



Hamlet of Chesterfield Inlet
ATTN: DOUGLAS AGGARK
PO Box 10
Chesterfield Inlet NU X0C 0B0

Date Received: 25-JUL-14
Report Date: 12-AUG-14 15:55 (MT)
Version: FINAL

Client Phone: 867-898-9926

Certificate of Analysis

Lab Work Order #: L1492613
Project P.O. #: NOT SUBMITTED
Job Reference: CHESTERFIELD INLET MONITORING PROGRAM
C of C Numbers:
Legal Site Desc:

Craig Riddell
Account Manager

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1492613-1 CHE3 Sampled By: RUSSELL MULLINS on 24-JUL-14 @ 14:40 Matrix: WW							
Miscellaneous Parameters							
Biochemical Oxygen Demand	287		6.0	mg/L		26-JUL-14	R2903699
Total Organic Carbon	133		1.0	mg/L	31-JUL-14	31-JUL-14	R2905936
Nunavut WW Group 1							
Alkalinity							
Alkalinity, Total (as CaCO3)	375		20	mg/L		29-JUL-14	R2905630
Bicarbonate (HCO3)	457		24	mg/L		29-JUL-14	R2905630
Carbonate (CO3)	<12		12	mg/L		29-JUL-14	R2905630
Hydroxide (OH)	<6.8		6.8	mg/L		29-JUL-14	R2905630
Ammonia by colour							
Ammonia, Total (as N)	88.0	DLA	2.0	mg/L		30-JUL-14	R2903553
Carbonaceous BOD							
BOD Carbonaceous	269		6.0	mg/L		26-JUL-14	R2903699
Chloride by Ion Chromatography							
Chloride	72.4		0.50	mg/L		26-JUL-14	R2900368
Conductivity							
Conductivity	1130		20	umhos/cm		29-JUL-14	R2905630
Fecal Coliform							
Fecal Coliforms	>110000		3	MPN/100mL		29-JUL-14	R2902669
Hardness Calculated							
Hardness (as CaCO3)	46.0		0.30	mg/L		07-AUG-14	
Mercury Total							
Mercury (Hg)-Total	<0.00020	DLM	0.00020	mg/L	28-JUL-14	28-JUL-14	R2901935
Nitrate as N by Ion Chromatography							
Nitrate-N	<0.050		0.050	mg/L		26-JUL-14	R2900368
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.071		0.071	mg/L		29-JUL-14	
Nitrite as N by Ion Chromatography							
Nitrite-N	<0.050		0.050	mg/L		26-JUL-14	R2900368
Oil and Grease, Total							
Oil and Grease, Total	50.3		2.0	mg/L	30-JUL-14	30-JUL-14	R2905734
Phenol (4AAP)							
Phenols (4AAP)	0.124		0.0010	mg/L	30-JUL-14	30-JUL-14	R2903714
Phosphorus, Total							
Phosphorus (P)-Total	13.2	DLA	0.10	mg/L		31-JUL-14	R2904550
Sulfate by Ion Chromatography							
Sulfate	21.2		0.50	mg/L		26-JUL-14	R2900368
Total Metals by ICP-MS							
Aluminum (Al)-Total	0.547		0.0050	mg/L	06-AUG-14	06-AUG-14	R2909941
Arsenic (As)-Total	0.00100		0.00020	mg/L	06-AUG-14	06-AUG-14	R2909941
Cadmium (Cd)-Total	0.000256		0.000010	mg/L	06-AUG-14	06-AUG-14	R2909941
Calcium (Ca)-Total	10.7		0.10	mg/L	06-AUG-14	06-AUG-14	R2909941
Chromium (Cr)-Total	0.0018		0.0010	mg/L	06-AUG-14	06-AUG-14	R2909941
Cobalt (Co)-Total	0.00071		0.00020	mg/L	06-AUG-14	06-AUG-14	R2909941
Copper (Cu)-Total	0.138		0.00020	mg/L	06-AUG-14	06-AUG-14	R2909941
Iron (Fe)-Total	0.94		0.10	mg/L	06-AUG-14	06-AUG-14	R2909941
Lead (Pb)-Total	0.00387		0.000090	mg/L	06-AUG-14	06-AUG-14	R2909941
Magnesium (Mg)-Total	4.66		0.010	mg/L	06-AUG-14	06-AUG-14	R2909941
Manganese (Mn)-Total	0.0473		0.00030	mg/L	06-AUG-14	06-AUG-14	R2909941
Nickel (Ni)-Total	0.0046		0.0020	mg/L	06-AUG-14	06-AUG-14	R2909941
Potassium (K)-Total	30.6		0.020	mg/L	06-AUG-14	06-AUG-14	R2909941
Sodium (Na)-Total	54.6		0.030	mg/L	06-AUG-14	06-AUG-14	R2909941
Zinc (Zn)-Total	0.230		0.0020	mg/L	06-AUG-14	06-AUG-14	R2909941

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

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1492613-1	CHE3							
Sampled By: RUSSELL MULLINS on 24-JUL-14 @ 14:40								
Matrix: WW								
Total Suspended Solids								
Total Suspended Solids		90.0		5.0	mg/L		29-JUL-14	R2903094
pH								
pH		7.81		0.10	pH units		29-JUL-14	R2905630
L1492613-2	CHE4							
Sampled By: RUSSELL MULLINS on 24-JUL-14 @ 14:30								
Matrix: WW								
Miscellaneous Parameters								
Biochemical Oxygen Demand		<6.0		6.0	mg/L		26-JUL-14	R2903699
Total Organic Carbon		13.5		1.0	mg/L	31-JUL-14	31-JUL-14	R2905936
Nunavut WW Group 1								
Alkalinity								
Alkalinity, Total (as CaCO3)		50		20	mg/L		29-JUL-14	R2905630
Bicarbonate (HCO3)		61		24	mg/L		29-JUL-14	R2905630
Carbonate (CO3)		<12		12	mg/L		29-JUL-14	R2905630
Hydroxide (OH)		<6.8		6.8	mg/L		29-JUL-14	R2905630
Ammonia by colour								
Ammonia, Total (as N)		0.026		0.010	mg/L		29-JUL-14	R2902301
Carbonaceous BOD								
BOD Carbonaceous		<6.0		6.0	mg/L		26-JUL-14	R2903699
Chloride by Ion Chromatography								
Chloride		45.2		0.50	mg/L		26-JUL-14	R2900368
Conductivity								
Conductivity		278		20	umhos/cm		29-JUL-14	R2905630
Fecal Coliform								
Fecal Coliforms		7		3	MPN/100mL		29-JUL-14	R2902669
Hardness Calculated								
Hardness (as CaCO3)		46.8		0.30	mg/L		07-AUG-14	
Mercury Total								
Mercury (Hg)-Total		<0.000020		0.000020	mg/L	28-JUL-14	28-JUL-14	R2901935
Nitrate as N by Ion Chromatography								
Nitrate-N		<0.050		0.050	mg/L		26-JUL-14	R2900368
Nitrate+Nitrite								
Nitrate and Nitrite as N		<0.071		0.071	mg/L		29-JUL-14	
Nitrite as N by Ion Chromatography								
Nitrite-N		<0.050		0.050	mg/L		26-JUL-14	R2900368
Oil and Grease, Total								
Oil and Grease, Total		<2.0		2.0	mg/L	30-JUL-14	30-JUL-14	R2905734
Phenol (4AAP)								
Phenols (4AAP)		<0.0010		0.0010	mg/L	30-JUL-14	30-JUL-14	R2903714
Phosphorus, Total								
Phosphorus (P)-Total		0.026		0.010	mg/L		31-JUL-14	R2904550
Sulfate by Ion Chromatography								
Sulfate		13.3		0.50	mg/L		26-JUL-14	R2900368
Total Metals by ICP-MS								
Aluminum (Al)-Total		0.0329		0.0050	mg/L	06-AUG-14	06-AUG-14	R2909941
Arsenic (As)-Total		0.00042		0.00020	mg/L	06-AUG-14	06-AUG-14	R2909941
Cadmium (Cd)-Total		<0.000010		0.000010	mg/L	06-AUG-14	06-AUG-14	R2909941
Calcium (Ca)-Total		12.2		0.10	mg/L	06-AUG-14	06-AUG-14	R2909941
Chromium (Cr)-Total		<0.0010		0.0010	mg/L	06-AUG-14	06-AUG-14	R2909941
Cobalt (Co)-Total		<0.00020		0.00020	mg/L	06-AUG-14	06-AUG-14	R2909941
Copper (Cu)-Total		0.00722		0.00020	mg/L	06-AUG-14	06-AUG-14	R2909941
Iron (Fe)-Total		0.12		0.10	mg/L	06-AUG-14	06-AUG-14	R2909941

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

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1492613-2	CHE4							
Sampled By:	RUSSELL MULLINS on 24-JUL-14 @ 14:30							
Matrix:	WW							
Total Metals by ICP-MS								
Lead (Pb)-Total		<0.000090		0.000090	mg/L	06-AUG-14	06-AUG-14	R2909941
Magnesium (Mg)-Total		3.95		0.010	mg/L	06-AUG-14	06-AUG-14	R2909941
Manganese (Mn)-Total		0.00284		0.00030	mg/L	06-AUG-14	06-AUG-14	R2909941
Nickel (Ni)-Total		0.0030		0.0020	mg/L	06-AUG-14	06-AUG-14	R2909941
Potassium (K)-Total		3.04		0.020	mg/L	06-AUG-14	06-AUG-14	R2909941
Sodium (Na)-Total		32.3		0.030	mg/L	06-AUG-14	06-AUG-14	R2909941
Zinc (Zn)-Total		0.0023		0.0020	mg/L	06-AUG-14	06-AUG-14	R2909941
Total Suspended Solids								
Total Suspended Solids		<5.0		5.0	mg/L		29-JUL-14	R2903094
pH								
pH		7.73		0.10	pH units		29-JUL-14	R2905630

* 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-TOT-WP	Water	Alkalinity	APHA 2320B
Alkalinity of water is a measure of its acid neutralizing capacity. Alkalinity is imparted by bicarbonate, carbonate and hydroxide components of water. It is determined by titration with a standard solution of strong mineral acid to the successive HCO ₃ ⁻ and H ₂ CO ₃ endpoints indicated electrometrically.			
BOD-CBOD-WP	Water	Carbonaceous BOD	APHA 5210 B-5 day Incub.-O ₂ electrode
A sample of water is incubated for 5 days at 20 degrees Celcius. Comparison of dissolved oxygen content at 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.			
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.			
CL-IC-WP	Water	Chloride by Ion Chromatography	EPA 300.1 (Modified)
Anions in aqueous matrices are analyzed using ion chromatography with conductivity and/or UV absorbance detectors.			
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).			
NH ₃ -COL-WP	Water	Ammonia by colour	APHA 4500 NH ₃ 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.			
NO ₂ +NO ₃ -CALC-WP	Water	Nitrate+Nitrite	CALCULATION
NO ₂ -IC-WP	Water	Nitrite as N by Ion Chromatography	EPA 300.1 (Modified)
Anions in aqueous matrices are analyzed using ion chromatography with conductivity and/or UV absorbance detectors.			
NO ₃ -IC-WP	Water	Nitrate as N by Ion Chromatography	EPA 300.1 (Modified)
Anions in aqueous matrices are analyzed using ion chromatography with conductivity and/or UV absorbance detectors.			
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			

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
		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-WP	Water	Sulfate by Ion Chromatography	EPA 300.1 (Modified)
Anions in aqueous matrices are analyzed using ion chromatography with conductivity and/or UV absorbance detectors.			
SOLIDS-TOTSUS-WP	Water	Total Suspended Solids	APHA 2540 D (modified)
Total suspended solids in aqueous 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 carbon 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
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 ww - 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.



L1492613-CQFC

Report To			Report			Service Request (Rush subject to availability - Contact ALS to confirm TAT)															
Company: <u>Hamlet of Chesterfield Inlet</u>			Standard: <input checked="" type="checkbox"/> Other (specify):			<input checked="" type="checkbox"/> Regular (Standard Turnaround Times - Business Days)															
Contact: <u>Douglas Assark</u>			Select: PDF <input checked="" type="checkbox"/> Excel Digital Fax			Priority (2-4 Business Days)-50% surcharge - Contact ALS to confirm TAT															
Address: <u>Box 10</u>			Email 1: <u>SAD - Hamlet@911iq-com</u>			Emergency (1-2 Business Days)-100% Surcharge - Contact ALS to confirm TAT															
			Email 2: <u>mlustya@gov.nv.ca</u>			Same Day or Weekend Emergency - Contact ALS to confirm TAT															
Phone: <u>867 895 9951</u> Fax: <u>867 895 9408</u>						Analysis Request															
Invoice To Same as Report? (circle) Yes or No (if No, provide details)			Client / Project Information			(Indicate Filtered or Preserved, F/P)															
Copy of Invoice with Report? (circle) Yes or No			Job #: <u>Chesterfield Inlet Monitoring Program</u>																		
Company:			PO / AFE:																		
Contact:			LSD:																		
Address:																					
Phone: Fax:			Quote #:																		
Lab Work Order # (lab use only)			ALS Contact: <u>Craig Riddle</u>			Sampler: <u>Russell Mullins</u>															
Sample #	Sample Identification (This description will appear on the report)		Date (dd-mm-yy)	Time (hh:mm)	Sample Type	BOD	Routine	Metals	Nutrients	Phenols	Bacteria	Oil + Grease								Number of Containers	
	<u>CHE-3</u>		<u>24-07-14</u>	<u>2:40 pm</u>	<u>Wastewater</u>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>									08
	<u>CHE-4</u>		<u>24-07-14</u>	<u>2:30 pm</u>	<u>Wastewater</u>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>									08
Special Instructions / Regulation with water or land use (CCME- Freshwater Aquatic Life/BC CSR-Commercial/AB Tier 1-Natural/etc) / Hazardous Details																					
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.																					
SHIPMENT RELEASE (client use)						SHIPMENT RECEPTION (lab use only)						SHIPMENT VERIFICATION (lab use only)									
Released by:	Date:	Time:	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations:											
<u>[Signature]</u>	<u>July 24/14</u>	<u>3:15</u>	<u>PD</u>	<u>25/7/14</u>	<u>10:20</u>	<u>10 °C</u>				Yes / No ? If Yes add SIF											