ANNUAL REPORT
FOR THE HAMLET OF WHALE COVE

YEAR BEING REPORTED: 2016

The following information is compiled pursuant to the requirements of Part B, Item 1 of Water License # 3BM-WHA1520 issued to the Hamlet of Whale Cove.

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

Month Reported	Quantity of Water Obtained from all sources (litres)	Quantity of Sewage Waste Discharged (Estimated)
January	1,397,510.00	Same
February	1,241,743.70	Same
March	1,386,385.80	Same
April	1,392,461.20	Same
May	1,406,025.50	Same
June	1,375,662.80	Same
July	1,525,870.80	Same
August	1,592,404.50	Same
September	1,373,361.70	Same
October	1,443,940.30	Same
November	1,504,876.60	Same
December	1,355,931.10	Same
ANNUAL TOTAL	**16,996,174**	**Same**

Note: There is no meter existing at the Sewage discharge pipe. Therefore the monthly discharge volume is considered as equal to the monthly water consumption 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;

- Construction of the Sewage Lagoon Expansion was delayed and is scheduled to begin summer 2016.

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

- 2016125, 2016-04-20, Whale Cove Unit 110A, Heating Oil, 250L
- 2016201, 2016-06-01, Unit #72, Whale Cove, Fuel Oil #2, 44L

- a summary of any abandonment and restoration work completed during the year and an outline of any work anticipated for the next year.
- No abandonment and restoration work took place in 2015 and no work is planned for 2016.

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

- Hamlet of Whale Cove Plan for Compliance was submitted with the Amendment/Renewal Application January 16, 2015.

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

- Signage for the Monitoring Program Stations will be ordered over the winter for installation summer 2016. Pictures of the signage at Monitoring Program Stations will be included in the 2016 Annual Report.

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

- The O&M Manual and QA/QC Plan will be reviewed and updated for submission to the NWB.

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:

- There was no inspection of Water Licence # 3BM-WHA1520 in 2016.

List of Appendixes:

Appendix A: WHA-3 Effluent Quality Limits – 1 page
Appendix B: Weekly Inspections at Monitoring Stations – 1 page
Appendix C: Certificate of Analysis July 13, 2016 – 11 pages
Appendix D: Certificate of Analysis July 26, 2016 – 7 pages
Appendix E: Certificate of Analysis August 31, 2016 – 10 pages
Appendix F: Hazardous Materials Spill Database, Whale Cove 2016 – 1 page

WHA-3 Effluent Quality Limits

Parameter	Maximum Concentration of Any Grab
BOD_5	120 mg/L
Total Suspended Solids	180 mg/L
Fecal Coliforms	1×10^6 CFU/100mL
Oil and Grease	No visible sheen
pH	between 6 and 9

Nunavut Water Board Licence No. 3BM-WHA1520

Whale Cove, NU

Part H, Item 5: Weekly Inspections at Monitoring Program Stations, May to August

Week	Starting Date	WHA-2			WHA-3			WHA-4			Checked By
		Water Present (check)			Water Present (check)			Water Present (check)			
		Yes	No	Frozen	Yes	No	Frozen	Yes	No	Frozen	
1	30-May-16										
2	06-Jun-16										
3	13-Jun-16										
4	20-Jun-16										
5	27-Jun-16										
6	04-Jul-16										
7	11-Jul-16										
8	18-Jul-16										
9	25-Jul-16										
10	01-Aug-16										
11	08-Aug-16										
12	15-Aug-16										
13	22-Aug-16										
14	29-Aug-16										

Monitoring Program Station Locations:

WHA-2: Runoff from Solid Waste Disposal Facilities

WHA-3: Final Discharge Point for effluent from the Sewage Disposal Facility prior to the wetland

WHA-4: Effluent outfall area from the wetland area

Hamlet of Whale Cove
ATTN: PAUL VOISEY
PO Box 120
Whale Cove NU X0C 0J0

Date Received: 14-JUL-16
Report Date: 26-JUL-16 15:21 (MT)
Version: FINAL

Client Phone: 867-896-9961

Certificate of Analysis

Lab Work Order #: L1798784

Project P.O. #: NOT SUBMITTED
Job Reference:
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
L1798784-1 WHA-8							
Sampled By: CLIENT on 13-JUL-16 @ 14:45							
Matrix: Waste Water							
BTEX plus F1-F4							
BTX plus F1 by GCMS							
Benzene	<0.00050		0.00050	mg/L		21-JUL-16	R3509937
Toluene	<0.0010		0.0010	mg/L		21-JUL-16	R3509937
Ethyl benzene	<0.00050		0.00050	mg/L		21-JUL-16	R3509937
o-Xylene	<0.00050		0.00050	mg/L		21-JUL-16	R3509937
m+p-Xylenes	<0.00050		0.00050	mg/L		21-JUL-16	R3509937
F1 (C6-C10)	<0.10		0.10	mg/L		21-JUL-16	R3509937
Surrogate: 4-Bromofluorobenzene (SS)	91.0		70-130	%		21-JUL-16	R3509937
CCME PHC F2-F4 in Water							
F2 (C10-C16)	<0.10		0.10	mg/L	19-JUL-16	19-JUL-16	R3507522
F3 (C16-C34)	<0.25		0.25	mg/L	19-JUL-16	19-JUL-16	R3507522
F4 (C34-C50)	<0.25		0.25	mg/L	19-JUL-16	19-JUL-16	R3507522
Surrogate: 2-Bromobenzotrifluoride	102.8		60-140	%	19-JUL-16	19-JUL-16	R3507522
CCME Total Hydrocarbons							
F1-BTEX	<0.10		0.10	mg/L		22-JUL-16	
F2-Naphth	<0.10		0.10	mg/L		22-JUL-16	
F3-PAH	<0.25		0.25	mg/L		22-JUL-16	
Total Hydrocarbons (C6-C50)	<0.38		0.38	mg/L		22-JUL-16	
Sum of Xylene Isomer Concentrations							
Xylenes (Total)	<0.0015		0.0015	mg/L		22-JUL-16	
Polyaromatic Hydrocarbons (PAHs)							
1-Methyl Naphthalene	<0.020	DLM	0.020	mg/L	15-JUL-16	18-JUL-16	R3506759
2-Methyl Naphthalene	<0.020	DLM	0.020	mg/L	15-JUL-16	18-JUL-16	R3506759
Acenaphthene	<0.020	DLM	0.020	mg/L	15-JUL-16	18-JUL-16	R3506759
Acenaphthylene	<0.020	DLM	0.020	mg/L	15-JUL-16	18-JUL-16	R3506759
Anthracene	<0.010	DLM	0.010	mg/L	15-JUL-16	18-JUL-16	R3506759
Acridine	<0.020	DLM	0.020	mg/L	15-JUL-16	18-JUL-16	R3506759
Benzo(a)anthracene	<0.010	DLM	0.010	mg/L	15-JUL-16	18-JUL-16	R3506759
Benzo(a)pyrene	<0.0050	DLM	0.0050	mg/L	15-JUL-16	18-JUL-16	R3506759
Benzo(b&j)fluoranthene	<0.010	DLM	0.010	mg/L	15-JUL-16	18-JUL-16	R3506759
Benzo(g,h,i)perylene	<0.020	DLM	0.020	mg/L	15-JUL-16	18-JUL-16	R3506759
Benzo(k)fluoranthene	<0.010	DLM	0.010	mg/L	15-JUL-16	18-JUL-16	R3506759
Chrysene	<0.020	DLM	0.020	mg/L	15-JUL-16	18-JUL-16	R3506759
Dibenzo(a,h)anthracene	<0.0050	DLM	0.0050	mg/L	15-JUL-16	18-JUL-16	R3506759
Fluoranthene	<0.020	DLM	0.020	mg/L	15-JUL-16	18-JUL-16	R3506759
Fluorene	<0.050	DLM	0.050	mg/L	15-JUL-16	18-JUL-16	R3506759
Indeno(1,2,3-cd)pyrene	<0.010	DLM	0.010	mg/L	15-JUL-16	18-JUL-16	R3506759
Naphthalene	<0.050	DLM	0.050	mg/L	15-JUL-16	18-JUL-16	R3506759
Phenanthrene	<0.050	DLM	0.050	mg/L	15-JUL-16	18-JUL-16	R3506759
Pyrene	<0.010	DLM	0.010	mg/L	15-JUL-16	18-JUL-16	R3506759
Quinoline	<0.020	DLM	0.020	mg/L	15-JUL-16	18-JUL-16	R3506759
B(a)P Total Potency Equivalent	<0.0072		0.0072	mg/L	15-JUL-16	18-JUL-16	R3506759
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	188		1.2	mg/L		20-JUL-16	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		20-JUL-16	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		20-JUL-16	
Alkalinity, Total (as CaCO3)							
Alkalinity, Total (as CaCO3)	154		1.0	mg/L		19-JUL-16	R3507511

* 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
L1798784-1 WHA-8							
Sampled By: CLIENT on 13-JUL-16 @ 14:45							
Matrix: Waste Water							
Ammonia by colour							
Ammonia, Total (as N)	0.405		0.010	mg/L		21-JUL-16	R3509741
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	2.0		2.0	mg/L		15-JUL-16	R3509408
Carbonaceous BOD							
BOD Carbonaceous	<2.0		2.0	mg/L		15-JUL-16	R3509408
Chloride in Water by IC							
Chloride (Cl)	73.7		0.50	mg/L		16-JUL-16	R3506585
Conductivity							
Conductivity	695		1.0	umhos/cm		19-JUL-16	R3507511
Fecal Coliform							
Fecal Coliforms	<3		3	MPN/100mL		14-JUL-16	R3506571
Hardness Calculated							
Hardness (as CaCO3)	234		0.30	mg/L		25-JUL-16	
Mercury Total							
Mercury (Hg)-Total	<0.000020		0.000020	mg/L	15-JUL-16	15-JUL-16	R3504411
Nitrate in Water by IC							
Nitrate (as N)	0.066		0.020	mg/L		16-JUL-16	R3506585
Nitrate+Nitrite							
Nitrate and Nitrite as N	0.077		0.070	mg/L		26-JUL-16	
Nitrite in Water by IC							
Nitrite (as N)	0.012		0.010	mg/L		16-JUL-16	R3506585
Oil & Grease - Gravimetric							
Oil and Grease	<5.0		5.0	mg/L		19-JUL-16	R3508759
Phenol (4AAP)							
Phenols (4AAP)	0.0026		0.0010	mg/L		22-JUL-16	R3509677
Phosphorus, Total							
Phosphorus (P)-Total	0.066		0.010	mg/L		26-JUL-16	R3511855
Sulfate in Water by IC							
Sulfate (SO4)	86.5		0.30	mg/L		16-JUL-16	R3506585
Total Metals by ICP-MS							
Aluminum (Al)-Total	0.0073		0.0050	mg/L	22-JUL-16	22-JUL-16	R3510655
Arsenic (As)-Total	0.00186		0.00020	mg/L	22-JUL-16	22-JUL-16	R3510655
Cadmium (Cd)-Total	0.000017		0.000010	mg/L	22-JUL-16	22-JUL-16	R3510655
Calcium (Ca)-Total	74.7		0.10	mg/L	22-JUL-16	22-JUL-16	R3510655
Chromium (Cr)-Total	<0.0010		0.0010	mg/L	22-JUL-16	22-JUL-16	R3510655
Cobalt (Co)-Total	0.00067		0.00020	mg/L	22-JUL-16	22-JUL-16	R3510655
Copper (Cu)-Total	0.00254		0.00020	mg/L	22-JUL-16	22-JUL-16	R3510655
Iron (Fe)-Total	1.10		0.010	mg/L	22-JUL-16	22-JUL-16	R3510655
Lead (Pb)-Total	0.000255		0.000090	mg/L	22-JUL-16	22-JUL-16	R3510655
Magnesium (Mg)-Total	11.6		0.010	mg/L	22-JUL-16	22-JUL-16	R3510655
Manganese (Mn)-Total	0.145		0.00030	mg/L	22-JUL-16	22-JUL-16	R3510655
Nickel (Ni)-Total	0.0053		0.0020	mg/L	22-JUL-16	22-JUL-16	R3510655
Potassium (K)-Total	11.4		0.020	mg/L	22-JUL-16	22-JUL-16	R3510655
Sodium (Na)-Total	46.4		0.030	mg/L	22-JUL-16	22-JUL-16	R3510655
Zinc (Zn)-Total	0.0106		0.0020	mg/L	22-JUL-16	22-JUL-16	R3510655
Total Organic Carbon by Combustion							
Total Organic Carbon	10.0		0.50	mg/L		21-JUL-16	R3511779
Total Suspended Solids							
Total Suspended Solids	6.0		5.0	mg/L		19-JUL-16	R3507508
pH							
pH	7.93		0.10	pH units		19-JUL-16	R3507511

* 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
L1798784-2 WHA-4							
Sampled By: CLIENT on 13-JUL-16 @ 15:00							
Matrix: Waste Water							
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	188		1.2	mg/L		20-JUL-16	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		20-JUL-16	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		20-JUL-16	
Alkalinity, Total (as CaCO3)							
Alkalinity, Total (as CaCO3)	154		1.0	mg/L		19-JUL-16	R3507511
Ammonia by colour							
Ammonia, Total (as N)	12.9		0.50	mg/L		22-JUL-16	R3512171
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	19.2		6.0	mg/L		15-JUL-16	R3509408
Carbonaceous BOD							
BOD Carbonaceous	11.3		2.0	mg/L		15-JUL-16	R3509408
Chloride in Water by IC							
Chloride (Cl)	86.2		0.50	mg/L		16-JUL-16	R3506585
Conductivity							
Conductivity	661		1.0	umhos/cm		19-JUL-16	R3507511
Fecal Coliform							
Fecal Coliforms	4300		3	MPN/100mL		14-JUL-16	R3506571
Hardness Calculated							
Hardness (as CaCO3)	109		0.30	mg/L		25-JUL-16	
Mercury Total							
Mercury (Hg)-Total	<0.000020		0.000020	mg/L	15-JUL-16	15-JUL-16	R3504411
Nitrate in Water by IC							
Nitrate (as N)	1.27		0.020	mg/L		16-JUL-16	R3506585
Nitrate+Nitrite							
Nitrate and Nitrite as N	1.64		0.070	mg/L		26-JUL-16	
Nitrite in Water by IC							
Nitrite (as N)	0.371		0.010	mg/L		16-JUL-16	R3506585
Oil & Grease - Gravimetric							
Oil and Grease	<5.0		5.0	mg/L		19-JUL-16	R3508759
Phenol (4AAP)							
Phenols (4AAP)	0.0018		0.0010	mg/L		22-JUL-16	R3509677
Phosphorus, Total							
Phosphorus (P)-Total	5.40		0.020	mg/L		26-JUL-16	R3511855
Sulfate in Water by IC							
Sulfate (SO4)	18.6		0.30	mg/L		16-JUL-16	R3506585
Total Metals by ICP-MS							
Aluminum (Al)-Total	0.0732		0.0050	mg/L	22-JUL-16	22-JUL-16	R3510655
Arsenic (As)-Total	0.00362		0.00020	mg/L	22-JUL-16	22-JUL-16	R3510655
Cadmium (Cd)-Total	0.000016		0.000010	mg/L	22-JUL-16	22-JUL-16	R3510655
Calcium (Ca)-Total	33.0		0.10	mg/L	22-JUL-16	22-JUL-16	R3510655
Chromium (Cr)-Total	<0.0010		0.0010	mg/L	22-JUL-16	22-JUL-16	R3510655
Cobalt (Co)-Total	0.00071		0.00020	mg/L	22-JUL-16	22-JUL-16	R3510655
Copper (Cu)-Total	0.0134		0.00020	mg/L	22-JUL-16	22-JUL-16	R3510655
Iron (Fe)-Total	0.682		0.010	mg/L	22-JUL-16	22-JUL-16	R3510655
Lead (Pb)-Total	0.000185		0.000090	mg/L	22-JUL-16	22-JUL-16	R3510655
Magnesium (Mg)-Total	6.53		0.010	mg/L	22-JUL-16	22-JUL-16	R3510655
Manganese (Mn)-Total	0.125		0.00030	mg/L	22-JUL-16	22-JUL-16	R3510655
Nickel (Ni)-Total	0.0023		0.0020	mg/L	22-JUL-16	22-JUL-16	R3510655

* 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
L1798784-2 WHA-4							
Sampled By: CLIENT on 13-JUL-16 @ 15:00							
Matrix: Waste Water							
Total Metals by ICP-MS							
Potassium (K)-Total	17.8		0.020	mg/L	22-JUL-16	22-JUL-16	R3510655
Sodium (Na)-Total	63.8		0.030	mg/L	22-JUL-16	22-JUL-16	R3510655
Zinc (Zn)-Total	0.0086		0.0020	mg/L	22-JUL-16	22-JUL-16	R3510655
Total Organic Carbon by Combustion							
Total Organic Carbon	24.0		0.50	mg/L		21-JUL-16	R3511779
Total Suspended Solids							
Total Suspended Solids	17.0		5.0	mg/L		19-JUL-16	R3507508
pH							
pH	7.45		0.10	pH units		19-JUL-16	R3507511
L1798784-3 WHA-3							
Sampled By: CLIENT on 13-JUL-16 @ 15:15							
Matrix: Waste Water							
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	191		1.2	mg/L		20-JUL-16	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		20-JUL-16	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		20-JUL-16	
Alkalinity, Total (as CaCO3)							
Alkalinity, Total (as CaCO3)	157		1.0	mg/L		19-JUL-16	R3507511
Ammonia by colour							
Ammonia, Total (as N)	16.1		0.50	mg/L		22-JUL-16	R3512171
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	23.8		6.0	mg/L		15-JUL-16	R3509408
Carbonaceous BOD							
BOD Carbonaceous	18.5		6.0	mg/L		15-JUL-16	R3509408
Chloride in Water by IC							
Chloride (Cl)	84.8		0.50	mg/L		16-JUL-16	R3506585
Conductivity							
Conductivity	666		1.0	umhos/cm		19-JUL-16	R3507511
Fecal Coliform							
Fecal Coliforms	2400		3	MPN/100mL		14-JUL-16	R3506571
Hardness Calculated							
Hardness (as CaCO3)	95.3		0.30	mg/L		25-JUL-16	
Mercury Total							
Mercury (Hg)-Total	<0.000020		0.000020	mg/L	15-JUL-16	15-JUL-16	R3504411
Nitrate in Water by IC							
Nitrate (as N)	0.861		0.020	mg/L		16-JUL-16	R3506585
Nitrate+Nitrite							
Nitrate and Nitrite as N	1.38		0.070	mg/L		26-JUL-16	
Nitrite in Water by IC							
Nitrite (as N)	0.518		0.010	mg/L		16-JUL-16	R3506585
Oil & Grease - Gravimetric							
Oil and Grease	<5.0		5.0	mg/L		19-JUL-16	R3508759
Phenol (4AAP)							
Phenols (4AAP)	0.0019		0.0010	mg/L		22-JUL-16	R3509677
Phosphorus, Total							
Phosphorus (P)-Total	5.66		0.020	mg/L		26-JUL-16	R3511855
Sulfate in Water by IC							
Sulfate (SO4)	22.2		0.30	mg/L		16-JUL-16	R3506585

* 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
L1798784-3 WHA-3							
Sampled By: CLIENT on 13-JUL-16 @ 15:15							
Matrix: Waste Water							
Total Metals by ICP-MS							
Aluminum (Al)-Total	0.0688		0.0050	mg/L	22-JUL-16	22-JUL-16	R3510655
Arsenic (As)-Total	0.00075		0.00020	mg/L	22-JUL-16	22-JUL-16	R3510655
Cadmium (Cd)-Total	0.000013		0.000010	mg/L	22-JUL-16	22-JUL-16	R3510655
Calcium (Ca)-Total	27.7		0.10	mg/L	22-JUL-16	22-JUL-16	R3510655
Chromium (Cr)-Total	<0.0010		0.0010	mg/L	22-JUL-16	22-JUL-16	R3510655
Cobalt (Co)-Total	0.00041		0.00020	mg/L	22-JUL-16	22-JUL-16	R3510655
Copper (Cu)-Total	0.0223		0.00020	mg/L	22-JUL-16	22-JUL-16	R3510655
Iron (Fe)-Total	0.109		0.010	mg/L	22-JUL-16	22-JUL-16	R3510655
Lead (Pb)-Total	0.000231		0.000090	mg/L	22-JUL-16	22-JUL-16	R3510655
Magnesium (Mg)-Total	6.35		0.010	mg/L	22-JUL-16	22-JUL-16	R3510655
Manganese (Mn)-Total	0.0512		0.00030	mg/L	22-JUL-16	22-JUL-16	R3510655
Nickel (Ni)-Total	<0.0020		0.0020	mg/L	22-JUL-16	22-JUL-16	R3510655
Potassium (K)-Total	19.0		0.020	mg/L	22-JUL-16	22-JUL-16	R3510655
Sodium (Na)-Total	63.4		0.030	mg/L	22-JUL-16	22-JUL-16	R3510655
Zinc (Zn)-Total	0.0153		0.0020	mg/L	22-JUL-16	22-JUL-16	R3510655
Total Organic Carbon by Combustion							
Total Organic Carbon	28.3		0.50	mg/L		21-JUL-16	R3511779
Total Suspended Solids							
Total Suspended Solids	27.0		5.0	mg/L		19-JUL-16	R3507508
pH							
pH	7.55		0.10	pH units		19-JUL-16	R3507511

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

Reference Information

Sample Parameter Qualifier Key:

Qualifier	Description
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Test Method References:

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

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

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

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

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

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

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

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

BOD-CBOD-WP	Water	Carbonaceous BOD	APHA 5210 B

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

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

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

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

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

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

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

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

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

EC-WP	Water	Conductivity	APHA 2510B

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

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.

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**

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

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

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

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

FC-MPN-WP	Water	Fecal Coliform	APHA 9221E

The Most Probable Number (MPN) method is based on the Multiple Tube Fermentation technique. Aliquots from three or more decimal dilutions of a sample are inoculated into tubes containing enrichment media and incubated at 35C for 48 – 3 hours. Sample aliquots exhibiting the characteristic positive response are transferred to various selective media for the coliform group(s) of interest and incubated at specific temperatures and times. The Most Probable Number for each target group is statistically derived from a standard MPN table based on the combinations of positive outcomes at each dilution.
The fecal (thermotolerant) coliform group may include organisms not originating in the intestines of warm-blooded animals.

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.

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

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

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

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.

Reference Information

Test Method References:

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

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

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

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

Chain of Custody Numbers:

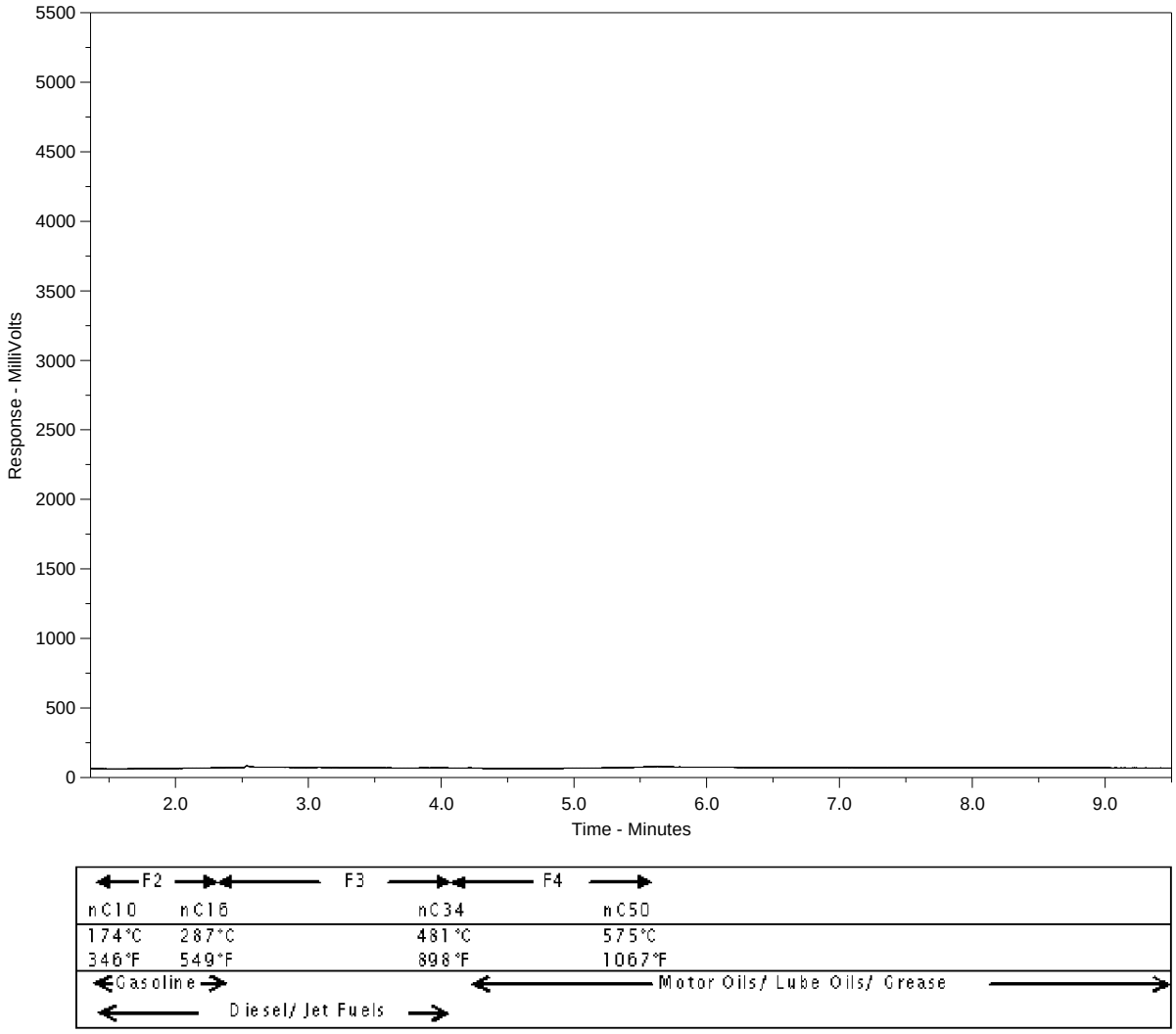
GLOSSARY OF REPORT TERMS

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

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

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L1798784-1
Client Sample ID: WHA-8



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

L1798784-COFC

COC Number: 15 - 571766

Page 1 of 1

L1798784

Report To	Contact and company name below will appear on the final report	Report Format / Distribution	Select Service Level Below - Please confirm all E&P TATs with your AM - surcharges will apply
Company:	Hamlet of Whale Cove	Select Report Format: ☑ PDF ☐ EXCEL ☐ EDD (DIGITAL)	Regular [R] ☑ Standard TAT if received by 3 pm - business days - no surcharges apply
Contact:		Quality Control (QC) Report with Report ☐ YES ☐ NO	PRIORITY (Business Days): 4 day [P4] ☐ / 3 day [P3] ☐ / 2 day [P2] ☐ — EMERGENCY: 1 Business day [E1] ☐ / Same Day, Weekend or Statutory holiday [E0] ☐
Phone:	867-896-9961	☐ Compare Results to Criteria on Report - provide details below if box checked	
	Company address below will appear on the final report	Select Distribution: ☐ EMAIL ☐ MAIL ☐ FAX	Date and Time Required for all E&P TATs:
Street:	PO Box 120	Email 1 or Fax	For tests that can not be performed according to the service level selected, you will be contacted.
City/Province:	Whale Cove, NU	Email 2	
Postal Code:	X0C 0J0	Email 3	

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 Account # / Quote #:	W10623	AFE/Cost Center:	PO#
Job #:		Major/Minor Code:	Routing Code:
PO / AFE:		Requisitioner:	
LSD:		Location:	
ALS Lab Work Order # (lab use only)		ALS Contact: Craig Riddell	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	Routine	BOD	Metals	Nutrients	Mercury	Bacteria	Phenols	Oil & Grease (x2)	BTX, F1 (x3)	F2-F4 (x2)	PAH			Number of Containers
	WHA-8	13-07-16	2:45 PM	wastewater	✓	✓	P	P	P	P	P	P	P	P	P			15
	WHA-4	13-07-16	3:00PM	wastewater	✓	✓	P	P	P	P	P	P	P	P	P			9
	WHA-3	13-07-16	3:15PM	wastewater	✓	✓	P	P	P	P	P	P	P	P	P			9

Drinking Water (DW) Samples[1] (client use)	Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)
Are samples taken from a Regulated DW System? ☐ YES ☒ NO	Nunavut-WW-CCP1
Are samples for human drinking water use? ☐ YES ☒ NO	BTX, F1-F4, PAH 16:30

SAMPLE CONDITION AS RECEIVED (lab use only)

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

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date: 3:40 PM July 13/16	Time:	Received by:	Date: 14-7-16	Time:	Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

OCTOBER 2015 FRONT

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

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

18

Nunavut Community & Government Services - Rankin Inlet
ATTN: MEGAN LUSTY
Box 490
Rankin Inlet NU X0C 0G0

Date Received: 28-JUL-16
Report Date: 09-AUG-16 13:15 (MT)
Version: FINAL

Client Phone: 867-645-8176

Certificate of Analysis

Lab Work Order #: L1805431

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
L1805431-1 WHA-3							
Sampled By: CLIENT on 26-JUL-16							
Matrix: WW							
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	185		1.2	mg/L		04-AUG-16	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		04-AUG-16	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		04-AUG-16	
Alkalinity, Total (as CaCO3)							
Alkalinity, Total (as CaCO3)	152		1.0	mg/L		03-AUG-16	R3518939
Ammonia by colour							
Ammonia, Total (as N)	2.55		0.10	mg/L		05-AUG-16	R3521229
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	67		20	mg/L		29-JUL-16	R3521973
Carbonaceous BOD							
BOD Carbonaceous	63		20	mg/L		29-JUL-16	R3521973
Chloride in Water by IC							
Chloride (Cl)	86.7		0.50	mg/L		30-JUL-16	R3517799
Conductivity							
Conductivity	625		1.0	umhos/cm		03-AUG-16	R3518939
Fecal Coliform							
Fecal Coliforms	430	PEHR	3	MPN/100mL		28-JUL-16	R3516798
Hardness Calculated							
Hardness (as CaCO3)	99.3		0.30	mg/L		08-AUG-16	
Mercury Total							
Mercury (Hg)-Total	<0.000020		0.000020	mg/L	05-AUG-16	05-AUG-16	R3519886
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		30-JUL-16	R3517799
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		03-AUG-16	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		30-JUL-16	R3517799
Oil & Grease - Gravimetric							
Oil and Grease	5.3		5.0	mg/L		04-AUG-16	R3519861
Phenol (4AAP)							
Phenols (4AAP)	0.0026		0.0010	mg/L		02-AUG-16	R3517234
Phosphorus, Total							
Phosphorus (P)-Total	5.56		0.020	mg/L		03-AUG-16	R3517831
Sulfate in Water by IC							
Sulfate (SO4)	20.8		0.30	mg/L		30-JUL-16	R3517799
Total Metals by ICP-MS							
Aluminum (Al)-Total	0.103		0.0050	mg/L	05-AUG-16	05-AUG-16	R3520033
Arsenic (As)-Total	0.00084		0.00020	mg/L	05-AUG-16	05-AUG-16	R3520033
Cadmium (Cd)-Total	0.000017		0.000010	mg/L	05-AUG-16	05-AUG-16	R3520033
Calcium (Ca)-Total	28.8		0.10	mg/L	05-AUG-16	05-AUG-16	R3520033
Chromium (Cr)-Total	<0.0010		0.0010	mg/L	05-AUG-16	05-AUG-16	R3520033
Cobalt (Co)-Total	0.00046		0.00020	mg/L	05-AUG-16	05-AUG-16	R3520033
Copper (Cu)-Total	0.0228		0.00020	mg/L	05-AUG-16	05-AUG-16	R3520033
Iron (Fe)-Total	0.142		0.010	mg/L	05-AUG-16	05-AUG-16	R3520033
Lead (Pb)-Total	0.000227		0.000090	mg/L	05-AUG-16	05-AUG-16	R3520033
Magnesium (Mg)-Total	6.66		0.010	mg/L	05-AUG-16	05-AUG-16	R3520033
Manganese (Mn)-Total	0.0613		0.00030	mg/L	05-AUG-16	05-AUG-16	R3520033
Nickel (Ni)-Total	0.0022		0.0020	mg/L	05-AUG-16	05-AUG-16	R3520033

* 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
L1805431-1 WHA-3							
Sampled By: CLIENT on 26-JUL-16							
Matrix: WW							
Total Metals by ICP-MS							
Potassium (K)-Total	18.7		0.020	mg/L	05-AUG-16	05-AUG-16	R3520033
Sodium (Na)-Total	69.8		0.030	mg/L	05-AUG-16	05-AUG-16	R3520033
Zinc (Zn)-Total	0.0177		0.0020	mg/L	05-AUG-16	05-AUG-16	R3520033
Total Organic Carbon by Combustion							
Total Organic Carbon	32.7		0.50	mg/L		05-AUG-16	R3520667
Total Suspended Solids							
Total Suspended Solids	970		25	mg/L		29-JUL-16	R3516804
pH							
pH	7.06		0.10	pH units		03-AUG-16	R3518939
L1805431-2 WHA-4							
Sampled By: CLIENT on 26-JUL-16							
Matrix: WW							
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	224		1.2	mg/L		04-AUG-16	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		04-AUG-16	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		04-AUG-16	
Alkalinity, Total (as CaCO3)							
Alkalinity, Total (as CaCO3)	184		1.0	mg/L		03-AUG-16	R3518939
Ammonia by colour							
Ammonia, Total (as N)	1.77		0.10	mg/L		05-AUG-16	R3521229
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	8.4		2.0	mg/L		29-JUL-16	R3521973
Carbonaceous BOD							
BOD Carbonaceous	7.9		2.0	mg/L		29-JUL-16	R3521973
Chloride in Water by IC							
Chloride (Cl)	98.2		0.50	mg/L		30-JUL-16	R3517799
Conductivity							
Conductivity	704		1.0	umhos/cm		03-AUG-16	R3518939
Hardness Calculated							
Hardness (as CaCO3)	183		0.30	mg/L		08-AUG-16	
Mercury Total							
Mercury (Hg)-Total	<0.000020		0.000020	mg/L	05-AUG-16	05-AUG-16	R3519886
Nitrate in Water by IC							
Nitrate (as N)	2.03		0.020	mg/L		30-JUL-16	R3517799
Nitrate+Nitrite							
Nitrate and Nitrite as N	2.12		0.070	mg/L		03-AUG-16	
Nitrite in Water by IC							
Nitrite (as N)	0.099		0.010	mg/L		30-JUL-16	R3517799
Oil & Grease - Gravimetric							
Oil and Grease	<5.0		5.0	mg/L		04-AUG-16	R3519861
Phenol (4AAP)							
Phenols (4AAP)	0.0013		0.0010	mg/L		02-AUG-16	R3517234
Phosphorus, Total							
Phosphorus (P)-Total	2.26		0.010	mg/L		03-AUG-16	R3517831
Sulfate in Water by IC							
Sulfate (SO4)	7.49		0.30	mg/L		30-JUL-16	R3517799
Total Metals by ICP-MS							
Aluminum (Al)-Total	0.0457		0.0050	mg/L	05-AUG-16	05-AUG-16	R3520033

* 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
L1805431-2 WHA-4							
Sampled By: CLIENT on 26-JUL-16							
Matrix: WW							
Total Metals by ICP-MS							
Arsenic (As)-Total	0.00359		0.00020	mg/L	05-AUG-16	05-AUG-16	R3520033
Cadmium (Cd)-Total	0.000010		0.000010	mg/L	05-AUG-16	05-AUG-16	R3520033
Calcium (Ca)-Total	59.2		0.10	mg/L	05-AUG-16	05-AUG-16	R3520033
Chromium (Cr)-Total	<0.0010		0.0010	mg/L	05-AUG-16	05-AUG-16	R3520033
Cobalt (Co)-Total	0.00074		0.00020	mg/L	05-AUG-16	05-AUG-16	R3520033
Copper (Cu)-Total	0.00234		0.00020	mg/L	05-AUG-16	05-AUG-16	R3520033
Iron (Fe)-Total	1.43		0.010	mg/L	05-AUG-16	05-AUG-16	R3520033
Lead (Pb)-Total	<0.000090		0.000090	mg/L	05-AUG-16	05-AUG-16	R3520033
Magnesium (Mg)-Total	8.61		0.010	mg/L	05-AUG-16	05-AUG-16	R3520033
Manganese (Mn)-Total	0.254		0.00030	mg/L	05-AUG-16	05-AUG-16	R3520033
Nickel (Ni)-Total	0.0031		0.0020	mg/L	05-AUG-16	05-AUG-16	R3520033
Potassium (K)-Total	10.5		0.020	mg/L	05-AUG-16	05-AUG-16	R3520033
Sodium (Na)-Total	75.9		0.030	mg/L	05-AUG-16	05-AUG-16	R3520033
Zinc (Zn)-Total	0.0022		0.0020	mg/L	05-AUG-16	05-AUG-16	R3520033
Total Organic Carbon by Combustion							
Total Organic Carbon	13.7		0.50	mg/L		05-AUG-16	R3520667
Total Suspended Solids							
Total Suspended Solids	<5.0		5.0	mg/L		29-JUL-16	R3516804
pH							
pH	7.70		0.10	pH units		03-AUG-16	R3518939

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

Reference Information

Sample Parameter Qualifier Key:

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

Test Method References:

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

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

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

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

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

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

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

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

BOD-CBOD-WP	Water	Carbonaceous BOD	APHA 5210 B

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

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

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

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

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

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

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

EC-WP	Water	Conductivity	APHA 2510B

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

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. Aliquots from three or more decimal dilutions of a sample are inoculated into tubes containing enrichment media and incubated at 35C for 48 – 3 hours. Sample aliquots exhibiting the characteristic positive response are transferred to various selective media for the coliform group(s) of interest and incubated at specific temperatures and times. The Most Probable Number for each target group is statistically derived from a standard MPN table based on the combinations of positive outcomes at each dilution.
The fecal (thermotolerant) coliform group may include organisms not originating in the intestines of warm-blooded animals.

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

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
Ammonia in water samples forms indophenol when reacted with hypochlorite and phenol. The intensity is amplified by the addition of sodium nitroprusside and measured colourmetrically.			
NO2+NO3-CALC-WP	Water	Nitrate+Nitrite	CALCULATION
NO2-IC-N-WP	Water	Nitrite in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
NO3-IC-N-WP	Water	Nitrate in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
OG-GRAV-WP	Water	Oil & Grease - Gravimetric	EPA 1664 (modified)
Water samples are acidified and extracted with hexane; the hexane extract is collected in a pre-weighed vial. The solvent is evaporated and Total Oil & Grease is determined from the weight of the residue in the vial.			
P-T-COL-WP	Water	Phosphorus, Total	APHA 4500 P PHOSPHORUS
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.			

** 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.

ALS Environmental
www.alsglobal.com

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

L1805431-COFC

COC Number: 15 - 571768

Page of

Report To	Contact and company name below will appear on the final report
Company:	WHALE COVE
Contact:	
Phone:	
	Company address below will appear on the final report
Street:	
City/Province:	
Postal Code:	

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

Confirm all E&P TATs with your AM - surcharges will apply

Standard TAT if received by 3 pm - business days - no surcharges apply

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

Date and Time Required for all E&P TATs:

For tests that can not be performed according to the service level selected, you will be contacted.

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

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

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

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

ALS Lab Work Order # (lab use only):

ALS Contact:

Sampler:

Analysis Request

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

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Routine	BOD	Nutrients	Metals	Phenols	Mercury	Bacteria	Oil + Grease (x2)	Number of Containers
	WHA-3	Jul 20		wastewater									
	WHA-4	Jul 20		wastewater									

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 by clicking on the drop-down list below (electronic COC only)

15°C

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen SIF Observations Yes No

Ice Packs Ice Cubes Custody seal intact Yes No

Cooling Initiated

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		

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

INITIAL SHIPMENT RECEPTION (lab use only)		
Received by:	Date:	Time:
TW	July 25/16	11:05

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

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

OCTOBER 2015 FRONT

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

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

Hamlet of Whale Cove
ATTN: PAUL VOISEY
PO Box 120
Whale Cove NU X0C 0J0

Date Received: 02-SEP-16
Report Date: 13-SEP-16 11:57 (MT)
Version: FINAL

Client Phone: 867-896-9961

Certificate of Analysis

Lab Work Order #: L1823081

Project P.O. #: NOT SUBMITTED
Job Reference: GARBAGE
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
L1823081-1 WHA-4							
Sampled By: CLIENT on 31-AUG-16 @ 16:00							
Matrix: WW							
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	60.4		1.2	mg/L		08-SEP-16	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		08-SEP-16	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		08-SEP-16	
Alkalinity, Total (as CaCO3)							
Alkalinity, Total (as CaCO3)	49.5		1.0	mg/L		07-SEP-16	R3543624
Ammonia by colour							
Ammonia, Total (as N)	0.038		0.010	mg/L		08-SEP-16	R3544535
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	<2.0		2.0	mg/L		02-SEP-16	R3543825
Carbonaceous BOD							
BOD Carbonaceous	<2.0		2.0	mg/L		02-SEP-16	R3543825
Chloride in Water by IC							
Chloride (Cl)	9.32		0.50	mg/L		02-SEP-16	R3542867
Conductivity							
Conductivity	133		1.0	umhos/cm		07-SEP-16	R3543624
Fecal Coliform							
Fecal Coliforms	<3	PEHT	3	MPN/100mL		02-SEP-16	R3543363
Hardness Calculated							
Hardness (as CaCO3)	52.9		0.30	mg/L		12-SEP-16	
Mercury Total							
Mercury (Hg)-Total	<0.000020		0.000020	mg/L	09-SEP-16	09-SEP-16	R3545817
Nitrate in Water by IC							
Nitrate (as N)	0.039		0.020	mg/L		02-SEP-16	R3542867
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		07-SEP-16	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		02-SEP-16	R3542867
Oil & Grease - Gravimetric							
Oil and Grease	<5.0		5.0	mg/L		09-SEP-16	R3546388
Phenol (4AAP)							
Phenols (4AAP)	0.0024		0.0010	mg/L		08-SEP-16	R3543610
Phosphorus, Total							
Phosphorus (P)-Total	0.019		0.010	mg/L		08-SEP-16	R3543724
Sulfate in Water by IC							
Sulfate (SO4)	4.43		0.30	mg/L		02-SEP-16	R3542867
Total Metals by ICP-MS							
Aluminum (Al)-Total	0.0665		0.0050	mg/L	09-SEP-16	11-SEP-16	R3545677
Arsenic (As)-Total	0.00025		0.00020	mg/L	09-SEP-16	11-SEP-16	R3545677
Cadmium (Cd)-Total	<0.000010		0.000010	mg/L	09-SEP-16	11-SEP-16	R3545677
Calcium (Ca)-Total	17.5		0.10	mg/L	09-SEP-16	11-SEP-16	R3545677
Chromium (Cr)-Total	<0.0010		0.0010	mg/L	09-SEP-16	11-SEP-16	R3545677
Cobalt (Co)-Total	<0.00020		0.00020	mg/L	09-SEP-16	11-SEP-16	R3545677
Copper (Cu)-Total	0.00975		0.00020	mg/L	09-SEP-16	11-SEP-16	R3545677
Iron (Fe)-Total	0.082		0.010	mg/L	09-SEP-16	11-SEP-16	R3545677
Lead (Pb)-Total	0.000191		0.000090	mg/L	09-SEP-16	11-SEP-16	R3545677
Magnesium (Mg)-Total	2.23		0.010	mg/L	09-SEP-16	11-SEP-16	R3545677
Manganese (Mn)-Total	0.00205		0.00030	mg/L	09-SEP-16	11-SEP-16	R3545677
Nickel (Ni)-Total	0.0027		0.0020	mg/L	09-SEP-16	11-SEP-16	R3545677

* 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
L1823081-1 WHA-4							
Sampled By: CLIENT on 31-AUG-16 @ 16:00							
Matrix: WW							
Total Metals by ICP-MS							
Potassium (K)-Total	0.575		0.020	mg/L	09-SEP-16	11-SEP-16	R3545677
Sodium (Na)-Total	8.95		0.030	mg/L	09-SEP-16	11-SEP-16	R3545677
Zinc (Zn)-Total	<0.0020		0.0020	mg/L	09-SEP-16	11-SEP-16	R3545677
Total Organic Carbon by Combustion							
Total Organic Carbon	6.62		0.50	mg/L		09-SEP-16	R3546230
Total Suspended Solids							
Total Suspended Solids	<5.0		5.0	mg/L		06-SEP-16	R3542512
pH							
pH	7.90		0.10	pH units		07-SEP-16	R3543624
L1823081-2 WHA-8							
Sampled By: CLIENT on 31-AUG-16 @ 16:00							
Matrix: WW							
BTEX plus F1-F4							
BTX plus F1 by GCMS							
Benzene	<0.00050		0.00050	mg/L		07-SEP-16	R3543774
Toluene	<0.0010		0.0010	mg/L		07-SEP-16	R3543774
Ethyl benzene	<0.00050		0.00050	mg/L		07-SEP-16	R3543774
o-Xylene	<0.00050		0.00050	mg/L		07-SEP-16	R3543774
m+p-Xylenes	<0.00050		0.00050	mg/L		07-SEP-16	R3543774
F1 (C6-C10)	<0.10		0.10	mg/L		07-SEP-16	R3543774
Surrogate: 4-Bromofluorobenzene (SS)	109.2		70-130	%		07-SEP-16	R3543774
CCME PHC F2-F4 in Water							
F2 (C10-C16)	<0.10		0.10	mg/L	06-SEP-16	07-SEP-16	R3543334
F3 (C16-C34)	<0.25		0.25	mg/L	06-SEP-16	07-SEP-16	R3543334
F4 (C34-C50)	<0.25		0.25	mg/L	06-SEP-16	07-SEP-16	R3543334
Surrogate: 2-Bromobenzotrifluoride	93.7		60-140	%	06-SEP-16	07-SEP-16	R3543334
CCME Total Hydrocarbons							
F1-BTEX	<0.10		0.10	mg/L		13-SEP-16	
F2-Naphth	<0.10		0.10	mg/L		13-SEP-16	
F3-PAH	<0.25		0.25	mg/L		13-SEP-16	
Total Hydrocarbons (C6-C50)	<0.38		0.38	mg/L		13-SEP-16	
Sum of Xylene Isomer Concentrations							
Xylenes (Total)	<0.0015		0.0015	mg/L		09-SEP-16	
Polyaromatic Hydrocarbons (PAHs)							
1-Methyl Naphthalene	<0.000020		0.000020	mg/L	08-SEP-16	08-SEP-16	R3546224
2-Methyl Naphthalene	<0.000020		0.000020	mg/L	08-SEP-16	08-SEP-16	R3546224
Acenaphthene	<0.000020		0.000020	mg/L	08-SEP-16	08-SEP-16	R3546224
Acenaphthylene	<0.000020		0.000020	mg/L	08-SEP-16	08-SEP-16	R3546224
Anthracene	<0.000010		0.000010	mg/L	08-SEP-16	08-SEP-16	R3546224
Acridine	<0.000020		0.000020	mg/L	08-SEP-16	08-SEP-16	R3546224
Benzo(a)anthracene	<0.000010		0.000010	mg/L	08-SEP-16	08-SEP-16	R3546224
Benzo(a)pyrene	<0.0000050		0.0000050	mg/L	08-SEP-16	08-SEP-16	R3546224
Benzo(b&j)fluoranthene	<0.000010		0.000010	mg/L	08-SEP-16	08-SEP-16	R3546224
Benzo(g,h,i)perylene	<0.000020		0.000020	mg/L	08-SEP-16	08-SEP-16	R3546224
Benzo(k)fluoranthene	<0.000010		0.000010	mg/L	08-SEP-16	08-SEP-16	R3546224
Chrysene	<0.000020		0.000020	mg/L	08-SEP-16	08-SEP-16	R3546224
Dibenzo(a,h)anthracene	<0.0000050		0.0000050	mg/L	08-SEP-16	08-SEP-16	R3546224
Fluoranthene	<0.000020		0.000020	mg/L	08-SEP-16	08-SEP-16	R3546224
Fluorene	<0.000020		0.000020	mg/L	08-SEP-16	08-SEP-16	R3546224
Indeno(1,2,3-cd)pyrene	<0.000010		0.000010	mg/L	08-SEP-16	08-SEP-16	R3546224

* 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
L1823081-2 WHA-8							
Sampled By: CLIENT on 31-AUG-16 @ 16:00							
Matrix: WW							
Polyaromatic Hydrocarbons (PAHs)							
Naphthalene	<0.000050		0.000050	mg/L	08-SEP-16	08-SEP-16	R3546224
Phenanthrene	<0.000050		0.000050	mg/L	08-SEP-16	08-SEP-16	R3546224
Pyrene	<0.000010		0.000010	mg/L	08-SEP-16	08-SEP-16	R3546224
Quinoline	0.000052		0.000020	mg/L	08-SEP-16	08-SEP-16	R3546224
B(a)P Total Potency Equivalent	<0.000030		0.000030	mg/L	08-SEP-16	08-SEP-16	R3546224
Surrogate: Acenaphthene d10	83.9		40-130	%	08-SEP-16	08-SEP-16	R3546224
Surrogate: Acridine d9	101.5		40-130	%	08-SEP-16	08-SEP-16	R3546224
Surrogate: Chrysene d12	91.9		40-130	%	08-SEP-16	08-SEP-16	R3546224
Surrogate: Naphthalene d8	82.5		40-130	%	08-SEP-16	08-SEP-16	R3546224
Surrogate: Phenanthrene d10	86.6		40-130	%	08-SEP-16	08-SEP-16	R3546224
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	407		1.2	mg/L		08-SEP-16	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		08-SEP-16	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		08-SEP-16	
Alkalinity, Total (as CaCO3)							
Alkalinity, Total (as CaCO3)	334		1.0	mg/L		07-SEP-16	R3543624
Ammonia by colour							
Ammonia, Total (as N)	2.26		0.10	mg/L		08-SEP-16	R3544535
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	3.4		2.0	mg/L		02-SEP-16	R3543825
Carbonaceous BOD							
BOD Carbonaceous	11.4		2.0	mg/L		02-SEP-16	R3543825
Chloride in Water by IC							
Chloride (Cl)	407		1.0	mg/L		02-SEP-16	R3542867
Conductivity							
Conductivity	1930		1.0	umhos/cm		07-SEP-16	R3543624
Fecal Coliform							
Fecal Coliforms	4	PEHT	3	MPN/100mL		02-SEP-16	R3543363
Hardness Calculated							
Hardness (as CaCO3)	392		0.30	mg/L		12-SEP-16	
Mercury Total							
Mercury (Hg)-Total	<0.000020		0.000020	mg/L	09-SEP-16	09-SEP-16	R3545817
Nitrate in Water by IC							
Nitrate (as N)	0.235		0.040	mg/L		02-SEP-16	R3542867
Nitrate+Nitrite							
Nitrate and Nitrite as N	0.296		0.070	mg/L		07-SEP-16	
Nitrite in Water by IC							
Nitrite (as N)	0.060		0.020	mg/L		02-SEP-16	R3542867
Oil & Grease - Gravimetric							
Oil and Grease	<5.0		5.0	mg/L		09-SEP-16	R3546388
Phenol (4AAP)							
Phenols (4AAP)	0.0018		0.0010	mg/L		10-SEP-16	R3545236
Phosphorus, Total							
Phosphorus (P)-Total	2.93		0.010	mg/L		08-SEP-16	R3543724
Sulfate in Water by IC							
Sulfate (SO4)	52.4		0.60	mg/L		02-SEP-16	R3542867
Total Metals by ICP-MS							
Aluminum (Al)-Total	0.0769		0.0050	mg/L	09-SEP-16	11-SEP-16	R3545677
Arsenic (As)-Total	0.00645		0.00020	mg/L	09-SEP-16	11-SEP-16	R3545677

* 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
L1823081-2 WHA-8							
Sampled By: CLIENT on 31-AUG-16 @ 16:00							
Matrix: WW							
Total Metals by ICP-MS							
Cadmium (Cd)-Total	<0.000010		0.000010	mg/L	09-SEP-16	11-SEP-16	R3545677
Calcium (Ca)-Total	107		0.10	mg/L	09-SEP-16	11-SEP-16	R3545677
Chromium (Cr)-Total	<0.0010		0.0010	mg/L	09-SEP-16	11-SEP-16	R3545677
Cobalt (Co)-Total	0.00108		0.00020	mg/L	09-SEP-16	11-SEP-16	R3545677
Copper (Cu)-Total	0.00220		0.00020	mg/L	09-SEP-16	11-SEP-16	R3545677
Iron (Fe)-Total	0.897		0.010	mg/L	09-SEP-16	11-SEP-16	R3545677
Lead (Pb)-Total	0.000136		0.000090	mg/L	09-SEP-16	11-SEP-16	R3545677
Magnesium (Mg)-Total	30.3		0.010	mg/L	09-SEP-16	11-SEP-16	R3545677
Manganese (Mn)-Total	0.296		0.00030	mg/L	09-SEP-16	11-SEP-16	R3545677
Nickel (Ni)-Total	0.0049		0.0020	mg/L	09-SEP-16	11-SEP-16	R3545677
Potassium (K)-Total	30.7		0.020	mg/L	09-SEP-16	11-SEP-16	R3545677
Sodium (Na)-Total	253		0.030	mg/L	09-SEP-16	11-SEP-16	R3545677
Zinc (Zn)-Total	0.0039		0.0020	mg/L	09-SEP-16	11-SEP-16	R3545677
Total Organic Carbon by Combustion							
Total Organic Carbon	24.8		0.50	mg/L		09-SEP-16	R3546230
Total Suspended Solids							
Total Suspended Solids	26.0		5.0	mg/L		06-SEP-16	R3542512
pH							
pH	8.09		0.10	pH units		07-SEP-16	R3543624

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

Reference Information

Sample Parameter Qualifier Key:

Qualifier	Description
DUP-H	Duplicate results outside ALS DQO, due to sample heterogeneity.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
PEHT	Parameter Exceeded Recommended Holding Time Prior to Analysis

Test Method References:

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

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

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

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

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

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

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

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

BOD-CBOD-WP	Water	Carbonaceous BOD	APHA 5210 B

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

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

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

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

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

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

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

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

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

EC-WP	Water	Conductivity	APHA 2510B

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

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.

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**

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

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

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

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

FC-MPN-WP	Water	Fecal Coliform	APHA 9221E

The Most Probable Number (MPN) method is based on the Multiple Tube Fermentation technique. Aliquots from three or more decimal dilutions of a sample are inoculated into tubes containing enrichment media and incubated at 35C for 48 – 3 hours. Sample aliquots exhibiting the characteristic positive response are transferred to various selective media for the coliform group(s) of interest and incubated at specific temperatures and times. The Most Probable Number for each target group is statistically derived from a standard MPN table based on the combinations of positive outcomes at each dilution.
The fecal (thermotolerant) coliform group may include organisms not originating in the intestines of warm-blooded animals.

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.

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

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

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

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.

Reference Information

Test Method References:

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

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

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

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

Chain of Custody Numbers:

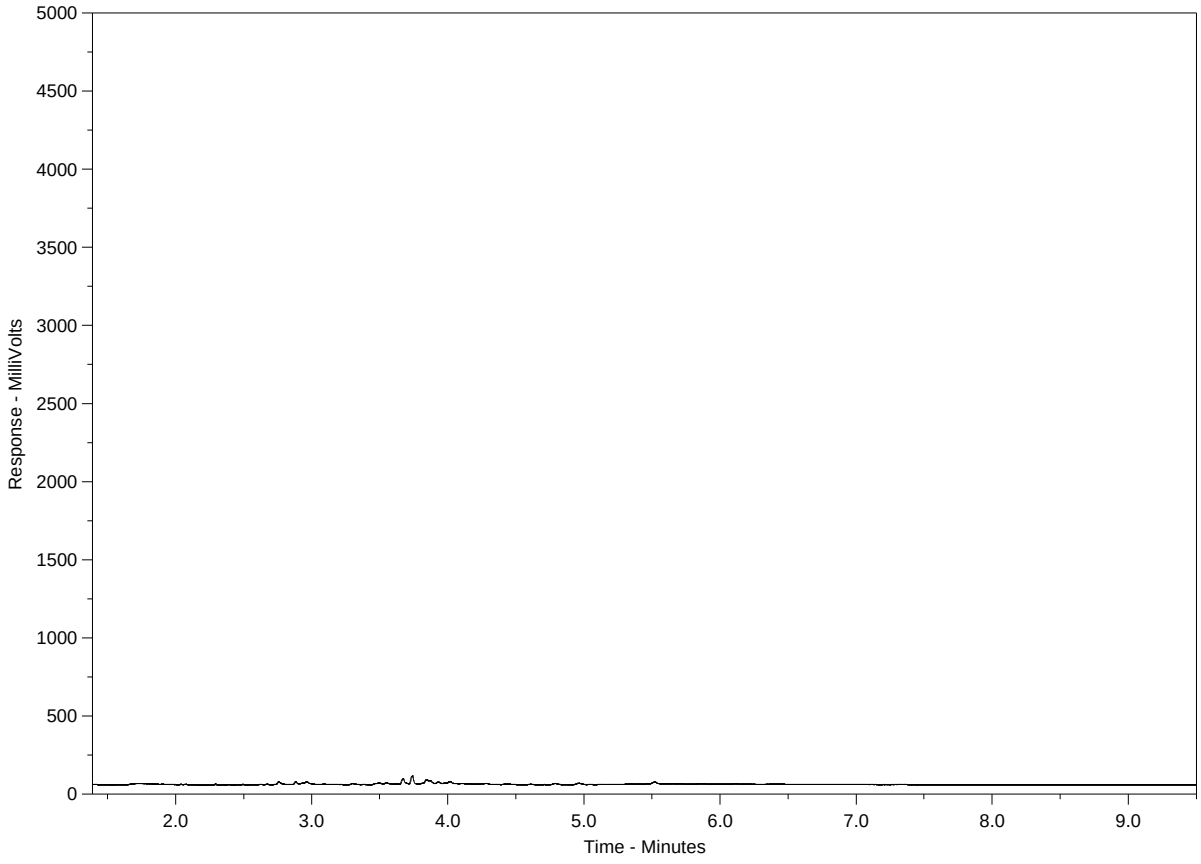
GLOSSARY OF REPORT TERMS

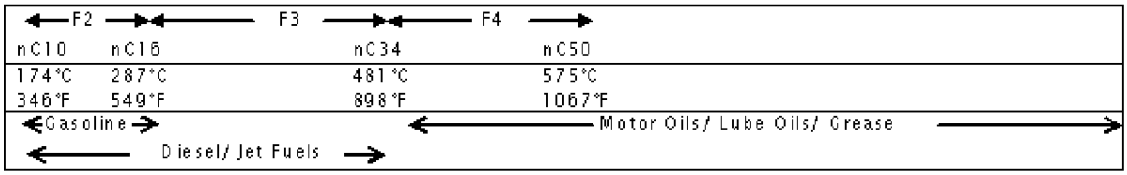
Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates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

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

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L1823081-2
Client Sample ID: WHA-8





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

L1823081-COFC

COC Number: 15 - 571767

Page of L1823081

Report To	Contact and company name below will appear on the final report	Report Format / Distribution	Select Service Level Below - Please confirm all E&P TATs with your AM - surcharges will apply
Company:		Select Report Format: PDF EXCEL EDD (DIGITAL)	Regular [R] Standard TAT if received by 3 pm - business days - no surcharges apply
Contact:		Quality Control (QC) Report with Report YES NO	PRIORITY (Business Days): 4 day [P4] 3 day [P3] 2 day [P2] — EMERGENCY: 1 Business day [E1] Same Day, Weekend or Statutory holiday [E0]
Phone:		Compare Results to Criteria on Report - provide details below if box checked	
	Company address below will appear on the final report	Select Distribution: EMAIL MAIL FAX	Date and Time Required for all E&P TATs:
Street:		Email 1 or Fax	For tests that can not be performed according to the service level selected, you will be contacted.
City/Province:	Whale Cove Nunavut	Email 2	Analysis Request
Postal Code:	X0C 0J0	Email 3	Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below
Invoice To	Same as Report To YES NO	Invoice Distribution	
	Copy of Invoice with Report YES NO	Select Invoice Distribution: EMAIL MAIL FAX	
Company:		Email 1 or Fax	
Contact:		Email 2	

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

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Number of Containers
	BOD	Aug 31	4:00		
	Routine	Aug 31	" "		
	Bacteria	Aug 31	" "		
	Hydrochloric acid	Aug 31	" "		
	Nitric acid	Aug 31	" "		
	OIL & Grease	Aug 31	" "		
	Sulfuric acid	Aug 31	" "		
	OIL & Grease	Aug 31	" "		
	Sulfuric acid	Aug	" "		

Drinking Water (DW) Samples (client use)	Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)	SAMPLE CONDITION AS RECEIVED (lab use only)
Are samples taken from a Regulated DW System? YES NO		Frozen SIF Observations Yes No
Are samples for human drinking water use? YES NO	10 Co	Ice Packs Ice Cubes Custody seal intact Yes No
		Cooling Initiated
		INITIAL COOLER TEMPERATURES °C / FINAL COOLER TEMPERATURES °C

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date: Aug 31, 2016	Time: 4:00	Received by:	Date: 2-9-16	Time:	Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

OCTOBER 2015 FRONT

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

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

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): **2016**

Spill No.	Date	Ter	Region	Location	Site Description	Commodity	Quantity	Source	Agency
2016125	2016-04-20	NU	KEE	Whale Cove	Whale Cove unit 110A	Heating Oil	250 L	ST<	GN
2016201	2016-06-01	NU	KEE	Whale Cove	Unit #72, Whole Cove	Fuel Oil #2	44 L	ST<	GN

Total Spills on this Report: 2

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