Municipality of Sanikiluaq
ATTN: MOSES NOVALINGA / KENNY PEARCE
PO Box 157
Sanikiluaq NU X0A 0W0

Date Received: 24-JUL-14
Report Date: 11-AUG-14 14:41 (MT)
Version: FINAL

Client Phone: 867-266-7900

Certificate of Analysis

Lab Work Order #: L1492043

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

Craig Riddell
Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1492043-1 SANI 2 (WASTE DISPOSAL GROUND - STREAM)							
Sampled By: CLIENT on 23-JUL-14 @ 11:30							
Matrix: DUMP STREAM							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.010		0.010	mg/L		25-JUL-14	R2899368
Conductivity	504		20	umhos/cm		26-JUL-14	R2898912
Fecal Coliforms	9300		3	MPN/100mL		28-JUL-14	R2900631
Mercury (Hg)-Total	<0.000020		0.000020	mg/L	28-JUL-14	28-JUL-14	R2901935
Oil and Grease, Total	<2.0		2.0	mg/L	31-JUL-14	31-JUL-14	R2907090
Phenols (4AAP)	<0.0010		0.0010	mg/L	29-JUL-14	29-JUL-14	R2901191
Phosphorus (P)-Total	<0.010		0.010	mg/L		30-JUL-14	R2902453
Sulfate	37.6		0.50	mg/L		25-JUL-14	R2899779
Total Suspended Solids	<5.0		5.0	mg/L		28-JUL-14	R2901609
pH	7.93		0.10	pH units		26-JUL-14	R2898912
Total Metals by ICP-MS							
Aluminum (Al)-Total	<0.0050		0.0050	mg/L	08-AUG-14	08-AUG-14	R2912990
Antimony (Sb)-Total	0.00045		0.00020	mg/L	08-AUG-14	08-AUG-14	R2912990
Arsenic (As)-Total	0.00023		0.00020	mg/L	08-AUG-14	08-AUG-14	R2912990
Barium (Ba)-Total	0.0133		0.00020	mg/L	08-AUG-14	08-AUG-14	R2912990
Beryllium (Be)-Total	<0.00020		0.00020	mg/L	08-AUG-14	08-AUG-14	R2912990
Bismuth (Bi)-Total	<0.00020		0.00020	mg/L	08-AUG-14	08-AUG-14	R2912990
Boron (B)-Total	0.113		0.010	mg/L	08-AUG-14	08-AUG-14	R2912990
Cadmium (Cd)-Total	<0.000010		0.000010	mg/L	08-AUG-14	08-AUG-14	R2912990
Calcium (Ca)-Total	46.4		0.10	mg/L	08-AUG-14	08-AUG-14	R2912990
Cesium (Cs)-Total	<0.00010		0.00010	mg/L	08-AUG-14	08-AUG-14	R2912990
Chromium (Cr)-Total	<0.0010		0.0010	mg/L	08-AUG-14	08-AUG-14	R2912990
Cobalt (Co)-Total	<0.00020		0.00020	mg/L	08-AUG-14	08-AUG-14	R2912990
Copper (Cu)-Total	0.00469		0.00020	mg/L	08-AUG-14	08-AUG-14	R2912990
Iron (Fe)-Total	<0.10		0.10	mg/L	08-AUG-14	08-AUG-14	R2912990
Lead (Pb)-Total	<0.000090		0.000090	mg/L	08-AUG-14	08-AUG-14	R2912990
Lithium (Li)-Total	0.0056		0.0020	mg/L	08-AUG-14	08-AUG-14	R2912990
Magnesium (Mg)-Total	17.1		0.010	mg/L	08-AUG-14	08-AUG-14	R2912990
Manganese (Mn)-Total	0.00039		0.00030	mg/L	08-AUG-14	08-AUG-14	R2912990
Molybdenum (Mo)-Total	0.00049		0.00020	mg/L	08-AUG-14	08-AUG-14	R2912990
Nickel (Ni)-Total	<0.0020		0.0020	mg/L	08-AUG-14	08-AUG-14	R2912990
Phosphorus (P)-Total	<0.10		0.10	mg/L	08-AUG-14	08-AUG-14	R2912990
Potassium (K)-Total	2.70		0.020	mg/L	08-AUG-14	08-AUG-14	R2912990
Rubidium (Rb)-Total	0.00133		0.00020	mg/L	08-AUG-14	08-AUG-14	R2912990
Selenium (Se)-Total	<0.0010		0.0010	mg/L	08-AUG-14	08-AUG-14	R2912990
Silicon (Si)-Total	1.61		0.10	mg/L	08-AUG-14	08-AUG-14	R2912990
Silver (Ag)-Total	<0.00010		0.00010	mg/L	08-AUG-14	08-AUG-14	R2912990
Sodium (Na)-Total	40.1		0.030	mg/L	08-AUG-14	08-AUG-14	R2912990
Strontium (Sr)-Total	0.132		0.00010	mg/L	08-AUG-14	08-AUG-14	R2912990
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	08-AUG-14	08-AUG-14	R2912990
Thallium (Tl)-Total	<0.00010		0.00010	mg/L	08-AUG-14	08-AUG-14	R2912990
Thorium (Th)-Total	<0.00010		0.00010	mg/L	08-AUG-14	08-AUG-14	R2912990
Tin (Sn)-Total	<0.00020		0.00020	mg/L	08-AUG-14	08-AUG-14	R2912990
Titanium (Ti)-Total	<0.00050		0.00050	mg/L	08-AUG-14	08-AUG-14	R2912990
Tungsten (W)-Total	<0.00010		0.00010	mg/L	08-AUG-14	08-AUG-14	R2912990
Uranium (U)-Total	0.00225		0.00010	mg/L	08-AUG-14	08-AUG-14	R2912990
Vanadium (V)-Total	<0.00020		0.00020	mg/L	08-AUG-14	08-AUG-14	R2912990
Zinc (Zn)-Total	0.0036		0.0020	mg/L	08-AUG-14	08-AUG-14	R2912990
Zirconium (Zr)-Total	<0.00040		0.00040	mg/L	08-AUG-14	08-AUG-14	R2912990
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	<6.0		6.0	mg/L		25-JUL-14	R2903636

* 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
L1492043-1 SANI 2 (WASTE DISPOSAL GROUND - STREAM)							
Sampled By: CLIENT on 23-JUL-14 @ 11:30							
Matrix: DUMP STREAM							
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	<6.0		6.0	mg/L		30-JUL-14	R2903636
L1492043-2 SANI 2 (WASTE DISPOSAL GROUND - STREAM) - TROUT							
Sampled By: CLIENT on 23-JUL-14 @ 11:30							
Matrix: DUMP STREAM							
Miscellaneous Parameters							
Trout Bioassay - Pass/Fail	See attached.					25-JUL-14	R2909951
L1492043-3 SANI 2 (WASTE DISPOSAL GROUND - STREAM) - DAPHNIA							
Sampled By: CLIENT on 23-JUL-14 @ 11:30							
Matrix: DUMP STREAM							
Miscellaneous Parameters							
Daphnia Magna - Pass/Fail	See attached.					25-JUL-14	R2902258
L1492043-4 SANI 4 (LAGOON - STREAM)							
Sampled By: CLIENT on 23-JUL-14 @ 11:00							
Matrix: LAGOON STREAM							
Miscellaneous Parameters							
Ammonia, Total (as N)	0.017		0.010	mg/L		25-JUL-14	R2899368
Conductivity	1810		20	umhos/cm		26-JUL-14	R2898912
Fecal Coliforms	9		3	MPN/100mL		28-JUL-14	R2900631
Mercury (Hg)-Total	0.000026		0.000020	mg/L	28-JUL-14	28-JUL-14	R2901935
Oil and Grease, Total	<2.0		2.0	mg/L	31-JUL-14	31-JUL-14	R2907090
Phenols (4AAP)	<0.0010		0.0010	mg/L	29-JUL-14	29-JUL-14	R2901191
Phosphorus (P)-Total	0.162		0.010	mg/L		30-JUL-14	R2902453
Sulfate	117		2.5	mg/L		25-JUL-14	R2899779
Total Suspended Solids	6.0		5.0	mg/L		28-JUL-14	R2901609
pH	7.94		0.10	pH units		26-JUL-14	R2898912
Total Metals by ICP-MS							
Aluminum (Al)-Total	<0.0050		0.0050	mg/L	08-AUG-14	08-AUG-14	R2912990
Antimony (Sb)-Total	<0.00020		0.00020	mg/L	08-AUG-14	08-AUG-14	R2912990
Arsenic (As)-Total	0.00070		0.00020	mg/L	08-AUG-14	08-AUG-14	R2912990
Barium (Ba)-Total	0.0109		0.00020	mg/L	08-AUG-14	08-AUG-14	R2912990
Beryllium (Be)-Total	<0.00020		0.00020	mg/L	08-AUG-14	08-AUG-14	R2912990
Bismuth (Bi)-Total	<0.00020		0.00020	mg/L	08-AUG-14	08-AUG-14	R2912990
Boron (B)-Total	0.128		0.010	mg/L	08-AUG-14	08-AUG-14	R2912990
Cadmium (Cd)-Total	0.000013		0.000010	mg/L	08-AUG-14	08-AUG-14	R2912990
Calcium (Ca)-Total	97.4		0.10	mg/L	08-AUG-14	08-AUG-14	R2912990
Cesium (Cs)-Total	<0.00010		0.00010	mg/L	08-AUG-14	08-AUG-14	R2912990
Chromium (Cr)-Total	<0.0010		0.0010	mg/L	08-AUG-14	08-AUG-14	R2912990
Cobalt (Co)-Total	0.00023		0.00020	mg/L	08-AUG-14	08-AUG-14	R2912990
Copper (Cu)-Total	0.00171		0.00020	mg/L	08-AUG-14	08-AUG-14	R2912990
Iron (Fe)-Total	<0.10		0.10	mg/L	08-AUG-14	08-AUG-14	R2912990
Lead (Pb)-Total	<0.000090		0.000090	mg/L	08-AUG-14	08-AUG-14	R2912990
Lithium (Li)-Total	0.0104		0.0020	mg/L	08-AUG-14	08-AUG-14	R2912990
Magnesium (Mg)-Total	48.7		0.010	mg/L	08-AUG-14	08-AUG-14	R2912990
Manganese (Mn)-Total	0.0103		0.00030	mg/L	08-AUG-14	08-AUG-14	R2912990
Molybdenum (Mo)-Total	0.00049		0.00020	mg/L	08-AUG-14	08-AUG-14	R2912990
Nickel (Ni)-Total	<0.0020		0.0020	mg/L	08-AUG-14	08-AUG-14	R2912990
Phosphorus (P)-Total	0.17		0.10	mg/L	08-AUG-14	08-AUG-14	R2912990
Potassium (K)-Total	4.94		0.020	mg/L	08-AUG-14	08-AUG-14	R2912990
Rubidium (Rb)-Total	0.00147		0.00020	mg/L	08-AUG-14	08-AUG-14	R2912990

* 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
L1492043-4 SANI 4 (LAGOON - STREAM)							
Sampled By: CLIENT on 23-JUL-14 @ 11:00							
Matrix: LAGOON STREAM							
Total Metals by ICP-MS							
Selenium (Se)-Total	<0.0010		0.0010	mg/L	08-AUG-14	08-AUG-14	R2912990
Silicon (Si)-Total	2.22		0.10	mg/L	08-AUG-14	08-AUG-14	R2912990
Silver (Ag)-Total	<0.00010		0.00010	mg/L	08-AUG-14	08-AUG-14	R2912990
Sodium (Na)-Total	273		0.030	mg/L	08-AUG-14	08-AUG-14	R2912990
Strontium (Sr)-Total	0.445		0.00010	mg/L	08-AUG-14	08-AUG-14	R2912990
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	08-AUG-14	08-AUG-14	R2912990
Thallium (Tl)-Total	<0.00010		0.00010	mg/L	08-AUG-14	08-AUG-14	R2912990
Thorium (Th)-Total	<0.00010		0.00010	mg/L	08-AUG-14	08-AUG-14	R2912990
Tin (Sn)-Total	<0.00020		0.00020	mg/L	08-AUG-14	08-AUG-14	R2912990
Titanium (Ti)-Total	<0.00050		0.00050	mg/L	08-AUG-14	08-AUG-14	R2912990
Tungsten (W)-Total	<0.00010		0.00010	mg/L	08-AUG-14	08-AUG-14	R2912990
Uranium (U)-Total	0.00230		0.00010	mg/L	08-AUG-14	08-AUG-14	R2912990
Vanadium (V)-Total	<0.00020		0.00020	mg/L	08-AUG-14	08-AUG-14	R2912990
Zinc (Zn)-Total	<0.0020		0.0020	mg/L	08-AUG-14	08-AUG-14	R2912990
Zirconium (Zr)-Total	<0.00040		0.00040	mg/L	08-AUG-14	08-AUG-14	R2912990
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	<6.0		6.0	mg/L		25-JUL-14	R2903636
Biochemical Oxygen Demand	<6.0		6.0	mg/L		30-JUL-14	R2903636
L1492043-5 SANI 4 (LAGOON - STREAM) - TROUT							
Sampled By: CLIENT on 23-JUL-14 @ 11:00							
Matrix: LAGOON STREAM							
Miscellaneous Parameters							
Trout Bioassay - Pass/Fail	See attached.					25-JUL-14	R2909951
L1492043-6 SANI 4 (LAGOON - STREAM) - DAPHNIA							
Sampled By: CLIENT on 23-JUL-14 @ 11:00							
Matrix: LAGOON STREAM							
Miscellaneous Parameters							
Daphnia Magna - Pass/Fail	See attached.					25-JUL-14	R2902258

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

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
BOD-WP	Water	Biochemical Oxygen Demand (BOD)	APHA 5210 B

The sample is incubated for 5 days at 20 degrees Celcius. Comparison of dissolved oxygen content at the beginning and end of incubation provides a measure of biochemical oxygen demand. If carbonaceous BOD is requested, TCMP is added to the sample to chemically inhibit nitrogenous oxygen demand. If soluble BOD is requested, the sample is filtered prior to analysis. Surface waters have a DL of 1 mg/L. Effluents are diluted according to their history and will have a sample DL of 6 mg/L or greater, depending on the dilutions used.

DAPHNIA-P/F-WP	Water	Daphnia Magna Pass/Fail	EPS/1/RM/11,EPS 1/RM/14

Daphnia Magna, grown under controlled conditions, are introduced into a single 100% concentration of a sample in order to obtain an Pass/Fail indication of toxicity. A Fail occurs when greater than 50% of the organisms die.

EC-WP	Water	Conductivity	APHA 2510B

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

FC-MPN-WP	Water	Fecal Coliform	APHA 9221E

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

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

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

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

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

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

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

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

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

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

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

PH-WP	Water	pH	APHA 4500H

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

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

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

SO4-IC-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 aquesous matrices is determined gravimetrically after drying the residue at 103 105°C.

TROUT-P/F-WP	Water	Trout Bioassay Pass/Fail	EPS 1/RM/13, EPS 1/RM/9

Certified, disease-free rainbow trout (Oncorhynchus mykiss) are exposed to the full-strength (100%) sample, under static conditions in order to obtain a pass/fail indication of toxicity. A sample is considered to "fail" if >50% mortality is observed within a 96-hour exposure period.

** 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

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
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.

Rainbow Trout Bioassay Test Report - Pass/Fail

Sample ID:	L1492043-2

Summary Results

96-hour Pass/Fail:	PASS

Sample Information

Sample Origin:	Municipality of Sanikiluaq
Sample Description:	SANI-2 (Waste Disposal Ground - Stream)
Sampling Date and Time:	23-Jul-14 11:30
Sampling Method:	Grab
Sampled By:	Moses
Container(s) Description:	1 x 20L polyethylene pail with liner
Sample Volume:	20L
Date and Time Received:	24-Jul-14 12:30
Transit Irregularities:	None
Storage Temperature (°C):	15

Test Information

Test Organism:	Oncorhynchus mykiss
Test Description:	Acute, 96-hour, Static, Pass/Fail
Reference Method(s):	EPS 1/RM/13, 2nd Ed. Dec. 2000, with May 2007 amendments, Environment Canada EPS 1/RM/9, May 1996 with May 2007 amendments, Environment Canada
Performed By:	JRB
Starting Date and Time:	25-Jul-14 10:45
Deviations from Reference Method:	None

Initial Parameters

Observations

Colour:	Light Yellow				
Odour:	Mild				
Turbidity:	None				
Solids:	None				
Hardness (mg/L):	1.9	mL Titration Solution/	10	mL of Sample x 1000 =	190
Alkalinity (mg/L):	1.6	mL Titration Solution/	10	mL of Sample x 1000 =	160
Temperature (°C):	15				
Dissolved Oxygen (mg/L):	9.32				
Conductivity (µmhos/cm):	481				
pH (5.5-8.5 pH units):	7.69				
pH Adjustment:	Not Adjusted				
pH Adjustment Procedure:	n/a				

Pre-Aeration

Aeration Rate (5.5-7.5 mL/min/L):	6.40 ± 0.6	
Aeration Time (min):	30	
Sample Test Concentration (v/v):	100%	0%
Dissolved Oxygen (D.O.) Before Pre-Aeration (%):	95.9	94.4
Average D.O. After Pre-Aeration (%):	98.5	91.8

Test Organism Data

Lot Number:	28/05/14 T2
Weekly Mortality Preceeding Test (%):	0.4
Sample Size:	10

Conditions Common to All Concentrations During Test

Source of Holding/Dilution Water:	Dechlorinated UV Treated City of Winnipeg Tap Water
Container Description:	20 L Polyethylene Pail with Liner
Aeration Method:	Compressed air bubbled through silica-glass air diffuser
Aeration Rate (5.5-7.5 mL/min/L):	6.40 ± 0.6
Test Solution Volume (L):	20
Test Solution Depth (cm):	34
Number of Test Organisms per Container:	10
Loading Density (g/L):	0.28

Conditions During Test

Concentration (% v/v)	Temperature (˚C) (15 ± 1˚C)					Dissolved Oxygen (mg/L)					pH (pH units)				
	0h	24h	48h	72h	96h	0h	24h	48h	72h	96h	0h	24h	48h	72h	96h
0	15	n/a	n/a	n/a	15	8.77	n/a	n/a	n/a	9.71	7.43	n/a	n/a	n/a	7.53
100	15	n/a	n/a	n/a	15	9.92	n/a	n/a	n/a	9.68	7.74	n/a	n/a	n/a	7.93

Conc. (% v/v)	Conductivity (µmhos/cm)	Number of Fish Dead				Number of Fish Stressed			
	0h	24h	48h	72h	96h	24h	48h	72h	96h
0	280	0	n/a	n/a	0	0	n/a	n/a	0
100	491	0	n/a	n/a	0	0	n/a	n/a	0

Control Fish Information at End of Test

Mean Fork Length (mm):	41
Lower Range Fork Length (mm):	36
Upper Range Fork Length (mm):	46
Mean Wet Weight:	0.56

Mortality and Stressed Behaviour Information

Conc. (% v/v)	Mean Number of Fish at End of Test		Mean Rate of Fish at End of Test (%)	
	Dead	Stressed	Dead	Stressed
0	0	0	0	0
100	0	0	0	0

Reference Toxicant Test Results

Reference Toxicant:	Zinc Sulfate
Date Reference Toxicant Initiated:	24-Jul-14
Recent 96h Reference Toxicant Test LC50 (mg/L Zinc):	0.45
Lower 95% Confidence Limit (mg/L Zinc):	0.31
Upper 95% Confidence Limit (mg/L Zinc):	0.61
Historic Geometric Mean LC50 (mg/L Zinc):	0.65
Lower 95% Confidence Limit (mg/L Zinc):	0.24
Upper 95% Confidence Limit (mg/L Zinc):	1.72
Method of Calculation:	Stephan LC50 Program, Probit
Confirmed by Graph:	Yes

Sublethal Biological Effects

No sublethal biological effects observed.

Observations/Comments

No toxicity observed.

Daphnia Magna Bioassay Test Report - Pass/Fail

Sample ID:	L1492043-3

Summary Results

48-hour Pass/Fail:	PASS

Sample Information

Sample Origin:	Municipality of Sanikiluaq
Sample Description:	SANI-2 (Waste Disposal Ground - Stream)
Sampling Date and Time:	23-Jul-14 11:30
Sampling Method:	Grab
Sampled By:	Moses
Container(s) Description:	1 x 20L polyethylene pail with liner
Sample Volume:	20L
Date and Time Received:	24-Jul-14 12:30
Transit Irregularities:	None
Storage Temperature (°C):	20

Test Information

Test Organism:	Daphnia magna
Test Description:	Acute, 48-hour, Static, Pass/Fail
Reference Method(s):	EPS 1/RM/14, 2nd Ed. Dec. 2000, Environment Canada
	EPS 1/RM/11, July 1990, Environment Canada
Performed By:	JRB
Starting Date and Time:	25-Jul-14 14:00
Deviations from Reference Method:	None

Condition of Effluent at 100% v/v Before Preparing Dilutions

Observations

Colour:	Light Yellow					
Odour:	Mild					
Turbidity:	None					
Solids:	None					
Temperature (°C):	20					
Dissolved Oxygen (mg/L):	10.15					
Conductivity (µmhos/cm):	547					
pH:	7.57					
pH Adjustment:	Not Adjusted					
pH Adjustment Procedure:	n/a					
Hardness (mg/L) Before Adjustment:	1.9	mL Titration Solution/	10	mL of Sample x 1000 =	190	
Hardness (mg/L) After Adjustment:	n/a	mL Titration Solution/	n/a	mL of Sample x 1000 =	n/a	
Alkalinity (mg/L):	1.6	mL Titration Solution/	10	mL of Sample x 1000 =	160	

Pre-Aeration

Aeration Rate (25-50 mL/min/L):	33.5 ± 0.2	
Aeration Time (min):	30	
Sample Test Concentration (v/v):	100%	0%
Dissolved Oxygen (D.O.) Before Pre-Aeration (%):	110.7	93.6
Average D.O. After Pre-Aeration (%):	99.8	94.2

Test Organism Data

Average age of daphnia at first brood (days):	10
Average number of neonates per brood:	24
Weekly Mortality Preceeding Test (%):	5.6
Date Parents Born:	8-Jul-14
Loading Density (organisms/20 mL):	1
Age of test organisms at beginning of test (hrs):	<24

Conditions Common to All Concentrations During Test

Volume Tested:	200 mL (for control and 100%)
Triplicate solutions for control & 100%:	Yes
Neonates per Vessel:	10
Volume per Neonate:	20 mL
Test Solution Depth:	70 mm
Container Description:	Plastic Cups
Source of Holding/Dilution Water:	Dechlorinated UV Treated City of Winnipeg Tap Water

Conditions During Test

Concentration	Temperature (°C)			Dissolved Oxygen (mg/L)		pH		Conductivity (µmhos/cm)	Hardness (mg/L)	Immobility (# of daphnids)		Mortality (# of daphnids)
(% v/v)	0h	24h	48h	0h	48h	0h	48h	0h	0h	24h	48h	48h
0	20	20	20	8.57	8.60	7.79	7.75	329	90	0	0	0
0	20	20	20	8.61	8.63	7.79	7.74	329	90	0	0	0
0	20	20	20	8.75	8.57	7.80	7.73	329	90	0	0	0
100	20	20	20	9.18	8.59	7.93	8.10	543	190	0	0	0
100	20	20	20	9.05	8.62	7.93	8.11	545	190	0	0	0
100	20	20	20	8.99	8.61	7.94	8.11	544	190	0	0	0

Mortality and Immobility Information

Conc.	Mean Number of Daphnids at End of Test		Mean Rate of Daphnids at End of Test (%)	
(% v/v)	Dead	Immobile	Dead	Immobile
0	0	0	0	0
100	0	0	0	0

Reference Toxicant Test Results

Reference Toxicant:	Sodium Chloride
Date Reference Toxicant Initiated:	23-Jul-14
Recent 48h Reference Toxicant Test LC50 (mg/L NaCl):	6382
Lower 95% Confidence Limit (mg/L NaCl):	6155
Upper 95% Confidence Limit (mg/L NaCl):	6975
Historic Geometric Mean LC50 (mg/L NaCl):	5806
Lower Warning Limit (-2 S.D.):	5220
Upper Warning Limit (+2 S.D.):	6459
Method of Calculation:	Stephan LC50 Program, Probit
Confirmed by Graph:	Yes

Observations/Comments

No toxicity observed.

Rainbow Trout Bioassay Test Report - Pass/Fail

Sample ID:	L1492043-5

Summary Results

96-hour Pass/Fail:	PASS

Sample Information

Sample Origin:	Municipality of Sanikiluaq
Sample Description:	SANI-4 (Lagoon-Stream)
Sampling Date and Time:	23-Jul-14 11:00
Sampling Method:	Grab
Sampled By:	Moses
Container(s) Description:	1 x 20L polyethylene pail with liner
Sample Volume:	20L
Date and Time Received:	24-Jul-14 12:30
Transit Irregularities:	None
Storage Temperature (°C):	15

Test Information

Test Organism:	Oncorhynchus mykiss
Test Description:	Acute, 96-hour, Static, Pass/Fail
Reference Method(s):	EPS 1/RM/13, 2nd Ed. Dec. 2000, with May 2007 amendments, Environment Canada EPS 1/RM/9, May 1996 with May 2007 amendments, Environment Canada
Performed By:	JRB
Starting Date and Time:	25-Jul-14 10:45
Deviations from Reference Method:	None

Initial Parameters

Observations

Colour:	Light Yellow				
Odour:	Mild				
Turbidity:	None				
Solids:	None				
Hardness (mg/L):	4.3	mL Titration Solution/	10	mL of Sample x 1000 =	430
Alkalinity (mg/L):	1.7	mL Titration Solution/	10	mL of Sample x 1000 =	170
Temperature (°C):	15				
Dissolved Oxygen (mg/L):	10.39				
Conductivity (µmhos/cm):	1990				
pH (5.5-8.5 pH units):	7.75				
pH Adjustment:	Not Adjusted				
pH Adjustment Procedure:	n/a				

Pre-Aeration

Aeration Rate (5.5-7.5 mL/min/L):	6.40 ± 0.6	
Aeration Time (min):	120	
Sample Test Concentration (v/v):	100%	0%
Dissolved Oxygen (D.O.) Before Pre-Aeration (%):	103.8	93.5
Average D.O. After Pre-Aeration (%):	100.2	95.2

Test Organism Data

Lot Number:	28/05/14 T2
Weekly Mortality Preceeding Test (%):	0.4
Sample Size:	10

Conditions Common to All Concentrations During Test

Source of Holding/Dilution Water:	Dechlorinated UV Treated City of Winnipeg Tap Water
Container Description:	20 L Polyethylene Pail with Liner
Aeration Method:	Compressed air bubbled through silica-glass air diffuser
Aeration Rate (5.5-7.5 mL/min/L):	6.40 ± 0.6
Test Solution Volume (L):	20
Test Solution Depth (cm):	34
Number of Test Organisms per Container:	10
Loading Density (g/L):	0.28

Conditions During Test

Concentration (% v/v)	Temperature (˚C) (15 ± 1˚C)					Dissolved Oxygen (mg/L)					pH (pH units)				
	0h	**24h**	**48h**	**72h**	**96h**	**0h**	**24h**	**48h**	**72h**	**96h**	**0h**	**24h**	**48h**	**72h**	**96h**
0	15	n/a	n/a	n/a	15	9.37	n/a	n/a	n/a	9.70	7.46	n/a	n/a	n/a	7.50
100	15	n/a	n/a	n/a	15	10.07	n/a	n/a	n/a	9.59	7.77	n/a	n/a	n/a	8.15

Conc. (% v/v)	Conductivity (µmhos/cm)	Number of Fish Dead				Number of Fish Stressed			
	0h	**24h**	**48h**	**72h**	**96h**	**24h**	**48h**	**72h**	**96h**
0	277	0	n/a	n/a	0	0	n/a	n/a	0
100	1980	0	n/a	n/a	0	0	n/a	n/a	0

Control Fish Information at End of Test

Mean Fork Length (mm):	41
Lower Range Fork Length (mm):	37
Upper Range Fork Length (mm):	45
Mean Wet Weight:	0.57

Mortality and Stressed Behaviour Information

Conc. (% v/v)	Mean Number of Fish at End of Test		Mean Rate of Fish at End of Test (%)	
	Dead	**Stressed**	**Dead**	**Stressed**
0	0	0	0	0
100	0	0	0	0

Reference Toxicant Test Results

Reference Toxicant:	Zinc Sulfate
Date Reference Toxicant Initiated:	24-Jul-14
Recent 96h Reference Toxicant Test LC50 (mg/L Zinc):	0.45
Lower 95% Confidence Limit (mg/L Zinc):	0.31
Upper 95% Confidence Limit (mg/L Zinc):	0.61
Historic Geometric Mean LC50 (mg/L Zinc):	0.65
Lower 95% Confidence Limit (mg/L Zinc):	0.24
Upper 95% Confidence Limit (mg/L Zinc):	1.72
Method of Calculation:	Stephan LC50 Program, Probit
Confirmed by Graph:	Yes

Sublethal Biological Effects

No sublethal biological effects observed.

Observations/Comments

No toxicity observed.

Daphnia Magna Bioassay Test Report - Pass/Fail

Sample ID:	L1492043-6

Summary Results

48-hour Pass/Fail:	PASS

Sample Information

Sample Origin:	Municipality of Sanikiluaq
Sample Description:	SANI-4 (Lagoon - Stream)
Sampling Date and Time:	23-Jul-14 11:00
Sampling Method:	Grab
Sampled By:	Moses
Container(s) Description:	1 x 20L polyethylene pail with liner
Sample Volume:	20L
Date and Time Received:	24-Jul-14 12:30
Transit Irregularities:	None
Storage Temperature (°C):	20

Test Information

Test Organism:	Daphnia magna
Test Description:	Acute, 48-hour, Static, Pass/Fail
Reference Method(s):	EPS 1/RM/14, 2nd Ed. Dec. 2000, Environment Canada
	EPS 1/RM/11, July 1990, Environment Canada
Performed By:	JRB
Starting Date and Time:	25-Jul-14 14:00
Deviations from Reference Method:	None

Condition of Effluent at 100% v/v Before Preparing Dilutions

Observations

Colour:	Light Yellow					
Odour:	Mild					
Turbidity:	None					
Solids:	None					
Temperature (°C):	20					
Dissolved Oxygen (mg/L):	10.27					
Conductivity (µmhos/cm):	2.6					
pH:	7.65					
pH Adjustment:	Not Adjusted					
pH Adjustment Procedure:	n/a					
Hardness (mg/L) Before Adjustment:	4.3	mL Titration Solution/	10	mL of Sample x 1000 =	430	
Hardness (mg/L) After Adjustment:	n/a	mL Titration Solution/	n/a	mL of Sample x 1000 =	n/a	
Alkalinity (mg/L):	1.7	mL Titration Solution/	10	mL of Sample x 1000 =	170	

Pre-Aeration

Aeration Rate (25-50 mL/min/L):	33.5 ± 0.2	
Aeration Time (min):	30	
Sample Test Concentration (v/v):	100%	0%
Dissolved Oxygen (D.O.) Before Pre-Aeration (%):	112.4	93.6
Average D.O. After Pre-Aeration (%):	99.1	95.5

Test Organism Data

Average age of daphnia at first brood (days):	10
Average number of neonates per brood:	24
Weekly Mortality Preceeding Test (%):	5.6
Date Parents Born:	8-Jul-14
Loading Density (organisms/20 mL):	1
Age of test organisms at beginning of test (hrs):	<24

Conditions Common to All Concentrations During Test

Volume Tested:	200 mL (for control and 100%)
Triplicate solutions for control & 100%:	Yes
Neonates per Vessel:	10
Volume per Neonate:	20 mL
Test Solution Depth:	70 mm
Container Description:	Plastic Cups
Source of Holding/Dilution Water:	Dechlorinated UV Treated City of Winnipeg Tap Water

Conditions During Test

Concentration	Temperature (°C)			Dissolved Oxygen (mg/L)		pH		Conductivity (µmhos/cm)	Hardness (mg/L)	Immobility (# of daphnids)		Mortality (# of daphnids)
(% v/v)	0h	24h	48h	0h	48h	0h	48h	0h	0h	24h	48h	48h
0	20	20	20	8.75	8.64	7.80	7.57	330	90	0	0	0
0	20	20	20	8.77	8.60	7.81	7.53	330	90	0	0	0
0	20	20	20	8.82	8.62	7.81	7.53	331	90	0	0	0
100	20	20	20	9.07	8.64	7.89	7.97	2170	430	0	0	0
100	20	20	20	9.03	8.56	7.90	7.99	2170	430	0	0	0
100	20	20	20	9.03	8.63	7.91	8.00	2160	430	0	0	0

Mortality and Immobility Information

Conc.	Mean Number of Daphnids at End of Test		Mean Rate of Daphnids at End of Test (%)	
(% v/v)	Dead	Immobile	Dead	Immobile
0	0	0	0	0
100	0	0	0	0

Reference Toxicant Test Results

Reference Toxicant:	Sodium Chloride
Date Reference Toxicant Initiated:	23-Jul-14
Recent 48h Reference Toxicant Test LC50 (mg/L NaCl):	6382
Lower 95% Confidence Limit (mg/L NaCl):	6155
Upper 95% Confidence Limit (mg/L NaCl):	6975
Historic Geometric Mean LC50 (mg/L NaCl):	5806
Lower Warning Limit (-2 S.D.):	5220
Upper Warning Limit (+2 S.D.):	6459
Method of Calculation:	Stephan LC50 Program, Probit
Confirmed by Graph:	Yes

Observations/Comments

No toxicity observed.

ALS Environmental

L1492043-COFC

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COC # ____

Page ___ of ___

Report To			
Company:	Municipality of SANIKILUAQ (W10375)	☑ Standard	☐ Other
Contact:	ANDRE LARABIE SAO	☑ PDF ☐ Excel ☐ Digital ☐ Fax	
Address:	Box 157	Email 1:	sanisao@qiniq.com
	Sanikiluaq, NU, X0A 0W0	Email 2:	sanilands@qiniq.com
Phone:	867-266-7900 Fax: 867-266-8919	Email 3:	broy@gov.nu.ca
Invoice To	Same as Report ? ☐ Yes ☐ No	Client / Project Information	
Hardcopy of Invoice with Report?	☐ Yes ☐ No	Job #:	SANIKILUAQ WWTP
Company:	(W10375)	PO / AFE:	
Contact:		LSD:	
Address:			
Phone:	Fax:	Quote #:	Q37083
Lab Work Order # (lab use only)		ALS Contact:	Sampler: Moses

Service Requested (Rush for routine analysis subject to availability)

- ◉ Regular (Standard Turnaround Times - Business Days)
- ○ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT
- ○ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT
- ○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT

Analysis Request

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

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	BOD-WP	pH, Cond	TSS, SO4	FC-MPN (Fecal Coliform)	NH3, P-Total	Met-T-L-MS-WP	HG-T-CVAF-WP	Phenols-4AAP-WT	OGG-TOT-WT		TROUT-P/F-WP	DAPHNIA-P/F-WP	Number of Containers (16)
	Sani 2 (Waste Disposal Ground - Stream)	23-07-14	11:30 AM	DUMP STRM	X	X	X	X	X	X	X	X	X		X	X	
	Sani 4 (Lagoon - Stream)	23-07-14	11:00 AM	LAGOON STM	X	X	X	X	X	X	X	X	X		X	X	

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

Bottles Required - 500 ml BOD, 125 ml Sterile Bacti, 250 ml Nutrient, 1 L Amber W/M OGG, 1 L Routine, 250 ml Metals, 40 ml Mercury + HCL, 250ml Phenols , 20 L Pail w liner

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.
By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab.
Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by: RD	Date: 24/7/14	Time: 12:30	Temperature: 10 °C	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF