ᑲᑐᔪᓗᒍ ᓄᓇᕗᑦ ᐱᕋᖅᑲᖅᑕᐊᑎᑦᑕᕗᑦ
Building Nunavut Together
Nunavu liuqatigiingniq
Bâtir le Nunavut ensemble

May 7, 2021

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

Attention: Richard Dwyer, Manager of Licensing

Dear Richard,

The Hamlet of Arviat is pleased to submit the 2020 Annual Report for water use and disposal of waste as required under the 3AM-ARV1016 water license from January 1-December 31, 2020. An application for a renewal-amendment was submitted to NWB on September 16, 2020. An additional amendment application to include the expansion of the sewage lagoon in the new license will be submitted to NWB in following screening by NIRB.

Water was pumped from Wolf Creek from June 29 to freeze up on September 25, 2020. The volume taken to fill the 3 reservoirs was 182,509 m^3, which is above the 86,000m^3 allowable limit. This is 0.17% of the 107,100,000 m^3/year flow through Wolf Creek according to the 2019 hydrological assessment.

An increase to the allowable limit to represent the total 235,393 m^3 reservoir volume has been requested as part of the renewal-amendment application submitted in 2020 to support the community growth for the design horizon. The estimated water use in 2020 was 105,878 m^3 and a 1.2% increase from last year (104,606 m^3).

Sampling of sewage effluent was tested at the ALS Laboratory in Winnipeg. The effluent sampled at the wetland discharge point ARV-4 was above the allowable limits for BOD and TSS for the September 16th and 17th samples. The effluent in these samples would not have benefited from the dilution that occurs during freshet, nor the treatment obtained from the appropriate retention time in the lagoon, which the expansion project will address.

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

Regards,
S. Collins

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

ANNUAL REPORT
FOR THE HAMLET OF ARVIAT

YEAR BEING REPORTED: 2020

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

a) **Tabular summaries of all data generated under the Monitoring Program;**
b) **The monthly and annual quantities of freshwater obtained from all sources;**
c) **The monthly and annual quantities of Wastes removed for disposal from Water Supply Facilities and Waste Disposal Facilities;**

Attached are quantities of water used as reported in our On Tap Water Delivery System and the estimated discharge of sewage waste based on quantities used.

Month Reported	Quantity of Water Obtained from all sources (m^3)	Quantity of Sewage Waste Discharged (Estimated, m^3)
January	9,258.356	Same
February	8,459.807	Same
March	9,182.697	Same
April	8,889.713	Same
May	9,046.009	Same
June	8,676.420	Same
July	9,256.838	Same
August	9,116.996	Same
September	8,893.566	Same
October	9,154.156	Same
November	7,900.441	Same
December	8,042.497	Same
ANNUAL TOTAL	**105,877.500**	**Same**

Note: There is no meter at the Sewage discharge pipe. Therefore, the monthly discharge volume is considered as equal to the monthly water consumption volume. The volume of wastewater generated by the water supply facility was not available.

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

- Vehicles, old sewage tanks, and tires were shredded for disposal by a metal shredder bought by the Hamlet of Arviat.

- Segregation continues to improve at the Solid Waste Site and Bulky Metals Site. Batteries are collected and being stored in a sea can. The Hamlet is working on getting these sent out on a ship as the sea can that contains them is full.
- The Solid Waste Site is improving drastically; there are currently minor piles of wood and waste within the fenced area.

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

Spill No.	Date	Site Description	Commodity	Quantity
2020047	02/14/20	RCMP Detachment 4th Avenue	Chemicals (including transformer oils)	410.00 L
2020108	04/22/20	602A-D/404A-D 6th Avenue	Wastewater (sewage, mine tailings)	200.00 L
2020123	05/04/20	Visitor's Centre, 621 3rd Avenue	Petroleum-fuel oil (jet A, diesel, turbo A, heat)	500.00 L
2020174	06/10/20	308 7th Avenue	Petroleum-fuel oil (jet A, diesel, turbo A, heat)	300.00 L
2020194	06/25/20	Northern Store	Petroleum-fuel oil (jet A, diesel, turbo A, heat)	100.00 L
2020428	11/06/20	Arviat Gas Bar	Petroleum-fuel oil (jet A, diesel, turbo A, heat)	113.65 L

f) Any revisions to approved plans and manuals as required by Part B, Item 12, submitted in the form of an addendum;

- Updates to current plans are complete and were submitted to NWB in March 2021.

g) A summary of the status of implementation of the Work Plan, including an indication of the status of the funding required to carry out the Work Plan and an estimated timeframe for receipt of the necessary funding;

- This 2010 document was not available at the time of this submission. The Licensee has made

significant improvement to solid waste management since 2010 and a project to upgrade the site is ongoing, the water treatment facility and reservoirs have been upgraded, and a plan to expand the wastewater treatment facility is ongoing.

f) A fiscal update of the Licensee's funding commitments associated with all facilities governed by this Licence including all associated structures and facilities for the upcoming year and identifying shortfalls in such funding commitments for the previous year;

- CGS is seeking funding to move into the design phase of the sewage lagoon expansion project.

- The budget for the solid waste upgrade project cannot support a 20-year fully engineered solid waste site, class D cost estimates are significantly higher than budgeted. An evaluation of the extent of upgrades that can be undertaken at the current site with the available budget will be completed in 2021/22.

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

- None

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

- The Wolf Creek 2019 Hydrologic Assessment report was finalized in 2020. Data was collected from June to October 2019. The estimated long-term mean annual discharge was calculated as 107,128,416 m^3/year. The total reservoir volume is 235,393 m^3, which is 0.22% of the annual discharge. The report determined that Wolf Creek will continue to be a viable potable water source for the Hamlet.

- The business case report for the expansion of the sewage lagoon will be finalized in May 2021. CGS is now seeking funding to move into the design phase. Concurrently, CGS plans to apply to include an amendment for the lagoon expansion in the ongoing renewal-amendment application. NPC notified CGS on April 16, 2021 that NIRB screening is required due to the extent of the expansion. CGS is expecting to submit the application package to NIRB by May 30, 2021, and the application to NWB will follow once the NIRB process is complete.

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

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

- None

ADDITIONAL INFORMATION THAT THE LICENSEE DEEMS USEFUL:

- The renewal-amendment application package was submitted to NWB on September 16, 2020 that includes the upgrades to the water treatment plant and reservoir, as well as an increase in the annual resupply from Wolf Creek to meet increasing community consumption levels, while respecting the findings of the Hydrological Assessment. CGS plans to submit an additional application to include the expansion of the lagoon in the new license.

- Emergency decanting of the lagoon was approved by CIRNAC and took place in June to prevent berm failure.

- Resupply of the raw water reservoirs took place at Wolf Creek, took place from June 29th until September 25th when pumping was terminated due to freeze-up, at which point each reservoir had been filled. A total of 182,509 m^3 was pumped during the resupply.

FOLLOW-UP REGARDING INSPECTION/COMPLIANCE CONCERNS:

- A copy of the CIRNAC report from the July 22nd inspection has not been received at the time of this submission.

- The sewage lagoon will need to be desludged before the 2021 inspection as requested by the CIRNAC inspector due to capacity issues relating to annual emergency discharges. The licensee is in communication with the inspector to discuss this undertaking in light of the new lagoon being planned for construction soon, pending funding applications.

- It is noted that the current sewage lagoon is inadequately treating the effluent, confirmed by non-compliant sampling results. The new sewage lagoon will address the capacity issues and treatment goals.

List of Appendices

Appendix A: ARV-4 Effluent Quality Limits – 1 page
Appendix B: Weekly Inspections at Monitoring Program Stations - 1 page
Appendix C: Laboratory Certificate of Analysis

- **Certificate of Analysis July 13, 2020 – 27 pages**
- **Certificate of Analysis July 29, 2020 – 18 pages**
- **Certificate of Analysis September 16, 2020 – 16 pages**
- **Certificate of Analysis September 17, 2020 – 17 pages**

Appendix D: Hazardous Materials Spill Database, Arviat 2020 – 1 page
Appendix E: Arviat 2020 Sampling Summary – 4 pages
Appendix F: CIRNAC Inspection Report - 1 pages

Appendix A : ARV-4 Effluent Quality Limits

3BM-ARV1016 Arviat Monitoring Program Results 2020 for Effluent Quality

Parameter	Limits	ARV-4			
		13-Jul-20	29-Jul-20	16-Sep-20	17-Sep-20
BOD5	80 mg/L	93	45	> 140	> 140
Total Suspended Solids	100 mg/L	89.9	33.5	177	208
Fecal Coliforms	1 x 10^4 CFU/100mL	19900	14100	2760	1380
Oil & Grease	no visible sheen	5	5	<5.0	<5.0
pH	between 6 and 9	7.75	7.73	8.43	8.01

Appendix B: Weekly Inspections at Monitoring Program Stations

Weekly inspection of monitoring sites was not received by CGS.

Appendix C: Laboratory Certificate of Analysis

Nunavut Community & Government
Services - Rankin Inlet
ATTN: ADAM ELDER / AGLUKAQ TARTAK
(Arviat)
Box 278
Arviat NU X0C 0E0

Date Received: 14-JUL-20
Report Date: 22-JUL-20 12:20 (MT)
Version: FINAL

Client Phone: 867-857-2661

Certificate of Analysis

Lab Work Order #: L2473824
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
L2473824-1 ARV-2							
Sampled By: CLIENT on 13-JUL-20 @ 08:58							
Matrix: WATER							
BTEX plus F1-F4							
BTX plus F1 by GCMS							
Benzene	<0.00050	VOCHS	0.00050	mg/L		16-JUL-20	R5154921
Toluene	<0.0010	VOCHS	0.0010	mg/L		16-JUL-20	R5154921
Ethyl benzene	<0.00050	VOCHS	0.00050	mg/L		16-JUL-20	R5154921
o-Xylene	<0.00050	VOCHS	0.00050	mg/L		16-JUL-20	R5154921
m+p-Xylenes	<0.00040	VOCHS	0.00040	mg/L		16-JUL-20	R5154921
F1 (C6-C10)	<0.10	VOCHS	0.10	mg/L		16-JUL-20	R5154921
Surrogate: 4-Bromofluorobenzene (SS)	83.1		70-130	%		16-JUL-20	R5154921
CCME PHC F2-F4 in Water							
F2 (C10-C16)	0.14		0.10	mg/L	15-JUL-20	15-JUL-20	R5156656
F3 (C16-C34)	0.30		0.25	mg/L	15-JUL-20	15-JUL-20	R5156656
F4 (C34-C50)	<0.25		0.25	mg/L	15-JUL-20	15-JUL-20	R5156656
Surrogate: 2-Bromobenzotrifluoride	122.7		60-140	%	15-JUL-20	15-JUL-20	R5156656
CCME Total Hydrocarbons							
F1-BTEX	<0.10		0.10	mg/L		20-JUL-20	
F2-Naphth	0.14		0.10	mg/L		20-JUL-20	
F3-PAH	0.30		0.25	mg/L		20-JUL-20	
Total Hydrocarbons (C6-C50)	0.44		0.38	mg/L		20-JUL-20	
Sum of Xylene Isomer Concentrations							
Xylenes (Total)	<0.00064		0.00064	mg/L		16-JUL-20	
Total and E. coli, 1:10 dilution by QT97							
Total Coliforms	510	MBHT	10	MPN/100mL		14-JUL-20	R5154004
Escherichia Coli	50	MBHT	10	MPN/100mL		14-JUL-20	R5154004
CCME PAHs in mg/L							
1-Methyl Naphthalene	<0.000020		0.000020	mg/L	16-JUL-20	20-JUL-20	R5158059
2-Methyl Naphthalene	<0.000020		0.000020	mg/L	16-JUL-20	20-JUL-20	R5158059
Acenaphthene	<0.000020		0.000020	mg/L	16-JUL-20	20-JUL-20	R5158059
Acenaphthylene	<0.000020		0.000020	mg/L	16-JUL-20	20-JUL-20	R5158059
Anthracene	<0.000010		0.000010	mg/L	16-JUL-20	20-JUL-20	R5158059
Acridine	<0.000020		0.000020	mg/L	16-JUL-20	20-JUL-20	R5158059
Benzo(a)anthracene	<0.000010		0.000010	mg/L	16-JUL-20	20-JUL-20	R5158059
Benzo(a)pyrene	<0.0000050		0.0000050	mg/L	16-JUL-20	20-JUL-20	R5158059
Benzo(b&j)fluoranthene	<0.000010		0.000010	mg/L	16-JUL-20	20-JUL-20	R5158059
Benzo(g,h,i)perylene	<0.000020		0.000020	mg/L	16-JUL-20	20-JUL-20	R5158059
Benzo(k)fluoranthene	<0.000010		0.000010	mg/L	16-JUL-20	20-JUL-20	R5158059
Chrysene	<0.000020		0.000020	mg/L	16-JUL-20	20-JUL-20	R5158059
Dibenzo(a,h)anthracene	<0.0000050		0.0000050	mg/L	16-JUL-20	20-JUL-20	R5158059
Fluoranthene	<0.000020		0.000020	mg/L	16-JUL-20	20-JUL-20	R5158059
Fluorene	<0.000020		0.000020	mg/L	16-JUL-20	20-JUL-20	R5158059
Indeno(1,2,3-cd)pyrene	<0.000010		0.000010	mg/L	16-JUL-20	20-JUL-20	R5158059
Naphthalene	<0.000050		0.000050	mg/L	16-JUL-20	20-JUL-20	R5158059
Phenanthrene	<0.000050		0.000050	mg/L	16-JUL-20	20-JUL-20	R5158059
Pyrene	<0.000010		0.000010	mg/L	16-JUL-20	20-JUL-20	R5158059
Quinoline	0.000055		0.000020	mg/L	16-JUL-20	20-JUL-20	R5158059
B(a)P Total Potency Equivalent	<0.000030		0.000030	mg/L	16-JUL-20	20-JUL-20	R5158059
Surrogate: d8-Naphthalene	94.6		50-150	%	16-JUL-20	20-JUL-20	R5158059
Surrogate: d10-Phenanthrene	90.8		50-150	%	16-JUL-20	20-JUL-20	R5158059
Surrogate: d12-Chrysene	76.0		50-150	%	16-JUL-20	20-JUL-20	R5158059
Surrogate: d10-Acenaphthene	89.1		50-150	%	16-JUL-20	20-JUL-20	R5158059
Surrogate: d9-Acridine (SS)	94.1		50-150	%	16-JUL-20	20-JUL-20	R5158059
Nunavut WW Group 1							

* 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
L2473824-1 ARV-2							
Sampled By: CLIENT on 13-JUL-20 @ 08:58							
Matrix: WATER							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	432		1.2	mg/L		16-JUL-20	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		16-JUL-20	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		16-JUL-20	
Alkalinity, Total (as CaCO3)							
Alkalinity, Total (as CaCO3)	354		1.0	mg/L		15-JUL-20	R5154480
Ammonia by colour							
Ammonia, Total (as N)	3.72		0.10	mg/L		16-JUL-20	R5157280
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	44		20	mg/L		15-JUL-20	R5159515
Carbonaceous BOD							
BOD Carbonaceous	34.6		6.0	mg/L		15-JUL-20	R5159515
Chloride in Water by IC							
Chloride (Cl)	573		10	mg/L		14-JUL-20	R5159802
Conductivity							
Conductivity	3360		1.0	umhos/cm		15-JUL-20	R5154480
Fecal coliforms, 1:10 dilution by QT97							
Fecal Coliforms	50	MBHT	10	MPN/100mL		14-JUL-20	R5153984
Hardness Calculated							
Hardness (as CaCO3)	959	HTC	0.20	mg/L		20-JUL-20	
Mercury Total							
Mercury (Hg)-Total	0.0000160		0.0000050	mg/L	16-JUL-20	16-JUL-20	R5156978
Nitrate in Water by IC							
Nitrate (as N)	<0.40	DLM	0.40	mg/L		14-JUL-20	R5159802
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.45		0.45	mg/L		21-JUL-20	
Nitrite in Water by IC							
Nitrite (as N)	<0.20	DLM	0.20	mg/L		14-JUL-20	R5159802
Oil & Grease - Gravimetric							
Oil and Grease	<5.0		5.0	mg/L		21-JUL-20	R5161499
Phenol (4AAP)							
Phenols (4AAP)	0.0029		0.0010	mg/L		16-JUL-20	R5156146
Phosphorus, Total							
Phosphorus (P)-Total	0.569		0.0030	mg/L		17-JUL-20	R5157047
Sulfate in Water by IC							
Sulfate (SO4)	686		6.0	mg/L		14-JUL-20	R5159802
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.0435		0.0030	mg/L	16-JUL-20	16-JUL-20	R5156998
Arsenic (As)-Total	0.00465		0.00010	mg/L	16-JUL-20	16-JUL-20	R5156998
Cadmium (Cd)-Total	0.0000777		0.0000050	mg/L	16-JUL-20	16-JUL-20	R5156998
Calcium (Ca)-Total	253		0.050	mg/L	16-JUL-20	16-JUL-20	R5156998
Chromium (Cr)-Total	0.00225		0.00010	mg/L	16-JUL-20	16-JUL-20	R5156998
Cobalt (Co)-Total	0.00278		0.00010	mg/L	16-JUL-20	16-JUL-20	R5156998
Copper (Cu)-Total	0.0169		0.00050	mg/L	16-JUL-20	16-JUL-20	R5156998
Iron (Fe)-Total	1.07		0.010	mg/L	16-JUL-20	16-JUL-20	R5156998
Lead (Pb)-Total	0.00112		0.000050	mg/L	16-JUL-20	16-JUL-20	R5156998
Magnesium (Mg)-Total	79.4		0.0050	mg/L	16-JUL-20	16-JUL-20	R5156998
Manganese (Mn)-Total	0.759		0.00010	mg/L	16-JUL-20	16-JUL-20	R5156998
Nickel (Ni)-Total	0.0109		0.00050	mg/L	16-JUL-20	16-JUL-20	R5156998
Potassium (K)-Total	63.4		0.050	mg/L	16-JUL-20	16-JUL-20	R5156998
Sodium (Na)-Total	348		0.050	mg/L	16-JUL-20	16-JUL-20	R5156998

* 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
L2473824-1 ARV-2							
Sampled By: CLIENT on 13-JUL-20 @ 08:58							
Matrix: WATER							
Total Metals in Water by CRC ICPMS							
Zinc (Zn)-Total	0.0905		0.0030	mg/L	16-JUL-20	16-JUL-20	R5156998
Total Organic Carbon by Combustion							
Total Organic Carbon	63.1		5.0	mg/L		17-JUL-20	R5158394
Total Suspended Solids							
Total Suspended Solids	42.3		3.0	mg/L		20-JUL-20	R5160054
pH							
pH	8.04		0.10	pH units		15-JUL-20	R5154480
L2473824-2 ARV-4							
Sampled By: CLIENT on 13-JUL-20 @ 08:40							
Matrix: WATER							
BTEX plus F1-F4							
BTX plus F1 by GCMS							
Benzene	<0.00050	VOCHS	0.00050	mg/L		16-JUL-20	R5154921
Toluene	<0.0010	VOCHS	0.0010	mg/L		16-JUL-20	R5154921
Ethyl benzene	<0.00050	VOCHS	0.00050	mg/L		16-JUL-20	R5154921
o-Xylene	<0.00050	VOCHS	0.00050	mg/L		16-JUL-20	R5154921
m+p-Xylenes	<0.00040	VOCHS	0.00040	mg/L		16-JUL-20	R5154921
F1 (C6-C10)	<0.10	VOCHS	0.10	mg/L		16-JUL-20	R5154921
Surrogate: 4-Bromofluorobenzene (SS)	83.5		70-130	%		16-JUL-20	R5154921
CCME PHC F2-F4 in Water							
F2 (C10-C16)	0.11		0.10	mg/L	15-JUL-20	15-JUL-20	R5156656
F3 (C16-C34)	1.65		0.25	mg/L	15-JUL-20	15-JUL-20	R5156656
F4 (C34-C50)	0.61		0.25	mg/L	15-JUL-20	15-JUL-20	R5156656
Surrogate: 2-Bromobenzotrifluoride	113.9		60-140	%	15-JUL-20	15-JUL-20	R5156656
CCME Total Hydrocarbons							
F1-BTEX	<0.10		0.10	mg/L		20-JUL-20	
F2-Naphth	0.11		0.10	mg/L		20-JUL-20	
F3-PAH	1.65		0.25	mg/L		20-JUL-20	
Total Hydrocarbons (C6-C50)	2.37		0.38	mg/L		20-JUL-20	
Sum of Xylene Isomer Concentrations							
Xylenes (Total)	<0.00064		0.00064	mg/L		16-JUL-20	
Total and E. coli, 1:10 dilution by QT97							
Total Coliforms	24200	MBHT	10	MPN/100mL		14-JUL-20	R5154004
Escherichia Coli	17300	MBHT	10	MPN/100mL		14-JUL-20	R5154004
CCME PAHs in mg/L							
1-Methyl Naphthalene	<0.000020		0.000020	mg/L	16-JUL-20	20-JUL-20	R5158059
2-Methyl Naphthalene	<0.000020		0.000020	mg/L	16-JUL-20	20-JUL-20	R5158059
Acenaphthene	<0.000020		0.000020	mg/L	16-JUL-20	20-JUL-20	R5158059
Acenaphthylene	<0.000020		0.000020	mg/L	16-JUL-20	20-JUL-20	R5158059
Anthracene	<0.000010		0.000010	mg/L	16-JUL-20	20-JUL-20	R5158059
Acridine	0.000047		0.000020	mg/L	16-JUL-20	20-JUL-20	R5158059
Benzo(a)anthracene	<0.000010		0.000010	mg/L	16-JUL-20	20-JUL-20	R5158059
Benzo(a)pyrene	<0.0000050		0.0000050	mg/L	16-JUL-20	20-JUL-20	R5158059
Benzo(b&j)fluoranthene	<0.000010		0.000010	mg/L	16-JUL-20	20-JUL-20	R5158059
Benzo(g,h,i)perylene	<0.000020		0.000020	mg/L	16-JUL-20	20-JUL-20	R5158059
Benzo(k)fluoranthene	<0.000010		0.000010	mg/L	16-JUL-20	20-JUL-20	R5158059
Chrysene	<0.000020		0.000020	mg/L	16-JUL-20	20-JUL-20	R5158059
Dibenzo(a,h)anthracene	<0.0000050		0.0000050	mg/L	16-JUL-20	20-JUL-20	R5158059
Fluoranthene	<0.000020		0.000020	mg/L	16-JUL-20	20-JUL-20	R5158059
Fluorene	<0.000020		0.000020	mg/L	16-JUL-20	20-JUL-20	R5158059

* 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
L2473824-2 ARV-4							
Sampled By: CLIENT on 13-JUL-20 @ 08:40							
Matrix: WATER							
CCME PAHs in mg/L							
Indeno(1,2,3-cd)pyrene	<0.000010		0.000010	mg/L	16-JUL-20	20-JUL-20	R5158059
Naphthalene	<0.000050		0.000050	mg/L	16-JUL-20	20-JUL-20	R5158059
Phenanthrene	<0.000050		0.000050	mg/L	16-JUL-20	20-JUL-20	R5158059
Pyrene	<0.000010		0.000010	mg/L	16-JUL-20	20-JUL-20	R5158059
Quinoline	0.000038		0.000020	mg/L	16-JUL-20	20-JUL-20	R5158059
B(a)P Total Potency Equivalent	<0.000030		0.000030	mg/L	16-JUL-20	20-JUL-20	R5158059
Surrogate: d8-Naphthalene	115.6		50-150	%	16-JUL-20	20-JUL-20	R5158059
Surrogate: d10-Phenanthrene	95.0		50-150	%	16-JUL-20	20-JUL-20	R5158059
Surrogate: d12-Chrysene	81.4		50-150	%	16-JUL-20	20-JUL-20	R5158059
Surrogate: d10-Acenaphthene	99.8		50-150	%	16-JUL-20	20-JUL-20	R5158059
Surrogate: d9-Acridine (SS)	95.6		50-150	%	16-JUL-20	20-JUL-20	R5158059
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	234		1.2	mg/L		16-JUL-20	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		16-JUL-20	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		16-JUL-20	
Alkalinity, Total (as CaCO3)							
Alkalinity, Total (as CaCO3)	192		1.0	mg/L		15-JUL-20	R5154480
Ammonia by colour							
Ammonia, Total (as N)	25.4		1.0	mg/L		16-JUL-20	R5157280
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	93		20	mg/L		15-JUL-20	R5159515
Carbonaceous BOD							
BOD Carbonaceous	47		20	mg/L		15-JUL-20	R5159515
Chloride in Water by IC							
Chloride (Cl)	87.0		0.50	mg/L		14-JUL-20	R5159802
Conductivity							
Conductivity	672		1.0	umhos/cm		15-JUL-20	R5154480
Fecal coliforms, 1:10 dilution by QT97							
Fecal Coliforms	19900	MBHT	10	MPN/100mL		14-JUL-20	R5153984
Hardness Calculated							
Hardness (as CaCO3)	72.3	HTC	0.20	mg/L		20-JUL-20	
Mercury Total							
Mercury (Hg)-Total	0.0000070		0.0000050	mg/L	16-JUL-20	16-JUL-20	R5156978
Nitrate in Water by IC							
Nitrate (as N)	0.260		0.020	mg/L		14-JUL-20	R5159802
Nitrate+Nitrite							
Nitrate and Nitrite as N	0.325		0.070	mg/L		21-JUL-20	
Nitrite in Water by IC							
Nitrite (as N)	0.065		0.010	mg/L		14-JUL-20	R5159802
Oil & Grease - Gravimetric							
Oil and Grease	<5.0		5.0	mg/L		21-JUL-20	R5161499
Phenol (4AAP)							
Phenols (4AAP)	0.0078	DLM	0.0050	mg/L		16-JUL-20	R5156146
Phosphorus, Total							
Phosphorus (P)-Total	7.10		0.030	mg/L		17-JUL-20	R5157047
Sulfate in Water by IC							
Sulfate (SO4)	3.91		0.30	mg/L		14-JUL-20	R5159802
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.0974		0.0030	mg/L	16-JUL-20	16-JUL-20	R5156998

* 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
L2473824-2 ARV-4							
Sampled By: CLIENT on 13-JUL-20 @ 08:40							
Matrix: WATER							
Total Metals in Water by CRC ICPMS							
Arsenic (As)-Total	0.00427		0.00010	mg/L	16-JUL-20	16-JUL-20	R5156998
Cadmium (Cd)-Total	0.0000705		0.0000050	mg/L	16-JUL-20	16-JUL-20	R5156998
Calcium (Ca)-Total	16.6		0.050	mg/L	16-JUL-20	16-JUL-20	R5156998
Chromium (Cr)-Total	0.00106		0.00010	mg/L	16-JUL-20	16-JUL-20	R5156998
Cobalt (Co)-Total	0.00183		0.00010	mg/L	16-JUL-20	16-JUL-20	R5156998
Copper (Cu)-Total	0.0557		0.00050	mg/L	16-JUL-20	16-JUL-20	R5156998
Iron (Fe)-Total	2.33		0.010	mg/L	16-JUL-20	16-JUL-20	R5156998
Lead (Pb)-Total	0.00175		0.000050	mg/L	16-JUL-20	16-JUL-20	R5156998
Magnesium (Mg)-Total	7.48		0.0050	mg/L	16-JUL-20	16-JUL-20	R5156998
Manganese (Mn)-Total	0.218		0.00010	mg/L	16-JUL-20	16-JUL-20	R5156998
Nickel (Ni)-Total	0.00639		0.00050	mg/L	16-JUL-20	16-JUL-20	R5156998
Potassium (K)-Total	20.5		0.050	mg/L	16-JUL-20	16-JUL-20	R5156998
Sodium (Na)-Total	61.9		0.050	mg/L	16-JUL-20	16-JUL-20	R5156998
Zinc (Zn)-Total	0.0472		0.0030	mg/L	16-JUL-20	16-JUL-20	R5156998
Total Organic Carbon by Combustion							
Total Organic Carbon	69.9		5.0	mg/L		17-JUL-20	R5158394
Total Suspended Solids							
Total Suspended Solids	89.9		3.0	mg/L		20-JUL-20	R5160054
pH							
pH	7.75		0.10	pH units		15-JUL-20	R5154480
L2473824-3 ARV-5							
Sampled By: CLIENT on 13-JUL-20 @ 09:14							
Matrix: WATER							
BTEX plus F1-F4							
BTX plus F1 by GCMS							
Benzene	<0.00050	VOCHS	0.00050	mg/L		16-JUL-20	R5154921
Toluene	<0.0010	VOCHS	0.0010	mg/L		16-JUL-20	R5154921
Ethyl benzene	<0.00050	VOCHS	0.00050	mg/L		16-JUL-20	R5154921
o-Xylene	<0.00050	VOCHS	0.00050	mg/L		16-JUL-20	R5154921
m+p-Xylenes	<0.00040	VOCHS	0.00040	mg/L		16-JUL-20	R5154921
F1 (C6-C10)	<0.10	VOCHS	0.10	mg/L		16-JUL-20	R5154921
Surrogate: 4-Bromofluorobenzene (SS)	86.5		70-130	%		16-JUL-20	R5154921
CCME PHC F2-F4 in Water							
F2 (C10-C16)	<0.10		0.10	mg/L	15-JUL-20	15-JUL-20	R5156656
F3 (C16-C34)	<0.25		0.25	mg/L	15-JUL-20	15-JUL-20	R5156656
F4 (C34-C50)	<0.25		0.25	mg/L	15-JUL-20	15-JUL-20	R5156656
Surrogate: 2-Bromobenzotrifluoride	97.3		60-140	%	15-JUL-20	15-JUL-20	R5156656
CCME Total Hydrocarbons							
F1-BTEX	<0.10		0.10	mg/L		20-JUL-20	
F2-Naphth	<0.10		0.10	mg/L		20-JUL-20	
F3-PAH	<0.25		0.25	mg/L		20-JUL-20	
Total Hydrocarbons (C6-C50)	<0.38		0.38	mg/L		20-JUL-20	
Sum of Xylene Isomer Concentrations							
Xylenes (Total)	<0.00064		0.00064	mg/L		16-JUL-20	
Total and E. coli, 1:10 dilution by QT97							
Total Coliforms	4880	MBHT	10	MPN/100mL		14-JUL-20	R5154004
Escherichia Coli	3650	MBHT	10	MPN/100mL		14-JUL-20	R5154004
CCME PAHs in mg/L							
1-Methyl Naphthalene	<0.000020		0.000020	mg/L	16-JUL-20	20-JUL-20	R5158059
2-Methyl Naphthalene	<0.000020		0.000020	mg/L	16-JUL-20	20-JUL-20	R5158059

* 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
L2473824-3 ARV-5							
Sampled By: CLIENT on 13-JUL-20 @ 09:14							
Matrix: WATER							
CCME PAHs in mg/L							
Acenaphthene	<0.000020		0.000020	mg/L	16-JUL-20	20-JUL-20	R5158059
Acenaphthylene	<0.000020		0.000020	mg/L	16-JUL-20	20-JUL-20	R5158059
Anthracene	<0.000010		0.000010	mg/L	16-JUL-20	20-JUL-20	R5158059
Acridine	<0.000020		0.000020	mg/L	16-JUL-20	20-JUL-20	R5158059
Benzo(a)anthracene	<0.000010		0.000010	mg/L	16-JUL-20	20-JUL-20	R5158059
Benzo(a)pyrene	<0.0000050		0.0000050	mg/L	16-JUL-20	20-JUL-20	R5158059
Benzo(b&j)fluoranthene	<0.000010		0.000010	mg/L	16-JUL-20	20-JUL-20	R5158059
Benzo(g,h,i)perylene	<0.000020		0.000020	mg/L	16-JUL-20	20-JUL-20	R5158059
Benzo(k)fluoranthene	<0.000010		0.000010	mg/L	16-JUL-20	20-JUL-20	R5158059
Chrysene	<0.000020		0.000020	mg/L	16-JUL-20	20-JUL-20	R5158059
Dibenzo(a,h)anthracene	<0.0000050		0.0000050	mg/L	16-JUL-20	20-JUL-20	R5158059
Fluoranthene	<0.000020		0.000020	mg/L	16-JUL-20	20-JUL-20	R5158059
Fluorene	<0.000020		0.000020	mg/L	16-JUL-20	20-JUL-20	R5158059
Indeno(1,2,3-cd)pyrene	<0.000010		0.000010	mg/L	16-JUL-20	20-JUL-20	R5158059
Naphthalene	<0.000050		0.000050	mg/L	16-JUL-20	20-JUL-20	R5158059
Phenanthrene	<0.000050		0.000050	mg/L	16-JUL-20	20-JUL-20	R5158059
Pyrene	<0.000010		0.000010	mg/L	16-JUL-20	20-JUL-20	R5158059
Quinoline	<0.000020		0.000020	mg/L	16-JUL-20	20-JUL-20	R5158059
B(a)P Total Potency Equivalent	<0.000030		0.000030	mg/L	16-JUL-20	20-JUL-20	R5158059
Surrogate: d8-Naphthalene	95.9		50-150	%	16-JUL-20	20-JUL-20	R5158059
Surrogate: d10-Phenanthrene	98.1		50-150	%	16-JUL-20	20-JUL-20	R5158059
Surrogate: d12-Chrysene	84.8		50-150	%	16-JUL-20	20-JUL-20	R5158059
Surrogate: d10-Acenaphthene	91.2		50-150	%	16-JUL-20	20-JUL-20	R5158059
Surrogate: d9-Acridine (SS)	93.7		50-150	%	16-JUL-20	20-JUL-20	R5158059
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	71.4		1.2	mg/L		16-JUL-20	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		16-JUL-20	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		16-JUL-20	
Alkalinity, Total (as CaCO3)							
Alkalinity, Total (as CaCO3)	58.5		1.0	mg/L		15-JUL-20	R5154480
Ammonia by colour							
Ammonia, Total (as N)	0.072		0.010	mg/L		21-JUL-20	R5161278
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	2.3		2.0	mg/L		15-JUL-20	R5159515
Carbonaceous BOD							
BOD Carbonaceous	<2.0		2.0	mg/L		15-JUL-20	R5159515
Chloride in Water by IC							
Chloride (Cl)	174		0.50	mg/L		14-JUL-20	R5159802
Conductivity							
Conductivity	694		1.0	umhos/cm		15-JUL-20	R5154480
Fecal coliforms, 1:10 dilution by QT97							
Fecal Coliforms	3260	MBHT	10	MPN/100mL		14-JUL-20	R5153984
Hardness Calculated							
Hardness (as CaCO3)	106	HTC	0.20	mg/L		20-JUL-20	
Mercury Total							
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L	16-JUL-20	16-JUL-20	R5156978
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		14-JUL-20	R5159802
Nitrate+Nitrite							

* 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
L2473824-3 ARV-5							
Sampled By: CLIENT on 13-JUL-20 @ 09:14							
Matrix: WATER							
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		21-JUL-20	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		14-JUL-20	R5159802
Oil & Grease - Gravimetric							
Oil and Grease	<5.0		5.0	mg/L		21-JUL-20	R5161499
Phenol (4AAP)							
Phenols (4AAP)	<0.0010		0.0010	mg/L		16-JUL-20	R5156146
Phosphorus, Total							
Phosphorus (P)-Total	0.159		0.0030	mg/L		17-JUL-20	R5157047
Sulfate in Water by IC							
Sulfate (SO4)	6.25		0.30	mg/L		14-JUL-20	R5159802
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.148		0.0030	mg/L	16-JUL-20	16-JUL-20	R5156998
Arsenic (As)-Total	0.00080		0.00010	mg/L	16-JUL-20	16-JUL-20	R5156998
Cadmium (Cd)-Total	0.0000063		0.0000050	mg/L	16-JUL-20	16-JUL-20	R5156998
Calcium (Ca)-Total	19.4		0.050	mg/L	16-JUL-20	16-JUL-20	R5156998
Chromium (Cr)-Total	0.00072		0.00010	mg/L	16-JUL-20	16-JUL-20	R5156998
Cobalt (Co)-Total	0.00041		0.00010	mg/L	16-JUL-20	16-JUL-20	R5156998
Copper (Cu)-Total	0.00074		0.00050	mg/L	16-JUL-20	16-JUL-20	R5156998
Iron (Fe)-Total	3.69		0.010	mg/L	16-JUL-20	16-JUL-20	R5156998
Lead (Pb)-Total	0.000311		0.000050	mg/L	16-JUL-20	16-JUL-20	R5156998
Magnesium (Mg)-Total	13.9		0.0050	mg/L	16-JUL-20	16-JUL-20	R5156998
Manganese (Mn)-Total	0.350		0.00010	mg/L	16-JUL-20	16-JUL-20	R5156998
Nickel (Ni)-Total	0.00078		0.00050	mg/L	16-JUL-20	16-JUL-20	R5156998
Potassium (K)-Total	6.18		0.050	mg/L	16-JUL-20	16-JUL-20	R5156998
Sodium (Na)-Total	89.2		0.050	mg/L	16-JUL-20	16-JUL-20	R5156998
Zinc (Zn)-Total	0.0209		0.0030	mg/L	16-JUL-20	16-JUL-20	R5156998
Total Organic Carbon by Combustion							
Total Organic Carbon	11.0		0.50	mg/L		17-JUL-20	R5158394
Total Suspended Solids							
Total Suspended Solids	9.1		3.0	mg/L		20-JUL-20	R5160054
pH							
pH	7.38		0.10	pH units		15-JUL-20	R5154480
L2473824-4 ARV-6							
Sampled By: CLIENT on 13-JUL-20 @ 09:31							
Matrix: WATER							
BTEX plus F1-F4							
BTX plus F1 by GCMS							
Benzene	<0.00050	VOCHS	0.00050	mg/L		16-JUL-20	R5154921
Toluene	<0.0010	VOCHS	0.0010	mg/L		16-JUL-20	R5154921
Ethyl benzene	<0.00050	VOCHS	0.00050	mg/L		16-JUL-20	R5154921
o-Xylene	<0.00050	VOCHS	0.00050	mg/L		16-JUL-20	R5154921
m+p-Xylenes	<0.00040	VOCHS	0.00040	mg/L		16-JUL-20	R5154921
F1 (C6-C10)	<0.10	VOCHS	0.10	mg/L		16-JUL-20	R5154921
Surrogate: 4-Bromofluorobenzene (SS)	85.7		70-130	%		16-JUL-20	R5154921
CCME PHC F2-F4 in Water							
F2 (C10-C16)	<0.10		0.10	mg/L	15-JUL-20	15-JUL-20	R5156656
F3 (C16-C34)	<0.25		0.25	mg/L	15-JUL-20	15-JUL-20	R5156656
F4 (C34-C50)	<0.25		0.25	mg/L	15-JUL-20	15-JUL-20	R5156656
Surrogate: 2-Bromobenzotrifluoride	95.4		60-140	%	15-JUL-20	15-JUL-20	R5156656
CCME Total Hydrocarbons							

* 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
L2473824-4 ARV-6							
Sampled By: CLIENT on 13-JUL-20 @ 09:31							
Matrix: WATER							
CCME Total Hydrocarbons							
F1-BTEX	<0.10		0.10	mg/L		20-JUL-20	
F2-Naphth	<0.10		0.10	mg/L		20-JUL-20	
F3-PAH	<0.25		0.25	mg/L		20-JUL-20	
Total Hydrocarbons (C6-C50)	<0.38		0.38	mg/L		20-JUL-20	
Sum of Xylene Isomer Concentrations							
Xylenes (Total)	<0.00064		0.00064	mg/L		16-JUL-20	
Total and E. coli, 1:10 dilution by QT97							
Total Coliforms	120	MBHT	10	MPN/100mL		14-JUL-20	R5154004
Escherichia Coli	<10	MBHT	10	MPN/100mL		14-JUL-20	R5154004
CCME PAHs in mg/L							
1-Methyl Naphthalene	0.000028		0.000020	mg/L	16-JUL-20	20-JUL-20	R5158059
2-Methyl Naphthalene	<0.000020		0.000020	mg/L	16-JUL-20	20-JUL-20	R5158059
Acenaphthene	<0.000020		0.000020	mg/L	16-JUL-20	20-JUL-20	R5158059
Acenaphthylene	<0.000020		0.000020	mg/L	16-JUL-20	20-JUL-20	R5158059
Anthracene	<0.000010		0.000010	mg/L	16-JUL-20	20-JUL-20	R5158059
Acridine	<0.000020		0.000020	mg/L	16-JUL-20	20-JUL-20	R5158059
Benzo(a)anthracene	<0.000010		0.000010	mg/L	16-JUL-20	20-JUL-20	R5158059
Benzo(a)pyrene	<0.0000050		0.0000050	mg/L	16-JUL-20	20-JUL-20	R5158059
Benzo(b&j)fluoranthene	<0.000010		0.000010	mg/L	16-JUL-20	20-JUL-20	R5158059
Benzo(g,h,i)perylene	<0.000020		0.000020	mg/L	16-JUL-20	20-JUL-20	R5158059
Benzo(k)fluoranthene	<0.000010		0.000010	mg/L	16-JUL-20	20-JUL-20	R5158059
Chrysene	<0.000020		0.000020	mg/L	16-JUL-20	20-JUL-20	R5158059
Dibenzo(a,h)anthracene	<0.0000050		0.0000050	mg/L	16-JUL-20	20-JUL-20	R5158059
Fluoranthene	<0.000020		0.000020	mg/L	16-JUL-20	20-JUL-20	R5158059
Fluorene	<0.000020		0.000020	mg/L	16-JUL-20	20-JUL-20	R5158059
Indeno(1,2,3-cd)pyrene	<0.000010		0.000010	mg/L	16-JUL-20	20-JUL-20	R5158059
Naphthalene	<0.000050		0.000050	mg/L	16-JUL-20	20-JUL-20	R5158059
Phenanthrene	<0.000050		0.000050	mg/L	16-JUL-20	20-JUL-20	R5158059
Pyrene	<0.000010		0.000010	mg/L	16-JUL-20	20-JUL-20	R5158059
Quinoline	<0.000020		0.000020	mg/L	16-JUL-20	20-JUL-20	R5158059
B(a)P Total Potency Equivalent	<0.000030		0.000030	mg/L	16-JUL-20	20-JUL-20	R5158059
Surrogate: d8-Naphthalene	91.9		50-150	%	16-JUL-20	20-JUL-20	R5158059
Surrogate: d10-Phenanthrene	93.0		50-150	%	16-JUL-20	20-JUL-20	R5158059
Surrogate: d12-Chrysene	64.9		50-150	%	16-JUL-20	20-JUL-20	R5158059
Surrogate: d10-Acenaphthene	88.7		50-150	%	16-JUL-20	20-JUL-20	R5158059
Surrogate: d9-Acridine (SS)	88.3		50-150	%	16-JUL-20	20-JUL-20	R5158059
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	121		1.2	mg/L		16-JUL-20	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		16-JUL-20	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		16-JUL-20	
Alkalinity, Total (as CaCO3)							
Alkalinity, Total (as CaCO3)	99.1		1.0	mg/L		15-JUL-20	R5154480
Ammonia by colour							
Ammonia, Total (as N)	0.053		0.010	mg/L		21-JUL-20	R5161278
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	3.0		2.0	mg/L		15-JUL-20	R5159515
Carbonaceous BOD							
BOD Carbonaceous	<2.0		2.0	mg/L		15-JUL-20	R5159515

* 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
L2473824-4 ARV-6							
Sampled By: CLIENT on 13-JUL-20 @ 09:31							
Matrix: WATER							
Chloride in Water by IC							
Chloride (Cl)	132		0.50	mg/L		14-JUL-20	R5159802
Conductivity							
Conductivity	604		1.0	umhos/cm		15-JUL-20	R5154480
Fecal coliforms, 1:10 dilution by QT97							
Fecal Coliforms	<10	MBHT	10	MPN/100mL		14-JUL-20	R5153984
Hardness Calculated							
Hardness (as CaCO3)	145	HTC	0.20	mg/L		20-JUL-20	
Mercury Total							
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L	16-JUL-20	16-JUL-20	R5156978
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		14-JUL-20	R5159802
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		21-JUL-20	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		14-JUL-20	R5159802
Oil & Grease - Gravimetric							
Oil and Grease	<5.0		5.0	mg/L		21-JUL-20	R5161499
Phenol (4AAP)							
Phenols (4AAP)	0.0026		0.0010	mg/L		16-JUL-20	R5156146
Phosphorus, Total							
Phosphorus (P)-Total	0.0324		0.0030	mg/L		17-JUL-20	R5157047
Sulfate in Water by IC							
Sulfate (SO4)	<0.30		0.30	mg/L		14-JUL-20	R5159802
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.0934		0.0030	mg/L	16-JUL-20	16-JUL-20	R5156998
Arsenic (As)-Total	0.00083		0.00010	mg/L	16-JUL-20	16-JUL-20	R5156998
Cadmium (Cd)-Total	0.0000110		0.0000050	mg/L	16-JUL-20	16-JUL-20	R5156998
Calcium (Ca)-Total	40.0		0.050	mg/L	16-JUL-20	16-JUL-20	R5156998
Chromium (Cr)-Total	0.00075		0.00010	mg/L	16-JUL-20	16-JUL-20	R5156998
Cobalt (Co)-Total	0.00233		0.00010	mg/L	16-JUL-20	16-JUL-20	R5156998
Copper (Cu)-Total	0.00059		0.00050	mg/L	16-JUL-20	16-JUL-20	R5156998
Iron (Fe)-Total	18.1		0.010	mg/L	16-JUL-20	16-JUL-20	R5156998
Lead (Pb)-Total	0.000290		0.000050	mg/L	16-JUL-20	16-JUL-20	R5156998
Magnesium (Mg)-Total	11.0		0.0050	mg/L	16-JUL-20	16-JUL-20	R5156998
Manganese (Mn)-Total	2.08		0.00010	mg/L	16-JUL-20	16-JUL-20	R5156998
Nickel (Ni)-Total	0.00122		0.00050	mg/L	16-JUL-20	16-JUL-20	R5156998
Potassium (K)-Total	6.36		0.050	mg/L	16-JUL-20	16-JUL-20	R5156998
Sodium (Na)-Total	53.0		0.050	mg/L	16-JUL-20	16-JUL-20	R5156998
Zinc (Zn)-Total	0.0810		0.0030	mg/L	16-JUL-20	16-JUL-20	R5156998
Total Organic Carbon by Combustion							
Total Organic Carbon	10.4		0.50	mg/L		17-JUL-20	R5158394
Total Suspended Solids							
Total Suspended Solids	44.3		3.0	mg/L		20-JUL-20	R5160054
pH							
pH	7.09		0.10	pH units		15-JUL-20	R5154480

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

Reference Information

Sample Parameter Qualifier Key:

Qualifier	Description
B	Method Blank exceeds ALS DQO. Associated sample results which are < Limit of Reporting or > 5 times blank level are considered reliable.
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).
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.
VOCHS	VOC analysis was conducted for a water sample that contained > 5% headspace. Results may be biased low.

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.			

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**

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

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

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

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

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

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

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

HARDNESS-CALC-WP Water Hardness Calculated APHA 2340B

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

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

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

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

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

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

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

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

NO2+NO3-CALC-WP Water Nitrate+Nitrite CALCULATION

NO2-IC-N-WP Water Nitrite in Water by IC EPA 300.1 (mod)

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

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

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

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

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

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

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

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

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

PH-WP Water pH APHA 4500H

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

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.

Quality Control Report

Client: Nunavut Community & Government Services - Rankin Inlet
Box 278
Arviat NU X0C 0E0
Contact: ADAM ELDER / AGLUKAQ TARTAK (Arviat)

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
ALK-TITR-WP	Water							
Batch R5154480								
WG3363682-14 LCS								
Alkalinity, Total (as CaCO3)			103.0		%		85-115	15-JUL-20
WG3363682-11 MB								
Alkalinity, Total (as CaCO3)			<1.0		mg/L		1	15-JUL-20
BOD-CBOD-WP	Water							
Batch R5159515								
WG3362051-7 LCS								
BOD Carbonaceous			104.0		%		85-115	15-JUL-20
WG3362051-6 MB								
BOD Carbonaceous			<2.0		mg/L		2	15-JUL-20
BOD-WP	Water							
Batch R5159515								
WG3362051-7 LCS								
Biochemical Oxygen Demand			108.1		%		85-115	15-JUL-20
WG3362051-6 MB								
Biochemical Oxygen Demand			<2.0		mg/L		2	15-JUL-20
BTEXS+F1-HSMS-WP	Water							
Batch R5154921								
WG3362937-2 LCS								
Benzene			94.2		%		70-130	15-JUL-20
Toluene			90.7		%		70-130	15-JUL-20
Ethyl benzene			94.0		%		70-130	15-JUL-20
o-Xylene			103.9		%		70-130	15-JUL-20
m+p-Xylenes			94.6		%		70-130	15-JUL-20
WG3362937-3 LCS								
F1 (C6-C10)			87.1		%		70-130	15-JUL-20
WG3362937-1 MB								
Benzene			<0.00050		mg/L		0.0005	15-JUL-20
Toluene			<0.0010		mg/L		0.001	15-JUL-20
Ethyl benzene			<0.00050		mg/L		0.0005	15-JUL-20
o-Xylene			<0.00050		mg/L		0.0005	15-JUL-20
m+p-Xylenes			<0.00040		mg/L		0.0004	15-JUL-20
F1 (C6-C10)			<0.10		mg/L		0.1	15-JUL-20
Surrogate: 4-Bromofluorobenzene (SS)			87.0		%		70-130	15-JUL-20
C-TOC-HTC-WP	Water							

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
C-TOC-HTC-WP	Water							
Batch R5158394								
WG3366084-2 LCS								
Total Organic Carbon			102.6		%		80-120	17-JUL-20
WG3366084-6 LCS								
Total Organic Carbon			102.6		%		80-120	17-JUL-20
WG3366084-1 MB								
Total Organic Carbon			<0.50		mg/L		0.5	17-JUL-20
WG3366084-5 MB								
Total Organic Carbon			<0.50		mg/L		0.5	17-JUL-20
CL-IC-N-WP	Water							
Batch R5159802								
WG3362114-10 LCS								
Chloride (Cl)			103.7		%		90-110	14-JUL-20
WG3362114-9 MB								
Chloride (Cl)			<0.50		mg/L		0.5	14-JUL-20
EC-WP	Water							
Batch R5154480								
WG3363682-13 LCS								
Conductivity			98.0		%		90-110	15-JUL-20
WG3363682-11 MB								
Conductivity			<1.0		umhos/cm		1	15-JUL-20
F2-F4-FID-WP	Water							
Batch R5156656								
WG3362782-1 MB								
F2 (C10-C16)			<0.10		mg/L		0.1	15-JUL-20
F3 (C16-C34)			<0.25		mg/L		0.25	15-JUL-20
F4 (C34-C50)			<0.25		mg/L		0.25	15-JUL-20
Surrogate: 2-Bromobenzotrifluoride			101.4		%		60-140	15-JUL-20
FC10-QT97-WP	Water							
Batch R5153984								
WG3362306-1 MB								
Fecal Coliforms			<1		MPN/100mL		1	14-JUL-20
HG-T-CVAA-WP	Water							
Batch R5156978								
WG3364116-3 DUP		**L2473824-4**						
Mercury (Hg)-Total		<0.0000050	<0.000005C	RPD-NA	mg/L	N/A	20	16-JUL-20
WG3364115-2 LCS								

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
HG-T-CVAA-WP	Water							
Batch R5156978								
WG3364115-2 LCS								
Mercury (Hg)-Total			112.0		%		80-120	16-JUL-20
WG3364116-2 LCS								
Mercury (Hg)-Total			112.0		%		80-120	16-JUL-20
WG3364115-1 MB								
Mercury (Hg)-Total			<0.000005C		mg/L		0.000005	16-JUL-20
WG3364116-1 MB								
Mercury (Hg)-Total			<0.000005C		mg/L		0.000005	16-JUL-20
MET-T-CCMS-WP	Water							
Batch R5156998								
WG3363385-2 LCS								
Aluminum (Al)-Total			98.4		%		80-120	16-JUL-20
Arsenic (As)-Total			96.4		%		80-120	16-JUL-20
Cadmium (Cd)-Total			96.9		%		80-120	16-JUL-20
Calcium (Ca)-Total			96.8		%		80-120	16-JUL-20
Chromium (Cr)-Total			95.8		%		80-120	16-JUL-20
Cobalt (Co)-Total			94.5		%		80-120	16-JUL-20
Copper (Cu)-Total			95.1		%		80-120	16-JUL-20
Iron (Fe)-Total			98.4		%		80-120	16-JUL-20
Lead (Pb)-Total			97.3		%		80-120	16-JUL-20
Magnesium (Mg)-Total			98.9		%		80-120	16-JUL-20
Manganese (Mn)-Total			98.1		%		80-120	16-JUL-20
Nickel (Ni)-Total			93.8		%		80-120	16-JUL-20
Potassium (K)-Total			98.9		%		80-120	16-JUL-20
Sodium (Na)-Total			93.7		%		80-120	16-JUL-20
Zinc (Zn)-Total			98.8		%		80-120	16-JUL-20
WG3363385-1 MB								
Aluminum (Al)-Total			<0.0030		mg/L		0.003	16-JUL-20
Arsenic (As)-Total			<0.00010		mg/L		0.0001	16-JUL-20
Cadmium (Cd)-Total			<0.000005C		mg/L		0.000005	16-JUL-20
Calcium (Ca)-Total			<0.050		mg/L		0.05	16-JUL-20
Chromium (Cr)-Total			0.00019	B	mg/L		0.0001	16-JUL-20
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	16-JUL-20
Copper (Cu)-Total			<0.00050		mg/L		0.0005	16-JUL-20
Iron (Fe)-Total			<0.010		mg/L		0.01	16-JUL-20
Lead (Pb)-Total			<0.000050		mg/L		0.00005	16-JUL-20

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WP	Water							
Batch R5156998								
WG3363385-1 MB								
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	16-JUL-20
Manganese (Mn)-Total			<0.00010		mg/L		0.0001	16-JUL-20
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	16-JUL-20
Potassium (K)-Total			<0.050		mg/L		0.05	16-JUL-20
Sodium (Na)-Total			<0.050		mg/L		0.05	16-JUL-20
Zinc (Zn)-Total			<0.0030		mg/L		0.003	16-JUL-20
NH3-COL-WP	Water							
Batch R5157280								
WG3364967-10 LCS								
Ammonia, Total (as N)			99.7		%		85-115	16-JUL-20
WG3364967-9 MB								
Ammonia, Total (as N)			<0.010		mg/L		0.01	16-JUL-20
Batch R5161278								
WG3367870-2 LCS								
Ammonia, Total (as N)			101.0		%		85-115	21-JUL-20
WG3367870-1 MB								
Ammonia, Total (as N)			<0.010		mg/L		0.01	21-JUL-20
NO2-IC-N-WP	Water							
Batch R5159802								
WG3362114-10 LCS								
Nitrite (as N)			107.5		%		90-110	14-JUL-20
WG3362114-9 MB								
Nitrite (as N)			<0.010		mg/L		0.01	14-JUL-20
NO3-IC-N-WP	Water							
Batch R5159802								
WG3362114-10 LCS								
Nitrate (as N)			105.1		%		90-110	14-JUL-20
WG3362114-9 MB								
Nitrate (as N)			<0.020		mg/L		0.02	14-JUL-20
OG-GRAV-WP	Water							
Batch R5161499								
WG3367113-2 LCS								
Oil and Grease			91.1		%		70-130	21-JUL-20
WG3367113-1 MB								
Oil and Grease			<5.0		mg/L		5	21-JUL-20
P-T-COL-WP	Water							

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
P-T-COL-WP	Water							
Batch R5157047								
WG3364533-6 LCS								
Phosphorus (P)-Total			97.5		%		80-120	17-JUL-20
WG3364533-5 MB								
Phosphorus (P)-Total			<0.0030		mg/L		0.003	17-JUL-20
PAH-CCME-PPM-WT	Water							
Batch R5158059								
WG3364045-2 LCS								
1-Methyl Naphthalene			91.4		%		50-150	20-JUL-20
2-Methyl Naphthalene			91.5		%		50-150	20-JUL-20
Acenaphthene			98.6		%		50-150	20-JUL-20
Acenaphthylene			91.3		%		50-150	20-JUL-20
Anthracene			100.8		%		50-150	20-JUL-20
Acridine			96.7		%		50-150	20-JUL-20
Benzo(a)anthracene			102.2		%		50-150	20-JUL-20
Benzo(a)pyrene			99.5		%		50-150	20-JUL-20
Benzo(b&j)fluoranthene			99.3		%		50-150	20-JUL-20
Benzo(g,h,i)perylene			113.8		%		50-150	20-JUL-20
Benzo(k)fluoranthene			95.8		%		50-150	20-JUL-20
Chrysene			102.6		%		50-150	20-JUL-20
Dibenzo(a,h)anthracene			102.3		%		50-150	20-JUL-20
Fluoranthene			94.9		%		50-150	20-JUL-20
Fluorene			96.4		%		50-150	20-JUL-20
Indeno(1,2,3-cd)pyrene			102.4		%		50-150	20-JUL-20
Naphthalene			93.4		%		50-150	20-JUL-20
Phenanthrene			106.8		%		50-150	20-JUL-20
Pyrene			97.1		%		50-150	20-JUL-20
Quinoline			106.9		%		50-150	20-JUL-20
WG3364045-1 MB								
1-Methyl Naphthalene			<0.000020		mg/L		0.00002	20-JUL-20
2-Methyl Naphthalene			<0.000020		mg/L		0.00002	20-JUL-20
Acenaphthene			<0.000020		mg/L		0.00002	20-JUL-20
Acenaphthylene			<0.000020		mg/L		0.00002	20-JUL-20
Anthracene			<0.000010		mg/L		0.00001	20-JUL-20
Acridine			<0.000020		mg/L		0.00002	20-JUL-20
Benzo(a)anthracene			<0.000010		mg/L		0.00001	20-JUL-20
Benzo(a)pyrene			<0.000005C		mg/L		0.000005	20-JUL-20

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PAH-CCME-PPM-WT	Water							
Batch R5158059								
WG3364045-1 MB								
Benzo(b&j)fluoranthene			<0.000010		mg/L		0.00001	20-JUL-20
Benzo(g,h,i)perylene			<0.000020		mg/L		0.00002	20-JUL-20
Benzo(k)fluoranthene			<0.000010		mg/L		0.00001	20-JUL-20
Chrysene			<0.000020		mg/L		0.00002	20-JUL-20
Dibenzo(a,h)anthracene			<0.000005C		mg/L		0.000005	20-JUL-20
Fluoranthene			<0.000020		mg/L		0.00002	20-JUL-20
Fluorene			<0.000020		mg/L		0.00002	20-JUL-20
Indeno(1,2,3-cd)pyrene			<0.000010		mg/L		0.00001	20-JUL-20
Naphthalene			<0.000050		mg/L		0.00005	20-JUL-20
Phenanthrene			<0.000050		mg/L		0.00005	20-JUL-20
Pyrene			<0.000010		mg/L		0.00001	20-JUL-20
Quinoline			<0.000020		mg/L		0.00002	20-JUL-20
Surrogate: d8-Naphthalene			100.5		%		50-150	20-JUL-20
Surrogate: d10-Phenanthrene			99.5		%		50-150	20-JUL-20
Surrogate: d12-Chrysene			88.4		%		50-150	20-JUL-20
Surrogate: d10-Acenaphthene			95.8		%		50-150	20-JUL-20
Surrogate: d9-Acridine (SS)			87.8		%		50-150	20-JUL-20
PH-WP	Water							
Batch R5154480								
WG3363682-12 LCS								
pH			7.39		pH units		7.3-7.5	15-JUL-20
PHENOLS-4AAP-WT	Water							
Batch R5156146								
WG3364233-3 DUP		**L2473824-3**						
Phenols (4AAP)		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	16-JUL-20
WG3364233-2 LCS								
Phenols (4AAP)			97.9		%		85-115	16-JUL-20
WG3364233-1 MB								
Phenols (4AAP)			<0.0010		mg/L		0.001	16-JUL-20
WG3364233-4 MS		**L2473824-3**						
Phenols (4AAP)			91.4		%		75-125	16-JUL-20
SO4-IC-N-WP	Water							

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
SO4-IC-N-WP	Water							
Batch R5159802								
WG3362114-10 LCS								
Sulfate (SO4)			103.5		%		90-110	14-JUL-20
WG3362114-9 MB								
Sulfate (SO4)			<0.30		mg/L		0.3	14-JUL-20
SOLIDS-TOTSUS-WP	Water							
Batch R5160054								
WG3366026-2 LCS								
Total Suspended Solids			88.8		%		85-115	20-JUL-20
WG3366026-1 MB								
Total Suspended Solids			<3.0		mg/L		3	20-JUL-20
TC,EC10-QT97-WP	Water							
Batch R5154004								
WG3362301-2 DUP		**L2473824-1**						
Total Coliforms		510	470		MPN/100mL	8.3	65	14-JUL-20
Escherichia Coli		50	40		MPN/100mL	24	65	14-JUL-20
WG3362301-1 MB								
Total Coliforms			<1		MPN/100mL		1	14-JUL-20
Escherichia Coli			<1		MPN/100mL		1	14-JUL-20

Legend:

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

Sample Parameter Qualifier Definitions:

Qualifier	Description
B	Method Blank exceeds ALS DQO. Associated sample results which are < Limit of Reporting or > 5 times blank level are considered reliable.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Hold Time Exceedances:

ALS Product Description	Sample ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
Physical Tests							
pH							
	1	13-JUL-20 08:58	15-JUL-20 12:00	0.25	51	hours	EHTR-FM
	2	13-JUL-20 08:40	15-JUL-20 12:00	0.25	51	hours	EHTR-FM
	3	13-JUL-20 09:14	15-JUL-20 12:00	0.25	51	hours	EHTR-FM
	4	13-JUL-20 09:31	15-JUL-20 12:00	0.25	50	hours	EHTR-FM
Bacteriological Tests							
Fecal coliforms, 1:10 dilution by QT97							
	1	13-JUL-20 08:58	14-JUL-20 18:00	30	33	hours	EHTL
	2	13-JUL-20 08:40	14-JUL-20 18:00	30	33	hours	EHTL
	3	13-JUL-20 09:14	14-JUL-20 18:00	30	33	hours	EHTL
	4	13-JUL-20 09:31	14-JUL-20 18:00	30	32	hours	EHTL
Total and E. coli, 1:10 dilution by QT97							
	1	13-JUL-20 08:58	14-JUL-20 18:00	30	33	hours	EHTL
	2	13-JUL-20 08:40	14-JUL-20 18:00	30	33	hours	EHTL
	3	13-JUL-20 09:14	14-JUL-20 18:00	30	33	hours	EHTL
	4	13-JUL-20 09:31	14-JUL-20 18:00	30	32	hours	EHTL

Legend & Qualifier Definitions:

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

Notes*:
Where actual sampling date is not provided to ALS, the date (& time) of receipt is used for calculation purposes.
Where actual sampling time is not provided to ALS, the earlier of 12 noon on the sampling date or the time (& date) of receipt is used for calculation purposes. Samples for L2473824 were received on 14-JUL-20 13:00.

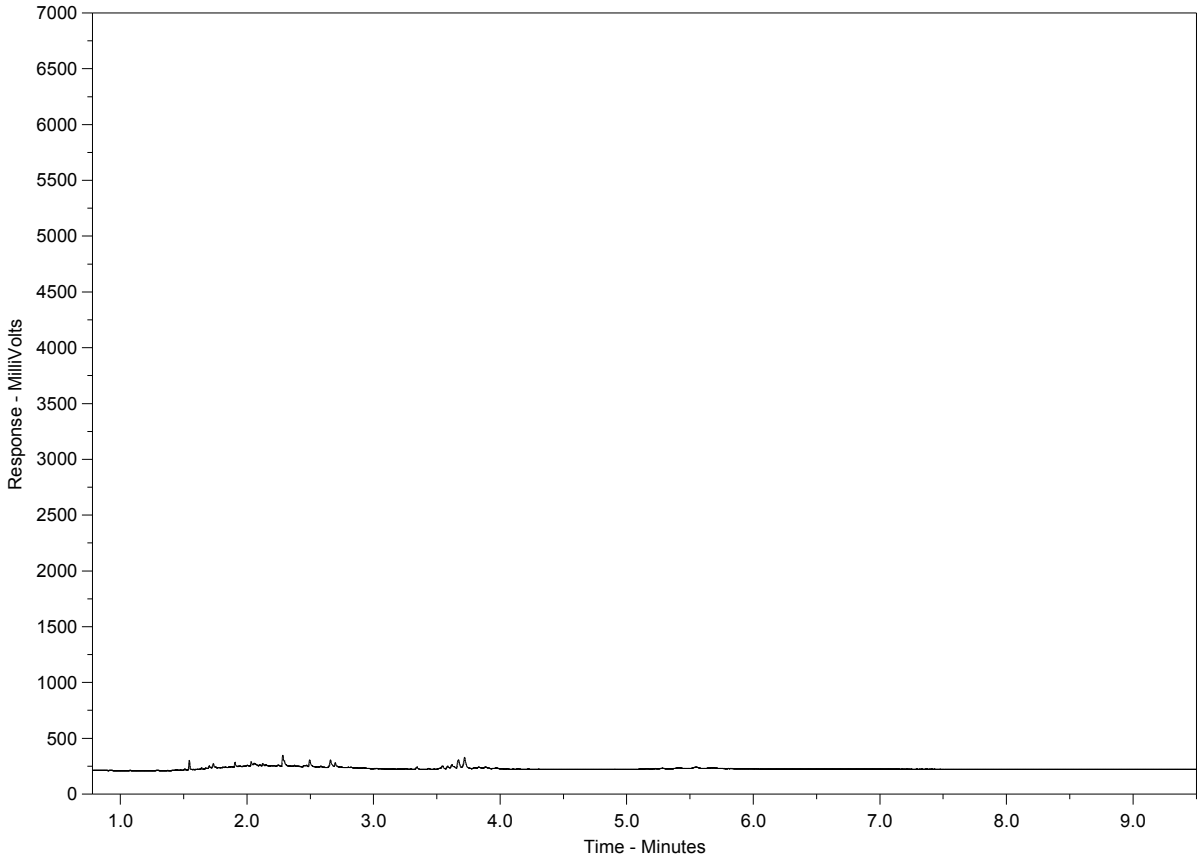
ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where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

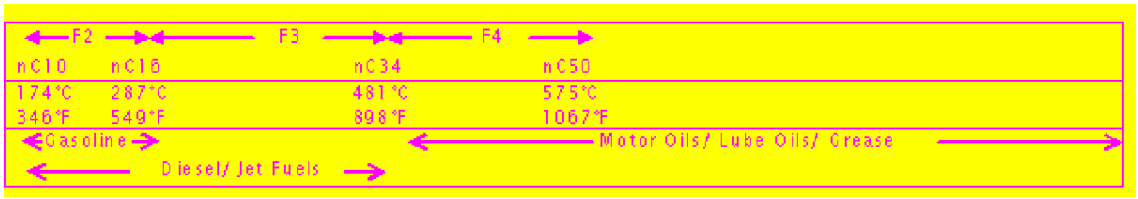
The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide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

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

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L2473824-1
Client Sample ID: ARV-2





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

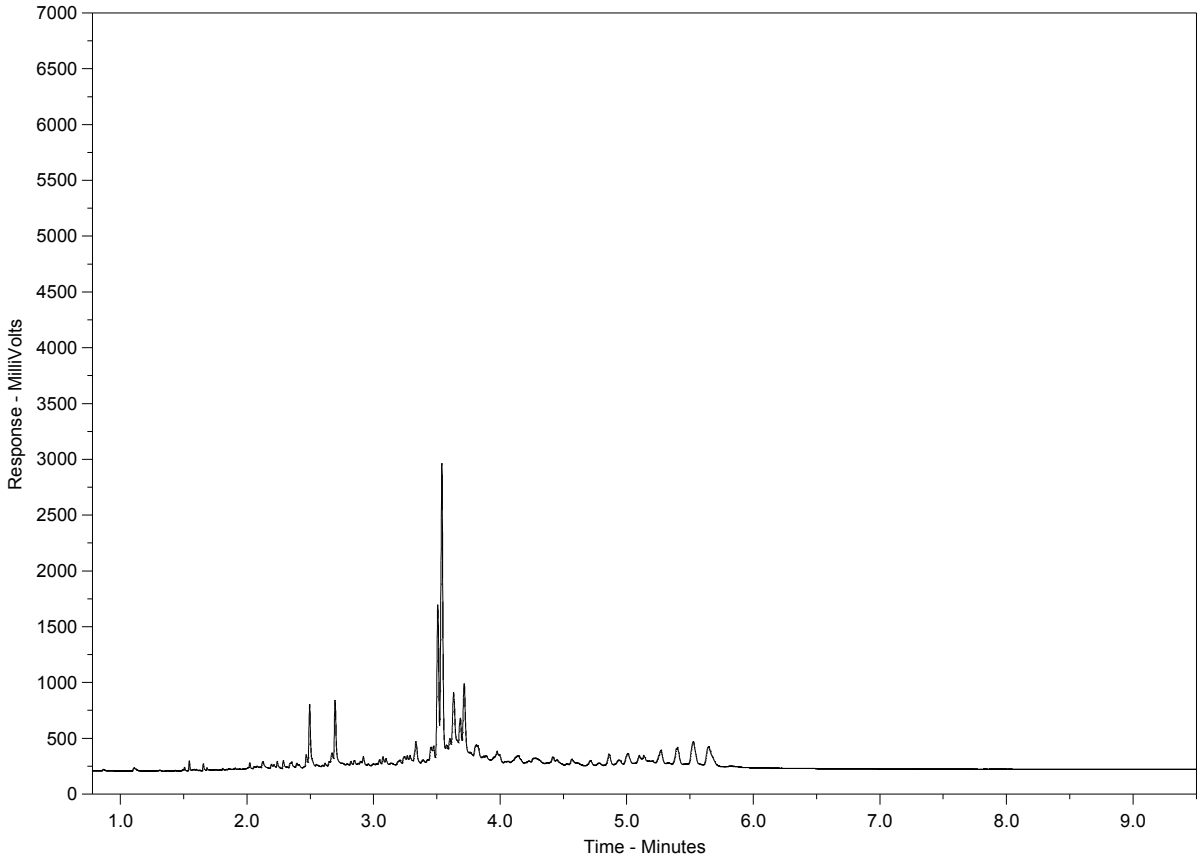
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

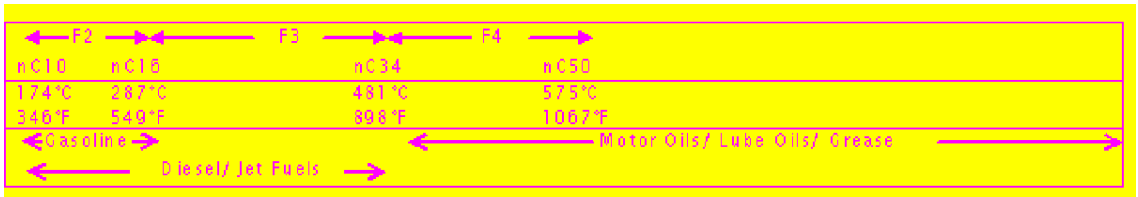
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

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

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L2473824-2
Client Sample ID: ARV-4





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

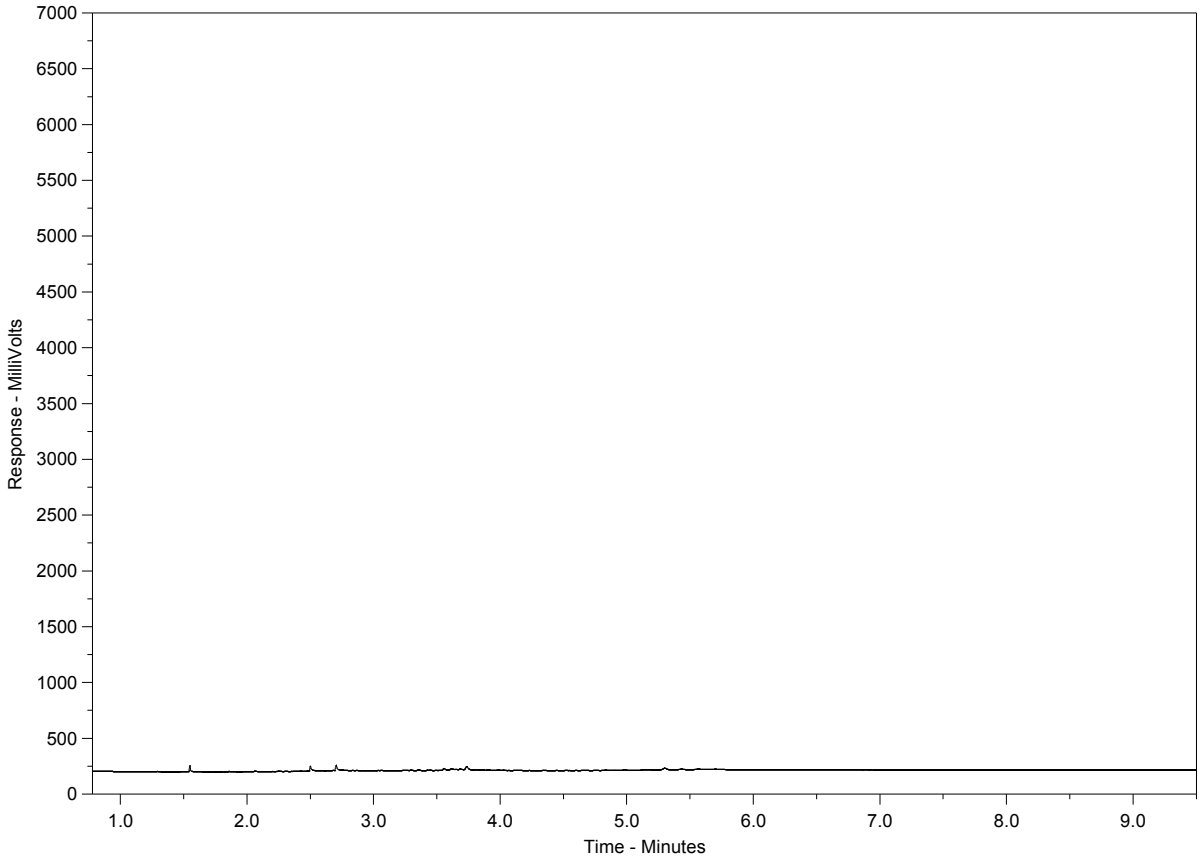
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

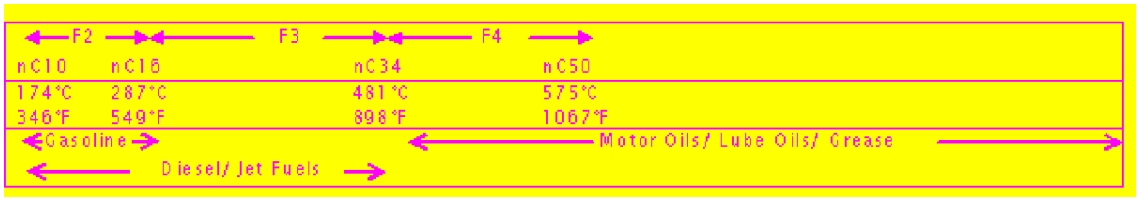
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

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

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L2473824-3
Client Sample ID: ARV-5





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

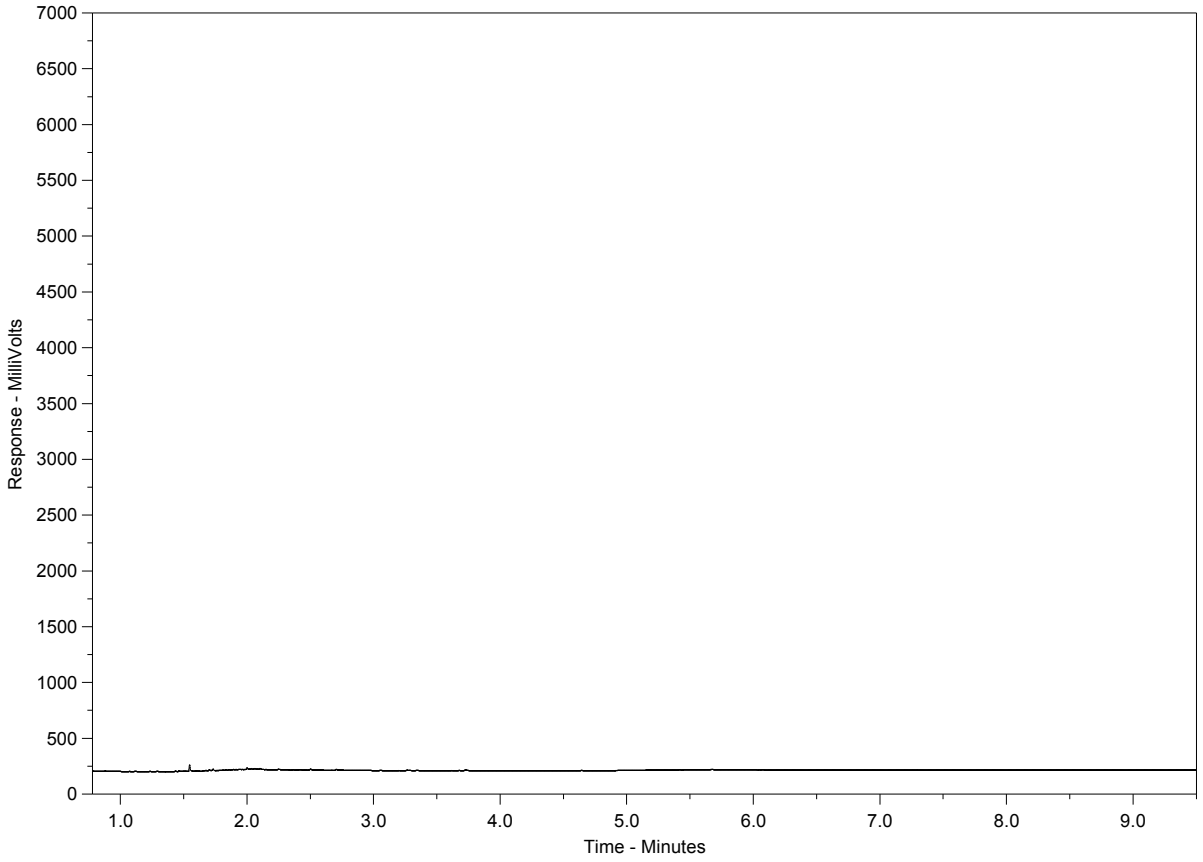
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

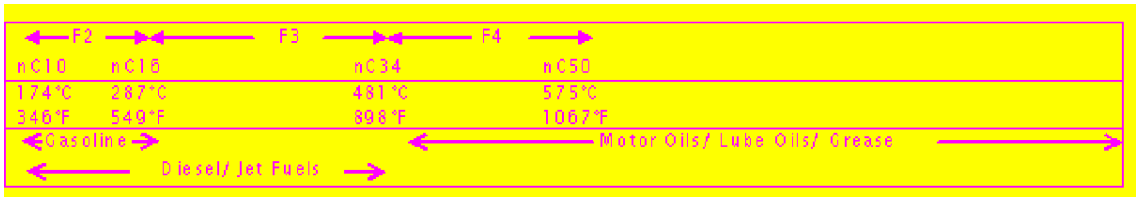
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

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

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L2473824-4
Client Sample ID: ARV-6





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

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

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

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

ALS Environmental

www.alsglobal.com

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

L2473824-COFC

COC Number: 17 - 747854

Page 1 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 arvlat sao@	For tests that can not be performed according to the service level selected, you will be contacted.
City/Province:	ARVIAT, NU	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:

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	Oil & Grease x2	Sulfuric Acid	Metals	Mercury	F2-F4	PAH/EPH/F2-F4	Bacteria	Extra x2 Plastic Green	Extra - Glass Purple label	SAMPLES ON HOLD	SUSPECTED HAZARD (see Special instructions)
	ARV-2	13-07-20	858am	Water		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
	ARV-4	13-07-20	840am	water		✓	✓	✓	✓	✓	✓	✓	✓		✓	✓		
	ARV-5	13-07-20	9:14am	Water		✓	✓	✓	✓	✓	✓	✓	✓		✓	✓		
	ARV-6	13-07-20	931am	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			
9.3							

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:
Laura	July 13/20	9:42am		14 July	1100			

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

JUNE 2018 FRONT

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

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

Date Received: 31-JUL-20
Report Date: 13-AUG-20 13:27 (MT)
Version: FINAL

Client Phone: 867-857-2841

Certificate of Analysis

Lab Work Order #: L2482395
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
L2482395-1 ARV-2							
Sampled By: CLIENT on 29-JUL-20 @ 09:12							
Matrix: WATER							
BTEX plus F1-F4							
BTX plus F1 by GCMS							
Benzene	<0.00050		0.00050	mg/L		06-AUG-20	R5177356
Toluene	<0.0010		0.0010	mg/L		06-AUG-20	R5177356
Ethyl benzene	<0.00050		0.00050	mg/L		06-AUG-20	R5177356
o-Xylene	<0.00050		0.00050	mg/L		06-AUG-20	R5177356
m+p-Xylenes	<0.00040		0.00040	mg/L		06-AUG-20	R5177356
F1 (C6-C10)	<0.10		0.10	mg/L		06-AUG-20	R5177356
Surrogate: 4-Bromofluorobenzene (SS)	88.6		70-130	%		06-AUG-20	R5177356
CCME PHC F2-F4 in Water							
F2 (C10-C16)	<0.10		0.10	mg/L	06-AUG-20	06-AUG-20	R5176059
F3 (C16-C34)	<0.25		0.25	mg/L	06-AUG-20	06-AUG-20	R5176059
F4 (C34-C50)	<0.25		0.25	mg/L	06-AUG-20	06-AUG-20	R5176059
Surrogate: 2-Bromobenzotrifluoride	96.0		60-140	%	06-AUG-20	06-AUG-20	R5176059
CCME Total Hydrocarbons							
F1-BTEX	<0.10		0.10	mg/L		12-AUG-20	
F2-Naphth	<0.10		0.10	mg/L		12-AUG-20	
F3-PAH	<0.25		0.25	mg/L		12-AUG-20	
Total Hydrocarbons (C6-C50)	<0.38		0.38	mg/L		12-AUG-20	
Sum of Xylene Isomer Concentrations							
Xylenes (Total)	<0.00064		0.00064	mg/L		10-AUG-20	
Total and E. coli, 1:10 dilution by QT97							
Total Coliforms	6490	PEHR	10	MPN/100mL		31-JUL-20	R5173328
Escherichia Coli	60	PEHR	10	MPN/100mL		31-JUL-20	R5173328
CCME PAHs in mg/L							
1-Methyl Naphthalene	<0.000020		0.000020	mg/L	06-AUG-20	12-AUG-20	R5180378
2-Methyl Naphthalene	<0.000020		0.000020	mg/L	06-AUG-20	12-AUG-20	R5180378
Acenaphthene	<0.000020		0.000020	mg/L	06-AUG-20	12-AUG-20	R5180378
Acenaphthylene	<0.000020		0.000020	mg/L	06-AUG-20	12-AUG-20	R5180378
Anthracene	<0.000010		0.000010	mg/L	06-AUG-20	12-AUG-20	R5180378
Acridine	<0.000020		0.000020	mg/L	06-AUG-20	12-AUG-20	R5180378
Benzo(a)anthracene	<0.000010		0.000010	mg/L	06-AUG-20	12-AUG-20	R5180378
Benzo(a)pyrene	<0.0000050		0.0000050	mg/L	06-AUG-20	12-AUG-20	R5180378
Benzo(b&j)fluoranthene	<0.000010		0.000010	mg/L	06-AUG-20	12-AUG-20	R5180378
Benzo(g,h,i)perylene	<0.000020		0.000020	mg/L	06-AUG-20	12-AUG-20	R5180378
Benzo(k)fluoranthene	<0.000010		0.000010	mg/L	06-AUG-20	12-AUG-20	R5180378
Chrysene	<0.000020		0.000020	mg/L	06-AUG-20	12-AUG-20	R5180378
Dibenzo(a,h)anthracene	<0.0000050		0.0000050	mg/L	06-AUG-20	12-AUG-20	R5180378
Fluoranthene	<0.000020		0.000020	mg/L	06-AUG-20	12-AUG-20	R5180378
Fluorene	<0.000020		0.000020	mg/L	06-AUG-20	12-AUG-20	R5180378
Indeno(1,2,3-cd)pyrene	<0.000010		0.000010	mg/L	06-AUG-20	12-AUG-20	R5180378
Naphthalene	<0.000050		0.000050	mg/L	06-AUG-20	12-AUG-20	R5180378
Phenanthrene	<0.000050		0.000050	mg/L	06-AUG-20	12-AUG-20	R5180378
Pyrene	<0.000010		0.000010	mg/L	06-AUG-20	12-AUG-20	R5180378
Quinoline	<0.000020		0.000020	mg/L	06-AUG-20	12-AUG-20	R5180378
B(a)P Total Potency Equivalent	<0.000030		0.000030	mg/L	06-AUG-20	12-AUG-20	R5180378
Surrogate: d8-Naphthalene	107.9		50-150	%	06-AUG-20	12-AUG-20	R5180378
Surrogate: d10-Phenanthrene	108.7		50-150	%	06-AUG-20	12-AUG-20	R5180378
Surrogate: d12-Chrysene	93.8		50-150	%	06-AUG-20	12-AUG-20	R5180378
Surrogate: d10-Acenaphthene	102.8		50-150	%	06-AUG-20	12-AUG-20	R5180378
Surrogate: d9-Acridine (SS)	103.0		50-150	%	06-AUG-20	12-AUG-20	R5180378
Nunavut WW Group 1							

* 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
L2482395-1 ARV-2							
Sampled By: CLIENT on 29-JUL-20 @ 09:12							
Matrix: WATER							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	488		1.2	mg/L		04-AUG-20	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		04-AUG-20	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		04-AUG-20	
Alkalinity, Total (as CaCO3)							
Alkalinity, Total (as CaCO3)	400		1.0	mg/L		31-JUL-20	R5173759
Ammonia by colour							
Ammonia, Total (as N)	5.69		0.20	mg/L		05-AUG-20	R5174886
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	29.4		6.0	mg/L		31-JUL-20	R5175204
Carbonaceous BOD							
BOD Carbonaceous	18.5		6.0	mg/L		31-JUL-20	R5175204
Chloride in Water by IC							
Chloride (Cl)	477		10	mg/L		31-JUL-20	R5174777
Conductivity							
Conductivity	3020		1.0	umhos/cm		31-JUL-20	R5173759
Fecal coliforms, 1:10 dilution by QT97							
Fecal Coliforms	60	PEHT	10	MPN/100mL		31-JUL-20	R5173332
Hardness Calculated							
Hardness (as CaCO3)	971	HTC	0.20	mg/L		06-AUG-20	
Mercury Total							
Mercury (Hg)-Total	0.0000180		0.0000050	mg/L	04-AUG-20	04-AUG-20	R5174196
Nitrate in Water by IC							
Nitrate (as N)	<0.40	DLM	0.40	mg/L		31-JUL-20	R5174777
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.45		0.45	mg/L		06-AUG-20	
Nitrite in Water by IC							
Nitrite (as N)	<0.20	DLM	0.20	mg/L		31-JUL-20	R5174777
Oil & Grease - Gravimetric							
Oil and Grease	<5.0		5.0	mg/L		07-AUG-20	R5177198
Phenol (4AAP)							
Phenols (4AAP)	0.0041		0.0010	mg/L		05-AUG-20	R5175495
Phosphorus, Total							
Phosphorus (P)-Total	0.689		0.0030	mg/L		06-AUG-20	R5176078
Sulfate in Water by IC							
Sulfate (SO4)	665		6.0	mg/L		31-JUL-20	R5174777
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.0145		0.0030	mg/L	05-AUG-20	05-AUG-20	R5175488
Arsenic (As)-Total	0.00531		0.00010	mg/L	05-AUG-20	05-AUG-20	R5175488
Cadmium (Cd)-Total	0.0000630		0.0000050	mg/L	05-AUG-20	05-AUG-20	R5175488
Calcium (Ca)-Total	276		0.050	mg/L	05-AUG-20	05-AUG-20	R5175488
Chromium (Cr)-Total	0.00147		0.00010	mg/L	05-AUG-20	05-AUG-20	R5175488
Cobalt (Co)-Total	0.00141		0.00010	mg/L	05-AUG-20	05-AUG-20	R5175488
Copper (Cu)-Total	0.0149		0.00050	mg/L	05-AUG-20	05-AUG-20	R5175488
Iron (Fe)-Total	1.19		0.010	mg/L	05-AUG-20	05-AUG-20	R5175488
Lead (Pb)-Total	0.00127		0.000050	mg/L	05-AUG-20	05-AUG-20	R5175488
Magnesium (Mg)-Total	68.6		0.0050	mg/L	05-AUG-20	05-AUG-20	R5175488
Manganese (Mn)-Total	0.972		0.00010	mg/L	05-AUG-20	05-AUG-20	R5175488
Nickel (Ni)-Total	0.00814		0.00050	mg/L	05-AUG-20	05-AUG-20	R5175488
Potassium (K)-Total	58.0		0.050	mg/L	05-AUG-20	05-AUG-20	R5175488
Sodium (Na)-Total	307		0.050	mg/L	05-AUG-20	05-AUG-20	R5175488

* 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
L2482395-1 ARV-2							
Sampled By: CLIENT on 29-JUL-20 @ 09:12							
Matrix: WATER							
Total Metals in Water by CRC ICPMS							
Zinc (Zn)-Total	0.0822		0.0030	mg/L	05-AUG-20	05-AUG-20	R5175488
Total Organic Carbon by Combustion							
Total Organic Carbon	36.6		0.50	mg/L		06-AUG-20	R5176327
Total Suspended Solids							
Total Suspended Solids	29.7		3.0	mg/L		04-AUG-20	R5175528
pH							
pH	8.05		0.10	pH units		31-JUL-20	R5173759
L2482395-2 ARV-4							
Sampled By: CLIENT on 29-JUL-20 @ 08:58							
Matrix: WATER							
BTEX plus F1-F4							
BTX plus F1 by GCMS							
Benzene	<0.00050		0.00050	mg/L		06-AUG-20	R5177356
Toluene	<0.0010		0.0010	mg/L		06-AUG-20	R5177356
Ethyl benzene	<0.00050		0.00050	mg/L		06-AUG-20	R5177356
o-Xylene	<0.00050		0.00050	mg/L		06-AUG-20	R5177356
m+p-Xylenes	<0.00040		0.00040	mg/L		06-AUG-20	R5177356
F1 (C6-C10)	<0.10		0.10	mg/L		06-AUG-20	R5177356
Surrogate: 4-Bromofluorobenzene (SS)	87.4		70-130	%		06-AUG-20	R5177356
CCME PHC F2-F4 in Water							
F2 (C10-C16)	<0.10		0.10	mg/L	06-AUG-20	06-AUG-20	R5176059
F3 (C16-C34)	1.64		0.25	mg/L	06-AUG-20	06-AUG-20	R5176059
F4 (C34-C50)	0.51		0.25	mg/L	06-AUG-20	06-AUG-20	R5176059
Surrogate: 2-Bromobenzotrifluoride	90.9		60-140	%	06-AUG-20	06-AUG-20	R5176059
CCME Total Hydrocarbons							
F1-BTEX	<0.10		0.10	mg/L		12-AUG-20	
F2-Naphth	<0.10		0.10	mg/L		12-AUG-20	
F3-PAH	1.64		0.25	mg/L		12-AUG-20	
Total Hydrocarbons (C6-C50)	2.14		0.38	mg/L		12-AUG-20	
Sum of Xylene Isomer Concentrations							
Xylenes (Total)	<0.00064		0.00064	mg/L		10-AUG-20	
Total and E. coli, 1:10 dilution by QT97							
Total Coliforms	>24200	PEHR	10	MPN/100mL		31-JUL-20	R5173328
Escherichia Coli	7700	PEHR	10	MPN/100mL		31-JUL-20	R5173328
CCME PAHs in mg/L							
1-Methyl Naphthalene	<0.000020		0.000020	mg/L	06-AUG-20	12-AUG-20	R5180378
2-Methyl Naphthalene	<0.000020		0.000020	mg/L	06-AUG-20	12-AUG-20	R5180378
Acenaphthene	<0.000020		0.000020	mg/L	06-AUG-20	12-AUG-20	R5180378
Acenaphthylene	<0.000020		0.000020	mg/L	06-AUG-20	12-AUG-20	R5180378
Anthracene	<0.000010		0.000010	mg/L	06-AUG-20	12-AUG-20	R5180378
Acridine	0.000033		0.000020	mg/L	06-AUG-20	12-AUG-20	R5180378
Benzo(a)anthracene	<0.000010		0.000010	mg/L	06-AUG-20	12-AUG-20	R5180378
Benzo(a)pyrene	<0.0000050		0.0000050	mg/L	06-AUG-20	12-AUG-20	R5180378
Benzo(b&j)fluoranthene	<0.000010		0.000010	mg/L	06-AUG-20	12-AUG-20	R5180378
Benzo(g,h,i)perylene	<0.000020		0.000020	mg/L	06-AUG-20	12-AUG-20	R5180378
Benzo(k)fluoranthene	<0.000010		0.000010	mg/L	06-AUG-20	12-AUG-20	R5180378
Chrysene	<0.000020		0.000020	mg/L	06-AUG-20	12-AUG-20	R5180378
Dibenzo(a,h)anthracene	<0.0000050		0.0000050	mg/L	06-AUG-20	12-AUG-20	R5180378
Fluoranthene	<0.000020		0.000020	mg/L	06-AUG-20	12-AUG-20	R5180378
Fluorene	<0.000020		0.000020	mg/L	06-AUG-20	12-AUG-20	R5180378

* 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
L2482395-2 ARV-4							
Sampled By: CLIENT on 29-JUL-20 @ 08:58							
Matrix: WATER							
CCME PAHs in mg/L							
Indeno(1,2,3-cd)pyrene	<0.000010		0.000010	mg/L	06-AUG-20	12-AUG-20	R5180378
Naphthalene	<0.000050		0.000050	mg/L	06-AUG-20	12-AUG-20	R5180378
Phenanthrene	<0.000050		0.000050	mg/L	06-AUG-20	12-AUG-20	R5180378
Pyrene	<0.000010		0.000010	mg/L	06-AUG-20	12-AUG-20	R5180378
Quinoline	0.000041		0.000020	mg/L	06-AUG-20	12-AUG-20	R5180378
B(a)P Total Potency Equivalent	<0.000030		0.000030	mg/L	06-AUG-20	12-AUG-20	R5180378
Surrogate: d8-Naphthalene	97.8		50-150	%	06-AUG-20	12-AUG-20	R5180378
Surrogate: d10-Phenanthrene	98.4		50-150	%	06-AUG-20	12-AUG-20	R5180378
Surrogate: d12-Chrysene	92.5		50-150	%	06-AUG-20	12-AUG-20	R5180378
Surrogate: d10-Acenaphthene	94.5		50-150	%	06-AUG-20	12-AUG-20	R5180378
Surrogate: d9-Acridine (SS)	89.3		50-150	%	06-AUG-20	12-AUG-20	R5180378
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	323		1.2	mg/L		04-AUG-20	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		04-AUG-20	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		04-AUG-20	
Alkalinity, Total (as CaCO3)							
Alkalinity, Total (as CaCO3)	265		1.0	mg/L		31-JUL-20	R5173759
Ammonia by colour							
Ammonia, Total (as N)	43.1		2.0	mg/L		05-AUG-20	R5174886
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	45		20	mg/L		31-JUL-20	R5175204
Carbonaceous BOD							
BOD Carbonaceous	31.1		6.0	mg/L		31-JUL-20	R5175204
Chloride in Water by IC							
Chloride (Cl)	122		1.0	mg/L		31-JUL-20	R5174777
Conductivity							
Conductivity	945		1.0	umhos/cm		31-JUL-20	R5173759
Fecal coliforms, 1:10 dilution by QT97							
Fecal Coliforms	14100	PEHT	10	MPN/100mL		31-JUL-20	R5173332
Hardness Calculated							
Hardness (as CaCO3)	67.2	HTC	0.20	mg/L		06-AUG-20	
Mercury Total							
Mercury (Hg)-Total	0.0000080		0.0000050	mg/L	04-AUG-20	04-AUG-20	R5174196
Nitrate in Water by IC							
Nitrate (as N)	0.141		0.040	mg/L		31-JUL-20	R5174777
Nitrate+Nitrite							
Nitrate and Nitrite as N	0.141		0.070	mg/L		06-AUG-20	
Nitrite in Water by IC							
Nitrite (as N)	<0.020	DLM	0.020	mg/L		31-JUL-20	R5174777
Oil & Grease - Gravimetric							
Oil and Grease	<5.0		5.0	mg/L		07-AUG-20	R5177198
Phenol (4AAP)							
Phenols (4AAP)	<0.0010		0.0010	mg/L		05-AUG-20	R5175495
Phosphorus, Total							
Phosphorus (P)-Total	10.6		0.15	mg/L		06-AUG-20	R5176078
Sulfate in Water by IC							
Sulfate (SO4)	7.26		0.60	mg/L		31-JUL-20	R5174777
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.0995		0.0030	mg/L	05-AUG-20	05-AUG-20	R5175488

* 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
L2482395-2 ARV-4							
Sampled By: CLIENT on 29-JUL-20 @ 08:58							
Matrix: WATER							
Total Metals in Water by CRC ICPMS							
Arsenic (As)-Total	0.00560		0.00010	mg/L	05-AUG-20	05-AUG-20	R5175488
Cadmium (Cd)-Total	0.0000481		0.0000050	mg/L	05-AUG-20	05-AUG-20	R5175488
Calcium (Ca)-Total	12.9		0.050	mg/L	05-AUG-20	05-AUG-20	R5175488
Chromium (Cr)-Total	0.00105		0.00010	mg/L	05-AUG-20	05-AUG-20	R5175488
Cobalt (Co)-Total	0.00120		0.00010	mg/L	05-AUG-20	05-AUG-20	R5175488
Copper (Cu)-Total	0.0461		0.00050	mg/L	05-AUG-20	05-AUG-20	R5175488
Iron (Fe)-Total	3.25		0.010	mg/L	05-AUG-20	05-AUG-20	R5175488
Lead (Pb)-Total	0.00126		0.000050	mg/L	05-AUG-20	05-AUG-20	R5175488
Magnesium (Mg)-Total	8.48		0.0050	mg/L	05-AUG-20	05-AUG-20	R5175488
Manganese (Mn)-Total	0.215		0.00010	mg/L	05-AUG-20	05-AUG-20	R5175488
Nickel (Ni)-Total	0.00525		0.00050	mg/L	05-AUG-20	05-AUG-20	R5175488
Potassium (K)-Total	22.5		0.050	mg/L	05-AUG-20	05-AUG-20	R5175488
Sodium (Na)-Total	82.8		0.050	mg/L	05-AUG-20	05-AUG-20	R5175488
Zinc (Zn)-Total	0.0372		0.0030	mg/L	05-AUG-20	05-AUG-20	R5175488
Total Organic Carbon by Combustion							
Total Organic Carbon	48.8		0.50	mg/L		06-AUG-20	R5176327
Total Suspended Solids							
Total Suspended Solids	33.5		3.0	mg/L		04-AUG-20	R5175528
pH							
pH	7.73		0.10	pH units		31-JUL-20	R5173759
L2482395-3 ARV-5(BOTTLE SAYS AR-V4)							
Sampled By: CLIENT on 29-JUL-20 @ 09:24							
Matrix: WATER							
BTEX plus F1-F4							
BTX plus F1 by GCMS							
Benzene	<0.00050		0.00050	mg/L		06-AUG-20	R5177356
Toluene	<0.0010		0.0010	mg/L		06-AUG-20	R5177356
Ethyl benzene	<0.00050		0.00050	mg/L		06-AUG-20	R5177356
o-Xylene	<0.00050		0.00050	mg/L		06-AUG-20	R5177356
m+p-Xylenes	<0.00040		0.00040	mg/L		06-AUG-20	R5177356
F1 (C6-C10)	<0.10		0.10	mg/L		06-AUG-20	R5177356
Surrogate: 4-Bromofluorobenzene (SS)	87.2		70-130	%		06-AUG-20	R5177356
CCME PHC F2-F4 in Water							
F2 (C10-C16)	<0.10		0.10	mg/L	06-AUG-20	06-AUG-20	R5176059
F3 (C16-C34)	<0.25		0.25	mg/L	06-AUG-20	06-AUG-20	R5176059
F4 (C34-C50)	<0.25		0.25	mg/L	06-AUG-20	06-AUG-20	R5176059
Surrogate: 2-Bromobenzotrifluoride	99.5		60-140	%	06-AUG-20	06-AUG-20	R5176059
CCME Total Hydrocarbons							
F1-BTEX	<0.10		0.10	mg/L		12-AUG-20	
F2-Naphth	<0.10		0.10	mg/L		12-AUG-20	
F3-PAH	<0.25		0.25	mg/L		12-AUG-20	
Total Hydrocarbons (C6-C50)	<0.38		0.38	mg/L		12-AUG-20	
Sum of Xylene Isomer Concentrations							
Xylenes (Total)	<0.00064		0.00064	mg/L		10-AUG-20	
Total and E. coli, 1:10 dilution by QT97							
Total Coliforms	5170	PEHR	10	MPN/100mL		31-JUL-20	R5173328
Escherichia Coli	<10	PEHR	10	MPN/100mL		31-JUL-20	R5173328
CCME PAHs in mg/L							
1-Methyl Naphthalene	<0.000020		0.000020	mg/L	06-AUG-20	12-AUG-20	R5180378
2-Methyl Naphthalene	<0.000020		0.000020	mg/L	06-AUG-20	12-AUG-20	R5180378

* 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
L2482395-3 ARV-5(BOTTLE SAYS AR-V4)							
Sampled By: CLIENT on 29-JUL-20 @ 09:24							
Matrix: WATER							
CCME PAHs in mg/L							
Acenaphthene	<0.000020		0.000020	mg/L	06-AUG-20	12-AUG-20	R5180378
Acenaphthylene	<0.000020		0.000020	mg/L	06-AUG-20	12-AUG-20	R5180378
Anthracene	<0.000010		0.000010	mg/L	06-AUG-20	12-AUG-20	R5180378
Acridine	<0.000020		0.000020	mg/L	06-AUG-20	12-AUG-20	R5180378
Benzo(a)anthracene	<0.000010		0.000010	mg/L	06-AUG-20	12-AUG-20	R5180378
Benzo(a)pyrene	<0.0000050		0.0000050	mg/L	06-AUG-20	12-AUG-20	R5180378
Benzo(b&j)fluoranthene	<0.000010		0.000010	mg/L	06-AUG-20	12-AUG-20	R5180378
Benzo(g,h,i)perylene	<0.000020		0.000020	mg/L	06-AUG-20	12-AUG-20	R5180378
Benzo(k)fluoranthene	<0.000010		0.000010	mg/L	06-AUG-20	12-AUG-20	R5180378
Chrysene	<0.000020		0.000020	mg/L	06-AUG-20	12-AUG-20	R5180378
Dibenzo(a,h)anthracene	<0.0000050		0.0000050	mg/L	06-AUG-20	12-AUG-20	R5180378
Fluoranthene	<0.000020		0.000020	mg/L	06-AUG-20	12-AUG-20	R5180378
Fluorene	<0.000020		0.000020	mg/L	06-AUG-20	12-AUG-20	R5180378
Indeno(1,2,3-cd)pyrene	<0.000010		0.000010	mg/L	06-AUG-20	12-AUG-20	R5180378
Naphthalene	<0.000050		0.000050	mg/L	06-AUG-20	12-AUG-20	R5180378
Phenanthrene	<0.000050		0.000050	mg/L	06-AUG-20	12-AUG-20	R5180378
Pyrene	<0.000010		0.000010	mg/L	06-AUG-20	12-AUG-20	R5180378
Quinoline	<0.000020		0.000020	mg/L	06-AUG-20	12-AUG-20	R5180378
B(a)P Total Potency Equivalent	<0.000030		0.000030	mg/L	06-AUG-20	12-AUG-20	R5180378
Surrogate: d8-Naphthalene	99.2		50-150	%	06-AUG-20	12-AUG-20	R5180378
Surrogate: d10-Phenanthrene	104.3		50-150	%	06-AUG-20	12-AUG-20	R5180378
Surrogate: d12-Chrysene	93.4		50-150	%	06-AUG-20	12-AUG-20	R5180378
Surrogate: d10-Acenaphthene	98.4		50-150	%	06-AUG-20	12-AUG-20	R5180378
Surrogate: d9-Acridine (SS)	88.7		50-150	%	06-AUG-20	12-AUG-20	R5180378
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	82.0		1.2	mg/L		04-AUG-20	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		04-AUG-20	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		04-AUG-20	
Alkalinity, Total (as CaCO3)							
Alkalinity, Total (as CaCO3)	67.2		1.0	mg/L		31-JUL-20	R5173759
Ammonia by colour							
Ammonia, Total (as N)	0.25		0.20	mg/L		05-AUG-20	R5174886
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	<2.0		2.0	mg/L		31-JUL-20	R5175204
Carbonaceous BOD							
BOD Carbonaceous	<2.0		2.0	mg/L		31-JUL-20	R5175204
Chloride in Water by IC							
Chloride (Cl)	243		1.0	mg/L		31-JUL-20	R5174777
Conductivity							
Conductivity	880		1.0	umhos/cm		31-JUL-20	R5173759
Fecal coliforms, 1:10 dilution by QT97							
Fecal Coliforms	10	PEHT	10	MPN/100mL		31-JUL-20	R5173332
Hardness Calculated							
Hardness (as CaCO3)	136	HTC	0.20	mg/L		06-AUG-20	
Mercury Total							
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L	04-AUG-20	04-AUG-20	R5174196
Nitrate in Water by IC							
Nitrate (as N)	<0.040	DLM	0.040	mg/L		31-JUL-20	R5174777
Nitrate+Nitrite							

* 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
L2482395-3 ARV-5(BOTTLE SAYS AR-V4)							
Sampled By: CLIENT on 29-JUL-20 @ 09:24							
Matrix: WATER							
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		06-AUG-20	
Nitrite in Water by IC							
Nitrite (as N)	<0.020	DLM	0.020	mg/L		31-JUL-20	R5174777
Oil & Grease - Gravimetric							
Oil and Grease	<5.0		5.0	mg/L		07-AUG-20	R5177198
Phenol (4AAP)							
Phenols (4AAP)	<0.0010		0.0010	mg/L		05-AUG-20	R5175495
Phosphorus, Total							
Phosphorus (P)-Total	0.0773		0.0030	mg/L		06-AUG-20	R5176078
Sulfate in Water by IC							
Sulfate (SO4)	5.71		0.60	mg/L		31-JUL-20	R5174777
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.0414		0.0030	mg/L	05-AUG-20	05-AUG-20	R5175488
Arsenic (As)-Total	0.00078		0.00010	mg/L	05-AUG-20	05-AUG-20	R5175488
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L	05-AUG-20	05-AUG-20	R5175488
Calcium (Ca)-Total	22.8		0.050	mg/L	05-AUG-20	05-AUG-20	R5175488
Chromium (Cr)-Total	0.00025		0.00010	mg/L	05-AUG-20	05-AUG-20	R5175488
Cobalt (Co)-Total	0.00027		0.00010	mg/L	05-AUG-20	05-AUG-20	R5175488
Copper (Cu)-Total	0.00056		0.00050	mg/L	05-AUG-20	05-AUG-20	R5175488
Iron (Fe)-Total	2.16		0.010	mg/L	05-AUG-20	05-AUG-20	R5175488
Lead (Pb)-Total	0.00118		0.000050	mg/L	05-AUG-20	05-AUG-20	R5175488
Magnesium (Mg)-Total	19.2		0.0050	mg/L	05-AUG-20	05-AUG-20	R5175488
Manganese (Mn)-Total	0.148		0.00010	mg/L	05-AUG-20	05-AUG-20	R5175488
Nickel (Ni)-Total	0.00112		0.00050	mg/L	05-AUG-20	05-AUG-20	R5175488
Potassium (K)-Total	7.53		0.050	mg/L	05-AUG-20	05-AUG-20	R5175488
Sodium (Na)-Total	127		0.050	mg/L	05-AUG-20	05-AUG-20	R5175488
Zinc (Zn)-Total	0.0150		0.0030	mg/L	05-AUG-20	05-AUG-20	R5175488
Total Organic Carbon by Combustion							
Total Organic Carbon	12.9		0.50	mg/L		06-AUG-20	R5176327
Total Suspended Solids							
Total Suspended Solids	8.9		3.0	mg/L		04-AUG-20	R5175528
pH							
pH	7.55		0.10	pH units		31-JUL-20	R5173759
L2482395-4 ARV-6							
Sampled By: CLIENT on 29-JUL-20 @ 09:37							
Matrix: WATER							
BTEX plus F1-F4							
BTX plus F1 by GCMS							
Benzene	<0.00050		0.00050	mg/L		06-AUG-20	R5177356
Toluene	<0.0010		0.0010	mg/L		06-AUG-20	R5177356
Ethyl benzene	<0.00050		0.00050	mg/L		06-AUG-20	R5177356
o-Xylene	<0.00050		0.00050	mg/L		06-AUG-20	R5177356
m+p-Xylenes	<0.00040		0.00040	mg/L		06-AUG-20	R5177356
F1 (C6-C10)	<0.10		0.10	mg/L		06-AUG-20	R5177356
Surrogate: 4-Bromofluorobenzene (SS)	86.5		70-130	%		06-AUG-20	R5177356
CCME PHC F2-F4 in Water							
F2 (C10-C16)	<0.10		0.10	mg/L	06-AUG-20	06-AUG-20	R5176059
F3 (C16-C34)	<0.25		0.25	mg/L	06-AUG-20	06-AUG-20	R5176059
F4 (C34-C50)	<0.25		0.25	mg/L	06-AUG-20	06-AUG-20	R5176059
Surrogate: 2-Bromobenzotrifluoride	94.8		60-140	%	06-AUG-20	06-AUG-20	R5176059
CCME Total Hydrocarbons							

* 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
L2482395-4 ARV-6							
Sampled By: CLIENT on 29-JUL-20 @ 09:37							
Matrix: WATER							
CCME Total Hydrocarbons							
F1-BTEX	<0.10		0.10	mg/L		12-AUG-20	
F2-Naphth	<0.10		0.10	mg/L		12-AUG-20	
F3-PAH	<0.25		0.25	mg/L		12-AUG-20	
Total Hydrocarbons (C6-C50)	<0.38		0.38	mg/L		12-AUG-20	
Sum of Xylene Isomer Concentrations							
Xylenes (Total)	<0.00064		0.00064	mg/L		10-AUG-20	
Total and E. coli, 1:10 dilution by QT97							
Total Coliforms	410	PEHR	10	MPN/100mL		31-JUL-20	R5173328
Escherichia Coli	<10	PEHR	10	MPN/100mL		31-JUL-20	R5173328
CCME PAHs in mg/L							
1-Methyl Naphthalene	0.000064		0.000020	mg/L	11-AUG-20	12-AUG-20	R5182224
2-Methyl Naphthalene	0.000034		0.000020	mg/L	11-AUG-20	12-AUG-20	R5182224
Acenaphthene	<0.000020		0.000020	mg/L	11-AUG-20	12-AUG-20	R5182224
Acenaphthylene	<0.000020		0.000020	mg/L	11-AUG-20	12-AUG-20	R5182224
Anthracene	<0.000010		0.000010	mg/L	11-AUG-20	12-AUG-20	R5182224
Acridine	<0.000020		0.000020	mg/L	11-AUG-20	12-AUG-20	R5182224
Benzo(a)anthracene	<0.000010		0.000010	mg/L	11-AUG-20	12-AUG-20	R5182224
Benzo(a)pyrene	<0.0000050		0.0000050	mg/L	11-AUG-20	12-AUG-20	R5182224
Benzo(b&j)fluoranthene	<0.000010		0.000010	mg/L	11-AUG-20	12-AUG-20	R5182224
Benzo(g,h,i)perylene	<0.000020		0.000020	mg/L	11-AUG-20	12-AUG-20	R5182224
Benzo(k)fluoranthene	<0.000010		0.000010	mg/L	11-AUG-20	12-AUG-20	R5182224
Chrysene	<0.000020		0.000020	mg/L	11-AUG-20	12-AUG-20	R5182224
Dibenzo(a,h)anthracene	<0.0000050		0.0000050	mg/L	11-AUG-20	12-AUG-20	R5182224
Fluoranthene	<0.000020		0.000020	mg/L	11-AUG-20	12-AUG-20	R5182224
Fluorene	<0.000020		0.000020	mg/L	11-AUG-20	12-AUG-20	R5182224
Indeno(1,2,3-cd)pyrene	<0.000010		0.000010	mg/L	11-AUG-20	12-AUG-20	R5182224
Naphthalene	<0.000050		0.000050	mg/L	11-AUG-20	12-AUG-20	R5182224
Phenanthrene	<0.000050		0.000050	mg/L	11-AUG-20	12-AUG-20	R5182224
Pyrene	<0.000010		0.000010	mg/L	11-AUG-20	12-AUG-20	R5182224
Quinoline	<0.000020		0.000020	mg/L	11-AUG-20	12-AUG-20	R5182224
B(a)P Total Potency Equivalent	<0.000030		0.000030	mg/L	11-AUG-20	12-AUG-20	R5182224
Surrogate: d8-Naphthalene	101.3		50-150	%	11-AUG-20	12-AUG-20	R5182224
Surrogate: d10-Phenanthrene	100.2		50-150	%	11-AUG-20	12-AUG-20	R5182224
Surrogate: d12-Chrysene	98.6		50-150	%	11-AUG-20	12-AUG-20	R5182224
Surrogate: d10-Acenaphthene	100.4		50-150	%	11-AUG-20	12-AUG-20	R5182224
Surrogate: d9-Acridine (SS)	86.7		50-150	%	11-AUG-20	12-AUG-20	R5182224
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	70.9		1.2	mg/L		04-AUG-20	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		04-AUG-20	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		04-AUG-20	
Alkalinity, Total (as CaCO3)							
Alkalinity, Total (as CaCO3)	58.1		1.0	mg/L		31-JUL-20	R5173759
Ammonia by colour							
Ammonia, Total (as N)	0.062		0.010	mg/L		05-AUG-20	R5174886
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	<2.0		2.0	mg/L		31-JUL-20	R5175204
Carbonaceous BOD							
BOD Carbonaceous	<2.0		2.0	mg/L		31-JUL-20	R5175204

* 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
L2482395-4 ARV-6							
Sampled By: CLIENT on 29-JUL-20 @ 09:37							
Matrix: WATER							
Chloride in Water by IC							
Chloride (Cl)	132		0.50	mg/L		31-JUL-20	R5174777
Conductivity							
Conductivity	548		1.0	umhos/cm		31-JUL-20	R5173759
Fecal coliforms, 1:10 dilution by QT97							
Fecal Coliforms	<10	PEHT	10	MPN/100mL		31-JUL-20	R5173332
Hardness Calculated							
Hardness (as CaCO3)	133	HTC	0.20	mg/L		06-AUG-20	
Mercury Total							
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L	12-AUG-20	12-AUG-20	R5185681
Nitrate in Water by IC							
Nitrate (as N)	0.026		0.020	mg/L		31-JUL-20	R5174777
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		06-AUG-20	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		31-JUL-20	R5174777
Oil & Grease - Gravimetric							
Oil and Grease	<5.0		5.0	mg/L		07-AUG-20	R5177198
Phenol (4AAP)							
Phenols (4AAP)	0.0011		0.0010	mg/L		05-AUG-20	R5175495
Phosphorus, Total							
Phosphorus (P)-Total	0.0441		0.0030	mg/L		06-AUG-20	R5176078
Sulfate in Water by IC							
Sulfate (SO4)	1.38		0.30	mg/L		31-JUL-20	R5174777
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.0384		0.0030	mg/L	05-AUG-20	05-AUG-20	R5175488
Arsenic (As)-Total	0.00051		0.00010	mg/L	05-AUG-20	05-AUG-20	R5175488
Cadmium (Cd)-Total	0.0000182		0.0000050	mg/L	05-AUG-20	05-AUG-20	R5175488
Calcium (Ca)-Total	38.5		0.050	mg/L	05-AUG-20	05-AUG-20	R5175488
Chromium (Cr)-Total	0.00034		0.00010	mg/L	05-AUG-20	05-AUG-20	R5175488
Cobalt (Co)-Total	0.00094		0.00010	mg/L	05-AUG-20	05-AUG-20	R5175488
Copper (Cu)-Total	<0.00050		0.00050	mg/L	05-AUG-20	05-AUG-20	R5175488
Iron (Fe)-Total	9.18		0.010	mg/L	05-AUG-20	05-AUG-20	R5175488
Lead (Pb)-Total	0.000291		0.000050	mg/L	05-AUG-20	05-AUG-20	R5175488
Magnesium (Mg)-Total	9.04		0.0050	mg/L	05-AUG-20	05-AUG-20	R5175488
Manganese (Mn)-Total	1.16		0.00010	mg/L	05-AUG-20	05-AUG-20	R5175488
Nickel (Ni)-Total	0.00085		0.00050	mg/L	05-AUG-20	05-AUG-20	R5175488
Potassium (K)-Total	4.26		0.050	mg/L	05-AUG-20	05-AUG-20	R5175488
Sodium (Na)-Total	49.3		0.050	mg/L	05-AUG-20	05-AUG-20	R5175488
Zinc (Zn)-Total	0.0322		0.0030	mg/L	05-AUG-20	05-AUG-20	R5175488
Total Organic Carbon by Combustion							
Total Organic Carbon	6.54		0.50	mg/L		06-AUG-20	R5176327
Total Suspended Solids							
Total Suspended Solids	17.7		3.0	mg/L		04-AUG-20	R5175528
pH							
pH	7.01		0.10	pH units		31-JUL-20	R5173759

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

Reference Information

Qualifiers for Individual Samples Listed:

Lab Sample ID	Client Sample ID	Qualifier	Description
L2482395-4	ARV-6	WSMT	Mercury - Water sample(s) for total mercury analysis was not submitted in glass or PTFE container with HCl preservative. Results may be biased low.

Sample Parameter Qualifier Key:

Qualifier	Description
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).
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.
PEHT	Parameter Exceeded Recommended Holding Time Prior to Analysis

Test Method References:

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

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

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

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

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

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

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

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

BOD-CBOD-WP	Water	Carbonaceous BOD	APHA 5210 B

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

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

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

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

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

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

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

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

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

EC-WP	Water	Conductivity	APHA 2510B

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

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

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

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**

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

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

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

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

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

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

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

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

HARDNESS-CALC-WP	Water	Hardness Calculated	APHA 2340B

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Reference Information

Test Method References:

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

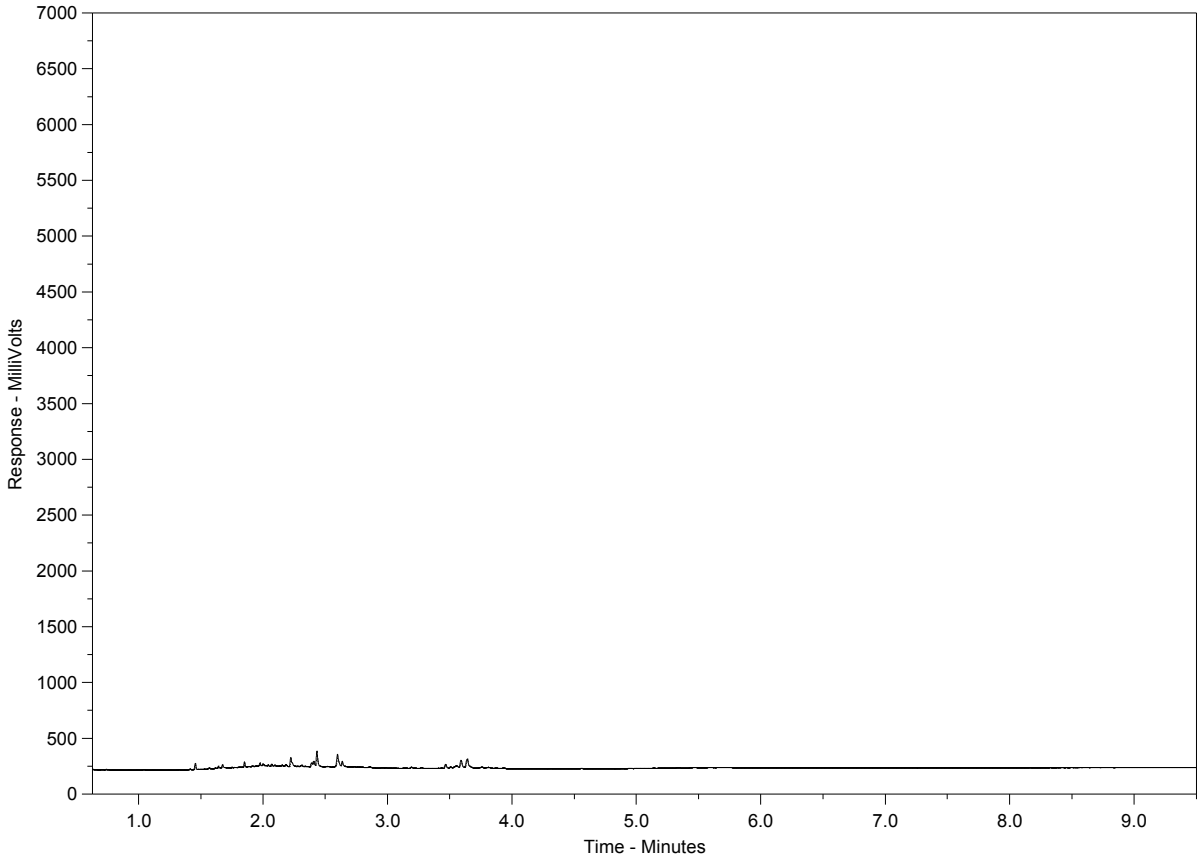
GLOSSARY OF REPORT TERMS

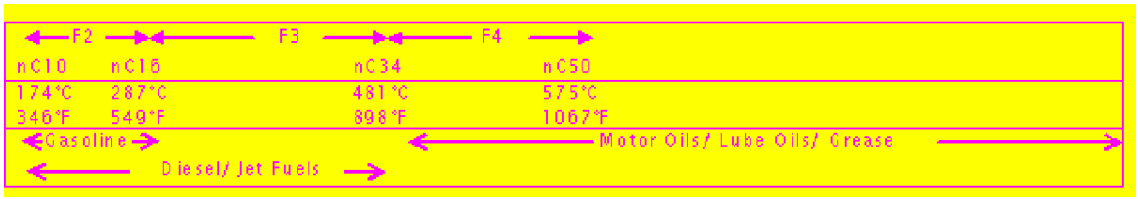
Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates 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: L2482395-1
Client Sample ID: ARV-2





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

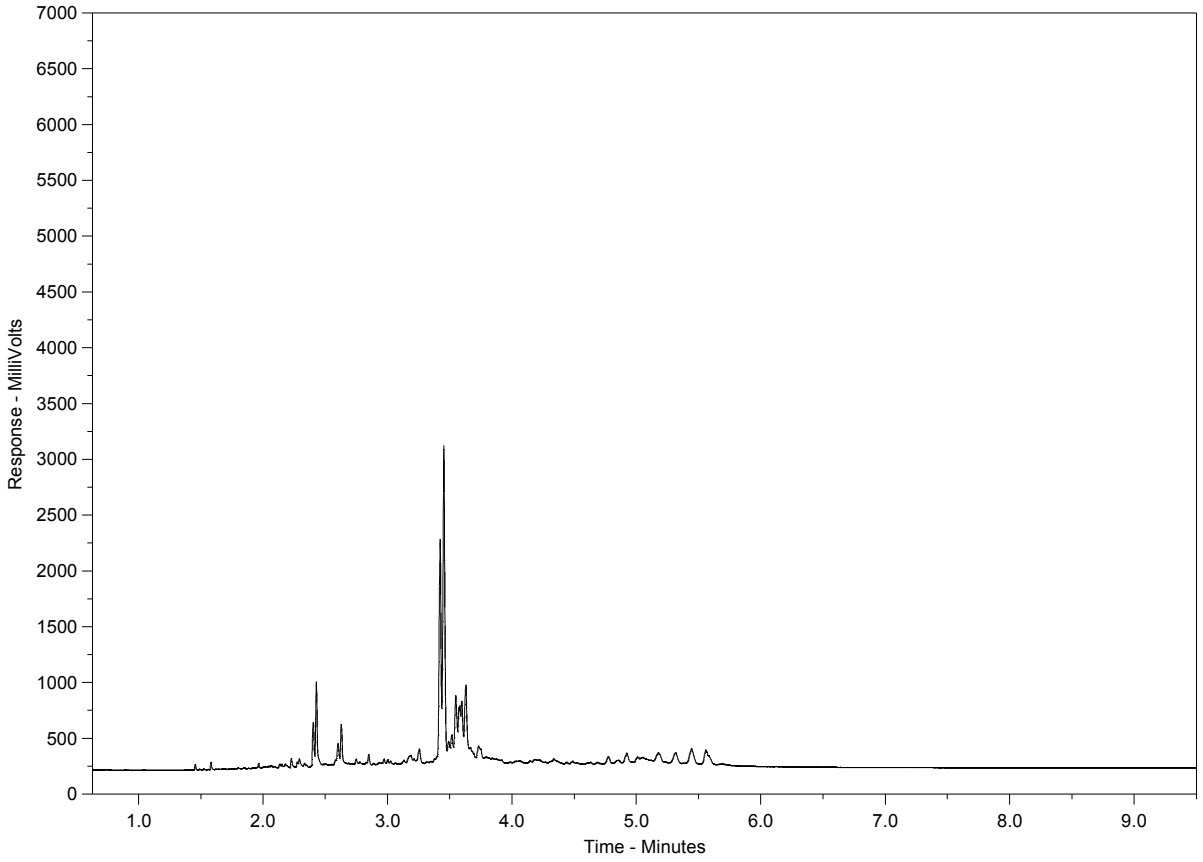
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

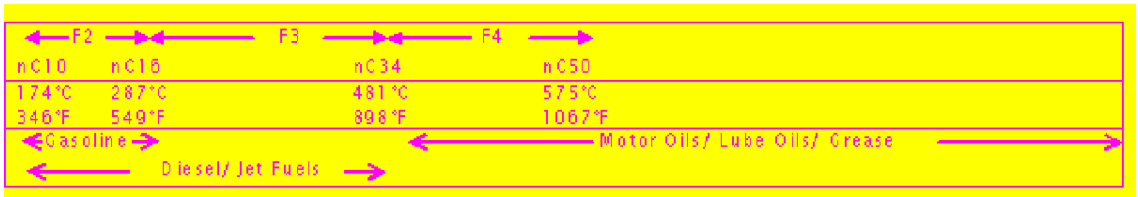
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

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

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L2482395-2
Client Sample ID: ARV-4





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

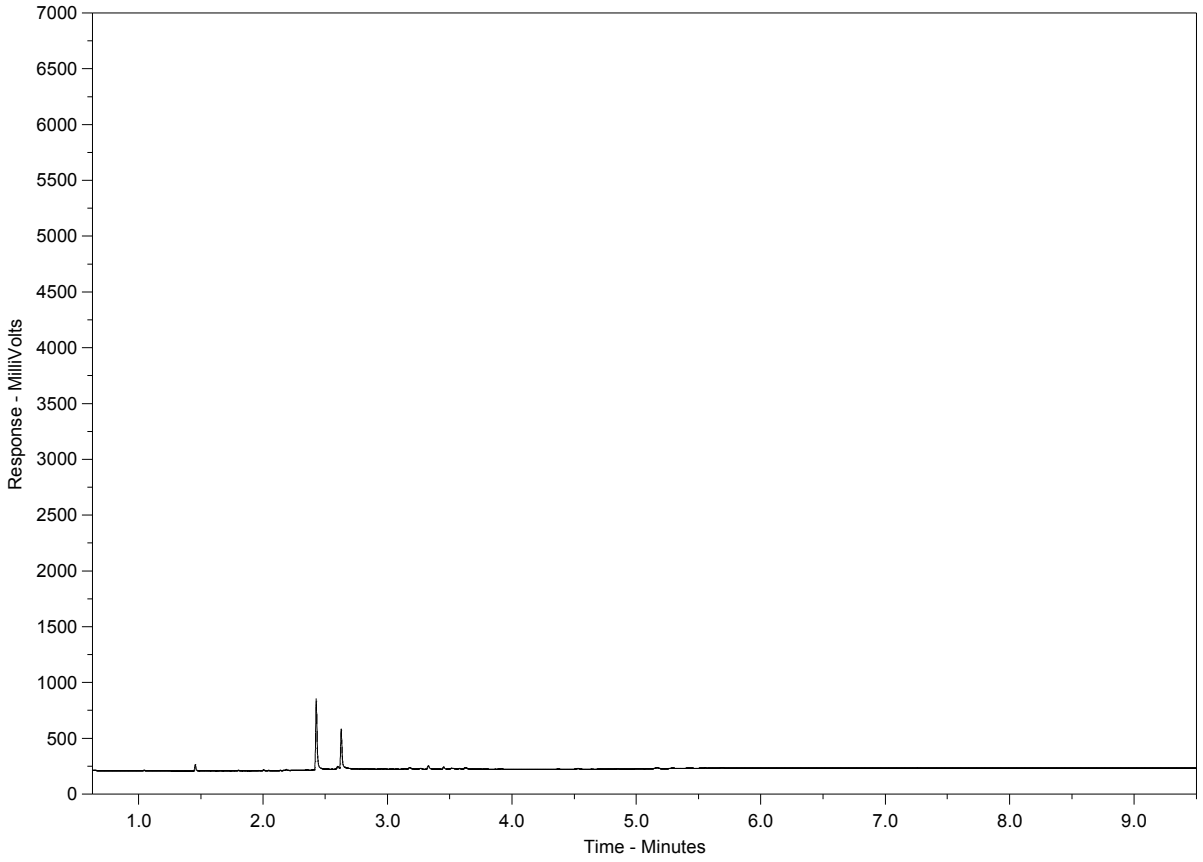
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

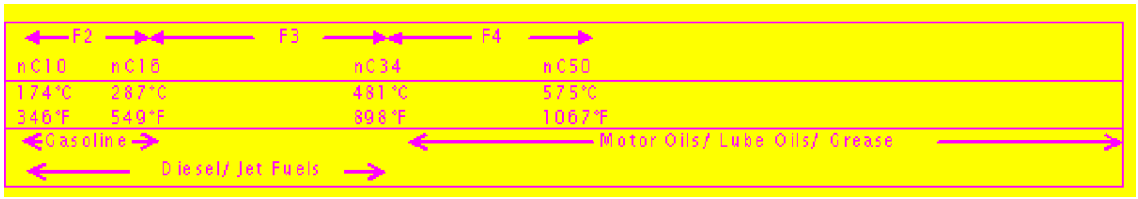
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

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

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L2482395-3
Client Sample ID: ARV-5(BOTTLE SAYS AR-V4)





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

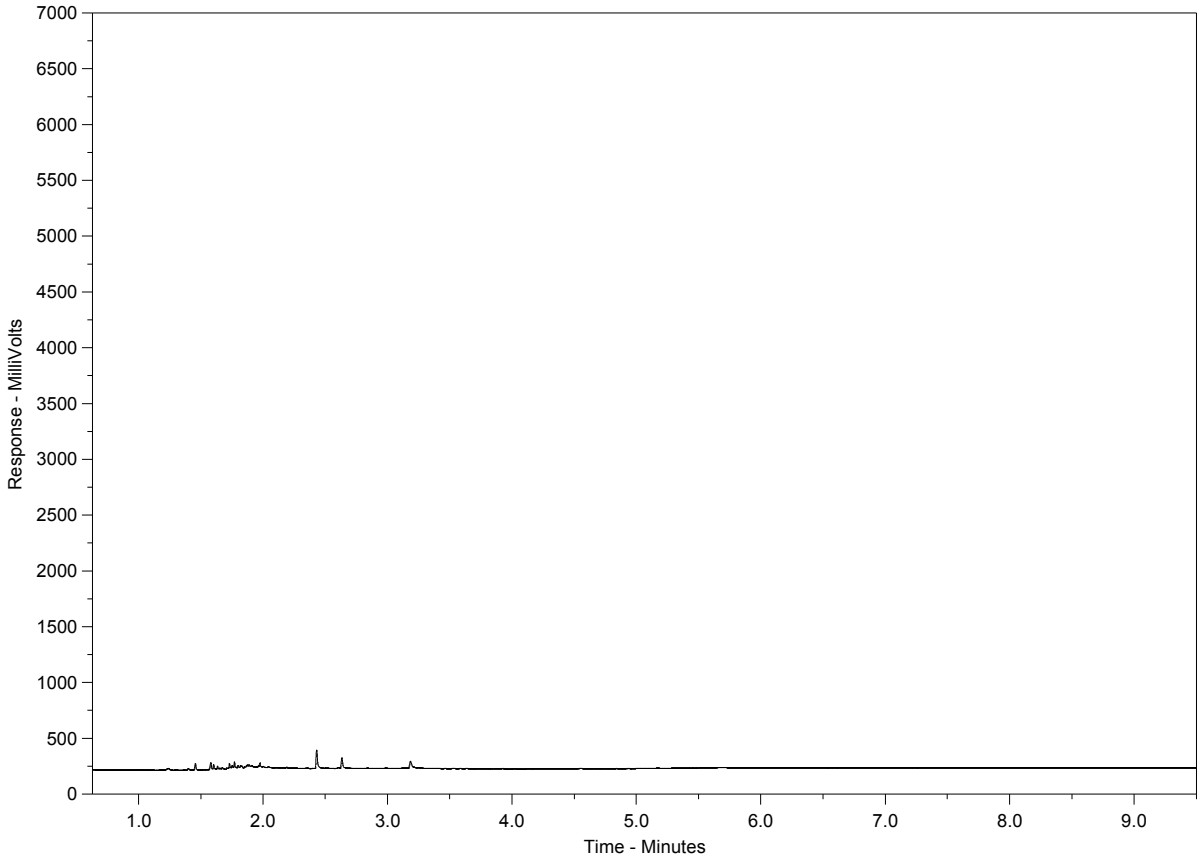
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

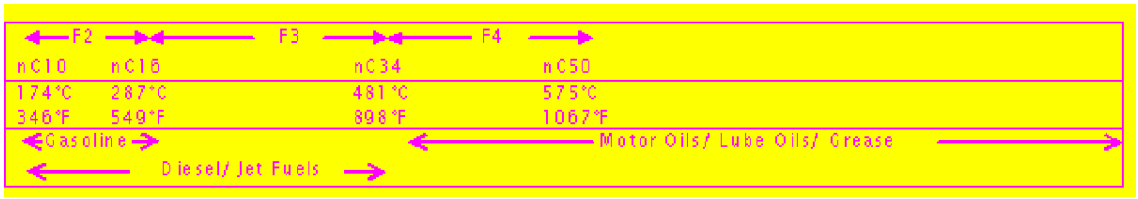
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

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

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L2482395-4
Client Sample ID: ARV-6





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

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

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

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

ALS Environmental
www.alsglobal.com

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

L2482395-COFC

COC Number: 17 - 747780

Page of

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:	Box 150
City/Province:	Arviat, Nunavut
Postal Code:	X0C-0E0
Invoice To	Same as Report To ☑ YES ☐ NO
	Copy of Invoice with Report ☐ YES ☑ NO
Company:	
Contact:	

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

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

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

Project Information
ALS Account # / Quote #:
Job #:
PO / AFE:
LSD:
ALS Lab Work Order # (lab use only):

Oil and Gas Required Fields (client use)
AFE/Cost Center: PO#
Major/Minor Code: Routing Code:
Requisitioner:
Location:
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	Routine	BOD	Bacteria	Mercury	Nitric Acid	Oil & Grease	EPH/LEPH/HEPH x2	F1-4 BTEX VOC x3	EPH LEPH HEPH x2	Phenols	SAMPLES ON HOLD
	ARV-2	29-07-20	9:12am			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	ARV-4	07-29-20	858am			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	ARV-5	07-29-20	924am			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	ARV-6	07-29-20	937am			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	

Drinking Water (DW) Samples[1] (client use)
Are samples taken from a Regulated DW System? ☐ YES ☐ NO
Are samples for human consumption/ use? ☐ YES ☐ NO

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

INITIAL COOLER TEMPERATURES °C	FINAL COOLER TEMPERATURES °C
18.0	

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by: [signature]	Date: July 29/20	Time: 950am	Received by:	Date:	Time:	Received by: BE	Date: July 31, 2020	Time: 11:45 AM

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.

Hamlet of Arviat
ATTN: LAURA TASSIUK
PO Box 150
Arviat NU X0C 0H0

Date Received: 21-SEP-20
Report Date: 06-OCT-20 10:16 (MT)
Version: FINAL REV. 2

Client Phone: 867-857-2841

Certificate of Analysis

Lab Work Order #: L2505947

Project P.O. #: NOT SUBMITTED
Job Reference: ARVIAT - WASTE WATER (AUG 2020)
C of C Numbers:
Legal Site Desc:

Comments: ADDITIONAL 23-SEP-20 12:26
ADDITIONAL 21-SEP-20 14:40

6-OCT-2020 AMENEDED REPORT - Report re-issued with BOD & CBOD QC Qualifier Comments

Hua Wo
Chemistry Laboratory Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2505947-1 ARV-2A							
Sampled By: CLIENT on 16-SEP-20 @ 12:00							
Matrix: Waste Water							
BTEX							
BTX plus F1 by GCMS							
Benzene	<0.00050		0.00050	mg/L		25-SEP-20	R5242014
Toluene	<0.0010		0.0010	mg/L		25-SEP-20	R5242014
Ethyl benzene	<0.00050		0.00050	mg/L		25-SEP-20	R5242014
o-Xylene	<0.00050		0.00050	mg/L		25-SEP-20	R5242014
m+p-Xylenes	<0.00040		0.00040	mg/L		25-SEP-20	R5242014
F1 (C6-C10)	<0.10		0.10	mg/L		25-SEP-20	R5242014
Surrogate: 4-Bromofluorobenzene (SS)	74.9		70-130	%		25-SEP-20	R5242014
CCME Total Hydrocarbons							
F1-BTEX	<0.10		0.10	mg/L		30-SEP-20	
F2-Naphth	<0.10		0.10	mg/L		30-SEP-20	
F3-PAH	<0.25		0.25	mg/L		30-SEP-20	
Total Hydrocarbons (C6-C50)	<0.38		0.38	mg/L		30-SEP-20	
Sum of Xylene Isomer Concentrations							
Xylenes (Total)	<0.00064		0.00064	mg/L		30-SEP-20	
F2-F4 (O.Reg.153/04)							
F2 (C10-C16)	<100		100	ug/L	25-SEP-20	28-SEP-20	R5241403
F3 (C16-C34)	<250		250	ug/L	25-SEP-20	28-SEP-20	R5241403
F4 (C34-C50)	<250		250	ug/L	25-SEP-20	28-SEP-20	R5241403
Chrom. to baseline at nC50	YES				25-SEP-20	28-SEP-20	R5241403
Surrogate: 2-Bromobenzotrifluoride	87.1		60-140	%	25-SEP-20	28-SEP-20	R5241403
CCME PAHs in mg/L							
1-Methyl Naphthalene	<0.000020		0.000020	mg/L	25-SEP-20	30-SEP-20	R5242828
2-Methyl Naphthalene	<0.000020		0.000020	mg/L	25-SEP-20	30-SEP-20	R5242828
Acenaphthene	<0.000020		0.000020	mg/L	25-SEP-20	30-SEP-20	R5242828
Acenaphthylene	<0.000020		0.000020	mg/L	25-SEP-20	30-SEP-20	R5242828
Anthracene	<0.000010		0.000010	mg/L	25-SEP-20	30-SEP-20	R5242828
Acridine	<0.000020		0.000020	mg/L	25-SEP-20	30-SEP-20	R5242828
Benzo(a)anthracene	<0.000010		0.000010	mg/L	25-SEP-20	30-SEP-20	R5242828
Benzo(a)pyrene	<0.0000050		0.0000050	mg/L	25-SEP-20	30-SEP-20	R5242828
Benzo(b&j)fluoranthene	<0.000010		0.000010	mg/L	25-SEP-20	30-SEP-20	R5242828
Benzo(g,h,i)perylene	<0.000020		0.000020	mg/L	25-SEP-20	30-SEP-20	R5242828
Benzo(k)fluoranthene	<0.000010		0.000010	mg/L	25-SEP-20	30-SEP-20	R5242828
Chrysene	<0.000020		0.000020	mg/L	25-SEP-20	30-SEP-20	R5242828
Dibenzo(a,h)anthracene	<0.0000050		0.0000050	mg/L	25-SEP-20	30-SEP-20	R5242828
Fluoranthene	<0.000020		0.000020	mg/L	25-SEP-20	30-SEP-20	R5242828
Fluorene	<0.000020		0.000020	mg/L	25-SEP-20	30-SEP-20	R5242828
Indeno(1,2,3-cd)pyrene	<0.000010		0.000010	mg/L	25-SEP-20	30-SEP-20	R5242828
Naphthalene	<0.000050		0.000050	mg/L	25-SEP-20	30-SEP-20	R5242828
Phenanthrene	<0.000050		0.000050	mg/L	25-SEP-20	30-SEP-20	R5242828
Pyrene	<0.000010		0.000010	mg/L	25-SEP-20	30-SEP-20	R5242828
Quinoline	0.000021		0.000020	mg/L	25-SEP-20	30-SEP-20	R5242828
B(a)P Total Potency Equivalent	<0.000030		0.000030	mg/L	25-SEP-20	30-SEP-20	R5242828
Surrogate: d8-Naphthalene	102.3		50-150	%	25-SEP-20	30-SEP-20	R5242828
Surrogate: d10-Phenanthrene	102.1		50-150	%	25-SEP-20	30-SEP-20	R5242828
Surrogate: d12-Chrysene	86.9		50-150	%	25-SEP-20	30-SEP-20	R5242828
Surrogate: d10-Acenaphthene	90.6		50-150	%	25-SEP-20	30-SEP-20	R5242828
Surrogate: d9-Acridine (SS)	98.2		50-150	%	25-SEP-20	30-SEP-20	R5242828
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	493		1.2	mg/L		25-SEP-20	

* 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
L2505947-1 ARV-2A							
Sampled By: CLIENT on 16-SEP-20 @ 12:00							
Matrix: Waste Water							
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		25-SEP-20	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		25-SEP-20	
Alkalinity, Total (as CaCO3)							
Alkalinity, Total (as CaCO3)	404		1.0	mg/L		24-SEP-20	R5235789
Ammonia by colour							
Ammonia, Total (as N)	5.60		0.20	mg/L		25-SEP-20	R5241312
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	6.0		2.0	mg/L		24-SEP-20	R5242487
Carbonaceous BOD							
BOD Carbonaceous	5.5		2.0	mg/L		24-SEP-20	R5242487
Chloride in Water by IC							
Chloride (Cl)	408		10	mg/L		24-SEP-20	R5238110
Conductivity							
Conductivity	3030		1.0	umhos/cm		24-SEP-20	R5235789
Fecal coliforms, 1:10 dilution by QT97							
Fecal Coliforms	10	PEHR	10	MPN/100mL		23-SEP-20	R5234537
Hardness Calculated							
Hardness (as CaCO3)	1090	HTC	1.2	mg/L		01-OCT-20	
Mercury Total							
Mercury (Hg)-Total	0.0000080		0.0000050	mg/L	28-SEP-20	28-SEP-20	R5241670
Nitrate in Water by IC							
Nitrate (as N)	<0.40	DLM	0.40	mg/L		24-SEP-20	R5238110
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.45		0.45	mg/L		28-SEP-20	
Nitrite in Water by IC							
Nitrite (as N)	<0.20	DLM	0.20	mg/L		24-SEP-20	R5238110
Oil & Grease - Gravimetric							
Oil and Grease	<5.0		5.0	mg/L		29-SEP-20	R5242756
Phenol (4AAP)							
Phenols (4AAP)	0.0018		0.0010	mg/L		24-SEP-20	R5236019
Phosphorus, Total							
Phosphorus (P)-Total	0.329		0.0030	mg/L		28-SEP-20	R5241526
Sulfate in Water by IC							
Sulfate (SO4)	699		6.0	mg/L		24-SEP-20	R5238110
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.0116		0.0030	mg/L	25-SEP-20	25-SEP-20	R5240019
Arsenic (As)-Total	0.00355		0.00010	mg/L	25-SEP-20	25-SEP-20	R5240019
Cadmium (Cd)-Total	0.0000171		0.0000050	mg/L	25-SEP-20	25-SEP-20	R5240019
Calcium (Ca)-Total	307		0.50	mg/L	25-SEP-20	25-SEP-20	R5240019
Chromium (Cr)-Total	0.00070		0.00010	mg/L	25-SEP-20	25-SEP-20	R5240019
Cobalt (Co)-Total	0.00081		0.00010	mg/L	25-SEP-20	25-SEP-20	R5240019
Copper (Cu)-Total	0.00954		0.00050	mg/L	25-SEP-20	25-SEP-20	R5240019
Iron (Fe)-Total	0.726		0.010	mg/L	25-SEP-20	25-SEP-20	R5240019
Lead (Pb)-Total	0.000661		0.000050	mg/L	25-SEP-20	25-SEP-20	R5240019
Magnesium (Mg)-Total	77.5		0.0050	mg/L	25-SEP-20	25-SEP-20	R5240019
Manganese (Mn)-Total	0.699		0.00010	mg/L	25-SEP-20	25-SEP-20	R5240019
Nickel (Ni)-Total	0.00677		0.00050	mg/L	25-SEP-20	25-SEP-20	R5240019
Potassium (K)-Total	57.0		0.050	mg/L	25-SEP-20	25-SEP-20	R5240019
Sodium (Na)-Total	297		0.050	mg/L	25-SEP-20	25-SEP-20	R5240019
Zinc (Zn)-Total	0.0137		0.0030	mg/L	25-SEP-20	25-SEP-20	R5240019
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
L2505947-1 ARV-2A							
Sampled By: CLIENT on 16-SEP-20 @ 12:00							
Matrix: Waste Water							
Total Organic Carbon by Combustion							
Total Organic Carbon	28.8		0.50	mg/L		24-SEP-20	R5237222
Total Suspended Solids							
Total Suspended Solids	12.3		3.0	mg/L		24-SEP-20	R5236461
pH							
pH	8.05		0.10	pH units		24-SEP-20	R5235789
L2505947-2 ARV-4							
Sampled By: CLIENT on 16-SEP-20 @ 12:00							
Matrix: Waste Water							
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	173		1.2	mg/L		25-SEP-20	
Alkalinity, Carbonate							
Carbonate (CO3)	4.80		0.60	mg/L		25-SEP-20	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		25-SEP-20	
Alkalinity, Total (as CaCO3)							
Alkalinity, Total (as CaCO3)	150		1.0	mg/L		24-SEP-20	R5235789
Ammonia by colour							
Ammonia, Total (as N)	9.06		0.20	mg/L		25-SEP-20	R5241312
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	> 140	BODQ	20	mg/L		24-SEP-20	R5245147
Carbonaceous BOD							
BOD Carbonaceous	23.1	BODQ	6.0	mg/L		24-SEP-20	R5245147
Chloride in Water by IC							
Chloride (Cl)	131		0.50	mg/L		24-SEP-20	R5238110
Conductivity							
Conductivity	724		1.0	umhos/cm		24-SEP-20	R5235789
Fecal coliforms, 1:10 dilution by QT97							
Fecal Coliforms	2760	PEHR	10	MPN/100mL		23-SEP-20	R5234537
Hardness Calculated							
Hardness (as CaCO3)	90.4	HTC	0.20	mg/L		28-SEP-20	
Mercury Total							
Mercury (Hg)-Total	0.0000070		0.0000050	mg/L	28-SEP-20	28-SEP-20	R5241670
Nitrate in Water by IC							
Nitrate (as N)	0.378		0.020	mg/L		24-SEP-20	R5238110
Nitrate+Nitrite							
Nitrate and Nitrite as N	0.637		0.070	mg/L		28-SEP-20	
Nitrite in Water by IC							
Nitrite (as N)	0.259		0.010	mg/L		24-SEP-20	R5238110
Oil & Grease - Gravimetric							
Oil and Grease	<5.0		5.0	mg/L		29-SEP-20	R5242756
Phenol (4AAP)							
Phenols (4AAP)	0.0415	DLM	0.0050	mg/L		24-SEP-20	R5236019
Phosphorus, Total							
Phosphorus (P)-Total	5.42		0.030	mg/L		28-SEP-20	R5241526
Sulfate in Water by IC							
Sulfate (SO4)	12.2		0.30	mg/L		24-SEP-20	R5238110
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.145		0.0030	mg/L	25-SEP-20	25-SEP-20	R5240019
Arsenic (As)-Total	0.00676		0.00010	mg/L	25-SEP-20	25-SEP-20	R5240019
Cadmium (Cd)-Total	0.0000569		0.0000050	mg/L	25-SEP-20	25-SEP-20	R5240019

* 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
L2505947-2 ARV-4							
Sampled By: CLIENT on 16-SEP-20 @ 12:00							
Matrix: Waste Water							
Total Metals in Water by CRC ICPMS							
Calcium (Ca)-Total	15.6		0.050	mg/L	25-SEP-20	25-SEP-20	R5240019
Chromium (Cr)-Total	0.00143		0.00010	mg/L	25-SEP-20	25-SEP-20	R5240019
Cobalt (Co)-Total	0.00132		0.00010	mg/L	25-SEP-20	25-SEP-20	R5240019
Copper (Cu)-Total	0.0235		0.00050	mg/L	25-SEP-20	25-SEP-20	R5240019
Iron (Fe)-Total	2.12		0.010	mg/L	25-SEP-20	25-SEP-20	R5240019
Lead (Pb)-Total	0.00111		0.000050	mg/L	25-SEP-20	25-SEP-20	R5240019
Magnesium (Mg)-Total	12.5		0.0050	mg/L	25-SEP-20	25-SEP-20	R5240019
Manganese (Mn)-Total	0.206		0.00010	mg/L	25-SEP-20	25-SEP-20	R5240019
Nickel (Ni)-Total	0.00561		0.00050	mg/L	25-SEP-20	25-SEP-20	R5240019
Potassium (K)-Total	25.8		0.050	mg/L	25-SEP-20	25-SEP-20	R5240019
Sodium (Na)-Total	103		0.050	mg/L	25-SEP-20	25-SEP-20	R5240019
Zinc (Zn)-Total	0.0280		0.0030	mg/L	25-SEP-20	25-SEP-20	R5240019
Total Organic Carbon by Combustion							
Total Organic Carbon	6.83		0.50	mg/L		24-SEP-20	R5237222
Total Suspended Solids							
Total Suspended Solids	177		3.0	mg/L		24-SEP-20	R5236461
pH							
pH	8.43		0.10	pH units		24-SEP-20	R5235789
L2505947-3 ARV-5							
Sampled By: CLIENT on 16-SEP-20 @ 12:00							
Matrix: Waste Water							
BTEX							
BTX plus F1 by GCMS							
Benzene	<0.00050		0.00050	mg/L		25-SEP-20	R5242014
Toluene	<0.0010		0.0010	mg/L		25-SEP-20	R5242014
Ethyl benzene	<0.00050		0.00050	mg/L		25-SEP-20	R5242014
o-Xylene	<0.00050		0.00050	mg/L		25-SEP-20	R5242014
m+p-Xylenes	<0.00040		0.00040	mg/L		25-SEP-20	R5242014
F1 (C6-C10)	<0.10		0.10	mg/L		25-SEP-20	R5242014
Surrogate: 4-Bromofluorobenzene (SS)	75.1		70-130	%		25-SEP-20	R5242014
CCME Total Hydrocarbons							
F1-BTEX	<0.10		0.10	mg/L		30-SEP-20	
F2-Naphth	<0.10		0.10	mg/L		30-SEP-20	
F3-PAH	<0.25		0.25	mg/L		30-SEP-20	
Total Hydrocarbons (C6-C50)	<0.38		0.38	mg/L		30-SEP-20	
Sum of Xylene Isomer Concentrations							
Xylenes (Total)	<0.00064		0.00064	mg/L		30-SEP-20	
F2-F4 (O.Reg.153/04)							
F2 (C10-C16)	<100		100	ug/L	25-SEP-20	28-SEP-20	R5241403
F3 (C16-C34)	<250		250	ug/L	25-SEP-20	28-SEP-20	R5241403
F4 (C34-C50)	<250		250	ug/L	25-SEP-20	28-SEP-20	R5241403
Chrom. to baseline at nC50	YES				25-SEP-20	28-SEP-20	R5241403
Surrogate: 2-Bromobenzotrifluoride	88.5		60-140	%	25-SEP-20	28-SEP-20	R5241403
CCME PAHs in mg/L							
1-Methyl Naphthalene	<0.000020		0.000020	mg/L	25-SEP-20	30-SEP-20	R5242828
2-Methyl Naphthalene	<0.000020		0.000020	mg/L	25-SEP-20	30-SEP-20	R5242828
Acenaphthene	<0.000020		0.000020	mg/L	25-SEP-20	30-SEP-20	R5242828
Acenaphthylene	<0.000020		0.000020	mg/L	25-SEP-20	30-SEP-20	R5242828
Anthracene	<0.000010		0.000010	mg/L	25-SEP-20	30-SEP-20	R5242828
Acridine	<0.000020		0.000020	mg/L	25-SEP-20	30-SEP-20	R5242828

* 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
L2505947-3 ARV-5							
Sampled By: CLIENT on 16-SEP-20 @ 12:00							
Matrix: Waste Water							
CCME PAHs in mg/L							
Benzo(a)anthracene	<0.000010		0.000010	mg/L	25-SEP-20	30-SEP-20	R5242828
Benzo(a)pyrene	<0.0000050		0.0000050	mg/L	25-SEP-20	30-SEP-20	R5242828
Benzo(b&j)fluoranthene	<0.000010		0.000010	mg/L	25-SEP-20	30-SEP-20	R5242828
Benzo(g,h,i)perylene	<0.000020		0.000020	mg/L	25-SEP-20	30-SEP-20	R5242828
Benzo(k)fluoranthene	<0.000010		0.000010	mg/L	25-SEP-20	30-SEP-20	R5242828
Chrysene	<0.000020		0.000020	mg/L	25-SEP-20	30-SEP-20	R5242828
Dibenzo(a,h)anthracene	<0.0000050		0.0000050	mg/L	25-SEP-20	30-SEP-20	R5242828
Fluoranthene	<0.000020		0.000020	mg/L	25-SEP-20	30-SEP-20	R5242828
Fluorene	<0.000020		0.000020	mg/L	25-SEP-20	30-SEP-20	R5242828
Indeno(1,2,3-cd)pyrene	<0.000010		0.000010	mg/L	25-SEP-20	30-SEP-20	R5242828
Naphthalene	<0.000050		0.000050	mg/L	25-SEP-20	30-SEP-20	R5242828
Phenanthrene	<0.000050		0.000050	mg/L	25-SEP-20	30-SEP-20	R5242828
Pyrene	<0.000010		0.000010	mg/L	25-SEP-20	30-SEP-20	R5242828
Quinoline	<0.000020		0.000020	mg/L	25-SEP-20	30-SEP-20	R5242828
B(a)P Total Potency Equivalent	<0.000030		0.000030	mg/L	25-SEP-20	30-SEP-20	R5242828
Surrogate: d8-Naphthalene	95.3		50-150	%	25-SEP-20	30-SEP-20	R5242828
Surrogate: d10-Phenanthrene	96.6		50-150	%	25-SEP-20	30-SEP-20	R5242828
Surrogate: d12-Chrysene	85.2		50-150	%	25-SEP-20	30-SEP-20	R5242828
Surrogate: d10-Acenaphthene	88.4		50-150	%	25-SEP-20	30-SEP-20	R5242828
Surrogate: d9-Acridine (SS)	86.9		50-150	%	25-SEP-20	30-SEP-20	R5242828
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	59.7		1.2	mg/L		25-SEP-20	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		25-SEP-20	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		25-SEP-20	
Alkalinity, Total (as CaCO3)							
Alkalinity, Total (as CaCO3)	48.9		1.0	mg/L		24-SEP-20	R5235789
Ammonia by colour							
Ammonia, Total (as N)	0.018		0.010	mg/L		25-SEP-20	R5241312
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	<2.0	BODQ	2.0	mg/L		24-SEP-20	R5245147
Carbonaceous BOD							
BOD Carbonaceous	3.7	BODQ	2.0	mg/L		24-SEP-20	R5245147
Chloride in Water by IC							
Chloride (Cl)	379		2.5	mg/L		24-SEP-20	R5238110
Conductivity							
Conductivity	1350		1.0	umhos/cm		24-SEP-20	R5235789
Fecal coliforms, 1:10 dilution by QT97							
Fecal Coliforms	<10	PEHR	10	MPN/100mL		23-SEP-20	R5234537
Hardness Calculated							
Hardness (as CaCO3)	207	HTC	0.20	mg/L		28-SEP-20	
Mercury Total							
Mercury (Hg)-Total	0.0000050		0.0000050	mg/L	28-SEP-20	28-SEP-20	R5241670
Nitrate in Water by IC							
Nitrate (as N)	<0.10	DLM	0.10	mg/L		24-SEP-20	R5238110
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.11		0.11	mg/L		28-SEP-20	
Nitrite in Water by IC							
Nitrite (as N)	<0.050	DLM	0.050	mg/L		24-SEP-20	R5238110
Oil & Grease - Gravimetric							

* 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
L2505947-3 ARV-5							
Sampled By: CLIENT on 16-SEP-20 @ 12:00							
Matrix: Waste Water							
Oil & Grease - Gravimetric							
Oil and Grease	<5.0		5.0	mg/L		29-SEP-20	R5242756
Phenol (4AAP)							
Phenols (4AAP)	<0.0010		0.0010	mg/L		24-SEP-20	R5236019
Phosphorus, Total							
Phosphorus (P)-Total	0.0477		0.0030	mg/L		28-SEP-20	R5241526
Sulfate in Water by IC							
Sulfate (SO4)	6.5		1.5	mg/L		24-SEP-20	R5238110
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.156		0.0030	mg/L	25-SEP-20	25-SEP-20	R5240019
Arsenic (As)-Total	0.00058		0.00010	mg/L	25-SEP-20	25-SEP-20	R5240019
Cadmium (Cd)-Total	0.0000081		0.0000050	mg/L	25-SEP-20	25-SEP-20	R5240019
Calcium (Ca)-Total	29.1		0.050	mg/L	25-SEP-20	25-SEP-20	R5240019
Chromium (Cr)-Total	0.00067		0.00010	mg/L	25-SEP-20	25-SEP-20	R5240019
Cobalt (Co)-Total	0.00030		0.00010	mg/L	25-SEP-20	25-SEP-20	R5240019
Copper (Cu)-Total	0.00087		0.00050	mg/L	25-SEP-20	25-SEP-20	R5240019
Iron (Fe)-Total	3.11		0.010	mg/L	25-SEP-20	25-SEP-20	R5240019
Lead (Pb)-Total	0.000238		0.000050	mg/L	25-SEP-20	25-SEP-20	R5240019
Magnesium (Mg)-Total	32.6		0.0050	mg/L	25-SEP-20	25-SEP-20	R5240019
Manganese (Mn)-Total	0.112		0.00010	mg/L	25-SEP-20	25-SEP-20	R5240019
Nickel (Ni)-Total	0.00080		0.00050	mg/L	25-SEP-20	25-SEP-20	R5240019
Potassium (K)-Total	8.79		0.050	mg/L	25-SEP-20	25-SEP-20	R5240019
Sodium (Na)-Total	191		0.050	mg/L	25-SEP-20	25-SEP-20	R5240019
Zinc (Zn)-Total	0.0082		0.0030	mg/L	25-SEP-20	25-SEP-20	R5240019
Total Organic Carbon by Combustion							
Total Organic Carbon	7.13		0.50	mg/L		24-SEP-20	R5237222
Total Suspended Solids							
Total Suspended Solids	50.3		3.0	mg/L		24-SEP-20	R5236461
pH							
pH	7.65		0.10	pH units		24-SEP-20	R5235789
L2505947-4 ARV-6							
Sampled By: CLIENT on 16-SEP-20 @ 12:00							
Matrix: Waste Water							
BTEX							
BTX plus F1 by GCMS							
Benzene	<0.00050		0.00050	mg/L		25-SEP-20	R5242014
Toluene	<0.0010		0.0010	mg/L		25-SEP-20	R5242014
Ethyl benzene	<0.00050		0.00050	mg/L		25-SEP-20	R5242014
o-Xylene	<0.00050		0.00050	mg/L		25-SEP-20	R5242014
m+p-Xylenes	<0.00040		0.00040	mg/L		25-SEP-20	R5242014
F1 (C6-C10)	<0.10		0.10	mg/L		25-SEP-20	R5242014
Surrogate: 4-Bromofluorobenzene (SS)	73.3		70-130	%		25-SEP-20	R5242014
CCME Total Hydrocarbons							
F1-BTEX	<0.10		0.10	mg/L		30-SEP-20	
F2-Naphth	<0.10		0.10	mg/L		30-SEP-20	
F3-PAH	<0.25		0.25	mg/L		30-SEP-20	
Total Hydrocarbons (C6-C50)	<0.38		0.38	mg/L		30-SEP-20	
Sum of Xylene Isomer Concentrations							
Xylenes (Total)	<0.00064		0.00064	mg/L		30-SEP-20	
F2-F4 (O.Reg.153/04)							
F2 (C10-C16)	<100		100	ug/L	25-SEP-20	28-SEP-20	R5241403

* 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
L2505947-4 ARV-6							
Sampled By: CLIENT on 16-SEP-20 @ 12:00							
Matrix: Waste Water							
F2-F4 (O.Reg.153/04)							
F3 (C16-C34)	<250		250	ug/L	25-SEP-20	28-SEP-20	R5241403
F4 (C34-C50)	<250		250	ug/L	25-SEP-20	28-SEP-20	R5241403
Chrom. to baseline at nC50	YES				25-SEP-20	28-SEP-20	R5241403
Surrogate: 2-Bromobenzotrifluoride	90.3		60-140	%	25-SEP-20	28-SEP-20	R5241403
CCME PAHs in mg/L							
1-Methyl Naphthalene	<0.000020		0.000020	mg/L	25-SEP-20	30-SEP-20	R5242828
2-Methyl Naphthalene	<0.000020		0.000020	mg/L	25-SEP-20	30-SEP-20	R5242828
Acenaphthene	<0.000020		0.000020	mg/L	25-SEP-20	30-SEP-20	R5242828
Acenaphthylene	<0.000020		0.000020	mg/L	25-SEP-20	30-SEP-20	R5242828
Anthracene	<0.000010		0.000010	mg/L	25-SEP-20	30-SEP-20	R5242828
Acridine	<0.000020		0.000020	mg/L	25-SEP-20	30-SEP-20	R5242828
Benzo(a)anthracene	<0.000010		0.000010	mg/L	25-SEP-20	30-SEP-20	R5242828
Benzo(a)pyrene	<0.0000050		0.0000050	mg/L	25-SEP-20	30-SEP-20	R5242828
Benzo(b&j)fluoranthene	<0.000010		0.000010	mg/L	25-SEP-20	30-SEP-20	R5242828
Benzo(g,h,i)perylene	<0.000020		0.000020	mg/L	25-SEP-20	30-SEP-20	R5242828
Benzo(k)fluoranthene	<0.000010		0.000010	mg/L	25-SEP-20	30-SEP-20	R5242828
Chrysene	<0.000020		0.000020	mg/L	25-SEP-20	30-SEP-20	R5242828
Dibenzo(a,h)anthracene	<0.0000050		0.0000050	mg/L	25-SEP-20	30-SEP-20	R5242828
Fluoranthene	<0.000020		0.000020	mg/L	25-SEP-20	30-SEP-20	R5242828
Fluorene	<0.000020		0.000020	mg/L	25-SEP-20	30-SEP-20	R5242828
Indeno(1,2,3-cd)pyrene	<0.000010		0.000010	mg/L	25-SEP-20	30-SEP-20	R5242828
Naphthalene	<0.000050		0.000050	mg/L	25-SEP-20	30-SEP-20	R5242828
Phenanthrene	<0.000050		0.000050	mg/L	25-SEP-20	30-SEP-20	R5242828
Pyrene	<0.000010		0.000010	mg/L	25-SEP-20	30-SEP-20	R5242828
Quinoline	<0.000020		0.000020	mg/L	25-SEP-20	30-SEP-20	R5242828
B(a)P Total Potency Equivalent	<0.000030		0.000030	mg/L	25-SEP-20	30-SEP-20	R5242828
Surrogate: d8-Naphthalene	100.2		50-150	%	25-SEP-20	30-SEP-20	R5242828
Surrogate: d10-Phenanthrene	97.9		50-150	%	25-SEP-20	30-SEP-20	R5242828
Surrogate: d12-Chrysene	89.6		50-150	%	25-SEP-20	30-SEP-20	R5242828
Surrogate: d10-Acenaphthene	88.5		50-150	%	25-SEP-20	30-SEP-20	R5242828
Surrogate: d9-Acridine (SS)	89.5		50-150	%	25-SEP-20	30-SEP-20	R5242828
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	73.8		1.2	mg/L		25-SEP-20	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		25-SEP-20	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		25-SEP-20	
Alkalinity, Total (as CaCO3)							
Alkalinity, Total (as CaCO3)	60.5		1.0	mg/L		24-SEP-20	R5235789
Ammonia by colour							
Ammonia, Total (as N)	0.103		0.010	mg/L		25-SEP-20	R5241312
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	<2.0	BODQ	2.0	mg/L		24-SEP-20	R5245147
Carbonaceous BOD							
BOD Carbonaceous	2.7	BODQ	2.0	mg/L		24-SEP-20	R5245147
Chloride in Water by IC							
Chloride (Cl)	316		1.0	mg/L		24-SEP-20	R5238110
Conductivity							
Conductivity	1140		1.0	umhos/cm		24-SEP-20	R5235789
Fecal coliforms, 1:10 dilution by QT97							
Fecal Coliforms	<10	PEHR	10	MPN/100mL		23-SEP-20	R5234537

* 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
L2505947-4 ARV-6							
Sampled By: CLIENT on 16-SEP-20 @ 12:00							
Matrix: Waste Water							
Hardness Calculated							
Hardness (as CaCO3)	449	HTC	0.20	mg/L		28-SEP-20	
Mercury Total							
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L	28-SEP-20	28-SEP-20	R5241670
Nitrate in Water by IC							
Nitrate (as N)	<0.040	DLM	0.040	mg/L		24-SEP-20	R5238110
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		28-SEP-20	
Nitrite in Water by IC							
Nitrite (as N)	<0.020	DLM	0.020	mg/L		24-SEP-20	R5238110
Oil & Grease - Gravimetric							
Oil and Grease	<5.0		5.0	mg/L		29-SEP-20	R5242756
Phenol (4AAP)							
Phenols (4AAP)	<0.0010		0.0010	mg/L		24-SEP-20	R5236019
Phosphorus, Total							
Phosphorus (P)-Total	0.0584		0.0030	mg/L		28-SEP-20	R5241526
Sulfate in Water by IC							
Sulfate (SO4)	<0.60	DLM	0.60	mg/L		24-SEP-20	R5238110
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.0604		0.0030	mg/L	25-SEP-20	25-SEP-20	R5240019
Arsenic (As)-Total	0.00057		0.00010	mg/L	25-SEP-20	25-SEP-20	R5240019
Cadmium (Cd)-Total	0.0000188		0.0000050	mg/L	25-SEP-20	25-SEP-20	R5240019
Calcium (Ca)-Total	162		0.050	mg/L	25-SEP-20	25-SEP-20	R5240019
Chromium (Cr)-Total	0.00063		0.00010	mg/L	25-SEP-20	25-SEP-20	R5240019
Cobalt (Co)-Total	0.00482		0.00010	mg/L	25-SEP-20	25-SEP-20	R5240019
Copper (Cu)-Total	0.00103		0.00050	mg/L	25-SEP-20	25-SEP-20	R5240019
Iron (Fe)-Total	11.2		0.010	mg/L	25-SEP-20	25-SEP-20	R5240019
Lead (Pb)-Total	0.000178		0.000050	mg/L	25-SEP-20	25-SEP-20	R5240019
Magnesium (Mg)-Total	10.8		0.0050	mg/L	25-SEP-20	25-SEP-20	R5240019
Manganese (Mn)-Total	1.66		0.00010	mg/L	25-SEP-20	25-SEP-20	R5240019
Nickel (Ni)-Total	0.00185		0.00050	mg/L	25-SEP-20	25-SEP-20	R5240019
Potassium (K)-Total	9.84		0.050	mg/L	25-SEP-20	25-SEP-20	R5240019
Sodium (Na)-Total	17.5		0.050	mg/L	25-SEP-20	25-SEP-20	R5240019
Zinc (Zn)-Total	0.0125		0.0030	mg/L	25-SEP-20	25-SEP-20	R5240019
Total Organic Carbon by Combustion							
Total Organic Carbon	6.75		0.50	mg/L		24-SEP-20	R5237222
Total Suspended Solids							
Total Suspended Solids	37.5		3.0	mg/L		24-SEP-20	R5236461
pH							
pH	7.28		0.10	pH units		24-SEP-20	R5235789

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

Reference Information

Sample Parameter Qualifier Key:

Qualifier	Description
BODQ	BOD Qualification: Lab Control Sample outside standard 85-115% objective (see QC report). Sample(s) cannot be rerun due to hold time expiry.
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.
RRQC	Refer to report remarks for information regarding this QC result.

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

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.			
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:

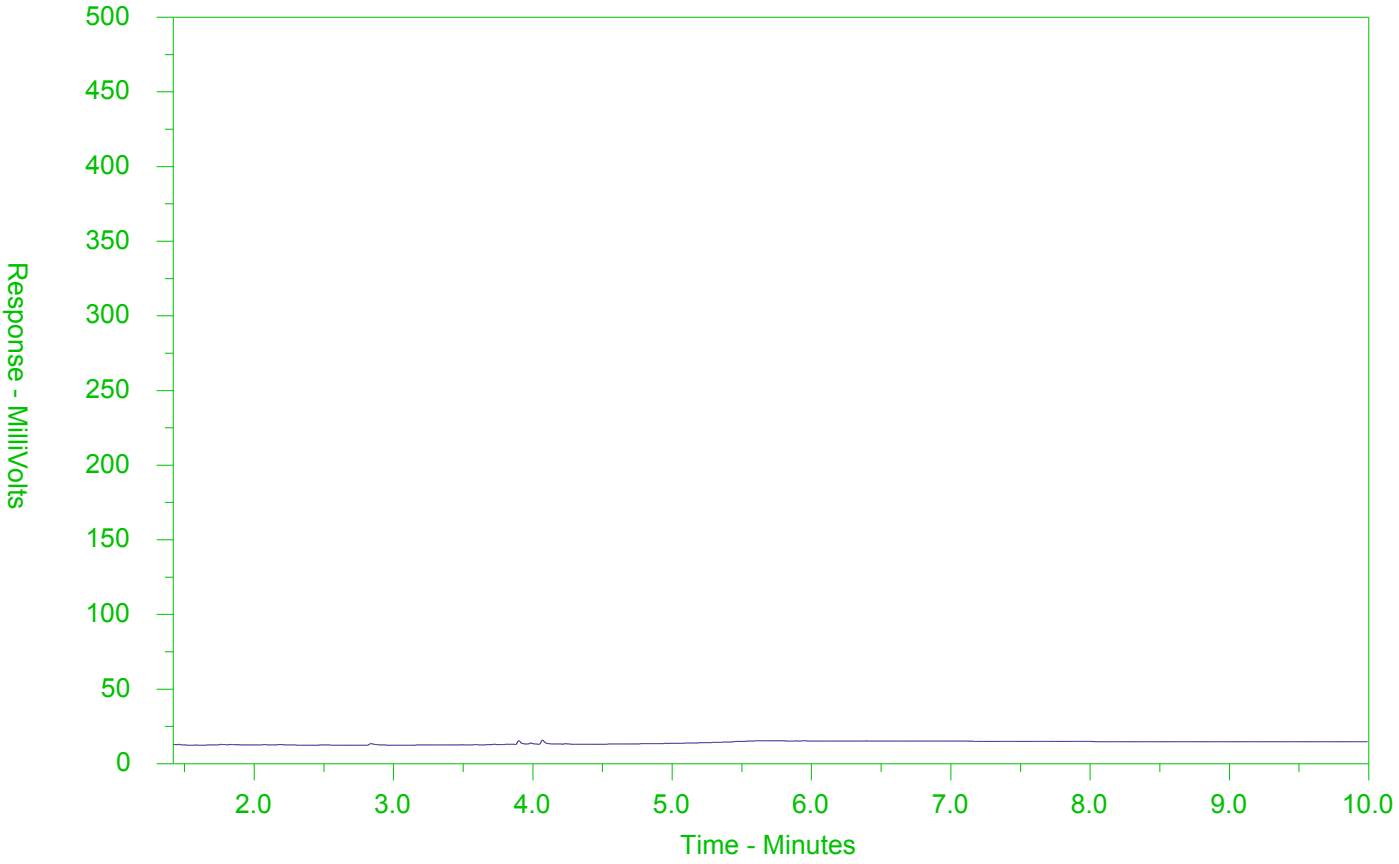
GLOSSARY OF REPORT TERMS

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: L2505947-1
Client Sample ID: ARV-2A



←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.

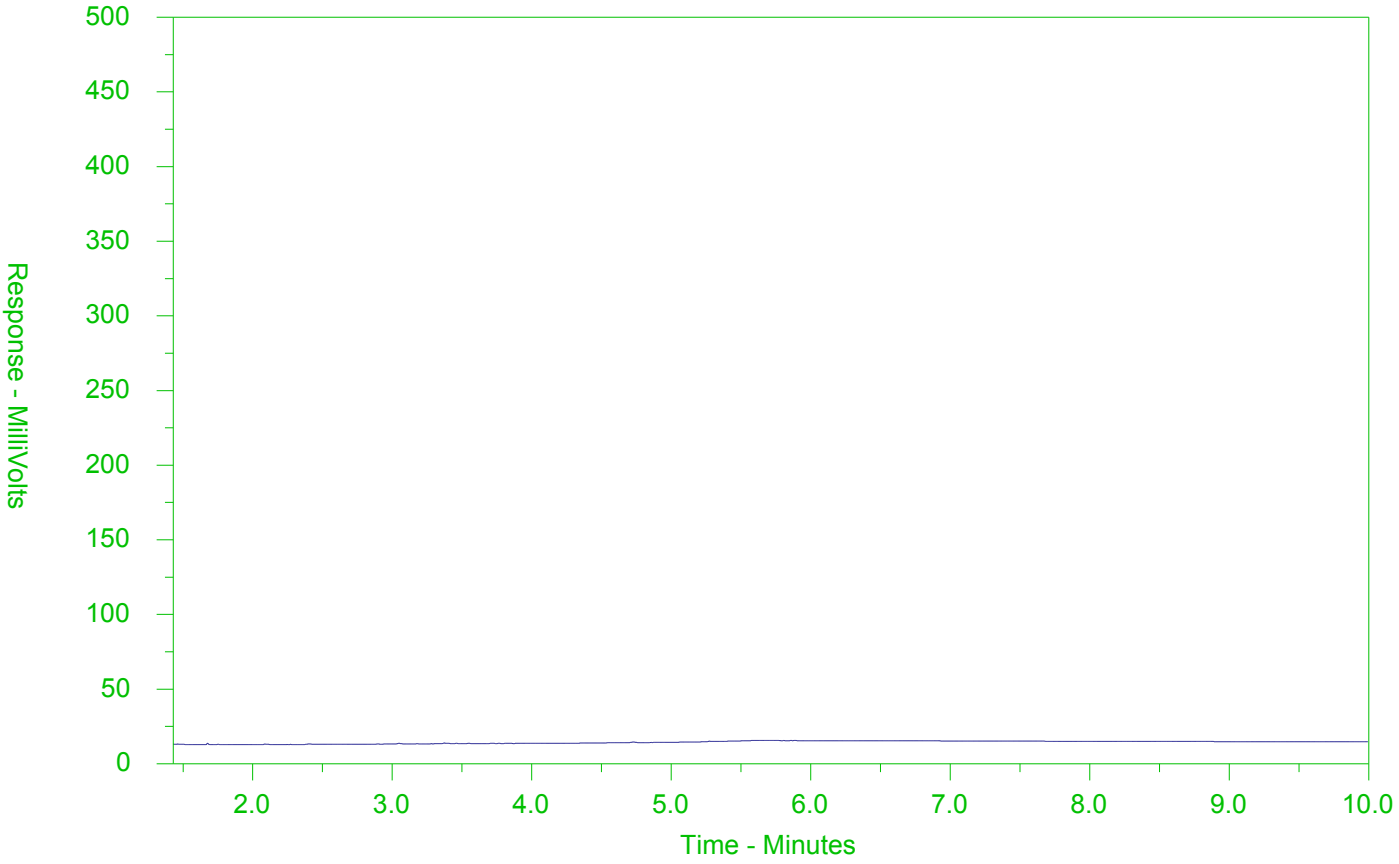
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

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: L2505947-3
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.

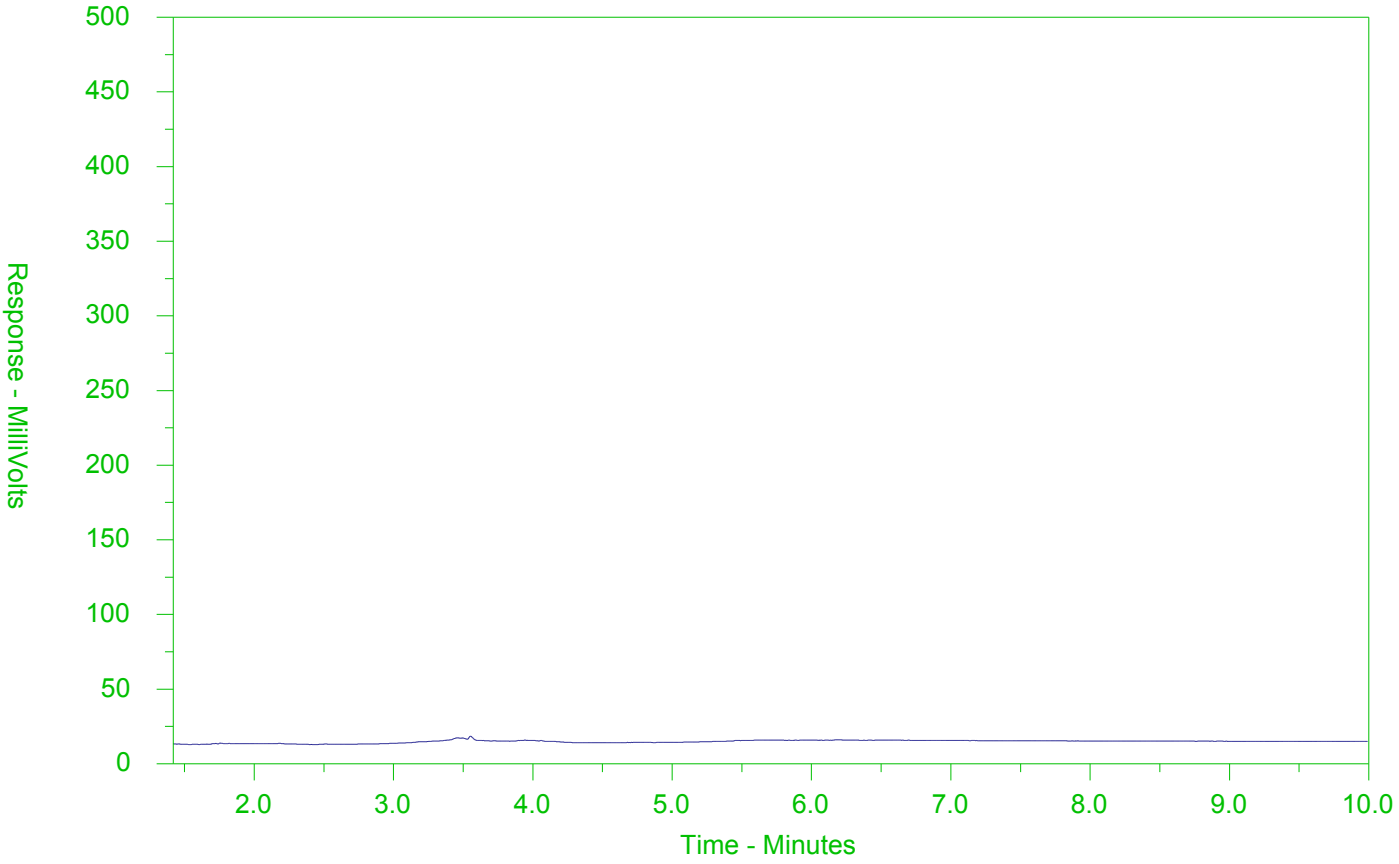
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

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: L2505947-4
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.

Chain of Custody (COC) / Analytical Request Form

ALS Environmental

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

L2505947-COFC

COC Number: 15 - L2505947

Page 1 of 1

Report To	Contact and company name below will appear on the final report
Company:	Hamlet of Arviat
Contact:	Laura Tassiuk
Phone:	867-857-2841
	Company address below will appear on the final report
Street:	PO Box 150
City/Province:	Arviat, NU
Postal Code:	X0C 0H0
Invoice To	Same as Report To ☑ YES ☐ NO
	Copy of Invoice with Report ☑ YES ☐ NO
Company:	
Contact:	

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

Project Information		Oil and Gas Required Fields (client use)	
ALS Account # / Quote #:	W10578	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:

Select Service Level Below - Please confirm all E&P TATs with your AM - surcharges will apply

Regular [R] ☑ Standard TAT if received by 3 pm - business days - no surcharges apply

PRIORITY (Business Days)		EMERGENCY	
4 day [P4]	☐	1 Business day [E1]	☐
3 day [P3]	☐	Same Day, Weekend or Statutory holiday [E0]	☐
2 day [P2]	☐		

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	BOD	Routine	CBOD	Total Metals	Total Mercury	Nutrients/Phenols (x2)	Bacteria	Oil & Grease (x2)	BTEX-F1 (x3)	F2-F4 (x2)	PAH (x2)			Number of Containers
	ARV-2a	Aug/20		Effluent	R	R	R	R	R	R	R	R	R	R	R			17
	ARV-4	Aug/20		Effluent	R	R	R	R	R	R	R	R						10
	ARV-5	Aug/20		Effluent	R	R	R	R	R	R	R	R	R	R	R			17
	ARV-6	Aug/20		Effluent	R	R	R	R	R	R	R	R	R	R	R			17

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

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐ SIF Observations Yes ☐ No ☐

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

Cooling Initiated ☐

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		
13.6					

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date:	Time:	Received by: AM	Date: 21/9/20	Time: 1510	Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

OCTOBER 2015 FRONT

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

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

Hamlet of Arviat
ATTN: LAURA TASSIUK
PO Box 150
Arviat NU X0C 0E0

Date Received: 21-SEP-20
Report Date: 01-OCT-20 12:40 (MT)
Version: FINAL

Client Phone: 867-857-2841

Certificate of Analysis

Lab Work Order #: L2505949

Project P.O. #: NOT SUBMITTED
Job Reference: ARVIAT - WASTE WATER (SEPT 2020)
C of C Numbers:
Legal Site Desc:

Comments: ADDITIONAL 23-SEP-20 12:18

Hua Wo
Chemistry Laboratory Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2505949-1 ARV-2A							
Sampled By: CLIENT on 17-SEP-20 @ 09:09							
Matrix: EFFLUENT							
BTEX							
BTX plus F1 by GCMS							
Benzene	<0.00050		0.00050	mg/L		25-SEP-20	R5242014
Toluene	<0.0010		0.0010	mg/L		25-SEP-20	R5242014
Ethyl benzene	<0.00050		0.00050	mg/L		25-SEP-20	R5242014
o-Xylene	<0.00050		0.00050	mg/L		25-SEP-20	R5242014
m+p-Xylenes	<0.00040		0.00040	mg/L		25-SEP-20	R5242014
F1 (C6-C10)	<0.10		0.10	mg/L		25-SEP-20	R5242014
Surrogate: 4-Bromofluorobenzene (SS)	72.9		70-130	%		25-SEP-20	R5242014
CCME Total Hydrocarbons							
F1-BTEX	<0.10		0.10	mg/L		30-SEP-20	
F2-Naphth	<0.10		0.10	mg/L		30-SEP-20	
F3-PAH	<0.25		0.25	mg/L		30-SEP-20	
Total Hydrocarbons (C6-C50)	<0.38		0.38	mg/L		30-SEP-20	
Sum of Xylene Isomer Concentrations							
Xylenes (Total)	<0.00064		0.00064	mg/L		30-SEP-20	
F2-F4 (O.Reg.153/04)							
F2 (C10-C16)	<100		100	ug/L	25-SEP-20	28-SEP-20	R5241403
F3 (C16-C34)	<250		250	ug/L	25-SEP-20	28-SEP-20	R5241403
F4 (C34-C50)	<250		250	ug/L	25-SEP-20	28-SEP-20	R5241403
Chrom. to baseline at nC50	YES				25-SEP-20	28-SEP-20	R5241403
Surrogate: 2-Bromobenzotrifluoride	89.4		60-140	%	25-SEP-20	28-SEP-20	R5241403
CCME PAHs in mg/L							
1-Methyl Naphthalene	<0.000020		0.000020	mg/L	25-SEP-20	30-SEP-20	R5242828
2-Methyl Naphthalene	<0.000020		0.000020	mg/L	25-SEP-20	30-SEP-20	R5242828
Acenaphthene	<0.000020		0.000020	mg/L	25-SEP-20	30-SEP-20	R5242828
Acenaphthylene	<0.000020		0.000020	mg/L	25-SEP-20	30-SEP-20	R5242828
Anthracene	<0.000010		0.000010	mg/L	25-SEP-20	30-SEP-20	R5242828
Acridine	<0.000020		0.000020	mg/L	25-SEP-20	30-SEP-20	R5242828
Benzo(a)anthracene	<0.000010		0.000010	mg/L	25-SEP-20	30-SEP-20	R5242828
Benzo(a)pyrene	<0.0000050		0.0000050	mg/L	25-SEP-20	30-SEP-20	R5242828
Benzo(b&j)fluoranthene	<0.000010		0.000010	mg/L	25-SEP-20	30-SEP-20	R5242828
Benzo(g,h,i)perylene	<0.000020		0.000020	mg/L	25-SEP-20	30-SEP-20	R5242828
Benzo(k)fluoranthene	<0.000010		0.000010	mg/L	25-SEP-20	30-SEP-20	R5242828
Chrysene	<0.000020		0.000020	mg/L	25-SEP-20	30-SEP-20	R5242828
Dibenzo(a,h)anthracene	<0.0000050		0.0000050	mg/L	25-SEP-20	30-SEP-20	R5242828
Fluoranthene	<0.000020		0.000020	mg/L	25-SEP-20	30-SEP-20	R5242828
Fluorene	<0.000020		0.000020	mg/L	25-SEP-20	30-SEP-20	R5242828
Indeno(1,2,3-cd)pyrene	<0.000010		0.000010	mg/L	25-SEP-20	30-SEP-20	R5242828
Naphthalene	<0.000050		0.000050	mg/L	25-SEP-20	30-SEP-20	R5242828
Phenanthrene	<0.000050		0.000050	mg/L	25-SEP-20	30-SEP-20	R5242828
Pyrene	<0.000010		0.000010	mg/L	25-SEP-20	30-SEP-20	R5242828
Quinoline	<0.000040	DLQ	0.000040	mg/L	25-SEP-20	30-SEP-20	R5242828
B(a)P Total Potency Equivalent	<0.000030		0.000030	mg/L	25-SEP-20	30-SEP-20	R5242828
Surrogate: d8-Naphthalene	74.4		50-150	%	25-SEP-20	30-SEP-20	R5242828
Surrogate: d10-Phenanthrene	100.7		50-150	%	25-SEP-20	30-SEP-20	R5242828
Surrogate: d12-Chrysene	89.4		50-150	%	25-SEP-20	30-SEP-20	R5242828
Surrogate: d10-Acenaphthene	89.1		50-150	%	25-SEP-20	30-SEP-20	R5242828
Surrogate: d9-Acridine (SS)	95.3		50-150	%	25-SEP-20	30-SEP-20	R5242828
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	483		1.2	mg/L		25-SEP-20	

* 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
L2505949-1 ARV-2A							
Sampled By: CLIENT on 17-SEP-20 @ 09:09							
Matrix: EFFLUENT							
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		25-SEP-20	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		25-SEP-20	
Alkalinity, Total (as CaCO3)							
Alkalinity, Total (as CaCO3)	396		1.0	mg/L		24-SEP-20	R5235789
Ammonia by colour							
Ammonia, Total (as N)	5.40		0.20	mg/L		25-SEP-20	R5241312
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	6.1		2.0	mg/L		24-SEP-20	R5242487
Carbonaceous BOD							
BOD Carbonaceous	7.7		2.0	mg/L		24-SEP-20	R5242487
Chloride in Water by IC							
Chloride (Cl)	415		10	mg/L		24-SEP-20	R5238110
Conductivity							
Conductivity	3030		1.0	umhos/cm		24-SEP-20	R5235789
Fecal coliforms, 1:10 dilution by QT97							
Fecal Coliforms	30	PEHR	10	MPN/100mL		23-SEP-20	R5234537
Hardness Calculated							
Hardness (as CaCO3)	1120	HTC	0.20	mg/L		28-SEP-20	
Mercury Total							
Mercury (Hg)-Total	0.0000080		0.0000050	mg/L	28-SEP-20	28-SEP-20	R5241670
Nitrate in Water by IC							
Nitrate (as N)	<0.40	DLM	0.40	mg/L		24-SEP-20	R5238110
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.45		0.45	mg/L		28-SEP-20	
Nitrite in Water by IC							
Nitrite (as N)	<0.20	DLM	0.20	mg/L		24-SEP-20	R5238110
Oil & Grease - Gravimetric							
Oil and Grease	<5.0		5.0	mg/L		29-SEP-20	R5242756
Phenol (4AAP)							
Phenols (4AAP)	0.0015		0.0010	mg/L		24-SEP-20	R5236019
Phosphorus, Total							
Phosphorus (P)-Total	0.327		0.0030	mg/L		28-SEP-20	R5241526
Sulfate in Water by IC							
Sulfate (SO4)	708		6.0	mg/L		24-SEP-20	R5238110
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.0116		0.0030	mg/L	25-SEP-20	25-SEP-20	R5240019
Arsenic (As)-Total	0.00358		0.00010	mg/L	25-SEP-20	25-SEP-20	R5240019
Cadmium (Cd)-Total	0.0000190		0.0000050	mg/L	25-SEP-20	25-SEP-20	R5240019
Calcium (Ca)-Total	318		0.050	mg/L	25-SEP-20	25-SEP-20	R5240019
Chromium (Cr)-Total	0.00060		0.00010	mg/L	25-SEP-20	25-SEP-20	R5240019
Cobalt (Co)-Total	0.00083		0.00010	mg/L	25-SEP-20	25-SEP-20	R5240019
Copper (Cu)-Total	0.00949		0.00050	mg/L	25-SEP-20	25-SEP-20	R5240019
Iron (Fe)-Total	0.742		0.010	mg/L	25-SEP-20	25-SEP-20	R5240019
Lead (Pb)-Total	0.000650		0.000050	mg/L	25-SEP-20	25-SEP-20	R5240019
Magnesium (Mg)-Total	78.4		0.0050	mg/L	25-SEP-20	25-SEP-20	R5240019
Manganese (Mn)-Total	0.708		0.00010	mg/L	25-SEP-20	25-SEP-20	R5240019
Nickel (Ni)-Total	0.00669		0.00050	mg/L	25-SEP-20	25-SEP-20	R5240019
Potassium (K)-Total	59.1		0.050	mg/L	25-SEP-20	25-SEP-20	R5240019
Sodium (Na)-Total	301		0.050	mg/L	25-SEP-20	25-SEP-20	R5240019
Zinc (Zn)-Total	0.0098		0.0030	mg/L	25-SEP-20	25-SEP-20	R5240019
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
L2505949-1 ARV-2A							
Sampled By: CLIENT on 17-SEP-20 @ 09:09							
Matrix: EFFLUENT							
Total Organic Carbon by Combustion							
Total Organic Carbon	28		10	mg/L		24-SEP-20	R5237222
Total Suspended Solids							
Total Suspended Solids	14.9		3.0	mg/L		24-SEP-20	R5236461
pH							
pH	8.04		0.10	pH units		24-SEP-20	R5235789
L2505949-2 ARV-4							
Sampled By: CLIENT on 17-SEP-20 @ 08:48							
Matrix: EFFLUENT							
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	180		1.2	mg/L		25-SEP-20	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		25-SEP-20	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		25-SEP-20	
Alkalinity, Total (as CaCO3)							
Alkalinity, Total (as CaCO3)	147		1.0	mg/L		24-SEP-20	R5235789
Ammonia by colour							
Ammonia, Total (as N)	9.20		0.20	mg/L		25-SEP-20	R5241312
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	> 140		6.0	mg/L		24-SEP-20	R5242487
Carbonaceous BOD							
BOD Carbonaceous	26		20	mg/L		24-SEP-20	R5242487
Chloride in Water by IC							
Chloride (Cl)	133		0.50	mg/L		24-SEP-20	R5238110
Conductivity							
Conductivity	757		1.0	umhos/cm		24-SEP-20	R5235789
Fecal coliforms, 1:10 dilution by QT97							
Fecal Coliforms	1380	PEHR	10	MPN/100mL		23-SEP-20	R5234537
Hardness Calculated							
Hardness (as CaCO3)	89.4	HTC	0.20	mg/L		28-SEP-20	
Mercury Total							
Mercury (Hg)-Total	0.0000070		0.0000050	mg/L	28-SEP-20	28-SEP-20	R5241670
Nitrate in Water by IC							
Nitrate (as N)	0.367		0.020	mg/L		24-SEP-20	R5238110
Nitrate+Nitrite							
Nitrate and Nitrite as N	0.622		0.070	mg/L		28-SEP-20	
Nitrite in Water by IC							
Nitrite (as N)	0.255		0.010	mg/L		24-SEP-20	R5238110
Oil & Grease - Gravimetric							
Oil and Grease	<5.0		5.0	mg/L		29-SEP-20	R5242756
Phenol (4AAP)							
Phenols (4AAP)	0.0404	DLM	0.0050	mg/L		24-SEP-20	R5236019
Phosphorus, Total							
Phosphorus (P)-Total	5.97		0.030	mg/L		28-SEP-20	R5241526
Sulfate in Water by IC							
Sulfate (SO4)	12.2		0.30	mg/L		24-SEP-20	R5238110
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.137		0.0030	mg/L	25-SEP-20	25-SEP-20	R5240019
Arsenic (As)-Total	0.00678		0.00010	mg/L	25-SEP-20	25-SEP-20	R5240019
Cadmium (Cd)-Total	0.0000507		0.0000050	mg/L	25-SEP-20	25-SEP-20	R5240019

* 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
L2505949-2 ARV-4							
Sampled By: CLIENT on 17-SEP-20 @ 08:48							
Matrix: EFFLUENT							
Total Metals in Water by CRC ICPMS							
Calcium (Ca)-Total	15.4		0.050	mg/L	25-SEP-20	25-SEP-20	R5240019
Chromium (Cr)-Total	0.00119		0.00010	mg/L	25-SEP-20	25-SEP-20	R5240019
Cobalt (Co)-Total	0.00129		0.00010	mg/L	25-SEP-20	25-SEP-20	R5240019
Copper (Cu)-Total	0.0226		0.00050	mg/L	25-SEP-20	25-SEP-20	R5240019
Iron (Fe)-Total	2.09		0.010	mg/L	25-SEP-20	25-SEP-20	R5240019
Lead (Pb)-Total	0.00108		0.000050	mg/L	25-SEP-20	25-SEP-20	R5240019
Magnesium (Mg)-Total	12.4		0.0050	mg/L	25-SEP-20	25-SEP-20	R5240019
Manganese (Mn)-Total	0.202		0.00010	mg/L	25-SEP-20	25-SEP-20	R5240019
Nickel (Ni)-Total	0.00550		0.00050	mg/L	25-SEP-20	25-SEP-20	R5240019
Potassium (K)-Total	25.0		0.050	mg/L	25-SEP-20	25-SEP-20	R5240019
Sodium (Na)-Total	101		0.050	mg/L	25-SEP-20	25-SEP-20	R5240019
Zinc (Zn)-Total	0.0252		0.0030	mg/L	25-SEP-20	25-SEP-20	R5240019
Total Organic Carbon by Combustion							
Total Organic Carbon	127		10	mg/L		25-SEP-20	R5241321
Total Suspended Solids							
Total Suspended Solids	208		3.0	mg/L		24-SEP-20	R5236461
pH							
pH	8.01		0.10	pH units		24-SEP-20	R5235789
L2505949-3 ARV-5							
Sampled By: CLIENT on 17-SEP-20 @ 09:27							
Matrix: EFFLUENT							
BTEX							
BTX plus F1 by GCMS							
Benzene	<0.00050		0.00050	mg/L		25-SEP-20	R5242014
Toluene	<0.0010		0.0010	mg/L		25-SEP-20	R5242014
Ethyl benzene	<0.00050		0.00050	mg/L		25-SEP-20	R5242014
o-Xylene	<0.00050		0.00050	mg/L		25-SEP-20	R5242014
m+p-Xylenes	<0.00040		0.00040	mg/L		25-SEP-20	R5242014
F1 (C6-C10)	<0.10		0.10	mg/L		25-SEP-20	R5242014
Surrogate: 4-Bromofluorobenzene (SS)	72.9		70-130	%		25-SEP-20	R5242014
CCME Total Hydrocarbons							
F1-BTEX	<0.10		0.10	mg/L		30-SEP-20	
F2-Naphth	<0.10		0.10	mg/L		30-SEP-20	
F3-PAH	<0.25		0.25	mg/L		30-SEP-20	
Total Hydrocarbons (C6-C50)	<0.38		0.38	mg/L		30-SEP-20	
Sum of Xylene Isomer Concentrations							
Xylenes (Total)	<0.00064		0.00064	mg/L		30-SEP-20	
F2-F4 (O.Reg.153/04)							
F2 (C10-C16)	<100		100	ug/L	25-SEP-20	28-SEP-20	R5241403
F3 (C16-C34)	<250		250	ug/L	25-SEP-20	28-SEP-20	R5241403
F4 (C34-C50)	<250		250	ug/L	25-SEP-20	28-SEP-20	R5241403
Chrom. to baseline at nC50	YES				25-SEP-20	28-SEP-20	R5241403
Surrogate: 2-Bromobenzotrifluoride	88.4		60-140	%	25-SEP-20	28-SEP-20	R5241403
CCME PAHs in mg/L							
1-Methyl Naphthalene	<0.000020		0.000020	mg/L	25-SEP-20	30-SEP-20	R5242828
2-Methyl Naphthalene	<0.000020		0.000020	mg/L	25-SEP-20	30-SEP-20	R5242828
Acenaphthene	<0.000020		0.000020	mg/L	25-SEP-20	30-SEP-20	R5242828
Acenaphthylene	<0.000020		0.000020	mg/L	25-SEP-20	30-SEP-20	R5242828
Anthracene	<0.000010		0.000010	mg/L	25-SEP-20	30-SEP-20	R5242828
Acridine	<0.000020		0.000020	mg/L	25-SEP-20	30-SEP-20	R5242828

* 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
L2505949-3 ARV-5							
Sampled By: CLIENT on 17-SEP-20 @ 09:27							
Matrix: EFFLUENT							
CCME PAHs in mg/L							
Benzo(a)anthracene	<0.000010		0.000010	mg/L	25-SEP-20	30-SEP-20	R5242828
Benzo(a)pyrene	<0.0000050		0.0000050	mg/L	25-SEP-20	30-SEP-20	R5242828
Benzo(b&j)fluoranthene	<0.000010		0.000010	mg/L	25-SEP-20	30-SEP-20	R5242828
Benzo(g,h,i)perylene	<0.000020		0.000020	mg/L	25-SEP-20	30-SEP-20	R5242828
Benzo(k)fluoranthene	<0.000010		0.000010	mg/L	25-SEP-20	30-SEP-20	R5242828
Chrysene	<0.000020		0.000020	mg/L	25-SEP-20	30-SEP-20	R5242828
Dibenzo(a,h)anthracene	<0.0000050		0.0000050	mg/L	25-SEP-20	30-SEP-20	R5242828
Fluoranthene	<0.000020		0.000020	mg/L	25-SEP-20	30-SEP-20	R5242828
Fluorene	<0.000020		0.000020	mg/L	25-SEP-20	30-SEP-20	R5242828
Indeno(1,2,3-cd)pyrene	<0.000010		0.000010	mg/L	25-SEP-20	30-SEP-20	R5242828
Naphthalene	<0.000050		0.000050	mg/L	25-SEP-20	30-SEP-20	R5242828
Phenanthrene	<0.000050		0.000050	mg/L	25-SEP-20	30-SEP-20	R5242828
Pyrene	<0.000010		0.000010	mg/L	25-SEP-20	30-SEP-20	R5242828
Quinoline	<0.000020		0.000020	mg/L	25-SEP-20	30-SEP-20	R5242828
B(a)P Total Potency Equivalent	<0.000030		0.000030	mg/L	25-SEP-20	30-SEP-20	R5242828
Surrogate: d8-Naphthalene	102.2		50-150	%	25-SEP-20	30-SEP-20	R5242828
Surrogate: d10-Phenanthrene	97.7		50-150	%	25-SEP-20	30-SEP-20	R5242828
Surrogate: d12-Chrysene	84.7		50-150	%	25-SEP-20	30-SEP-20	R5242828
Surrogate: d10-Acenaphthene	90.7		50-150	%	25-SEP-20	30-SEP-20	R5242828
Surrogate: d9-Acridine (SS)	87.2		50-150	%	25-SEP-20	30-SEP-20	R5242828
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	58.3		1.2	mg/L		25-SEP-20	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		25-SEP-20	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		25-SEP-20	
Alkalinity, Total (as CaCO3)							
Alkalinity, Total (as CaCO3)	47.8		1.0	mg/L		24-SEP-20	R5235789
Ammonia by colour							
Ammonia, Total (as N)	0.018		0.010	mg/L		25-SEP-20	R5241312
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	<2.0		2.0	mg/L		24-SEP-20	R5242487
Carbonaceous BOD							
BOD Carbonaceous	2.0		2.0	mg/L		24-SEP-20	R5242487
Chloride in Water by IC							
Chloride (Cl)	359		1.0	mg/L		24-SEP-20	R5238110
Conductivity							
Conductivity	1280		1.0	umhos/cm		24-SEP-20	R5235789
Fecal coliforms, 1:10 dilution by QT97							
Fecal Coliforms	10	PEHR	10	MPN/100mL		23-SEP-20	R5234537
Hardness Calculated							
Hardness (as CaCO3)	188	HTC	0.20	mg/L		28-SEP-20	
Mercury Total							
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L	28-SEP-20	28-SEP-20	R5241670
Nitrate in Water by IC							
Nitrate (as N)	<0.040	DLM	0.040	mg/L		24-SEP-20	R5238110
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		28-SEP-20	
Nitrite in Water by IC							
Nitrite (as N)	<0.020	DLM	0.020	mg/L		24-SEP-20	R5238110
Oil & Grease - Gravimetric							

* 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
L2505949-3 ARV-5							
Sampled By: CLIENT on 17-SEP-20 @ 09:27							
Matrix: EFFLUENT							
Oil & Grease - Gravimetric							
Oil and Grease	<5.0		5.0	mg/L		29-SEP-20	R5242756
Phenol (4AAP)							
Phenols (4AAP)	<0.0010		0.0010	mg/L		24-SEP-20	R5236019
Phosphorus, Total							
Phosphorus (P)-Total	0.0134		0.0030	mg/L		28-SEP-20	R5241526
Sulfate in Water by IC							
Sulfate (SO4)	8.82		0.60	mg/L		24-SEP-20	R5238110
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.0132		0.0030	mg/L	25-SEP-20	25-SEP-20	R5240019
Arsenic (As)-Total	0.00041		0.00010	mg/L	25-SEP-20	25-SEP-20	R5240019
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L	25-SEP-20	25-SEP-20	R5240019
Calcium (Ca)-Total	27.6		0.050	mg/L	25-SEP-20	25-SEP-20	R5240019
Chromium (Cr)-Total	0.00021		0.00010	mg/L	25-SEP-20	25-SEP-20	R5240019
Cobalt (Co)-Total	0.00013		0.00010	mg/L	25-SEP-20	25-SEP-20	R5240019
Copper (Cu)-Total	<0.00050		0.00050	mg/L	25-SEP-20	25-SEP-20	R5240019
Iron (Fe)-Total	1.28		0.010	mg/L	25-SEP-20	25-SEP-20	R5240019
Lead (Pb)-Total	<0.000050		0.000050	mg/L	25-SEP-20	25-SEP-20	R5240019
Magnesium (Mg)-Total	28.8		0.0050	mg/L	25-SEP-20	25-SEP-20	R5240019
Manganese (Mn)-Total	0.0735		0.00010	mg/L	25-SEP-20	25-SEP-20	R5240019
Nickel (Ni)-Total	<0.00050		0.00050	mg/L	25-SEP-20	25-SEP-20	R5240019
Potassium (K)-Total	7.42		0.050	mg/L	25-SEP-20	25-SEP-20	R5240019
Sodium (Na)-Total	167		0.050	mg/L	25-SEP-20	25-SEP-20	R5240019
Zinc (Zn)-Total	0.0120		0.0030	mg/L	25-SEP-20	25-SEP-20	R5240019
Total Organic Carbon by Combustion							
Total Organic Carbon	6.97		0.50	mg/L		24-SEP-20	R5237222
Total Suspended Solids							
Total Suspended Solids	70.7		3.0	mg/L		24-SEP-20	R5236461
pH							
pH	7.46		0.10	pH units		24-SEP-20	R5235789
L2505949-4 ARV-6							
Sampled By: CLIENT on 17-SEP-20 @ 09:52							
Matrix: EFFLUENT							
BTEX							
BTX plus F1 by GCMS							
Benzene	<0.00050		0.00050	mg/L		25-SEP-20	R5242014
Toluene	<0.0010		0.0010	mg/L		25-SEP-20	R5242014
Ethyl benzene	<0.00050		0.00050	mg/L		25-SEP-20	R5242014
o-Xylene	<0.00050		0.00050	mg/L		25-SEP-20	R5242014
m+p-Xylenes	<0.00040		0.00040	mg/L		25-SEP-20	R5242014
F1 (C6-C10)	<0.10		0.10	mg/L		25-SEP-20	R5242014
Surrogate: 4-Bromofluorobenzene (SS)	73.3		70-130	%		25-SEP-20	R5242014
CCME Total Hydrocarbons							
F1-BTEX	<0.10		0.10	mg/L		30-SEP-20	
F2-Naphth	<0.10		0.10	mg/L		30-SEP-20	
F3-PAH	<0.25		0.25	mg/L		30-SEP-20	
Total Hydrocarbons (C6-C50)	<0.38		0.38	mg/L		30-SEP-20	
Sum of Xylene Isomer Concentrations							
Xylenes (Total)	<0.00064		0.00064	mg/L		30-SEP-20	
F2-F4 (O.Reg.153/04)							
F2 (C10-C16)	<100		100	ug/L	25-SEP-20	28-SEP-20	R5241403

* 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
L2505949-4 ARV-6							
Sampled By: CLIENT on 17-SEP-20 @ 09:52							
Matrix: EFFLUENT							
F2-F4 (O.Reg.153/04)							
F3 (C16-C34)	<250		250	ug/L	25-SEP-20	28-SEP-20	R5241403
F4 (C34-C50)	<250		250	ug/L	25-SEP-20	28-SEP-20	R5241403
Chrom. to baseline at nC50	YES				25-SEP-20	28-SEP-20	R5241403
Surrogate: 2-Bromobenzotrifluoride	86.4		60-140	%	25-SEP-20	28-SEP-20	R5241403
CCME PAHs in mg/L							
1-Methyl Naphthalene	<0.000020		0.000020	mg/L	25-SEP-20	30-SEP-20	R5242828
2-Methyl Naphthalene	<0.000020		0.000020	mg/L	25-SEP-20	30-SEP-20	R5242828
Acenaphthene	<0.000020		0.000020	mg/L	25-SEP-20	30-SEP-20	R5242828
Acenaphthylene	<0.000020		0.000020	mg/L	25-SEP-20	30-SEP-20	R5242828
Anthracene	<0.000010		0.000010	mg/L	25-SEP-20	30-SEP-20	R5242828
Acridine	<0.000020		0.000020	mg/L	25-SEP-20	30-SEP-20	R5242828
Benzo(a)anthracene	<0.000010		0.000010	mg/L	25-SEP-20	30-SEP-20	R5242828
Benzo(a)pyrene	<0.0000050		0.0000050	mg/L	25-SEP-20	30-SEP-20	R5242828
Benzo(b&j)fluoranthene	<0.000010		0.000010	mg/L	25-SEP-20	30-SEP-20	R5242828
Benzo(g,h,i)perylene	<0.000020		0.000020	mg/L	25-SEP-20	30-SEP-20	R5242828
Benzo(k)fluoranthene	<0.000010		0.000010	mg/L	25-SEP-20	30-SEP-20	R5242828
Chrysene	<0.000020		0.000020	mg/L	25-SEP-20	30-SEP-20	R5242828
Dibenzo(a,h)anthracene	<0.0000050		0.0000050	mg/L	25-SEP-20	30-SEP-20	R5242828
Fluoranthene	<0.000020		0.000020	mg/L	25-SEP-20	30-SEP-20	R5242828
Fluorene	<0.000020		0.000020	mg/L	25-SEP-20	30-SEP-20	R5242828
Indeno(1,2,3-cd)pyrene	<0.000010		0.000010	mg/L	25-SEP-20	30-SEP-20	R5242828
Naphthalene	<0.000050		0.000050	mg/L	25-SEP-20	30-SEP-20	R5242828
Phenanthrene	<0.000050		0.000050	mg/L	25-SEP-20	30-SEP-20	R5242828
Pyrene	<0.000010		0.000010	mg/L	25-SEP-20	30-SEP-20	R5242828
Quinoline	<0.000030	DLQ	0.000030	mg/L	25-SEP-20	30-SEP-20	R5242828
B(a)P Total Potency Equivalent	<0.000030		0.000030	mg/L	25-SEP-20	30-SEP-20	R5242828
Surrogate: d8-Naphthalene	108.0		50-150	%	25-SEP-20	30-SEP-20	R5242828
Surrogate: d10-Phenanthrene	104.4		50-150	%	25-SEP-20	30-SEP-20	R5242828
Surrogate: d12-Chrysene	89.3		50-150	%	25-SEP-20	30-SEP-20	R5242828
Surrogate: d10-Acenaphthene	98.0		50-150	%	25-SEP-20	30-SEP-20	R5242828
Surrogate: d9-Acridine (SS)	94.2		50-150	%	25-SEP-20	30-SEP-20	R5242828
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	101		1.2	mg/L		25-SEP-20	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		25-SEP-20	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		25-SEP-20	
Alkalinity, Total (as CaCO3)							
Alkalinity, Total (as CaCO3)	82.9		1.0	mg/L		24-SEP-20	R5235789
Ammonia by colour							
Ammonia, Total (as N)	0.102		0.010	mg/L		25-SEP-20	R5241312
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	<2.0		2.0	mg/L		24-SEP-20	R5242487
Carbonaceous BOD							
BOD Carbonaceous	<2.0		2.0	mg/L		24-SEP-20	R5242487
Chloride in Water by IC							
Chloride (Cl)	122		0.50	mg/L		24-SEP-20	R5238110
Conductivity							
Conductivity	560		1.0	umhos/cm		24-SEP-20	R5235789
Fecal coliforms, 1:10 dilution by QT97							
Fecal Coliforms	<10	PEHR	10	MPN/100mL		23-SEP-20	R5234537

* 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
L2505949-4 ARV-6							
Sampled By: CLIENT on 17-SEP-20 @ 09:52							
Matrix: EFFLUENT							
Hardness Calculated							
Hardness (as CaCO3)	123	HTC	0.20	mg/L		28-SEP-20	
Mercury Total							
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L	28-SEP-20	28-SEP-20	R5241670
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		24-SEP-20	R5238110
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		28-SEP-20	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		24-SEP-20	R5238110
Oil & Grease - Gravimetric							
Oil and Grease	<5.0		5.0	mg/L		29-SEP-20	R5242756
Phenol (4AAP)							
Phenols (4AAP)	<0.0010		0.0010	mg/L		24-SEP-20	R5236019
Phosphorus, Total							
Phosphorus (P)-Total	0.0428		0.0030	mg/L		28-SEP-20	R5241526
Sulfate in Water by IC							
Sulfate (SO4)	0.87		0.30	mg/L		24-SEP-20	R5238110
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.291		0.0030	mg/L	25-SEP-20	25-SEP-20	R5240019
Arsenic (As)-Total	0.00054		0.00010	mg/L	25-SEP-20	25-SEP-20	R5240019
Cadmium (Cd)-Total	0.0000119		0.0000050	mg/L	25-SEP-20	25-SEP-20	R5240019
Calcium (Ca)-Total	31.9		0.050	mg/L	25-SEP-20	25-SEP-20	R5240019
Chromium (Cr)-Total	0.00090		0.00010	mg/L	25-SEP-20	25-SEP-20	R5240019
Cobalt (Co)-Total	0.00083		0.00010	mg/L	25-SEP-20	25-SEP-20	R5240019
Copper (Cu)-Total	0.00133		0.00050	mg/L	25-SEP-20	25-SEP-20	R5240019
Iron (Fe)-Total	8.43		0.010	mg/L	25-SEP-20	25-SEP-20	R5240019
Lead (Pb)-Total	0.000484		0.000050	mg/L	25-SEP-20	25-SEP-20	R5240019
Magnesium (Mg)-Total	10.5		0.0050	mg/L	25-SEP-20	25-SEP-20	R5240019
Manganese (Mn)-Total	0.853		0.00010	mg/L	25-SEP-20	25-SEP-20	R5240019
Nickel (Ni)-Total	0.00112		0.00050	mg/L	25-SEP-20	25-SEP-20	R5240019
Potassium (K)-Total	5.16		0.050	mg/L	25-SEP-20	25-SEP-20	R5240019
Sodium (Na)-Total	58.8		0.050	mg/L	25-SEP-20	25-SEP-20	R5240019
Zinc (Zn)-Total	0.0709		0.0030	mg/L	25-SEP-20	25-SEP-20	R5240019
Total Organic Carbon by Combustion							
Total Organic Carbon	7.21		0.50	mg/L		24-SEP-20	R5237222
Total Suspended Solids							
Total Suspended Solids	29.3		3.0	mg/L		24-SEP-20	R5236461
pH							
pH	7.55		0.10	pH units		24-SEP-20	R5235789

* 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).
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
PEHR	Parameter Exceeded Recommended Holding Time On Receipt: Proceed With Analysis As Requested.

Test Method References:

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

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

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

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

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

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

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

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

BOD-CBOD-WP	Water	Carbonaceous BOD	APHA 5210 B

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

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

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

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

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

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

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

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

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

EC-WP	Water	Conductivity	APHA 2510B

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

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

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

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

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

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**

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

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

F2-F4-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.

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

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

Reference Information

Test Method References:

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

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

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

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

Chain of Custody Numbers:

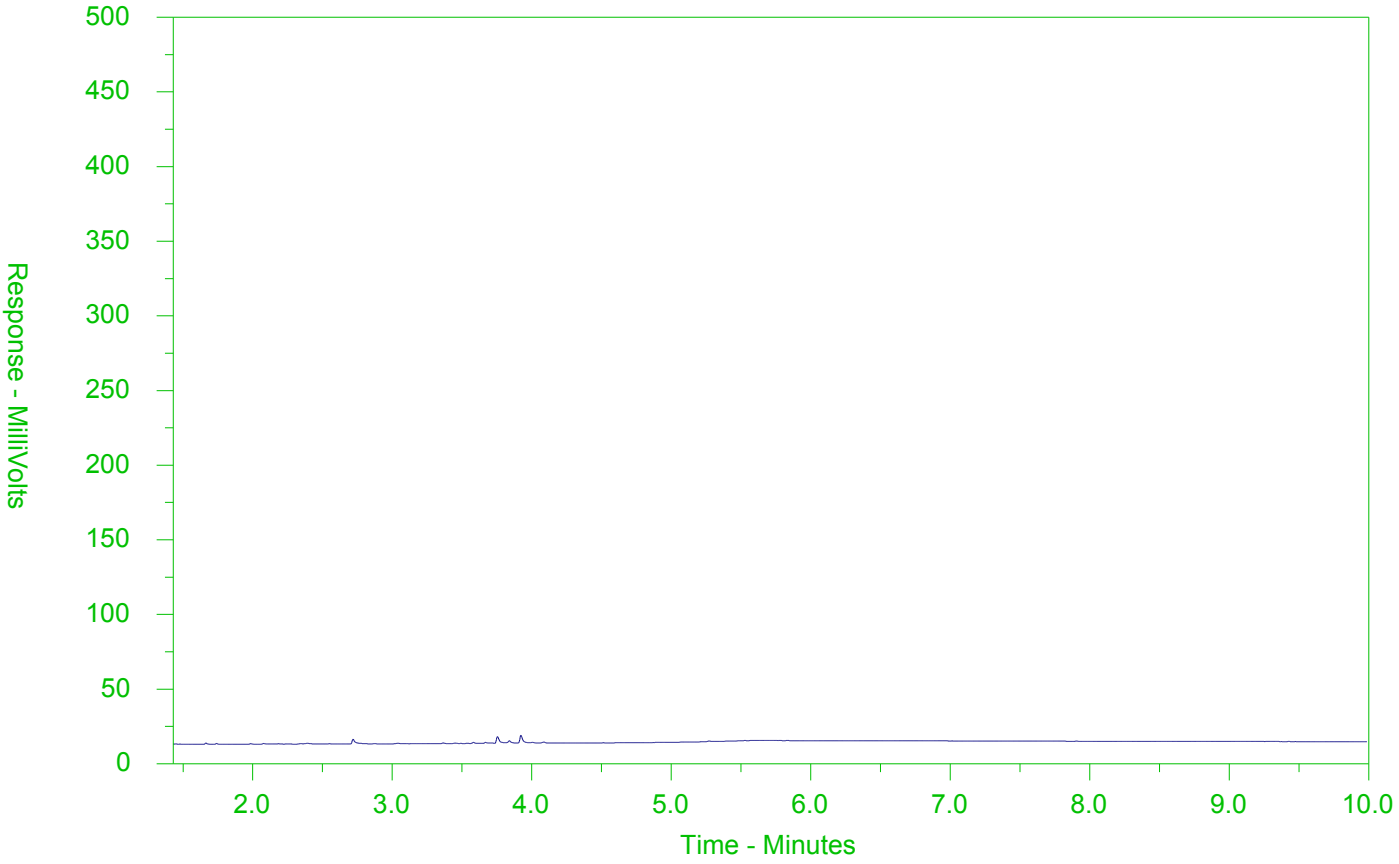
GLOSSARY OF REPORT TERMS

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

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

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L2505949-1
Client Sample ID: ARV-2A



←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.

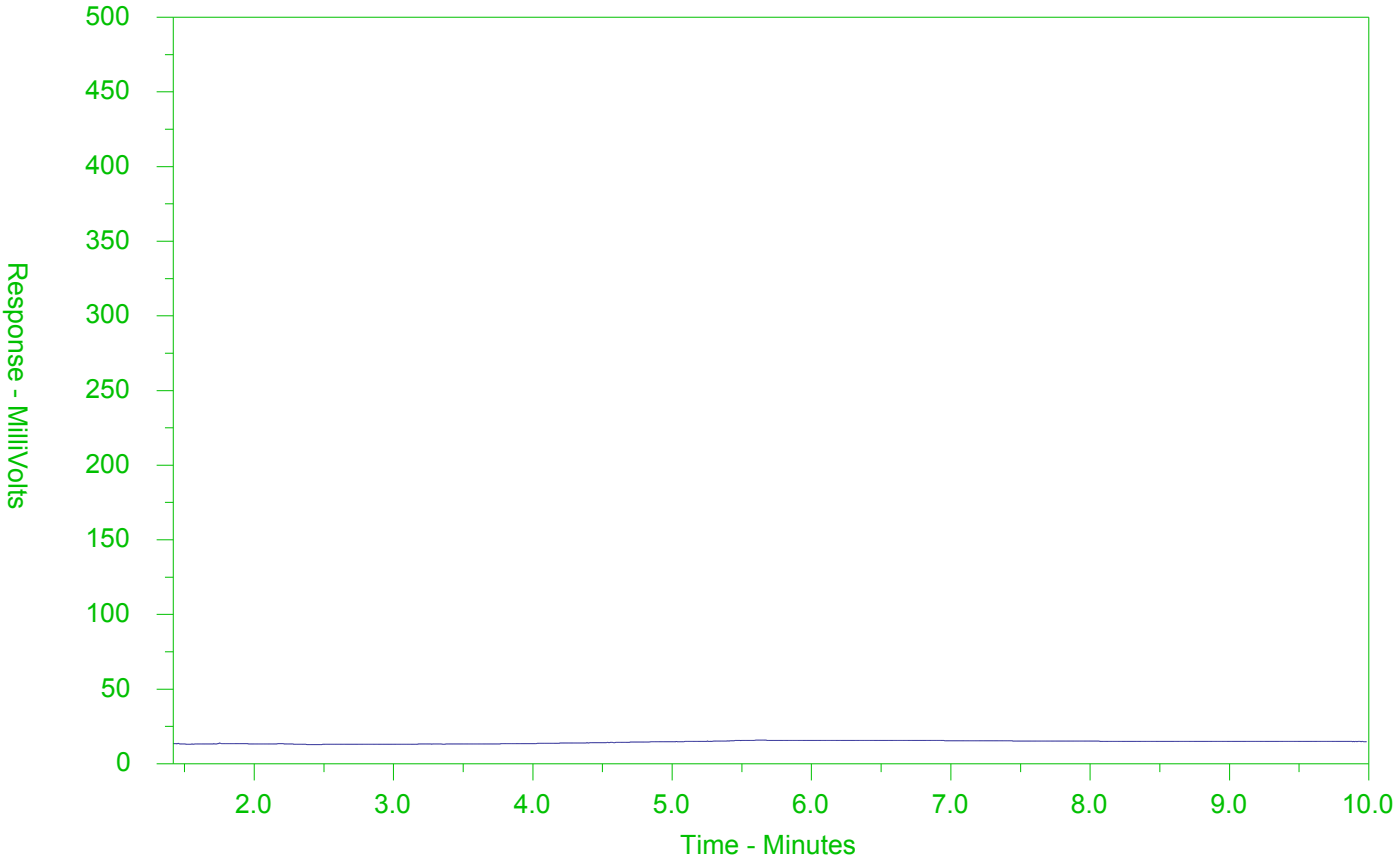
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

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: L2505949-3
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.

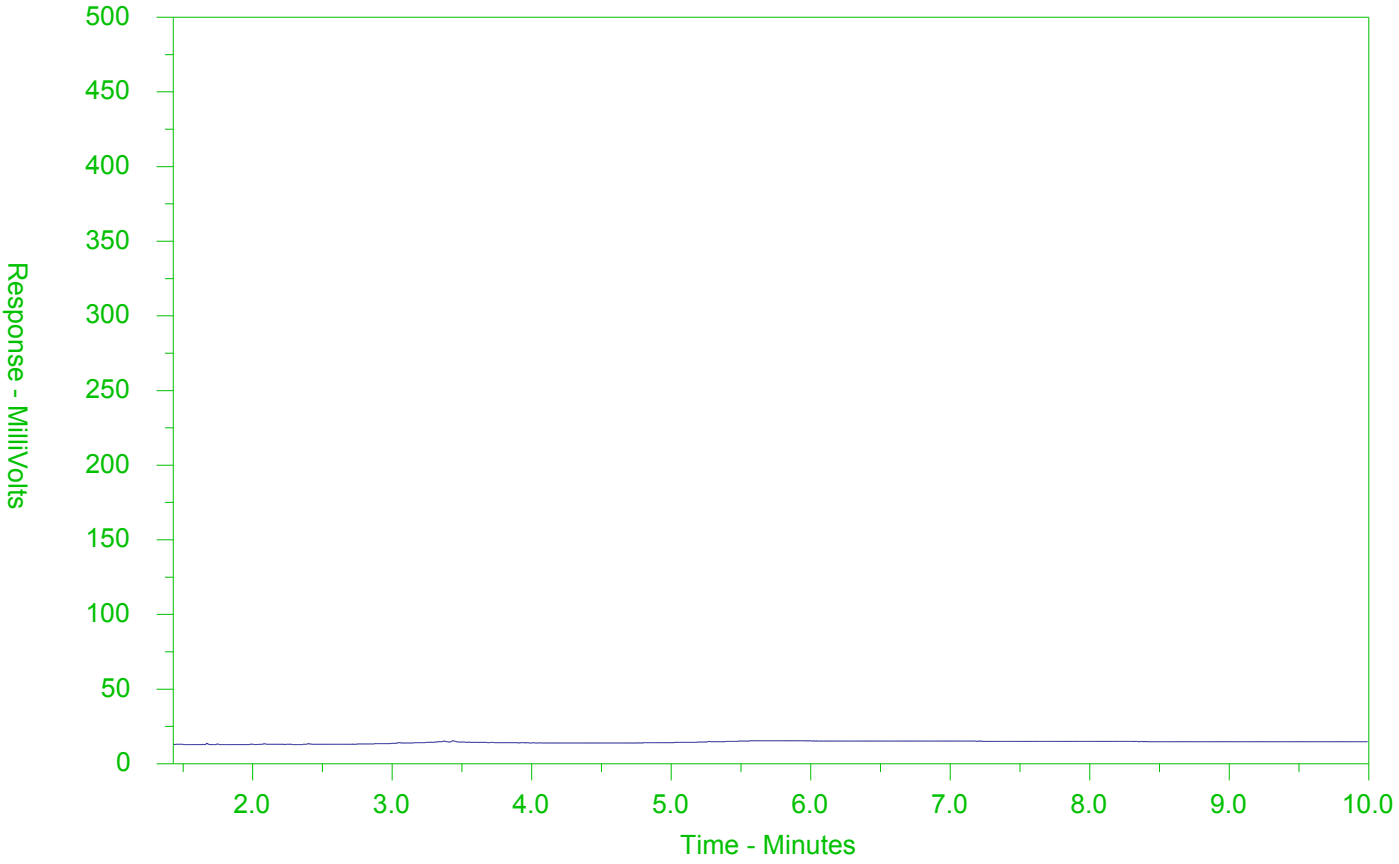
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

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: L2505949-4
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.

Sept 17/20

Chain of Custody (COC) / Analytical Request Form

ALS Environmental

Canada Toll Free: 1 800 668 9878

www.alsglobal.com

L2505949-COFC

COC Number: 15 - L2505949

Page 1 of 1

Report To	Contact and company name below will appear on the final report	Report Format / Distribution		Turnaround Time (TAT) Requested
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:	Laura Tassiuk	Quality Control (QC) Report with Report	☐ YES ☐ NO	PRIORITY (Business Days): 4 day [P4] ☐ / 3 day [P3] ☐ / 2 day [P2] ☐
Phone:	867-857-2841	☐ Compare Results to Criteria on Report - provide details below if box checked		EMERGENCY: 1 Business day [E1] ☐ / Same Day, Weekend or Statutory holiday [E0] ☐
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:	PO Box 150	Email 1 or Fax	waterclerk@arviat.ca	For tests that can not be performed according to the service level selected, you will be contacted.
City/Province:	Arviat, NU	Email 2	cfaulkner@gov.nu.ca	
Postal Code:	~~X0C 0H0~~ X0C-0E0	Email 3	scollins@gov.nu.ca	
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 #:	W10578	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	BOD	Routine	CBOD	Total Metals	Total Mercury	Nutrients/Phenols (x2)	Bacteria	Oil & Grease (x2)	BTEX-F1 (x3)	F2-F4 (x2)	PAH (x2)			Number of Containers
	ARV-2a	17/09/20	9:09am	Effluent	R	R	R	R	R	R	R	R	R	R	R			17
	ARV-4	17/09/20	8:48am	Effluent	R	R	R	R	R	R	R	R						10
	ARV-5	17/09/20	9:27am	Effluent	R	R	R	R	R	R	R	R	R	R	R			17
	ARV-6	17/09/20	9:52am	Effluent	R	R	R	R	R	R	R	R	R	R	R			17

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

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐ SIF Observations Yes ☐ No ☐

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

Cooling Initiated ☐

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		
9.9					

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by: Laura	Date: Sept 17/20	Time:	Received by: AM	Date: 21/9/20	Time: 1510	Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

OCTOBER 2015 FRONT

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

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

Sept 17/20

Chain of Custody (COC) / Analytical Request Form

ALS Environmental

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

L2505949-COFC

COC Number: 15 - L2505949

Page 1 of 1

Report To	Contact and company name below will appear on the final report	Report Format / Distribution		E&P TATs with your AM - surcharges will 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:	Laura Tassiuk	Quality Control (QC) Report with Report	☐ YES ☐ NO	PRIORITY (Business Days)	4 day [P4] ☐	EMERGENCY	1 Business day [E1] ☐
Phone:	867-857-2841	☐ Compare Results to Criteria on Report - provide details below if box checked			3 day [P3] ☐		Same Day, Weekend or Statutory holiday [E0] ☐
	Company address below will appear on the final report	Select Distribution:	☑ EMAIL ☐ MAIL ☐ FAX		2 day [P2] ☐		
Street:	PO Box 150	Email 1 or Fax	waterclerk@arviat.ca	Date and Time Required for all E&P TATs:		dd-mmm-yy hh:mm	
City/Province:	Arviat, NU	Email 2	cfaulkner@gov.nu.ca	For tests that can not be performed according to the service level selected, you will be contacted.			
Postal Code:	~~X0C 0H0~~ X0C-0E0	Email 3	scollins@gov.nu.ca				
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 #:	W10578	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	BOD	Routine	CBOD	Total Metals	Total Mercury	Nutrients/Phenols (x2)	Bacteria	Oil & Grease (x2)	BTEX-F1 (x3)	F2-F4 (x2)	PAH (x2)			Number of Containers
	ARV-2a	17/09/20	9:09am	Effluent	R	R	R	R	R	R	R	R	R	R	R			17
	ARV-4	17/09/20	8:48am	Effluent	R	R	R	R	R	R	R	R						10
	ARV-5	17/09/20	9:27am	Effluent	R	R	R	R	R	R	R	R	R	R	R			17
	ARV-6	17/09/20	9:52am	Effluent	R	R	R	R	R	R	R	R	R	R	R			17

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

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐ SIF Observations Yes ☐ No ☐

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

Cooling Initiated ☐

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		
9.9					

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by: Laura	Date: Sept 17/20	Time:	Received by: AR	Date: 21/9/20	Time: 1510	Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

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

Appendix D: Hazardous Materials Spill Database, Arviat 2020

Spill	Occurance Date	Spill Region	Location	Location Description	Product Spilled	Quantity	Measurement	Spill Cause	Lead Agency
spill-2020428	November 6, 2020	Keewatin	Arviat, Community, Nunavut	Arviat Gas Bar	Petroleum - fuel oil (jet A, diesel, turbo A, heat)	113.65	Litres	Breakage	GN - Government of Nunavut
spill-2020194	June 25, 2020	Keewatin	Arviat, Community, Nunavut	Northern Store	Petroleum - fuel oil (jet A, diesel, turbo A, heat)	100.00	Litres	Breakage	GN - Government of Nunavut
spill-2020174	June 10, 2020	Keewatin	Arviat, Community, Nunavut	308 7th Avenue	Petroleum - fuel oil (jet A, diesel, turbo A, heat)	300.00		Breakage	GN - Government of Nunavut
spill-2020123	May 4, 2020	Keewatin	Arviat, Community, Nunavut	Visitor's Centre, 621 3rd Avenue	Petroleum - fuel oil (jet A, diesel, turbo A, heat)	500.00	Litres	Breakage	GN - Government of Nunavut
spill-2020108	April 22, 2020	Keewatin	Arviat, Community, Nunavut	602A-D/404A-D 6th Ave	Wastewater (sewage, mine tailings)	200.00	Litres	Breakage	GN - Government of Nunavut
spill-2020047	February 14, 2020	Keewatin	Arviat, Community, Nunavut	New RCMP Detachment - 4th Avenue	Chemicals (including transformer oils)	410.00	Litres	Breakage	GN - Government of Nunavut

Appendix E: Arviat 2020 Sampling Summary

Arviat
ARV-2A

			2020			
Parameter	**Unit**	**DL**	**13-Jul-20**	**29-Jul-20**	**16-Sep-20**	**17-Sep-20**
Alkalinity						
Bicarbonate (HCO3)	mg/L	1.2	432	488	493	483
Carbonate (CO3)	mg/L	0.60	0.60	0.60	<0.60	<0.60
Hydroxide (OH)	mg/L	0.34	0.34	0.34	<0.34	<0.34
Total (as CaCO3)	mg/L	1.0	354	400	404	396
Ammonia by Colour						
Total (as N)	mg/L	0.010	3.72	5.69	5.60	5.40
Biochemical Oxygen Demand (BOD)						
Biochemical Oxygen Demand	mg/L	20	44	29.4	6	6.1
Carbonaceous BOD						
BOD Carbonaceous	mg/L	20	34.6	18.5	5.5	7.7
Chloride in Water by IC						
Chloride (Cl)	mg/L	10	573	477	408	415
Conductivity						
Conductivity	umhos/cm	1.0	3360	3020	3030	3030
Fecal Coliforms						
Fecal Coliforms	MPN/100mL	3	50	60	10	30
Hardness Calculated						
Hardness (as CaCO3)	mg/L	0.30	959	971	1090	1120
Mercury Total						
Mercury (Hg)	mg/L	0.000200	0.0000160	0.0000180	0.0000080	0.0000080
Nitrate in Water by IC						
Nitrate (as N)	mg/L	0.020	0.40	0.40	<0.40	<0.40
Nitrate + Nitrite						
Nitrate and Nitrite as N	mg/L	0.070	0.45	0.45	<0.45	<0.45
Nitrite in Water by IC						
Nitrite (as N)	mg/L	0.010	0.20	0.20	<0.20	<0.20
Oil & Grease - Gravimetric						
Oil and Grease	mg/L	2.00	5.0	5.0	<5.0	<5.0
Phenol						
Phenols	mg/L	0.0010	0.0029	0.0041	0.0018	0.0015
Phosphorus, Total						
Phosphorus (P)	mg/L	0.10	0.569	0.689	0.329	0.327
Sulfate in Water by IC						
Sulfate (SO4)	mg/L	0.30	686	665	699	708
Total Metals by ICP-MS						
Aluminium (Al)	mg/L	0.0050	0.435	0.0145	0.0116	0.0116
Arsenic (As)	mg/L	0.00020	0.00465	0.00531	0.00355	0.00358
Cadmium (Cd)	mg/L	0.000010	0.0000777	0.0000630	0.0000171	0.0000190
Calcium (Ca)	mg/L	0.10	253	276	307	318
Chromium (Cr)	mg/L	0.0010	0.00226	0.00147	0.00070	0.00060
Cobalt (Co)	mg/L	0.00020	0.00278	0.00141	0.00081	0.00083
Copper (Cu)	mg/L	0.00020	0.0169	0.0149	0.00954	0.00949
Iron (Fe)	mg/L	0.010	1.07	1.19	0.726	0.742
Lead (Pb)	mg/L	0.000090	0.00112	0.00127	0.00066	0.00065
Magnesium (Mg)	mg/L	0.010	79.4	68.6	77.5	78.4
Manganese (Mn)	mg/L	0.00030	0.759	0.972	0.699	0.708
Nickel (Ni)	mg/L	0.0020	0.0109	0.00814	0.00677	0.00669
Potassium (K)	mg/L	0.020	63.4	58	57	59.1
Sodium (Na)	mg/L	0.030	348	307	297	301
Zinc (Zn)	mg/L	0.0020	0.0905	0.0822	0.0137	0.0098
Total Organic Carbon by Combustion						
Total Organic Carbon	mg/L	0.50	63.1	36.6	28.8	28
Total Suspended Solids						
Total Suspended Solids	mg/L	5.0	42.3	29.7	12.3	14.9
pH						
pH	pH Units	0.10	8.04	8.05	8.05	8.04
Benzene	mg/L	0.00050	0.00050	0.00050	<0.00050	<0.00050
Toluene	mg/L	0.0010	0.0010	0.0010	<0.0010	<0.0010
Ethyl Benzene	mg/L	0.00050	0.00050	0.00050	<0.00050	<0.00050
o-Xylene	mg/L	0.00050	0.00050	0.00050	<0.00050	<0.00050
F1 (C6-C10)	mg/L	0.10	0.10	0.10	<0.10	<0.10
F2 (C10-C16)	mg/L	0.25	0.14	0.10	<0.10	<0.10
F3 (C16-C34)	mg/L	0.25	0.30	0.25	<0.25	<0.25
F4 (C34-C50)	mg/L	0.25	0.25	0.25	<0.25	<0.25
Total Hydrocarbons (C6-C50)	mg/L	0.44	0.44	0.38	<0.38	<0.38

Arviat
ARV-4

			2020			
Parameter	**Unit**	**DL**	**13-Jul-20**	**29-Jul-20**	**16-Sep-20**	**17-Sep-20**
Alkalinity						
Bicarbonate (HCO3)	mg/L	1.2	234	323	173	180
Carbonate (CO3)	mg/L	0.60	0.60	0.60	4.80	<0.60
Hydroxide (OH)	mg/L	0.34	0.34	0.34	<0.34	<0.34
Total (as CaCO3)	mg/L	1.0	192	265	150	147
Ammonia by Colour						
Total (as N)	mg/L	0.20	25.40	43.10	9.06	9.20
Biochemical Oxygen Demand (BOD)						
Biochemical Oxygen Demand	mg/L	20	93	45	> 140	> 140
Carbonaceous BOD						
BOD Carbonaceous	mg/L	20	47	31.1	23.1	26
Chloride in Water by IC						
Chloride (Cl)	mg/L	10	87	122	131	133
Conductivity						
Conductivity	umhos/cm	1.0	672	945	724	757
Fecal Coliforms						
Fecal Coliforms	MPN/100mL	3	19900	14100	2760	1380
Hardness Calculated						
Hardness (as CaCO3)	mg/L	0.30	72.3	67.2	90.4	89.4
Mercury Total						
Mercury (Hg)	mg/L	0.00020	0.0000070	0.0000080	0.0000070	0.0000070
Nitrate in Water by IC						
Nitrate (as N)	mg/L	0.020	0.260	0.141	0.378	0.367
Nitrate + Nitrite						
Nitrate and Nitrite as N	mg/L	0.070	0.325	0.141	0.637	0.622
Nitrite in Water by IC						
Nitrite (as N)	mg/L	0.010	0.065	0.020	0.259	0.255
Oil & Grease - Gravimetric						
Oil and Grease	mg/L	2.0	5.0	5.0	<5.0	<5.0
Phenol						
Phenols	mg/L	0.0010	0.0078	0.0010	0.0415	0.0404
Phosphorus, Total						
Phosphorus (P)	mg/L	0.10	7.10	10.6	5.4	5.97
Sulfate in Water by IC						
Sulfate (SO4)	mg/L	6.0	3.91	7.26	12.2	12.2
Total Metals by ICP-MS						
Aluminium (Al)	mg/L	0.0050	0.0974	0.09950	0.14500	0.13700
Arsenic (As)	mg/L	0.00020	0.00427	0.00560	0.00676	0.00678
Cadmium (Cd)	mg/L	0.000010	0.0000705	0.0000481	0.0000569	0.0000507
Calcium (Ca)	mg/L	0.10	16.6	12.9	15.6	15.4
Chromium (Cr)	mg/L	0.0010	0.00106	0.00105	0.00143	0.00119
Cobalt (Co)	mg/L	0.00020	0.00183	0.00120	0.00132	0.00129
Copper (Cu)	mg/L	0.00020	0.0557	0.0461	0.0235	0.0226
Iron (Fe)	mg/L	0.010	2.33	3.25	2.12	2.09
Lead (Pb)	mg/L	0.000090	0.001750	0.00126	0.00111	0.00108
Magnesium (Mg)	mg/L	0.010	7.48	8.48	12.5	12.4
Manganese (Mn)	mg/L	0.00030	0.218	0.215	0.206	0.202
Nickel (Ni)	mg/L	0.0020	0.00639	0.00525	0.00561	0.00550
Potassium (K)	mg/L	0.020	20.5	22.5	25.8	25
Sodium (Na)	mg/L	0.030	61.9	82.8	103	101
Zinc (Zn)	mg/L	0.0020	0.0472	0.0372	0.028	0.0252
Total Organic Carbon by Combustion						
Total Organic Carbon	mg/L	0.50	69.9	48.8	6.83	127
Total Suspended Solids						
Total Suspended Solids	mg/L	13	89.9	33.5	177.0	208.0
pH						
pH	pH Units	0.10	7.75	7.73	8.43	8.01
Benzene	mg/L	0.00050	0.00050	0.00050	N/A	N/A
Toluene	mg/L	0.0010	0.0010	0.0010	N/A	N/A
Ethyl Benzene	mg/L	0.00050	0.00050	0.00050	N/A	N/A
o-Xylene	mg/L	0.00050	0.00050	0.00050	N/A	N/A
F1 (C6-C10)	mg/L	0.10	0.10	0.10	N/A	N/A
F2 (C10-C16)	mg/L	0.25	0.11	0.10	N/A	N/A
F3 (C16-C34)	mg/L	0.25	1.65	1.64	N/A	N/A
F4 (C34-C50)	mg/L	0.25	0.61	0.51	N/A	N/A
Total Hydrocarbons (C6-C50)	mg/L	0.44	2.37	2.14	N/A	N/A

Arviat
ARV-5

			2020			
Parameter	**Unit**	**DL**	**13-Jul-20**	**29-Jul-20**	**16-Sep-20**	**17-Sep-20**
Alkalinity						
Bicarbonate (HCO3)	mg/L	1.2	71.4	82	59.7	58.3
Carbonate (CO3)	mg/L	0.60	0.60	0.60	<0.60	<0.60
Hydroxide (OH)	mg/L	0.34	0.34	0.34	<0.34	<0.34
Total (as CaCO3)	mg/L	1.0	58.5	67.2	48.9	47.8
Ammonia by Colour						
Total (as N)	mg/L	0.20	0.072	0.25	0.018	0.018
Biochemical Oxygen Demand (BOD)						
Biochemical Oxygen Demand	mg/L	6.0	2.3	2	<2.0	<2.0
Carbonaceous BOD						
BOD Carbonaceous	mg/L	6.0	2	2	3.7	2
Chloride in Water by IC						
Chloride (Cl)	mg/L	10	174	243	379	359
Conductivity						
Conductivity	umhos/cm	1.0	694	880	1350	1280
Fecal Coliforms						
Fecal Coliforms	MPN/100mL	3	3260	10	<10	10
Hardness Calculated						
Hardness (as CaCO3)	mg/L	0.30	106	136	207	188
Mercury Total						
Mercury (Hg)	mg/L	0.00020	0.0000050	0.0000050	0.0000050	<0.0000050
Nitrate in Water by IC						
Nitrate (as N)	mg/L	0.020	0.020	0.040	<0.10	<0.040
Nitrate + Nitrite						
Nitrate and Nitrite as N	mg/L	0.070	0.070	0.070	<0.11	<0.070
Nitrite in Water by IC						
Nitrite (as N)	mg/L	0.010	0.010	0.020	<0.050	<0.020
Oil & Grease - Gravimetric						
Oil and Grease	mg/L	5.0	5.0	5.0	<5.0	<5.0
Phenol						
Phenols	mg/L	0.0010	0.0010	0.0010	<0.0010	<0.0010
Phosphorus, Total						
Phosphorus (P)	mg/L	0.010	0.159	0.0773	0.0477	0.0134
Sulfate in Water by IC						
Sulfate (SO4)	mg/L	6.0	6.25	5.71	6.5	8.82
Total Metals by ICP-MS						
Aluminium (Al)	mg/L	0.0050	0.148	0.0414	0.156	0.0132
Arsenic (As)	mg/L	0.00020	0.00080	0.00078	0.00058	0.00041
Cadmium (Cd)	mg/L	0.000010	0.0000063	0.0000050	0.0000081	<0.0000050
Calcium (Ca)	mg/L	0.10	19.4	22.8	29.1	27.6
Chromium (Cr)	mg/L	0.0010	0.00072	0.00025	0.00067	0.00021
Cobalt (Co)	mg/L	0.00020	0.00041	0.00027	0.00030	0.00013
Copper (Cu)	mg/L	0.00020	0.00074	0.00056	0.00087	<0.00050
Iron (Fe)	mg/L	0.010	3.69	2.16	3.11	1.28
Lead (Pb)	mg/L	0.000090	0.000311	0.00118	0.00024	<0.000050
Magnesium (Mg)	mg/L	0.010	13.9	19.2	32.6	28.8
Manganese (Mn)	mg/L	0.00030	0.350	0.148	0.112	0.074
Nickel (Ni)	mg/L	0.0020	0.00078	0.00112	0.0008	<0.00050
Potassium (K)	mg/L	0.020	6.18	7.53	8.79	7.42
Sodium (Na)	mg/L	0.030	89.2	127	191	167
Zinc (Zn)	mg/L	0.0020	0.0209	0.0150	0.0082	0.0120
Total Organic Carbon by Combustion						
Total Organic Carbon	mg/L	0.50	11	12.9	7.13	6.97
Total Suspended Solids						
Total Suspended Solids	mg/L	13	9.1	8.9	50.3	70.7
pH						
pH	pH Units	0.10	7.38	7.55	7.65	7.46
Benzene	mg/L	0.00050	0.00050	0.00050	<0.00050	<0.00050
Toluene	mg/L	0.0010	0.0010	0.0010	<0.0010	<0.0010
Ethyl Benzene	mg/L	0.00050	0.00050	0.00050	<0.00050	<0.00050
o-Xylene	mg/L	0.00050	0.00050	0.00050	<0.00050	<0.00050
F1 (C6-C10)	mg/L	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
F3 (C16-C34)	mg/L	0.25	0.25	0.25	<0.25	<0.25
F4 (C34-C50)	mg/L	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

Arviat
ARV-6

			2020			
Parameter	**Unit**	**DL**	**13-Jul-20**	**29-Jul-20**	**16-Sep-20**	**17-Sep-20**
Alkalinity						
Bicarbonate (HCO3)	mg/L	1.2	121	70.9	73.8	101
Carbonate (CO3)	mg/L	0.60	0.60	0.60	<0.60	<0.60
Hydroxide (OH)	mg/L	0.34	0.34	0.34	<0.34	<0.34
Total (as CaCO3)	mg/L	1.0	99.1	58.1	60.5	82.9
Ammonia by Colour						
Total (as N)	mg/L	0.20	0.053	0.062	0.103	0.102
Biochemical Oxygen Demand (BOD)						
Biochemical Oxygen Demand	mg/L	6.0	3.0	2.0	<2.0	<2.0
Carbonaceous BOD						
BOD Carbonaceous	mg/L	6.0	2.0	2.0	2.7	<2.0
Chloride in Water by IC						
Chloride (Cl)	mg/L	10	132	132	316	122
Conductivity						
Conductivity	umhos/cm	1.0	604	548	1140	560
Fecal Coliforms						
Fecal Coliforms	MPN/100mL	3	10	10	<10	<10
Hardness Calculated						
Hardness (as CaCO3)	mg/L	0.30	145	133	449	123
Mercury Total						
Mercury (Hg)	mg/L	0.00020	0.0000050	0.0000050	<0.0000050	<0.0000050
Nitrate in Water by IC						
Nitrate (as N)	mg/L	0.40	0.020	0.026	<0.040	<0.020
Nitrate + Nitrite						
Nitrate and Nitrite as N	mg/L	0.45	0.070	0.070	<0.070	<0.070
Nitrite in Water by IC						
Nitrite (as N)	mg/L	0.20	0.010	0.010	<0.020	<0.010
Oil & Grease - Gravimetric						
Oil and Grease	mg/L	5.0	5.0	5.0	<5.0	<5.0
Phenol						
Phenols	mg/L	0.0010	0.0026	0.0011	<0.0010	<0.0010
Phosphorus, Total						
Phosphorus (P)	mg/L	0.010	0.0324	0.0441	0.0584	0.0428
Sulfate in Water by IC						
Sulfate (SO4)	mg/L	6.0	0.30	1.38	<0.60	0.87
Total Metals by ICP-MS						
Aluminium (Al)	mg/L	0.0050	0.0934	0.0384	0.0604	0.291
Arsenic (As)	mg/L	0.00020	0.00083	0.00051	0.00057	0.00054
Cadmium (Cd)	mg/L	0.000010	0.000011	0.0000182	0.0000188	0.0000119
Calcium (Ca)	mg/L	0.10	40	38.5	162	31.9
Chromium (Cr)	mg/L	0.0010	0.00075	0.00034	0.00063	0.00090
Cobalt (Co)	mg/L	0.00020	0.00233	0.00094	0.00482	0.00083
Copper (Cu)	mg/L	0.00020	0.00059	0.00050	0.00103	0.00133
Iron (Fe)	mg/L	0.010	18.1	9.18	11.2	8.43
Lead (Pb)	mg/L	0.000090	0.000290	0.000291	0.000178	0.000484
Magnesium (Mg)	mg/L	0.010	11	9.04	10.8	10.5
Manganese (Mn)	mg/L	0.00030	2.08	1.16	1.66	0.853
Nickel (Ni)	mg/L	0.0020	0.00122	0.00085	0.00185	0.00112
Potassium (K)	mg/L	0.020	6.36	4.26	9.84	5.16
Sodium (Na)	mg/L	0.030	53	49.3	17.5	58.8
Zinc (Zn)	mg/L	0.0020	0.081	0.0322	0.0125	0.0709
Total Organic Carbon by Combustion						
Total Organic Carbon	mg/L	0.50	10.4	6.54	6.75	7.21
Total Suspended Solids						
Total Suspended Solids	mg/L	13	44.3	17.7	37.5	29.3
pH						
pH	pH Units	0.10	7.09	7.01	7.28	7.55
Benzene	mg/L	0.00050	0.00050	0.00050	<0.00050	<0.00050
Toluene	mg/L	0.0010	0.0010	0.0010	<0.0010	<0.0010
Ethyl Benzene	mg/L	0.00050	0.00050	0.00050	<0.00050	<0.00050
o-Xylene	mg/L	0.00050	0.00050	0.00050	<0.00050	<0.00050
F1 (C6-C10)	mg/L	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
F3 (C16-C34)	mg/L	0.25	0.25	0.25	<0.25	<0.25
F4 (C34-C50)	mg/L	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

Appendix F: CIRNAC Inspection Report

The CIRNAC inspection report was not received by CGS.