



Report of Analysis

812-CE / CL- EPD COMPLIANCE 2017/18

Connor Fraleigh
MOE
BC
Lower Mainland

Siute 200-10470 152 Street
Surry, BC
V3R 0Y3

Work Order: V18B075

Reported: 2018-03-07

Printed: 2018-03-07

Authorization:

Lauretta Liem For Graham van Aggelen
Manager, PYLET

The results reported pertain only to the samples submitted to and tested by the Environment and Climate Change Canada (ECCC) laboratory indicated in the report.

These ECCC laboratories are accredited by the Canadian Association for Laboratory Accreditation (CALA) to the standard ISO/IEC 17025 for each of the reported analytes, except where indicated by an asterisk (). Please refer to the CALA website (www.cala.ca) to view the full Scope(s) of Accreditation.*

ABSTRACT

Sample Manager contact:

Email: ec.coordonnateurdusoutiendelaboratoire-labsupportcoordinator.ec@canada.ca
<<mailto:ec.coordonnateurdusoutiendelaboratoire-labsupportcoordinator.ec@canada.ca>>

Phone: (604) 903-4413

QA Officer contact:

Email: ec.agentdassurancedelaqualitelepy-qualityassuranceofficerpylet.ec@canada.ca
<<mailto:ec.agentdassurancedelaqualitelepy-qualityassuranceofficerpylet.ec@canada.ca>>

Phone: (604) 903-4411

<u>Unit</u>	<u>Description</u>
% by Volume	Percent by volume

<u>Qualifier</u>	<u>Description</u>
NAL	Not Acutely Lethal
*	Non-Accredited Analysis/Analyte
ND	Not Detected at Reporting Limit (RL)
NR	Not Recoverable

SAMPLE DESCRIPTION

<u>Lab ID</u>	<u>Client ID</u>	<u>Station ID</u>	<u>Matrix</u>	<u>Date/Time Sampled</u>	<u>Date Received</u>	<u>Sample Type</u>
V18B075-01	SAMPLE 1		Water	2018-02-21 13:07 PAC Sampled By: Laura Hunse	2018-02-28	Grab

REFERENCES

<u>Method ID</u>	<u>Laboratory Method</u>	<u>Reference</u>
V0503W	V_Microtox_IC50ML	EPS 1/RM/24
<u>Toxicology Containers</u>		<u>Temperature °C</u>

ACUTE LETHALITY TEST USING RAINBOW TROUT (96 HOUR SINGLE CONCENTRATION) - REPORT

LAB SAMPLE ID: V18B075-01

Analyst: CWB

DESCRIPTION OF SAMPLE:

-yellow grey; E311189

DESCRIPTION OF TEST FACILITIES & CONDITIONS:

The fish were held at $15 \pm 2^\circ\text{C}$ for ≥ 2 weeks prior to the use in the test. Fish were not fed < 16 hours before the start of the test. Testing was started ≤ 5 days of sample collection. Tests were conducted in glass aquarium or plastic tanks lined with disposable polyethylene liners. Test solutions were randomly assigned to test locations. The height of the test solution was ≥ 15 cm. Aeration of oil-free compressed air was provided at a rate of 6.5 ± 1 ml/min.L through airstones. Photoperiod was 16 ± 1 hour light / 8 ± 1 hour dark with an intensity of 100-500 lux. All pH and conductivity measurements were performed using instruments that were automatically temperature compensated. Conductivity measurements are corrected for 25°C . Unless otherwise noted, all test conditions and validity criteria as specified by the Environment Canada test method were met.

pH Adjustment: Samples are normally tested without pH adjustment.

PROTOCOL USED:

Test was performed as prescribed in the laboratory's Standard Operating Procedure and the Environment Canada biological test method, Report EPS 1/RM/13 Second Edition 2000, amended May 2007 and February 2016.

TEST METHOD and/or SOP DEVIATIONS:

The test solutions were $< 14^\circ\text{C}$ at the start of the test. The requirement is $15 \pm 1^\circ\text{C}$.

ANALYSIS TYPE: 96 hr (Static) Single Conc. @ 36 % Test Volume: 1 kg Replicates: 1 Fish / Vessel: 2 Temp. ($^\circ\text{C}$): 15 ± 1

CONTROL/DILUTION WATER: Fresh Water ($\leq 10 \text{‰}$) Source: PYLET Well

TEST ORGANISM: Species: Rainbow Trout *Oncorhynchus mykiss* Batch ID: 171227T6/rbt-fw Tank #: 6
 Source: Aqua Farms Mortality for 7d immediately preceding test: $< 2 \%$

CONTROL FISH DATA: Control Fish Status: no mortality, normal behaviour

Fork Length (cm) Mean: Min.: Max.:
 Weight (g) Mean: Min.: Max.: Loading Density (g/L):

TEST CONDITIONS - WATER QUALITY

Start Date: 2018-02-23 Aeration Start Time: Pre-aeration Time (min): Test Start Time: 13:00

Conc. (%)		Control	Ctrl 9ppt salt	36
D.O. (mg/L)	Initial	10.5	10.1	8.0
	Final	10.3	9.7	9.5
Temp. ($^\circ\text{C}$)	Initial	13.8	13.0	13.1
	Final	13.7	13.7	13.5
pH	Initial	7.65	7.55	7.16
	Final	7.92	7.98	8.05
Conductivity ($\mu\text{S/cm}$)	Initial	420	15930	15900

ACUTE LETHALITY TEST USING RAINBOW TROUT (96 HOUR SINGLE CONCENTRATION) - REPORT

LAB SAMPLE ID: V18B075-01

TEST CONDITIONS - CUMULATIVE MORTALITY / OBSERVATIONS †

Time Check	Concentration (%)					
	Control		Ctrl 9ppt salt		36	
	mortality	obs.	mortality	obs.	mortality	obs.
24 hr	0		0		0	
48 hr	0		0		0	
72 hr	0		0		0	
96 hr	0		0		0	

† Test observation Codes - EPS 1/RM/9 July 1990 amended May 1996 and 2007 Appendix E

** immediate stress, coughing & erratic swimming + behaviour cannot be observed **Integument:** A Shedding B Mucous C Hemorrhaging **Pigmentation:** D Light E Dark F Mottled

General behavior: G Quiescent H Hyperexcitable I Irritated J Surfacing K Sounding L Twitching M Tetanic N Normal Δ Moribund

Swimming: O Ceased P Erratic Q Gyrating R Skittering S Inverted T On side **Respiration:** U Rapid V Slow W Coughing X Surface Z Irregular

QUALITY CONTROL: Reference Toxicant Test

Test Date: 2018-02-23 96 hr (Static) LC50 = 8.6 mg/L 95% confidence limits: 8.0 & 9.3

Chemical: Phenol Geomean 96 hr LC50 = 10.7 mg/L 95% warning limits: 8.2 & 13.8 (n = 20)

ANALYSIS RESULTS:

Conc. (%)	Control	Ctrl 9ppt salt	36
96 hr Mortality (%)	0	0	0

96 hr (Static) Single Concentration = not acutely lethal @ 36% test concentration.

Where the single concentration (SC) is percent mortality of the test organisms held in a particular test solution over an exposure period of 96 hours.

RESULTS NOTES:

The test solution at 36 % has a salinity of 9.1 ppt.

LIQUID PHASE - TOXICITY TEST USING LUMINESCENT BACTERIA - *Vibrio fischeri* (5 & 15 MINUTE IC50) - REPORT

LAB SAMPLE ID: V18B075-01

Analyst: CB

DESCRIPTION OF SAMPLE:

- 250mL sub-sample from 4x20L carboys of cloudy liquid

DESCRIPTION OF TEST FACILITIES & CONDITIONS:

Testing was started ≤ 72 hours of sample collection. Tests were conducted in glass cuvettes. Test instrument was the Microtox M500. Test results were calculated using Microtox Omni software. All physical chemical measurements were performed using instruments that were automatically temperature compensated where necessary. Unless otherwise noted, all test conditions and validity criteria as specified by the Environment Canada test method were met.

PROTOCOL USED:

Test was performed as prescribed in the lab Standard Operating Procedure and the Environment Canada biological test method, Toxicity Test Using Luminescent Bacteria, Report EPS 1/RM/24 November 1992.

TEST METHOD and/or SOP DEVIATIONS:

The test was conducted at 15 ± 0.5°C.

ANALYSIS TYPE:

5 & 15 min IC50 Basic Test Turbidity correction: No Colour correction: No Test Equipment: Model 500 Analyzer

Test Volume: 1 mL Control Replicates: 1 Test Replicates: 1 Start date: 2018-02-27 Start time: 14:45 Test Temp. (°C): 15 ± 0.5

TEST CONCENTRATIONS (%):

1.	0	2.	0.195	3.	0.391	4.	0.781	5.	1.563	6.	3.125	7.	6.25	8.	12.5	9.	25	10.	50
----	---	----	-------	----	-------	----	-------	----	-------	----	-------	----	------	----	------	----	----	-----	----

CONTROL/DILUTION WATER TYPE and SOURCE:

Type: Sea Water ‰ Salinity: 24.5 Source: Sea Water

TEST ORGANISM:

Species: *Vibrio fischeri* Strain: NRRL B-11177 Source: Modern Water Reagent lot #: 17E4123A Receive date: 2017-10-31

Reagent expiry date: 2019-06-01 Reagent reconstitution time: 13:25 Test start time from reagent reconstitution (min): 80

SAMPLE ADJUSTMENTS:

Osmotic Adjustment: 2% NaCl by weight Source: Fisher Scientific (ACS)

QUALITY CONTROL: Reference Toxicant Test

Test Date: 2018-02-27 15 min (Static) IC50 = 20.4 mg/L 95% confidence limits: 15.3 & 27.2

Chemical: Phenol Geomean 15 min (Static) IC50 = 22.8 mg/L 95% warning limits: 16.8 & 30.8 (n = 20)

LIQUID PHASE - TOXICITY TEST USING LUMINESCENT BACTERIA - *Vibrio fischeri* (5 & 15 MINUTE IC50) - REPORT

LAB SAMPLE ID: V18B075-01

ANALYSIS RESULTS:

5 minute (Static) IC50 = not acutely toxic 95% confidence limits: &

Where the inhibition concentration (IC50) is the concentration of material in water that is calculated to cause a 50% decrease in light emission of the test organisms over an exposure period of 5 minutes.

15 minute (Static) IC50 = not acutely toxic 95% confidence limits: &

Where the inhibition concentration (IC50) is the concentration of material in water that is calculated to cause a 50% decrease in light emission of the test organisms over an exposure period of 15 minutes.

The statistical method used to generate the results was the MicrotoxOmni Software for Windows® Version 1.18 95/98/NT: [Copyright by Azur Environmental 1999, issued by Strategic Diagnostics Inc. 2004].

RESULTS NOTES:

The sample was not acutely toxic to *Vibrio fischeri* (Microtox® bacteria) over 5 minutes of exposure.

The sample was not acutely toxic to *Vibrio fischeri* (Microtox® bacteria) over 15 minutes of exposure.

LIQUID PHASE - TOXICITY TEST USING LUMINESCENT BACTERIA - *Vibrio fischeri* (5 & 15 MINUTE IC50) - REPORT

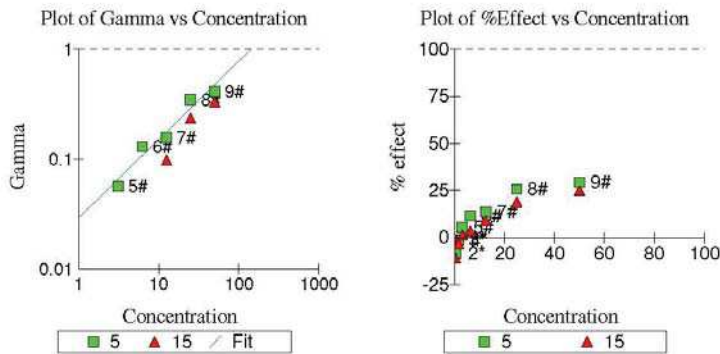
LAB SAMPLE ID: V18B075-01

Microtox Report

Acute Liquid Phase Microtox Test Report

Date: - -

Test Protocol: Basic-type Test
 Sample: Sample 1 E311189
 Toxicant:
 Reagent Lot no.:
 Test description: Sample 1 E311189
 Data File: Sample 1 E311189.K5; Sample 1 E311189.K15;



Sample	Conc	5 Mins Data:				15 Mins Data:		
		To	It	Gamma	% effect	It	Gamma	% effect
Control	0.000	95.50	90.31	0.9457 #		92.87	0.9725 #	
1	0.1953	96.88	93.42	-0.0193 *	-1.970%	96.89	-0.0276 *	-2.843%
2	0.3906	84.40	86.65	-0.0789 *	-8.566%	91.05	-0.0985 *	-10.93%
3	0.7813	89.46	85.55	-0.0111 *	-1.125%	88.37	-0.0155 *	-1.579%
4	1.563	86.02	82.31	-0.0117 *	-1.186%	86.26	-0.0302 *	-3.119%
5	3.125	91.34	81.73	0.0568 #	5.379%	87.53	0.0147 *	1.457%
6	6.250	87.86	73.58	0.1292 #	11.44%	82.42	0.0366 *	3.535%
7	12.50	88.49	72.27	0.1579 #	13.64%	78.36	0.0981	8.940%
8	25.00	92.53	65.00	0.3462 #	25.72%	72.90	0.2343	18.98%
9	50.00	84.19	56.35	0.4129 #	29.22%	61.46	0.3321	24.93%

- used in calculation; * - invalid data; D - deleted from calcs.
 Autocalc has been used.

Calculations on 5 Mins data:
 IC50 Concentration: 127.9% (95% confidence range: 46.49 to 352.0)
 95% Confidence Factor: 2.752
 IC50 value is greater than 100%
 Estimating Equation: LOG C = 1.336 x LOG G + 2.107
 Coeff. of Determination (R²): 0.9542
 Slope: 0.7143
 Correction Factor: 0.9457

Statistical calculations could not be performed on the 15 Mins data.
 Highest % effect: 24.93%

ESTL SAMPLE SUBMISSION FORM / FORMULAIRE DE SOUMISSION D'ÉCHANTILLONS DU LEST

ATTN: CRAIG BUDET

Laboratory / Laboratoire: **CC** ELEMENT Client / Project No. - No du projet (NNNN) **V18B075** Work Order No. - Numéro de demande d'analyse **V18B075** Date/Time Rec'd - Date/heure de réception **FEB 23 2018 (NF)** Temperature on Arrival - Température à l'arrivée (°C) ENVIRODAT submitter ID - Identification ENVIRODAT du client Page **1** of **1**

Sampled by - Échantillonné par (F Name, L Name / surnom, prénom) **LAURE HUNSE** Client Project Manager/Gestionnaire de projet (Client) **CONNOR FRALEIGH MOE** Submitter Expéditeur (F Name, L Name / surnom, prénom) **LAURA HUNSE** Submitter Email - Courriel de l'expéditeur **laura.hunse@gov.bc.ca** Submitter Tel. No - No de tél de l'expéditeur **(250) 751-3224**

Lab Sample No. No du laboratoire	No of containers Nbr de récipients	Client / Field Sample No. No d'échantillon du client	Client / Field Sample Alias No. No d'échantillon alias du client (Alias)	Analyses Requested Analyses demandées												ENVIRODAT Station ID No de station ENVIRODAT	Date (YYYY-MM-DD) (AAAA-MM-JJ)	Time/Heure (h:mm)	Time Zone Fuseau horaire	Matrix / Matrice	Sample Type / Type d'échantillon	Preservative / Agent de conservation	Remarks, Site Description, Sample Descriptions, Preservation Comments, etc. / Remarques, Description du site, Description de l'échantillon, Commentaires sur le conservation etc.
				(1-N)	(Required / Requis)	(Optional / Optionnel)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>								
01	5	XXXXXXXXXXXX SAMPLE 1	E 311189	BC	<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"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		2018-02-23	07	PST	WATER	01	NO	SALINITY = 2.35 AT SITE	

Vertical text on right: **Page 8 of 9 V18B075_1 Detailed 2018.03.07.1643**

Handwritten notes: **96464550 JB**, **Microtox Liquid**, **28 FEB 2018**

Bottom checkboxes:

Metals Extraction/Extraction des métaux:

Metals in water/Métaux dans l'eau: Dissolved/Dissous

Metals in water/Métaux dans l'eau: Extractable/Extractible

Metals in water/Métaux dans l'eau: Total/Totaux

Metals in solid/Métaux dans solide: Extractable/Extractible

Metals in solid/Métaux dans solide: Total Recoverable/Totaux récupérable

Metals in solid/Métaux dans solide: Total/Totaux

Sample Return/Retour d'échantillon: Will pick up sample after analysis complete/Collectera l'échantillon après l'analyse complétée

Samples are non-hazardous and may be disposed after analysis completed / Les échantillons sont non-dangereux et peuvent être jetés après l'analyse complétée.

COE (NF)
WOCN (NF)

Sample Type Code/Code du type d'échantillon

- | | | |
|----|-------------------|--------------------------------|
| # | ENVIRODAT | Element |
| 01 | Discrete Sample | Grab::Instantané |
| 03 | Duplicate Sample | Duplicate::Duplicata |
| 04 | Triplicate Sample | Triplicate::Triplacata |
| 06 | Composite Sample | Composite::Composite |
| 08 | Trp Blank | Trp Blank::Blanc transport |
| 09 | Matrix Spike | Matrix Spike::Matrice enrichie |
| 11 | Pooled Sample | Pooled::Mise en commun |
| 22 | Field Blank | Field Spike::Enrichi terrain |
| 28 | Trp Spike | Trp Spike::Enrichi transport |

Lab Contacts / Contacts des laboratoires

Moncton
Hélène Harper
ALET
443 University Ave.
Moncton, NB
E1A 6S8
Tel/Fax: 506-851-7208
Fax: 506-851-6608

Montreal
François Dumouchel
LECO
105 McGill
Montreal, QC
H2Y 2E7
Tel/Fax: 514-496-7100
Fax: 514-283-1719

Ottawa
Carl Brown
ESTS
335 River Road
Ottawa, ON
K1A 0H3
Tel/Fax: 613-991-1118
Fax: 613-991-9485

Burlington
Sharon Carter
NLET
887 Lakeshore Road
Burlington, ON
L7S 1A1
Tel/Fax: 905-336-6261
Fax: 905-336-6404

Edmonton
Paul Houle
PNLET
5320 122 Street
Edmonton, AB
T6H 3S6
Tel/Fax: 780-435-7335
Fax: 780-435-7268

Vancouver
Graham vanAggelen
PYLET
2645 Dollarton Highway
North Vancouver, BC
V7H 1B1
Tel/Fax: 604-903-4444
Fax: 604-903-4408

