve management of waste including hazardous waste segregation and containment options. The results will be used to develop a business case which is expected to be complete by March 2023. The Business Case and updated project timelines will be submitted to NWB.

Appendix A: ARV-4 Effluent Quality Limits

Appendix B: Weekly Inspections at Monitoring Program Station

Appendix C: Certificate of Analysis June 29, 2021
Certificate of Analysis August 26, 2021
Certificate of Analysis September 23, 2021

Appendix D: Hazardous Materials Spill Database, Arviat 2021

Appendix E: Arviat 2021 Sampling Summary

Appendix F: Arviat 2021 CIRNAC Inspection Report

Appendix A

3AM-ARV1016 Arviat Monitoring Program Results 2021
ARV-4 Effluent Quality limits

Parameter	Maximum Concentration of any grab sample	ARV-4	
		29-Jun-21	26-Aug-21
BOD_5	80 mg/L	82	27.2
Total Suspended Solids	100 mg/L	26.5	68
Fecal Coliforms	1 x 10^4 CFU/100mL	>24200	170
Oil & Grease	no visible sheen	15.9	<5.0
pH	between 6 and 9	7.29	7.76

Appendix B

Nunavut Water Board Licence No. 3AM-ARV1016
Arviat, NU
Weekly Inspections at Monitoring Program Stations - 2021

Near Garbage Near Lagoon Near Metal Dumps Near Garage

Week	Starting Date	ARV-2a Water Present (check)			ARV-4 Water Present (check)			ARV-5 Water Present (check)			ARV-6 Water Present (check)			Checked By
		Yes	No	Frozen	Yes	No	Frozen	Yes	No	Frozen	Yes	No	Frozen	
1	31-May-21			✓			✓			✓			✓	Laura
2	07-Jun-21	✓			✓			✓					✓	Laura
3	14-Jun-21	✓			✓			✓			✓			Laura
4	21-Jun-21	✓			✓			✓			✓			Laura
5	28-Jun-21	✓			✓			✓			✓			Laura
6	05-Jul-21	✓			✓			✓			✓			Laura
7	12-Jul-21	✓			✓			✓			✓			Laura
8	19-Jul-21	✓			✓			✓			✓			Laura
9	26-Jul-21	✓			✓			✓			✓			Laura
10	02-Aug-21	✓			✓			✓			✓			Laura
11	09-Aug-21	✓			✓			✓			✓			Laura
12	16-Aug-21	✓			✓			✓			✓			Laura
13	23-Aug-21	✓			✓			✓			✓			Laura
14	30-Aug-21	✓			✓			✓			✓			Laura
15	06-Sep-21	✓			✓			✓			✓			Laura
16	13-Sep-21	✓			✓			✓			✓			Laura
17	20-Sep-21	✓			✓			✓			✓			Laura
18	27-Sep-21	✓			✓			✓			✓			Laura

Monitoring Program Station Locations:

ARV-2a: Effluent discharge from the Discharge Point of the Solid Waste Disposal Facility
ARV-4: Effluent from the discharge point of the Sewage Disposal Facility (end of wetland)
ARV-5: Discharge from the Bulky Metal Waste Area
ARV-6: Discharge from the Hazardous Waste Storage Area

* Send sheets weekly to Matthew Hewey - CGS Rankin Inlet by email: MHewey@GOV.NU.CA or fax: (867) 645-8143

Appendix C

Hamlet of Arviat
ATTN: STEVE ENGLAND
PO Box 150
Arviat NU X0C 0E0

Date Received: 02-JUL-21
Report Date: 12-JUL-21 15:58 (MT)
Version: FINAL

Client Phone: 867-857-2841

Certificate of Analysis

Lab Work Order #: L2609119

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
L2609119-1 ARV-2							
Sampled By: CLIENT on 29-JUN-21 @ 13:43							
Matrix: WATER							
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	548		1.2	mg/L		06-JUL-21	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		06-JUL-21	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		06-JUL-21	
Alkalinity, Total (as CaCO3)							
Alkalinity, Total (as CaCO3)	449		1.0	mg/L		05-JUL-21	R5512873
Ammonia by colour							
Ammonia, Total (as N)	11.1		1.0	mg/L		07-JUL-21	R5513713
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	159		50	mg/L		02-JUL-21	R5514758
Carbonaceous BOD							
BOD Carbonaceous	137		50	mg/L		02-JUL-21	R5514758
Chloride in Water by IC							
Chloride (Cl)	303		10	mg/L		03-JUL-21	R5509596
Conductivity							
Conductivity	2910		1.0	umhos/cm		05-JUL-21	R5512873
Fecal coliforms, 1:10 dilution by QT97							
Fecal Coliforms	1050	PEHR	10	MPN/100mL		02-JUL-21	R5511283
Hardness Calculated							
Hardness (as CaCO3)	1150	HTC	1.2	mg/L		08-JUL-21	
Mercury Total							
Mercury (Hg)-Total	0.0000548		0.0000050	mg/L	08-JUL-21	08-JUL-21	R5515973
Nitrate in Water by IC							
Nitrate (as N)	<0.40	DLM	0.40	mg/L		03-JUL-21	R5509596
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.45		0.45	mg/L		05-JUL-21	
Nitrite in Water by IC							
Nitrite (as N)	<0.20	DLM	0.20	mg/L		03-JUL-21	R5509596
Oil & Grease - Gravimetric							
Oil and Grease	<5.0		5.0	mg/L		08-JUL-21	R5516437
Phenol (4AAP)							
Phenols (4AAP)	0.103	DLHC	0.0050	mg/L		09-JUL-21	R5516401
Phosphorus, Total							
Phosphorus (P)-Total	0.923		0.0030	mg/L		09-JUL-21	R5516413
Sulfate in Water by IC							
Sulfate (SO4)	739		6.0	mg/L		03-JUL-21	R5509596
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.0482		0.0030	mg/L	06-JUL-21	06-JUL-21	R5514068
Arsenic (As)-Total	0.00611		0.00010	mg/L	06-JUL-21	06-JUL-21	R5514068
Cadmium (Cd)-Total	0.000687		0.0000050	mg/L	06-JUL-21	06-JUL-21	R5514068
Calcium (Ca)-Total	361		0.50	mg/L	06-JUL-21	07-JUL-21	R5515816
Chromium (Cr)-Total	0.00223		0.00010	mg/L	06-JUL-21	06-JUL-21	R5514068
Cobalt (Co)-Total	0.00820		0.00010	mg/L	06-JUL-21	06-JUL-21	R5514068
Copper (Cu)-Total	0.106		0.00050	mg/L	06-JUL-21	06-JUL-21	R5514068
Iron (Fe)-Total	6.60		0.010	mg/L	06-JUL-21	06-JUL-21	R5514068
Lead (Pb)-Total	0.00793		0.000050	mg/L	06-JUL-21	06-JUL-21	R5514068
Magnesium (Mg)-Total	61.1		0.0050	mg/L	06-JUL-21	06-JUL-21	R5514068
Manganese (Mn)-Total	2.87		0.00010	mg/L	06-JUL-21	06-JUL-21	R5514068
Nickel (Ni)-Total	0.0165		0.00050	mg/L	06-JUL-21	06-JUL-21	R5514068

* 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
L2609119-1 ARV-2							
Sampled By: CLIENT on 29-JUN-21 @ 13:43							
Matrix: WATER							
Total Metals in Water by CRC ICPMS							
Potassium (K)-Total	61.2		0.050	mg/L	06-JUL-21	06-JUL-21	R5514068
Sodium (Na)-Total	258		0.050	mg/L	06-JUL-21	06-JUL-21	R5514068
Zinc (Zn)-Total	1.02		0.0030	mg/L	06-JUL-21	06-JUL-21	R5514068
Total Organic Carbon by Combustion							
Total Organic Carbon	98.4		5.0	mg/L		08-JUL-21	R5516230
Total Suspended Solids							
Total Suspended Solids	33.1		3.0	mg/L		06-JUL-21	R5513886
pH							
pH	7.37		0.10	pH units		05-JUL-21	R5512873
L2609119-2 ARV-4							
Sampled By: CLIENT on 29-JUN-21 @ 13:21							
Matrix: WATER							
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	276		1.2	mg/L		06-JUL-21	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		06-JUL-21	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		06-JUL-21	
Alkalinity, Total (as CaCO3)							
Alkalinity, Total (as CaCO3)	226		1.0	mg/L		05-JUL-21	R5512873
Ammonia by colour							
Ammonia, Total (as N)	43.9		1.0	mg/L		07-JUL-21	R5513713
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	82		20	mg/L		02-JUL-21	R5514758
Carbonaceous BOD							
BOD Carbonaceous	78		20	mg/L		02-JUL-21	R5514758
Chloride in Water by IC							
Chloride (Cl)	62.0		0.50	mg/L		03-JUL-21	R5509596
Conductivity							
Conductivity	735		1.0	umhos/cm		05-JUL-21	R5512873
Fecal coliforms, 1:10 dilution by QT97							
Fecal Coliforms	>24200	PEHR	10	MPN/100mL		02-JUL-21	R5511283
Hardness Calculated							
Hardness (as CaCO3)	62.6	HTC	0.20	mg/L		07-JUL-21	
Mercury Total							
Mercury (Hg)-Total	0.0000109		0.0000050	mg/L	08-JUL-21	08-JUL-21	R5515973
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		03-JUL-21	R5509596
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		05-JUL-21	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		03-JUL-21	R5509596
Oil & Grease - Gravimetric							
Oil and Grease	15.9		5.0	mg/L		08-JUL-21	R5516437
Phenol (4AAP)							
Phenols (4AAP)	0.252	DLHC	0.0050	mg/L		08-JUL-21	R5516401
Phosphorus, Total							
Phosphorus (P)-Total	6.95		0.030	mg/L		09-JUL-21	R5516413
Sulfate in Water by IC							
Sulfate (SO4)	8.82		0.30	mg/L		03-JUL-21	R5509596

* 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
L2609119-2 ARV-4							
Sampled By: CLIENT on 29-JUN-21 @ 13:21							
Matrix: WATER							
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.0991		0.0030	mg/L	06-JUL-21	06-JUL-21	R5514068
Arsenic (As)-Total	0.00370		0.00010	mg/L	06-JUL-21	06-JUL-21	R5514068
Cadmium (Cd)-Total	0.000137		0.0000050	mg/L	06-JUL-21	06-JUL-21	R5514068
Calcium (Ca)-Total	14.7		0.050	mg/L	06-JUL-21	06-JUL-21	R5514068
Chromium (Cr)-Total	0.00085		0.00010	mg/L	06-JUL-21	06-JUL-21	R5514068
Cobalt (Co)-Total	0.00301		0.00010	mg/L	06-JUL-21	06-JUL-21	R5514068
Copper (Cu)-Total	0.118		0.00050	mg/L	06-JUL-21	06-JUL-21	R5514068
Iron (Fe)-Total	1.62		0.010	mg/L	06-JUL-21	06-JUL-21	R5514068
Lead (Pb)-Total	0.00297		0.000050	mg/L	06-JUL-21	06-JUL-21	R5514068
Magnesium (Mg)-Total	6.30		0.0050	mg/L	06-JUL-21	06-JUL-21	R5514068
Manganese (Mn)-Total	0.226		0.00010	mg/L	06-JUL-21	06-JUL-21	R5514068
Nickel (Ni)-Total	0.00791		0.00050	mg/L	06-JUL-21	06-JUL-21	R5514068
Potassium (K)-Total	19.6		0.050	mg/L	06-JUL-21	06-JUL-21	R5514068
Sodium (Na)-Total	50.0		0.050	mg/L	06-JUL-21	06-JUL-21	R5514068
Zinc (Zn)-Total	0.0553		0.0030	mg/L	06-JUL-21	06-JUL-21	R5514068
Total Organic Carbon by Combustion							
Total Organic Carbon	54.8		5.0	mg/L		08-JUL-21	R5516230
Total Suspended Solids							
Total Suspended Solids	26.5		3.0	mg/L		06-JUL-21	R5513886
pH							
pH	7.29		0.10	pH units		05-JUL-21	R5512873
L2609119-3 ARV-5							
Sampled By: CLIENT on 29-JUN-21 @ 13:54							
Matrix: WATER							
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	47.9		1.2	mg/L		06-JUL-21	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		06-JUL-21	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		06-JUL-21	
Alkalinity, Total (as CaCO3)							
Alkalinity, Total (as CaCO3)	39.3		1.0	mg/L		05-JUL-21	R5512873
Ammonia by colour							
Ammonia, Total (as N)	0.021		0.010	mg/L		07-JUL-21	R5513713
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	<2.0		2.0	mg/L		02-JUL-21	R5514758
Carbonaceous BOD							
BOD Carbonaceous	<2.0		2.0	mg/L		02-JUL-21	R5514758
Chloride in Water by IC							
Chloride (Cl)	137		0.50	mg/L		03-JUL-21	R5509596
Conductivity							
Conductivity	558		1.0	umhos/cm		05-JUL-21	R5512873
Fecal coliforms, 1:10 dilution by QT97							
Fecal Coliforms	<10	PEHR	10	MPN/100mL		02-JUL-21	R5511283
Hardness Calculated							
Hardness (as CaCO3)	87.0	HTC	0.20	mg/L		12-JUL-21	
Mercury Total							
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L	08-JUL-21	08-JUL-21	R5515973
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		03-JUL-21	R5509596

* 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
L2609119-3 ARV-5							
Sampled By: CLIENT on 29-JUN-21 @ 13:54							
Matrix: WATER							
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		05-JUL-21	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		03-JUL-21	R5509596
Oil & Grease - Gravimetric							
Oil and Grease	<5.0		5.0	mg/L		08-JUL-21	R5516437
Phenol (4AAP)							
Phenols (4AAP)	<0.0010		0.0010	mg/L		09-JUL-21	R5516401
Phosphorus, Total							
Phosphorus (P)-Total	0.110		0.0030	mg/L		09-JUL-21	R5516413
Sulfate in Water by IC							
Sulfate (SO4)	8.63		0.30	mg/L		03-JUL-21	R5509596
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.124		0.0030	mg/L	06-JUL-21	06-JUL-21	R5514068
Arsenic (As)-Total	0.00055		0.00010	mg/L	06-JUL-21	08-JUL-21	R5517556
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L	06-JUL-21	06-JUL-21	R5514068
Calcium (Ca)-Total	14.5		0.050	mg/L	06-JUL-21	06-JUL-21	R5514068
Chromium (Cr)-Total	0.00037		0.00010	mg/L	06-JUL-21	06-JUL-21	R5514068
Cobalt (Co)-Total	0.00023		0.00010	mg/L	06-JUL-21	06-JUL-21	R5514068
Copper (Cu)-Total	0.00102		0.00050	mg/L	06-JUL-21	06-JUL-21	R5514068
Iron (Fe)-Total	2.18		0.010	mg/L	06-JUL-21	06-JUL-21	R5514068
Lead (Pb)-Total	0.000263		0.000050	mg/L	06-JUL-21	06-JUL-21	R5514068
Magnesium (Mg)-Total	12.4		0.0050	mg/L	06-JUL-21	06-JUL-21	R5514068
Manganese (Mn)-Total	0.0906		0.00010	mg/L	06-JUL-21	06-JUL-21	R5514068
Nickel (Ni)-Total	0.00069		0.00050	mg/L	06-JUL-21	06-JUL-21	R5514068
Potassium (K)-Total	4.46		0.050	mg/L	06-JUL-21	06-JUL-21	R5514068
Sodium (Na)-Total	77.6		0.050	mg/L	06-JUL-21	06-JUL-21	R5514068
Zinc (Zn)-Total	0.0069		0.0030	mg/L	06-JUL-21	06-JUL-21	R5514068
Total Organic Carbon by Combustion							
Total Organic Carbon	7.92		0.50	mg/L		08-JUL-21	R5516230
Total Suspended Solids							
Total Suspended Solids	<3.0		3.0	mg/L		06-JUL-21	R5513886
pH							
pH	7.16		0.10	pH units		05-JUL-21	R5512873
L2609119-4 ARV-6							
Sampled By: CLIENT on 29-JUN-21 @ 14:09							
Matrix: WATER							
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	99.7		1.2	mg/L		06-JUL-21	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		06-JUL-21	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		06-JUL-21	
Alkalinity, Total (as CaCO3)							
Alkalinity, Total (as CaCO3)	81.7		1.0	mg/L		05-JUL-21	R5512873
Ammonia by colour							
Ammonia, Total (as N)	0.057		0.010	mg/L		07-JUL-21	R5513713
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	<6.0		6.0	mg/L		02-JUL-21	R5514758
Carbonaceous BOD							
BOD Carbonaceous	<6.0		6.0	mg/L		02-JUL-21	R5514758

* 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
L2609119-4 ARV-6							
Sampled By: CLIENT on 29-JUN-21 @ 14:09							
Matrix: WATER							
Chloride in Water by IC							
Chloride (Cl)	67.5		0.50	mg/L		03-JUL-21	R5509596
Conductivity							
Conductivity	383		1.0	umhos/cm		05-JUL-21	R5512873
Fecal coliforms, 1:10 dilution by QT97							
Fecal Coliforms	<10	PEHR	10	MPN/100mL		02-JUL-21	R5511283
Hardness Calculated							
Hardness (as CaCO3)	114	HTC	0.20	mg/L		12-JUL-21	
Mercury Total							
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L	08-JUL-21	08-JUL-21	R5515973
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		03-JUL-21	R5509596
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		05-JUL-21	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		03-JUL-21	R5509596
Oil & Grease - Gravimetric							
Oil and Grease	23.3		5.0	mg/L		08-JUL-21	R5516437
Phenol (4AAP)							
Phenols (4AAP)	0.0076		0.0010	mg/L		08-JUL-21	R5516401
Phosphorus, Total							
Phosphorus (P)-Total	0.0386		0.0030	mg/L		09-JUL-21	R5516413
Sulfate in Water by IC							
Sulfate (SO4)	0.38		0.30	mg/L		03-JUL-21	R5509596
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.0253		0.0030	mg/L	06-JUL-21	06-JUL-21	R5514068
Arsenic (As)-Total	0.00065		0.00010	mg/L	06-JUL-21	08-JUL-21	R5517556
Cadmium (Cd)-Total	0.0000089		0.0000050	mg/L	06-JUL-21	06-JUL-21	R5514068
Calcium (Ca)-Total	30.1		0.050	mg/L	06-JUL-21	06-JUL-21	R5514068
Chromium (Cr)-Total	0.00026		0.00010	mg/L	06-JUL-21	06-JUL-21	R5514068
Cobalt (Co)-Total	0.00231		0.00010	mg/L	06-JUL-21	06-JUL-21	R5514068
Copper (Cu)-Total	0.00110		0.00050	mg/L	06-JUL-21	06-JUL-21	R5514068
Iron (Fe)-Total	9.03		0.010	mg/L	06-JUL-21	06-JUL-21	R5514068
Lead (Pb)-Total	0.000330		0.000050	mg/L	06-JUL-21	06-JUL-21	R5514068
Magnesium (Mg)-Total	9.44		0.0050	mg/L	06-JUL-21	06-JUL-21	R5514068
Manganese (Mn)-Total	2.77		0.00010	mg/L	06-JUL-21	06-JUL-21	R5514068
Nickel (Ni)-Total	0.00192		0.00050	mg/L	06-JUL-21	06-JUL-21	R5514068
Potassium (K)-Total	5.23		0.050	mg/L	06-JUL-21	06-JUL-21	R5514068
Sodium (Na)-Total	31.8		0.050	mg/L	06-JUL-21	06-JUL-21	R5514068
Zinc (Zn)-Total	0.0125		0.0030	mg/L	06-JUL-21	06-JUL-21	R5514068
Total Organic Carbon by Combustion							
Total Organic Carbon	13.4		0.50	mg/L		08-JUL-21	R5516230
Total Suspended Solids							
Total Suspended Solids	21.7		3.0	mg/L		06-JUL-21	R5513886
pH							
pH	7.02		0.10	pH units		05-JUL-21	R5512873
L2609119-5 SEWAGE LAGOON							
Sampled By: CLIENT on 29-JUN-21 @ 13:32							
Matrix: WATER							
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	284		1.2	mg/L		06-JUL-21	

* 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
L2609119-5 SEWAGE LAGOON							
Sampled By: CLIENT on 29-JUN-21 @ 13:32							
Matrix: WATER							
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		06-JUL-21	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		06-JUL-21	
Alkalinity, Total (as CaCO3)							
Alkalinity, Total (as CaCO3)	233		1.0	mg/L		05-JUL-21	R5512873
Ammonia by colour							
Ammonia, Total (as N)	66.5		2.0	mg/L		07-JUL-21	R5513713
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	209		50	mg/L		02-JUL-21	R5514758
Carbonaceous BOD							
BOD Carbonaceous	181		50	mg/L		02-JUL-21	R5514758
Chloride in Water by IC							
Chloride (Cl)	48.9		0.50	mg/L		03-JUL-21	R5509596
Conductivity							
Conductivity	739		1.0	umhos/cm		05-JUL-21	R5512873
Fecal coliforms, 1:10 dilution by QT97							
Fecal Coliforms	>24200	PEHR	10	MPN/100mL		02-JUL-21	R5511283
Hardness Calculated							
Hardness (as CaCO3)	36.6	HTC	0.20	mg/L		12-JUL-21	
Mercury Total							
Mercury (Hg)-Total	0.0000110		0.0000050	mg/L	08-JUL-21	08-JUL-21	R5515973
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		03-JUL-21	R5509596
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		05-JUL-21	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		03-JUL-21	R5509596
Oil & Grease - Gravimetric							
Oil and Grease	25.3		5.0	mg/L		08-JUL-21	R5516437
Phenol (4AAP)							
Phenols (4AAP)	0.0864		0.0010	mg/L		08-JUL-21	R5516401
Phosphorus, Total							
Phosphorus (P)-Total	8.74		0.030	mg/L		09-JUL-21	R5516413
Sulfate in Water by IC							
Sulfate (SO4)	8.12		0.30	mg/L		03-JUL-21	R5509596
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.137		0.0030	mg/L	06-JUL-21	06-JUL-21	R5514068
Arsenic (As)-Total	0.00042		0.00010	mg/L	06-JUL-21	08-JUL-21	R5517556
Cadmium (Cd)-Total	0.0000847		0.0000050	mg/L	06-JUL-21	06-JUL-21	R5514068
Calcium (Ca)-Total	7.94		0.050	mg/L	06-JUL-21	06-JUL-21	R5514068
Chromium (Cr)-Total	0.00088		0.00010	mg/L	06-JUL-21	06-JUL-21	R5514068
Cobalt (Co)-Total	0.00046		0.00010	mg/L	06-JUL-21	06-JUL-21	R5514068
Copper (Cu)-Total	0.125		0.00050	mg/L	06-JUL-21	06-JUL-21	R5514068
Iron (Fe)-Total	0.639		0.010	mg/L	06-JUL-21	06-JUL-21	R5514068
Lead (Pb)-Total	0.00122		0.000050	mg/L	06-JUL-21	06-JUL-21	R5514068
Magnesium (Mg)-Total	4.07		0.0050	mg/L	06-JUL-21	06-JUL-21	R5514068
Manganese (Mn)-Total	0.0339		0.00010	mg/L	06-JUL-21	06-JUL-21	R5514068
Nickel (Ni)-Total	0.00232		0.00050	mg/L	06-JUL-21	06-JUL-21	R5514068
Potassium (K)-Total	19.2		0.050	mg/L	06-JUL-21	06-JUL-21	R5514068
Sodium (Na)-Total	42.0		0.050	mg/L	06-JUL-21	06-JUL-21	R5514068
Zinc (Zn)-Total	0.0838		0.0030	mg/L	06-JUL-21	06-JUL-21	R5514068
Total Organic Carbon by Combustion							

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2609119-5 SEWAGE LAGOON							
Sampled By: CLIENT on 29-JUN-21 @ 13:32							
Matrix: WATER							
Total Organic Carbon by Combustion							
Total Organic Carbon	96.4		5.0	mg/L		08-JUL-21	R5516230
Total Suspended Solids							
Total Suspended Solids	25.5		3.0	mg/L		06-JUL-21	R5513886
pH							
pH	7.16		0.10	pH units		05-JUL-21	R5512873

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

Reference Information

Sample Parameter Qualifier Key:

Qualifier	Description
B	Method Blank exceeds ALS DQO. Associated sample results which are < Limit of Reporting or > 5 times blank level are considered reliable.
DLHC	Detection Limit Raised: Dilution required due to high concentration of test analyte(s).
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.
PEHR	Parameter Exceeded Recommended Holding Time On Receipt: Proceed With Analysis As Requested.

Test Method References:

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

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

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

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

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

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

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

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

BOD-CBOD-WP	Water	Carbonaceous BOD	APHA 5210 B

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

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

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

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.

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.

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
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.			
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.			

** 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.

ALS Environmental
www.alsglobal.com

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

L2609119-COFC

COC Number: 17 - 747621

Page 1 of 1

Report To	Contact and company name below will appear on the final report
Company:	Hamlet of Arviat
Contact:	Steve England
Phone:	867-857-2841
	Company address below will appear on the final report
Street:	
City/Province:	ARVIAT, NU
Postal Code:	X0C-0E0
Invoice To	Same as Report To [X] YES [ ] NO
	Copy of Invoice with Report [ ] YES [X] 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	arviatsao@arviat.com
Email 2	MHenley@gov.nu.ca
Email 3	

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

Project Information	
ALS Account # / Quote #:	
Job #:	
PO / AFE:	
LSD:	

Oil and Gas Required Fields (client use)	
AFE/Cost Center:	PO#
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

ALS Lab Work Order # (lab use only):

ALS Contact:

Sampler:

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%] [ ]
- 3 day [P3-25%] [ ]
- 2 day [P2-50%] [ ]

EMERGENCY:
- 1 Business day [E - 100%] [ ]
- Same Day, Weekend or Statutory holiday [E2 -200% (Laboratory opening fees may apply)] [ ]

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.

Analysis Request

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

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	Routine	BOD	BOD	Metals	Mercury	Batena	Batena	Oil & Grease x2	Phenols x 2	SAMPLES ON HOLD	SUSPECTED HAZARD (see Special Instructions)
	ARV-2	26-06-21	1:43pm			✓	✓	✓	✓	✓	✓	✓	✓	✓		
	ARV-4	26-06-21	1:21pm			✓	✓	✓	✓	✓	✓	✓	✓	✓		
	ARV-5	26-06-21	1:54pm			✓	✓	✓	✓	✓	✓	✓	✓	✓		
	ARV-6	26-06-21	2:09pm			✓	✓	✓	✓	✓	✓	✓	✓	✓		
	Sewage Lagoon	26-06-21	1:32pm			✓	✓	✓	✓	✓	✓	✓	✓	✓		

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	
Are samples for human consumption/ 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			

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by: Laura	Date: June 29/21	Time: 2:23pm	Received by: O.A.	Date: 2/7/2021	Time: 9:24am	Received by: NMK	Date: JUL 02 2021	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.**

Temp: 9.0°C

Hamlet of Arviat
ATTN: STEVE ENGLAND
PO Box 150
Arviat NU X0C 0E0

Date Received: 01-SEP-21
Report Date: 20-SEP-21 15:08 (MT)
Version: FINAL

Client Phone: 867-857-2841

Certificate of Analysis

Lab Work Order #: L2634685

Project P.O. #: NOT SUBMITTED
Job Reference: HAMLET OF ARVIAT - WASTE WATERS
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
L2634685-1 ARV-2							
Sampled By: CLIENT on 26-AUG-21 @ 09:52							
Matrix: WW							
F2-F4 (O.Reg.153/04)							
F2-F4 (O.Reg.153/04)							
F2 (C10-C16)	<100		100	ug/L	07-SEP-21	08-SEP-21	R5580948
F3 (C16-C34)	<250		250	ug/L	07-SEP-21	08-SEP-21	R5580948
F4 (C34-C50)	<250		250	ug/L	07-SEP-21	08-SEP-21	R5580948
Chrom. to baseline at nC50	YES				07-SEP-21	08-SEP-21	R5580948
Surrogate: 2-Bromobenzotrifluoride	94.3		60-140	%	07-SEP-21	08-SEP-21	R5580948
Miscellaneous Parameters							
Xylenes (Total)	<0.00064		0.00064	mg/L		10-SEP-21	
Total and E. coli, 1:10 dilution by QT97							
Total Coliforms	1020	PEHR	10	MPN/100mL		01-SEP-21	R5575500
Escherichia Coli	30	PEHR	10	MPN/100mL		01-SEP-21	R5575500
BTX plus F1 by GCMS							
Benzene	<0.00050		0.00050	mg/L		08-SEP-21	R5581554
Toluene	<0.0010		0.0010	mg/L		08-SEP-21	R5581554
Ethyl benzene	<0.00050		0.00050	mg/L		08-SEP-21	R5581554
o-Xylene	<0.00050		0.00050	mg/L		08-SEP-21	R5581554
m+p-Xylenes	<0.00040		0.00040	mg/L		08-SEP-21	R5581554
F1 (C6-C10)	<0.10		0.10	mg/L		08-SEP-21	R5581554
Surrogate: 4-Bromofluorobenzene (SS)	77.4		70-130	%		08-SEP-21	R5581554
Surrogate: 3,4-Dichlorotoluene (SS)	113.3		70-130	%		08-SEP-21	R5581554
CCME PAHs in mg/L							
1-Methylnaphthalene	0.000021		0.000020	mg/L	07-SEP-21	09-SEP-21	R5581268
2-Methylnaphthalene	<0.000020		0.000020	mg/L	07-SEP-21	09-SEP-21	R5581268
Acenaphthene	<0.000020		0.000020	mg/L	07-SEP-21	09-SEP-21	R5581268
Acenaphthylene	<0.000020		0.000020	mg/L	07-SEP-21	09-SEP-21	R5581268
Anthracene	<0.000010		0.000010	mg/L	07-SEP-21	09-SEP-21	R5581268
Acridine	<0.000020		0.000020	mg/L	07-SEP-21	09-SEP-21	R5581268
Benzo(a)anthracene	<0.000010		0.000010	mg/L	07-SEP-21	09-SEP-21	R5581268
Benzo(a)pyrene	<0.0000050		0.0000050	mg/L	07-SEP-21	09-SEP-21	R5581268
Benzo(b&j)fluoranthene	<0.000010		0.000010	mg/L	07-SEP-21	09-SEP-21	R5581268
Benzo(g,h,i)perylene	<0.000020		0.000020	mg/L	07-SEP-21	09-SEP-21	R5581268
Benzo(k)fluoranthene	<0.000010		0.000010	mg/L	07-SEP-21	09-SEP-21	R5581268
Chrysene	<0.000020		0.000020	mg/L	07-SEP-21	09-SEP-21	R5581268
Dibenz(a,h)anthracene	<0.0000050		0.0000050	mg/L	07-SEP-21	09-SEP-21	R5581268
Fluoranthene	<0.000020		0.000020	mg/L	07-SEP-21	09-SEP-21	R5581268
Fluorene	<0.000020		0.000020	mg/L	07-SEP-21	09-SEP-21	R5581268
Indeno(1,2,3-cd)pyrene	<0.000010		0.000010	mg/L	07-SEP-21	09-SEP-21	R5581268
Naphthalene	<0.000050		0.000050	mg/L	07-SEP-21	09-SEP-21	R5581268
Phenanthrene	<0.000050		0.000050	mg/L	07-SEP-21	09-SEP-21	R5581268
Pyrene	<0.000010		0.000010	mg/L	07-SEP-21	09-SEP-21	R5581268
Quinoline	<0.000095	DLQ	0.000095	mg/L	07-SEP-21	09-SEP-21	R5581268
B(a)P Total Potency Equivalent	<0.000030		0.000030	mg/L	07-SEP-21	09-SEP-21	R5581268
Surrogate: Naphthalene d8	113.3		50-130	%	07-SEP-21	09-SEP-21	R5581268
Surrogate: Phenanthrene d10	97.5		60-130	%	07-SEP-21	09-SEP-21	R5581268
Surrogate: Chrysene d12	88.6		60-130	%	07-SEP-21	09-SEP-21	R5581268
Surrogate: Acridine d9	104.0		60-130	%	07-SEP-21	09-SEP-21	R5581268
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	747		1.2	mg/L		03-SEP-21	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		03-SEP-21	
Alkalinity, Hydroxide							

* 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
L2634685-1 ARV-2							
Sampled By: CLIENT on 26-AUG-21 @ 09:52							
Matrix: WW							
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		03-SEP-21	
Alkalinity, Total (as CaCO3)							
Alkalinity, Total (as CaCO3)	612		1.0	mg/L		02-SEP-21	R5577242
Ammonia by colour							
Ammonia, Total (as N)	5.97		0.20	mg/L		09-SEP-21	R5582164
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	12.6		6.0	mg/L		02-SEP-21	R5580190
Carbonaceous BOD							
BOD Carbonaceous	8.9		6.0	mg/L		02-SEP-21	R5580190
Chloride in Water by IC							
Chloride (Cl)	257		5.0	mg/L		02-SEP-21	R5578905
Conductivity							
Conductivity	2750		1.0	umhos/cm		02-SEP-21	R5577242
Fecal coliforms, 1:10 dilution by QT97							
Fecal Coliforms	20	PEHR	10	MPN/100mL		01-SEP-21	R5575505
Hardness Calculated							
Hardness (as CaCO3)	1200	HTC	1.2	mg/L		08-SEP-21	
Mercury Total							
Mercury (Hg)-Total	0.0000129		0.0000050	mg/L	10-SEP-21	10-SEP-21	R5583066
Nitrate in Water by IC							
Nitrate (as N)	<0.20	DLM	0.20	mg/L		02-SEP-21	R5578905
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.22		0.22	mg/L		04-SEP-21	
Nitrite in Water by IC							
Nitrite (as N)	<0.10	DLM	0.10	mg/L		02-SEP-21	R5578905
Oil & Grease - Gravimetric							
Oil and Grease	<5.0		5.0	mg/L		10-SEP-21	R5583680
Phenol (4AAP)							
Phenols (4AAP)	0.0099		0.0010	mg/L		07-SEP-21	R5580324
Phosphorus, Total							
Phosphorus (P)-Total	0.415		0.0030	mg/L		07-SEP-21	R5580238
Sulfate in Water by IC							
Sulfate (SO4)	705		3.0	mg/L		02-SEP-21	R5578905
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.0110		0.0030	mg/L	02-SEP-21	03-SEP-21	R5580263
Arsenic (As)-Total	0.00339		0.00010	mg/L	02-SEP-21	03-SEP-21	R5580263
Cadmium (Cd)-Total	0.0000655		0.0000050	mg/L	02-SEP-21	03-SEP-21	R5580263
Calcium (Ca)-Total	383		0.50	mg/L	02-SEP-21	03-SEP-21	R5580263
Chromium (Cr)-Total	0.00077		0.00010	mg/L	02-SEP-21	03-SEP-21	R5580263
Cobalt (Co)-Total	0.00308		0.00010	mg/L	02-SEP-21	03-SEP-21	R5580263
Copper (Cu)-Total	0.0332		0.00050	mg/L	02-SEP-21	03-SEP-21	R5580263
Iron (Fe)-Total	4.79		0.010	mg/L	02-SEP-21	03-SEP-21	R5580263
Lead (Pb)-Total	0.00219		0.000050	mg/L	02-SEP-21	03-SEP-21	R5580263
Magnesium (Mg)-Total	58.7		0.0050	mg/L	02-SEP-21	03-SEP-21	R5580263
Manganese (Mn)-Total	2.56		0.00010	mg/L	02-SEP-21	03-SEP-21	R5580263
Nickel (Ni)-Total	0.0118		0.00050	mg/L	02-SEP-21	03-SEP-21	R5580263
Potassium (K)-Total	50.0		0.050	mg/L	02-SEP-21	03-SEP-21	R5580263
Sodium (Na)-Total	199		0.050	mg/L	02-SEP-21	03-SEP-21	R5580263
Zinc (Zn)-Total	0.0228		0.0030	mg/L	02-SEP-21	03-SEP-21	R5580263
Total Organic Carbon by Combustion							
Total Organic Carbon	66.7		2.5	mg/L		08-SEP-21	R5581182
Total Suspended Solids							

* 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
L2634685-1 ARV-2							
Sampled By: CLIENT on 26-AUG-21 @ 09:52							
Matrix: WW							
Total Suspended Solids							
Total Suspended Solids	13.7		3.0	mg/L		02-SEP-21	R5578957
pH							
pH	7.77		0.10	pH units		02-SEP-21	R5577242
L2634685-2 ARV-4							
Sampled By: CLIENT on 26-AUG-21 @ 09:37							
Matrix: WW							
F2-F4 (O.Reg.153/04)							
F2-F4 (O.Reg.153/04)							
F2 (C10-C16)	<100		100	ug/L	07-SEP-21	08-SEP-21	R5580948
F3 (C16-C34)	250		250	ug/L	07-SEP-21	08-SEP-21	R5580948
F4 (C34-C50)	<250		250	ug/L	07-SEP-21	08-SEP-21	R5580948
Chrom. to baseline at nC50	YES				07-SEP-21	08-SEP-21	R5580948
Surrogate: 2-Bromobenzotrifluoride	97.4		60-140	%	07-SEP-21	08-SEP-21	R5580948
Miscellaneous Parameters							
Xylenes (Total)	<0.00064		0.00064	mg/L		10-SEP-21	
Total and E. coli, 1:10 dilution by QT97							
Total Coliforms	>24200	PEHR	10	MPN/100mL		01-SEP-21	R5575500
Escherichia Coli	50	PEHR	10	MPN/100mL		01-SEP-21	R5575500
BTX plus F1 by GCMS							
Benzene	<0.00050		0.00050	mg/L		08-SEP-21	R5581554
Toluene	<0.0010		0.0010	mg/L		08-SEP-21	R5581554
Ethyl benzene	<0.00050		0.00050	mg/L		08-SEP-21	R5581554
o-Xylene	<0.00050		0.00050	mg/L		08-SEP-21	R5581554
m+p-Xylenes	<0.00040		0.00040	mg/L		08-SEP-21	R5581554
F1 (C6-C10)	<0.10		0.10	mg/L		08-SEP-21	R5581554
Surrogate: 4-Bromofluorobenzene (SS)	72.6		70-130	%		08-SEP-21	R5581554
Surrogate: 3,4-Dichlorotoluene (SS)	104.1		70-130	%		08-SEP-21	R5581554
CCME PAHs in mg/L							
1-Methylnaphthalene	<0.000020		0.000020	mg/L	07-SEP-21	09-SEP-21	R5581268
2-Methylnaphthalene	<0.000020		0.000020	mg/L	07-SEP-21	09-SEP-21	R5581268
Acenaphthene	<0.000020		0.000020	mg/L	07-SEP-21	09-SEP-21	R5581268
Acenaphthylene	<0.000020		0.000020	mg/L	07-SEP-21	09-SEP-21	R5581268
Anthracene	<0.000010		0.000010	mg/L	07-SEP-21	09-SEP-21	R5581268
Acridine	0.000072		0.000020	mg/L	07-SEP-21	09-SEP-21	R5581268
Benzo(a)anthracene	<0.000010		0.000010	mg/L	07-SEP-21	09-SEP-21	R5581268
Benzo(a)pyrene	<0.0000050		0.0000050	mg/L	07-SEP-21	09-SEP-21	R5581268
Benzo(b&j)fluoranthene	<0.000010		0.000010	mg/L	07-SEP-21	09-SEP-21	R5581268
Benzo(g,h,i)perylene	<0.000020		0.000020	mg/L	07-SEP-21	09-SEP-21	R5581268
Benzo(k)fluoranthene	<0.000010		0.000010	mg/L	07-SEP-21	09-SEP-21	R5581268
Chrysene	<0.000020		0.000020	mg/L	07-SEP-21	09-SEP-21	R5581268
Dibenz(a,h)anthracene	<0.0000050		0.0000050	mg/L	07-SEP-21	09-SEP-21	R5581268
Fluoranthene	<0.000020		0.000020	mg/L	07-SEP-21	09-SEP-21	R5581268
Fluorene	<0.000020		0.000020	mg/L	07-SEP-21	09-SEP-21	R5581268
Indeno(1,2,3-cd)pyrene	0.000047		0.000010	mg/L	07-SEP-21	09-SEP-21	R5581268
Naphthalene	<0.000050		0.000050	mg/L	07-SEP-21	09-SEP-21	R5581268
Phenanthrene	<0.000050		0.000050	mg/L	07-SEP-21	09-SEP-21	R5581268
Pyrene	<0.000010		0.000010	mg/L	07-SEP-21	09-SEP-21	R5581268
Quinoline	0.000048		0.000020	mg/L	07-SEP-21	09-SEP-21	R5581268
B(a)P Total Potency Equivalent	<0.000030		0.000030	mg/L	07-SEP-21	09-SEP-21	R5581268
Surrogate: Naphthalene d8	101.6		50-130	%	07-SEP-21	09-SEP-21	R5581268
Surrogate: Phenanthrene d10	102.7		60-130	%	07-SEP-21	09-SEP-21	R5581268

* 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
L2634685-2 ARV-4							
Sampled By: CLIENT on 26-AUG-21 @ 09:37							
Matrix: WW							
CCME PAHs in mg/L							
Surrogate: Chrysene d12	113.8		60-130	%	07-SEP-21	09-SEP-21	R5581268
Surrogate: Acridine d9	103.5		60-130	%	07-SEP-21	09-SEP-21	R5581268
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	311		1.2	mg/L		03-SEP-21	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		03-SEP-21	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		03-SEP-21	
Alkalinity, Total (as CaCO3)							
Alkalinity, Total (as CaCO3)	255		1.0	mg/L		02-SEP-21	R5577242
Ammonia by colour							
Ammonia, Total (as N)	58.4		2.0	mg/L		09-SEP-21	R5582164
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	27.2		6.0	mg/L		02-SEP-21	R5580190
Carbonaceous BOD							
BOD Carbonaceous	17.6		6.0	mg/L		02-SEP-21	R5580190
Chloride in Water by IC							
Chloride (Cl)	93.8		1.0	mg/L		02-SEP-21	R5578905
Conductivity							
Conductivity	868		1.0	umhos/cm		02-SEP-21	R5577242
Fecal coliforms, 1:10 dilution by QT97							
Fecal Coliforms	170	PEHR	10	MPN/100mL		01-SEP-21	R5575505
Hardness Calculated							
Hardness (as CaCO3)	67.1	HTC	0.20	mg/L		08-SEP-21	
Mercury Total							
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L	10-SEP-21	10-SEP-21	R5583066
Nitrate in Water by IC							
Nitrate (as N)	<0.040	DLM	0.040	mg/L		02-SEP-21	R5578905
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		04-SEP-21	
Nitrite in Water by IC							
Nitrite (as N)	<0.020	DLM	0.020	mg/L		02-SEP-21	R5578905
Oil & Grease - Gravimetric							
Oil and Grease	<5.0		5.0	mg/L		10-SEP-21	R5583680
Phenol (4AAP)							
Phenols (4AAP)	<0.010	DLM	0.010	mg/L		07-SEP-21	R5580324
Phosphorus, Total							
Phosphorus (P)-Total	7.36		0.030	mg/L		07-SEP-21	R5580238
Sulfate in Water by IC							
Sulfate (SO4)	10.3		0.60	mg/L		02-SEP-21	R5578905
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.137		0.0030	mg/L	02-SEP-21	03-SEP-21	R5580263
Arsenic (As)-Total	0.00620		0.00010	mg/L	02-SEP-21	03-SEP-21	R5580263
Cadmium (Cd)-Total	0.0000696		0.0000050	mg/L	02-SEP-21	03-SEP-21	R5580263
Calcium (Ca)-Total	13.0		0.050	mg/L	02-SEP-21	03-SEP-21	R5580263
Chromium (Cr)-Total	0.00125		0.00010	mg/L	02-SEP-21	03-SEP-21	R5580263
Cobalt (Co)-Total	0.00129		0.00010	mg/L	02-SEP-21	03-SEP-21	R5580263
Copper (Cu)-Total	0.0446		0.00050	mg/L	02-SEP-21	03-SEP-21	R5580263
Iron (Fe)-Total	2.57		0.010	mg/L	02-SEP-21	03-SEP-21	R5580263
Lead (Pb)-Total	0.00149		0.000050	mg/L	02-SEP-21	03-SEP-21	R5580263
Magnesium (Mg)-Total	8.40		0.0050	mg/L	02-SEP-21	03-SEP-21	R5580263

* 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
L2634685-2 ARV-4							
Sampled By: CLIENT on 26-AUG-21 @ 09:37							
Matrix: WW							
Total Metals in Water by CRC ICPMS							
Manganese (Mn)-Total	0.181		0.00010	mg/L	02-SEP-21	03-SEP-21	R5580263
Nickel (Ni)-Total	0.00554		0.00050	mg/L	02-SEP-21	03-SEP-21	R5580263
Potassium (K)-Total	22.1		0.050	mg/L	02-SEP-21	03-SEP-21	R5580263
Sodium (Na)-Total	73.5		0.050	mg/L	02-SEP-21	03-SEP-21	R5580263
Zinc (Zn)-Total	0.0277		0.0030	mg/L	02-SEP-21	03-SEP-21	R5580263
Total Organic Carbon by Combustion							
Total Organic Carbon	74		10	mg/L		08-SEP-21	R5581182
Total Suspended Solids							
Total Suspended Solids	68		10	mg/L		02-SEP-21	R5578957
pH							
pH	7.76		0.10	pH units		02-SEP-21	R5577242
L2634685-3 ARV-5							
Sampled By: CLIENT on 26-AUG-21 @ 10:08							
Matrix: WW							
F2-F4 (O.Reg.153/04)							
F2-F4 (O.Reg.153/04)							
F2 (C10-C16)	<100		100	ug/L	07-SEP-21	08-SEP-21	R5580948
F3 (C16-C34)	<250		250	ug/L	07-SEP-21	08-SEP-21	R5580948
F4 (C34-C50)	<250		250	ug/L	07-SEP-21	08-SEP-21	R5580948
Chrom. to baseline at nC50	YES				07-SEP-21	08-SEP-21	R5580948
Surrogate: 2-Bromobenzotrifluoride	95.5		60-140	%	07-SEP-21	08-SEP-21	R5580948
Miscellaneous Parameters							
Xylenes (Total)	<0.00064		0.00064	mg/L		10-SEP-21	
Total and E. coli, 1:10 dilution by QT97							
Total Coliforms	3260	PEHR	10	MPN/100mL		01-SEP-21	R5575500
Escherichia Coli	<10	PEHR	10	MPN/100mL		01-SEP-21	R5575500
BTX plus F1 by GCMS							
Benzene	<0.00050		0.00050	mg/L		08-SEP-21	R5581554
Toluene	<0.0010		0.0010	mg/L		08-SEP-21	R5581554
Ethyl benzene	<0.00050		0.00050	mg/L		08-SEP-21	R5581554
o-Xylene	<0.00050		0.00050	mg/L		08-SEP-21	R5581554
m+p-Xylenes	<0.00040		0.00040	mg/L		08-SEP-21	R5581554
F1 (C6-C10)	<0.10		0.10	mg/L		08-SEP-21	R5581554
Surrogate: 4-Bromofluorobenzene (SS)	73.7		70-130	%		08-SEP-21	R5581554
Surrogate: 3,4-Dichlorotoluene (SS)	122.4		70-130	%		08-SEP-21	R5581554
CCME PAHs in mg/L							
1-Methylnaphthalene	<0.000020		0.000020	mg/L	07-SEP-21	09-SEP-21	R5581268
2-Methylnaphthalene	<0.000020		0.000020	mg/L	07-SEP-21	09-SEP-21	R5581268
Acenaphthene	<0.000020		0.000020	mg/L	07-SEP-21	09-SEP-21	R5581268
Acenaphthylene	<0.000020		0.000020	mg/L	07-SEP-21	09-SEP-21	R5581268
Anthracene	<0.000010		0.000010	mg/L	07-SEP-21	09-SEP-21	R5581268
Acridine	<0.000020		0.000020	mg/L	07-SEP-21	09-SEP-21	R5581268
Benzo(a)anthracene	<0.000010		0.000010	mg/L	07-SEP-21	09-SEP-21	R5581268
Benzo(a)pyrene	<0.0000050		0.0000050	mg/L	07-SEP-21	09-SEP-21	R5581268
Benzo(b&j)fluoranthene	<0.000010		0.000010	mg/L	07-SEP-21	09-SEP-21	R5581268
Benzo(g,h,i)perylene	<0.000020		0.000020	mg/L	07-SEP-21	09-SEP-21	R5581268
Benzo(k)fluoranthene	<0.000010		0.000010	mg/L	07-SEP-21	09-SEP-21	R5581268
Chrysene	<0.000020		0.000020	mg/L	07-SEP-21	09-SEP-21	R5581268
Dibenz(a,h)anthracene	<0.0000050		0.0000050	mg/L	07-SEP-21	09-SEP-21	R5581268
Fluoranthene	<0.000020		0.000020	mg/L	07-SEP-21	09-SEP-21	R5581268
Fluorene	<0.000020		0.000020	mg/L	07-SEP-21	09-SEP-21	R5581268

* 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
L2634685-3 ARV-5							
Sampled By: CLIENT on 26-AUG-21 @ 10:08							
Matrix: WW							
CCME PAHs in mg/L							
Indeno(1,2,3-cd)pyrene	<0.000010		0.000010	mg/L	07-SEP-21	09-SEP-21	R5581268
Naphthalene	<0.000050		0.000050	mg/L	07-SEP-21	09-SEP-21	R5581268
Phenanthrene	<0.000050		0.000050	mg/L	07-SEP-21	09-SEP-21	R5581268
Pyrene	<0.000010		0.000010	mg/L	07-SEP-21	09-SEP-21	R5581268
Quinoline	<0.000020		0.000020	mg/L	07-SEP-21	09-SEP-21	R5581268
B(a)P Total Potency Equivalent	<0.000030		0.000030	mg/L	07-SEP-21	09-SEP-21	R5581268
Surrogate: Naphthalene d8	102.5		50-130	%	07-SEP-21	09-SEP-21	R5581268
Surrogate: Phenanthrene d10	102.9		60-130	%	07-SEP-21	09-SEP-21	R5581268
Surrogate: Chrysene d12	109.0		60-130	%	07-SEP-21	09-SEP-21	R5581268
Surrogate: Acridine d9	99.0		60-130	%	07-SEP-21	09-SEP-21	R5581268
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	74.9		1.2	mg/L		03-SEP-21	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		03-SEP-21	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		03-SEP-21	
Alkalinity, Total (as CaCO3)							
Alkalinity, Total (as CaCO3)	61.4		1.0	mg/L		02-SEP-21	R5577242
Ammonia by colour							
Ammonia, Total (as N)	0.032		0.010	mg/L		10-SEP-21	R5583198
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	<2.0		2.0	mg/L		02-SEP-21	R5580190
Carbonaceous BOD							
BOD Carbonaceous	<2.0		2.0	mg/L		02-SEP-21	R5580190
Chloride in Water by IC							
Chloride (Cl)	144		0.50	mg/L		02-SEP-21	R5578905
Conductivity							
Conductivity	612		1.0	umhos/cm		02-SEP-21	R5577242
Fecal coliforms, 1:10 dilution by QT97							
Fecal Coliforms	<10	PEHR	10	MPN/100mL		01-SEP-21	R5575505
Hardness Calculated							
Hardness (as CaCO3)	103	HTC	0.20	mg/L		08-SEP-21	
Mercury Total							
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L	10-SEP-21	10-SEP-21	R5583066
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		02-SEP-21	R5578905
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		04-SEP-21	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		02-SEP-21	R5578905
Oil & Grease - Gravimetric							
Oil and Grease	<5.0		5.0	mg/L		10-SEP-21	R5583680
Phenol (4AAP)							
Phenols (4AAP)	<0.0010		0.0010	mg/L		07-SEP-21	R5580324
Phosphorus, Total							
Phosphorus (P)-Total	0.124		0.0030	mg/L		07-SEP-21	R5580238
Sulfate in Water by IC							
Sulfate (SO4)	8.57		0.30	mg/L		02-SEP-21	R5578905
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.0379		0.0030	mg/L	02-SEP-21	03-SEP-21	R5580263
Arsenic (As)-Total	0.00036		0.00010	mg/L	02-SEP-21	03-SEP-21	R5580263

* 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
L2634685-3 ARV-5							
Sampled By: CLIENT on 26-AUG-21 @ 10:08							
Matrix: WW							
Total Metals in Water by CRC ICPMS							
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L	02-SEP-21	03-SEP-21	R5580263
Calcium (Ca)-Total	19.2		0.050	mg/L	02-SEP-21	03-SEP-21	R5580263
Chromium (Cr)-Total	0.00015		0.00010	mg/L	02-SEP-21	03-SEP-21	R5580263
Cobalt (Co)-Total	<0.00010		0.00010	mg/L	02-SEP-21	03-SEP-21	R5580263
Copper (Cu)-Total	0.00058		0.00050	mg/L	02-SEP-21	03-SEP-21	R5580263
Iron (Fe)-Total	0.776		0.010	mg/L	02-SEP-21	03-SEP-21	R5580263
Lead (Pb)-Total	0.000078		0.000050	mg/L	02-SEP-21	03-SEP-21	R5580263
Magnesium (Mg)-Total	13.4		0.0050	mg/L	02-SEP-21	03-SEP-21	R5580263
Manganese (Mn)-Total	0.0309		0.00010	mg/L	02-SEP-21	03-SEP-21	R5580263
Nickel (Ni)-Total	<0.00050		0.00050	mg/L	02-SEP-21	03-SEP-21	R5580263
Potassium (K)-Total	5.48		0.050	mg/L	02-SEP-21	03-SEP-21	R5580263
Sodium (Na)-Total	75.8		0.050	mg/L	02-SEP-21	03-SEP-21	R5580263
Zinc (Zn)-Total	<0.0030		0.0030	mg/L	02-SEP-21	03-SEP-21	R5580263
Total Organic Carbon by Combustion							
Total Organic Carbon	9.53		0.50	mg/L		06-SEP-21	R5579916
Total Suspended Solids							
Total Suspended Solids	12.3		3.0	mg/L		02-SEP-21	R5578957
pH							
pH	7.64		0.10	pH units		02-SEP-21	R5577242
L2634685-4 ARV-6							
Sampled By: CLIENT on 26-AUG-21 @ 10:25							
Matrix: WW							
F2-F4 (O.Reg.153/04)							
F2-F4 (O.Reg.153/04)							
F2 (C10-C16)	<100		100	ug/L	07-SEP-21	08-SEP-21	R5580948
F3 (C16-C34)	<250		250	ug/L	07-SEP-21	08-SEP-21	R5580948
F4 (C34-C50)	<250		250	ug/L	07-SEP-21	08-SEP-21	R5580948
Chrom. to baseline at nC50	YES				07-SEP-21	08-SEP-21	R5580948
Surrogate: 2-Bromobenzotrifluoride	99.6		60-140	%	07-SEP-21	08-SEP-21	R5580948
Miscellaneous Parameters							
Xylenes (Total)	<0.00064		0.00064	mg/L		10-SEP-21	
Total and E. coli, 1:10 dilution by QT97							
Total Coliforms	130	PEHR	10	MPN/100mL		01-SEP-21	R5575500
Escherichia Coli	<10	PEHR	10	MPN/100mL		01-SEP-21	R5575500
BTX plus F1 by GCMS							
Benzene	<0.00050		0.00050	mg/L		08-SEP-21	R5581554
Toluene	<0.0010		0.0010	mg/L		08-SEP-21	R5581554
Ethyl benzene	<0.00050		0.00050	mg/L		08-SEP-21	R5581554
o-Xylene	<0.00050		0.00050	mg/L		08-SEP-21	R5581554
m+p-Xylenes	<0.00040		0.00040	mg/L		08-SEP-21	R5581554
F1 (C6-C10)	<0.10		0.10	mg/L		08-SEP-21	R5581554
Surrogate: 4-Bromofluorobenzene (SS)	77.3		70-130	%		08-SEP-21	R5581554
Surrogate: 3,4-Dichlorotoluene (SS)	104.9		70-130	%		08-SEP-21	R5581554
CCME PAHs in mg/L							
1-Methylnaphthalene	0.000049		0.000020	mg/L	07-SEP-21	09-SEP-21	R5581268
2-Methylnaphthalene	0.000025		0.000020	mg/L	07-SEP-21	09-SEP-21	R5581268
Acenaphthene	<0.000020		0.000020	mg/L	07-SEP-21	09-SEP-21	R5581268
Acenaphthylene	<0.000020		0.000020	mg/L	07-SEP-21	09-SEP-21	R5581268
Anthracene	<0.000010		0.000010	mg/L	07-SEP-21	09-SEP-21	R5581268
Acridine	<0.000020		0.000020	mg/L	07-SEP-21	09-SEP-21	R5581268
Benzo(a)anthracene	<0.000010		0.000010	mg/L	07-SEP-21	09-SEP-21	R5581268

* 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
L2634685-4 ARV-6							
Sampled By: CLIENT on 26-AUG-21 @ 10:25							
Matrix: WW							
CCME PAHs in mg/L							
Benzo(a)pyrene	<0.0000050		0.0000050	mg/L	07-SEP-21	09-SEP-21	R5581268
Benzo(b&j)fluoranthene	<0.000010		0.000010	mg/L	07-SEP-21	09-SEP-21	R5581268
Benzo(g,h,i)perylene	<0.000020		0.000020	mg/L	07-SEP-21	09-SEP-21	R5581268
Benzo(k)fluoranthene	<0.000010		0.000010	mg/L	07-SEP-21	09-SEP-21	R5581268
Chrysene	<0.000020		0.000020	mg/L	07-SEP-21	09-SEP-21	R5581268
Dibenz(a,h)anthracene	<0.0000050		0.0000050	mg/L	07-SEP-21	09-SEP-21	R5581268
Fluoranthene	<0.000020		0.000020	mg/L	07-SEP-21	09-SEP-21	R5581268
Fluorene	<0.000020		0.000020	mg/L	07-SEP-21	09-SEP-21	R5581268
Indeno(1,2,3-cd)pyrene	<0.000010		0.000010	mg/L	07-SEP-21	09-SEP-21	R5581268
Naphthalene	<0.000050		0.000050	mg/L	07-SEP-21	09-SEP-21	R5581268
Phenanthrene	<0.000050		0.000050	mg/L	07-SEP-21	09-SEP-21	R5581268
Pyrene	<0.000010		0.000010	mg/L	07-SEP-21	09-SEP-21	R5581268
Quinoline	<0.000230	DLQ	0.00023	mg/L	07-SEP-21	09-SEP-21	R5581268
B(a)P Total Potency Equivalent	<0.000030		0.000030	mg/L	07-SEP-21	09-SEP-21	R5581268
Surrogate: Naphthalene d8	103.3		50-130	%	07-SEP-21	09-SEP-21	R5581268
Surrogate: Phenanthrene d10	97.4		60-130	%	07-SEP-21	09-SEP-21	R5581268
Surrogate: Chrysene d12	112.2		60-130	%	07-SEP-21	09-SEP-21	R5581268
Surrogate: Acridine d9	94.2		60-130	%	07-SEP-21	09-SEP-21	R5581268
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	106		1.2	mg/L		03-SEP-21	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		03-SEP-21	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		03-SEP-21	
Alkalinity, Total (as CaCO3)							
Alkalinity, Total (as CaCO3)	87.0		1.0	mg/L		02-SEP-21	R5577242
Ammonia by colour							
Ammonia, Total (as N)	0.377		0.020	mg/L		13-SEP-21	R5583786
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	7.9		2.0	mg/L		02-SEP-21	R5580190
Carbonaceous BOD							
BOD Carbonaceous	2.2		2.0	mg/L		02-SEP-21	R5580190
Chloride in Water by IC							
Chloride (Cl)	112		0.50	mg/L		02-SEP-21	R5578905
Conductivity							
Conductivity	510		1.0	umhos/cm		02-SEP-21	R5577242
Fecal coliforms, 1:10 dilution by QT97							
Fecal Coliforms	<10	PEHR	10	MPN/100mL		01-SEP-21	R5575505
Hardness Calculated							
Hardness (as CaCO3)	122	HTC	0.20	mg/L		08-SEP-21	
Mercury Total							
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L	10-SEP-21	10-SEP-21	R5583066
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		02-SEP-21	R5578905
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		04-SEP-21	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		02-SEP-21	R5578905
Oil & Grease - Gravimetric							
Oil and Grease	<5.0		5.0	mg/L		10-SEP-21	R5583680
Phenol (4AAP)							

* 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
L2634685-4 ARV-6							
Sampled By: CLIENT on 26-AUG-21 @ 10:25							
Matrix: WW							
Phenol (4AAP)							
Phenols (4AAP)	<0.0010		0.0010	mg/L		07-SEP-21	R5580324
Phosphorus, Total							
Phosphorus (P)-Total	0.332		0.0030	mg/L		07-SEP-21	R5580238
Sulfate in Water by IC							
Sulfate (SO4)	0.41		0.30	mg/L		02-SEP-21	R5578905
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.299		0.0030	mg/L	02-SEP-21	03-SEP-21	R5580263
Arsenic (As)-Total	0.00078		0.00010	mg/L	02-SEP-21	03-SEP-21	R5580263
Cadmium (Cd)-Total	0.0000108		0.0000050	mg/L	02-SEP-21	03-SEP-21	R5580263
Calcium (Ca)-Total	31.6		0.050	mg/L	02-SEP-21	03-SEP-21	R5580263
Chromium (Cr)-Total	0.00114		0.00010	mg/L	02-SEP-21	03-SEP-21	R5580263
Cobalt (Co)-Total	0.00149		0.00010	mg/L	02-SEP-21	03-SEP-21	R5580263
Copper (Cu)-Total	0.00117		0.00050	mg/L	02-SEP-21	03-SEP-21	R5580263
Iron (Fe)-Total	20.0		0.010	mg/L	02-SEP-21	03-SEP-21	R5580263
Lead (Pb)-Total	0.000349		0.000050	mg/L	02-SEP-21	03-SEP-21	R5580263
Magnesium (Mg)-Total	10.5		0.0050	mg/L	02-SEP-21	03-SEP-21	R5580263
Manganese (Mn)-Total	1.52		0.00010	mg/L	02-SEP-21	03-SEP-21	R5580263
Nickel (Ni)-Total	0.00150		0.00050	mg/L	02-SEP-21	03-SEP-21	R5580263
Potassium (K)-Total	5.27		0.050	mg/L	02-SEP-21	03-SEP-21	R5580263
Sodium (Na)-Total	50.4		0.050	mg/L	02-SEP-21	03-SEP-21	R5580263
Zinc (Zn)-Total	0.0460		0.0030	mg/L	02-SEP-21	03-SEP-21	R5580263
Total Organic Carbon by Combustion							
Total Organic Carbon	14.2		0.50	mg/L		06-SEP-21	R5579916
Total Suspended Solids							
Total Suspended Solids	252		4.3	mg/L		02-SEP-21	R5578957
pH							
pH	7.24		0.10	pH units		02-SEP-21	R5577242

* 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).
DLQ	Detection Limit raised due to co-eluting interference. GCMS qualifier ion ratio did not meet acceptance criteria.
DUPM	MPN duplicate results were outside default ALS Data Quality Objective, but within 95% confidence interval for MPN reference method. Sample results are reliable.
HTC	Hardness was calculated from Total Ca and/or Mg concentrations and may be biased high (dissolved Ca/Mg results unavailable).
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
PEHR	Parameter Exceeded Recommended Holding Time On Receipt: Proceed With Analysis As Requested.

Test Method References:

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

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

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

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

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

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

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

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

BOD-CBOD-WP	Water	Carbonaceous BOD	APHA 5210 B

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

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

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

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

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

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

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

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

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

EC-WP	Water	Conductivity	APHA 2510B

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

F1-F4-CALC-WT	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

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**

represents a result where the sum of Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Phenanthrene, and Pyrene has been subtracted from F3.

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

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-WT	Water	F2-F4 (O.Reg.153/04)	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.

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.

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
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.			
TC,EC10-QT97-WP	Water	Total and E. coli, 1:10 dilution by QT97	APHA 9223B QT97
Analysis is carried out using procedures adapted from APHA 9223 "Enzyme Susbtrate Coliform Test". Total coliforms and Eschericia coli bacteria are simultaneously 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 35.0 +/- 0.5 degrees C for 18 or 24 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.			
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:

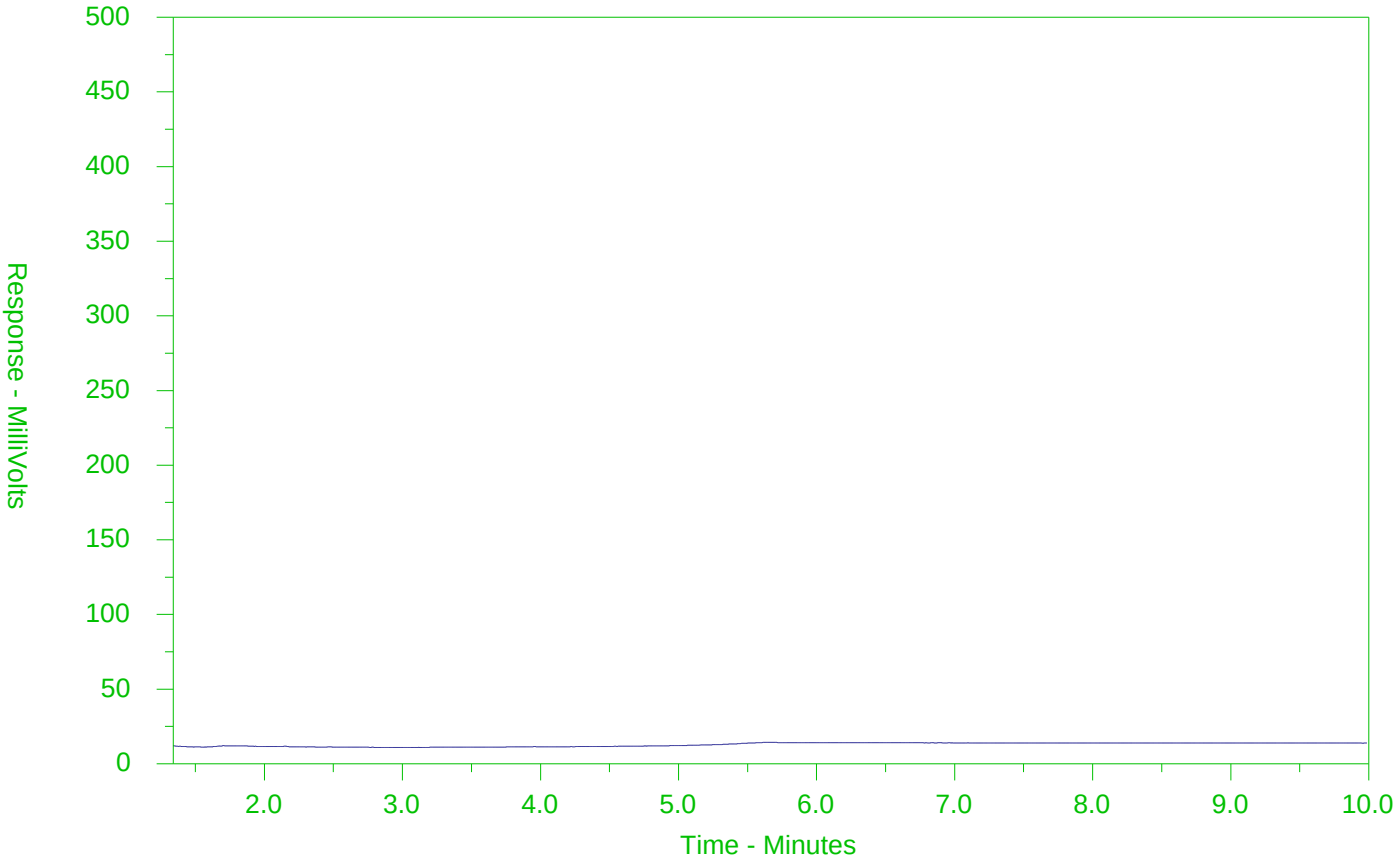
GLOSSARY OF REPORT TERMS

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: L2634685-1
Client Sample ID: ARV-2



←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.

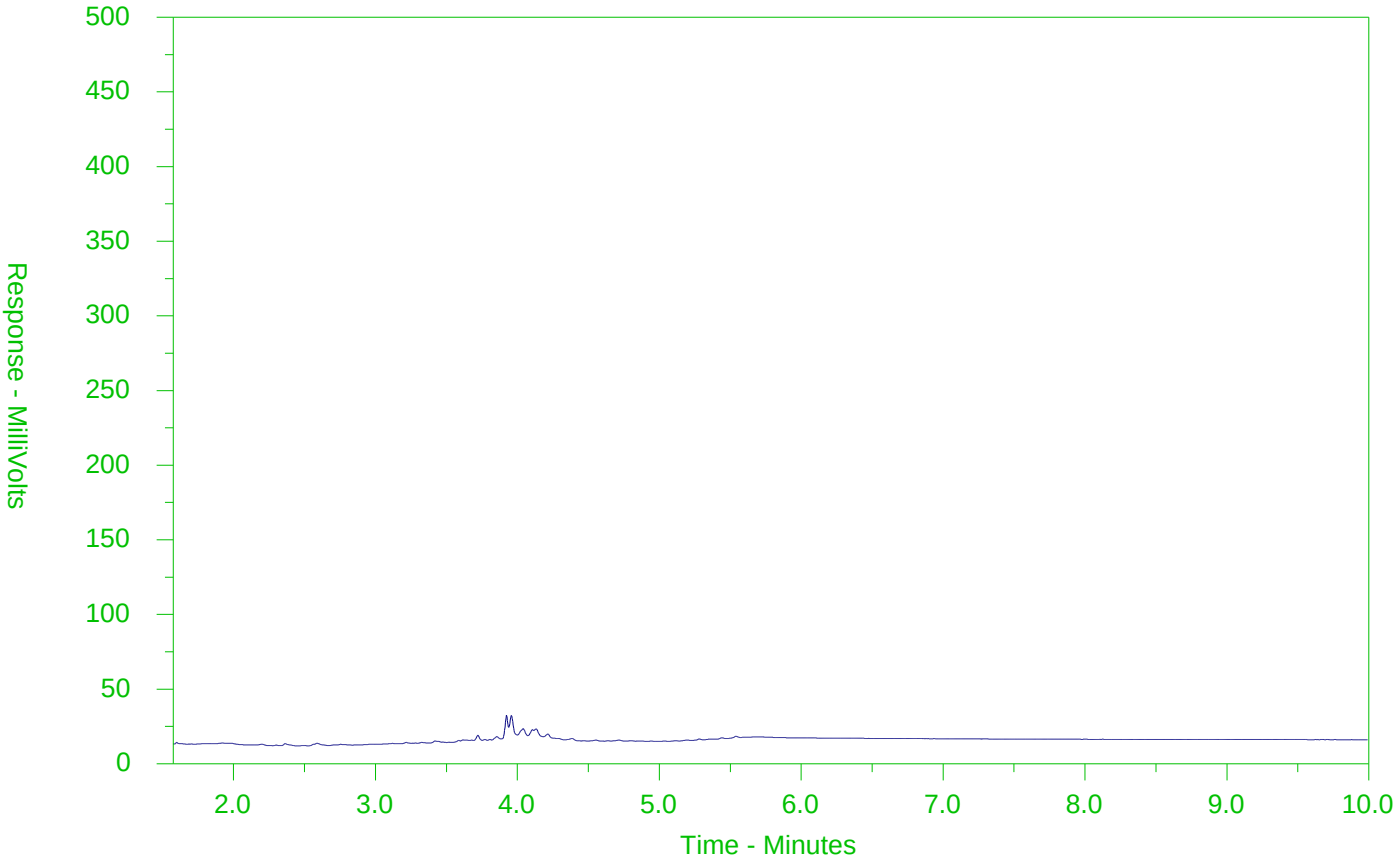
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

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.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L2634685-2
Client Sample ID: ARV-4



←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.

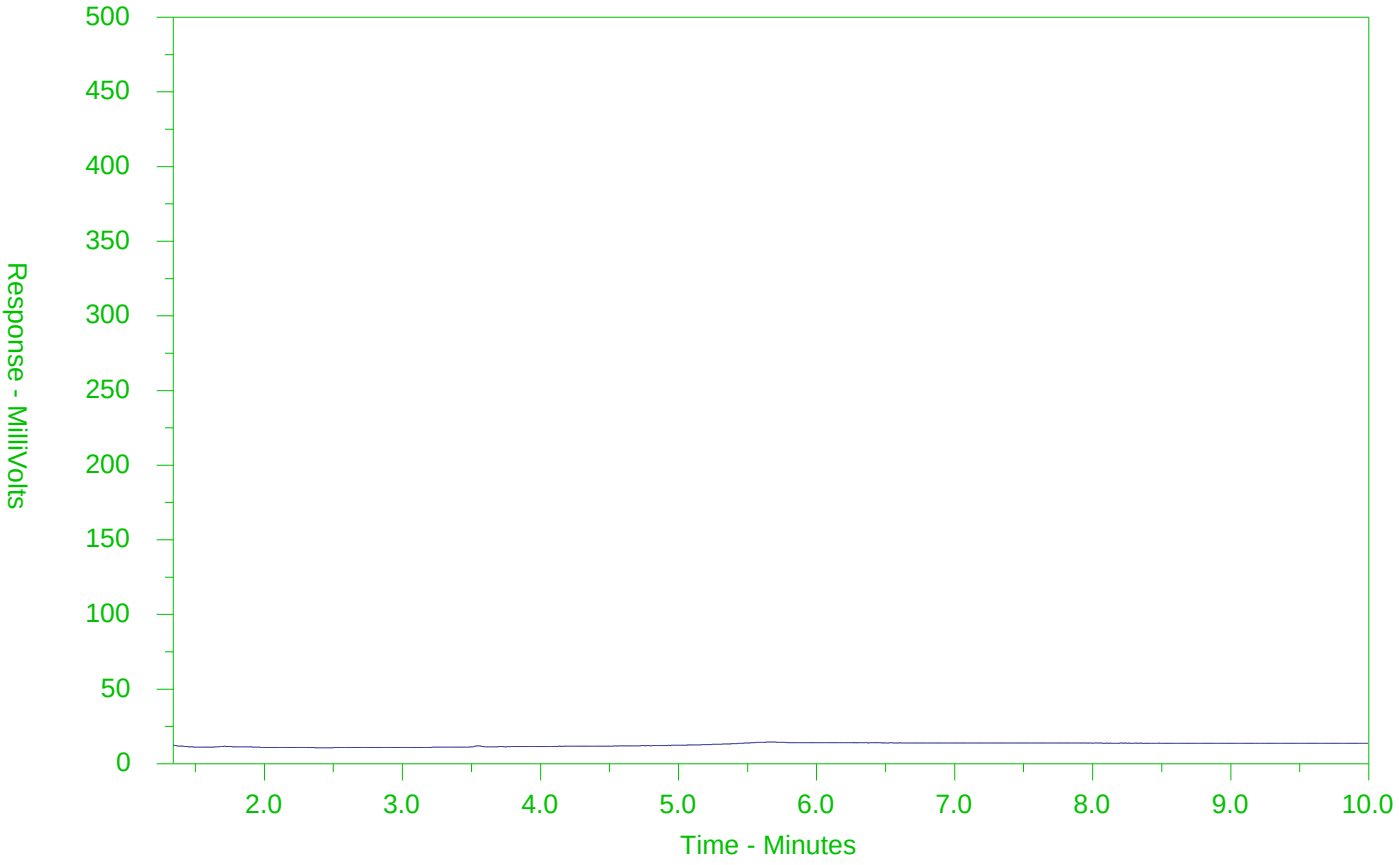
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

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.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L2634685-3
Client Sample ID: ARV-5



←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.

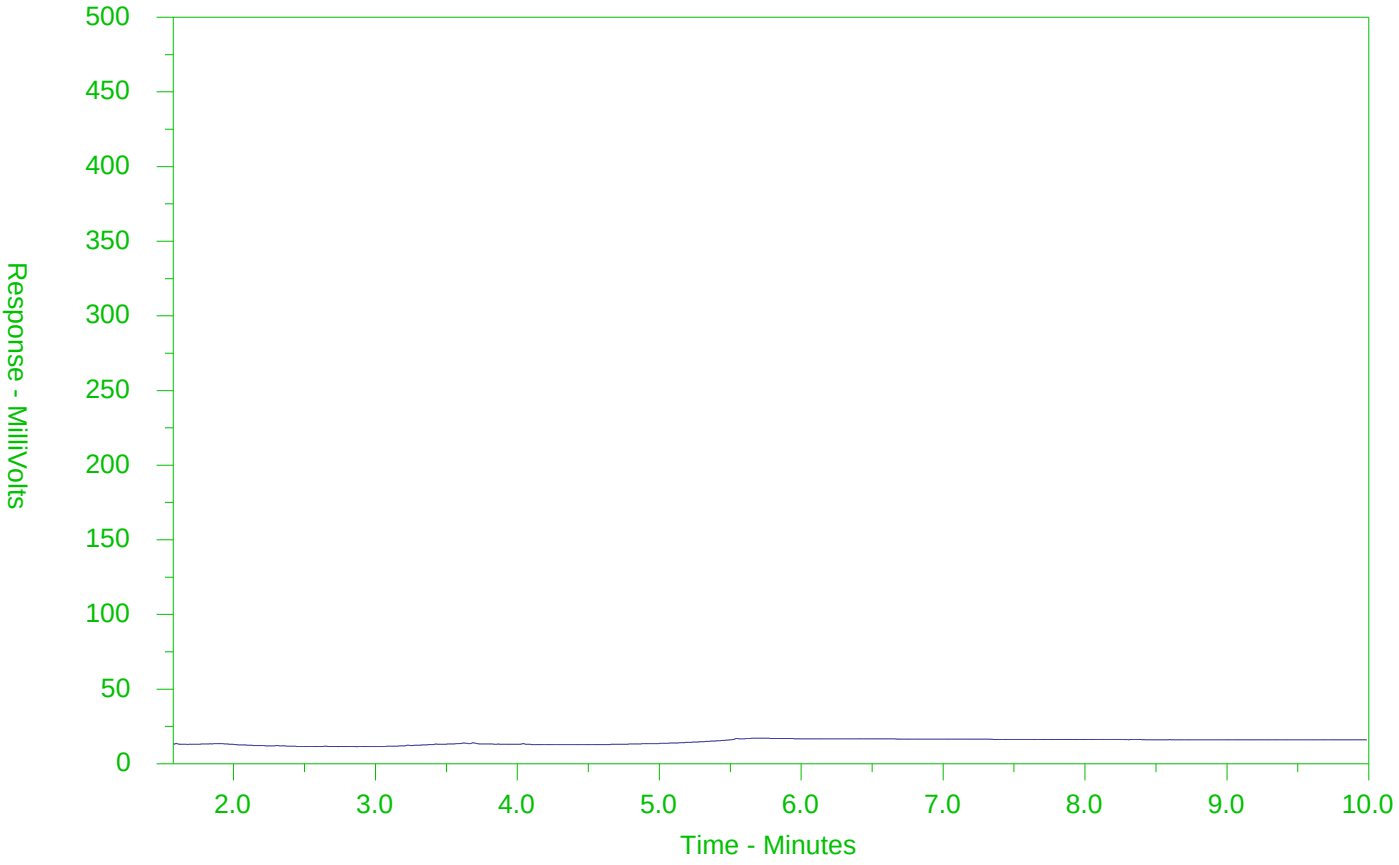
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

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.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L2634685-4
Client Sample ID: ARV-6



←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

L2634685-COFC

COC Number: 17 - 747855

Page of

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:	Hamlet of ARVIAT	Select Report Format: ☐ PDF ☐ EXCEL ☐ EDD (DIGITAL)	Regular [R] ☐ Standard TAT if received by 3 pm - business days - no surcharges apply
Contact:	Steve England	Quality Control (QC) Report with Report ☐ YES ☐ NO	PRIORITY (Business Days): 4 day [P4-20%] ☐ / 3 day [P3-25%] ☐ / 2 day [P2-50%] ☐
Phone:	867-857-2841	☐ Compare Results to Criteria on Report - provide details below if box checked	EMERGENCY: 1 Business day [E - 100%] ☐ / 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	Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm
Street:		Email 1 or Fax arviatsao@arviat.com	For tests that can not be performed according to the service level selected, you will be contacted.
City/Province:	ARVIAT, NU	Email 2 MHeney@gov.nu.ca	
Postal Code:	X0C-0E0	Email 3	
Invoice To	Same as Report To ☑ YES ☐ NO	Invoice Distribution	
	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 #:		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:

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	Analysis Request: Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below	SAMPLES ON HOLD	SUSPECTED HAZARD (see Special Instructions)
	ARV-2	26-08-21	915am			ROUTINE, BOD, Oil & Grease, Boron x 2, Total Phenols x2, Metals, Mercury, Hexavalent Chromium, PAH x 2, BTEX x 3, F2-F4 x 2, TEC10-QT97-up		
	ARV-4	26-08-21	937am					
	ARV-5	26-08-21	1008am					
	ARV-6	26-08-21	1045am					

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)	SAMPLE CONDITION AS RECEIVED (lab use only)
Are samples taken from a Regulated DW System? ☐ YES ☐ NO		Frozen ☐ SIF Observations Yes ☐ No ☐
Are samples for human consumption/ use? ☐ YES ☐ NO		Ice Packs ☐ Ice Cubes ☐ Custody seal intact Yes ☐ No ☐ Cooling Initiated ☐
		INITIAL COOLER TEMPERATURES °C: 20.3°C / FINAL COOLER TEMPERATURES °C

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date:	Time:	Received by: BJ	Date: 01 Sep 21	Time: 15:55	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**.

5

Hamlet of Arviat
ATTN: STEVE ENGLAND
PO Box 150
Arviat NU X0C 0E0

Date Received: 24-SEP-21
Report Date: 08-OCT-21 15:49 (MT)
Version: FINAL

Client Phone: 867-857-2841

Certificate of Analysis

Lab Work Order #: L2643721

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
L2643721-1 ARV-2							
Sampled By: CLIENT on 23-SEP-21 @ 09:00							
Matrix: WATER							
BTEX							
BTX plus F1 by GCMS							
Benzene	<0.00050		0.00050	mg/L		28-SEP-21	R5602699
Toluene	<0.0010		0.0010	mg/L		28-SEP-21	R5602699
Ethyl benzene	<0.00050		0.00050	mg/L		28-SEP-21	R5602699
o-Xylene	<0.00050		0.00050	mg/L		28-SEP-21	R5602699
m+p-Xylenes	<0.00040		0.00040	mg/L		28-SEP-21	R5602699
F1 (C6-C10)	<0.10		0.10	mg/L		28-SEP-21	R5602699
Surrogate: 4-Bromofluorobenzene (SS)	104.9		70-130	%		28-SEP-21	R5602699
CCME Total Hydrocarbons							
F1-BTEX	<0.10		0.10	mg/L		04-OCT-21	
F2-Naphth	<0.10		0.10	mg/L		04-OCT-21	
F3-PAH	<0.25		0.25	mg/L		04-OCT-21	
Total Hydrocarbons (C6-C50)	<0.38		0.38	mg/L		04-OCT-21	
Sum of Xylene Isomer Concentrations							
Xylenes (Total)	<0.00064		0.00064	mg/L		28-SEP-21	
F2-F4 reported in ppm							
F2 (C10-C16)	<0.10		0.10	mg/L	29-SEP-21	30-SEP-21	R5605385
F3 (C16-C34)	<0.25		0.25	mg/L	29-SEP-21	30-SEP-21	R5605385
F4 (C34-C50)	<0.25		0.25	mg/L	29-SEP-21	30-SEP-21	R5605385
Chrom. to baseline at nC50	YES				29-SEP-21	30-SEP-21	R5605385
Surrogate: 2-Bromobenzotrifluoride	80.2		60-140	%	29-SEP-21	30-SEP-21	R5605385
CCME PAHs in mg/L							
1-Methylnaphthalene	0.000030		0.000020	mg/L	29-SEP-21	04-OCT-21	R5607048
2-Methylnaphthalene	0.000033		0.000020	mg/L	29-SEP-21	04-OCT-21	R5607048
Acenaphthene	<0.000020		0.000020	mg/L	29-SEP-21	04-OCT-21	R5607048
Acenaphthylene	<0.000020		0.000020	mg/L	29-SEP-21	04-OCT-21	R5607048
Anthracene	<0.000010		0.000010	mg/L	29-SEP-21	04-OCT-21	R5607048
Acridine	<0.000020		0.000020	mg/L	29-SEP-21	04-OCT-21	R5607048
Benzo(a)anthracene	<0.000010		0.000010	mg/L	29-SEP-21	04-OCT-21	R5607048
Benzo(a)pyrene	<0.0000050		0.0000050	mg/L	29-SEP-21	04-OCT-21	R5607048
Benzo(b&j)fluoranthene	<0.000010		0.000010	mg/L	29-SEP-21	04-OCT-21	R5607048
Benzo(g,h,i)perylene	<0.000020		0.000020	mg/L	29-SEP-21	04-OCT-21	R5607048
Benzo(k)fluoranthene	<0.000010		0.000010	mg/L	29-SEP-21	04-OCT-21	R5607048
Chrysene	<0.000020		0.000020	mg/L	29-SEP-21	04-OCT-21	R5607048
Dibenz(a,h)anthracene	<0.0000050		0.0000050	mg/L	29-SEP-21	04-OCT-21	R5607048
Fluoranthene	<0.000020		0.000020	mg/L	29-SEP-21	04-OCT-21	R5607048
Fluorene	<0.000020		0.000020	mg/L	29-SEP-21	04-OCT-21	R5607048
Indeno(1,2,3-cd)pyrene	<0.000010		0.000010	mg/L	29-SEP-21	04-OCT-21	R5607048
Naphthalene	<0.000050		0.000050	mg/L	29-SEP-21	04-OCT-21	R5607048
Phenanthrene	<0.000050		0.000050	mg/L	29-SEP-21	04-OCT-21	R5607048
Pyrene	<0.000010		0.000010	mg/L	29-SEP-21	04-OCT-21	R5607048
Quinoline	<0.000120	DLQ	0.00012	mg/L	29-SEP-21	04-OCT-21	R5607048
B(a)P Total Potency Equivalent	<0.000030		0.000030	mg/L	29-SEP-21	04-OCT-21	R5607048
Surrogate: Naphthalene d8	106.7		50-130	%	29-SEP-21	04-OCT-21	R5607048
Surrogate: Phenanthrene d10	98.7		60-130	%	29-SEP-21	04-OCT-21	R5607048
Surrogate: Chrysene d12	74.7		60-130	%	29-SEP-21	04-OCT-21	R5607048
Surrogate: Acridine d9	90.9		60-130	%	29-SEP-21	04-OCT-21	R5607048
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	712		1.2	mg/L		28-SEP-21	
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
L2643721-1 ARV-2							
Sampled By: CLIENT on 23-SEP-21 @ 09:00							
Matrix: WATER							
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		28-SEP-21	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		28-SEP-21	
Alkalinity, Total (as CaCO3)							
Alkalinity, Total (as CaCO3)	584		1.0	mg/L		27-SEP-21	R5603026
Ammonia by colour							
Ammonia, Total (as N)	5.6		1.0	mg/L		01-OCT-21	R5607220
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	50		20	mg/L		25-SEP-21	R5606205
Carbonaceous BOD							
BOD Carbonaceous	50		20	mg/L		25-SEP-21	R5606205
Chloride in Water by IC							
Chloride (Cl)	170		5.0	mg/L		25-SEP-21	R5604454
Conductivity							
Conductivity	2310		1.0	umhos/cm		27-SEP-21	R5603026
Fecal coliforms, 1:10 dilution by QT97							
Fecal Coliforms	510	MBHT	10	MPN/100mL		24-SEP-21	R5600848
Hardness Calculated							
Hardness (as CaCO3)	273	HTC	0.20	mg/L		05-OCT-21	
Mercury Total							
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L	07-OCT-21	07-OCT-21	R5614728
Nitrate in Water by IC							
Nitrate (as N)	<0.20	DLM	0.20	mg/L		25-SEP-21	R5604454
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.22		0.22	mg/L		29-SEP-21	
Nitrite in Water by IC							
Nitrite (as N)	<0.10	DLM	0.10	mg/L		25-SEP-21	R5604454
Oil & Grease - Gravimetric							
Oil and Grease	<5.0		5.0	mg/L		28-SEP-21	R5604576
Phenol (4AAP)							
Phenols (4AAP)	0.023	DLM	0.010	mg/L		01-OCT-21	R5607326
Phosphorus, Total							
Phosphorus (P)-Total	0.335		0.0030	mg/L		04-OCT-21	R5607369
Sulfate in Water by IC							
Sulfate (SO4)	519		3.0	mg/L		25-SEP-21	R5604454
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.0167		0.0030	mg/L	28-SEP-21	30-SEP-21	R5606218
Arsenic (As)-Total	0.00342		0.00010	mg/L	28-SEP-21	30-SEP-21	R5606218
Cadmium (Cd)-Total	0.000152		0.0000050	mg/L	28-SEP-21	30-SEP-21	R5606218
Calcium (Ca)-Total	37.1		0.050	mg/L	28-SEP-21	04-OCT-21	R5609610
Chromium (Cr)-Total	0.00082		0.00010	mg/L	28-SEP-21	30-SEP-21	R5606218
Cobalt (Co)-Total	0.00328		0.00010	mg/L	28-SEP-21	30-SEP-21	R5606218
Copper (Cu)-Total	0.0308		0.00050	mg/L	28-SEP-21	30-SEP-21	R5606218
Iron (Fe)-Total	7.34		0.010	mg/L	28-SEP-21	30-SEP-21	R5606218
Lead (Pb)-Total	0.00285		0.000050	mg/L	28-SEP-21	30-SEP-21	R5606218
Magnesium (Mg)-Total	43.8		0.0050	mg/L	28-SEP-21	30-SEP-21	R5606218
Manganese (Mn)-Total	1.98		0.00010	mg/L	28-SEP-21	30-SEP-21	R5606218
Nickel (Ni)-Total	0.0113		0.00050	mg/L	28-SEP-21	30-SEP-21	R5606218
Potassium (K)-Total	38.7		0.050	mg/L	28-SEP-21	30-SEP-21	R5606218
Sodium (Na)-Total	135		0.050	mg/L	28-SEP-21	30-SEP-21	R5606218
Zinc (Zn)-Total	0.116		0.0030	mg/L	28-SEP-21	30-SEP-21	R5606218
Total Organic Carbon by Combustion							

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2643721-1 ARV-2							
Sampled By: CLIENT on 23-SEP-21 @ 09:00							
Matrix: WATER							
Total Organic Carbon by Combustion							
Total Organic Carbon	63.1		5.0	mg/L		29-SEP-21	R5605062
Total Suspended Solids							
Total Suspended Solids	24.1		3.0	mg/L		29-SEP-21	R5605159
pH							
pH	7.79		0.10	pH units		27-SEP-21	R5603026
L2643721-2 ARV-5							
Sampled By: CLIENT on 23-SEP-21 @ 09:24							
Matrix: WATER							
BTEX							
BTX plus F1 by GCMS							
Benzene	<0.00050		0.00050	mg/L		28-SEP-21	R5602699
Toluene	<0.0010		0.0010	mg/L		28-SEP-21	R5602699
Ethyl benzene	<0.00050		0.00050	mg/L		28-SEP-21	R5602699
o-Xylene	<0.00050		0.00050	mg/L		28-SEP-21	R5602699
m+p-Xylenes	<0.00040		0.00040	mg/L		28-SEP-21	R5602699
F1 (C6-C10)	<0.10		0.10	mg/L		28-SEP-21	R5602699
Surrogate: 4-Bromofluorobenzene (SS)	98.6		70-130	%		28-SEP-21	R5602699
CCME Total Hydrocarbons							
F1-BTEX	<0.10		0.10	mg/L		04-OCT-21	
F2-Naphth	<0.10		0.10	mg/L		04-OCT-21	
F3-PAH	<0.25		0.25	mg/L		04-OCT-21	
Total Hydrocarbons (C6-C50)	<0.38		0.38	mg/L		04-OCT-21	
Sum of Xylene Isomer Concentrations							
Xylenes (Total)	<0.00064		0.00064	mg/L		28-SEP-21	
F2-F4 reported in ppm							
F2 (C10-C16)	<0.10		0.10	mg/L	29-SEP-21	30-SEP-21	R5605385
F3 (C16-C34)	<0.25		0.25	mg/L	29-SEP-21	30-SEP-21	R5605385
F4 (C34-C50)	<0.25		0.25	mg/L	29-SEP-21	30-SEP-21	R5605385
Chrom. to baseline at nC50	YES				29-SEP-21	30-SEP-21	R5605385
Surrogate: 2-Bromobenzotrifluoride	80.9		60-140	%	29-SEP-21	30-SEP-21	R5605385
CCME PAHs in mg/L							
1-Methylnaphthalene	<0.000020		0.000020	mg/L	29-SEP-21	04-OCT-21	R5607048
2-Methylnaphthalene	<0.000020		0.000020	mg/L	29-SEP-21	04-OCT-21	R5607048
Acenaphthene	<0.000020		0.000020	mg/L	29-SEP-21	04-OCT-21	R5607048
Acenaphthylene	<0.000020		0.000020	mg/L	29-SEP-21	04-OCT-21	R5607048
Anthracene	<0.000010		0.000010	mg/L	29-SEP-21	04-OCT-21	R5607048
Acridine	<0.000020		0.000020	mg/L	29-SEP-21	04-OCT-21	R5607048
Benzo(a)anthracene	<0.000010		0.000010	mg/L	29-SEP-21	04-OCT-21	R5607048
Benzo(a)pyrene	<0.0000050		0.0000050	mg/L	29-SEP-21	04-OCT-21	R5607048
Benzo(b&j)fluoranthene	<0.000010		0.000010	mg/L	29-SEP-21	04-OCT-21	R5607048
Benzo(g,h,i)perylene	<0.000020		0.000020	mg/L	29-SEP-21	04-OCT-21	R5607048
Benzo(k)fluoranthene	<0.000010		0.000010	mg/L	29-SEP-21	04-OCT-21	R5607048
Chrysene	<0.000020		0.000020	mg/L	29-SEP-21	04-OCT-21	R5607048
Dibenz(a,h)anthracene	<0.0000050		0.0000050	mg/L	29-SEP-21	04-OCT-21	R5607048
Fluoranthene	<0.000020		0.000020	mg/L	29-SEP-21	04-OCT-21	R5607048
Fluorene	<0.000020		0.000020	mg/L	29-SEP-21	04-OCT-21	R5607048
Indeno(1,2,3-cd)pyrene	<0.000010		0.000010	mg/L	29-SEP-21	04-OCT-21	R5607048
Naphthalene	<0.000050		0.000050	mg/L	29-SEP-21	04-OCT-21	R5607048
Phenanthrene	<0.000050		0.000050	mg/L	29-SEP-21	04-OCT-21	R5607048
Pyrene	<0.000010		0.000010	mg/L	29-SEP-21	04-OCT-21	R5607048

* 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
L2643721-2 ARV-5							
Sampled By: CLIENT on 23-SEP-21 @ 09:24							
Matrix: WATER							
CCME PAHs in mg/L							
Quinoline	<0.000020		0.000020	mg/L	29-SEP-21	04-OCT-21	R5607048
B(a)P Total Potency Equivalent	<0.000030		0.000030	mg/L	29-SEP-21	04-OCT-21	R5607048
Surrogate: Naphthalene d8	88.1		50-130	%	29-SEP-21	04-OCT-21	R5607048
Surrogate: Phenanthrene d10	100.8		60-130	%	29-SEP-21	04-OCT-21	R5607048
Surrogate: Chrysene d12	80.5		60-130	%	29-SEP-21	04-OCT-21	R5607048
Surrogate: Acridine d9	83.6		60-130	%	29-SEP-21	04-OCT-21	R5607048
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	32.9		1.2	mg/L		28-SEP-21	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		28-SEP-21	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		28-SEP-21	
Alkalinity, Total (as CaCO3)							
Alkalinity, Total (as CaCO3)	27.0		1.0	mg/L		27-SEP-21	R5603026
Ammonia by colour							
Ammonia, Total (as N)	<0.010		0.010	mg/L		01-OCT-21	R5607220
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	<2.0		2.0	mg/L		25-SEP-21	R5606205
Carbonaceous BOD							
BOD Carbonaceous	<2.0		2.0	mg/L		25-SEP-21	R5606205
Chloride in Water by IC							
Chloride (Cl)	81.2		0.50	mg/L		25-SEP-21	R5604454
Conductivity							
Conductivity	342		1.0	umhos/cm		27-SEP-21	R5603026
Fecal coliforms, 1:10 dilution by QT97							
Fecal Coliforms	10	MBHT	10	MPN/100mL		24-SEP-21	R5600848
Hardness Calculated							
Hardness (as CaCO3)	53.7	HTC	0.20	mg/L		01-OCT-21	
Mercury Total							
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L	07-OCT-21	07-OCT-21	R5614728
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		25-SEP-21	R5604454
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		29-SEP-21	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		25-SEP-21	R5604454
Oil & Grease - Gravimetric							
Oil and Grease	<5.0		5.0	mg/L		28-SEP-21	R5604576
Phenol (4AAP)							
Phenols (4AAP)	0.0013		0.0010	mg/L		01-OCT-21	R5607326
Phosphorus, Total							
Phosphorus (P)-Total	0.0241		0.0030	mg/L		04-OCT-21	R5607369
Sulfate in Water by IC							
Sulfate (SO4)	6.97		0.30	mg/L		25-SEP-21	R5604454
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.101		0.0030	mg/L	28-SEP-21	30-SEP-21	R5606218
Arsenic (As)-Total	0.00035		0.00010	mg/L	28-SEP-21	30-SEP-21	R5606218
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L	28-SEP-21	30-SEP-21	R5606218
Calcium (Ca)-Total	10.1		0.050	mg/L	28-SEP-21	30-SEP-21	R5606218
Chromium (Cr)-Total	0.00040		0.00010	mg/L	28-SEP-21	30-SEP-21	R5606218
Cobalt (Co)-Total	0.00010		0.00010	mg/L	28-SEP-21	30-SEP-21	R5606218

* 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
L2643721-2 ARV-5							
Sampled By: CLIENT on 23-SEP-21 @ 09:24							
Matrix: WATER							
Total Metals in Water by CRC ICPMS							
Copper (Cu)-Total	0.00091		0.00050	mg/L	28-SEP-21	30-SEP-21	R5606218
Iron (Fe)-Total	0.837		0.010	mg/L	28-SEP-21	30-SEP-21	R5606218
Lead (Pb)-Total	0.000203		0.000050	mg/L	28-SEP-21	30-SEP-21	R5606218
Magnesium (Mg)-Total	6.94		0.0050	mg/L	28-SEP-21	30-SEP-21	R5606218
Manganese (Mn)-Total	0.0190		0.00010	mg/L	28-SEP-21	30-SEP-21	R5606218
Nickel (Ni)-Total	0.00060		0.00050	mg/L	28-SEP-21	30-SEP-21	R5606218
Potassium (K)-Total	2.60		0.050	mg/L	28-SEP-21	30-SEP-21	R5606218
Sodium (Na)-Total	40.7		0.050	mg/L	28-SEP-21	30-SEP-21	R5606218
Zinc (Zn)-Total	0.0041		0.0030	mg/L	28-SEP-21	30-SEP-21	R5606218
Total Organic Carbon by Combustion							
Total Organic Carbon	9.62		0.50	mg/L		28-SEP-21	R5604217
Total Suspended Solids							
Total Suspended Solids	<3.0		3.0	mg/L		29-SEP-21	R5605159
pH							
pH	7.44		0.10	pH units		27-SEP-21	R5603026
L2643721-3 ARV-6							
Sampled By: CLIENT on 23-SEP-21 @ 09:39							
Matrix: WATER							
BTEX							
BTX plus F1 by GCMS							
Benzene	<0.00050		0.00050	mg/L		28-SEP-21	R5602699
Toluene	<0.0010		0.0010	mg/L		28-SEP-21	R5602699
Ethyl benzene	<0.00050		0.00050	mg/L		28-SEP-21	R5602699
o-Xylene	<0.00050		0.00050	mg/L		28-SEP-21	R5602699
m+p-Xylenes	<0.00040		0.00040	mg/L		28-SEP-21	R5602699
F1 (C6-C10)	<0.10		0.10	mg/L		28-SEP-21	R5602699
Surrogate: 4-Bromofluorobenzene (SS)	95.3		70-130	%		28-SEP-21	R5602699
CCME Total Hydrocarbons							
F1-BTEX	<0.10		0.10	mg/L		04-OCT-21	
F2-Naphth	<0.10		0.10	mg/L		04-OCT-21	
F3-PAH	<0.25		0.25	mg/L		04-OCT-21	
Total Hydrocarbons (C6-C50)	<0.38		0.38	mg/L		04-OCT-21	
Sum of Xylene Isomer Concentrations							
Xylenes (Total)	<0.00064		0.00064	mg/L		28-SEP-21	
F2-F4 reported in ppm							
F2 (C10-C16)	<0.10		0.10	mg/L	29-SEP-21	30-SEP-21	R5605385
F3 (C16-C34)	<0.25		0.25	mg/L	29-SEP-21	30-SEP-21	R5605385
F4 (C34-C50)	<0.25		0.25	mg/L	29-SEP-21	30-SEP-21	R5605385
Chrom. to baseline at nC50	YES				29-SEP-21	30-SEP-21	R5605385
Surrogate: 2-Bromobenzotrifluoride	82.6		60-140	%	29-SEP-21	30-SEP-21	R5605385
CCME PAHs in mg/L							
1-Methylnaphthalene	<0.000020		0.000020	mg/L	29-SEP-21	04-OCT-21	R5607048
2-Methylnaphthalene	<0.000020		0.000020	mg/L	29-SEP-21	04-OCT-21	R5607048
Acenaphthene	<0.000020		0.000020	mg/L	29-SEP-21	04-OCT-21	R5607048
Acenaphthylene	<0.000020		0.000020	mg/L	29-SEP-21	04-OCT-21	R5607048
Anthracene	<0.000010		0.000010	mg/L	29-SEP-21	04-OCT-21	R5607048
Acridine	<0.000020		0.000020	mg/L	29-SEP-21	04-OCT-21	R5607048
Benzo(a)anthracene	<0.000010		0.000010	mg/L	29-SEP-21	04-OCT-21	R5607048
Benzo(a)pyrene	<0.0000050		0.0000050	mg/L	29-SEP-21	04-OCT-21	R5607048
Benzo(b&j)fluoranthene	<0.000010		0.000010	mg/L	29-SEP-21	04-OCT-21	R5607048

* 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
L2643721-3 ARV-6							
Sampled By: CLIENT on 23-SEP-21 @ 09:39							
Matrix: WATER							
CCME PAHs in mg/L							
Benzo(g,h,i)perylene	<0.000020		0.000020	mg/L	29-SEP-21	04-OCT-21	R5607048
Benzo(k)fluoranthene	<0.000010		0.000010	mg/L	29-SEP-21	04-OCT-21	R5607048
Chrysene	<0.000020		0.000020	mg/L	29-SEP-21	04-OCT-21	R5607048
Dibenz(a,h)anthracene	<0.0000050		0.0000050	mg/L	29-SEP-21	04-OCT-21	R5607048
Fluoranthene	<0.000020		0.000020	mg/L	29-SEP-21	04-OCT-21	R5607048
Fluorene	<0.000020		0.000020	mg/L	29-SEP-21	04-OCT-21	R5607048
Indeno(1,2,3-cd)pyrene	<0.000010		0.000010	mg/L	29-SEP-21	04-OCT-21	R5607048
Naphthalene	<0.000050		0.000050	mg/L	29-SEP-21	04-OCT-21	R5607048
Phenanthrene	<0.000050		0.000050	mg/L	29-SEP-21	04-OCT-21	R5607048
Pyrene	<0.000010		0.000010	mg/L	29-SEP-21	04-OCT-21	R5607048
Quinoline	<0.000050	DLQ	0.000050	mg/L	29-SEP-21	04-OCT-21	R5607048
B(a)P Total Potency Equivalent	<0.000030		0.000030	mg/L	29-SEP-21	04-OCT-21	R5607048
Surrogate: Naphthalene d8	92.5		50-130	%	29-SEP-21	04-OCT-21	R5607048
Surrogate: Phenanthrene d10	100.2		60-130	%	29-SEP-21	04-OCT-21	R5607048
Surrogate: Chrysene d12	76.1		60-130	%	29-SEP-21	04-OCT-21	R5607048
Surrogate: Acridine d9	78.9		60-130	%	29-SEP-21	04-OCT-21	R5607048
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	53.6		1.2	mg/L		28-SEP-21	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		28-SEP-21	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		28-SEP-21	
Alkalinity, Total (as CaCO3)							
Alkalinity, Total (as CaCO3)	43.9		1.0	mg/L		27-SEP-21	R5603026
Ammonia by colour							
Ammonia, Total (as N)	0.055		0.010	mg/L		01-OCT-21	R5607220
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	<2.0		2.0	mg/L		25-SEP-21	R5606205
Carbonaceous BOD							
BOD Carbonaceous	<2.0		2.0	mg/L		25-SEP-21	R5606205
Chloride in Water by IC							
Chloride (Cl)	83.9		0.50	mg/L		25-SEP-21	R5604454
Conductivity							
Conductivity	377		1.0	umhos/cm		27-SEP-21	R5603026
Fecal coliforms, 1:10 dilution by QT97							
Fecal Coliforms	<10	MBHT	10	MPN/100mL		24-SEP-21	R5600848
Hardness Calculated							
Hardness (as CaCO3)	72.1	HTC	0.20	mg/L		01-OCT-21	
Mercury Total							
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L	07-OCT-21	07-OCT-21	R5614728
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		25-SEP-21	R5604454
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		29-SEP-21	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		25-SEP-21	R5604454
Oil & Grease - Gravimetric							
Oil and Grease	<5.0		5.0	mg/L		28-SEP-21	R5604576
Phenol (4AAP)							
Phenols (4AAP)	<0.0010		0.0010	mg/L		01-OCT-21	R5607326
Phosphorus, Total							

* 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
L2643721-3 ARV-6							
Sampled By: CLIENT on 23-SEP-21 @ 09:39							
Matrix: WATER							
Phosphorus, Total							
Phosphorus (P)-Total	0.0274		0.0030	mg/L		04-OCT-21	R5607369
Sulfate in Water by IC							
Sulfate (SO4)	2.87		0.30	mg/L		25-SEP-21	R5604454
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.0563		0.0030	mg/L	28-SEP-21	30-SEP-21	R5606218
Arsenic (As)-Total	0.00041		0.00010	mg/L	28-SEP-21	30-SEP-21	R5606218
Cadmium (Cd)-Total	0.0000085		0.0000050	mg/L	28-SEP-21	30-SEP-21	R5606218
Calcium (Ca)-Total	16.7		0.050	mg/L	28-SEP-21	30-SEP-21	R5606218
Chromium (Cr)-Total	0.00049		0.00010	mg/L	28-SEP-21	30-SEP-21	R5606218
Cobalt (Co)-Total	0.00042		0.00010	mg/L	28-SEP-21	30-SEP-21	R5606218
Copper (Cu)-Total	0.00129		0.00050	mg/L	28-SEP-21	30-SEP-21	R5606218
Iron (Fe)-Total	3.41		0.010	mg/L	28-SEP-21	30-SEP-21	R5606218
Lead (Pb)-Total	0.000189		0.000050	mg/L	28-SEP-21	30-SEP-21	R5606218
Magnesium (Mg)-Total	7.37		0.0050	mg/L	28-SEP-21	30-SEP-21	R5606218
Manganese (Mn)-Total	0.441		0.00010	mg/L	28-SEP-21	30-SEP-21	R5606218
Nickel (Ni)-Total	0.00082		0.00050	mg/L	28-SEP-21	30-SEP-21	R5606218
Potassium (K)-Total	3.74		0.050	mg/L	28-SEP-21	30-SEP-21	R5606218
Sodium (Na)-Total	39.1		0.050	mg/L	28-SEP-21	30-SEP-21	R5606218
Zinc (Zn)-Total	0.0243		0.0030	mg/L	28-SEP-21	30-SEP-21	R5606218
Total Organic Carbon by Combustion							
Total Organic Carbon	9.94		0.50	mg/L		28-SEP-21	R5604217
Total Suspended Solids							
Total Suspended Solids	5.5		3.0	mg/L		29-SEP-21	R5605159
pH							
pH	7.16		0.10	pH units		27-SEP-21	R5603026

* 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).
DLQ	Detection Limit raised due to co-eluting interference. GCMS qualifier ion ratio did not meet acceptance criteria.
HTC	Hardness was calculated from Total Ca and/or Mg concentrations and may be biased high (dissolved Ca/Mg results unavailable).
MBHT	The APHA 30 hour hold time was exceeded for microbiological testing. Samples processed within 48 hours from time of sampling may be valid in some cases (refer to Health Canada guidance).
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Test Method References:

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

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

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

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

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

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

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

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

BOD-CBOD-WP	Water	Carbonaceous BOD	APHA 5210 B

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

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

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

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

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

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

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

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

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

EC-WP	Water	Conductivity	APHA 2510B

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

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

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

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

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

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**

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

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

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

F2-F4-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.

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

Reference Information

Test Method References:

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

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

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

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

Chain of Custody Numbers:

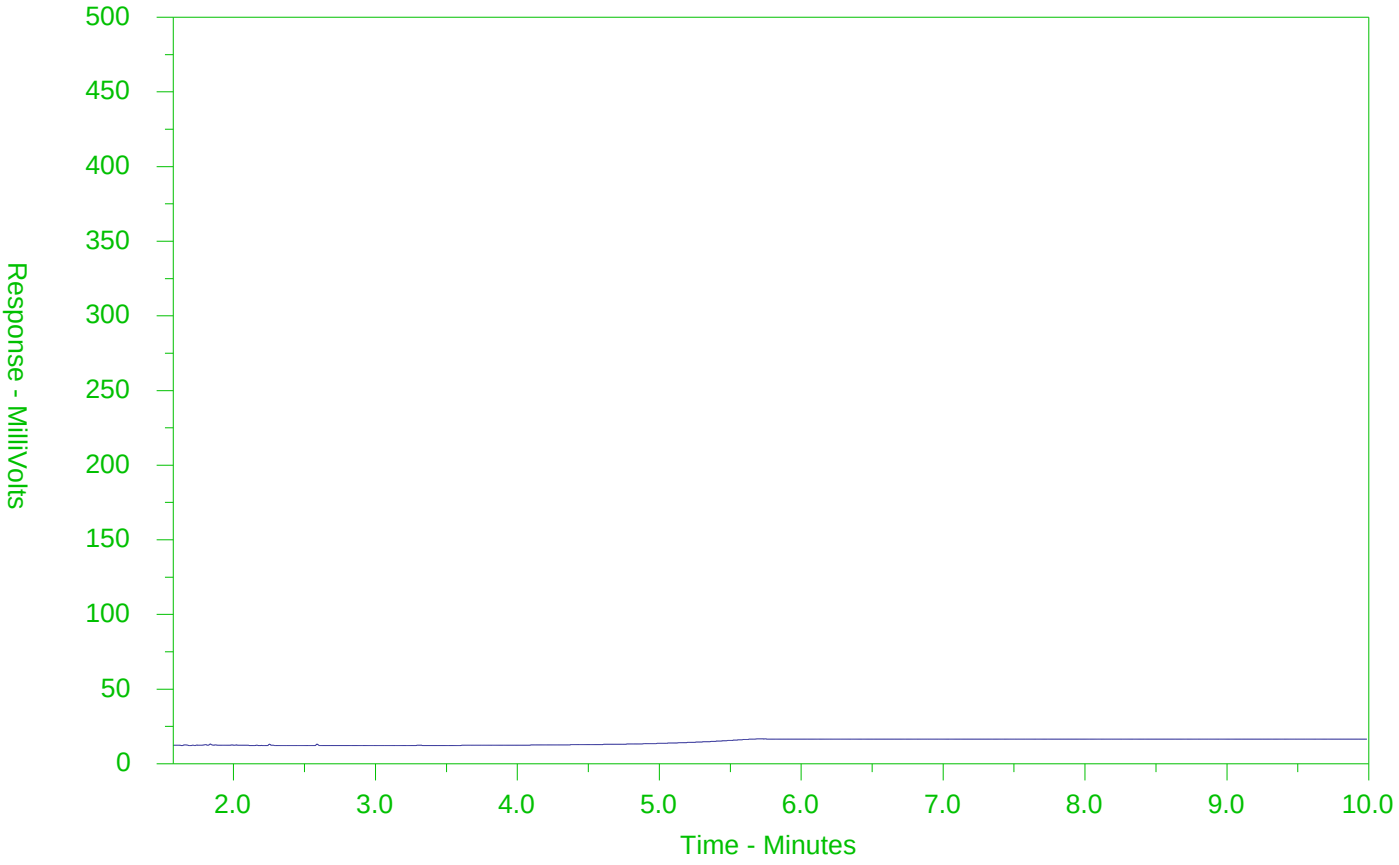
GLOSSARY OF REPORT TERMS

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

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

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L2643721-1
Client Sample ID: ARV-2



←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.

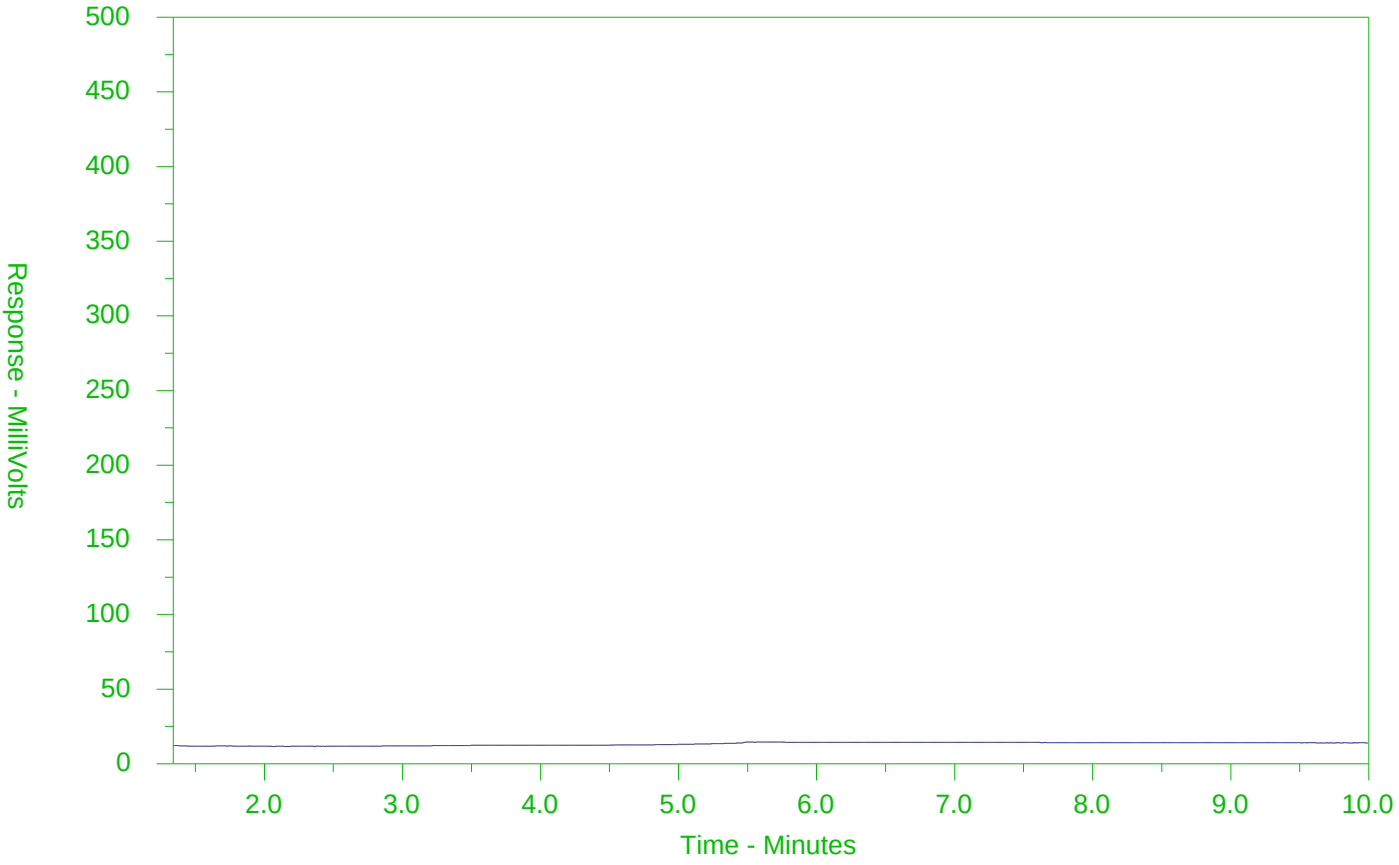
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

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.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L2643721-2
Client Sample ID: ARV-5



←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.

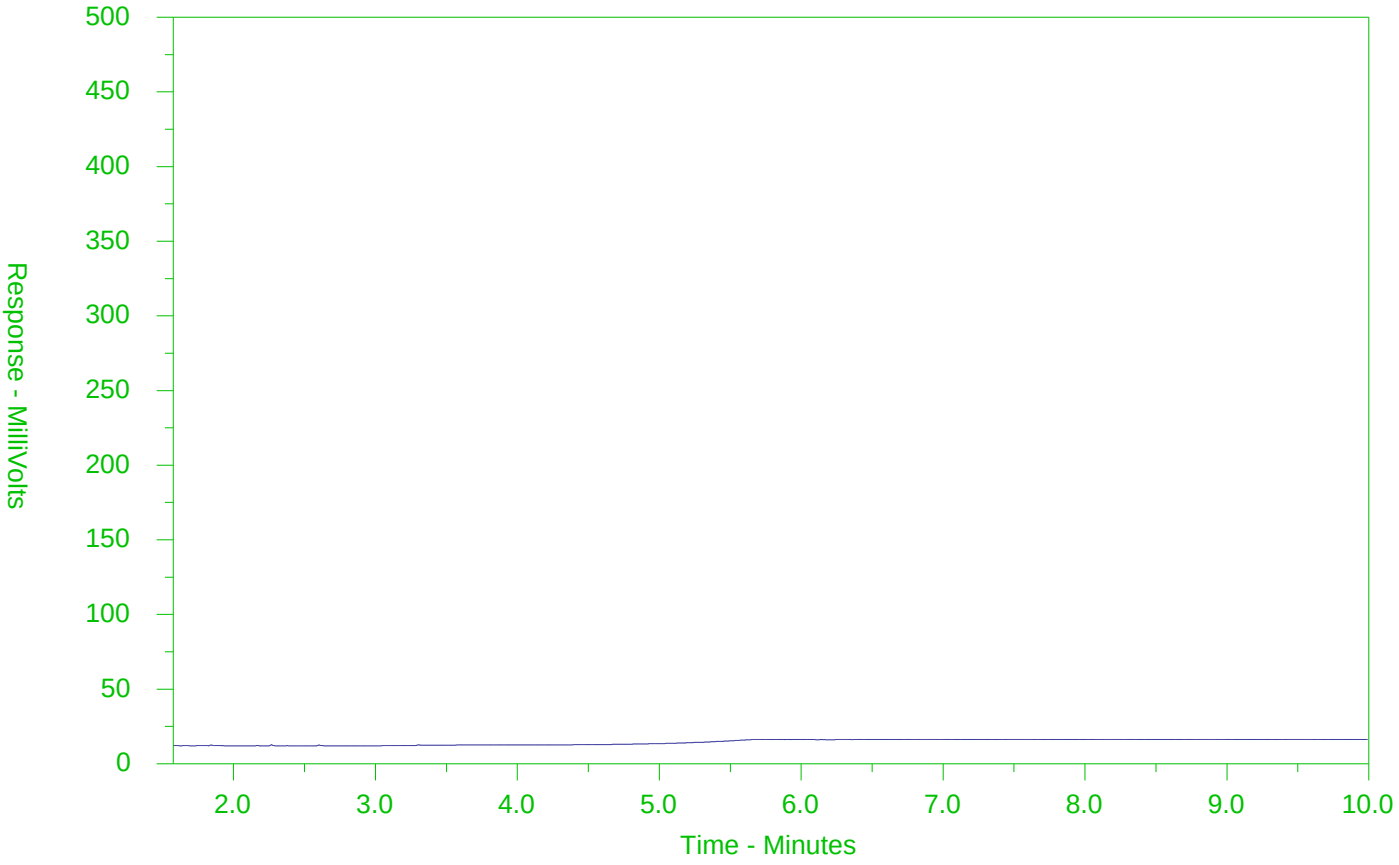
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

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.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L2643721-3
Client Sample ID: ARV-6



←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

L2643721-COFC

COC Number: 17 - 747857

Page of

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:	Hamlet of Arviat	Select Report Format: ☐ PDF ☐ EXCEL | | EDD (DIGITAL)	Regular [R] ☐ Standard TAT if received by 3 pm - business days - no surcharges apply
Contact:	Steve England	Quality Control (QC) Report with Report ☐ YES ☐ NO	PRIORITY (Business Days): 4 day [P4-20%] ☐ / 3 day [P3-25%] ☐ / 2 day [P2-50%] ☐ — EMERGENCY: 1 Business day [E - 100%] ☐ / Same Day, Weekend or Statutory holiday [E2 -200%] (Laboratory opening fees may apply)] ☐
Phone:	867-857-2841	☐ 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	Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm
Street:	Box 150	Email 1 or Fax sao@arviat.ca	For tests that can not be performed according to the service level selected, you will be contacted.
City/Province:	ARVIAT, NUNAVUT	Email 2 mlusty@gov.nu.ca	
Postal Code:	X0C-0E0	Email 3	
Invoice To	Same as Report To ☐ YES ☐ NO	**Invoice Distribution**	
	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 #:		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

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 x2	Oil & Grease x2	Total Metals	NAH, TDC, TKN @ DX2	Mercury	Bacteria x2	Routine	PAH x2	F2-F4 x2	BTEX x3	SAMPLES ON HOLD	SUSPECTED HAZARD (see Special Instructions)
	ARV-7	23-09-21	906am	Water													
	ARV-4 - POLAR BEAR	AT SIGHT		Water													
	ARV-5	23-09-21	924	Water													
	ARV-6	23-09-21	939am	Water													

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	
Are samples for human consumption/ 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			
				9.4			

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date:	Time:	Received by:	Date:	Time:	Received by:	Date:	Time:
	Sept 23/21	10am		9/24/21	15:00			

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

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

Appendix D

List of spills reported to the NT-NU Spill Report Line and are listed on the Hazardous Materials Spills Database of Arviat in 2021

Spill	Occurrence Date	Location Description	Product Spilled	Quantity
2021310	22- July- 2021	Northern Store, Arviat	Petroleum - fuel oil (jet A, diesel, turbo A, heat)	5.00 L
2021220	31- May- 2021	500B/ 800B, 6th Street, Arviat	Petroleum - fuel oil (jet A, diesel, turbo A, heat)	555.00 L
2021129	17- April- 2021	Hamlet of Arviat Office building at 904 6th street, Arviat, NU	Petroleum - fuel oil (jet A, diesel, turbo A, heat)	150.0 L
2021002	1- January- 2021	Caller states there was a heat fuel tank being filled up and it overflowed and spilled onto the floor. It is spreading to the other apartments through the floor. Address is 205 3rd Ave, Arviat NU X0C 0E0	Petroleum - fuel oil (jet A, diesel, turbo A, heat)	297.40 L

Appendix E

Arviat
ARV-2A

			2017				2018				2019				2020				2021			Statistics		
Parameter	**Unit**	**DL**	**19-Jun-17**	**12-Jul-17**	**10-Aug-17**	**19-Sep-17**	**21-Jun-18**	**17-Jul-18**	**13-Aug-18**	**10-Sep-18**	**13-Jun-19**	**17-Jul-19**	**26-Aug-19**	**20-Sep-19**	**13-Jul-20**	**29-Jul-20**	**16-Sep-20**	**17-Sep-20**	**29-Jun-21**	**26-Aug-21**	**23-Sep-21**	**Min**	**Max**	**Average**
Alkalinity																								
Bicarbonate (HCO3)	mg/L	1.2	243	356	366	776	460	478	479	548	160	537	699	786	432	488	493	483	548	747	712	160.0000	786.0000	510.6627
Carbonate (CO3)	mg/L	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	<0.60	<0.60	<0.60	<0.60	<0.60	0.6000	0.6000	0.6000
Hydroxide (OH)	mg/L	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	<0.34	<0.34	<0.34	<0.34	<0.34	0.3400	0.3400	0.3400
Total (as CaCO3)	mg/L	1.0	199	292	300	636	377	391	393	449	132	440	573	645	354	400	404	396	449	612	584	132.0000	645.0000	418.6770
Ammonia by Colour																								
Total (as N)	mg/L	0.010	0.90	2.85	2.75	9.00	9.20	5.27	5.45	6.07	2.24	4.72	0.484	13.10	3.72	5.69	5.60	5.40	11.10	5.97	5.60	0.1190	15.2000	5.7345
Biochemical Oxygen Demand (BOD)																								
Biochemical Oxygen Demand	mg/L	20	51	35.2	38	23.8	17.5	25.5	32	27.6	10.4	31.5	13.6	9	44	29.4	6	6.1	159	12.6	50	2.2000	159.0000	31.8450
Carbonaceous BOD																								
BOD Carbonaceous	mg/L	20	46	21.2	29.5	17.1	13.4	20.5	42.2	26.1	8.2	16.6	9.6	6	34.6	18.5	5.5	7.7	137	8.9	50	5.5000	137.0000	26.8364
Chloride in Water by IC																								
Chloride (Cl)	mg/L	10	422	836	869	430	372	691	732	650	142	49	317	415	573	477	408	415	303	257	170	49.0000	869.0000	450.9378
Conductivity																								
Conductivity	umhos/cm	1.0	1920	3310	3500	2410	2360	3580	3820	3670	1030	2930	2910	3110	3360	3020	3030	3030	2910	2750	2310	272.0000	3820.0000	2816.2632
Fecal Coliforms																								
Fecal Coliforms	MPN/100mL	3	50	10	130	20	390	30	200	140	230	60	360	60	50	60	10	30	1050	20	510	3.0000	1050.0000	177.3254
Hardness Calculated																								
Hardness (as CaCO3)	mg/L	0.30	520	839	1010	1130	709	879	1180	1140	289	841	1030	1310	959	971	1090	1120	1150	1200	273	273.0000	1310.0000	917.1842
Mercury Total																								
Mercury (Hg)	mg/L	0.000200	0.0000122	0.0000050	0.0000050	0.0000057	0.0000554	0.0000050	0.0000050	0.0000050	0.0000060	0.0000190	0.0000150	0.0000090	0.0000160	0.0000180	0.0000080	0.0000080	0.0000548	0.0000129	<0.0000050	0.0000	0.0001	0.0000
Nitrate in Water by IC																								
Nitrate (as N)	mg/L	0.020	0.25	0.40	0.40	0.20	0.10	0.40	0.40	0.40	0.50	0.40	0.020	0.40	0.40	0.40	<0.40	<0.40	<0.40	<0.20	<0.20	0.0200	0.5010	0.3257
Nitrate + Nitrite																								
Nitrate and Nitrite as N	mg/L	0.070	0.25	0.45	0.45	0.22	0.11	0.45	0.45	0.45	0.53	0.45	0.07	0.45	0.45	0.45	<0.45	<0.45	<0.45	<0.22	<00.22	0.0700	0.5340	0.3662
Nitrite in Water by IC																								
Nitrite (as N)	mg/L	0.010	0.10	0.27	0.20	0.10	0.05	0.20	0.20	0.20	0.03	0.20	0.01	0.20	0.20	0.20	<0.20	<0.20	<0.20	<0.10	<0.10	0.0100	0.2700	0.1533
Oil & Grease - Gravimetric																								
Oil and Grease	mg/L	2.00	5.0	11.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	<5.0	<5.0	<5.0	<5.0	<5.0	2.0000	11.0000	5.5502
Phenol																								
Phenols	mg/L	0.0010	0.0041	0.0021	0.0016	0.0042	0.0057	0.0049	0.0034	0.0015	0.0016	0.0056	0.0367	0.0029	0.0029	0.0041	0.0018	0.0015	0.103	0.0099	0.023	0.0010	0.1030	0.0120
Phosphorus, Total																								
Phosphorus (P)	mg/L	0.10	0.71	0.665	0.694	1.01	0.968	0.363	0.552	0.429	0.32	0.411	0.587	0.538	0.569	0.689	0.329	0.327	0.923	0.415	0.335	0.1000	1.0600	0.5731
Sulfate in Water by IC																								
Sulfate (SO4)	mg/L	0.30	322	431	565	536	384	456	664	625	164	81.5	669	803	686	665	699	708	739	705	519	50.1000	803.0000	536.2127
Total Metals by ICP-MS																								
Aluminium (Al)	mg/L	0.0050	0.0252	0.0283	0.0203	0.0147	0.0379	0.0271	0.0168	0.0088	0.068	0.0228	0.0193	0.0125	0.435	0.0145	0.0116	0.0116	0.0482	0.011	0.0167	0.0088	0.4350	0.0609
Arsenic (As)	mg/L	0.00020	0.00403	0.00541	0.00753	0.00853	0.00468	0.00557	0.00618	0.00574	0.00223	0.00490	0.00473	0.00750	0.00465	0.00531	0.00355	0.00358	0.00611	0.00339	0.00342	0.0004	0.0085	0.0051
Cadmium (Cd)	mg/L	0.000010	0.000154	0.0000342	0.0000104	0.0000912	0.000606	0.0000338	0.0000134	0.0000113	0.0000929	0.000179	0.000223	0.0000530	0.0000777	0.0000630	0.0000171	0.0000190	0.0006870	0.0000655	0.000152	0.0000	0.0007	0.0001
Calcium (Ca)	mg/L	0.10	133	181	238	343	207	201	311	310	82.4	232	312	396	253	276	307	318	361	383	37.1	36.1000	396.0000	253.3440
Chromium (Cr)	mg/L	0.0010	0.0010	0.00096	0.00093	0.00127	0.00157	0.00215	0.00083	0.00076	0.00045	0.00142	0.00096	0.00093	0.00226	0.00147	0.00070	0.00060	0.00223	0.00077	0.00082	0.0005	0.0023	0.0012
Cobalt (Co)	mg/L	0.00020	0.00173	0.00110	0.00095	0.00098	0.00308	0.00124	0.00098	0.00086	0.00098	0.00183	0.00138	0.00104	0.00278	0.00141	0.00081	0.00083	0.0082	0.00308	0.00328	0.0005	0.0082	0.0019
Copper (Cu)	mg/L	0.00020	0.0216	0.00573	0.00352	0.00677	0.0666	0.00960	0.00428	0.00343	0.0145	0.0269	0.171	0.0118	0.0169	0.0149	0.00954	0.00949	0.106	0.0332	0.0308	0.0028	0.1710	0.0347
Iron (Fe)	mg/L	0.010	1.91	0.775	0.596	1.84	4.55	1.10	0.66	0.65	0.501	1.29	1.75	1.05	1.07	1.19	0.726	0.742	6.6	4.79	7.34	0.3400	7.3400	2.0584
Lead (Pb)	mg/L	0.000090	0.00319	0.000650	0.000332	0.001340	0.009010	0.000967	0.000224	0.000250	0.000671	0.00329	0.00510	0.00161	0.00112	0.00127	0.00066	0.00065	0.00793	0.00219	0.00285	0.0002	0.0090	0.0025
Magnesium (Mg)	mg/L	0.010	45.5	94.0	100	66.9	46.4	91.8	98.6	88.9	20.3	63.7	60.1	78.5	79.4	68.6	77.5	78.4	61.1	58.7	43.8	3.6600	100.0000	68.0099
Manganese (Mn)	mg/L	0.00030	0.348	0.588	0.496	0.804	0.972	0.213	0.64	0.761	0.246	0.794	1.29	1.44	0.759	0.972	0.699	0.708	2.87	2.56	1.98	0.1970	2.8700	0.9773
Nickel (Ni)	mg/L	0.0020	0.0077	0.00693	0.00728	0.00672	0.00877	0.00904	0.00765	0.00695	0.00384	0.00854	0.0102	0.00923	0.0109	0.00814	0.00677	0.00669	0.0165	0.01180	0.01130	0.0020	0.0165	0.0084
Potassium (K)	mg/L	0.020	44.9	78.1	78.5	59.5	42.9	82.7	68.6	61.4	15.7	53.8	57.9	72.7	63.4	58	57	59.1	61.2	50	38.7	4.0000	82.7000	56.8220
Sodium (Na)	mg/L	0.030	259	572	567	307	234	473	460	419	94.9	284	238	305	348	307	297	301	258	199	135	7.8400	572.0000	316.7822
Zinc (Zn)	mg/L	0.0020	0.0782	0.0265	0.0129	0.0312	0.311	0.0151	0.0156	0.0067	0.0744	0.109	/	0.0330	0.0905	0.0822	0.0137	0.0098	1.0200	0.0228	0.116	0.0067	1.0200	0.1163
Total Organic Carbon by Combustion																								
Total Organic Carbon	mg/L	0.50	38.4	54.1	46.3	37.3	43.8	53.4	55.5	47.7	15.4	48.1	43.9	42.4	63.1	36.6	28.8	28	98.4	66.7	63.1	15.4000	98.4000	46.9342
Total Suspended Solids																								
Total Suspended Solids	mg/L	5.0	48	90	68	35	22	8.1	71.7	24	11.1	25.1	11.9	16.3	42.3	29.7	12.3	14.9	33.1	13.7	24.1	5.0000	143.0000	35.9524
pH																								
pH	pH Units	0.10	8.11	7.63	7.40	7.78	7.57	8.10	7.76	8.00	7.83	8.09	8.04	7.96	8.04	8.05	8.05	8.04	7.37	7.77	7.79	7.3700	8.1100	7.8536
Benzene	mg/L	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	/	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	<0.00050	<0.00050	N/A	<0.00050	<0.00050	0.0005	0.0005	0.0005
Toluene	mg/L	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	/	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	<0.0010	<0.0010	N/A	<0.0010	<0.0010	0.0010	0.0010	0.0010
Ethyl Benzene	mg/L	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	/	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	<0.00050	<0.00050	N/A	<0.00050	<0.00050	0.0005	0.0005	0.0005
o-Xylene	mg/L	0.00050	0.00050	0.00050	0.00050	0.00082	0.00050	0.00050	0.00050	/	0.00050	0.0050	0.00050	0.00050	0.00050	0.00050	<0.00050	<0.00050	N/A	<0.00050	<0.00050	0.0005	0.0050	0.0011
F1 (C6-C10)	mg/L	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	/	0.10	0.10	0.10	0.10	0.10	0.10	<0.10	<0.10	N/A	<0.10	<0.10	0.1000	0.1000	0.1000
F2 (C10-C16)	mg/L	0.25	0.10	0.15	0.15	0.21	0.15	0.17	0.13	/	0.10	0.10	0.16	0.14	0.14	0.10	<0.10	<0.10	N/A	<0.10	<0.10	0.1000	0.2100	0.1406
F3 (C16-C34)	mg/L	0.25	0.25	0.46	0.39	0.46	0.31	0.30	0.36	/	0.25	0.25	0.25	0.25	0.30	0.25	<0.25	<0.25	N/A	<0.25	<0.25	0.2500	0.4700	0.3209
F4 (C34-C50)	mg/L	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	/	0.25	0.25	0.25	0.25	0.25	0.25	<0.25	<0.25	N/A	<0.25	<0.25	0.2500	0.2500	0.2500
Total Hydrocarbons (C6-C50)	mg/L	0.44	0.38	0.62	0.54	0.67	0.46	0.48	0.5	/	0.38	0.38	0.38	0.38	0.44	0.38	<0.38	<0.38	N/A	N/A	<0.38	0.3800	0.6700	0.4702

Arviat
ARV-4

			2017				2018				2019				2020				2021		Statistics		
Parameter	**Unit**	**DL**	**19-Jun-17**	**12-Jul-17**	**10-Aug-17**	**19-Sep-17**	**21-Jun-18**	**17-Jul-18**	**13-Aug-18**	**10-Sep-18**	**13-Jun-19**	**17-Jul-19**	**26-Aug-19**	**20-Sep-19**	**13-Jul-20**	**29-Jul-20**	**16-Sep-20**	**17-Sep-20**	**29-Jun-21**	**26-Aug-21**	**Min**	**Max**	**Average**
Alkalinity																							
Bicarbonate (HCO3)	mg/L	1.2	224	354	168	236	155	310	247	192	159	340	208	86.6	234	323	173	180	276	311	82.000	354.000	230.238
Carbonate (CO3)	mg/L	0.60	0.60	0.60	13.2	0.6	0.60	0.60	0.60	0.60	0.60	0.60	2.76	24.00	0.60	0.60	4.80	<0.60	<0.60	<0.60	0.600	24.000	4.384
Hydroxide (OH)	mg/L	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.6	0.34	0.34	0.34	0.34	0.34	0.34	0.34	<0.34	<0.34	<0.34	<0.34	0.340	0.600	0.371
Total (as CaCO3)	mg/L	1.0	183	290	159	194	127	254	202	158	131	279	175	111	192	265	150	147	226	255	67.000	290.000	192.439
Ammonia by Colour																							
Total (as N)	mg/L	0.20	19.1	27.9	8.68	19.40	8.56	43.7	22.8	18.50	19.6	65.9	28.0	5.95	25.40	43.10	9.06	9.20	43.90	58.40	5.950	65.900	27.230
Biochemical Oxygen Demand (BOD)																							
Biochemical Oxygen Demand	mg/L	20	27.2	215	50	5.6	10	43	36.1	12.3	22.4	65	27.1	51	93	45	> 140	> 140	82	27.2	5.600	215.000	56.663
Carbonaceous BOD																							
BOD Carbonaceous	mg/L	20	21.9	154	43	2.2	5	30.6	18.9	7.2	12.6	58	18.2	25.4	47	31.1	23.1	26	78	17.6	2.000	154.000	38.323
Chloride in Water by IC																							
Chloride (Cl)	mg/L	10	146	167	146	517	155	194	416	465	154	73.8	84.9	87.8	87	122	131	133	62	93.8	62.000	517.000	192.394
Conductivity																							
Conductivity	umhos/cm	1.0	817	1090	761	1830	782	1120	1770	1880	832	856	647	477	672	945	724	757	735	868	477.000	1880.000	999.524
Fecal Coliforms																							
Fecal Coliforms	MPN/100mL	3	990	2050	230	190	10	24200	11200	220	19900	24200	5790	3870	19900	14100	2760	1380	>24200	170	4.000	24200.000	8114.918
Hardness Calculated																							
Hardness (as CaCO3)	mg/L	0.30	87.6	117	93.7	254	85.7	123	243	246	98.8	58.0	54.6	61.2	72.3	67.2	90.4	89.4	62.6	67.1	54.600	254.000	114.501
Mercury Total																							
Mercury (Hg)	mg/L	0.00020	0.0000052	0.0000050	0.000050	0.000005	0.0000107	0.0000250	0.0000050	0.0000050	0.0000100	0.0000050	0.0000050	0.0000050	0.0000070	0.0000080	0.0000070	0.0000070	0.0000109	<0.0000050	0.000	0.000	0.000
Nitrate in Water by IC																							
Nitrate (as N)	mg/L	0.020	0.494	0.040	0.020	1.940	0.50	0.10	0.10	0.25	0.17	0.020	0.372	0.455	0.260	0.141	0.378	0.367	<0.020	<0.040	0.020	1.940	0.417
Nitrate + Nitrite																							
Nitrate and Nitrite as N	mg/L	0.070	0.540	0.070	0.182	2.15	0.62	0.11	0.11	0.25	0.173	0.070	0.548	0.833	0.325	0.141	0.637	0.622	<0.070	<0.070	0.070	2.150	0.529
Nitrite in Water by IC																							
Nitrite (as N)	mg/L	0.010	0.047	0.020	0.182	0.21	0.12	0.05	0.05	0.10	0.020	0.010	0.18	0.378	0.065	0.020	0.259	0.255	<0.010	<0.020	0.010	0.378	0.130
Oil & Grease - Gravimetric																							
Oil and Grease	mg/L	2.0	5.0	5.0	5.0	5.5	5.0	5.6	5.0	5.0	5.0	11.7	5.0	5.0	5.0	5.0	<5.0	<5.0	15.9	<5.0	2.000	15.900	6.270
Phenol																							
Phenols	mg/L	0.0010	0.0040	0.022	0.010	0.003	0.0011	0.0049	0.0029	0.0025	0.0072	0.197	0.010	0.0065	0.0078	0.0010	0.0415	0.0404	0.252	<0.010	0.001	0.252	0.042
Phosphorus, Total																							
Phosphorus (P)	mg/L	0.10	3.91	6.88	8.65	0.92	3.15	7.80	22.40	13.8	4.36	9.46	6.18	6.64	7.10	10.6	5.4	5.97	6.95	7.360	0.918	22.400	7.996
Sulfate in Water by IC																							
Sulfate (SO4)	mg/L	6.0	8.78	3.87	18.6	66	13.6	6.9	23.4	42.7	22	3.54	10.2	8.94	3.91	7.26	12.2	12.2	8.82	10.3	2.180	66.000	17.553
Total Metals by ICP-MS																							
Aluminium (Al)	mg/L	0.0050	0.104	1.26	0.344	0.0259	0.151	0.156	0.0492	0.0327	0.113	0.148	0.119	0.191	0.0974	0.09950	0.14500	0.13700	0.0991	0.137	0.026	1.260	0.232
Arsenic (As)	mg/L	0.00020	0.00590	0.0101	0.0110	0.0034	0.011	0.00758	0.00476	0.00398	0.00491	0.0042	0.00585	0.00672	0.00427	0.00560	0.00676	0.00678	0.00370	0.0062	0.003	0.011	0.006
Cadmium (Cd)	mg/L	0.000010	0.000052	0.000266	0.0000669	0.0000191	0.00061	0.0000524	0.0000122	0.0000092	0.000132	0.0000898	0.0000653	0.0000711	0.0000705	0.0000481	0.0000569	0.0000507	0.0001370	0.0000696	0.000	0.001	0.000
Calcium (Ca)	mg/L	0.10	15.8	22.1	18.3	44.1	15.4	21.7	38.5	37.3	17.2	13.6	10.8	11.9	16.6	12.9	15.6	15.4	14.7	13	10.800	44.100	20.563
Chromium (Cr)	mg/L	0.0010	0.0010	0.0047	0.00165	0.00038	0.00114	0.00112	0.00059	0.00420	0.00070	0.00108	0.00111	0.00142	0.00106	0.00105	0.00143	0.00119	0.00085	0.00125	0.000	0.005	0.002
Cobalt (Co)	mg/L	0.00020	0.00256	0.0047	0.00219	0.00113	0.00487	0.00273	0.00179	0.00119	0.00256	0.00172	0.00123	0.00144	0.00183	0.00120	0.00132	0.00129	0.00301	0.00129	0.001	0.005	0.002
Copper (Cu)	mg/L	0.00020	0.0213	0.103	0.0438	0.00448	0.0188	0.0374	0.00244	0.00221	0.041	0.0753	0.0368	0.0337	0.0557	0.0461	0.0235	0.0226	0.118	0.0446	0.002	0.118	0.041
Iron (Fe)	mg/L	0.010	3.51	19.6	4.14	1.72	4.02	4.58	3.57	3.86	3.55	2.61	2.09	2.48	2.33	3.25	2.12	2.09	1.62	2.57	1.590	19.600	4.514
Lead (Pb)	mg/L	0.000090	0.000993	0.00571	0.00213	0.000142	0.001400	0.00172	0.00015	0.000113	0.00175	0.00213	0.00163	0.001330	0.001750	0.00126	0.00111	0.00108	0.00297	0.00149	0.000	0.006	0.002
Magnesium (Mg)	mg/L	0.010	11.7	15.0	11.6	34.8	11.5	16.7	35.6	37.3	13.5	5.84	6.73	7.65	7.48	8.48	12.5	12.4	6.3	8.4	5.840	37.300	15.402
Manganese (Mn)	mg/L	0.00030	0.324	0.731	0.331	0.708	0.0107	0.418	0.79	0.794	0.293	0.206	0.182	0.179	0.218	0.215	0.206	0.202	0.226	0.181	0.011	0.817	0.355
Nickel (Ni)	mg/L	0.0020	0.0072	0.0115	0.00879	0.00419	0.00877	0.00772	0.00537	0.0038	0.00617	0.00622	0.00557	0.00580	0.00639	0.00525	0.00561	0.00550	0.00791	0.00554	0.004	0.012	0.007
Potassium (K)	mg/L	0.020	19.6	23.9	37.4	24.2	18.3	24.0	22.1	20.1	15.8	22.6	18.6	22.5	20.5	22.5	25.8	25	19.6	22.1	15.800	37.400	22.890
Sodium (Na)	mg/L	0.030	96.2	116	112	315	107	137	232	261	97.7	55.6	67.6	74.1	61.9	82.8	103	101	50	73.5	50.000	315.000	126.268
Zinc (Zn)	mg/L	0.0020	0.0115	0.061	0.0397	0.0051	0.0079	0.0225	0.003	0.0066	0.0196	0.0681	0.0233	0.0271	0.0472	0.0372	0.028	0.0252	0.0553	0.0277	0.002	0.068	0.029
Total Organic Carbon by Combustion																							
Total Organic Carbon	mg/L	0.50	34.7	48.5	175	17.6	33.2	39.7	38	34.5	30.9	88.7	59.8	112	69.9	48.8	6.83	127	54.8	74	6.830	175.000	63.359
Total Suspended Solids																							
Total Suspended Solids	mg/L	13	28	1670	272	13	53	50	8	349	15.9	46	138	224	89.9	33.5	177.0	208.0	26.5	68.0	8.100	1670.000	253.826
pH																							
pH	pH Units	0.10	7.49	6.76	8.82	7.18	7.29	7.25	7.21	7.00	7.47	7.66	8.34	9.37	7.75	7.73	8.43	8.01	7.29	7.76	6.760	9.370	7.743
Benzene	mg/L	0.00050	0.00050	0.00050	0.00050		0.00050	0.00050	0.00050		0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	N/A	N/A	N/A	<0.00050	0.001	0.001	0.001
Toluene	mg/L	0.0010	0.0010	0.0010	0.0187		0.0010	0.0015	0.0015		0.0010	0.0173	0.0010	0.0050	0.0010	0.0010	N/A	N/A	N/A	<0.0010	0.001	0.019	0.005
Ethyl Benzene	mg/L	0.00050	0.00050	0.00050	0.00050		0.00050	0.00050	0.00050		0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	N/A	N/A	N/A	<0.00050	0.001	0.001	0.001
o-Xylene	mg/L	0.00050	0.00050	0.00050	0.00050		0.00050	0.00050	0.00050		0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	N/A	N/A	N/A	<0.00050	0.001	0.001	0.001
F1 (C6-C10)	mg/L	0.10	0.10	0.10	0.10		0.10	0.20	0.20		0.10	0.10	0.10	0.10	0.10	0.10	N/A	N/A	N/A	<0.10	0.100	0.200	0.121
F2 (C10-C16)	mg/L	0.25	0.10	0.16	0.16		0.1	0.13	0.12		0.1	0.61	0.10	0.10	0.11	0.10	N/A	N/A	N/A	<100	0.100	0.610	0.184
F3 (C16-C34)	mg/L	0.25	0.34	1.72	2.85		0.25	0.59	0.25		0.75	6.46	0.95	1.54	1.65	1.64	N/A	N/A	N/A	250	0.250	250.000	17.324
F4 (C34-C50)	mg/L	0.25	0.25	0.64	0.92		0.25	0.25	0.25		0.25	1.62	0.28	0.49	0.61	0.51	N/A	N/A	N/A	<250	0.250	1.620	0.580
Total Hydrocarbons (C6-C50)	mg/L	0.44	0.38	2.53	3.93		0.38	0.72	0.38		0.75	8.69	1.23	2.03	2.37	2.14	N/A	N/A	N/A	N/A	0.380	8.690	2.440

Arviat
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			2017				2018				2019				2020				2021			Statistics		
Parameter	**Unit**	**DL**	**19-Jun-17**	**12-Jul-17**	**10-Aug-17**	**19-Sep-17**	**21-Jun-18**	**17-Jul-18**	**13-Aug-18**	**10-Sep-18**	**13-Jun-19**	**17-Jul-19**	**26-Aug-19**	**20-Sep-19**	**13-Jul-20**	**29-Jul-20**	**16-Sep-20**	**17-Sep-20**	**29-Jun-21**	**26-Aug-21**	**23-Sep-21**	**Min**	**Max**	**Average**
Alkalinity																								
Bicarbonate (HCO3)	mg/L	1.2	78.7	135	135	42.5	55.5	92.0	94.4	88.2	64.7	92.2	78.2	76	71.4	82	59.7	58.3	47.9	74.9	32.9	32.90	135.00	76.82
Carbonate (CO3)	mg/L	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	<0.60	<0.60	<0.60	<0.60	<0.60	0.60	0.60	0.60
Hydroxide (OH)	mg/L	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	<0.34	<0.34	<0.34	<0.34	<0.34	0.34	0.34	0.34
Total (as CaCO3)	mg/L	1.0	64.5	110	110	34.8	45.5	75.4	77.4	72.3	53.0	75.6	64.1	62.3	58.5	67.2	48.9	47.8	39.3	61.4	27	27.00	110.00	62.89
Ammonia by Colour																								
Total (as N)	mg/L	0.20	0.020	0.025	0.025	0.010	0.01	0.025	0.019	0.02	0.015	0.057	0.014	0.018	0.072	0.25	0.018	0.018	0.02	0.032	<0.010	0.01	0.25	0.04
Biochemical Oxygen Demand (BOD)																								
Biochemical Oxygen Demand	mg/L	6.0	2.0	2.0	2.3	2	2	2	2	2.3	2.0	2	2	2	2.3	2	<2.0	<2.0	<2.0	<2.0	<2.0	2.00	2.30	2.06
Carbonaceous BOD																								
BOD Carbonaceous	mg/L	6.0	2.0	2.0	2.0	2.0	2	2	2	2	2.0	2	2	6	2	2	3.7	2	<2.0	<2.0	<2.0	2.00	6.00	2.36
Chloride in Water by IC																								
Chloride (Cl)	mg/L	10	746	1300	868	277	131	259	372	441	164	200	173	176	174	243	379	359	137	144	81.2	81.20	1300.00	348.64
Conductivity																								
Conductivity	umhos/cm	1.0	2200	3890	2790	1010	537	953	1340	1570	679	834	699	676	694	880	1350	1280	558	612	342	342.00	3890.00	1204.95
Fecal Coliforms																								
Fecal Coliforms	MPN/100mL	3	10	10	60	10	10	30	20	30	500	10	30	10	3260	10	<10	10	<10	<10	10	10.00	3260.00	251.25
Hardness Calculated																								
Hardness (as CaCO3)	mg/L	0.30	390	744	412	204	81.6	138	212	226	109	133	112	109	106	136	207	188	87	103	53.7	53.70	744.00	197.44
Mercury Total																								
Mercury (Hg)	mg/L	0.00020	0.0000050	0.0000050	0.0000050	0.0000050	0.0000050	0.0000050	0.0000050	0.0000050	0.0000050	0.0000050	0.0000050	0.0000050	0.0000050	0.0000050	0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	0.00	0.00	0.00
Nitrate in Water by IC																								
Nitrate (as N)	mg/L	0.020	0.20	0.40	0.20	0.04	0.02	0.04	0.10	0.10	0.020	0.020	0.020	0.020	0.020	0.040	<0.10	<0.040	<0.020	<0.020	<0.020	0.02	0.40	0.09
Nitrate + Nitrite																								
Nitrate and Nitrite as N	mg/L	0.070	0.22	0.45	0.22	0.07	0.07	0.07	0.11	0.11	0.070	0.070	0.070	0.070	0.070	0.070	<0.11	<0.070	<0.070	<0.070	<0.070	0.07	0.45	0.12
Nitrite in Water by IC																								
Nitrite (as N)	mg/L	0.010	0.10	0.20	0.10	0.02	0.01	0.02	0.05	0.05	0.010	0.010	0.010	0.010	0.010	0.020	<0.050	<0.020	<0.010	<0.010	<0.010	0.01	0.20	0.04
Oil & Grease - Gravimetric																								
Oil and Grease	mg/L	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	10.9	5.0	5.0	5.0	5.0	5.0	<5.0	<5.0	<5.0	<5.0	<5.0	5.00	10.90	5.42
Phenol																								
Phenols	mg/L	0.0010	0.0033	0.0010	0.0010	0.0010	0.001	0.0011	0.0015	0.001	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0013	0.00	0.00	0.00
Phosphorus, Total																								
Phosphorus (P)	mg/L	0.010	0.0038	0.043	0.135	0.013	0.0058	0.0314	0.0275	0.0236	0.0290	0.0353	0.0179	0.0190	0.159	0.0773	0.0477	0.0134	0.11	0.124	0.024	0.00	0.16	0.05
Sulfate in Water by IC																								
Sulfate (SO4)	mg/L	6.0	14.4	119	39.7	80.1	13.2	5.40	2.80	11.2	16.7	10.9	12.3	12.1	6.25	5.71	6.5	8.82	8.63	8.57	6.97	2.80	119.00	20.49
Total Metals by ICP-MS																								
Aluminium (Al)	mg/L	0.0050	0.0576	0.0220	0.0744	0.0096	0.0158	0.0157	0.042	0.0094	0.0254	0.026	0.0126	0.0196	0.148	0.0414	0.156	0.0132	0.124	0.0379	0.101	0.01	0.16	0.05
Arsenic (As)	mg/L	0.00020	0.00068	0.00050	0.00090	0.00029	0.0004	0.00076	0.00077	0.00055	0.00043	0.00062	0.00038	0.00040	0.00080	0.00078	0.00058	0.00041	0.00055	0.00036	0.00035	0.00	0.00	0.00
Cadmium (Cd)	mg/L	0.000010	0.000010	0.0000050	0.0000050	0.0000050	0.000005	0.000005	0.000005	0.000005	0.0000050	0.0000093	0.0000075	0.0000050	0.0000063	0.0000050	0.0000081	<0.0000050	<0.0000050	<0.0000050	<0.0000050	0.00	0.00	0.00
Calcium (Ca)	mg/L	0.10	40.6	79.9	55.1	40.6	14.8	21.7	34.5	36	19.4	24.5	22.2	19.8	19.4	22.8	29.1	27.6	14.5	19.2	10.1	10.10	79.90	29.04
Chromium (Cr)	mg/L	0.0010	0.0010	0.00022	0.00047	0.00014	0.00014	0.00018	0.00025	0.00016	0.00025	0.00030	0.00026	0.00018	0.00072	0.00025	0.00067	0.00021	0.00037	0.00015	0.00040	0.00	0.00	0.00
Cobalt (Co)	mg/L	0.00020	0.00030	0.00021	0.00023	0.0001	0.0001	0.00029	0.0005	0.00015	0.00010	0.00015	0.00010	0.00010	0.00041	0.00027	0.00030	0.00013	0.00023	<0.00010	0.0001	0.00	0.00	0.00
Copper (Cu)	mg/L	0.00020	0.00067	0.00058	<0.00050	0.00058	0.00059	0.00066	0.0005	0.00061	0.00079	0.00074	0.00089	0.00068	0.00074	0.00056	0.00087	<0.00050	0.00102	0.00058	0.00091	0.00	0.00	0.00
Iron (Fe)	mg/L	0.010	3.45	1.17	4.25	0.207	0.514	1.79	3.54	0.721	0.518	1.14	0.464	0.742	3.69	2.16	3.11	1.28	2.18	0.776	0.837	0.21	4.25	1.71
Lead (Pb)	mg/L	0.000090	0.000091	0.000050	0.000164	0.000064	0.000052	0.000072	0.000070	0.000066	0.000077	0.000057	0.000057	0.000095	0.000311	0.00118	0.00024	<0.000050	0.00026	0.00008	0.00020	0.00	0.00	0.00
Magnesium (Mg)	mg/L	0.010	70.0	132	66.6	25	10.8	20.2	30.7	33.1	14.6	17.5	13.7	14.4	13.9	19.2	32.6	28.8	12.4	13.4	6.94	6.94	132.00	30.31
Manganese (Mn)	mg/L	0.00030	0.226	0.137	0.214	0.0322	0.00856	0.150	0.536	0.0619	0.0158	0.0662	0.0274	0.0203	0.350	0.148	0.112	0.074	0.09006	0.0309	0.019	0.01	0.54	0.12
Nickel (Ni)	mg/L	0.0020	0.0020	0.00050	0.00060	0.00058	0.00055	0.00077	0.00052	0.00052	0.00057	0.00052	0.00056	0.00064	0.00078	0.00112	0.0008	<0.00050	0.00069	<0.00050	0.00060	0.00	0.00	0.00
Potassium (K)	mg/L	0.020	14.5	23.6	16.2	7.72	4.92	6.81	7.08	7.64	6.78	6.48	5.77	5.96	6.18	7.53	8.79	7.42	4.46	5.48	2.6	2.60	23.60	8.21
Sodium (Na)	mg/L	0.030	442	765	415	140	72.2	144	191	222	92.1	106	92.8	92	89.2	127	191	167	77.6	75.8	40.7	40.70	765.00	186.44
Zinc (Zn)	mg/L	0.0020	0.0050	0.0031	0.0030	0.0084	0.0031	0.0052	0.0058	0.0611	0.0050	0.0079	0.0045	0.0037	0.0209	0.0150	0.0082	0.0120	0.0069	<0.0030	0.0041	0.00	0.06	0.01
Total Organic Carbon by Combustion																								
Total Organic Carbon	mg/L	0.50	8.95	9.84	12.3	7.23	7.76	11.4	11.0	10.6	8.13	10.4	8.04	9.37	11	12.9	7.13	6.97	7.92	9.53	9.62	6.97	12.90	9.48
Total Suspended Solids																								
Total Suspended Solids	mg/L	13	20	31.0	32.0	5.0	<2.0	3.1	22.5	146	3.6	6.7	2.0	2.0	9.1	8.9	50.3	70.7	<3.0	12.3	<3.0	2.00	146.00	26.58
pH																								
pH	pH Units	0.10	7.07	8.05	7.45	6.96	7.67	7.51	7.18	7.24	7.63	7.80	7.79	7.70	7.38	7.55	7.65	7.46	7.16	7.64	7.44	6.96	8.05	7.49
Benzene	mg/L	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050		0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	<0.00050	<0.00050	N/A	<0.00050	<0.00050	0.00	0.00	0.00
Toluene	mg/L	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010		0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	<0.0010	<0.0010	N/A	<0.0010	<0.0010	0.00	0.00	0.00
Ethyl Benzene	mg/L	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050		0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	<0.00050	<0.00050	N/A	<0.00050	<0.00050	0.00	0.00	0.00
o-Xylene	mg/L	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050		0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	<0.00050	<0.00050	N/A	<0.00050	<0.00050	0.00	0.00	0.00
F1 (C6-C10)	mg/L	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10		0.10	0.10	0.10	0.10	0.10	0.10	<0.10	<0.10	N/A	<0.10	<0.10	0.10	0.10	0.10
F2 (C10-C16)	mg/L	0.25	0.10	0.10	0.10	0.10	0.1	0.1	0.1		0.10	0.10	0.10	0.10	0.10	0.10	<0.10	<0.10	N/A	<0.10	<0.10	0.10	0.10	0.10
F3 (C16-C34)	mg/L	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25		0.25	0.25	0.25	0.25	0.25	0.25	<0.25	<0.25	N/A	<0.10	<0.25	0.25	0.25	0.25
F4 (C34-C50)	mg/L	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25		0.25	0.25	0.25	0.25	0.25	0.25	<0.25	<0.25	N/A	<0.25	<0.25	0.25	0.25	0.25
Total Hydrocarbons (C6-C50)	mg/L	0.44	0.38	0.38	0.38	0.38	0.38	0.38	0.38		0.38	0.38	0.38	0.38	0.38	0.38	<0.38	<0.38	N/A	N/A	<0.38	0.38	0.38	0.38

Arviat
ARV-6

			2017				2018				2019				2020				2021			Statistics		
Parameter	**Unit**	**DL**	**19-Jun-17**	**12-Jul-17**	**10-Aug-17**	**19-Sep-17**	**21-Jun-18**	**17-Jul-18**	**13-Aug-18**	**10-Sep-18**	**13-Jun-19**	**17-Jul-19**	**26-Aug-19**	**20-Sep-19**	**13-Jul-20**	**29-Jul-20**	**16-Sep-20**	**17-Sep-20**	**29-Jun-21**	**26-Aug-21**	**23-Sep-21**	**Min**	**Max**	**Average**
Alkalinity																								
Bicarbonate (HCO3)	mg/L	1.2	76.9	94.6	/	/	98.7	136	79.3	96	/	127	102	115	121	70.9	73.8	101	99.7	106	53.6	53.60	136.00	97.84
Carbonate (CO3)	mg/L	0.60	0.60	0.60	/	/	0.60	0.6	0.6	0.60	/	0.60	0.60	0.60	0.60	0.60	<0.60	<0.60	<0.60	<0.60	<0.60	0.60	0.60	0.60
Hydroxide (OH)	mg/L	0.34	0.34	0.34	/	/	0.34	0.34	0.34	0.34	/	0.34	0.34	0.34	0.34	0.34	<0.34	<0.34	<0.34	<0.34	<0.34	0.34	0.34	0.34
Total (as CaCO3)	mg/L	1.0	63.0	77.5	/	/	80.9	111	65	78.7	/	104	83.2	94.4	99.1	58.1	60.5	82.9	81.7	87	43.9	43.90	111.00	80.12
Ammonia by Colour																								
Total (as N)	mg/L	0.20	0.070	0.251	/	/	0.12	0.639	0.038	0.052	/	0.100	0.117	0.145	0.053	0.062	0.103	0.102	0.06	0.38	0.06	0.04	0.83	0.18
Biochemical Oxygen Demand (BOD)																								
Biochemical Oxygen Demand	mg/L	6.0	8.2	2.1	/	/	11.4	6	2	2.1	/	6.0	2.0	6.0	3.0	2.0	<2.0	<2.0	<6.0	7.9	<2.0	2.00	11.40	5.12
Carbonaceous BOD																								
BOD Carbonaceous	mg/L	6.0	6.6	2.0	/	/	7.3	6	2	2	/	6.0	2.0	6.0	2.0	2.0	2.7	<2.0	<6.0	2.2	<2.0	2.00	7.30	3.86
Chloride in Water by IC																								
Chloride (Cl)	mg/L	10	66.9	196	/	/	247	177	238	224	/	130	163	184	132	132	316	122	67.5	112	83.9	66.90	316.00	166.40
Conductivity																								
Conductivity	umhos/cm	1.0	333	737	/	/	944	767	894	892	/	630	677	721	604	548	1140	560	383	510	377	333.00	1140.00	681.41
Fecal Coliforms																								
Fecal Coliforms	MPN/100mL	3	10	10	/	/	10	10	20	10	/	10	10	10	10	10	<10	<10	<10	<10	<10	3.00	20.00	10.91
Hardness Calculated																								
Hardness (as CaCO3)	mg/L	0.30	99.6	209	/	/	319	272	223	207	/	164	156	180	145	133	449	123	114	122	72.1	72.10	449.00	197.19
Mercury Total																								
Mercury (Hg)	mg/L	0.00020	0.0000050	0.0000050	/	/	0.0000050	0.0000100	0.0000050	0.0000050	/	/	0.0000050	0.0000050	0.0000050	0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<.0000050	0.00	0.00	0.00
Nitrate in Water by IC																								
Nitrate (as N)	mg/L	0.40	0.020	0.020	/	/	0.02	0.02	0.04	0.04	/	0.020	0.020	0.020	0.020	0.026	<0.040	<0.020	<0.020	<0.020	<0.020	0.02	0.16	0.03
Nitrate + Nitrite																								
Nitrate and Nitrite as N	mg/L	0.45	0.070	0.070	/	/	0.07	0.07	0.07	0.07	/	0.070	0.070	0.070	0.070	0.070	<0.070	<0.070	<0.070	<0.070	<0.070	0.07	0.16	0.08
Nitrite in Water by IC																								
Nitrite (as N)	mg/L	0.20	0.010	0.010	/	/	0.01	0.01	0.02	0.02	/	0.010	0.010	0.010	0.010	0.010	<0.020	<0.010	<0.010	<0.010	<0.010	0.01	0.02	0.01
Oil & Grease - Gravimetric																								
Oil and Grease	mg/L	5.0	5.0	5.0	/	/	5.0	6.5	5.0	5.0	/	5.0	5.0	5.0	5.0	5.0	<5.0	<5.0	23.3	<5.0	<5.0	5.00	23.30	6.43
Phenol																								
Phenols	mg/L	0.0010	0.0141	0.0018	/	/	0.0145	0.0043	0.0014	0.001	/	0.0034	0.0010	0.0010	0.0026	0.0011	<0.0010	<0.0010	0.0076	<0.0010	<0.0010	0.00	0.01	0.00
Phosphorus, Total																								
Phosphorus (P)	mg/L	0.010	0.065	0.082	/	/	0.0433	0.399	0.028	0.0638	/	0.0560	0.0412	0.102	0.0324	0.0441	0.0584	0.0428	0.0386	0.332	0.027	0.03	0.40	0.10
Sulfate in Water by IC																								
Sulfate (SO4)	mg/L	6.0	0.30	0.81	/	/	0.99	0.59	0.6	1.65	/	2.68	0.51	0.30	0.30	1.38	<0.60	0.87	0.38	0.41	2.87	0.30	3.22	1.07
Total Metals by ICP-MS																								
Aluminium (Al)	mg/L	0.0050	0.0867	0.245	/	/	0.0202	0.132	0.0305	0.152	/	0.0339	0.201	0.0806	0.0934	0.0384	0.0604	0.291	0.0253	0.299	0.0563	0.02	1.69	0.20
Arsenic (As)	mg/L	0.00020	0.00065	0.00102	/	/	0.0068	0.00321	0.00045	0.00054	/	0.00100	0.00085	0.00085	0.00083	0.00051	0.00057	0.00054	0.00065	0.00078	0.00041	0.00	0.01	0.00
Cadmium (Cd)	mg/L	0.000010	0.000010	0.0000054	/	/	0.000015	0.0000172	0.000005	0.0000332	/	0.0000712	0.0000252	0.0000055	0.000011	0.0000182	0.0000188	0.0000119	0.0000089	0.0000108	0.000009	0.00	0.00	0.00
Calcium (Ca)	mg/L	0.10	28.7	56.9	/	/	101	84.7	60.1	54.3	/	44.8	40.5	48.8	40	38.5	162	31.9	30.1	31.6	16.7	16.70	162.00	59.12
Chromium (Cr)	mg/L	0.0010	0.0010	0.00130	/	/	0.00024	0.00097	0.00047	0.00073	/	0.00044	0.00103	0.00117	0.00075	0.00034	0.00063	0.00090	0.00026	0.00114	0.00049	0.00	0.00	0.00
Cobalt (Co)	mg/L	0.00020	0.00209	0.00201	/	/	0.00347	0.00198	0.001	0.00126	/	0.00212	0.00143	0.00111	0.00233	0.00094	0.00482	0.00083	0.00231	0.00149	0.00042	0.00	0.00	0.00
Copper (Cu)	mg/L	0.00020	0.00073	0.00142	/	/	0.00123	0.00116	0.0005	0.0014	/	0.00087	0.00108	0.00050	0.00059	0.00050	0.00103	0.00133	0.0011	0.00117	0.00129	0.00	0.00	0.00
Iron (Fe)	mg/L	0.010	15.5	24.7	/	/	8.93	34.0	11.5	7.69	/	11.1	13.2	18.7	18.1	9.18	11.2	8.43	9.03	20	3.41	3.41	34.00	14.84
Lead (Pb)	mg/L	0.000090	0.000197	0.000352	/	/	0.000102	0.000272	0.000196	0.000370	/	0.000082	0.000344	0.000126	0.000290	0.000291	0.000178	0.000484	0.00033	0.00035	0.00019	0.00	0.00	0.00
Magnesium (Mg)	mg/L	0.010	6.76	16.1	/	/	16.3	14.7	17.7	17.4	/	12.7	13.3	14.1	11	9.04	10.8	10.5	9.44	10.5	7.37	6.76	17.70	12.40
Manganese (Mn)	mg/L	0.00030	2.32	2.78	/	/	3.91	1.60	1.66	2.13	/	2.27	1.49	1.8	2.08	1.16	1.66	0.853	2.77	1.52	0.441	0.44	3.91	1.96
Nickel (Ni)	mg/L	0.0020	0.0020	0.00126	/	/	0.00419	0.00189	0.00062	0.00134	/	0.00141	0.00151	0.00108	0.00122	0.00085	0.00185	0.00112	0.00192	0.00150	0.00082	0.00	0.00	0.00
Potassium (K)	mg/L	0.020	3.99	5.36	/	/	9.58	9.17	5.09	5.72	/	6.41	6.27	6.84	6.36	4.26	9.84	5.16	5.23	5.27	3.74	3.74	9.84	6.25
Sodium (Na)	mg/L	0.030	23.8	82.7	/	/	43.5	35.0	84.5	85.7	/	43.0	67.7	83.2	53	49.3	17.5	58.8	31.8	50.4	39.1	17.50	85.70	53.11
Zinc (Zn)	mg/L	0.0020	0.0050	0.0075	/	/	0.0131	0.0173	0.0135	0.0234	/	0.0183	0.016	0.0049	0.081	0.0322	0.0125	0.0709	0.0125	0.046	0.0243	0.00	0.08	0.03
Total Organic Carbon by Combustion																								
Total Organic Carbon	mg/L	0.50	14.6	11.2	/	/	16.3	17.9	7.99	7.2	/	11.0	8.31	9.59	10.4	6.54	6.75	7.21	13.4	14.2	9.94	6.54	17.90	10.91
Total Suspended Solids																								
Total Suspended Solids	mg/L	13	36	41.0	/	/	35	132	30	24	/	30.7	45.1	43.9	44.3	17.7	37.5	29.3	21.7	252.0	5.5	5.50	252.00	59.31
pH																								
pH	pH Units	0.10	6.95	6.64	/	/	6.92	6.77	6.66	6.66	/	7.63	7.28	7.16	7.09	7.01	7.28	7.55	7.02	7.24	7.16	6.61	7.63	7.07
Benzene	mg/L	0.00050	0.00050	0.00050	/	/	0.00050	0.0005	0.0005		/	0.00050	0.00050	0.00050	0.00050	0.00050	<0.00050	<0.00050	N/A	<0.00050	<0.00050	0.00	0.00	0.00
Toluene	mg/L	0.0010	0.0035	0.0010	/	/	0.0012	0.0013	0.0013		/	0.0011	0.0019	0.0033	0.0010	0.0010	<0.0010	<0.0010	N/A	<0.0010	<0.0010	0.00	0.00	0.00
Ethyl Benzene	mg/L	0.00050	0.00050	0.00050	/	/	0.00050	0.0005	0.0005		/	0.00050	0.00050	0.00050	0.00050	0.00050	<0.00050	<0.00050	N/A	<0.00050	<0.00050	0.00	0.00	0.00
o-Xylene	mg/L	0.00050	0.00050	0.00050	/	/	0.00050	0.0005	0.0005		/	0.00050	0.00050	0.00050	0.00050	0.00050	<0.00050	<0.00050	N/A	<0.00050	<0.00050	0.00	0.00	0.00
F1 (C6-C10)	mg/L	0.10	0.10	0.10	/	/	0.10	0.10	0.10		/	0.10	0.10	0.10	0.10	0.10	<0.10	<0.10	N/A	<0.10	<0.10	0.10	0.10	0.10
F2 (C10-C16)	mg/L	0.25	0.10	0.17	/	/	0.1	0.16	0.14		/	0.12	0.10	0.10	0.10	0.10	<0.10	<0.10	N/A	<0.10	<0.10	0.10	0.17	0.12
F3 (C16-C34)	mg/L	0.25	0.25	1.25	/	/	0.25	0.25	0.25		/	0.25	0.25	0.25	0.25	0.25	<0.25	<0.25	N/A	<0.25	<0.25	0.25	1.25	0.41
F4 (C34-C50)	mg/L	0.25	0.25	0.25	/	/	0.25	0.25	0.25		/	0.25	0.25	0.25	0.25	0.25	<0.25	<0.25	N/A	<0.25	<0.25	0.25	0.25	0.25
Total Hydrocarbons (C6-C50)	mg/L	0.44	0.38	1.41	/	/	0.38	0.38	0.38		/	0.38	0.38	0.38	0.38	0.38	<0.38	<0.38	N/A	N/A	<0.38	0.38	1.41	0.55

Appendix F

WATER LICENCE INSPECTION FORM

☒ **Original**
☐ **Follow-Up Report**

Licensee	**Licensee Representative**
Hamlet of Arviat	Steve England
Licence No. / Expiry	**Representative's Title**
3AM-ARV1016/ February 27th 2016	Senior Administrative Officer
Land / Other Authorizations	**Land / Other Authorizations**
Not applicable	Not applicable
Date of Inspection	**Inspector**
August 31st 2020	Atuat Shouldice

Activities Inspected

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

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

Background:

On August 31st 2021, a water licence inspection was conducted by Resources Management Officer (RMO) Atuat Shouldice of Crown Indigenous Relations and Northern Affairs Canada of expired water licence no. 3AM-ARV1016. The inspection was conducted with the assistances from Mathew Hewey, Community and Government Services, Government of Nunavut. The purpose of the inspection was to ensure compliance with applicable terms and conditions of the above mentioned licence. The hamlet is working under an expired licence. On September 16th,2020 a renewal application as well as an amendment application was submitted for the expansion of the sewage lagoon to accommodate the growth of the community.

Observations:

1. Fresh water is metered at the source from Wolf River at ARV-1. Fresh water is pumped from Wolf River to three potable water reservoirs (photo 1).
2. 182 509m^3 of fresh water was pumped from Wolf River to the potable water reservoirs. The total annual allotment is 86 000m^3.
3. All sewage is directed to the Sewage Disposal Facility ('SDF'). The community utilizes a lagoon that discharges to wetland (photo 2).
4. Over the last three years the SDF has required an emergency decant due to limited capacity. Plans to upgrade and improve the SDF are underway. The SDF requires regular maintenance to increase capacity until such time that the amendment is approved (e.g.: sludge removal, and maintenance to the structures).
5. The Landfill is continuously covered and packed to limit the attractant for polar bears and other wildlife (photo 3).
6. Vehicles are depolluted then shredded and used as fire barrier in Landfill. The volume of the Bulk Waste Storage Facility has greatly reduced (photo 4).
7. Hazardous waste is collected and segregated. Improvements need to be made to the storage of these materials specifically the batteries and propane (photo 5).

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

Concerns related to Water Licence no. 3AM-ARV1016;

- *Battery storage satisfactory to the inspector.*

PART D ITEM 15 Licensee shall implement measures to ensure hazardous materials and/or leachate from the Waste Disposal Facilities does not enter Water.

- As per item 2 of the observations, licensee is withdrawing more volume of water than it is currently allowable under the water license.

Failures related to the *Nunavut Waters and Nunavut Surface Rights Tribunal Act;*

Section 11(2): No person shall use or permit the use of water in Nunavut except in accordance with the conditions of a licence.

- The Licensee shall submit the necessary information, as required by the Nunavut Water Board, for the renewal application, prior to the term of the next inspection or further enforcement action will be taken.

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

The hamlet of Arviat is currently using water and depositing waste without a valid water licence. All annual reports have been submitted to date for past years, an application was submitted for licence renewal and an application submitted for modification to sewage lagoon. If modification for sewage lagoon are not started by 2022 , The inspector recommends that the solids be removed from the sewage lagoon to increase capacity so an emergency discharge isn't required.

If not already done so, the hamlet of Arviat is encouraged by the Inspector to submit a plan to the NWB for approval in order to withdraw more volume of water in order to prevent non-compliance of the current and expired water license.

The inspector requests a plan for the storage of discarded batteries by December 7th 2021 identifying how batteries will be stored and not to leak in to the environment.

Licensee or Representative	**Inspector's Name**
Steve England	Atuat Shouldice
Signature	**Signature**
	Sent Electronically
Date	**Date**
	November 4th ,2021

CC: Licensing Department, NWB
Manager of Field Operations, CIRNAC
Megan Lusty, Municipal Works, CGS

Date:	**Authorization Number:**	**Camera/Model:**	**Inspector**
August 31st , 2020	3AM-ARV1016	Samsung S9	RMO Shouldice
Photo #		**Location:**	
1		Landfill	

Description
West cell of the 3 water lagoons

Photo #	Location:
2	Sewage Lagoon

Description: discharge location at sewage lagoon.
Battery collection area North of bulk storage.

Photo #	Location
3	landfill

Description
Landfill is continually packed and cover so not to attract bears.

Photo #	Location
4	Bulk storage

Description
Bulk storage, segregated in to different items

Photo #	Location
4	Battary storage area

Description
Discarded battery storage area at entrance of bulk storage area.