ANNUAL REPORT
FOR THE HAMLET OF ARVIAT

YEAR BEING REPORTED: 2015

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

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

Attached are results for Monitoring Stations ARV-1, as well as detailed chemical, physical and biological analysis required at ARV-2a, ARV-4, ARV-5 and ARV-6 (for the months of July to September).

Month Reported	Quantity of Water Obtained from all sources (m^3)	Quantity of Sewage Waste Discharged (m^3)
January	7,596.7120	Same
February	7,008.8280	Same
March	7,355.0860	Same
April	7,227.1344	Same
May	7,790.5371	Same
June	7,665.5200	Same
July	7,901.4285	Same
August	7,947.0738	Same
September	7,657.3262	Same
October	8,071.9445	Same
November	7,509.3702	Same
December	7,762.0658	Same
ANNUAL TOTAL	**91,493.0265**	**91,493.0265**

Note: No meter exists to measure the sewage discharge volume, therefore water consumption volume is considered as equal volume to the Sewage discharge volume.

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

- No modifications and/or major maintenance work was carried out in 2015.
- Segregation has improved at the Solid Waste Site and Bulky Metals Dump. Batteries have been collected and are being stored in a seacan. A wood recycling area has been created.

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

The following spills were reported to the NT-NU Spill Report Line and are listed on the Hazardous Materials Spills Database for Arviat in 2015:

- 2015062, 2015-02-23, QEC Power Plant Area, Propylene Glycol 50%, 1600L
- 2015079, 2015-03-05, Building 600 Airport Road, Jet A with FS11, 170L
- 2015146, 2015-04-10, Unit 228/800-7th Avenue 5-plex, Heating Fuel #2, 1058L
- 2015216, 2015-05-22, 707 5th Avenue, Heating Fuel, 100L
- 20152226, 2015-05-26, Unit 221 8th Avenue, No. 2 Home Heating Fuel, 1000L
- 2015227, 2015-05-27, 803 1st Avenue, P-50, 205L
- 2015244, 801 1st Avenue, Heating Fuel, ---L
- 2015319, 2015-07-29, Elementary School, Heating Fuel, 100L
- 2015413, 2015-09-28, 400-6th Avenue Unit 604, Heating Fuel, 50L
- 2015414, 2015-09-30, Middle School, Heating Fuel, 0L
- 2015447, 2015-10-29, Unit 240/705-9th Avenue, Heating Fuel #2, 170L

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

- Abandonment and Restoration will take place during 2016 for the Old Sewage Lagoons, as per the *Old Sewage Lagoons Abandonment and Restoration Plan, Hamlet of Arviat* prepared by Nuna Burnside, December 2010.
- Samples from the Old Sewage Lagoon were collected on July 21, 2015. All parameters are below the effluent quality limits outlined in the Licence.

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

- An Amendment/Renewal Application was submitted to the NWB February 27, 2015.
- On July 20, 2015, a Short Term Renewal was approved by the Minister of AANDC. The expiry date of the Licence was extended to February 27, 2016.

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

- Signage for the Monitoring Program Stations and improved solid waste segregation was installed summer 2015. Refer to the following pictures.


ARV-2
S.W.P.
Arviat Solid Waste Site


Wood Recycling Area
(Please help Yourself)


ARVIAT HAMLET COUNCIL
Arviat Metal Waste Site
(Metal Waste Only)


ARVIAT HAMLET COUNCIL
Place Used Batteries
In this Seacan


HAMLET OF ARVIAT
WATER LICENSED
WATER SAMPLE SITE
ARV-04


HAMLET OF ARVIAT
WATER LICENSED
WATER SAMPLE SITE
ARV-05


HAMLET OF ARVIAT
WATER LICENSED
WATER SAMPLE SITE
ARV-06

ix. updates or revisions to the approved Operation and Maintenance Plans.

- The *Water Supply Operation and Maintenance (O&M) Plan, Hamlet of Arviat* prepared by Nuna Burnside, May 2009 is currently being updated. The updated O&M Plan will be submitted to the NWB in 2016.
- The *Sewage Treatment Facility Operation and Maintenance (O&M) Plan, Hamlet of Arviat* prepared by Nuna Burnside, January 2009, revised May 2009 is currently being updated. The updated O&M Plan will be submitted to the NWB in 2016.
- The *Solid Waste Management Facility Operation and Maintenance (O&M) Plan, Hamlet of Arviat* prepared by Nuna Burnside, January 2009, revised May 2009 is currently being updated. The updated O&M Plan will be submitted to the NWB in 2016.
- The *Environmental Monitoring Program and Quality Assurance/Quality Control Plan, Hamlet of Arviat* prepared by Nuna Burnside, December 2010 is currently being updated. The updated QA/QC Plan will be submitted to the NWB in 2016.
- The *Environmental Emergency Contingency Plan, Hamlet of Arviat* prepared by Nuna Burnside, May 2009, revised May 2010 is currently being updated. The updated Plan will be submitted to the NWB in 2016.

ADDITIONAL INFORMATION THAT THE LICENSEE DEEMS USEFUL:

- The Hamlet is working with the Water Compliance Working Group to implement the Solid Waste Workplan goals.

FOLLOW-UP REGARDING INSPECTION/COMPLIANCE CONCERNS:

- On July 15, 2015, AANDC (INAC) issued a compliance review letter to Steve England, SAO. This letter stated that items not mentioned in this document. This letter is attached.
- The 3AM-ARV1016 Water Licence Inspection took place on July 20, 2015. The Inspection Report was issued on October 22, 2015 and indicated there were no concerns. The Inspection Report is attached.

Appendix A: ARV-4 Effluent Quality Limits – 1 page
Appendix B: Weekly Inspections at Monitoring Program Stations – 1 page
Appendix C: Certificate of Analysis June 15, 2015 – 9 pages
Appendix D: Certificate of Analysis July 21, 2015 – 18 pages

Appendix E: Certificate of Analysis August 18, 2015 – 17 pages
Appendix F: Certificate of Analysis September 16, 2015 – 16 pages
Appendix G: Old Sewage Lagoon Effluent Quality Limits – 1 page
Appendix H: Certificate of Analysis July 21, 2015 – 6 pages
Appendix I: AANDC Compliance Review Letter, July 15, 2015 – 2 pages
Appendix J: AANDC Inspection Report, October 22, 2015 – 1 page
Appendix K: Hazardous Materials Spill Database, Arviat 2015 – 1 page

3AM-ARV1016 Arviat Monitoring Program Results 2015
Part D, Item 2; ARV-4 Effluent Quality limits

Parameter	Maximum Concentration of any grab sample	ARV-4			
		15-Jun-15	21-Jul-15	18-Aug-15	16-Sep-15
BOD_5	80 mg/L	67	30.2	77	7.7
Total Suspended Solids	100 mg/L	68	20	67	19.0
Fecal Coliforms	1 x 10^4 CFU/100mL	24000	930	300	150
Oil & Grease	no visible sheen	2	<2.0	18.5	<2.0
pH	between 6 and 9	8.11	7.35	7.22	7.50

Exceeds effluent quality limits

The location of ARV-4 was confirmed at the July 15, 2015 AANDC Inspection to sample from the pond outside of the sewage lagoon and not at the end of the wetland. The June 15, 2015 sample was taken before this location was confirmed with the AANDC Inspector.

Nunavut Water Board Licence No. 3AM-ARV1015

Arviat, NU

Part H, Item 8: Weekly Inspections at Monitoring Program Stations, May to August

Week	Starting Date	ARV-2a Water Present (check)			ARV-4 Water Present (check)			ARV-5 Water Present (check)			ARV-6 Water Present (check)			Checked By
		Yes	No	Frozen	Yes	No	Frozen	Yes	No	Frozen	Yes	No	Frozen	
1	04-May-15	NO	ROADS			FROZEN			FROZEN			Covered w Snow		Laura
2	11-May-15	Under Snow				FROZEN			FROZEN			Under Snow		Laura
3	18-May-15	Under Snow				FROZEN			FROZEN			Under Snow		Laura
4	25-May-15	Under Snow				FROZEN			FROZEN			Under Snow		Laura
5	01-Jun-15	under Snow			✓				✓				✓	Laura
6	08-Jun-15		✓		✓				✓				✓	Laura
7	15-Jun-15	✓			✓			✓			✓	With Snow around		Laura
8	22-Jun-15													
9	29-Jun-15													
10	06-Jul-15													
11	13-Jul-15													
12	20-Jul-15													
13	27-Jul-15													
14	03-Aug-15													
15	10-Aug-15													
16	17-Aug-15													
17	24-Aug-15													
18	31-Aug-15													

Monitoring Program Station Locations:

ARV-2a: Effluent discharge from the Discharge Point of the Solid Waste Disposal Facility – Near Garbage

ARV-4: Effluent from the discharge point of the Sewage Disposal Facility (end of wetland) – Behind Lagoon

ARV-5: Discharge from the Bulky Metal Waste Area – Near Metal Dumps

ARV-6: Discharge from the Hazardous Waste Storage Area – Near Garage

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

Date Received: 17-JUN-15
Report Date: 02-JUL-15 16:38 (MT)
Version: FINAL

Client Phone: 867-857-2841

Certificate of Analysis

Lab Work Order #: L1628555

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

Craig Riddell, B.Sc.Ag
Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1628555-1 ARV 2							
Sampled By: CLIENT on 15-JUN-15 @ 09:50							
Matrix: EFFLUENT							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	0.267		0.020	mg/L		18-JUN-15	R3210696
Nitrate+Nitrite							
Nitrate and Nitrite as N	0.267		0.070	mg/L		23-JUN-15	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		18-JUN-15	R3210696
Miscellaneous Parameters							
Ammonia, Total (as N)	0.119		0.010	mg/L		18-JUN-15	R3210850
Biochemical Oxygen Demand	2.2		2.0	mg/L		18-JUN-15	R3217141
Conductivity	272		1.0	umhos/cm		25-JUN-15	R3216500
Fecal Coliforms	4		3	MPN/100mL		17-JUN-15	R3212366
Mercury (Hg)-Total	<0.000020		0.000020	mg/L	26-JUN-15	26-JUN-15	R3215797
Oil and Grease, Total	<2.0		2.0	mg/L	24-JUN-15	24-JUN-15	R3216385
Phenols (4AAP)	<0.0010		0.0010	mg/L		26-JUN-15	R3216333
Sulfate (SO4)	50.1		0.30	mg/L		18-JUN-15	R3210696
Total Suspended Solids	<5.0		5.0	mg/L		22-JUN-15	R3214315
pH	8.00		0.10	pH units		25-JUN-15	R3216500
Total Metals by ICP-MS							
Aluminum (Al)-Total	0.0689		0.0050	mg/L	24-JUN-15	30-JUN-15	R3217980
Antimony (Sb)-Total	0.00047		0.00020	mg/L	24-JUN-15	30-JUN-15	R3217980
Arsenic (As)-Total	0.00038		0.00020	mg/L	24-JUN-15	30-JUN-15	R3217980
Barium (Ba)-Total	0.0156		0.00020	mg/L	24-JUN-15	30-JUN-15	R3217980
Beryllium (Be)-Total	<0.00020		0.00020	mg/L	24-JUN-15	30-JUN-15	R3217980
Bismuth (Bi)-Total	<0.00020		0.00020	mg/L	24-JUN-15	30-JUN-15	R3217980
Boron (B)-Total	0.188		0.010	mg/L	24-JUN-15	30-JUN-15	R3217980
Cadmium (Cd)-Total	<0.000010		0.000010	mg/L	24-JUN-15	30-JUN-15	R3217980
Calcium (Ca)-Total	36.1		0.10	mg/L	24-JUN-15	30-JUN-15	R3217980
Cesium (Cs)-Total	<0.00010		0.00010	mg/L	24-JUN-15	30-JUN-15	R3217980
Chromium (Cr)-Total	<0.0010		0.0010	mg/L	24-JUN-15	30-JUN-15	R3217980
Cobalt (Co)-Total	0.00047		0.00020	mg/L	24-JUN-15	30-JUN-15	R3217980
Copper (Cu)-Total	0.00282		0.00020	mg/L	24-JUN-15	30-JUN-15	R3217980
Iron (Fe)-Total	0.34		0.10	mg/L	24-JUN-15	30-JUN-15	R3217980
Lead (Pb)-Total	0.000174		0.000090	mg/L	24-JUN-15	30-JUN-15	R3217980
Lithium (Li)-Total	<0.0020		0.0020	mg/L	24-JUN-15	30-JUN-15	R3217980
Magnesium (Mg)-Total	3.66		0.010	mg/L	24-JUN-15	30-JUN-15	R3217980
Manganese (Mn)-Total	0.197		0.00030	mg/L	24-JUN-15	30-JUN-15	R3217980
Molybdenum (Mo)-Total	0.00037		0.00020	mg/L	24-JUN-15	30-JUN-15	R3217980
Nickel (Ni)-Total	<0.0020		0.0020	mg/L	24-JUN-15	30-JUN-15	R3217980
Phosphorus (P)-Total	<0.10		0.10	mg/L	24-JUN-15	30-JUN-15	R3217980
Potassium (K)-Total	4.00		0.020	mg/L	24-JUN-15	30-JUN-15	R3217980
Rubidium (Rb)-Total	0.00348		0.00020	mg/L	24-JUN-15	30-JUN-15	R3217980
Selenium (Se)-Total	<0.0010		0.0010	mg/L	24-JUN-15	30-JUN-15	R3217980
Silicon (Si)-Total	1.50		0.10	mg/L	24-JUN-15	30-JUN-15	R3217980
Silver (Ag)-Total	<0.00010		0.00010	mg/L	24-JUN-15	30-JUN-15	R3217980
Sodium (Na)-Total	7.84		0.030	mg/L	24-JUN-15	30-JUN-15	R3217980
Strontium (Sr)-Total	0.276		0.00010	mg/L	24-JUN-15	30-JUN-15	R3217980
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	24-JUN-15	30-JUN-15	R3217980
Thallium (Tl)-Total	<0.00010		0.00010	mg/L	24-JUN-15	30-JUN-15	R3217980
Thorium (Th)-Total	<0.00010		0.00010	mg/L	24-JUN-15	30-JUN-15	R3217980
Tin (Sn)-Total	<0.00020		0.00020	mg/L	24-JUN-15	30-JUN-15	R3217980
Titanium (Ti)-Total	0.00248		0.00050	mg/L	24-JUN-15	30-JUN-15	R3217980

* 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
L1628555-1 ARV 2							
Sampled By: CLIENT on 15-JUN-15 @ 09:50							
Matrix: EFFLUENT							
Total Metals by ICP-MS							
Tungsten (W)-Total	<0.00010		0.00010	mg/L	24-JUN-15	30-JUN-15	R3217980
Uranium (U)-Total	0.00037		0.00010	mg/L	24-JUN-15	30-JUN-15	R3217980
Vanadium (V)-Total	<0.00020		0.00020	mg/L	24-JUN-15	30-JUN-15	R3217980
Zinc (Zn)-Total	0.0119		0.0020	mg/L	24-JUN-15	30-JUN-15	R3217980
Zirconium (Zr)-Total	<0.00040		0.00040	mg/L	24-JUN-15	30-JUN-15	R3217980
L1628555-2 ARV 4							
Sampled By: CLIENT on 15-JUN-15 @ 10:37							
Matrix: EFFLUENT							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	0.049		0.020	mg/L		18-JUN-15	R3210696
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		23-JUN-15	
Nitrite in Water by IC							
Nitrite (as N)	0.015		0.010	mg/L		18-JUN-15	R3210696
Miscellaneous Parameters							
Ammonia, Total (as N)	37.8	DLA	1.0	mg/L		19-JUN-15	R3212106
Biochemical Oxygen Demand	67	DLA	20	mg/L		18-JUN-15	R3217141
Conductivity	809		1.0	umhos/cm		25-JUN-15	R3216500
Fecal Coliforms	24000		3	MPN/100mL		17-JUN-15	R3212366
Mercury (Hg)-Total	<0.00020	DLM	0.00020	mg/L	26-JUN-15	26-JUN-15	R3215797
Oil and Grease, Total	2.0		2.0	mg/L	24-JUN-15	24-JUN-15	R3216385
Phenols (4AAP)	0.0018		0.0010	mg/L		26-JUN-15	R3216333
Sulfate (SO4)	8.97		0.30	mg/L		18-JUN-15	R3210696
Total Suspended Solids	68.0		5.0	mg/L		22-JUN-15	R3214315
pH	8.11		0.10	pH units		25-JUN-15	R3216500
Total Metals by ICP-MS							
Aluminum (Al)-Total	0.0934		0.0050	mg/L	24-JUN-15	30-JUN-15	R3217980
Antimony (Sb)-Total	0.00030		0.00020	mg/L	24-JUN-15	30-JUN-15	R3217980
Arsenic (As)-Total	0.00433		0.00020	mg/L	24-JUN-15	30-JUN-15	R3217980
Barium (Ba)-Total	0.0220		0.00020	mg/L	24-JUN-15	30-JUN-15	R3217980
Beryllium (Be)-Total	<0.00020		0.00020	mg/L	24-JUN-15	30-JUN-15	R3217980
Bismuth (Bi)-Total	0.00025		0.00020	mg/L	24-JUN-15	30-JUN-15	R3217980
Boron (B)-Total	0.119		0.010	mg/L	24-JUN-15	30-JUN-15	R3217980
Cadmium (Cd)-Total	0.000147		0.000010	mg/L	24-JUN-15	30-JUN-15	R3217980
Calcium (Ca)-Total	18.5		0.10	mg/L	24-JUN-15	30-JUN-15	R3217980
Cesium (Cs)-Total	<0.00010		0.00010	mg/L	24-JUN-15	30-JUN-15	R3217980
Chromium (Cr)-Total	0.0011		0.0010	mg/L	24-JUN-15	30-JUN-15	R3217980
Cobalt (Co)-Total	0.00323		0.00020	mg/L	24-JUN-15	30-JUN-15	R3217980
Copper (Cu)-Total	0.0608		0.00020	mg/L	24-JUN-15	30-JUN-15	R3217980
Iron (Fe)-Total	2.59		0.10	mg/L	24-JUN-15	30-JUN-15	R3217980
Lead (Pb)-Total	0.00136		0.000090	mg/L	24-JUN-15	30-JUN-15	R3217980
Lithium (Li)-Total	0.0037		0.0020	mg/L	24-JUN-15	30-JUN-15	R3217980
Magnesium (Mg)-Total	11.3		0.010	mg/L	24-JUN-15	30-JUN-15	R3217980
Manganese (Mn)-Total	0.294		0.00030	mg/L	24-JUN-15	30-JUN-15	R3217980
Molybdenum (Mo)-Total	0.00098		0.00020	mg/L	24-JUN-15	30-JUN-15	R3217980
Nickel (Ni)-Total	0.0076		0.0020	mg/L	24-JUN-15	30-JUN-15	R3217980
Phosphorus (P)-Total	5.63		0.10	mg/L	24-JUN-15	30-JUN-15	R3217980
Potassium (K)-Total	20.6		0.020	mg/L	24-JUN-15	30-JUN-15	R3217980
Rubidium (Rb)-Total	0.0203		0.00020	mg/L	24-JUN-15	30-JUN-15	R3217980

* 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
L1628555-2 ARV 4							
Sampled By: CLIENT on 15-JUN-15 @ 10:37							
Matrix: EFFLUENT							
Total Metals by ICP-MS							
Selenium (Se)-Total	<0.0010		0.0010	mg/L	24-JUN-15	30-JUN-15	R3217980
Silicon (Si)-Total	1.90		0.10	mg/L	24-JUN-15	30-JUN-15	R3217980
Silver (Ag)-Total	0.00028		0.00010	mg/L	24-JUN-15	30-JUN-15	R3217980
Sodium (Na)-Total	66.8		0.030	mg/L	24-JUN-15	30-JUN-15	R3217980
Strontium (Sr)-Total	0.169		0.00010	mg/L	24-JUN-15	30-JUN-15	R3217980
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	24-JUN-15	30-JUN-15	R3217980
Thallium (Tl)-Total	<0.00010		0.00010	mg/L	24-JUN-15	30-JUN-15	R3217980
Thorium (Th)-Total	<0.00010		0.00010	mg/L	24-JUN-15	30-JUN-15	R3217980
Tin (Sn)-Total	0.00022		0.00020	mg/L	24-JUN-15	30-JUN-15	R3217980
Titanium (Ti)-Total	0.00230		0.00050	mg/L	24-JUN-15	30-JUN-15	R3217980
Tungsten (W)-Total	<0.00010		0.00010	mg/L	24-JUN-15	30-JUN-15	R3217980
Uranium (U)-Total	0.00046		0.00010	mg/L	24-JUN-15	30-JUN-15	R3217980
Vanadium (V)-Total	0.00186		0.00020	mg/L	24-JUN-15	30-JUN-15	R3217980
Zinc (Zn)-Total	0.0322		0.0020	mg/L	24-JUN-15	30-JUN-15	R3217980
Zirconium (Zr)-Total	<0.00040		0.00040	mg/L	24-JUN-15	30-JUN-15	R3217980
L1628555-3 ARV 5							
Sampled By: CLIENT on 15-JUN-15 @ 10:50							
Matrix: EFFLUENT							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		18-JUN-15	R3210696
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		23-JUN-15	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		18-JUN-15	R3210696
Miscellaneous Parameters							
Ammonia, Total (as N)	0.015		0.010	mg/L		18-JUN-15	R3210850
Biochemical Oxygen Demand	<2.0		2.0	mg/L		18-JUN-15	R3217141
Conductivity	305		1.0	umhos/cm		25-JUN-15	R3216500
Fecal Coliforms	4		3	MPN/100mL		17-JUN-15	R3212366
Mercury (Hg)-Total	<0.000020		0.000020	mg/L	26-JUN-15	26-JUN-15	R3215797
Oil and Grease, Total	<2.0		2.0	mg/L	24-JUN-15	24-JUN-15	R3216385
Phenols (4AAP)	<0.0010		0.0010	mg/L		26-JUN-15	R3216333
Sulfate (SO4)	7.18		0.30	mg/L		18-JUN-15	R3210696
Total Suspended Solids	<5.0		5.0	mg/L		22-JUN-15	R3214315
pH	7.71		0.10	pH units		25-JUN-15	R3216500
Total Metals by ICP-MS							
Aluminum (Al)-Total	0.0124		0.0050	mg/L	24-JUN-15	30-JUN-15	R3217980
Antimony (Sb)-Total	<0.00020		0.00020	mg/L	24-JUN-15	30-JUN-15	R3217980
Arsenic (As)-Total	<0.00020		0.00020	mg/L	24-JUN-15	30-JUN-15	R3217980
Barium (Ba)-Total	0.00949		0.00020	mg/L	24-JUN-15	30-JUN-15	R3217980
Beryllium (Be)-Total	<0.00020		0.00020	mg/L	24-JUN-15	30-JUN-15	R3217980
Bismuth (Bi)-Total	<0.00020		0.00020	mg/L	24-JUN-15	30-JUN-15	R3217980
Boron (B)-Total	0.034		0.010	mg/L	24-JUN-15	30-JUN-15	R3217980
Cadmium (Cd)-Total	<0.000010		0.000010	mg/L	24-JUN-15	30-JUN-15	R3217980
Calcium (Ca)-Total	8.98		0.10	mg/L	24-JUN-15	30-JUN-15	R3217980
Cesium (Cs)-Total	<0.00010		0.00010	mg/L	24-JUN-15	30-JUN-15	R3217980
Chromium (Cr)-Total	<0.0010		0.0010	mg/L	24-JUN-15	30-JUN-15	R3217980
Cobalt (Co)-Total	<0.00020		0.00020	mg/L	24-JUN-15	30-JUN-15	R3217980
Copper (Cu)-Total	0.00054		0.00020	mg/L	24-JUN-15	30-JUN-15	R3217980

* 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
L1628555-3 ARV 5							
Sampled By: CLIENT on 15-JUN-15 @ 10:50							
Matrix: EFFLUENT							
Total Metals by ICP-MS							
Iron (Fe)-Total	0.33		0.10	mg/L	24-JUN-15	30-JUN-15	R3217980
Lead (Pb)-Total	<0.000090		0.000090	mg/L	24-JUN-15	30-JUN-15	R3217980
Lithium (Li)-Total	0.0025		0.0020	mg/L	24-JUN-15	30-JUN-15	R3217980
Magnesium (Mg)-Total	6.27		0.010	mg/L	24-JUN-15	30-JUN-15	R3217980
Manganese (Mn)-Total	0.00699		0.00030	mg/L	24-JUN-15	30-JUN-15	R3217980
Molybdenum (Mo)-Total	<0.00020		0.00020	mg/L	24-JUN-15	30-JUN-15	R3217980
Nickel (Ni)-Total	<0.0020		0.0020	mg/L	24-JUN-15	30-JUN-15	R3217980
Phosphorus (P)-Total	<0.10		0.10	mg/L	24-JUN-15	30-JUN-15	R3217980
Potassium (K)-Total	2.90		0.020	mg/L	24-JUN-15	30-JUN-15	R3217980
Rubidium (Rb)-Total	0.00244		0.00020	mg/L	24-JUN-15	30-JUN-15	R3217980
Selenium (Se)-Total	<0.0010		0.0010	mg/L	24-JUN-15	30-JUN-15	R3217980
Silicon (Si)-Total	<0.10		0.10	mg/L	24-JUN-15	30-JUN-15	R3217980
Silver (Ag)-Total	<0.00010		0.00010	mg/L	24-JUN-15	30-JUN-15	R3217980
Sodium (Na)-Total	41.6		0.030	mg/L	24-JUN-15	30-JUN-15	R3217980
Strontium (Sr)-Total	0.0592		0.00010	mg/L	24-JUN-15	30-JUN-15	R3217980
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	24-JUN-15	30-JUN-15	R3217980
Thallium (Tl)-Total	<0.00010		0.00010	mg/L	24-JUN-15	30-JUN-15	R3217980
Thorium (Th)-Total	<0.00010		0.00010	mg/L	24-JUN-15	30-JUN-15	R3217980
Tin (Sn)-Total	<0.00020		0.00020	mg/L	24-JUN-15	30-JUN-15	R3217980
Titanium (Ti)-Total	0.00054		0.00050	mg/L	24-JUN-15	30-JUN-15	R3217980
Tungsten (W)-Total	<0.00010		0.00010	mg/L	24-JUN-15	30-JUN-15	R3217980
Uranium (U)-Total	<0.00010		0.00010	mg/L	24-JUN-15	30-JUN-15	R3217980
Vanadium (V)-Total	<0.00020		0.00020	mg/L	24-JUN-15	30-JUN-15	R3217980
Zinc (Zn)-Total	0.0077		0.0020	mg/L	24-JUN-15	30-JUN-15	R3217980
Zirconium (Zr)-Total	<0.00040		0.00040	mg/L	24-JUN-15	30-JUN-15	R3217980
L1628555-4 ARV 6							
Sampled By: CLIENT on 15-JUN-15 @ 11:07							
Matrix: EFFLUENT							
Nitrate + Nitrite							
Nitrate in Water by IC							
Nitrate (as N)	0.030		0.020	mg/L		18-JUN-15	R3210696
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		23-JUN-15	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		18-JUN-15	R3210696
Miscellaneous Parameters							
Ammonia, Total (as N)	0.071		0.010	mg/L		18-JUN-15	R3210850
Biochemical Oxygen Demand	70.1	DLA	6.0	mg/L		18-JUN-15	R3217141
Conductivity	198		1.0	umhos/cm		25-JUN-15	R3216500
Fecal Coliforms	4		3	MPN/100mL		17-JUN-15	R3212366
Mercury (Hg)-Total	<0.00020	DLM	0.00020	mg/L	26-JUN-15	26-JUN-15	R3215797
Oil and Grease, Total	<2.0		2.0	mg/L	24-JUN-15	24-JUN-15	R3216385
Phenols (4AAP)	0.0028		0.0010	mg/L		26-JUN-15	R3216333
Sulfate (SO4)	1.75		0.30	mg/L		18-JUN-15	R3210696
Total Suspended Solids	18.0		5.0	mg/L		22-JUN-15	R3214315
pH	7.67		0.10	pH units		25-JUN-15	R3216500
Total Metals by ICP-MS							
Aluminum (Al)-Total	0.680		0.0050	mg/L	24-JUN-15	30-JUN-15	R3217980
Antimony (Sb)-Total	0.00022		0.00020	mg/L	24-JUN-15	30-JUN-15	R3217980
Arsenic (As)-Total	0.00036		0.00020	mg/L	24-JUN-15	30-JUN-15	R3217980

* 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
L1628555-4 ARV 6							
Sampled By: CLIENT on 15-JUN-15 @ 11:07							
Matrix: EFFLUENT							
Total Metals by ICP-MS							
Barium (Ba)-Total	0.0438		0.00020	mg/L	24-JUN-15	30-JUN-15	R3217980
Beryllium (Be)-Total	<0.00020		0.00020	mg/L	24-JUN-15	30-JUN-15	R3217980
Bismuth (Bi)-Total	<0.00020		0.00020	mg/L	24-JUN-15	30-JUN-15	R3217980
Boron (B)-Total	0.018		0.010	mg/L	24-JUN-15	30-JUN-15	R3217980
Cadmium (Cd)-Total	0.000047		0.000010	mg/L	24-JUN-15	30-JUN-15	R3217980
Calcium (Ca)-Total	17.4		0.10	mg/L	24-JUN-15	30-JUN-15	R3217980
Cesium (Cs)-Total	<0.00010		0.00010	mg/L	24-JUN-15	30-JUN-15	R3217980
Chromium (Cr)-Total	0.0010		0.0010	mg/L	24-JUN-15	30-JUN-15	R3217980
Cobalt (Co)-Total	0.00141		0.00020	mg/L	24-JUN-15	30-JUN-15	R3217980
Copper (Cu)-Total	0.00266		0.00020	mg/L	24-JUN-15	30-JUN-15	R3217980
Iron (Fe)-Total	2.81		0.10	mg/L	24-JUN-15	30-JUN-15	R3217980
Lead (Pb)-Total	0.00101		0.000090	mg/L	24-JUN-15	30-JUN-15	R3217980
Lithium (Li)-Total	0.0093		0.0020	mg/L	24-JUN-15	30-JUN-15	R3217980
Magnesium (Mg)-Total	4.13		0.010	mg/L	24-JUN-15	30-JUN-15	R3217980
Manganese (Mn)-Total	1.07		0.00030	mg/L	24-JUN-15	30-JUN-15	R3217980
Molybdenum (Mo)-Total	0.00055		0.00020	mg/L	24-JUN-15	30-JUN-15	R3217980
Nickel (Ni)-Total	<0.0020		0.0020	mg/L	24-JUN-15	30-JUN-15	R3217980
Phosphorus (P)-Total	<0.10		0.10	mg/L	24-JUN-15	30-JUN-15	R3217980
Potassium (K)-Total	3.23		0.020	mg/L	24-JUN-15	30-JUN-15	R3217980
Rubidium (Rb)-Total	0.00452		0.00020	mg/L	24-JUN-15	30-JUN-15	R3217980
Selenium (Se)-Total	<0.0010		0.0010	mg/L	24-JUN-15	30-JUN-15	R3217980
Silicon (Si)-Total	2.53		0.10	mg/L	24-JUN-15	30-JUN-15	R3217980
Silver (Ag)-Total	<0.00010		0.00010	mg/L	24-JUN-15	30-JUN-15	R3217980
Sodium (Na)-Total	10.0		0.030	mg/L	24-JUN-15	30-JUN-15	R3217980
Strontium (Sr)-Total	0.153		0.00010	mg/L	24-JUN-15	30-JUN-15	R3217980
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	24-JUN-15	30-JUN-15	R3217980
Thallium (Tl)-Total	<0.00010		0.00010	mg/L	24-JUN-15	30-JUN-15	R3217980
Thorium (Th)-Total	0.00037		0.00010	mg/L	24-JUN-15	30-JUN-15	R3217980
Tin (Sn)-Total	<0.00020		0.00020	mg/L	24-JUN-15	30-JUN-15	R3217980
Titanium (Ti)-Total	0.0303		0.00050	mg/L	24-JUN-15	30-JUN-15	R3217980
Tungsten (W)-Total	<0.00010		0.00010	mg/L	24-JUN-15	30-JUN-15	R3217980
Uranium (U)-Total	0.00023		0.00010	mg/L	24-JUN-15	30-JUN-15	R3217980
Vanadium (V)-Total	0.00110		0.00020	mg/L	24-JUN-15	30-JUN-15	R3217980
Zinc (Zn)-Total	0.0523		0.0020	mg/L	24-JUN-15	30-JUN-15	R3217980
Zirconium (Zr)-Total	0.00049		0.00040	mg/L	24-JUN-15	30-JUN-15	R3217980

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

Reference Information

Sample Parameter Qualifier Key:

Qualifier	Description
DLA	Detection Limit adjusted for required dilution
DLM	Detection Limit Adjusted due to sample matrix effects.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
BOD-WP	Water	Biochemical Oxygen Demand (BOD)	APHA 5210 B
The sample is incubated for 5 days at 20 degrees Celcius. Comparison of dissolved oxygen content at the beginning and end of incubation provides a measure of biochemical oxygen demand. If carbonaceous BOD is requested, TCMP is added to the sample to chemically inhibit nitrogenous oxygen demand. If soluble BOD is requested, the sample is filtered prior to analysis. Surface waters have a DL of 1 mg/L. Effluents are diluted according to their history and will have a sample DL of 6 mg/L or greater, depending on the dilutions used.			
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.			
FC-MPN-WP	Water	Fecal Coliform	APHA 9221E
The Most Probable Number (MPN) method is based on the Multiple Tube Fermentation technique. The results of examination of replicate tubes and dilutions of a sample are reported after confirmations specific to total coliform, fecal coliform and E. coli are performed. Results are reported in MPN/100 mL for water and MPN/gram for food and solid samples.			
HG-T-CVAF-WP	Water	Mercury Total	EPA245.7 V2.0
Mercury in filtered and unfiltered waters is oxidized with Bromine monochloride and analyzed by cold-vapour atomic fluorescence spectrometry.			
MET-T-L-MS-WP	Water	Total Metals by ICP-MS	APHA 3030E/EPA 6020A-TL
This analysis involves preliminary sample treatment by hotblock acid digestion (APHA 3030E). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).			
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.			
OGG-TOT-WT	Water	Oil and Grease, Total	APHA 5520 B
Sample is extracted with hexane, extract is then evaporated and the residue is weighed to determine total oil and grease.			
PH-WP	Water	pH	APHA 4500H
The pH of a sample is the determination of the activity of the hydrogen ions by potentiometric measurement using a standard hydrogen electrode and a reference electrode.			
PHENOLS-4AAP-WT	Water	Phenol (4AAP)	EPA 9066
An automated method is used to distill the sample. The distillate is then buffered to pH 9.4 which reacts with 4AAP and potassium ferricyanide to form a red complex which is measured colorimetrically.			
SO4-IC-N-WP	Water	Sulfate in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
SOLIDS-TOTSUS-WP	Water	Total Suspended Solids	APHA 2540 D (modified)
Total suspended solids in aquesous matrices is determined gravimetrically after drying the residue at 103 105°C.			

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

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**

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
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA
WP	ALS ENVIRONMENTAL - WINNIPEG, MANITOBA, 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.

ALS Environmental

L1628555-COFC

COC # _____

Page ___ of ___

Report To		Re	Service Requested (Rush for routine analysis subject to availability)
Company:	HAMLET OF ARVIAT (W10578)	☐	◉ Regular (Standard Turnaround Times - Business Days)
Contact:	~~ED MURPHY~~ Steve England.	☐ PDF ☐ Excel ☐ Digital ☐ Fax	○ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT
Address:	PO Box 150	Email 1: arviatsao@qiniq.com	○ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT
	ARVIAT, NUNAVUT, X0C 0E0	Email 2:	○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT
Phone:	867-857-2841 Fax:	Email 3:	
Invoice To	Same as Report ? ☑ Yes ☐ No	**Client / Project Information**	
Hardcopy of Invoice with Report?	☐ Yes ☑ No	Job #: HAMLET OF ARVIAT WWTP	
Company:		PO / AFE:	
Contact:		LSD:	
Address:			
Phone:	Fax:	Quote #: Q30948	
Lab Work Order # (lab use only)		**ALS Contact:**	**Sampler:**

Analysis Request

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

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	BOD-WP	TSS	EC-WP	PH-WP	SO4-IC-WP	ANIONS-N2N3-IC-WP	NH3-0COL-WP	FECAL COLIFORM (FC-MPN)	MET-T-L-MS-WP	HG-T-CVAF-WP	OGG-TOT-WT	PHENOLS-4AAP-WT	Number of Containers
	ARV 2	15-06-15	9:50am	EFF	x	x	x	x	x	x	x	x	x	x	x	x	
	ARV 4	15-06-15	10:37am	EFF	x	x	x	x	x	x	x	x	x	x	x	x	
	ARV 5	15-06-15	10:50am	EFF	x	x	x	x	x	x	x	x	x	x	x	x	
	ARV 6	15-06-15	11:09am	EFF	x	x	x	x	x	x	x	x	x	x	x	x	

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

Bottlles Required per sample: 500 ml BOD, 500 ml Routine, 250 ml Nutrient + H2SO4 pres, 125 ml Sterile Bacti, 250 ml Metals + HNO3 pres, 40 ml glass vial Mercury + HCL, 1 L Amber W/M Oil & Grease, 250 ml Amber Phenols + H2SO4

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

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

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

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
			EE	6-17-15	3:45	5° °C				

GENF 18.01 Front

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

Date Received: 23-JUL-15
Report Date: 05-AUG-15 15:06 (MT)
Version: FINAL

Client Phone: 867-857-2841

Certificate of Analysis

Lab Work Order #: L1647049

Project P.O. #: NOT SUBMITTED
Job Reference: ARVIAT , NU
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
L1647049-1 ARV-2							
Sampled By: Paulie I. on 21-JUL-15 @ 14:00							
Matrix: WATER							
BTEX plus F1-F4							
BTX plus F1 by GCMS							
Benzene	<0.00050		0.00050	mg/L		24-JUL-15	R3230990
Toluene	<0.0010		0.0010	mg/L		24-JUL-15	R3230990
Ethyl benzene	<0.00050		0.00050	mg/L		24-JUL-15	R3230990
o-Xylene	<0.00050		0.00050	mg/L		24-JUL-15	R3230990
m+p-Xylenes	<0.00050		0.00050	mg/L		24-JUL-15	R3230990
F1 (C6-C10)	<0.10		0.10	mg/L		24-JUL-15	R3230990
Surrogate: 4-Bromofluorobenzene (SS)	84.5		70-130	%		24-JUL-15	R3230990
CCME Total Hydrocarbons							
F1-BTEX	<0.10		0.10	mg/L		04-AUG-15	
F2-Naphth	0.38		0.25	mg/L		04-AUG-15	
F3-PAH	0.69		0.25	mg/L		04-AUG-15	
Total Hydrocarbons (C6-C50)	1.07		0.44	mg/L		04-AUG-15	
F2-F4 PHC method							
F2 (C10-C16)	0.38		0.25	mg/L	27-JUL-15	27-JUL-15	R3233578
F3 (C16-C34)	0.69		0.25	mg/L	27-JUL-15	27-JUL-15	R3233578
F4 (C34-C50)	<0.25		0.25	mg/L	27-JUL-15	27-JUL-15	R3233578
Surrogate: 2-Bromobenzotrifluoride	92.7		60-140	%	27-JUL-15	27-JUL-15	R3233578
Sum of Xylene Isomer Concentrations							
Xylenes (Total)	<0.0015		0.0015	mg/L		27-JUL-15	
Miscellaneous Parameters							
Total Organic Carbon	58.8		1.0	mg/L		27-JUL-15	R3233565
Polyaromatic Hydrocarbons (PAHs)							
1-Methyl Naphthalene	0.000050		0.000020	mg/L	30-JUL-15	31-JUL-15	R3237781
2-Methyl Naphthalene	0.000146	EMPC	0.000020	mg/L	30-JUL-15	31-JUL-15	R3237781
Acenaphthene	<0.000040	DLM	0.000040	mg/L	30-JUL-15	31-JUL-15	R3237781
Acenaphthylene	0.000052		0.000020	mg/L	30-JUL-15	31-JUL-15	R3237781
Anthracene	<0.000010		0.000010	mg/L	30-JUL-15	31-JUL-15	R3237781
Acridine	<0.000020		0.000020	mg/L	30-JUL-15	31-JUL-15	R3237781
Benzo(a)anthracene	<0.000010		0.000010	mg/L	30-JUL-15	31-JUL-15	R3237781
Benzo(a)pyrene	<0.0000050		0.0000050	mg/L	30-JUL-15	31-JUL-15	R3237781
Benzo(b&j)fluoranthene	<0.000010		0.000010	mg/L	30-JUL-15	31-JUL-15	R3237781
Benzo(g,h,i)perylene	<0.000020		0.000020	mg/L	30-JUL-15	31-JUL-15	R3237781
Benzo(k)fluoranthene	<0.000010		0.000010	mg/L	30-JUL-15	31-JUL-15	R3237781
Chrysene	<0.000020		0.000020	mg/L	30-JUL-15	31-JUL-15	R3237781
Dibenzo(a,h)anthracene	<0.0000050		0.0000050	mg/L	30-JUL-15	31-JUL-15	R3237781
Fluoranthene	<0.000020		0.000020	mg/L	30-JUL-15	31-JUL-15	R3237781
Fluorene	<0.000020		0.000020	mg/L	30-JUL-15	31-JUL-15	R3237781
Indeno(1,2,3-cd)pyrene	<0.000010		0.000010	mg/L	30-JUL-15	31-JUL-15	R3237781
Naphthalene	0.000053		0.000050	mg/L	30-JUL-15	31-JUL-15	R3237781
Phenanthrene	<0.000050		0.000050	mg/L	30-JUL-15	31-JUL-15	R3237781
Pyrene	<0.000010		0.000010	mg/L	30-JUL-15	31-JUL-15	R3237781
Quinoline	<0.000020		0.000020	mg/L	30-JUL-15	31-JUL-15	R3237781
B(a)P Total Potency Equivalent	<0.000030		0.000030	mg/L	30-JUL-15	31-JUL-15	R3237781
Surrogate: Acenaphthene d10	85.4		40-130	%	30-JUL-15	31-JUL-15	R3237781
Surrogate: Acridine d9	83.5		40-130	%	30-JUL-15	31-JUL-15	R3237781
Surrogate: Chrysene d12	126.4		40-130	%	30-JUL-15	31-JUL-15	R3237781
Surrogate: Naphthalene d8	116.2		40-130	%	30-JUL-15	31-JUL-15	R3237781
Surrogate: Phenanthrene d10	83.4		40-130	%	30-JUL-15	31-JUL-15	R3237781
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	934		1.2	mg/L		31-JUL-15	

* 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
L1647049-1 ARV-2							
Sampled By: Paulie I. on 21-JUL-15 @ 14:00							
Matrix: WATER							
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		31-JUL-15	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		31-JUL-15	
Ammonia by colour							
Ammonia, Total (as N)	14.0	DLA	1.0	mg/L		24-JUL-15	R3232895
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	79	DLA	50	mg/L		24-JUL-15	R3235808
Carbonaceous BOD							
BOD Carbonaceous	40	DLA	20	mg/L		24-JUL-15	R3235808
Chloride in Water by IC							
Chloride (Cl)	409		10	mg/L		23-JUL-15	R3232180
Conductivity							
Conductivity	3340		1.0	umhos/cm		30-JUL-15	R3236541
Fecal Coliform							
Fecal Coliforms	36	PEHR	3	MPN/100mL		23-JUL-15	R3234479
Hardness Calculated							
Hardness (as CaCO3)	1160		0.30	mg/L		29-JUL-15	
Mercury Total							
Mercury (Hg)-Total	<0.00020	DLM	0.00020	mg/L	28-JUL-15	28-JUL-15	R3234932
Nitrate in Water by IC							
Nitrate (as N)	<0.40	DLM	0.40	mg/L		23-JUL-15	R3232180
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.45		0.45	mg/L		24-JUL-15	
Nitrite in Water by IC							
Nitrite (as N)	<0.20	DLM	0.20	mg/L		23-JUL-15	R3232180
Oil and Grease, Total							
Oil and Grease, Total	4.5		2.0	mg/L	27-JUL-15	27-JUL-15	R3233501
Phenol (4AAP)							
Phenols (4AAP)	0.0295		0.0010	mg/L		30-JUL-15	R3236288
Phosphorus, Total							
Phosphorus (P)-Total	1.65		0.010	mg/L		29-JUL-15	R3234756
Sulfate in Water by IC							
Sulfate (SO4)	469		6.0	mg/L		23-JUL-15	R3232180
Total Alkalinity as CaCO3							
Alkalinity, Total (as CaCO3)	766		1.0	mg/L		30-JUL-15	R3236541
Total Metals by ICP-MS							
Aluminum (Al)-Total	0.0934		0.0050	mg/L	27-JUL-15	27-JUL-15	R3233554
Arsenic (As)-Total	0.00631		0.00020	mg/L	27-JUL-15	27-JUL-15	R3233554
Cadmium (Cd)-Total	0.000199		0.000010	mg/L	27-JUL-15	27-JUL-15	R3233554
Calcium (Ca)-Total	353	DLA	10	mg/L	27-JUL-15	28-JUL-15	R3234373
Chromium (Cr)-Total	0.0027		0.0010	mg/L	27-JUL-15	27-JUL-15	R3233554
Cobalt (Co)-Total	0.00167		0.00020	mg/L	27-JUL-15	27-JUL-15	R3233554
Copper (Cu)-Total	0.0274		0.00020	mg/L	27-JUL-15	27-JUL-15	R3233554
Iron (Fe)-Total	1.72		0.10	mg/L	27-JUL-15	27-JUL-15	R3233554
Lead (Pb)-Total	0.00662		0.000090	mg/L	27-JUL-15	27-JUL-15	R3233554
Magnesium (Mg)-Total	67.3		0.010	mg/L	27-JUL-15	27-JUL-15	R3233554
Manganese (Mn)-Total	1.28	DLA	0.030	mg/L	27-JUL-15	28-JUL-15	R3234373
Nickel (Ni)-Total	0.0089		0.0020	mg/L	27-JUL-15	27-JUL-15	R3233554
Potassium (K)-Total	75.1		0.020	mg/L	27-JUL-15	27-JUL-15	R3233554
Sodium (Na)-Total	327		0.030	mg/L	27-JUL-15	27-JUL-15	R3233554
Zinc (Zn)-Total	0.121		0.0020	mg/L	27-JUL-15	27-JUL-15	R3233554
Total Suspended Solids							

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1647049-1 ARV-2							
Sampled By: Paulie I. on 21-JUL-15 @ 14:00							
Matrix: WATER							
Total Suspended Solids							
Total Suspended Solids	<5.0		5.0	mg/L		27-JUL-15	R3234080
pH							
pH	7.98		0.10	pH units		30-JUL-15	R3236541
L1647049-2 ARV-4							
Sampled By: Paulie I. on 21-JUL-15 @ 14:00							
Matrix: WATER							
BTEX plus F1-F4							
BTX plus F1 by GCMS							
Benzene	<0.00050		0.00050	mg/L		24-JUL-15	R3230990
Toluene	<0.0010		0.0010	mg/L		24-JUL-15	R3230990
Ethyl benzene	<0.00050		0.00050	mg/L		24-JUL-15	R3230990
o-Xylene	<0.00050		0.00050	mg/L		24-JUL-15	R3230990
m+p-Xylenes	<0.00050		0.00050	mg/L		24-JUL-15	R3230990
F1 (C6-C10)	<0.10		0.10	mg/L		24-JUL-15	R3230990
Surrogate: 4-Bromofluorobenzene (SS)	84.5		70-130	%		24-JUL-15	R3230990
CCME Total Hydrocarbons							
F1-BTEX	<0.10		0.10	mg/L		04-AUG-15	
F2-Naphth	<0.25		0.25	mg/L		04-AUG-15	
F3-PAH	0.71		0.25	mg/L		04-AUG-15	
Total Hydrocarbons (C6-C50)	1.02		0.44	mg/L		04-AUG-15	
F2-F4 PHC method							
F2 (C10-C16)	<0.25		0.25	mg/L	27-JUL-15	27-JUL-15	R3233578
F3 (C16-C34)	0.71		0.25	mg/L	27-JUL-15	27-JUL-15	R3233578
F4 (C34-C50)	0.31		0.25	mg/L	27-JUL-15	27-JUL-15	R3233578
Surrogate: 2-Bromobenzotrifluoride	93.9		60-140	%	27-JUL-15	27-JUL-15	R3233578
Sum of Xylene Isomer Concentrations							
Xylenes (Total)	<0.0015		0.0015	mg/L		27-JUL-15	
Miscellaneous Parameters							
Total Organic Carbon	50.0		1.0	mg/L		27-JUL-15	R3233565
Polyaromatic Hydrocarbons (PAHs)							
1-Methyl Naphthalene	<0.000020		0.000020	mg/L	30-JUL-15	31-JUL-15	R3237781
2-Methyl Naphthalene	<0.000020		0.000020	mg/L	30-JUL-15	31-JUL-15	R3237781
Acenaphthene	<0.000020		0.000020	mg/L	30-JUL-15	31-JUL-15	R3237781
Acenaphthylene	<0.000020		0.000020	mg/L	30-JUL-15	31-JUL-15	R3237781
Anthracene	<0.000010		0.000010	mg/L	30-JUL-15	31-JUL-15	R3237781
Acridine	<0.000040	DLM	0.000040	mg/L	30-JUL-15	31-JUL-15	R3237781
Benzo(a)anthracene	<0.000010		0.000010	mg/L	30-JUL-15	31-JUL-15	R3237781
Benzo(a)pyrene	<0.0000050		0.0000050	mg/L	30-JUL-15	31-JUL-15	R3237781
Benzo(b&j)fluoranthene	<0.000010		0.000010	mg/L	30-JUL-15	31-JUL-15	R3237781
Benzo(g,h,i)perylene	<0.000020		0.000020	mg/L	30-JUL-15	31-JUL-15	R3237781
Benzo(k)fluoranthene	<0.000010		0.000010	mg/L	30-JUL-15	31-JUL-15	R3237781
Chrysene	<0.000020		0.000020	mg/L	30-JUL-15	31-JUL-15	R3237781
Dibenzo(a,h)anthracene	<0.0000050		0.0000050	mg/L	30-JUL-15	31-JUL-15	R3237781
Fluoranthene	<0.000020		0.000020	mg/L	30-JUL-15	31-JUL-15	R3237781
Fluorene	<0.000020		0.000020	mg/L	30-JUL-15	31-JUL-15	R3237781
Indeno(1,2,3-cd)pyrene	<0.000010		0.000010	mg/L	30-JUL-15	31-JUL-15	R3237781
Naphthalene	<0.000050		0.000050	mg/L	30-JUL-15	31-JUL-15	R3237781
Phenanthrene	<0.000050		0.000050	mg/L	30-JUL-15	31-JUL-15	R3237781
Pyrene	<0.000010		0.000010	mg/L	30-JUL-15	31-JUL-15	R3237781
Quinoline	<0.000020		0.000020	mg/L	30-JUL-15	31-JUL-15	R3237781
B(a)P Total Potency Equivalent	<0.000030		0.000030	mg/L	30-JUL-15	31-JUL-15	R3237781

* 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
L1647049-2 ARV-4							
Sampled By: Paulie I. on 21-JUL-15 @ 14:00							
Matrix: WATER							
Polyaromatic Hydrocarbons (PAHs)							
Surrogate: Acenaphthene d10	83.9		40-130	%	30-JUL-15	31-JUL-15	R3237781
Surrogate: Acridine d9	87.9		40-130	%	30-JUL-15	31-JUL-15	R3237781
Surrogate: Chrysene d12	98.5		40-130	%	30-JUL-15	31-JUL-15	R3237781
Surrogate: Naphthalene d8	79.7		40-130	%	30-JUL-15	31-JUL-15	R3237781
Surrogate: Phenanthrene d10	83.6		40-130	%	30-JUL-15	31-JUL-15	R3237781
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	205		1.2	mg/L		31-JUL-15	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		31-JUL-15	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		31-JUL-15	
Ammonia by colour							
Ammonia, Total (as N)	13.6	DLA	1.0	mg/L		24-JUL-15	R3232895
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	30.2	DLA	6.0	mg/L		24-JUL-15	R3235808
Carbonaceous BOD							
BOD Carbonaceous	16.1	DLA	6.0	mg/L		24-JUL-15	R3235808
Chloride in Water by IC							
Chloride (Cl)	161		1.0	mg/L		23-JUL-15	R3232180
Conductivity							
Conductivity	903		1.0	umhos/cm		30-JUL-15	R3236541
Fecal Coliform							
Fecal Coliforms	930	PEHR	3	MPN/100mL		23-JUL-15	R3234479
Hardness Calculated							
Hardness (as CaCO3)	114		0.30	mg/L		28-JUL-15	
Mercury Total							
Mercury (Hg)-Total	<0.00040	DLM	0.00040	mg/L	28-JUL-15	28-JUL-15	R3234932
Nitrate in Water by IC							
Nitrate (as N)	<0.040	DLM	0.040	mg/L		23-JUL-15	R3232180
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		24-JUL-15	
Nitrite in Water by IC							
Nitrite (as N)	<0.020	DLM	0.020	mg/L		23-JUL-15	R3232180
Oil and Grease, Total							
Oil and Grease, Total	<2.0		2.0	mg/L	27-JUL-15	27-JUL-15	R3233501
Phenol (4AAP)							
Phenols (4AAP)	0.0054		0.0010	mg/L		30-JUL-15	R3236288
Phosphorus, Total							
Phosphorus (P)-Total	6.60	DLA	0.050	mg/L		29-JUL-15	R3234756
Sulfate in Water by IC							
Sulfate (SO4)	5.60		0.60	mg/L		23-JUL-15	R3232180
Total Alkalinity as CaCO3							
Alkalinity, Total (as CaCO3)	168		1.0	mg/L		30-JUL-15	R3236541
Total Metals by ICP-MS							
Aluminum (Al)-Total	0.128		0.0050	mg/L	27-JUL-15	27-JUL-15	R3233554
Arsenic (As)-Total	0.00523		0.00020	mg/L	27-JUL-15	27-JUL-15	R3233554
Cadmium (Cd)-Total	0.000048		0.000010	mg/L	27-JUL-15	27-JUL-15	R3233554
Calcium (Ca)-Total	20.8		0.10	mg/L	27-JUL-15	27-JUL-15	R3233554
Chromium (Cr)-Total	<0.0010		0.0010	mg/L	27-JUL-15	27-JUL-15	R3233554
Cobalt (Co)-Total	0.00231		0.00020	mg/L	27-JUL-15	27-JUL-15	R3233554
Copper (Cu)-Total	0.0190		0.00020	mg/L	27-JUL-15	27-JUL-15	R3233554

* 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
L1647049-2 ARV-4							
Sampled By: Paulie I. on 21-JUL-15 @ 14:00							
Matrix: WATER							
Total Metals by ICP-MS							
Iron (Fe)-Total	3.91		0.10	mg/L	27-JUL-15	27-JUL-15	R3233554
Lead (Pb)-Total	0.00251		0.000090	mg/L	27-JUL-15	27-JUL-15	R3233554
Magnesium (Mg)-Total	15.1		0.010	mg/L	27-JUL-15	27-JUL-15	R3233554
Manganese (Mn)-Total	0.449		0.00030	mg/L	27-JUL-15	27-JUL-15	R3233554
Nickel (Ni)-Total	0.0061		0.0020	mg/L	27-JUL-15	27-JUL-15	R3233554
Potassium (K)-Total	18.6		0.020	mg/L	27-JUL-15	27-JUL-15	R3233554
Sodium (Na)-Total	103		0.030	mg/L	27-JUL-15	27-JUL-15	R3233554
Zinc (Zn)-Total	0.0173		0.0020	mg/L	27-JUL-15	27-JUL-15	R3233554
Total Suspended Solids							
Total Suspended Solids	20.0		5.0	mg/L		27-JUL-15	R3234080
pH							
pH	7.35		0.10	pH units		30-JUL-15	R3236541
L1647049-3 ARV-5							
Sampled By: Paulie I. on 21-JUL-15 @ 14:00							
Matrix: WATER							
BTEX plus F1-F4							
BTX plus F1 by GCMS							
Benzene	<0.00050		0.00050	mg/L		24-JUL-15	R3230990
Toluene	<0.0010		0.0010	mg/L		24-JUL-15	R3230990
Ethyl benzene	<0.00050		0.00050	mg/L		24-JUL-15	R3230990
o-Xylene	<0.00050		0.00050	mg/L		24-JUL-15	R3230990
m+p-Xylenes	<0.00050		0.00050	mg/L		24-JUL-15	R3230990
F1 (C6-C10)	<0.10		0.10	mg/L		24-JUL-15	R3230990
Surrogate: 4-Bromofluorobenzene (SS)	85.5		70-130	%		24-JUL-15	R3230990
CCME Total Hydrocarbons							
F1-BTEX	<0.10		0.10	mg/L		04-AUG-15	
F2-Naphth	<0.25		0.25	mg/L		04-AUG-15	
F3-PAH	<0.25		0.25	mg/L		04-AUG-15	
Total Hydrocarbons (C6-C50)	<0.44		0.44	mg/L		04-AUG-15	
F2-F4 PHC method							
F2 (C10-C16)	<0.25		0.25	mg/L	27-JUL-15	27-JUL-15	R3233578
F3 (C16-C34)	<0.25		0.25	mg/L	27-JUL-15	27-JUL-15	R3233578
F4 (C34-C50)	<0.25		0.25	mg/L	27-JUL-15	27-JUL-15	R3233578
Surrogate: 2-Bromobenzotrifluoride	73.9		60-140	%	27-JUL-15	27-JUL-15	R3233578
Sum of Xylene Isomer Concentrations							
Xylenes (Total)	<0.0015		0.0015	mg/L		27-JUL-15	
Miscellaneous Parameters							
Total Organic Carbon	9.1		1.0	mg/L		28-JUL-15	R3234426
Polyaromatic Hydrocarbons (PAHs)							
1-Methyl Naphthalene	<0.000020		0.000020	mg/L	30-JUL-15	31-JUL-15	R3237781
2-Methyl Naphthalene	<0.000020		0.000020	mg/L	30-JUL-15	31-JUL-15	R3237781
Acenaphthene	<0.000020		0.000020	mg/L	30-JUL-15	31-JUL-15	R3237781
Acenaphthylene	<0.000020		0.000020	mg/L	30-JUL-15	31-JUL-15	R3237781
Anthracene	<0.000010		0.000010	mg/L	30-JUL-15	31-JUL-15	R3237781
Acridine	<0.000020		0.000020	mg/L	30-JUL-15	31-JUL-15	R3237781
Benzo(a)anthracene	<0.000010		0.000010	mg/L	30-JUL-15	31-JUL-15	R3237781
Benzo(a)pyrene	<0.0000050		0.0000050	mg/L	30-JUL-15	31-JUL-15	R3237781
Benzo(b&j)fluoranthene	<0.000010		0.000010	mg/L	30-JUL-15	31-JUL-15	R3237781
Benzo(g,h,i)perylene	<0.000020		0.000020	mg/L	30-JUL-15	31-JUL-15	R3237781
Benzo(k)fluoranthene	<0.000010		0.000010	mg/L	30-JUL-15	31-JUL-15	R3237781
Chrysene	<0.000020		0.000020	mg/L	30-JUL-15	31-JUL-15	R3237781

* 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
L1647049-3 ARV-5							
Sampled By: Paulie I. on 21-JUL-15 @ 14:00							
Matrix: WATER							
Polyaromatic Hydrocarbons (PAHs)							
Dibenzo(a,h)anthracene	<0.0000050		0.0000050	mg/L	30-JUL-15	31-JUL-15	R3237781
Fluoranthene	<0.000020		0.000020	mg/L	30-JUL-15	31-JUL-15	R3237781
Fluorene	<0.000020		0.000020	mg/L	30-JUL-15	31-JUL-15	R3237781
Indeno(1,2,3-cd)pyrene	<0.000010		0.000010	mg/L	30-JUL-15	31-JUL-15	R3237781
Naphthalene	<0.000050		0.000050	mg/L	30-JUL-15	31-JUL-15	R3237781
Phenanthrene	<0.000050		0.000050	mg/L	30-JUL-15	31-JUL-15	R3237781
Pyrene	<0.000010		0.000010	mg/L	30-JUL-15	31-JUL-15	R3237781
Quinoline	<0.000020		0.000020	mg/L	30-JUL-15	31-JUL-15	R3237781
B(a)P Total Potency Equivalent	<0.000030		0.000030	mg/L	30-JUL-15	31-JUL-15	R3237781
Surrogate: Acenaphthene d10	89.5		40-130	%	30-JUL-15	31-JUL-15	R3237781
Surrogate: Acridine d9	95.2		40-130	%	30-JUL-15	31-JUL-15	R3237781
Surrogate: Chrysene d12	103.1		40-130	%	30-JUL-15	31-JUL-15	R3237781
Surrogate: Naphthalene d8	86.8		40-130	%	30-JUL-15	31-JUL-15	R3237781
Surrogate: Phenanthrene d10	94.1		40-130	%	30-JUL-15	31-JUL-15	R3237781
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	93.9		1.2	mg/L		31-JUL-15	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		31-JUL-15	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		31-JUL-15	
Ammonia by colour							
Ammonia, Total (as N)	0.021		0.010	mg/L		23-JUL-15	R3231684
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	<2.0		2.0	mg/L		24-JUL-15	R3235808
Carbonaceous BOD							
BOD Carbonaceous	<2.0		2.0	mg/L		24-JUL-15	R3235808
Chloride in Water by IC							
Chloride (Cl)	901		10	mg/L		23-JUL-15	R3232180
Conductivity							
Conductivity	2990		1.0	umhos/cm		29-JUL-15	R3235920
Fecal Coliform							
Fecal Coliforms	4	PEHR	3	MPN/100mL		23-JUL-15	R3234479
Hardness Calculated							
Hardness (as CaCO3)	466		0.30	mg/L		28-JUL-15	
Mercury Total							
Mercury (Hg)-Total	<0.000020		0.000020	mg/L	28-JUL-15	28-JUL-15	R3234932
Nitrate in Water by IC							
Nitrate (as N)	<0.40	DLM	0.40	mg/L		23-JUL-15	R3232180
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.45		0.45	mg/L		24-JUL-15	
Nitrite in Water by IC							
Nitrite (as N)	<0.20	DLM	0.20	mg/L		23-JUL-15	R3232180
Oil and Grease, Total							
Oil and Grease, Total	<2.0		2.0	mg/L	27-JUL-15	27-JUL-15	R3233501
Phenol (4AAP)							
Phenols (4AAP)	0.0138		0.0010	mg/L		30-JUL-15	R3236288
Phosphorus, Total							
Phosphorus (P)-Total	0.044		0.010	mg/L		29-JUL-15	R3234756
Sulfate in Water by IC							
Sulfate (SO4)	53.0		6.0	mg/L		23-JUL-15	R3232180
Total Alkalinity as CaCO3							

* 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
L1647049-3 ARV-5							
Sampled By: Paulie I. on 21-JUL-15 @ 14:00							
Matrix: WATER							
Total Alkalinity as CaCO3							
Alkalinity, Total (as CaCO3)	77.0		1.0	mg/L		29-JUL-15	R3235920
Total Metals by ICP-MS							
Aluminum (Al)-Total	0.0779		0.0050	mg/L	27-JUL-15	27-JUL-15	R3233554
Arsenic (As)-Total	0.00050		0.00020	mg/L	27-JUL-15	27-JUL-15	R3233554
Cadmium (Cd)-Total	<0.000010		0.000010	mg/L	27-JUL-15	27-JUL-15	R3233554
Calcium (Ca)-Total	47.2		0.10	mg/L	27-JUL-15	27-JUL-15	R3233554
Chromium (Cr)-Total	<0.0010		0.0010	mg/L	27-JUL-15	27-JUL-15	R3233554
Cobalt (Co)-Total	<0.00020		0.00020	mg/L	27-JUL-15	27-JUL-15	R3233554
Copper (Cu)-Total	0.00043		0.00020	mg/L	27-JUL-15	27-JUL-15	R3233554
Iron (Fe)-Total	1.83		0.10	mg/L	27-JUL-15	27-JUL-15	R3233554
Lead (Pb)-Total	0.000560		0.000090	mg/L	27-JUL-15	27-JUL-15	R3233554
Magnesium (Mg)-Total	84.5		0.010	mg/L	27-JUL-15	27-JUL-15	R3233554
Manganese (Mn)-Total	0.0366		0.00030	mg/L	27-JUL-15	27-JUL-15	R3233554
Nickel (Ni)-Total	<0.0020		0.0020	mg/L	27-JUL-15	27-JUL-15	R3233554
Potassium (K)-Total	16.3		0.020	mg/L	27-JUL-15	27-JUL-15	R3233554
Sodium (Na)-Total	486		0.030	mg/L	27-JUL-15	27-JUL-15	R3233554
Zinc (Zn)-Total	<0.0020		0.0020	mg/L	27-JUL-15	27-JUL-15	R3233554
Total Suspended Solids							
Total Suspended Solids	8.0		5.0	mg/L		27-JUL-15	R3234080
pH							
pH	7.90		0.10	pH units		29-JUL-15	R3235920
L1647049-4 ARV-6							
Sampled By: Paulie I. on 21-JUL-15 @ 14:00							
Matrix: WATER							
BTEX plus F1-F4							
BTX plus F1 by GCMS							
Benzene	<0.00050		0.00050	mg/L		30-JUL-15	R3236257
Toluene	0.0042		0.0010	mg/L		30-JUL-15	R3236257
Ethyl benzene	0.00051		0.00050	mg/L		30-JUL-15	R3236257
o-Xylene	0.00095		0.00050	mg/L		30-JUL-15	R3236257
m+p-Xylenes	0.00150		0.00050	mg/L		30-JUL-15	R3236257
F1 (C6-C10)	<0.10		0.10	mg/L		30-JUL-15	R3236257
Surrogate: 4-Bromofluorobenzene (SS)	107.2		70-130	%		30-JUL-15	R3236257
CCME Total Hydrocarbons							
F1-BTEX	<0.10		0.10	mg/L		04-AUG-15	
F2-Naphth	<0.25		0.25	mg/L		04-AUG-15	
F3-PAH	0.57		0.25	mg/L		04-AUG-15	
Total Hydrocarbons (C6-C50)	0.57		0.44	mg/L		04-AUG-15	
F2-F4 PHC method							
F2 (C10-C16)	<0.25		0.25	mg/L	27-JUL-15	27-JUL-15	R3233578
F3 (C16-C34)	0.57		0.25	mg/L	27-JUL-15	27-JUL-15	R3233578
F4 (C34-C50)	<0.25		0.25	mg/L	27-JUL-15	27-JUL-15	R3233578
Surrogate: 2-Bromobenzotrifluoride	92.6		60-140	%	27-JUL-15	27-JUL-15	R3233578
Sum of Xylene Isomer Concentrations							
Xylenes (Total)	0.0025		0.0015	mg/L		31-JUL-15	
Miscellaneous Parameters							
Total Organic Carbon	28.2		1.0	mg/L		27-JUL-15	R3233565
Polyaromatic Hydrocarbons (PAHs)							
1-Methyl Naphthalene	0.000024		0.000020	mg/L	30-JUL-15	31-JUL-15	R3237781
2-Methyl Naphthalene	<0.000020		0.000020	mg/L	30-JUL-15	31-JUL-15	R3237781
Acenaphthene	<0.000020		0.000020	mg/L	30-JUL-15	31-JUL-15	R3237781

* 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
L1647049-4 ARV-6							
Sampled By: Paulie I. on 21-JUL-15 @ 14:00							
Matrix: WATER							
Polyaromatic Hydrocarbons (PAHs)							
Acenaphthylene	<0.000020		0.000020	mg/L	30-JUL-15	31-JUL-15	R3237781
Anthracene	<0.000010		0.000010	mg/L	30-JUL-15	31-JUL-15	R3237781
Acridine	<0.000020		0.000020	mg/L	30-JUL-15	31-JUL-15	R3237781
Benzo(a)anthracene	<0.000010		0.000010	mg/L	30-JUL-15	31-JUL-15	R3237781
Benzo(a)pyrene	<0.0000050		0.0000050	mg/L	30-JUL-15	31-JUL-15	R3237781
Benzo(b&j)fluoranthene	<0.000010		0.000010	mg/L	30-JUL-15	31-JUL-15	R3237781
Benzo(g,h,i)perylene	<0.000020		0.000020	mg/L	30-JUL-15	31-JUL-15	R3237781
Benzo(k)fluoranthene	<0.000010		0.000010	mg/L	30-JUL-15	31-JUL-15	R3237781
Chrysene	<0.000020		0.000020	mg/L	30-JUL-15	31-JUL-15	R3237781
Dibenzo(a,h)anthracene	<0.0000050		0.0000050	mg/L	30-JUL-15	31-JUL-15	R3237781
Fluoranthene	<0.000020		0.000020	mg/L	30-JUL-15	31-JUL-15	R3237781
Fluorene	<0.000020		0.000020	mg/L	30-JUL-15	31-JUL-15	R3237781
Indeno(1,2,3-cd)pyrene	<0.000010		0.000010	mg/L	30-JUL-15	31-JUL-15	R3237781
Naphthalene	<0.000050		0.000050	mg/L	30-JUL-15	31-JUL-15	R3237781
Phenanthrene	<0.000050		0.000050	mg/L	30-JUL-15	31-JUL-15	R3237781
Pyrene	<0.000010		0.000010	mg/L	30-JUL-15	31-JUL-15	R3237781
Quinoline	<0.000060	DLM	0.000060	mg/L	30-JUL-15	31-JUL-15	R3237781
B(a)P Total Potency Equivalent	<0.000030		0.000030	mg/L	30-JUL-15	31-JUL-15	R3237781
Surrogate: Acenaphthene d10	86.7		40-130	%	30-JUL-15	31-JUL-15	R3237781
Surrogate: Acridine d9	88.9		40-130	%	30-JUL-15	31-JUL-15	R3237781
Surrogate: Chrysene d12	99.3		40-130	%	30-JUL-15	31-JUL-15	R3237781
Surrogate: Naphthalene d8	82.3		40-130	%	30-JUL-15	31-JUL-15	R3237781
Surrogate: Phenanthrene d10	84.8		40-130	%	30-JUL-15	31-JUL-15	R3237781
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	138		1.2	mg/L		31-JUL-15	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		31-JUL-15	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		31-JUL-15	
Ammonia by colour							
Ammonia, Total (as N)	0.256		0.010	mg/L		23-JUL-15	R3231684
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	6.3		6.0	mg/L		24-JUL-15	R3235808
Carbonaceous BOD							
BOD Carbonaceous	5.9		2.0	mg/L		24-JUL-15	R3235808
Chloride in Water by IC							
Chloride (Cl)	45.1		0.50	mg/L		23-JUL-15	R3232180
Conductivity							
Conductivity	691		1.0	umhos/cm		29-JUL-15	R3235920
Fecal Coliform							
Fecal Coliforms	<3	PEHR	3	MPN/100mL		23-JUL-15	R3234479
Hardness Calculated							
Hardness (as CaCO3)	205		0.30	mg/L		29-JUL-15	
Mercury Total							
Mercury (Hg)-Total	<0.00020	DLM	0.00020	mg/L	28-JUL-15	28-JUL-15	R3234932
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		23-JUL-15	R3232180
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		24-JUL-15	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		23-JUL-15	R3232180

* 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
L1647049-4 ARV-6							
Sampled By: Paulie I. on 21-JUL-15 @ 14:00							
Matrix: WATER							
Oil and Grease, Total							
Oil and Grease, Total	<2.0		2.0	mg/L	27-JUL-15	27-JUL-15	R3233501
Phenol (4AAP)							
Phenols (4AAP)	0.0102		0.0010	mg/L		30-JUL-15	R3236288
Phosphorus, Total							
Phosphorus (P)-Total	0.407		0.010	mg/L		29-JUL-15	R3234756
Sulfate in Water by IC							
Sulfate (SO4)	2.64		0.30	mg/L		23-JUL-15	R3232180
Total Alkalinity as CaCO3							
Alkalinity, Total (as CaCO3)	113		1.0	mg/L		29-JUL-15	R3235920
Total Metals by ICP-MS							
Aluminum (Al)-Total	1.36		0.0050	mg/L	27-JUL-15	27-JUL-15	R3233554
Arsenic (As)-Total	0.00319		0.00020	mg/L	27-JUL-15	27-JUL-15	R3233554
Cadmium (Cd)-Total	0.000020		0.000010	mg/L	27-JUL-15	27-JUL-15	R3233554
Calcium (Ca)-Total	52.6		0.10	mg/L	27-JUL-15	27-JUL-15	R3233554
Chromium (Cr)-Total	0.0048		0.0010	mg/L	27-JUL-15	27-JUL-15	R3233554
Cobalt (Co)-Total	0.00480		0.00020	mg/L	27-JUL-15	27-JUL-15	R3233554
Copper (Cu)-Total	0.00318		0.00020	mg/L	27-JUL-15	27-JUL-15	R3233554
Iron (Fe)-Total	129		0.10	mg/L	27-JUL-15	27-JUL-15	R3233554
Lead (Pb)-Total	0.00131		0.000090	mg/L	27-JUL-15	27-JUL-15	R3233554
Magnesium (Mg)-Total	17.8		0.010	mg/L	27-JUL-15	27-JUL-15	R3233554
Manganese (Mn)-Total	3.89	DLA	0.030	mg/L	27-JUL-15	28-JUL-15	R3234373
Nickel (Ni)-Total	0.0034		0.0020	mg/L	27-JUL-15	27-JUL-15	R3233554
Potassium (K)-Total	6.88		0.020	mg/L	27-JUL-15	27-JUL-15	R3233554
Sodium (Na)-Total	70.3		0.030	mg/L	27-JUL-15	27-JUL-15	R3233554
Zinc (Zn)-Total	0.0251		0.0020	mg/L	27-JUL-15	27-JUL-15	R3233554
Total Suspended Solids							
Total Suspended Solids	105		5.0	mg/L		27-JUL-15	R3234080
pH							
pH	7.05		0.10	pH units		29-JUL-15	R3235920

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

Reference Information

Sample Parameter Qualifier Key:

Qualifier	Description
DLA	Detection Limit adjusted for required dilution
DLM	Detection Limit Adjusted due to sample matrix effects.
EMPC	Estimated Maximum Possible Concentration. Parameter detected but didn't meet all criteria for positive identification.
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	Total Alkalinity 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.

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.

ETL-HARDNESS-TOT-WP	Water	Hardness Calculated	HARDNESS CALCULATED
F1-F4-CALC-WP	Water	CCME Total Hydrocarbons	CCME CWS-PHC, Pub #1310, Dec 2001-L

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

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

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

Unless otherwise qualified, the following quality control criteria have been met for the F1 hydrocarbon range:

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**

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	F2-F4 PHC method	CWS (CCME)

Petroleum Hydrocarbons (F2-F4) in Water Method is adapted from US EPA Method 3511: Organic Compounds in Water by Micro-extraction" (Nov 2002) with instrumental analysis as per the "Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil - Tier 1 Method" (CCMS, Dec 2000) Water samples (in their entirety) are extracted using hexane prior to capillary column gas chromatography with flame ionization detection (GC/FID).

FC-MPN-WP	Water	Fecal Coliform	APHA 9221E

The Most Probable Number (MPN) method is based on the Multiple Tube Fermentation technique. The results of examination of replicate tubes and dilutions of a sample are reported after confirmations specific to total coliform, fecal coliform and E. coli are performed. Results are reported in MPN/100 mL for water and MPN/gram for food and solid samples.

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

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

MET-T-L-MS-WP	Water	Total Metals by ICP-MS	APHA 3030E/EPA 6020A-TL

This analysis involves preliminary sample treatment by hotblock acid digestion (APHA 3030E). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

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.

OGG-TOT-WT	Water	Oil and Grease, Total	APHA 5520 B

Sample is extracted with hexane, extract is then evaporated and the residue is weighed to determine total oil and grease.

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

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

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

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

PH-WP	Water	pH	APHA 4500H

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

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

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

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

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

SOLIDS-TOTSUS-WP	Water	Total Suspended Solids	APHA 2540 D (modified)

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
		Total suspended solids in aquesous matrices is determined gravimetrically after drying the residue at 103 105°C.	
TOC-WT	Water	Total Organic Carbon	APHA 5310B
		Sample is injected into a heated reaction chamber which is packed with an oxidative catalyst. The water is vaporized and the organic cabon is oxidized to carbon dioxide. The carbon dioxide is transported in a carrier gas and is measured by a non-dispersive infrared detector.	
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:

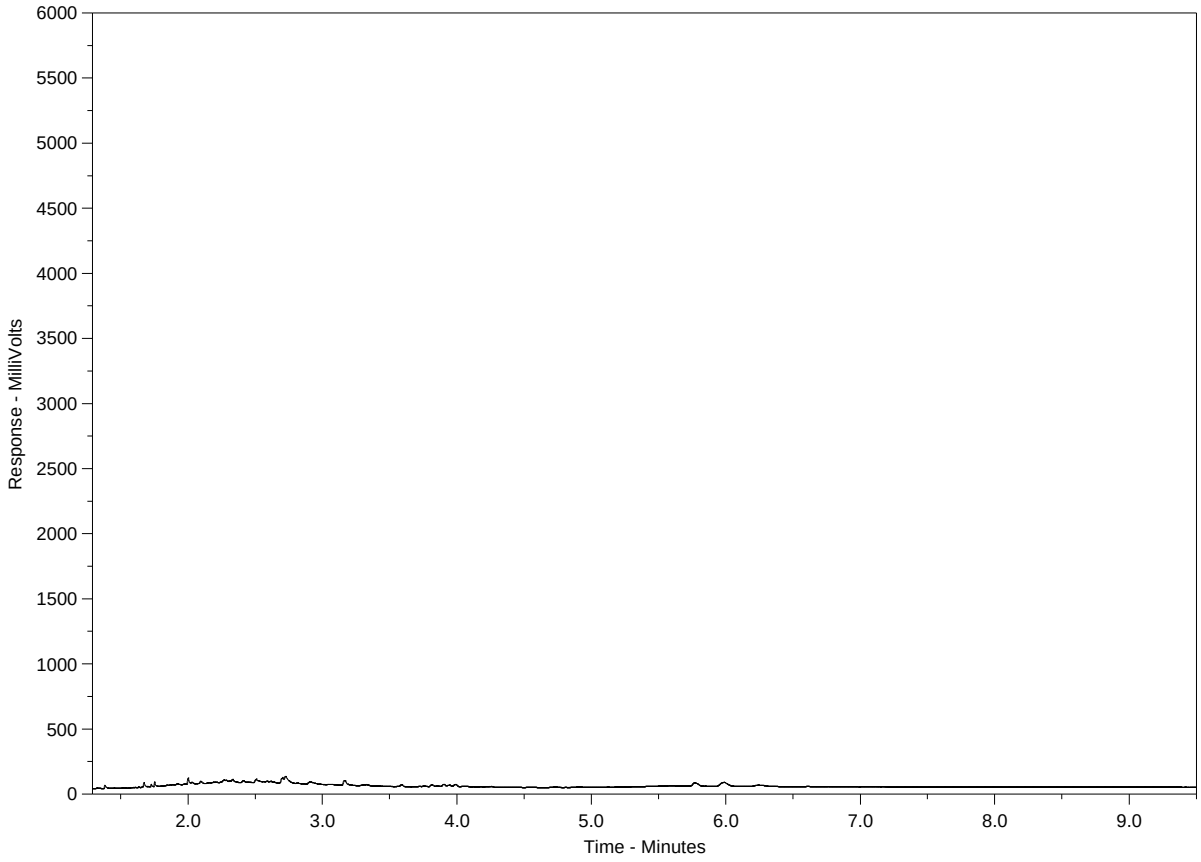
GLOSSARY OF REPORT TERMS

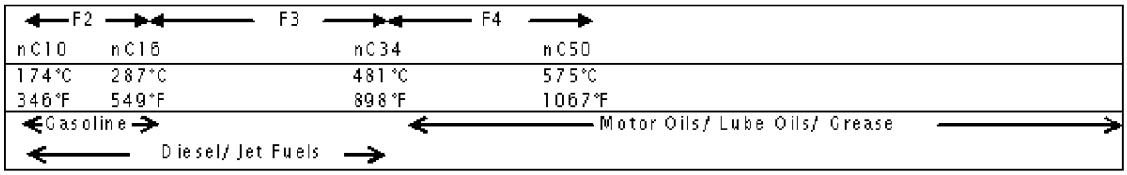
Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates 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: L1647049-1
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.

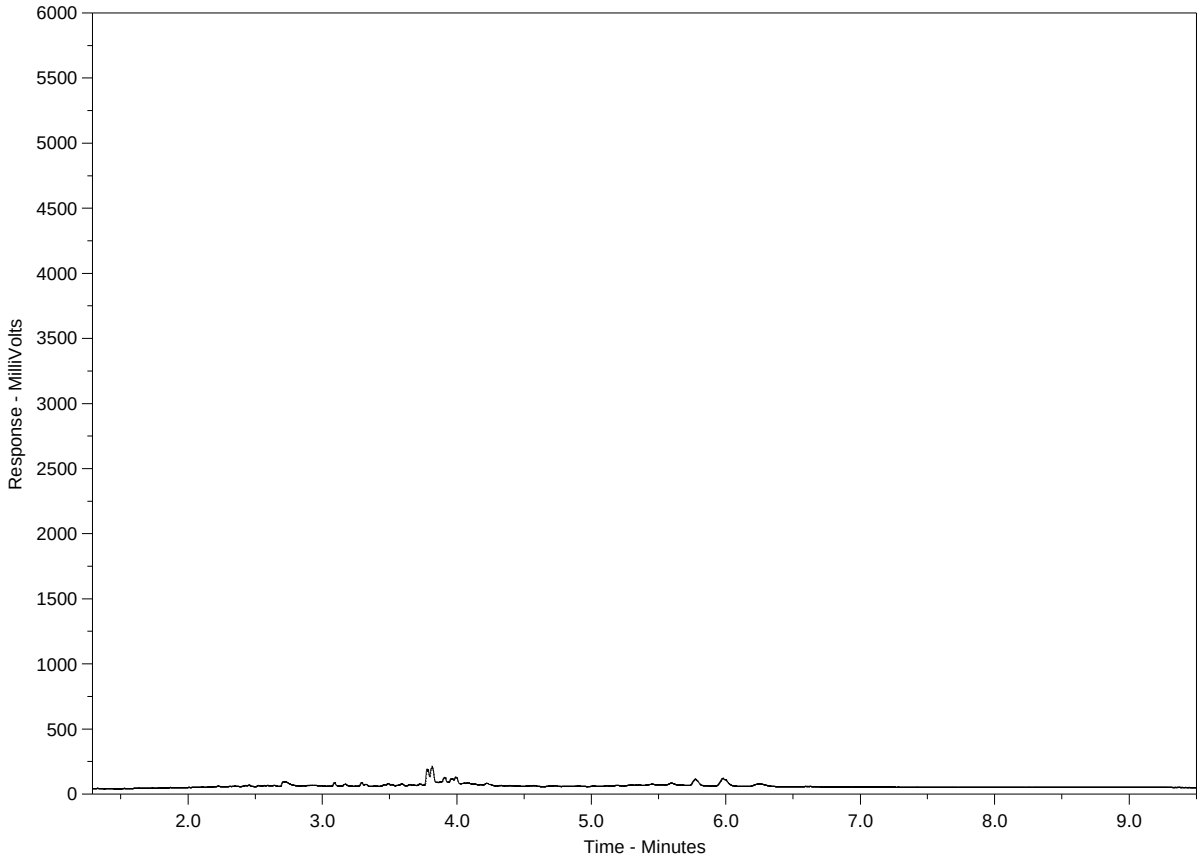
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

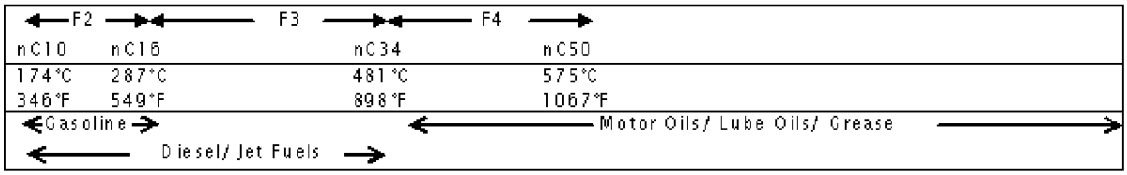
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

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: L1647049-2
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.

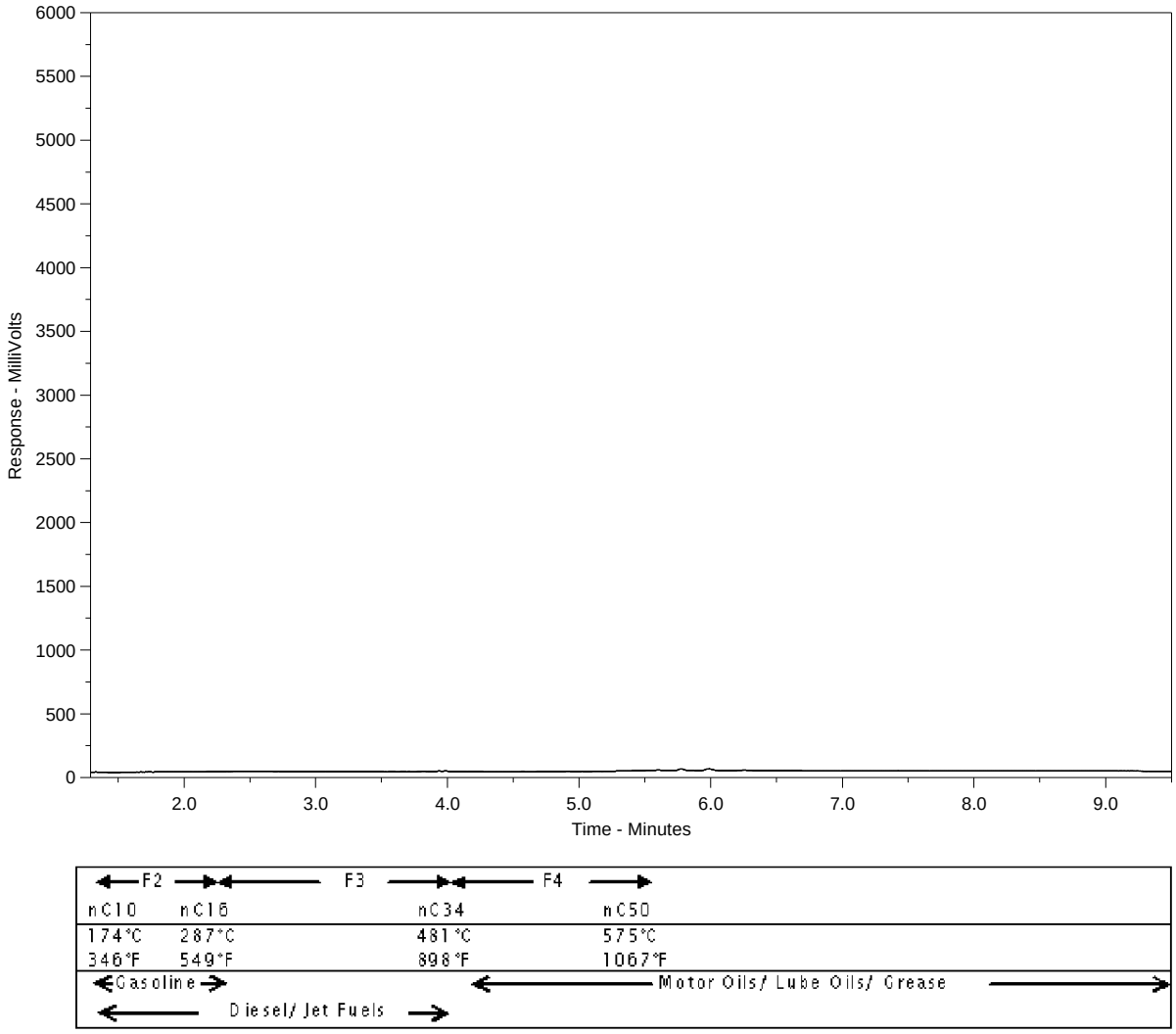
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

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: L1647049-3
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.

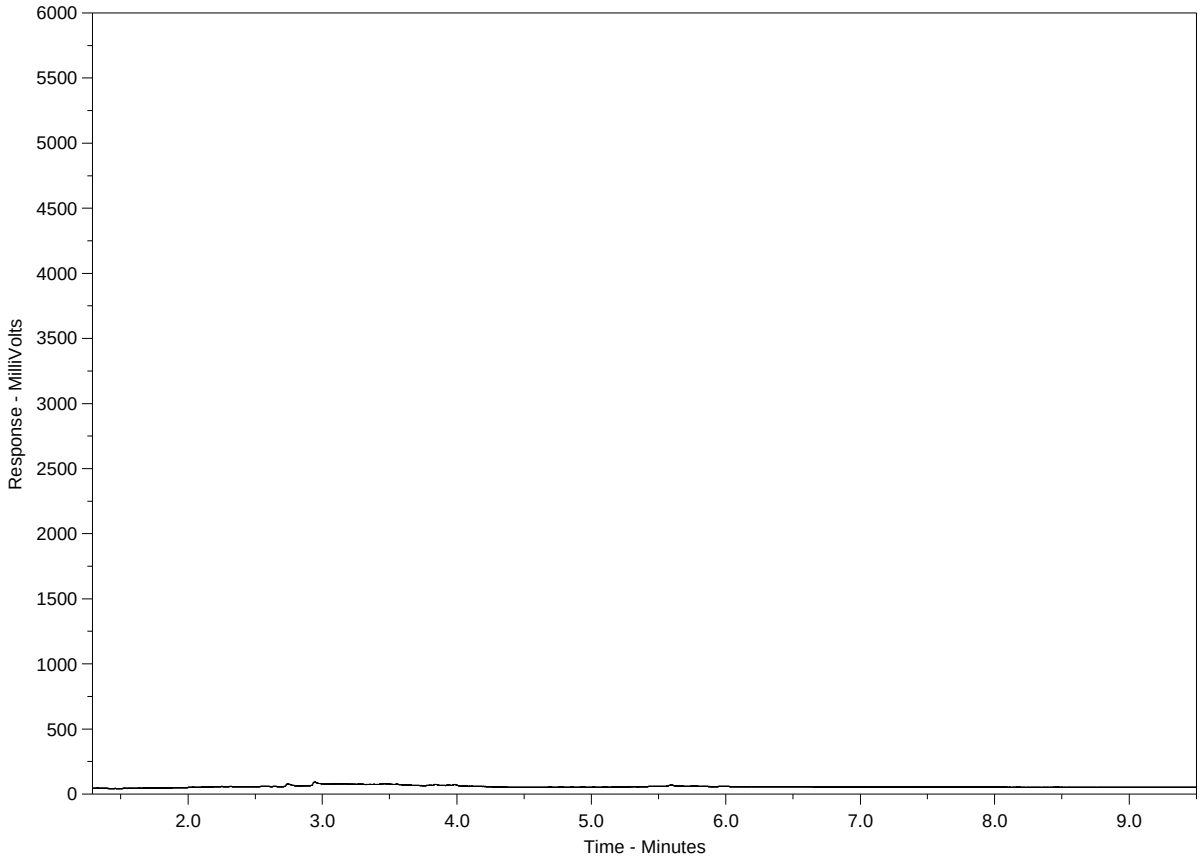
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

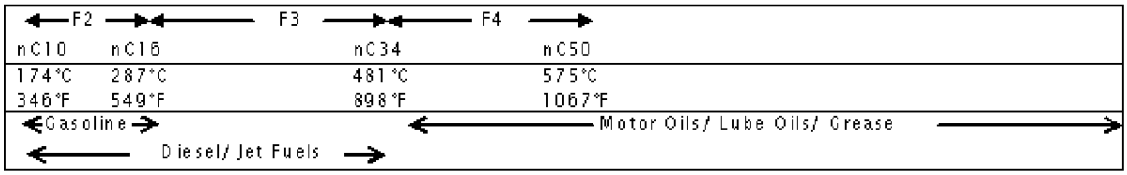
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

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: L1647049-4
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.

L1647049-COFC

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Sample Integrity Form

Date: _____ Client: _____

ALS Contact: _____ COC #: _____

Phone #: _____ Work Order #: _____

Please note the following observations that prevent your samples from being processed.
ALS is attempting to contact you for further instructions.
If our attempts fail, please contact us as soon as possible to ensure your analytical needs are met.

	Observation	Details
☐	Temperature < freezing point	actual temp. (breakdown by cooler):
☐	Temperature ≥ 10 Celsius	actual temp. (breakdown by cooler):
☐	Containers broken in transit	details:
☐	Sample integrity compromised	details:
☐	Regulatory non-compliance	details:
☐	No COC with shipment	details:
☐	Discrepancy between COC and label	details:
☐	COC incomplete or unclear	details:
☐	Container incompatible with test	details:
☐	Volume is insufficient for test	details:
☐	Preservation incompatible with test	details:
☐	No preservation	details:
☐	Other observation	details:

Additional Information (list all affected sample portions):

× No COC

× EE / 7-23-15 / 11:25 am

Labelled as:
- ARV-2
- ARV-4
- ARV-5
- ARV-6

× 1 Btle broke in Transit ARV-4.

1st Cooler: 16°

2nd Cooler: 13°

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

Date Received: 21-AUG-15
Report Date: 03-SEP-15 06:57 (MT)
Version: FINAL

Client Phone: 867-857-2841

Certificate of Analysis

Lab Work Order #: L1661523

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
L1661523-1 ARV-2							
Sampled By: LAURA on 18-AUG-15 @ 09:14							
Matrix: EFF							
BTEX plus F1-F4							
BTX plus F1 by GCMS							
Benzene	<0.00050		0.00050	mg/L		29-AUG-15	R3256939
Toluene	<0.0010		0.0010	mg/L		29-AUG-15	R3256939
Ethyl benzene	<0.00050		0.00050	mg/L		29-AUG-15	R3256939
o-Xylene	<0.00050		0.00050	mg/L		29-AUG-15	R3256939
m+p-Xylenes	<0.00050		0.00050	mg/L		29-AUG-15	R3256939
F1 (C6-C10)	<0.10		0.10	mg/L		29-AUG-15	R3256939
Surrogate: 4-Bromofluorobenzene (SS)	100.2		70-130	%		29-AUG-15	R3256939
CCME Total Hydrocarbons							
F1-BTEX	<0.10		0.10	mg/L		01-SEP-15	
F2-Naphth	<0.25		0.25	mg/L		01-SEP-15	
F3-PAH	0.58		0.25	mg/L		01-SEP-15	
Total Hydrocarbons (C6-C50)	0.88		0.44	mg/L		01-SEP-15	
F2-F4 PHC method							
F2 (C10-C16)	<0.25		0.25	mg/L	26-AUG-15	27-AUG-15	R3254980
F3 (C16-C34)	0.58		0.25	mg/L	26-AUG-15	27-AUG-15	R3254980
F4 (C34-C50)	0.30		0.25	mg/L	26-AUG-15	27-AUG-15	R3254980
Surrogate: 2-Bromobenzotrifluoride	92.8		60-140	%	26-AUG-15	27-AUG-15	R3254980
Sum of Xylene Isomer Concentrations							
Xylenes (Total)	<0.0015		0.0015	mg/L		31-AUG-15	
Miscellaneous Parameters							
Total Organic Carbon	67	DLA	10	mg/L		26-AUG-15	R3254351
Polyaromatic Hydrocarbons (PAHs)							
1-Methyl Naphthalene	<0.000020		0.000020	mg/L	27-AUG-15	30-AUG-15	R3255859
2-Methyl Naphthalene	<0.000020		0.000020	mg/L	27-AUG-15	30-AUG-15	R3255859
Acenaphthene	<0.000020		0.000020	mg/L	27-AUG-15	30-AUG-15	R3255859
Acenaphthylene	<0.000050	DLM	0.000050	mg/L	27-AUG-15	30-AUG-15	R3255859
Anthracene	<0.000010		0.000010	mg/L	27-AUG-15	30-AUG-15	R3255859
Acridine	<0.000020		0.000020	mg/L	27-AUG-15	30-AUG-15	R3255859
Benzo(a)anthracene	<0.000010		0.000010	mg/L	27-AUG-15	30-AUG-15	R3255859
Benzo(a)pyrene	<0.0000050		0.0000050	mg/L	27-AUG-15	30-AUG-15	R3255859
Benzo(b&j)fluoranthene	<0.000010		0.000010	mg/L	27-AUG-15	30-AUG-15	R3255859
Benzo(g,h,i)perylene	<0.000020		0.000020	mg/L	27-AUG-15	30-AUG-15	R3255859
Benzo(k)fluoranthene	<0.000010		0.000010	mg/L	27-AUG-15	30-AUG-15	R3255859
Chrysene	<0.000020		0.000020	mg/L	27-AUG-15	30-AUG-15	R3255859
Dibenzo(a,h)anthracene	<0.0000050		0.0000050	mg/L	27-AUG-15	30-AUG-15	R3255859
Fluoranthene	<0.000020		0.000020	mg/L	27-AUG-15	30-AUG-15	R3255859
Fluorene	<0.000020		0.000020	mg/L	27-AUG-15	30-AUG-15	R3255859
Indeno(1,2,3-cd)pyrene	<0.000010		0.000010	mg/L	27-AUG-15	30-AUG-15	R3255859
Naphthalene	<0.000050		0.000050	mg/L	27-AUG-15	30-AUG-15	R3255859
Phenanthrene	<0.000050		0.000050	mg/L	27-AUG-15	30-AUG-15	R3255859
Pyrene	<0.000010		0.000010	mg/L	27-AUG-15	30-AUG-15	R3255859
Quinoline	<0.00015	DLM	0.00015	mg/L	27-AUG-15	30-AUG-15	R3255859
B(a)P Total Potency Equivalent	<0.000030		0.000030	mg/L	27-AUG-15	30-AUG-15	R3255859
Surrogate: Acenaphthene d10	90.0		40-130	%	27-AUG-15	30-AUG-15	R3255859
Surrogate: Acridine d9	96.9		40-130	%	27-AUG-15	30-AUG-15	R3255859
Surrogate: Chrysene d12	92.7		40-130	%	27-AUG-15	30-AUG-15	R3255859
Surrogate: Naphthalene d8	86.5		40-130	%	27-AUG-15	30-AUG-15	R3255859
Surrogate: Phenanthrene d10	84.7		40-130	%	27-AUG-15	30-AUG-15	R3255859
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	722		1.2	mg/L		01-SEP-15	

* 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
L1661523-1 ARV-2							
Sampled By: LAURA on 18-AUG-15 @ 09:14							
Matrix: EFF							
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		01-SEP-15	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		01-SEP-15	
Ammonia by colour							
Ammonia, Total (as N)	8.6	DLA	1.0	mg/L		28-AUG-15	R3256770
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	34.1	DLA	6.0	mg/L		22-AUG-15	R3255815
Carbonaceous BOD							
BOD Carbonaceous	14.6	DLA	6.0	mg/L		22-AUG-15	R3255815
Chloride in Water by IC							
Chloride (Cl)	380		2.5	mg/L		22-AUG-15	R3252971
Conductivity							
Conductivity	2910		1.0	umhos/cm		31-AUG-15	R3257924
Fecal Coliform							
Fecal Coliforms	15		3	MPN/100mL		21-AUG-15	R3255958
Hardness Calculated							
Hardness (as CaCO3)	1000		0.30	mg/L		27-AUG-15	
Mercury Total							
Mercury (Hg)-Total	<0.00020	DLM	0.00020	mg/L	25-AUG-15	25-AUG-15	R3253685
Nitrate in Water by IC							
Nitrate (as N)	<0.10	DLM	0.10	mg/L		22-AUG-15	R3252971
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.11		0.11	mg/L		25-AUG-15	
Nitrite in Water by IC							
Nitrite (as N)	<0.050	DLM	0.050	mg/L		22-AUG-15	R3252971
Oil and Grease, Total							
Oil and Grease, Total	<2.0		2.0	mg/L	25-AUG-15	25-AUG-15	R3253766
Phenol (4AAP)							
Phenols (4AAP)	0.0049		0.0010	mg/L		31-AUG-15	R3257596
Phosphorus, Total							
Phosphorus (P)-Total	0.907		0.010	mg/L		31-AUG-15	R3256967
Sulfate in Water by IC							
Sulfate (SO4)	539		1.5	mg/L		22-AUG-15	R3252971
Total Alkalinity as CaCO3							
Alkalinity, Total (as CaCO3)	592		1.0	mg/L		31-AUG-15	R3257924
Total Metals by ICP-MS							
Aluminum (Al)-Total	0.0195		0.0050	mg/L	25-AUG-15	26-AUG-15	R3254377
Arsenic (As)-Total	0.00766		0.00020	mg/L	25-AUG-15	26-AUG-15	R3254377
Cadmium (Cd)-Total	0.000068		0.000010	mg/L	25-AUG-15	26-AUG-15	R3254377
Calcium (Ca)-Total	307		0.10	mg/L	25-AUG-15	26-AUG-15	R3254377
Chromium (Cr)-Total	0.0014		0.0010	mg/L	25-AUG-15	26-AUG-15	R3254377
Cobalt (Co)-Total	0.00136		0.00020	mg/L	25-AUG-15	26-AUG-15	R3254377
Copper (Cu)-Total	0.0110		0.00020	mg/L	25-AUG-15	26-AUG-15	R3254377
Iron (Fe)-Total	0.83		0.10	mg/L	25-AUG-15	26-AUG-15	R3254377
Lead (Pb)-Total	0.00186		0.000090	mg/L	25-AUG-15	26-AUG-15	R3254377
Magnesium (Mg)-Total	57.2		0.010	mg/L	25-AUG-15	26-AUG-15	R3254377
Manganese (Mn)-Total	0.787		0.00030	mg/L	25-AUG-15	26-AUG-15	R3254377
Nickel (Ni)-Total	0.0085		0.0020	mg/L	25-AUG-15	26-AUG-15	R3254377
Potassium (K)-Total	66.4		0.020	mg/L	25-AUG-15	26-AUG-15	R3254377
Sodium (Na)-Total	282		0.030	mg/L	25-AUG-15	26-AUG-15	R3254377
Zinc (Zn)-Total	0.0280		0.0020	mg/L	25-AUG-15	26-AUG-15	R3254377
Total Suspended Solids							

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1661523-1 ARV-2							
Sampled By: LAURA on 18-AUG-15 @ 09:14							
Matrix: EFF							
Total Suspended Solids							
Total Suspended Solids	39.0		5.0	mg/L		24-AUG-15	R3253983
pH							
pH	7.90		0.10	pH units		31-AUG-15	R3257924
L1661523-2 ARV-4							
Sampled By: LAURA on 18-AUG-15 @ 08:56							
Matrix: EFF							
BTEX plus F1-F4							
BTX plus F1 by GCMS							
Benzene	<0.00050		0.00050	mg/L		29-AUG-15	R3256939
Toluene	0.0029		0.0010	mg/L		29-AUG-15	R3256939
Ethyl benzene	<0.00050		0.00050	mg/L		29-AUG-15	R3256939
o-Xylene	<0.00050		0.00050	mg/L		29-AUG-15	R3256939
m+p-Xylenes	<0.00050		0.00050	mg/L		29-AUG-15	R3256939
F1 (C6-C10)	<0.10		0.10	mg/L		29-AUG-15	R3256939
Surrogate: 4-Bromofluorobenzene (SS)	97.6		70-130	%		29-AUG-15	R3256939
CCME Total Hydrocarbons							
F1-BTEX	<0.10		0.10	mg/L		01-SEP-15	
F2-Naphth	<0.25		0.25	mg/L		01-SEP-15	
F3-PAH	0.65		0.25	mg/L		01-SEP-15	
Total Hydrocarbons (C6-C50)	0.98		0.44	mg/L		01-SEP-15	
F2-F4 PHC method							
F2 (C10-C16)	<0.25		0.25	mg/L	26-AUG-15	27-AUG-15	R3254980
F3 (C16-C34)	0.65		0.25	mg/L	26-AUG-15	27-AUG-15	R3254980
F4 (C34-C50)	0.33		0.25	mg/L	26-AUG-15	27-AUG-15	R3254980
Surrogate: 2-Bromobenzotrifluoride	92.8		60-140	%	26-AUG-15	27-AUG-15	R3254980
Sum of Xylene Isomer Concentrations							
Xylenes (Total)	<0.0015		0.0015	mg/L		31-AUG-15	
Miscellaneous Parameters							
Total Organic Carbon	26.3		1.0	mg/L		26-AUG-15	R3254351
Polyaromatic Hydrocarbons (PAHs)							
1-Methyl Naphthalene	<0.000020		0.000020	mg/L	27-AUG-15	30-AUG-15	R3255859
2-Methyl Naphthalene	<0.000020		0.000020	mg/L	27-AUG-15	30-AUG-15	R3255859
Acenaphthene	<0.000020		0.000020	mg/L	27-AUG-15	30-AUG-15	R3255859
Acenaphthylene	<0.000020		0.000020	mg/L	27-AUG-15	30-AUG-15	R3255859
Anthracene	<0.000010		0.000010	mg/L	27-AUG-15	30-AUG-15	R3255859
Acridine	<0.000020		0.000020	mg/L	27-AUG-15	30-AUG-15	R3255859
Benzo(a)anthracene	<0.000010		0.000010	mg/L	27-AUG-15	30-AUG-15	R3255859
Benzo(a)pyrene	<0.0000050		0.0000050	mg/L	27-AUG-15	30-AUG-15	R3255859
Benzo(b&j)fluoranthene	<0.000010		0.000010	mg/L	27-AUG-15	30-AUG-15	R3255859
Benzo(g,h,i)perylene	<0.000020		0.000020	mg/L	27-AUG-15	30-AUG-15	R3255859
Benzo(k)fluoranthene	<0.000010		0.000010	mg/L	27-AUG-15	30-AUG-15	R3255859
Chrysene	<0.000020		0.000020	mg/L	27-AUG-15	30-AUG-15	R3255859
Dibenzo(a,h)anthracene	<0.0000050		0.0000050	mg/L	27-AUG-15	30-AUG-15	R3255859
Fluoranthene	<0.000020		0.000020	mg/L	27-AUG-15	30-AUG-15	R3255859
Fluorene	<0.000020		0.000020	mg/L	27-AUG-15	30-AUG-15	R3255859
Indeno(1,2,3-cd)pyrene	<0.000010		0.000010	mg/L	27-AUG-15	30-AUG-15	R3255859
Naphthalene	<0.000050		0.000050	mg/L	27-AUG-15	30-AUG-15	R3255859
Phenanthrene	<0.000050		0.000050	mg/L	27-AUG-15	30-AUG-15	R3255859
Pyrene	<0.000010		0.000010	mg/L	27-AUG-15	30-AUG-15	R3255859
Quinoline	<0.000020		0.000020	mg/L	27-AUG-15	30-AUG-15	R3255859
B(a)P Total Potency Equivalent	<0.000030		0.000030	mg/L	27-AUG-15	30-AUG-15	R3255859

* 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
L1661523-2 ARV-4							
Sampled By: LAURA on 18-AUG-15 @ 08:56							
Matrix: EFF							
Polyaromatic Hydrocarbons (PAHs)							
Surrogate: Acenaphthene d10	88.8		40-130	%	27-AUG-15	30-AUG-15	R3255859
Surrogate: Acridine d9	95.0		40-130	%	27-AUG-15	30-AUG-15	R3255859
Surrogate: Chrysene d12	92.4		40-130	%	27-AUG-15	30-AUG-15	R3255859
Surrogate: Naphthalene d8	82.9		40-130	%	27-AUG-15	30-AUG-15	R3255859
Surrogate: Phenanthrene d10	85.4		40-130	%	27-AUG-15	30-AUG-15	R3255859
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	202		1.2	mg/L		01-SEP-15	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		01-SEP-15	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		01-SEP-15	
Ammonia by colour							
Ammonia, Total (as N)	14.8	DLA	1.0	mg/L		28-AUG-15	R3256770
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	112	DLA	20	mg/L		22-AUG-15	R3255815
Carbonaceous BOD							
BOD Carbonaceous	77	DLA	20	mg/L		22-AUG-15	R3255815
Chloride in Water by IC							
Chloride (Cl)	233		0.50	mg/L		22-AUG-15	R3252971
Conductivity							
Conductivity	1100		1.0	umhos/cm		31-AUG-15	R3257924
Fecal Coliform							
Fecal Coliforms	300		3	MPN/100mL		21-AUG-15	R3255958
Hardness Calculated							
Hardness (as CaCO3)	158		0.30	mg/L		27-AUG-15	
Mercury Total							
Mercury (Hg)-Total	<0.00020	DLM	0.00020	mg/L	25-AUG-15	25-AUG-15	R3253685
Nitrate in Water by IC							
Nitrate (as N)	0.378		0.020	mg/L		22-AUG-15	R3252971
Nitrate+Nitrite							
Nitrate and Nitrite as N	0.416		0.070	mg/L		25-AUG-15	
Nitrite in Water by IC							
Nitrite (as N)	0.037		0.010	mg/L		22-AUG-15	R3252971
Oil and Grease, Total							
Oil and Grease, Total	18.5		4.0	mg/L	25-AUG-15	25-AUG-15	R3253766
Phenol (4AAP)							
Phenols (4AAP)	0.0031		0.0010	mg/L		31-AUG-15	R3257596
Phosphorus, Total							
Phosphorus (P)-Total	3.32		0.010	mg/L		31-AUG-15	R3256967
Sulfate in Water by IC							
Sulfate (SO4)	10.4		0.30	mg/L		22-AUG-15	R3252971
Total Alkalinity as CaCO3							
Alkalinity, Total (as CaCO3)	166		1.0	mg/L		31-AUG-15	R3257924
Total Metals by ICP-MS							
Aluminum (Al)-Total	1.18		0.0050	mg/L	25-AUG-15	26-AUG-15	R3254377
Arsenic (As)-Total	0.00870		0.00020	mg/L	25-AUG-15	26-AUG-15	R3254377
Cadmium (Cd)-Total	0.000214		0.000010	mg/L	25-AUG-15	26-AUG-15	R3254377
Calcium (Ca)-Total	27.9		0.10	mg/L	25-AUG-15	26-AUG-15	R3254377
Chromium (Cr)-Total	0.0037		0.0010	mg/L	25-AUG-15	26-AUG-15	R3254377
Cobalt (Co)-Total	0.00423		0.00020	mg/L	25-AUG-15	26-AUG-15	R3254377
Copper (Cu)-Total	0.0601		0.00020	mg/L	25-AUG-15	26-AUG-15	R3254377

* 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
L1661523-2 ARV-4							
Sampled By: LAURA on 18-AUG-15 @ 08:56							
Matrix: EFF							
Total Metals by ICP-MS							
Iron (Fe)-Total	13.4		0.10	mg/L	25-AUG-15	26-AUG-15	R3254377
Lead (Pb)-Total	0.00452		0.000090	mg/L	25-AUG-15	26-AUG-15	R3254377
Magnesium (Mg)-Total	21.3		0.010	mg/L	25-AUG-15	26-AUG-15	R3254377
Manganese (Mn)-Total	0.891		0.00030	mg/L	25-AUG-15	26-AUG-15	R3254377
Nickel (Ni)-Total	0.0097		0.0020	mg/L	25-AUG-15	26-AUG-15	R3254377
Potassium (K)-Total	19.6		0.020	mg/L	25-AUG-15	26-AUG-15	R3254377
Sodium (Na)-Total	135		0.030	mg/L	25-AUG-15	26-AUG-15	R3254377
Zinc (Zn)-Total	0.0554		0.0020	mg/L	25-AUG-15	26-AUG-15	R3254377
Total Suspended Solids							
Total Suspended Solids	67.0		5.0	mg/L		24-AUG-15	R3253983
pH							
pH	7.22		0.10	pH units		31-AUG-15	R3257924
L1661523-3 ARV-5							
Sampled By: LAURA on 18-AUG-15 @ 09:26							
Matrix: EFF							
BTEX plus F1-F4							
BTX plus F1 by GCMS							
Benzene	<0.00050		0.00050	mg/L		29-AUG-15	R3256939
Toluene	<0.0010		0.0010	mg/L		29-AUG-15	R3256939
Ethyl benzene	<0.00050		0.00050	mg/L		29-AUG-15	R3256939
o-Xylene	<0.00050		0.00050	mg/L		29-AUG-15	R3256939
m+p-Xylenes	<0.00050		0.00050	mg/L		29-AUG-15	R3256939
F1 (C6-C10)	<0.10		0.10	mg/L		29-AUG-15	R3256939
Surrogate: 4-Bromofluorobenzene (SS)	105.2		70-130	%		29-AUG-15	R3256939
CCME Total Hydrocarbons							
F1-BTEX	<0.10		0.10	mg/L		31-AUG-15	
Total Hydrocarbons (C6-C50)	<0.44		0.44	mg/L		31-AUG-15	
F2-F4 PHC method							
F2 (C10-C16)	<0.25		0.25	mg/L	26-AUG-15	27-AUG-15	R3254980
F3 (C16-C34)	<0.25		0.25	mg/L	26-AUG-15	27-AUG-15	R3254980
F4 (C34-C50)	<0.25		0.25	mg/L	26-AUG-15	27-AUG-15	R3254980
Surrogate: 2-Bromobenzotrifluoride	86.3		60-140	%	26-AUG-15	27-AUG-15	R3254980
Sum of Xylene Isomer Concentrations							
Xylenes (Total)	<0.0015		0.0015	mg/L		31-AUG-15	
Miscellaneous Parameters							
Total Organic Carbon	13.2		1.0	mg/L		26-AUG-15	R3254351
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	133		1.2	mg/L		01-SEP-15	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		01-SEP-15	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		01-SEP-15	
Ammonia by colour							
Ammonia, Total (as N)	0.037		0.010	mg/L		26-AUG-15	R3254918
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	<2.0		2.0	mg/L		22-AUG-15	R3255815
Carbonaceous BOD							
BOD Carbonaceous	<2.0		2.0	mg/L		22-AUG-15	R3255815
Chloride in Water by IC							
Chloride (Cl)	517		2.5	mg/L		22-AUG-15	R3252971
Conductivity							

* 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
L1661523-3 ARV-5							
Sampled By: LAURA on 18-AUG-15 @ 09:26							
Matrix: EFF							
Conductivity							
Conductivity	1920		1.0	umhos/cm		31-AUG-15	R3257924
Fecal Coliform							
Fecal Coliforms	7500		3	MPN/100mL		21-AUG-15	R3255958
Hardness Calculated							
Hardness (as CaCO3)	273		0.30	mg/L		27-AUG-15	
Mercury Total							
Mercury (Hg)-Total	<0.00020	DLM	0.00020	mg/L	25-AUG-15	25-AUG-15	R3253685
Nitrate in Water by IC							
Nitrate (as N)	<0.10	DLM	0.10	mg/L		22-AUG-15	R3252971
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.11		0.11	mg/L		25-AUG-15	
Nitrite in Water by IC							
Nitrite (as N)	<0.050	DLM	0.050	mg/L		22-AUG-15	R3252971
Oil and Grease, Total							
Oil and Grease, Total	<2.0		2.0	mg/L	25-AUG-15	25-AUG-15	R3253766
Phenol (4AAP)							
Phenols (4AAP)	0.0027		0.0010	mg/L		31-AUG-15	R3257596
Phosphorus, Total							
Phosphorus (P)-Total	0.043		0.010	mg/L		31-AUG-15	R3256967
Sulfate in Water by IC							
Sulfate (SO4)	10.0		1.5	mg/L		22-AUG-15	R3252971
Total Alkalinity as CaCO3							
Alkalinity, Total (as CaCO3)	109		1.0	mg/L		31-AUG-15	R3257924
Total Metals by ICP-MS							
Aluminum (Al)-Total	0.0536		0.0050	mg/L	25-AUG-15	26-AUG-15	R3254377
Arsenic (As)-Total	0.00076		0.00020	mg/L	25-AUG-15	26-AUG-15	R3254377
Cadmium (Cd)-Total	<0.000010		0.000010	mg/L	25-AUG-15	26-AUG-15	R3254377
Calcium (Ca)-Total	37.7		0.10	mg/L	25-AUG-15	26-AUG-15	R3254377
Chromium (Cr)-Total	<0.0010		0.0010	mg/L	25-AUG-15	26-AUG-15	R3254377
Cobalt (Co)-Total	0.00033		0.00020	mg/L	25-AUG-15	26-AUG-15	R3254377
Copper (Cu)-Total	0.00032		0.00020	mg/L	25-AUG-15	26-AUG-15	R3254377
Iron (Fe)-Total	4.19		0.10	mg/L	25-AUG-15	26-AUG-15	R3254377
Lead (Pb)-Total	<0.000090		0.000090	mg/L	25-AUG-15	26-AUG-15	R3254377
Magnesium (Mg)-Total	43.4		0.010	mg/L	25-AUG-15	26-AUG-15	R3254377
Manganese (Mn)-Total	0.253		0.00030	mg/L	25-AUG-15	26-AUG-15	R3254377
Nickel (Ni)-Total	<0.0020		0.0020	mg/L	25-AUG-15	26-AUG-15	R3254377
Potassium (K)-Total	12.6		0.020	mg/L	25-AUG-15	26-AUG-15	R3254377
Sodium (Na)-Total	287		0.030	mg/L	25-AUG-15	26-AUG-15	R3254377
Zinc (Zn)-Total	0.0033		0.0020	mg/L	25-AUG-15	26-AUG-15	R3254377
Total Suspended Solids							
Total Suspended Solids	13.0		5.0	mg/L		24-AUG-15	R3253983
pH							
pH	7.74		0.10	pH units		31-AUG-15	R3257924
L1661523-4 ARV-6							
Sampled By: LAURA on 18-AUG-15 @ 08:25							
Matrix: EFF							
BTEX plus F1-F4							
BTX plus F1 by GCMS							
Benzene	<0.00050		0.00050	mg/L		29-AUG-15	R3256939
Toluene	0.0021		0.0010	mg/L		29-AUG-15	R3256939
Ethyl benzene	<0.00050		0.00050	mg/L		29-AUG-15	R3256939
o-Xylene	<0.00050		0.00050	mg/L		29-AUG-15	R3256939

* 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
L1661523-4 ARV-6							
Sampled By: LAURA on 18-AUG-15 @ 08:25							
Matrix: EFF							
BTX plus F1 by GCMS							
m+p-Xylenes	<0.00050		0.00050	mg/L		29-AUG-15	R3256939
F1 (C6-C10)	<0.10		0.10	mg/L		29-AUG-15	R3256939
Surrogate: 4-Bromofluorobenzene (SS)	94.2		70-130	%		29-AUG-15	R3256939
CCME Total Hydrocarbons							
F1-BTEX	<0.10		0.10	mg/L		01-SEP-15	
F2-Naphth	<0.25		0.25	mg/L		01-SEP-15	
F3-PAH	<0.25		0.25	mg/L		01-SEP-15	
Total Hydrocarbons (C6-C50)	<0.44		0.44	mg/L		01-SEP-15	
F2-F4 PHC method							
F2 (C10-C16)	<0.25		0.25	mg/L	26-AUG-15	27-AUG-15	R3254980
F3 (C16-C34)	<0.25		0.25	mg/L	26-AUG-15	27-AUG-15	R3254980
F4 (C34-C50)	<0.25		0.25	mg/L	26-AUG-15	27-AUG-15	R3254980
Surrogate: 2-Bromobenzotrifluoride	90.8		60-140	%	26-AUG-15	27-AUG-15	R3254980
Sum of Xylene Isomer Concentrations							
Xylenes (Total)	<0.0015		0.0015	mg/L		31-AUG-15	
Miscellaneous Parameters							
Total Organic Carbon	14.3		1.0	mg/L		26-AUG-15	R3254351
Polyaromatic Hydrocarbons (PAHs)							
1-Methyl Naphthalene	<0.000020		0.000020	mg/L	27-AUG-15	30-AUG-15	R3255859
2-Methyl Naphthalene	<0.000020		0.000020	mg/L	27-AUG-15	30-AUG-15	R3255859
Acenaphthene	<0.000020		0.000020	mg/L	27-AUG-15	30-AUG-15	R3255859
Acenaphthylene	<0.000020		0.000020	mg/L	27-AUG-15	30-AUG-15	R3255859
Anthracene	<0.000010		0.000010	mg/L	27-AUG-15	30-AUG-15	R3255859
Acridine	<0.000020		0.000020	mg/L	27-AUG-15	30-AUG-15	R3255859
Benzo(a)anthracene	<0.000010		0.000010	mg/L	27-AUG-15	30-AUG-15	R3255859
Benzo(a)pyrene	<0.0000050		0.0000050	mg/L	27-AUG-15	30-AUG-15	R3255859
Benzo(b&j)fluoranthene	<0.000010		0.000010	mg/L	27-AUG-15	30-AUG-15	R3255859
Benzo(g,h,i)perylene	<0.000020		0.000020	mg/L	27-AUG-15	30-AUG-15	R3255859
Benzo(k)fluoranthene	<0.000010		0.000010	mg/L	27-AUG-15	30-AUG-15	R3255859
Chrysene	<0.000020		0.000020	mg/L	27-AUG-15	30-AUG-15	R3255859
Dibenzo(a,h)anthracene	<0.0000050		0.0000050	mg/L	27-AUG-15	30-AUG-15	R3255859
Fluoranthene	<0.000020		0.000020	mg/L	27-AUG-15	30-AUG-15	R3255859
Fluorene	<0.000020		0.000020	mg/L	27-AUG-15	30-AUG-15	R3255859
Indeno(1,2,3-cd)pyrene	<0.000010		0.000010	mg/L	27-AUG-15	30-AUG-15	R3255859
Naphthalene	<0.000050		0.000050	mg/L	27-AUG-15	30-AUG-15	R3255859
Phenanthrene	<0.000050		0.000050	mg/L	27-AUG-15	30-AUG-15	R3255859
Pyrene	<0.000010		0.000010	mg/L	27-AUG-15	30-AUG-15	R3255859
Quinoline	<0.000025	DLM	0.000025	mg/L	27-AUG-15	30-AUG-15	R3255859
B(a)P Total Potency Equivalent	<0.000030		0.000030	mg/L	27-AUG-15	30-AUG-15	R3255859
Surrogate: Acenaphthene d10	95.8		40-130	%	27-AUG-15	30-AUG-15	R3255859
Surrogate: Acridine d9	98.8		40-130	%	27-AUG-15	30-AUG-15	R3255859
Surrogate: Chrysene d12	94.0		40-130	%	27-AUG-15	30-AUG-15	R3255859
Surrogate: Naphthalene d8	89.7		40-130	%	27-AUG-15	30-AUG-15	R3255859
Surrogate: Phenanthrene d10	92.2		40-130	%	27-AUG-15	30-AUG-15	R3255859
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	128		1.2	mg/L		02-SEP-15	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		02-SEP-15	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		02-SEP-15	
Ammonia by colour							

* 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
L1661523-4 ARV-6							
Sampled By: LAURA on 18-AUG-15 @ 08:25							
Matrix: EFF							
Ammonia by colour							
Ammonia, Total (as N)	0.330		0.010	mg/L		26-AUG-15	R3254918
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	8.0	DLA	2.0	mg/L		22-AUG-15	R3255815
Carbonaceous BOD							
BOD Carbonaceous	3.1		2.0	mg/L		22-AUG-15	R3255815
Chloride in Water by IC							
Chloride (Cl)	99.8		0.50	mg/L		22-AUG-15	R3252971
Conductivity							
Conductivity	693		1.0	umhos/cm		31-AUG-15	R3257924
Fecal Coliform							
Fecal Coliforms	<3		3	MPN/100mL		21-AUG-15	R3255958
Hardness Calculated							
Hardness (as CaCO3)	152		0.30	mg/L		27-AUG-15	
Mercury Total							
Mercury (Hg)-Total	<0.00020	DLM	0.00020	mg/L	25-AUG-15	25-AUG-15	R3253685
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		22-AUG-15	R3252971
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		25-AUG-15	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		22-AUG-15	R3252971
Oil and Grease, Total							
Oil and Grease, Total	<2.0		2.0	mg/L	25-AUG-15	25-AUG-15	R3253766
Phenol (4AAP)							
Phenols (4AAP)	0.0055		0.0010	mg/L		31-AUG-15	R3257596
Phosphorus, Total							
Phosphorus (P)-Total	0.063		0.010	mg/L		31-AUG-15	R3256967
Sulfate in Water by IC							
Sulfate (SO4)	<0.30		0.30	mg/L		22-AUG-15	R3252971
Total Alkalinity as CaCO3							
Alkalinity, Total (as CaCO3)	105		1.0	mg/L		01-SEP-15	R3258711
Total Metals by ICP-MS							
Aluminum (Al)-Total	0.0310		0.0050	mg/L	25-AUG-15	26-AUG-15	R3254377
Arsenic (As)-Total	0.00082		0.00020	mg/L	25-AUG-15	26-AUG-15	R3254377
Cadmium (Cd)-Total	<0.000010		0.000010	mg/L	25-AUG-15	26-AUG-15	R3254377
Calcium (Ca)-Total	39.6		0.10	mg/L	25-AUG-15	26-AUG-15	R3254377
Chromium (Cr)-Total	0.0011		0.0010	mg/L	25-AUG-15	26-AUG-15	R3254377
Cobalt (Co)-Total	0.00238		0.00020	mg/L	25-AUG-15	26-AUG-15	R3254377
Copper (Cu)-Total	0.00033		0.00020	mg/L	25-AUG-15	26-AUG-15	R3254377
Iron (Fe)-Total	31.2		0.10	mg/L	25-AUG-15	26-AUG-15	R3254377
Lead (Pb)-Total	<0.000090		0.000090	mg/L	25-AUG-15	26-AUG-15	R3254377
Magnesium (Mg)-Total	13.0		0.010	mg/L	25-AUG-15	26-AUG-15	R3254377
Manganese (Mn)-Total	2.64		0.00030	mg/L	25-AUG-15	26-AUG-15	R3254377
Nickel (Ni)-Total	<0.0020		0.0020	mg/L	25-AUG-15	26-AUG-15	R3254377
Potassium (K)-Total	4.62		0.020	mg/L	25-AUG-15	26-AUG-15	R3254377
Sodium (Na)-Total	66.7		0.030	mg/L	25-AUG-15	26-AUG-15	R3254377
Zinc (Zn)-Total	0.0020		0.0020	mg/L	25-AUG-15	26-AUG-15	R3254377
Total Suspended Solids							
Total Suspended Solids	61.0		5.0	mg/L		24-AUG-15	R3253983
pH							
pH	7.05		0.10	pH units		31-AUG-15	R3257924

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

Reference Information

Sample Parameter Qualifier Key:

Qualifier	Description
DLA	Detection Limit adjusted for required dilution
DLM	Detection Limit Adjusted due to sample matrix effects.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Test Method References:

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

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

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

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

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

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

ALK-TITR-WP	Water	Total Alkalinity 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.

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.

ETL-HARDNESS-TOT-WP	Water	Hardness Calculated	HARDNESS CALCULATED
F1-F4-CALC-WP	Water	CCME Total Hydrocarbons	CCME CWS-PHC, Pub #1310, Dec 2001-L

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

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

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

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

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**

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

F2-F4-FID-WP	Water	F2-F4 PHC method	CWS (CCME)

Petroleum Hydrocarbons (F2-F4) in Water Method is adapted from US EPA Method 3511: Organic Compounds in Water by Micro-extraction" (Nov 2002) with instrumental analysis as per the "Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil - Tier 1 Method" (CCMS, Dec 2000) Water samples (in their entirety) are extracted using hexane prior to capillary column gas chromatography with flame ionization detection (GC/FID).

FC-MPN-WP	Water	Fecal Coliform	APHA 9221E

The Most Probable Number (MPN) method is based on the Multiple Tube Fermentation technique. The results of examination of replicate tubes and dilutions of a sample are reported after confirmations specific to total coliform, fecal coliform and E. coli are performed. Results are reported in MPN/100 mL for water and MPN/gram for food and solid samples.

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

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

MET-T-L-MS-WP	Water	Total Metals by ICP-MS	APHA 3030E/EPA 6020A-TL

This analysis involves preliminary sample treatment by hotblock acid digestion (APHA 3030E). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

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.

OGG-TOT-WT	Water	Oil and Grease, Total	APHA 5520 B

Sample is extracted with hexane, extract is then evaporated and the residue is weighed to determine total oil and grease.

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

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

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

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

PH-WP	Water	pH	APHA 4500H

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

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

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

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

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.

TOC-WT	Water	Total Organic Carbon	APHA 5310B

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
		Sample is injected into a heated reaction chamber which is packed with an oxidative catalyst. The water is vaporized and the organic cabon is oxidized to carbon dioxide. The carbon dioxide is transported in a carrier gas and is measured by a non-dispersive infrared detector.	
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:

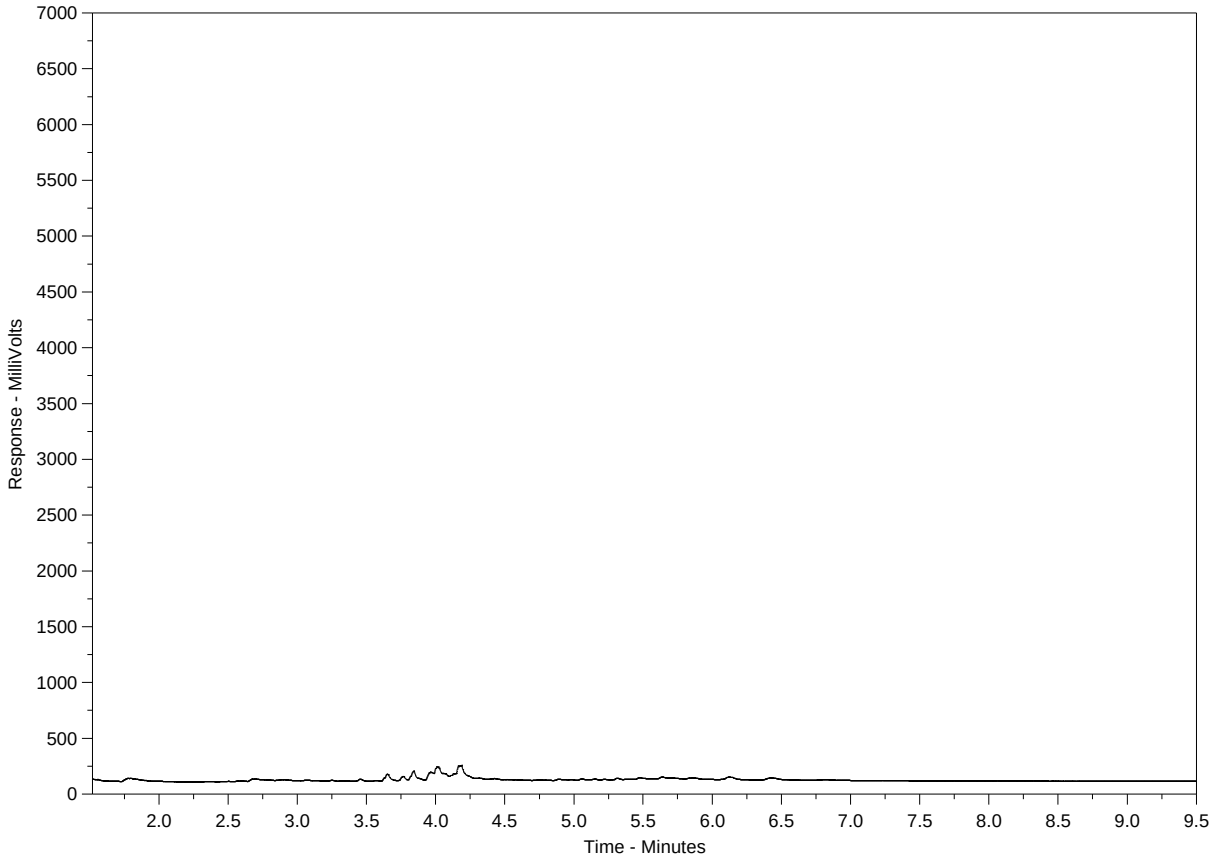
GLOSSARY OF REPORT TERMS

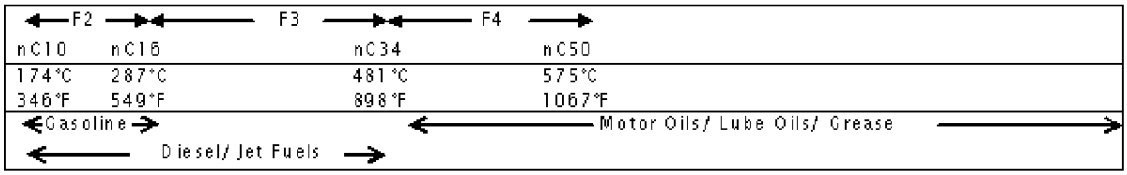
Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates 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: L1661523-1
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.

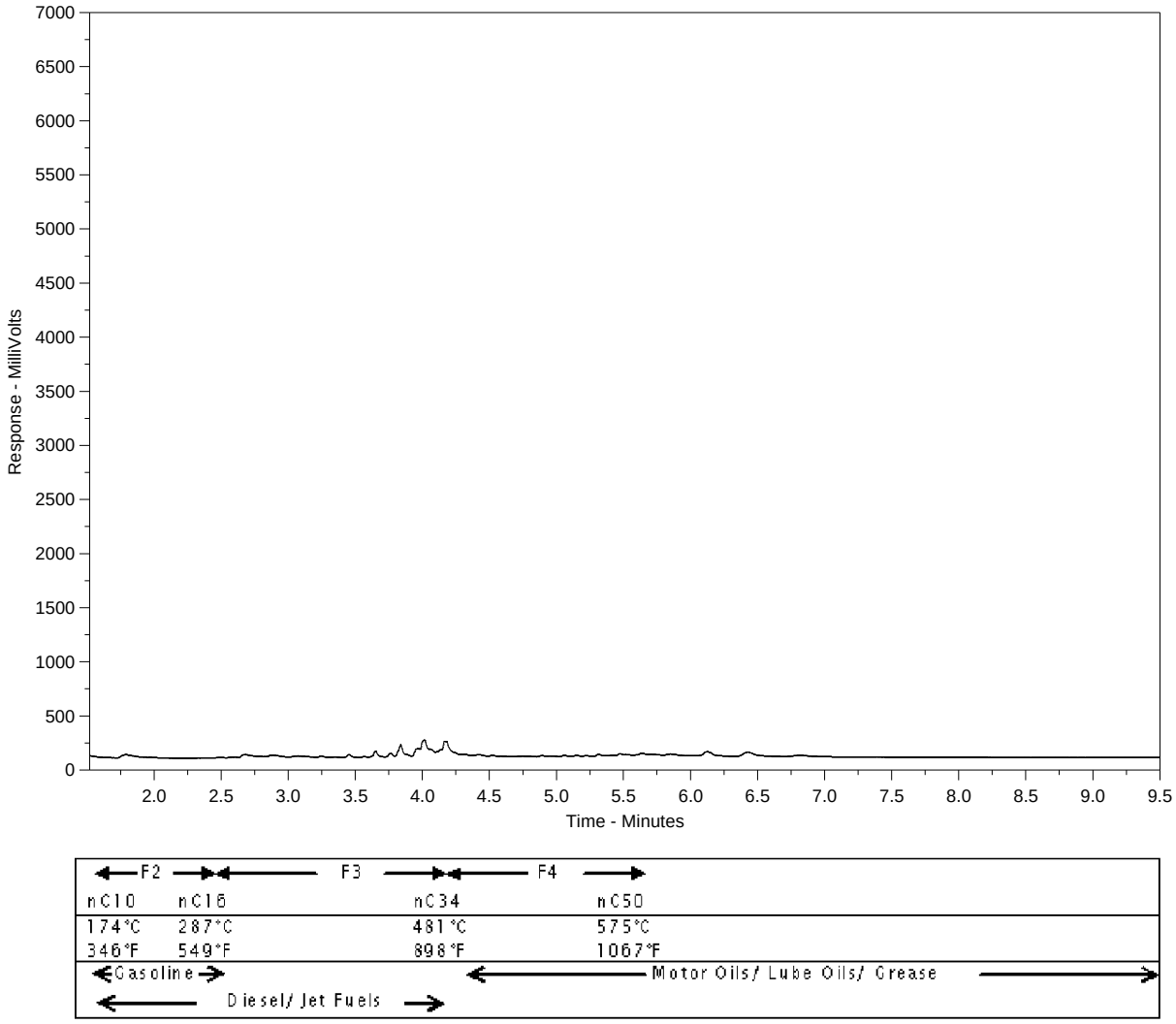
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

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: L1661523-2
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.

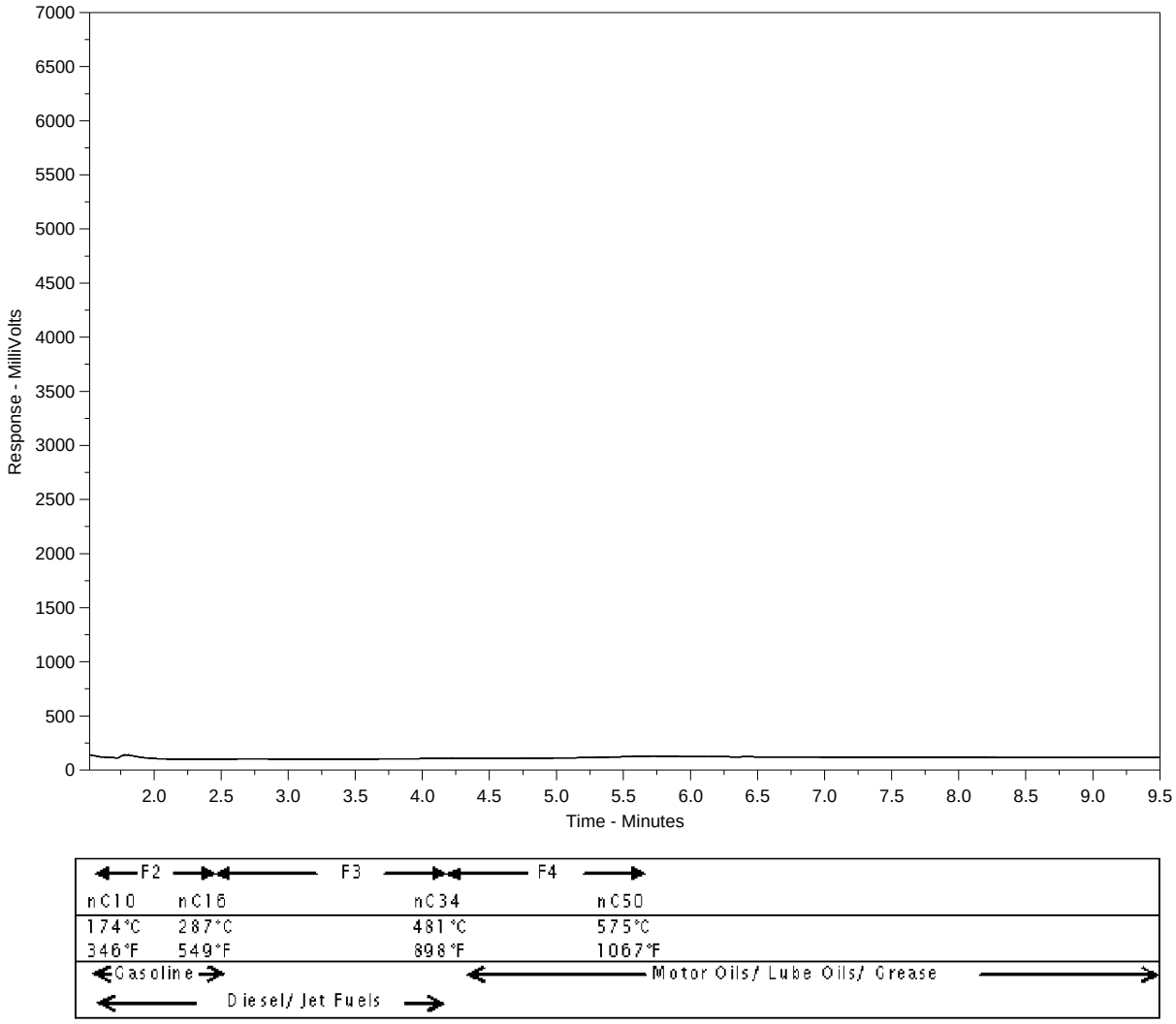
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

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: L1661523-3
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.

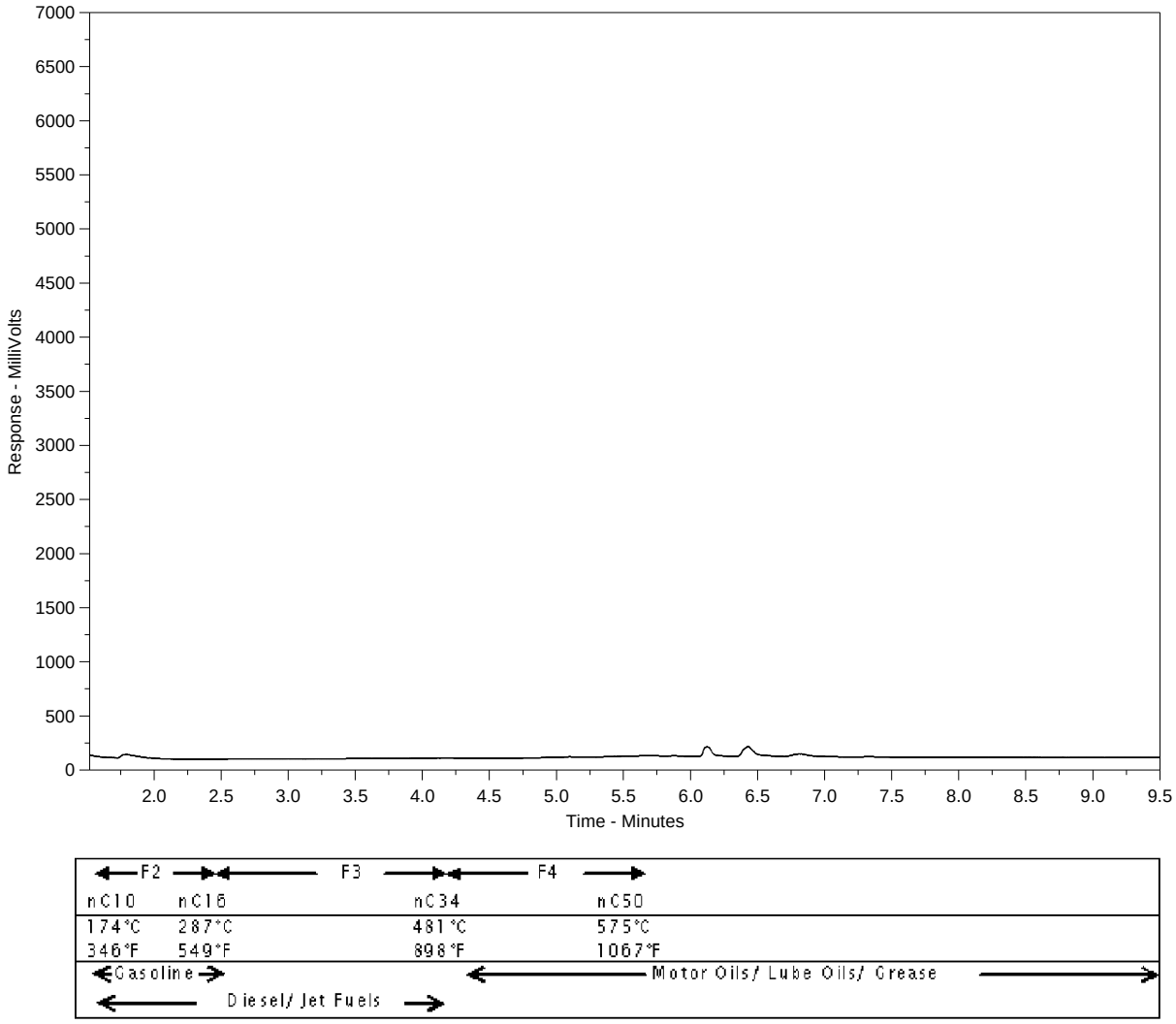
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

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: L1661523-4
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

L1661523-COFC

COC Number: 14 - 454533

Page 1 of 1

Report To		Report Format / Distribution		Select Service Level Below (Rush Turnaround Time (TAT) is not available for all tests)
Company:	Hamlet of Arviat	Select Report Format:	PDF EXCEL EDD (DIGITAL)	R Regular (Standard TAT if received by 3pm)
Contact:	Steve England	Quality Control (QC) Report with Report	Yes No	P Priority (2-4 business days if received by 3pm)
Address:	Box 150 Arviat, NU X0C-0E0	Criteria on Report - provide details below if box checked		E Emergency (1-2 business days if received by 3pm)
		Select Distribution:	EMAIL MAIL FAX	E2 Same day or weekend emergency if received by 10am – contact ALS for surcharge.
Phone:	867-857-2841	Email 1 or Fax	arviattsao@qiniq.com	Specify Date Required for E2,E or P:
		Email 2	mlusty@gov.nu.ca	
Invoice To	Same as Report To: Yes No	Invoice Distribution		Analysis Request
	Copy of Invoice with Report: Yes No	Select Invoice Distribution:	EMAIL MAIL FAX	Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below
Company:		Email 1 or Fax		
Contact:		Email 2		
Project Information		Oil and Gas Required Fields (client use)		
ALS Quote #:		Approver ID:	Cost Center:	
Job #:		GL Account:	Routine	
PO / AFE:		Activity Code:	Nitric Acid	
LSD:		Location:	BOD	
ALS Lab Work Order # (lab use only)		ALS Contact:	Sampler: Laura	Barium
				Mercury
				Oil & Grease
				Sulfuric Acid
				Phenols
				Sodium x2
				BTEX/VOC x3

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
	ARV-2	Aug/18/15	9:14	EFF	
	ARV-4	18/15	8:56	EFF	
	ARV-5	18/15	9:26	EFF	
	ARV-6	18/15	8:25	EFF	

Drinking Water (DW) Samples[1] (client use)	Special Instructions / Specify Criteria to add on report (client Use)
Are samples taken from a Regulated DW System? Yes No	
Are samples for human drinking water use? Yes No	

SAMPLE CONDITION AS RECEIVED (lab use only)

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

INITIAL COOLER TEMPERATURES °C		FINAL COOLER TEMPERATURES °C			
1°C	0°C				

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date:	Time:	Received by:	Date:	Time:	Received by:	Date:	Time:
				Aug 18 15	1:00			

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

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

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

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

Date Received: 17-SEP-15
Report Date: 07-OCT-15 15:02 (MT)
Version: FINAL

Client Phone: 867-857-2841

Certificate of Analysis

Lab Work Order #: L1674736

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
L1674736-1 ARV-2							
Sampled By: LAURA on 16-SEP-15 @ 09:40							
Matrix: EFF							
BTEX plus F1-F4							
BTX plus F1 by GCMS							
Benzene	<0.00050		0.00050	mg/L		23-SEP-15	R3275299
Toluene	<0.0010		0.0010	mg/L		23-SEP-15	R3275299
Ethyl benzene	<0.00050		0.00050	mg/L		23-SEP-15	R3275299
o-Xylene	<0.00050		0.00050	mg/L		23-SEP-15	R3275299
m+p-Xylenes	<0.00050		0.00050	mg/L		23-SEP-15	R3275299
F1 (C6-C10)	<0.10		0.10	mg/L		23-SEP-15	R3275299
Surrogate: 4-Bromofluorobenzene (SS)	109.6		70-130	%		23-SEP-15	R3275299
CCME Total Hydrocarbons							
F1-BTEX	<0.10		0.10	mg/L		07-OCT-15	
F2-Naphth	<0.25		0.25	mg/L		07-OCT-15	
F3-PAH	0.47		0.25	mg/L		07-OCT-15	
Total Hydrocarbons (C6-C50)	0.47		0.44	mg/L		07-OCT-15	
F2-F4 PHC method							
F2 (C10-C16)	<0.25		0.25	mg/L	19-SEP-15	19-SEP-15	R3273652
F3 (C16-C34)	0.47		0.25	mg/L	19-SEP-15	19-SEP-15	R3273652
F4 (C34-C50)	<0.25		0.25	mg/L	19-SEP-15	19-SEP-15	R3273652
Surrogate: 2-Bromobenzotrifluoride	95.6		60-140	%	19-SEP-15	19-SEP-15	R3273652
Sum of Xylene Isomer Concentrations							
Xylenes (Total)	<0.0015		0.0015	mg/L		25-SEP-15	
Miscellaneous Parameters							
Total Organic Carbon	39.2		1.0	mg/L		20-SEP-15	R3270930
Polyaromatic Hydrocarbons (PAHs)							
1-Methyl Naphthalene	<0.000020		0.000020	mg/L	23-SEP-15	03-OCT-15	R3284296
2-Methyl Naphthalene	<0.000020		0.000020	mg/L	23-SEP-15	03-OCT-15	R3284296
Acenaphthene	<0.000020		0.000020	mg/L	23-SEP-15	03-OCT-15	R3284296
Acenaphthylene	<0.000020		0.000020	mg/L	23-SEP-15	03-OCT-15	R3284296
Anthracene	<0.000010		0.000010	mg/L	23-SEP-15	03-OCT-15	R3284296
Acridine	<0.000020		0.000020	mg/L	23-SEP-15	03-OCT-15	R3284296
Benzo(a)anthracene	<0.000010		0.000010	mg/L	23-SEP-15	03-OCT-15	R3284296
Benzo(a)pyrene	<0.0000050		0.0000050	mg/L	23-SEP-15	03-OCT-15	R3284296
Benzo(b&j)fluoranthene	<0.000010		0.000010	mg/L	23-SEP-15	03-OCT-15	R3284296
Benzo(g,h,i)perylene	<0.000020		0.000020	mg/L	23-SEP-15	03-OCT-15	R3284296
Benzo(k)fluoranthene	<0.000010		0.000010	mg/L	23-SEP-15	03-OCT-15	R3284296
Chrysene	<0.000020		0.000020	mg/L	23-SEP-15	03-OCT-15	R3284296
Dibenzo(a,h)anthracene	<0.0000050		0.0000050	mg/L	23-SEP-15	03-OCT-15	R3284296
Fluoranthene	<0.000020		0.000020	mg/L	23-SEP-15	03-OCT-15	R3284296
Fluorene	<0.000020		0.000020	mg/L	23-SEP-15	03-OCT-15	R3284296
Indeno(1,2,3-cd)pyrene	<0.000010		0.000010	mg/L	23-SEP-15	03-OCT-15	R3284296
Naphthalene	<0.000050		0.000050	mg/L	23-SEP-15	03-OCT-15	R3284296
Phenanthrene	<0.000050		0.000050	mg/L	23-SEP-15	03-OCT-15	R3284296
Pyrene	<0.000010		0.000010	mg/L	23-SEP-15	03-OCT-15	R3284296
Quinoline	<0.000020		0.000020	mg/L	23-SEP-15	03-OCT-15	R3284296
B(a)P Total Potency Equivalent	<0.000030		0.000030	mg/L	23-SEP-15	03-OCT-15	R3284296
Surrogate: Acenaphthene d10	83.3		40-130	%	23-SEP-15	03-OCT-15	R3284296
Surrogate: Acridine d9	94.2		40-130	%	23-SEP-15	03-OCT-15	R3284296
Surrogate: Chrysene d12	100.9		40-130	%	23-SEP-15	03-OCT-15	R3284296
Surrogate: Naphthalene d8	81.5		40-130	%	23-SEP-15	03-OCT-15	R3284296
Surrogate: Phenanthrene d10	80.4		40-130	%	23-SEP-15	03-OCT-15	R3284296
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	634		1.2	mg/L		25-SEP-15	

* 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
L1674736-1 ARV-2							
Sampled By: LAURA on 16-SEP-15 @ 09:40							
Matrix: EFF							
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		25-SEP-15	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		25-SEP-15	
Ammonia by colour							
Ammonia, Total (as N)	5.6		1.0	mg/L		23-SEP-15	R3274915
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	17.8	DLA	6.0	mg/L		18-SEP-15	R3275517
Carbonaceous BOD							
BOD Carbonaceous	9.9		2.0	mg/L		18-SEP-15	R3275517
Chloride in Water by IC							
Chloride (Cl)	408		1.0	mg/L		21-SEP-15	R3274095
Conductivity							
Conductivity	2720		1.0	umhos/cm		23-SEP-15	R3275450
Fecal Coliform							
Fecal Coliforms	9	MBHT	3	MPN/100mL		17-SEP-15	R3274652
Hardness Calculated							
Hardness (as CaCO3)	831		0.30	mg/L		23-SEP-15	
Mercury Total							
Mercury (Hg)-Total	<0.00020	DLM	0.00020	mg/L	18-SEP-15	18-SEP-15	R3271485
Nitrate in Water by IC							
Nitrate (as N)	0.381	HTD	0.040	mg/L		21-SEP-15	R3274095
Nitrate+Nitrite							
Nitrate and Nitrite as N	0.479		0.070	mg/L		23-SEP-15	
Nitrite in Water by IC							
Nitrite (as N)	0.098	HTD	0.020	mg/L		21-SEP-15	R3274095
Oil and Grease, Total							
Oil and Grease, Total	<2.0		2.0	mg/L	22-SEP-15	22-SEP-15	R3274912
Phenol (4AAP)							
Phenols (4AAP)	0.0061		0.0010	mg/L		25-SEP-15	R3277801
Phosphorus, Total							
Phosphorus (P)-Total	0.756		0.010	mg/L		22-SEP-15	R3273325
Sulfate in Water by IC							
Sulfate (SO4)	466		0.60	mg/L		21-SEP-15	R3274095
Total Alkalinity as CaCO3							
Alkalinity, Total (as CaCO3)	520		1.0	mg/L		23-SEP-15	R3275450
Total Metals by ICP-MS							
Aluminum (Al)-Total	0.0105		0.0050	mg/L	21-SEP-15	21-SEP-15	R3272587
Arsenic (As)-Total	0.00843		0.00020	mg/L	21-SEP-15	21-SEP-15	R3272587
Cadmium (Cd)-Total	0.000023		0.000010	mg/L	21-SEP-15	21-SEP-15	R3272587
Calcium (Ca)-Total	245		10	mg/L	21-SEP-15	22-SEP-15	R3273630
Chromium (Cr)-Total	<0.0010		0.0010	mg/L	21-SEP-15	21-SEP-15	R3272587
Cobalt (Co)-Total	0.00094		0.00020	mg/L	21-SEP-15	21-SEP-15	R3272587
Copper (Cu)-Total	0.00401		0.00020	mg/L	21-SEP-15	21-SEP-15	R3272587
Iron (Fe)-Total	0.36		0.10	mg/L	21-SEP-15	21-SEP-15	R3272587
Lead (Pb)-Total	0.000456		0.000090	mg/L	21-SEP-15	21-SEP-15	R3272587
Magnesium (Mg)-Total	53.3		0.010	mg/L	21-SEP-15	21-SEP-15	R3272587
Manganese (Mn)-Total	0.380		0.00030	mg/L	21-SEP-15	21-SEP-15	R3272587
Nickel (Ni)-Total	0.0062		0.0020	mg/L	21-SEP-15	21-SEP-15	R3272587
Potassium (K)-Total	53.0		0.020	mg/L	21-SEP-15	21-SEP-15	R3272587
Sodium (Na)-Total	263		0.030	mg/L	21-SEP-15	21-SEP-15	R3272587
Zinc (Zn)-Total	0.0087		0.0020	mg/L	21-SEP-15	21-SEP-15	R3272587
Total Suspended Solids							

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1674736-1 ARV-2							
Sampled By: LAURA on 16-SEP-15 @ 09:40							
Matrix: EFF							
Total Suspended Solids							
Total Suspended Solids	34.0		5.0	mg/L		23-SEP-15	R3275555
pH							
pH	7.99		0.10	pH units		23-SEP-15	R3275450
L1674736-2 ARV-4							
Sampled By: LAURA on 16-SEP-15 @ 09:30							
Matrix: EFF							
Miscellaneous Parameters							
Total Organic Carbon	23.5		1.0	mg/L		20-SEP-15	R3270930
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	227		1.2	mg/L		25-SEP-15	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		25-SEP-15	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		25-SEP-15	
Ammonia by colour							
Ammonia, Total (as N)	15.6		1.0	mg/L		23-SEP-15	R3274915
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	7.7		2.0	mg/L		18-SEP-15	R3275517
Carbonaceous BOD							
BOD Carbonaceous	<2.0		2.0	mg/L		18-SEP-15	R3275517
Chloride in Water by IC							
Chloride (Cl)	300		0.50	mg/L		21-SEP-15	R3274095
Conductivity							
Conductivity	1350		1.0	umhos/cm		23-SEP-15	R3275450
Fecal Coliform							
Fecal Coliforms	150	MBHT	3	MPN/100mL		17-SEP-15	R3274652
Hardness Calculated							
Hardness (as CaCO3)	187		0.30	mg/L		22-SEP-15	
Mercury Total							
Mercury (Hg)-Total	<0.00020	DLM	0.00020	mg/L	18-SEP-15	18-SEP-15	R3271485
Nitrate in Water by IC							
Nitrate (as N)	0.569	HTD	0.020	mg/L		21-SEP-15	R3274095
Nitrate+Nitrite							
Nitrate and Nitrite as N	0.594		0.070	mg/L		23-SEP-15	
Nitrite in Water by IC							
Nitrite (as N)	0.025	HTD	0.010	mg/L		21-SEP-15	R3274095
Oil and Grease, Total							
Oil and Grease, Total	<2.0		2.0	mg/L	22-SEP-15	22-SEP-15	R3274912
Phenol (4AAP)							
Phenols (4AAP)	0.0040		0.0010	mg/L		25-SEP-15	R3277801
Phosphorus, Total							
Phosphorus (P)-Total	4.81		0.010	mg/L		22-SEP-15	R3273325
Sulfate in Water by IC							
Sulfate (SO4)	27.2		0.30	mg/L		21-SEP-15	R3274095
Total Alkalinity as CaCO3							
Alkalinity, Total (as CaCO3)	186		1.0	mg/L		23-SEP-15	R3275450
Total Metals by ICP-MS							
Aluminum (Al)-Total	0.255		0.0050	mg/L	21-SEP-15	21-SEP-15	R3272587
Arsenic (As)-Total	0.00725		0.00020	mg/L	21-SEP-15	21-SEP-15	R3272587
Cadmium (Cd)-Total	0.000073		0.000010	mg/L	21-SEP-15	21-SEP-15	R3272587
Calcium (Ca)-Total	36.6		0.10	mg/L	21-SEP-15	21-SEP-15	R3272587

* 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
L1674736-2 ARV-4							
Sampled By: LAURA on 16-SEP-15 @ 09:30							
Matrix: EFF							
Total Metals by ICP-MS							
Chromium (Cr)-Total	0.0013		0.0010	mg/L	21-SEP-15	21-SEP-15	R3272587
Cobalt (Co)-Total	0.00230		0.00020	mg/L	21-SEP-15	21-SEP-15	R3272587
Copper (Cu)-Total	0.0180		0.00020	mg/L	21-SEP-15	21-SEP-15	R3272587
Iron (Fe)-Total	13.1		0.10	mg/L	21-SEP-15	21-SEP-15	R3272587
Lead (Pb)-Total	0.00161		0.000090	mg/L	21-SEP-15	21-SEP-15	R3272587
Magnesium (Mg)-Total	23.2		0.010	mg/L	21-SEP-15	21-SEP-15	R3272587
Manganese (Mn)-Total	0.842		0.00030	mg/L	21-SEP-15	21-SEP-15	R3272587
Nickel (Ni)-Total	0.0063		0.0020	mg/L	21-SEP-15	21-SEP-15	R3272587
Potassium (K)-Total	19.3		0.020	mg/L	21-SEP-15	21-SEP-15	R3272587
Sodium (Na)-Total	156		0.030	mg/L	21-SEP-15	21-SEP-15	R3272587
Zinc (Zn)-Total	0.0141		0.0020	mg/L	21-SEP-15	21-SEP-15	R3272587
Total Suspended Solids							
Total Suspended Solids	19.0		5.0	mg/L		23-SEP-15	R3275555
pH							
pH	7.50		0.10	pH units		23-SEP-15	R3275450
L1674736-3 ARV-5							
Sampled By: LAURA on 16-SEP-15 @ 09:55							
Matrix: EFF							
BTEX plus F1-F4							
BTX plus F1 by GCMS							
Benzene	<0.00050		0.00050	mg/L		23-SEP-15	R3275299
Toluene	<0.0010		0.0010	mg/L		23-SEP-15	R3275299
Ethyl benzene	<0.00050		0.00050	mg/L		23-SEP-15	R3275299
o-Xylene	<0.00050		0.00050	mg/L		23-SEP-15	R3275299
m+p-Xylenes	<0.00050		0.00050	mg/L		23-SEP-15	R3275299
F1 (C6-C10)	<0.10		0.10	mg/L		23-SEP-15	R3275299
Surrogate: 4-Bromofluorobenzene (SS)	86.7		70-130	%		23-SEP-15	R3275299
CCME Total Hydrocarbons							
F1-BTEX	<0.10		0.10	mg/L		07-OCT-15	
F2-Naphth	<0.25		0.25	mg/L		07-OCT-15	
F3-PAH	<0.25		0.25	mg/L		07-OCT-15	
Total Hydrocarbons (C6-C50)	<0.44		0.44	mg/L		07-OCT-15	
F2-F4 PHC method							
F2 (C10-C16)	<0.25		0.25	mg/L	19-SEP-15	19-SEP-15	R3273652
F3 (C16-C34)	<0.25		0.25	mg/L	19-SEP-15	19-SEP-15	R3273652
F4 (C34-C50)	<0.25		0.25	mg/L	19-SEP-15	19-SEP-15	R3273652
Surrogate: 2-Bromobenzotrifluoride	92.5		60-140	%	19-SEP-15	19-SEP-15	R3273652
Sum of Xylene Isomer Concentrations							
Xylenes (Total)	<0.0015		0.0015	mg/L		25-SEP-15	
Miscellaneous Parameters							
Total Organic Carbon	8.8		1.0	mg/L		20-SEP-15	R3270930
Polyaromatic Hydrocarbons (PAHs)							
1-Methyl Naphthalene	<0.000020		0.000020	mg/L	23-SEP-15	03-OCT-15	R3284296
2-Methyl Naphthalene	<0.000020		0.000020	mg/L	23-SEP-15	03-OCT-15	R3284296
Acenaphthene	<0.000020		0.000020	mg/L	23-SEP-15	03-OCT-15	R3284296
Acenaphthylene	<0.000020		0.000020	mg/L	23-SEP-15	03-OCT-15	R3284296
Anthracene	<0.000010		0.000010	mg/L	23-SEP-15	03-OCT-15	R3284296
Acridine	<0.000020		0.000020	mg/L	23-SEP-15	03-OCT-15	R3284296
Benzo(a)anthracene	<0.000010		0.000010	mg/L	23-SEP-15	03-OCT-15	R3284296
Benzo(a)pyrene	<0.0000050		0.0000050	mg/L	23-SEP-15	03-OCT-15	R3284296
Benzo(b&j)fluoranthene	<0.000010		0.000010	mg/L	23-SEP-15	03-OCT-15	R3284296

* 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
L1674736-3 ARV-5							
Sampled By: LAURA on 16-SEP-15 @ 09:55							
Matrix: EFF							
Polyaromatic Hydrocarbons (PAHs)							
Benzo(g,h,i)perylene	<0.000020		0.000020	mg/L	23-SEP-15	03-OCT-15	R3284296
Benzo(k)fluoranthene	<0.000010		0.000010	mg/L	23-SEP-15	03-OCT-15	R3284296
Chrysene	<0.000020		0.000020	mg/L	23-SEP-15	03-OCT-15	R3284296
Dibenzo(a,h)anthracene	<0.0000050		0.0000050	mg/L	23-SEP-15	03-OCT-15	R3284296
Fluoranthene	<0.000020		0.000020	mg/L	23-SEP-15	03-OCT-15	R3284296
Fluorene	<0.000020		0.000020	mg/L	23-SEP-15	03-OCT-15	R3284296
Indeno(1,2,3-cd)pyrene	<0.000010		0.000010	mg/L	23-SEP-15	03-OCT-15	R3284296
Naphthalene	<0.000050		0.000050	mg/L	23-SEP-15	03-OCT-15	R3284296
Phenanthrene	<0.000050		0.000050	mg/L	23-SEP-15	03-OCT-15	R3284296
Pyrene	<0.000010		0.000010	mg/L	23-SEP-15	03-OCT-15	R3284296
Quinoline	<0.000020		0.000020	mg/L	23-SEP-15	03-OCT-15	R3284296
B(a)P Total Potency Equivalent	<0.000030		0.000030	mg/L	23-SEP-15	03-OCT-15	R3284296
Surrogate: Acenaphthene d10	85.1		40-130	%	23-SEP-15	03-OCT-15	R3284296
Surrogate: Acridine d9	95.8		40-130	%	23-SEP-15	03-OCT-15	R3284296
Surrogate: Chrysene d12	93.4		40-130	%	23-SEP-15	03-OCT-15	R3284296
Surrogate: Naphthalene d8	82.0		40-130	%	23-SEP-15	03-OCT-15	R3284296
Surrogate: Phenanthrene d10	83.3		40-130	%	23-SEP-15	03-OCT-15	R3284296
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	87.0		1.2	mg/L		25-SEP-15	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		25-SEP-15	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		25-SEP-15	
Ammonia by colour							
Ammonia, Total (as N)	0.020		0.010	mg/L		23-SEP-15	R3274915
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	<2.0		2.0	mg/L		18-SEP-15	R3275517
Carbonaceous BOD							
BOD Carbonaceous	<2.0		2.0	mg/L		18-SEP-15	R3275517
Chloride in Water by IC							
Chloride (Cl)	361		0.50	mg/L		21-SEP-15	R3274095
Conductivity							
Conductivity	1280		1.0	umhos/cm		23-SEP-15	R3275450
Fecal Coliform							
Fecal Coliforms	4	MBHT	3	MPN/100mL		17-SEP-15	R3274652
Hardness Calculated							
Hardness (as CaCO3)	214		0.30	mg/L		22-SEP-15	
Mercury Total							
Mercury (Hg)-Total	<0.00020	DLM	0.00020	mg/L	18-SEP-15	18-SEP-15	R3271485
Nitrate in Water by IC							
Nitrate (as N)	<0.020	HTD	0.020	mg/L		21-SEP-15	R3274095
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		23-SEP-15	
Nitrite in Water by IC							
Nitrite (as N)	<0.010	HTD	0.010	mg/L		21-SEP-15	R3274095
Oil and Grease, Total							
Oil and Grease, Total	<2.0		2.0	mg/L	22-SEP-15	22-SEP-15	R3274912
Phenol (4AAP)							
Phenols (4AAP)	0.0013		0.0010	mg/L		25-SEP-15	R3277801
Phosphorus, Total							
Phosphorus (P)-Total	0.034		0.010	mg/L		22-SEP-15	R3273325

* 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
L1674736-3 ARV-5							
Sampled By: LAURA on 16-SEP-15 @ 09:55							
Matrix: EFF							
Sulfate in Water by IC							
Sulfate (SO4)	7.13		0.30	mg/L		21-SEP-15	R3274095
Total Alkalinity as CaCO3							
Alkalinity, Total (as CaCO3)	71.3		1.0	mg/L		23-SEP-15	R3275450
Total Metals by ICP-MS							
Aluminum (Al)-Total	0.0471		0.0050	mg/L	21-SEP-15	21-SEP-15	R3272587
Arsenic (As)-Total	0.00057		0.00020	mg/L	21-SEP-15	21-SEP-15	R3272587
Cadmium (Cd)-Total	<0.000010		0.000010	mg/L	21-SEP-15	21-SEP-15	R3272587
Calcium (Ca)-Total	39.5		0.10	mg/L	21-SEP-15	21-SEP-15	R3272587
Chromium (Cr)-Total	<0.0010		0.0010	mg/L	21-SEP-15	21-SEP-15	R3272587
Cobalt (Co)-Total	<0.00020		0.00020	mg/L	21-SEP-15	21-SEP-15	R3272587
Copper (Cu)-Total	0.00048		0.00020	mg/L	21-SEP-15	21-SEP-15	R3272587
Iron (Fe)-Total	3.61		0.10	mg/L	21-SEP-15	21-SEP-15	R3272587
Lead (Pb)-Total	<0.000090		0.000090	mg/L	21-SEP-15	21-SEP-15	R3272587
Magnesium (Mg)-Total	28.0		0.010	mg/L	21-SEP-15	21-SEP-15	R3272587
Manganese (Mn)-Total	0.0645		0.00030	mg/L	21-SEP-15	21-SEP-15	R3272587
Nickel (Ni)-Total	<0.0020		0.0020	mg/L	21-SEP-15	21-SEP-15	R3272587
Potassium (K)-Total	8.10		0.020	mg/L	21-SEP-15	21-SEP-15	R3272587
Sodium (Na)-Total	190		0.030	mg/L	21-SEP-15	21-SEP-15	R3272587
Zinc (Zn)-Total	0.0037		0.0020	mg/L	21-SEP-15	21-SEP-15	R3272587
Total Suspended Solids							
Total Suspended Solids	<5.0		5.0	mg/L		23-SEP-15	R3275555
pH							
pH	7.25		0.10	pH units		23-SEP-15	R3275450
L1674736-4 ARV-6							
Sampled By: LAURA on 16-SEP-15 @ 08:15							
Matrix: EFF							
BTEX plus F1-F4							
BTX plus F1 by GCMS							
Benzene	<0.00050		0.00050	mg/L		23-SEP-15	R3275299
Toluene	<0.0010		0.0010	mg/L		23-SEP-15	R3275299
Ethyl benzene	<0.00050		0.00050	mg/L		23-SEP-15	R3275299
o-Xylene	<0.00050		0.00050	mg/L		23-SEP-15	R3275299
m+p-Xylenes	<0.00050		0.00050	mg/L		23-SEP-15	R3275299
F1 (C6-C10)	<0.10		0.10	mg/L		23-SEP-15	R3275299
Surrogate: 4-Bromofluorobenzene (SS)	98.5		70-130	%		23-SEP-15	R3275299
CCME Total Hydrocarbons							
F1-BTEX	<0.10		0.10	mg/L		07-OCT-15	
F2-Naphth	<0.25		0.25	mg/L		07-OCT-15	
F3-PAH	1.77		0.25	mg/L		07-OCT-15	
Total Hydrocarbons (C6-C50)	2.38		0.44	mg/L		07-OCT-15	
F2-F4 PHC method							
F2 (C10-C16)	<0.25		0.25	mg/L	19-SEP-15	19-SEP-15	R3273652
F3 (C16-C34)	1.77		0.25	mg/L	19-SEP-15	19-SEP-15	R3273652
F4 (C34-C50)	0.61		0.25	mg/L	19-SEP-15	19-SEP-15	R3273652
Surrogate: 2-Bromobenzotrifluoride	90.6		60-140	%	19-SEP-15	19-SEP-15	R3273652
Sum of Xylene Isomer Concentrations							
Xylenes (Total)	<0.0015		0.0015	mg/L		25-SEP-15	
Miscellaneous Parameters							
Total Organic Carbon	25.7		1.0	mg/L		20-SEP-15	R3270930
Polyaromatic Hydrocarbons (PAHs)							
1-Methyl Naphthalene	<0.000020		0.000020	mg/L	23-SEP-15	03-OCT-15	R3284296

* 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
L1674736-4 ARV-6							
Sampled By: LAURA on 16-SEP-15 @ 08:15							
Matrix: EFF							
Polyaromatic Hydrocarbons (PAHs)							
2-Methyl Naphthalene	<0.000020		0.000020	mg/L	23-SEP-15	03-OCT-15	R3284296
Acenaphthene	<0.000020		0.000020	mg/L	23-SEP-15	03-OCT-15	R3284296
Acenaphthylene	<0.000020		0.000020	mg/L	23-SEP-15	03-OCT-15	R3284296
Anthracene	<0.000010		0.000010	mg/L	23-SEP-15	03-OCT-15	R3284296
Acridine	<0.000020		0.000020	mg/L	23-SEP-15	03-OCT-15	R3284296
Benzo(a)anthracene	<0.000010		0.000010	mg/L	23-SEP-15	03-OCT-15	R3284296
Benzo(a)pyrene	<0.0000050		0.0000050	mg/L	23-SEP-15	03-OCT-15	R3284296
Benzo(b&j)fluoranthene	<0.000010		0.000010	mg/L	23-SEP-15	03-OCT-15	R3284296
Benzo(g,h,i)perylene	<0.000020		0.000020	mg/L	23-SEP-15	03-OCT-15	R3284296
Benzo(k)fluoranthene	<0.000010		0.000010	mg/L	23-SEP-15	03-OCT-15	R3284296
Chrysene	<0.000020		0.000020	mg/L	23-SEP-15	03-OCT-15	R3284296
Dibenzo(a,h)anthracene	<0.0000050		0.0000050	mg/L	23-SEP-15	03-OCT-15	R3284296
Fluoranthene	<0.000020		0.000020	mg/L	23-SEP-15	03-OCT-15	R3284296
Fluorene	<0.000020		0.000020	mg/L	23-SEP-15	03-OCT-15	R3284296
Indeno(1,2,3-cd)pyrene	<0.000010		0.000010	mg/L	23-SEP-15	03-OCT-15	R3284296
Naphthalene	0.000051		0.000050	mg/L	23-SEP-15	03-OCT-15	R3284296
Phenanthrene	<0.000050		0.000050	mg/L	23-SEP-15	03-OCT-15	R3284296
Pyrene	<0.000010		0.000010	mg/L	23-SEP-15	03-OCT-15	R3284296
Quinoline	<0.000020		0.000020	mg/L	23-SEP-15	03-OCT-15	R3284296
B(a)P Total Potency Equivalent	<0.000030		0.000030	mg/L	23-SEP-15	03-OCT-15	R3284296
Surrogate: Acenaphthene d10	83.3		40-130	%	23-SEP-15	03-OCT-15	R3284296
Surrogate: Acridine d9	93.9		40-130	%	23-SEP-15	03-OCT-15	R3284296
Surrogate: Chrysene d12	103.9		40-130	%	23-SEP-15	03-OCT-15	R3284296
Surrogate: Naphthalene d8	75.6		40-130	%	23-SEP-15	03-OCT-15	R3284296
Surrogate: Phenanthrene d10	76.9		40-130	%	23-SEP-15	03-OCT-15	R3284296
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	118		1.2	mg/L		25-SEP-15	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		25-SEP-15	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		25-SEP-15	
Ammonia by colour							
Ammonia, Total (as N)	0.435		0.010	mg/L		23-SEP-15	R3274915
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	<6.0		6.0	mg/L		18-SEP-15	R3275517
Carbonaceous BOD							
BOD Carbonaceous	<2.0		2.0	mg/L		18-SEP-15	R3275517
Chloride in Water by IC							
Chloride (Cl)	176		0.50	mg/L		21-SEP-15	R3274095
Conductivity							
Conductivity	712		1.0	umhos/cm		23-SEP-15	R3275450
Fecal Coliform							
Fecal Coliforms	430	MBHT	3	MPN/100mL		17-SEP-15	R3274652
Hardness Calculated							
Hardness (as CaCO3)	172		0.30	mg/L		23-SEP-15	
Mercury Total							
Mercury (Hg)-Total	<0.00040	DLM	0.00040	mg/L	18-SEP-15	18-SEP-15	R3271485
Nitrate in Water by IC							
Nitrate (as N)	<0.020	HTD	0.020	mg/L		21-SEP-15	R3274095
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		23-SEP-15	

* 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
L1674736-4 ARV-6							
Sampled By: LAURA on 16-SEP-15 @ 08:15							
Matrix: EFF							
Nitrite in Water by IC							
Nitrite (as N)	<0.010	HTD	0.010	mg/L		21-SEP-15	R3274095
Oil and Grease, Total							
Oil and Grease, Total	4.4		2.0	mg/L	22-SEP-15	22-SEP-15	R3274912
Phenol (4AAP)							
Phenols (4AAP)	0.0027		0.0010	mg/L		25-SEP-15	R3277801
Phosphorus, Total							
Phosphorus (P)-Total	0.433		0.010	mg/L		22-SEP-15	R3273325
Sulfate in Water by IC							
Sulfate (SO4)	1.11		0.30	mg/L		21-SEP-15	R3274095
Total Alkalinity as CaCO3							
Alkalinity, Total (as CaCO3)	96.8		1.0	mg/L		23-SEP-15	R3275450
Total Metals by ICP-MS							
Aluminum (Al)-Total	0.627		0.0050	mg/L	21-SEP-15	21-SEP-15	R3272587
Arsenic (As)-Total	0.00137		0.00020	mg/L	21-SEP-15	21-SEP-15	R3272587
Cadmium (Cd)-Total	0.000017		0.000010	mg/L	21-SEP-15	21-SEP-15	R3272587
Calcium (Ca)-Total	47.0		0.10	mg/L	21-SEP-15	21-SEP-15	R3272587
Chromium (Cr)-Total	0.0035		0.0010	mg/L	21-SEP-15	21-SEP-15	R3272587
Cobalt (Co)-Total	0.00265		0.00020	mg/L	21-SEP-15	21-SEP-15	R3272587
Copper (Cu)-Total	0.00230		0.00020	mg/L	21-SEP-15	21-SEP-15	R3272587
Iron (Fe)-Total	54.1		0.10	mg/L	21-SEP-15	21-SEP-15	R3272587
Lead (Pb)-Total	0.000875		0.000090	mg/L	21-SEP-15	21-SEP-15	R3272587
Magnesium (Mg)-Total	13.3		0.010	mg/L	21-SEP-15	21-SEP-15	R3272587
Manganese (Mn)-Total	2.49		0.030	mg/L	21-SEP-15	22-SEP-15	R3273630
Nickel (Ni)-Total	0.0030		0.0020	mg/L	21-SEP-15	21-SEP-15	R3272587
Potassium (K)-Total	5.80		0.020	mg/L	21-SEP-15	21-SEP-15	R3272587
Sodium (Na)-Total	71.1		0.030	mg/L	21-SEP-15	21-SEP-15	R3272587
Zinc (Zn)-Total	0.0251		0.0020	mg/L	21-SEP-15	21-SEP-15	R3272587
Total Suspended Solids							
Total Suspended Solids	1500		5.0	mg/L		22-SEP-15	R3275437
pH							
pH	6.98		0.10	pH units		23-SEP-15	R3275450

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

Reference Information

Sample Parameter Qualifier Key:

Qualifier	Description
DLA	Detection Limit adjusted for required dilution
DLM	Detection Limit Adjusted due to sample matrix effects.
HTD	Hold time exceeded for re-analysis or dilution, but initial testing was conducted within hold time.
MBHT	The APHA 30 hour hold time was exceeded for microbiological testing. Samples processed within 48 hours from time of sampling may be valid in some cases (refer to Health Canada guidance).
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Test Method References:

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

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

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

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

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

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

ALK-TITR-WP	Water	Total Alkalinity 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.

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.

ETL-HARDNESS-TOT-WP	Water	Hardness Calculated	HARDNESS CALCULATED
F1-F4-CALC-WP	Water	CCME Total Hydrocarbons	CCME CWS-PHC, Pub #1310, Dec 2001-L

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

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

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

Unless otherwise qualified, the following quality control criteria have been met for the F1 hydrocarbon range:

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**

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	F2-F4 PHC method	CWS (CCME)

Petroleum Hydrocarbons (F2-F4) in Water Method is adapted from US EPA Method 3511: Organic Compounds in Water by Micro-extraction" (Nov 2002) with instrumental analysis as per the "Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil - Tier 1 Method" (CCMS, Dec 2000) Water samples (in their entirety) are extracted using hexane prior to capillary column gas chromatography with flame ionization detection (GC/FID).

FC-MPN-WP	Water	Fecal Coliform	APHA 9221E

The Most Probable Number (MPN) method is based on the Multiple Tube Fermentation technique. The results of examination of replicate tubes and dilutions of a sample are reported after confirmations specific to total coliform, fecal coliform and E. coli are performed. Results are reported in MPN/100 mL for water and MPN/gram for food and solid samples.

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

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

MET-T-L-MS-WP	Water	Total Metals by ICP-MS	APHA 3030E/EPA 6020A-TL

This analysis involves preliminary sample treatment by hotblock acid digestion (APHA 3030E). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

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.

OGG-TOT-WT	Water	Oil and Grease, Total	APHA 5520 B

Sample is extracted with hexane, extract is then evaporated and the residue is weighed to determine total oil and grease.

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

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

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

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

PH-WP	Water	pH	APHA 4500H

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

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

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

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

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

SOLIDS-TOTSUS-WP	Water	Total Suspended Solids	APHA 2540 D (modified)

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
		Total suspended solids in aquesous matrices is determined gravimetrically after drying the residue at 103 105°C.	
TOC-WT	Water	Total Organic Carbon	APHA 5310B
		Sample is injected into a heated reaction chamber which is packed with an oxidative catalyst. The water is vaporized and the organic cabon is oxidized to carbon dioxide. The carbon dioxide is transported in a carrier gas and is measured by a non-dispersive infrared detector.	
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:

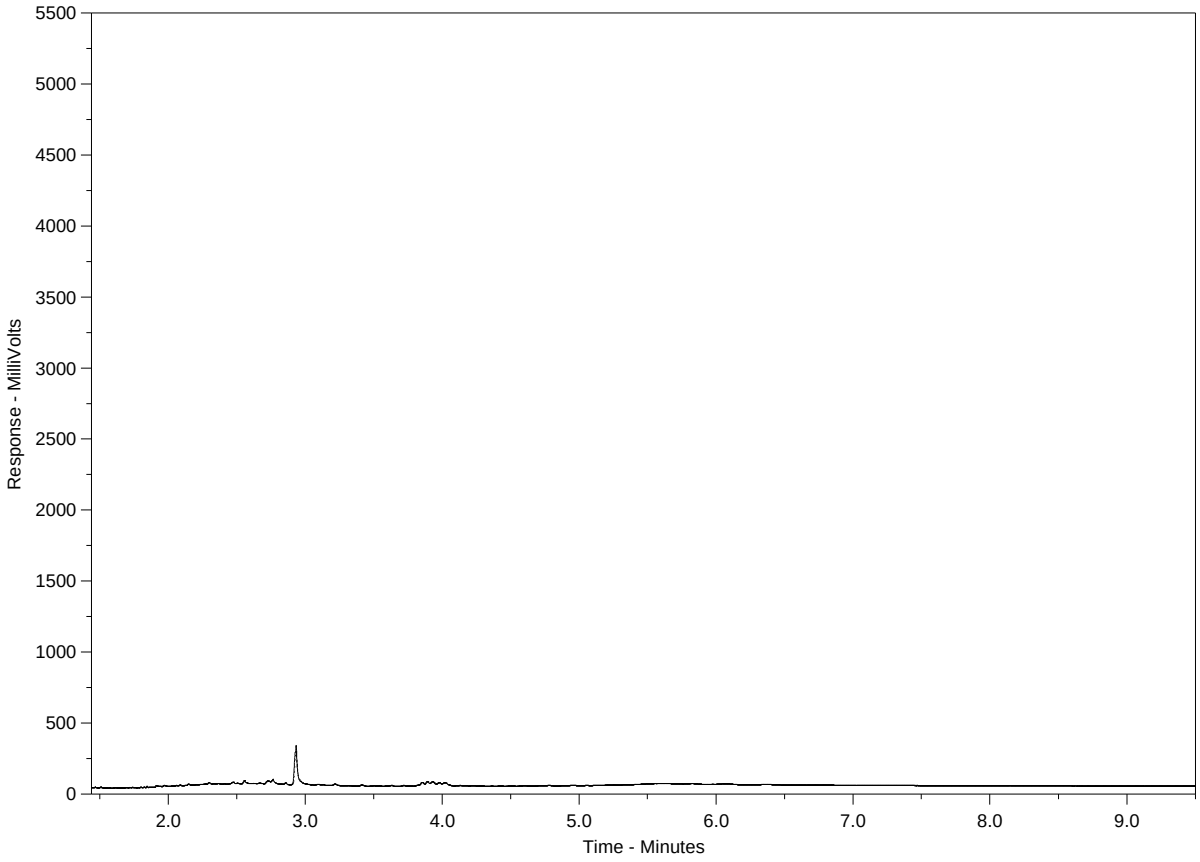
GLOSSARY OF REPORT TERMS

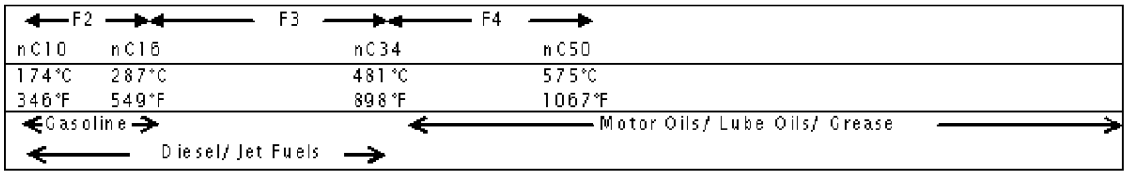
Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates 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: L1674736-1
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.

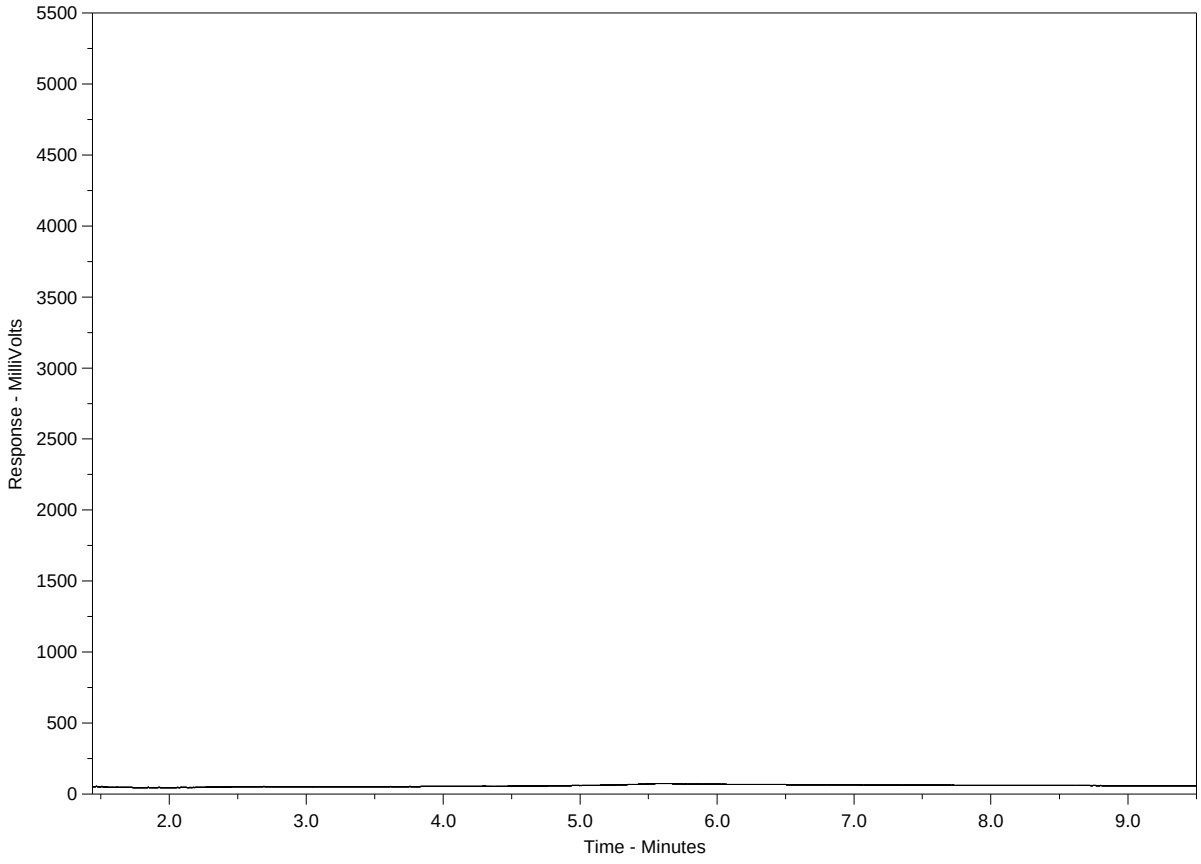
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

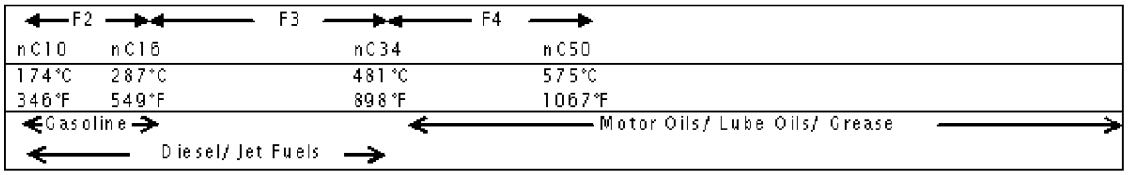
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

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: L1674736-3
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.

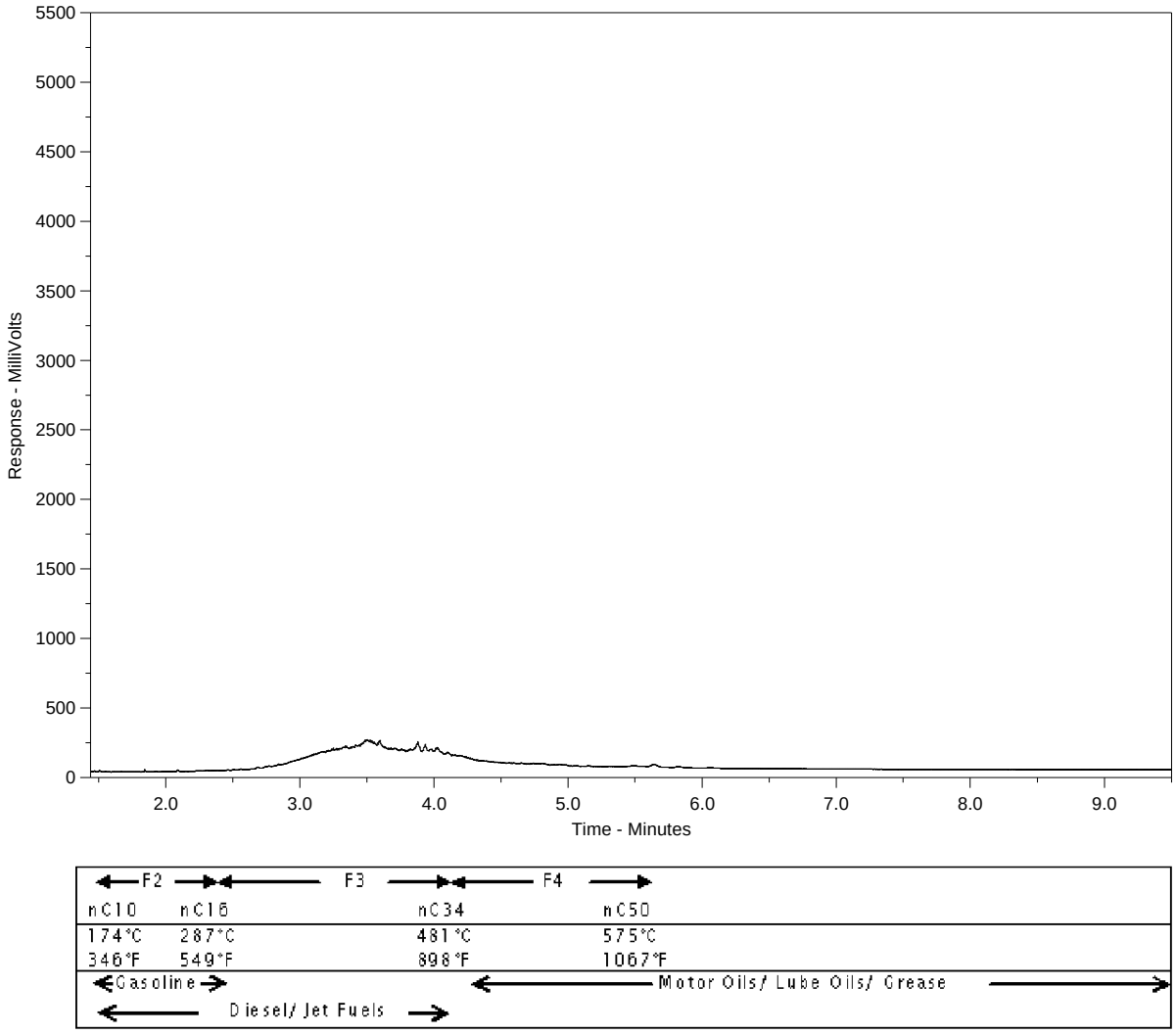
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

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: L1674736-4
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.

Chain of Custody (COC) / Analytical Request Form

ALS Environmental
www.alsglobal.com

Canada Toll Free: 1 800 668 9878

L1674736-COFC

COC Number: 14 - 454511

Page 1 of 1

Report To		Report Format		Turnaround Time (TAT) Below (Rush Turnaround Time (TAT) is not available for all tests)
Company:	Hamlet of Arviat	Select Report Format:	☐ PDF ☐ EXCEL ☐ EDD (DIGITAL)	R ☑ Regular (Standard TAT if received by 3pm)
Contact:	Steve England	Quality Control (QC) Report with Report	☐ Yes ☐ No	P ☐ Priority (2-4 business days if received by 3pm)
Address:	Box 150 Arviat, NU X0C-0E0	☐ Criteria on Report - provide details below if box checked		E ☐ Emergency (1-2 business days if received by 3pm)
		Select Distribution:	☐ EMAIL ☐ MAIL ☐ FAX	E2 ☐ Same day or weekend emergency if received by 10am – contact ALS for surcharge.
Phone:	867-857-2841	Email 1 or Fax	arviatsao@qiniq.com	Specify Date Required for E2,E or P:
		Email 2	mlusty@gov.nu.ca	

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

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

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

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Routine	Nitric Acid	BOD	Bacteria	Mercury	Oil & Grease	Sulfuric Acid	Phenols	Sodium x2	BTEX / VOC x3	Number of Containers
	ARV-2	Sept 16'15	9:40am	EFF	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	ARV-4	Sept 16'15	9:32am	EFF	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	ARV-5	Sept 16'15	9:55am	EFF	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	ARV-6	Sept 16'15	8:15am	EFF	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	

Drinking Water (DW) Samples[1] (client use)	Special Instructions / Specify Criteria to add on report (client Use)
Are samples taken from a Regulated DW System? ☐ Yes ☐ No	11°C
Are samples for human drinking water use? ☐ Yes ☐ No	

SAMPLE CONDITION AS RECEIVED (lab use only)

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

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date:	Time:	Received by:	Date:	Time:	Received by:	Date:	Time:
	Sept 16'15	9:55		9-17-15	2:35			

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

ALS-FM-0326e v06 Front/BO October 2013

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.

Arviat Old Sewage Lagoon Sampling Results
Part D, Item 2; ARV-4 Effluent Quality limits

Parameter	Maximum Concentration of any grab sample	Result
BOD	80 mg/L	6.6 mg/L
Total Suspended Solids	100 mg/L	10
Fecal Coliforms	1×10^4 CFU/100mL	<3
Oil & Grease	no visible sheen	<2
pH	between 6 and 9	8.09

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

Date Received: 22-JUL-15
Report Date: 31-JUL-15 12:12 (MT)
Version: FINAL

Client Phone: 867-857-2841

Certificate of Analysis

Lab Work Order #: L1646214

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
L1646214-1 OLD SEWAGE LAGOON							
Sampled By: CLIENT on 21-JUL-15 @ 11:45							
Matrix:							
Miscellaneous Parameters							
Total Organic Carbon	19.0		1.0	mg/L		27-JUL-15	R3233565
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	69.4		1.2	mg/L		30-JUL-15	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		30-JUL-15	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		30-JUL-15	
Ammonia by colour							
Ammonia, Total (as N)	0.278		0.010	mg/L		23-JUL-15	R3231684
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	6.6		2.0	mg/L		23-JUL-15	R3235259
Carbonaceous BOD							
BOD Carbonaceous	3.6		2.0	mg/L		23-JUL-15	R3235259
Chloride in Water by IC							
Chloride (Cl)	53.7		0.50	mg/L		23-JUL-15	R3232180
Conductivity							
Conductivity	299		1.0	umhos/cm		28-JUL-15	R3235243
Fecal Coliform							
Fecal Coliforms	<3		3	MPN/100mL		22-JUL-15	R3233764
Hardness Calculated							
Hardness (as CaCO3)	46.7		0.30	mg/L		27-JUL-15	
Mercury Total							
Mercury (Hg)-Total	<0.00020	DLM	0.00020	mg/L	23-JUL-15	23-JUL-15	R3233122
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		23-JUL-15	R3232180
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		24-JUL-15	
Nitrite in Water by IC							
Nitrite (as N)	0.012		0.010	mg/L		23-JUL-15	R3232180
Oil and Grease, Total							
Oil and Grease, Total	<2.0		2.0	mg/L	24-JUL-15	24-JUL-15	R3233500
Phenol (4AAP)							
Phenols (4AAP)	<0.0010		0.0010	mg/L		30-JUL-15	R3236288
Phosphorus, Total							
Phosphorus (P)-Total	1.19		0.010	mg/L		28-JUL-15	R3233948
Sulfate in Water by IC							
Sulfate (SO4)	3.37		0.30	mg/L		23-JUL-15	R3232180
Total Alkalinity as CaCO3							
Alkalinity, Total (as CaCO3)	56.9		1.0	mg/L		28-JUL-15	R3235243
Total Metals by ICP-MS							
Aluminum (Al)-Total	0.201		0.0050	mg/L	24-JUL-15	24-JUL-15	R3232825
Arsenic (As)-Total	0.00159		0.00020	mg/L	24-JUL-15	24-JUL-15	R3232825
Cadmium (Cd)-Total	0.000017		0.000010	mg/L	24-JUL-15	24-JUL-15	R3232825
Calcium (Ca)-Total	11.3		0.10	mg/L	24-JUL-15	24-JUL-15	R3232825
Chromium (Cr)-Total	<0.0010		0.0010	mg/L	24-JUL-15	24-JUL-15	R3232825
Cobalt (Co)-Total	0.00042		0.00020	mg/L	24-JUL-15	24-JUL-15	R3232825
Copper (Cu)-Total	0.00589		0.00020	mg/L	24-JUL-15	24-JUL-15	R3232825
Iron (Fe)-Total	0.31		0.10	mg/L	24-JUL-15	24-JUL-15	R3232825
Lead (Pb)-Total	0.000252		0.000090	mg/L	24-JUL-15	24-JUL-15	R3232825
Magnesium (Mg)-Total	4.48		0.010	mg/L	24-JUL-15	24-JUL-15	R3232825
Manganese (Mn)-Total	0.0430		0.00030	mg/L	24-JUL-15	24-JUL-15	R3232825

* 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
L1646214-1 OLD SEWAGE LAGOON							
Sampled By: CLIENT on 21-JUL-15 @ 11:45							
Matrix:							
Total Metals by ICP-MS							
Nickel (Ni)-Total	0.0020		0.0020	mg/L	24-JUL-15	24-JUL-15	R3232825
Potassium (K)-Total	7.52		0.020	mg/L	24-JUL-15	24-JUL-15	R3232825
Sodium (Na)-Total	36.2		0.030	mg/L	24-JUL-15	24-JUL-15	R3232825
Zinc (Zn)-Total	0.0032		0.0020	mg/L	24-JUL-15	24-JUL-15	R3232825
Total Suspended Solids							
Total Suspended Solids	10.0		5.0	mg/L		24-JUL-15	R3233217
pH							
pH	8.09		0.10	pH units		28-JUL-15	R3235243

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

Reference Information

Sample Parameter Qualifier Key:

Qualifier	Description
DLA	Detection Limit adjusted for required dilution
DLM	Detection Limit Adjusted due to sample matrix effects.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Test Method References:

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

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

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

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

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

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

ALK-TITR-WP	Water	Total Alkalinity 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.

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.

ETL-HARDNESS-TOT-WP	Water	Hardness Calculated	HARDNESS CALCULATED
FC-MPN-WP	Water	Fecal Coliform	APHA 9221E

The Most Probable Number (MPN) method is based on the Multiple Tube Fermentation technique. The results of examination of replicate tubes and dilutions of a sample are reported after confirmations specific to total coliform, fecal coliform and E. coli are performed. Results are reported in MPN/100 mL for water and MPN/gram for food and solid samples.

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

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

MET-T-L-MS-WP	Water	Total Metals by ICP-MS	APHA 3030E/EPA 6020A-TL

This analysis involves preliminary sample treatment by hotblock acid digestion (APHA 3030E). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

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.

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
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.			
OGG-TOT-WT	Water	Oil and Grease, Total	APHA 5520 B
Sample is extracted with hexane, extract is then evaporated and the residue is weighed to determine total oil and grease.			
P-T-COL-WP	Water	Phosphorus, Total	APHA 4500 P PHOSPHORUS
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.			
PH-WP	Water	pH	APHA 4500H
The pH of a sample is the determination of the activity of the hydrogen ions by potentiometric measurement using a standard hydrogen electrode and a reference electrode.			
PHENOLS-4AAP-WT	Water	Phenol (4AAP)	EPA 9066
An automated method is used to distill the sample. The distillate is then buffered to pH 9.4 which reacts with 4AAP and potassium ferricyanide to form a red complex which is measured colorimetrically.			
SO4-IC-N-WP	Water	Sulfate in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
SOLIDS-TOTSUS-WP	Water	Total Suspended Solids	APHA 2540 D (modified)
Total suspended solids in aquesous matrices is determined gravimetrically after drying the residue at 103 105°C.			
TOC-WT	Water	Total Organic Carbon	APHA 5310B
Sample is injected into a heated reaction chamber which is packed with an oxidative catalyst. The water is vaporized and the organic cabon is oxidized to carbon dioxide. The carbon dioxide is transported in a carrier gas and is measured by a non-dispersive infrared detector.			

** 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
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA
WP	ALS ENVIRONMENTAL - WINNIPEG, MANITOBA, 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.

ALS Environmental
www.alsglobal.com

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

L1646214-COFC

COC Number: 14 - 453319

Page 1 of 1

Report To		Report Format / Distribution		Select Service Level Below (Rush Turnaround Time (TAT) is not available for all tests)
Company:	Hamlet of Arviat	Select Report Format:	☐ PDF ☐ EXCEL ☐ EDD (DIGITAL)	R ☑ Regular (Standard TAT if received by 3pm)
Contact:	Steve England	Quality Control (QC) Report with Report	☐ Yes ☐ No	P ☐ Priority (2-4 business days if received by 3pm)
Address:	Box 150 Arviat NU X0C-0E0	☐ Criteria on Report - provide details below if box checked		E ☐ Emergency (1-2 business days if received by 3pm)
		Select Distribution:	☐ EMAIL ☐ MAIL ☐ FAX	E2 ☐ Same day or weekend emergency if received by 10am – contact ALS for surcharge.
Phone:	867-857-2841	Email 1 or Fax		Specify Date Required for E2,E or P:
		Email 2		

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 Quote #:		Approver ID:	Cost Center:
Job #:		GL Account:	Routing Code:
PO / AFE:		Activity Code:	
LSD:		Location:	

ALS Lab Work Order # (lab use only):

ALS Contact:

Sampler:

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	Sulfuric Acid	Diarrheals	Bacteria Routine	Mercury	BOD	Total Metals	Nutrients	Dil + Surg x2	Number of Containers
	Old Sewage Lagoon	21-07-15	11:45am		✓	✓	✓	✓	✓	✓	✓	✓	

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ Yes ☐ No

Are samples for human drinking water use? ☐ Yes ☑ No

Special Instructions / Specify Criteria to add on report (client Use)

13°

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐ SIF Observations Yes ☐ No ☐

Ice packs Yes ☐ No ☐ Custody seal intact Yes ☐ No ☐

Cooling Initiated ☐

INITIAL COOLER TEMPERATURES °C		FINAL COOLER TEMPERATURES °C	

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date: July 21 15	Time: 11:45am	Received by: EE	Date: 7-22-15	Time: 11:30	Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

NA-FM-0024e v08 Front/03 October 2013

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.**

July 15, 2015

IC# *2015-05AS*
WL#3AM-ARV1016

Steve England
Senior Administrative Officer
Hamlet of Arviat, Nunavut
X0A- 0E0
Email: arviatsao@qiniq.com

Dear Mr. England

Aboriginal Affairs and Northern Development Canada (AANDC) Water Resource Officers, Field Operations is currently undertaking a review to update files related to enforcement and compliance of municipal water licences in Nunavut.

The focus of this review includes administrative requirements as well as requirements to conduct water sampling and other field work related to the water licence authorization.

This review will be conducted in two parts; the first will be the administrative review of your water licence. The second part of the review will include a municipal site visit to meet with you and your support staff to discuss the water licence requirements. At this time AANDC Inspectors will provide you an opportunity to tell us about the Hamlet operation successes and challenges while implementing your water licence requirements. A final 'close out 'meeting will result and the ANNDC Inspector will provide you with a summary of the observations from the site inspection and provide you the opportunity to discuss any issues as well as timelines to meet any compliance issues identified before leaving the Hamlet

Municipal Water Compliance Working Group

AANDC has recently begun working with GN-CGS towards changes to the landfill operations within Nunavut including the creation of the Municipal Water Compliance Working Group through partnerships and support from Municipal, Government of Nunavut and Federal Government involvement. AANDC believes that this approach will help all municipalities work towards a Nunavut Territorial strategy to address solid waste management.

Determination for outstanding compliance issues

It has been determined by AANDC that any relevant items not mentioned in this document as 'outstanding items' that were not submitted as required in a water licence, compliance requirements from previous inspections reports, or items mentioned in the 'multi-year municipal compliance summary' have either been fulfilled or are being fulfilled through your active participation in the Municipal Water Licence Compliance Working Group initiative which includes Municipal, Government of Nunavut and Federal Government representative involvement. AANDC further recognizes that additional outstanding items will be addressed through your current water licence renewal/amendment with the Nunavut Water Board (NWB).

To this end, AANDC has determined that it is not in the public interest to pursue further action beyond the items initiated through the Municipal Water Licence Compliance Working Group and the items listed below or items that may be detected in future inspections.

Outstanding Items

AANDC requests that the following requirements are met and will be verified during the 2015 municipal inspection season:

1. It is recommended that the licencee contact the Government of Nunavut (GN), Department of Environment for further guidance on the process of 'farming' soil within a land farm so that soils can be actively managed and discharged when they meet GN guidelines. This will ensure that any land farm will be able to meet any future capacity requirements and also minimize any potential environmental liability.

2. The licencee is reminded to continue to work towards meeting the requirement of renewing the municipal water licence as required by the *Nunavut Waters and Nunavut Surface Rights Tribunal Act.*

3. A follow-up inspection will be conducted within the Hamlet of Arviat in the 2015 season by the regional AANDC Inspectors to ensure any potential risks or issues are identified and provided to the Licencee to address in the form of a water licence inspection report.

Sincerely,

Atuat Shouldice
Resources Management Officer
Aboriginal Affairs and Northern Development Canada
Rankin Inlet Nunavut.

cc. Erik Allain, Manager, Field Operations, AANDC Iqaluit.
Ralph Rudiger, Director of Community Development, CGS
Meagan Lusty, Municipal Planning E.I.T., CGS
Phyllis Beaulieu, Nunavut Water Board

Aboriginal Affairs and Northern Development Canada | Affaires autochtones et Développement du Nord Canada

WATER LICENCE INSPECTION FORM

☒ Original
☐ Follow-Up Report

Licensee	Licensee Representative
Hamlet of Arviat	Steve England
Licence No. / Expiry	**Representative's Title**
3AM-ARV1016	Senior Administrative Officer
Land / Other Authorizations	**Land / Other Authorizations**
Date of Inspection	**Inspector**
20/07/2015	Atuat Shouldice

Activities Inspected

☐ Camp ☐ Drilling ☐ Mining ☐ Construction ☐ Reclamation ☒ Fuel Storage
☐ Roads/Hauling ☒ Other: Deposit of Waste ☒ Other:Water use

Conditions: A - Acceptable C - Concern U - Unacceptable NA – Not Applicable NI – Not Inspected

Water Use	Condition	Comment	Site Conditions	Condition	Comment	Haz/Mat Management	Condition	Comment
Intake/Screen	A		Water Management Structures	A		Storage	A	4
Flow Measure. Device	C	1	Culverts / Bridges	A		Spills	A	
Source:	A		Drainage	A		Spill Plan	A	
Water Use:	A		Erosion / Sediment	A				
Recirculation (y /n)	N		Mitigation Measures	A		**Administrative**		
			Reclamation Activities	A	3	Records	A	
			Materials Storage	A		Reports	NI	
Waste Disposal			Signage	A		Plans	NI	
Waste Water	A					Notifications	A	
Solid Waste	A		**Monitoring**			**Other**		
Hazardous Waste	A	2	Sample Collection / Analysis	A				

**The number in the comments field will correspond with specific comments provided below.*

Samples taken by Inspector:	Location(s): Hamlet of Arviat
☐ Yes ☒ No	

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

A compliance inspection was conducted on July 20th 2015 of water licence 3AM-ARV1016.

SECTION 2 ☒ Comments (s.__) ☐ Non-Compliance with Act or Licence (s.__) ☐ Action Required (s.__)

Water Use: 1

Water meter was installed at source to measure total amount of water being pumped in to water lagoon, during pumping small piece of debris made it passed filter and damaged water meter. Since incident water meter has been repaired.

Waste Disposal:2

Waste oil being generated in community is being burnt in a waste oil burner.

Site Conditions:3

Contractors hired in previous year to remove hazardous waste from old equipment and back haul to approved waste disposal facility.

Haz/Mat Management:4

Hazardous waste is being properly stored and segregated from landfill.

SECTION 3 ☒ Comments (s.__) ☐ Non-Compliance with Act or Licence, (s.__) ☐ Action Required (s.__)

No concerns with site.

Related to the use of water and the deposit of waste the Hamlet of Arviat has been following the goal set in the Water licence working compliance group.

Licensee or Representative	Inspector's Name
	Atuat Shouldice
Signature	**Signature** Atuat Shouldice
Date	**Date** 10/22/2015

Office Use Only: Follow-up report to be issued by Inspector ☐ Yes ☐ No

Canada

IQALUIT#818092 - v1

Hazardous Materials Spill Database

Environment Division of ENR
Scotia 6, 5102-50th Avenue; Yellowknife, NT X1A 3S8
Phone: (867) 873-7654 Fax: (867) 873-0221

Sorted By: SpillNo for the year(s): 2015

Spill No.	Date	Ter	Region	Location	Site Description	Commodity	Quantity	Source	Agency
2015062	2015-02-23	NU	KEE	Arviat	Arviat, QEC power plant area	Propylene Glycol 50%	1600 L	PL	GN
2015079	2015-03-05	NU	KEE	Arviat	Building 600 Airport Rd	Jet A with FS11	170 L	DRUM	GN
2015146	2015-04-10	NU	KEE	Arviat	Arviat NU, Unit 228/800-7th Ave, 5-plex	Heating Fuel #2	1058 L	PL	EPS
2015216	2015-05-22	NU	KEE	Arviat	Arviat, 707 5th Ave	heating fuel	100 L	ST<	GN
2015226	2015-05-26	NU	KEE	Arviat	Unit 221 8th Avenue	No.2 Home heating fuel	1000 L	INST	GN
2015227	2015-05-27	NU	KEE	Arviat	803 1st Avenue	P-50	205 L	PL	GN
2015244	2015-06-08	NU	KEE	Arviat	Arviat, 801, 1st Ave	Heating Fuel	L	PL	GN
2015319	2015-07-29	NU	KEE	Arviat	Arviat Elementary School	Heating fuel	100 L	PL	GN
2015413	2015-09-28	NU	KEE	Arviat	400 6th Avenue unit604	Heating Fuel	50 L	ST<	GN
2015414	2015-09-30	NU	KEE	Arviat	Middle School	Heating Fuel	0 L	ST<	GN
2015447	2015-10-29	NU	KEE	Arviat	Arviat, NU. Unit # 240 / 705 - 9 th Ave.	Heating Fuel # 2	170 L	ST<	GN

Total Spills on this Report: 11

This report contains information regarding spills that were reported to the NWT 24-Hour Spill Line. The absence of information on any particular location in no way guarantees that contamination has not occurred at that location.

LEGEND

Region:
BAF - Baffin
DEH - Deh Cho
INU - Inuvik
KEE - Keewatin
KIT - Kitikmeot
NSL - North Slave
SAH - Sahtu
SSL - South Slave

Source:
AIR - Aircraft
DRUM - Drum or Barrel
MV - Marine Vessel
NS - Natural Seepage
OTH - Other Transportation
PL - Pipe or Line
RT - Rail Train
SL - Sewage Lagoon
ST< - Storage Tank <4000 litres
ST> - Storage Tank >4000 litres
TP - Tailings Pond
TRU - Truck
UK - Unkown
WELL - Wet Wells, Flaring
Boom

Agency:
CCG - Canadian Coast Guard
EP - Environment Canada
GN - Government of Nunavut
GNWT - Government of Northwest Territories
ILA - Inuvialiut Land Administration
INAC - Indian and Northern Affairs Canada
NEB - National Energy Board