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: V18B066

Reported: 2018-03-06 Printed: 2018-03-06

Authorization:

Lauretta Liem For Graham van Aggelen Manager, PYLET

L. Kiem

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.

Project: 812-CE / CL- EPD COMPLIANCE 2017/18

Work Order: V18B066

ABSTRACT

Client: Connor Fraleigh

Sample Manager contact:

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Email: ec.agentdassurancedelaqualiteleepy-qualityassuranceofficerpylet.ec@canada.ca

Phone: (604) 903-4411

Unit Description

% by Volume Percent by volume

<u>Qualifier</u> <u>Description</u>

* Non-Accredited Analysis/Analyte
 ND Not Detected at Reporting Limit (RL)

NR Not Recoverable

SAMPLE DESCRIPTION

<u>Lab ID</u>	Client ID	Station ID	<u>Matrix</u>	Date/Time Sampled	<u>Date</u> Received	Sample Type
V18B066-01	Effluent - 1		Water	2018-02-22 10:40 PAC	2018-02-26	Grab
				Sampled By: Travis Kurink	а	
V18B066-02	Effluent - 2		Water	2018-02-22 08:40 PAC	2018-02-26	Grab
				Sampled By: Travis Kurink	а	

REFERENCES

Method ID	Laboratory Method	Reference
V0501W	V_Trout_LC50FF	EPS 1/RM/9 or EPS 1/RM13 Second Edition (trout)
Toxicology C	ontainers	Temperature °C

LAB SAMPLE ID: V18B066-01 Analyst: CL2

DESCRIPTION OF SAMPLE:

-light brown, opaque liquid with an odour and particulates

DESCRIPTION OF TEST FACILITIES & CONDITIONS:

The fish were held at $15 \pm 2^{\circ}$ 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:

Test solutions control, 10%, 18%, 32%, and 56% were < 14°C at the start of the test. The requirement is 15 ± 1°C.

ANALYSIS TYPE: 96 hr (Static) LC50 Test Volume: 30 kg Replicates: 1 Fish / Vessel: 10 Temp. (°C): 15 ± 1

CONTROL/DILUTION WATER: Fresh Water (≤ 10 %) Source: PYLET Well Water

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: 5.0 Min.: 4.5 Max.: 6.2

Weight (g) Mean: 1.20 Min.: 0.83 Max.: 2.10 Loading Density (g/L): 0.4

WATER QUALITY @ PREPARATION:

Test Solution	D.O. (mg/L %)		Temp. (°C)	рН	Conductivity (µS/cm)	Salinity (‰)	Hardness (mg/L CaCO ₃)	
100 %	3.8	36.7	14.1	6.91	467	0.2	-	

TEST CONDITIONS - WATER QUALITY

Start Date: 2018-02-27 Aeration Start Time: 09:35 Pre-aeration Time (min): 120 Test Start Time: 11:35

Conc. (%)		Cor	ntrol	1	0	1	8	3	2	56		10	00				
D.O. (mg/L)	Initial	10.1	10.3	9.6	9.8	9.1	9.1	8.2	7.9	6.1	6.1 5.5		2.1				
	Final	10.0		9.5		9	9.1		8.7		.4	1.	3				
Temp. (°C)	Initial	14.0	13.8	13.9	13.7	13.8	13.8	13.9	13.8	14.0	14.0 13.9		14.0				
	Final	14	1.7	14	.7	14	1.5	14	.4	14	1.7	14	.2				
рН	Initial	7.61	7.93	7.53	7.70	7.43	7.51	7.28	7.33	7.11	7.14	6.95	6.98				
	Final	7.	99	7.	82	7.	71	7.	58	7.	7.56		7.56 6.9		96		
Conductivity (µS/cm)	Initial	4	17	42	23	42	26	433 445		445		445		445		46	67



LAB SAMPLE ID: V18B066-01

TEST CONDITIONS - CUMULATIVE MORTALITY / OBSERVATIONS †

		Concentration (%)										
Time Check	Control		10		18		32		56		100	
	mortality	obs.	mortality	obs.	mortality	obs.	mortality	obs.	mortality	obs.	mortality	obs.
0.08 hr (5 min)	0	N	0	N	0	N	0	N	0	U	0	X**
0.16 hr (10 min)	0	N	0	N	0	+	0	N	0	U	0	Т
0.33 hr (20 min)	0	N	0	N	0	N	0	N	0	+	0	ST
0.67 hr (40 min)	0	N	0	N	0	+	0	U	0	U	10	-
1.33 hr (80 min)	0	N	0	+	0	+	0	+	0	+	10	-
2.67 hr	0	N	0	+	0	+	0	+	0	+	10	-
24 hr	0	N	0	N	0	N	0	N	3	+	10	-
48 hr	0	N	0	N	0	N	0	А	4	+	10	-
72 hr	0	N	0	N	0	N	0	N	7	+	10	-
96 hr	0	N	0	N	0	N	0	N	10	-	10	-

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

 $\textbf{General behavior:} \quad \textbf{\textit{G}} \quad \text{Quiescent} \quad \textbf{\textit{H}} \quad \text{Hyperexcitable} \quad \textbf{\textit{I}} \quad \text{Irritated} \quad \textbf{\textit{J}} \quad \text{Surfacing} \quad \textbf{\textit{K}} \quad \text{Sounding} \quad \textbf{\textit{L}} \quad \text{Twitching} \quad \textbf{\textit{M}} \quad \text{Tetanic} \quad \textbf{\textit{N}} \quad \text{Normal} \quad \Delta \quad \text{Moribund}$

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	10	18	32	56	100
96 hr Mortality (%)	0	0	0	0	100	100

96 hr (Static) LC50 = 42.33 % 95% confidence limits: 32 & 56

Where the median lethal concentration (LC50) is the concentration of material in water that is calculated to be lethal to 50% of the test organisms over an exposure period of 96 hours.

Statistical Method used: Binomial/Graphical CETIS (Tidepool Scientific Software) was used to analyze test data.

RESULTS NOTES:



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

LAB SAMPLE ID: V18B066-01

CETIS Analytical Report

CETIS Ana	lytical Re	eport						ort Date: Code:			5:29 (p 1 of 2) 17-9999-5689
Fish 96-h Acu	te Lethality	Test									PYLET
Analysis ID: Analyzed:	13-5996-01 05 Mar-18 1			96 h LC50 Binomial Meth	od			CETIS Version: Official Results		.9.2	
Batch ID:	13-1142-783	6 Tes	t Type:	Lethality-Fish	(96h)		Anal	vst: Chris	stopher Le		
Start Date:	27 Feb-18 1			EC/EPS 1/RM			Dilue		Water		
Ending Date:			ecles: Oncorhynchus my				Brine		10.4151		
Duration:	96h	13		A							
Sample ID:	15-3014-114	3 Co	da	V18B066-01			Clier	· · ·			
Sample Date:				Unknown			Proje		Env Routine	Cample	
Receipt Date:				Unknown			Fioje	sci. BC	EIIV ROUUIIE	Sample	
Sample Age:			tion:	Olikilowii							
			tion.								
Binomial/Grap			Trim		Siamo		EC50	050/ 1 01	06% 1101		
Threshold Op Control Thresh	MANUAL PROPERTY.	Threshold 0	Trim 0.00%	Mu 1.627	Sigma 0		7.5-760000000	95% LCL	95% UCL 56	8	
Control Inresn	ioid	U	0.00%	1.627	0		42.33	32	36		
96 h LC50 Summary				Calc	ulated Varia	ate(A/B)					
Conc-%	Code	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect	Α	В
0	D	1	0.0000		0.0000	0.0000	0.0000		0.0%	0	10
10		1	0.0000		0.0000	0.0000	0.0000		0.0%	0	10
18		1	0.0000		0.0000	0.0000	0.0000		0.0%	0	10
32		1	0.0000	0.0000	0.0000	0.0000	0.0000		0.0%	0	10
56		1	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	100.0%	10	10
100		1	1,0000	1.0000	1.0000	0.0000	0.0000	0.00%	100.0%	10	10
96 h LC50 Det	tail										
Conc-%	Code	Rep 1									
0	D	0.0000									
10		0.0000									
18		0.0000									
32		0.0000									
56		1.0000									
100		1.0000									
96 h LC50 Bin	omials	ATISTENEDIC									
		Den 4									
Conc-%	Code	Rep 1 0/10									
10	-	0/10									
18		0/10									
32		0/10									
56		10/10									
100		10/10									

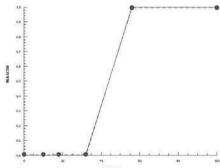


LAB SAMPLE ID: V18B066-01

CETIS Analytical Report

CETIS Ana	alytical Report			Report Date: Test Code:	05 Mar-18 15:29 (p 2 of 2) V18B066-01 17-9999-5689
Fish 96-h Acu	ite Lethality Test			10,000	PYLET
Analysis ID:	13-5996-0112	Endpoint:	96 h LC50	CETIS Version:	CETISv1,9.2
Analyzed:	05 Mar-18 15:28	Analysis:	Binomial Method	Official Results:	Yes

Graphics





LAB SAMPLE ID: V18B066-02 Analyst: CL2

DESCRIPTION OF SAMPLE:

-clear, colourless liquid

DESCRIPTION OF TEST FACILITIES & CONDITIONS:

The fish were held at $15 \pm 2^{\circ}$ 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:

None

ANALYSIS TYPE: 96 hr (Static) LC50 Test Volume: 30 kg Replicates: 1 Fish / Vessel: 10 Temp. (°C): 15 ± 1

CONTROL/DILUTION WATER: Fresh Water (≤ 10 %) Source: PYLET Well Water

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: 4.8 Min.: 4.5 Max.: 5.2

Weight (g) Mean: 1.03 Min.: 0.79 Max.: 1.40 Loading Density (g/L): 0.3

WATER QUALITY @ PREPARATION:

Test Solution	D.O. (m	ıg/L %)	Temp. (°C)	рН	Conductivity (µS/cm)	Salinity (‰)	Hardness (mg/L CaCO ₃)	
100 %	10.7	104.9	14.4	7.18	83	0.1	-	

TEST CONDITIONS - WATER QUALITY

Start Date: 2018-02-27 Aeration Start Time: 09:05 Pre-aeration Time (min): 120 Test Start Time: 11:05

Conc. (%)		Cor	ntrol	1	0	1	8	3	2	2 56		10	00
D.O. (mg/L)	Initial	10.0	10.1	10.3	10.1	10.2	10.2	10.2	10.2	10.3	10.2	10.5	10.4
	Final	9.8		9.9		9.	.9	10).1	10).2	10).2
Temp. (°C)	Initial	15.2	14.9	14.6	14.7	14.6	14.7	14.6	14.6	14.5 14.5		14.4	14.4
	Final	15	5.0	14	.8	15	5.1	14	.8	15	5.0	14	1.5
рН	Initial	7.78	7.95	0.82	7.96	7.82	7.94	7.82	7.94	7.79	7.89	7.78	7.90
	Final	8.	01	7.9	99	7.9	98	8.	02	7.84		7.	80
Conductivity (µS/cm)	Initial	4	19	388		361		314		233		8	3



LAB SAMPLE ID: V18B066-02

TEST CONDITIONS - CUMULATIVE MORTALITY / OBSERVATIONS †

		Concentration (%)										
Time Check	Control		10		18		3	32		6	100	
	mortality	obs.	mortality	obs.	mortality	obs.	mortality	obs.	mortality	obs.	mortality	obs.
0.08 hr (5 min)	0	N	0	N	0	N	0	N	0	N	0	N
0.33 hr (20 min)	0	N	0	N	0	N	0	N	0	N	0	N
0.67 hr (40 min)	0	N	0	N	0	N	0	N	0	U	0	3S, N
1.33 hr (80 min)	0	N	0	N	0	U	0	w	0	5O, U	8	W
2.67 hr	0	N	0	N	0	U	0	w	1	O, U	10	-
24 hr	0	N	0	N	0	U	6	w	10		10	-
48 hr	0	N	0	N	0	N	9	0	10	-	10	-
72 hr	0	N	0	N	0	N	9	N	10	-	10	-
96 hr	0	N	0	N	0	N	9	N	10	-	10	-

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

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	10	18	32	56	100
96 hr Mortality (%)	0	0	0	90	100	100

96 hr (Static) LC50 = 25.4 % 95% confidence limits: 22.81 & 28.29

Where the median lethal concentration (LC50) is the concentration of material in water that is calculated to be lethal to 50% of the test organisms over an exposure period of 96 hours.

Statistical Method used: Untrimmed Spearman-Karber CETIS (Tidepool Scientific Software) was used to analyze test data.

RESULTS NOTES:

The 100% test concentration had a D.O. of 103.6 % after 20 mins of aeration and 102 % after 110mins of aeration.



^{**} 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

LAB SAMPLE ID: V18B066-02

CETIS Analytical Report

CETIS Analytical Report						Report Date: Test Code:		05 Mar-18 15:34 (p 1 of 2) V18B066-02 15-6860-4656			
Fish 96-h Acu	ite Lethality T	est							R03158		PYLET
Analysis ID: Analyzed:			A CONTRACTOR OF THE PERSON NAMED IN				CETIS Version: CETISv1.9.2 Official Results: Yes				
Batch ID: Start Date: Ending Date: Duration:	27 Feb-18 11:35 Pro : 03 Mar-18 11:35 Spe		otocol: E ecles: C	ocol: EC/EPS 1/RM/13 les: Oncorhynchus mykiss			Analyst: Christopher Le Diluent: Well Water Brine: Age:				
Receipt Date: 22 Feb-18 12:00 Sou			de: V18B066-02 terial: Unknown urce: Unknown tion:				Client: Project: BC Env Routine Sample				
Spearman-Kä	irber Estimate	es									
Threshold Option 1		Threshold	Trim	Mu	Sigma		EC50	95% LCL	95% UCL	65	
Control Thresh	Control Threshold 0		0.00%	1.405	0.02338		25.4	22.81	28.29		
96 h LC50 Su	mmary		ne-		Calc	ulated Varia	ate(A/B)			=:	
Conc-%	Code	Count	Mean	Min	Max	Std Err	Std Dev	CV%	% Effect	Α	В
0	D	1	0.0000	0.0000	0.0000	0.0000	0.0000	V.C. (10 (10 (10 (10 (10 (10 (10 (10 (10 (10	0.0%	0	10
10		1	0.0000	0.0000	0.0000	0.0000	0.0000		0.0%	0	10
18		1	0.0000	0.0000	0.0000	0.0000	0.0000		0.0%	0	10
32		1	0.9000	0.9000	0.9000	0.0000	0.0000	0.00%	90.0%	9	10
56		1	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	100.0%	10	10
100		1	1,0000	1.0000	1.0000	0.0000	0.0000	0.00%	100.0%	10	10
96 h LC50 De	tail										
Conc-%	Code	Rep 1									
0	D	0.0000									
10		0.0000									
18		0.0000									
32		0.9000									
56		1.0000									
100		1.0000									
96 h LC50 Bir	nomials										
Conc-%	Code	Rep 1									
0	D	0/10									
10		0/10									
18		0/10									
32		9/10									
56		10/10									
100		10/10									
Artists.		10/10									

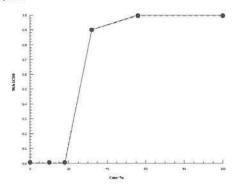


LAB SAMPLE ID: V18B066-02

CETIS Analytical Report

CETIS Ana	lytical Report		Report Date: Test Code:	05 Mar-18 15:34 (p 2 of 2) V18B066-02 15-6860-4656		
Fish 96-h Acute Lethality Test						
Analysis ID:	19-3340-4874	Endpoint:	96 h LC50	CETIS Version:	CETISv1.9.2	
Analyzed:	d: 05 Mar-18 15:34 Analysis: Untrimmed Spe		Untrimmed Spearman-Kärber	Official Results:	Yes	

Graphics





Environment and Climate Change Canada Changement climatique Canada

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

ELEMENT Client /Project No No du projet (NNNN)	Work Order No Numéro de demande d'analy	Date/Time Rec'd - Date/Heure de réception	Temperature on Arrival - Température à l'arrivée (°C)	ENVIRODAT submitter ID - Identification ENVIRODAT du client	Page of/de
Sampled by - Échantillonné par (F. Name, L. Name / surnom, prénom) Lab Sample No. No. of Cilent / Field Sample No. containers Nombré de No d'échantillon du client	Client Project Manager/Gestionnaire de projet (C	Submitter Expéditeur (F. Name / L. Name / surnom, prér Trani Analyses Requested Analyses demandées	HONIZE KURIN KAR ROLDERA	Summitter Tel. No - No de têt de l'expéditeur 1/30 75 - 725 Sampled / Echantillionne Sampled / Echantillionne Time/Heure Time Zone Fusesu horaire Matrix / Matrice 88	Remarks, Site Description, Sample Descriptions, Preservation Comments, etc. / Remarques, Description du site, Description du Secription du Sechantillon, Commentaires sur le conservation etc.
(1-N) (Required/Requis) 5 Effluent - 1 02 5 Effluent - 2	(Optional / Optionnel) 8 8		S S (LINILININI) GAAA		Non (Optional / Optionnel)
Extraction des metaux: Dissolved/Dissous	Metals in water/Métaux dans l'eau: Extractable/Extractible complete/Collectera l'échantillon après l'analyse complét	Total/Totaux	Metals in solid/Métaux dans solide: Extractable/Extractible	0-COFC	in solid/Métaux dans solide:

350/240466/60/2012 12°6/60/500/500

Moncton Helbne Harper ALET AGS University Ave, Moncton, NB EAA 508-851-7208 Tel/Tel: 506-851-6508 Fax: 506-851-6608

Page 12 of 12 V18B066_

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Burlington, ON L7S 1A1 Tel/Tél: 905-336-6261 Fax: 905-336-6404 Burlington Sharon Carrier 867 Lakeshore Road Burlington ON

Edmonton, AB T6H 355 Tel/Tél: 780-435-7355 Fax: 780-435-7268 Edmonton Paul Houle 5320 122 Street 54 Appropries

Vancouver
Graham vanAggelen
PYLET
S645 Dollarton Highway
VOH 181
Tell'fel: 604-903-4444

Canadã

ab Contacts / Contacts des laboratoires

A LABORATORY USE ONLY I VIUSAGE DU LABORATOIRE SEULEMENT

8 Trip Spike Trip Spike::Enirchi transport 24 Field Spike Field Spike::Enrichi terrain 11 Pooled Sample 22 Field Blank Field Blank::Blanc terrain Pooled::Mise en commun 09 Matrix Spike Matrix Spike::Matrice enrichie 08 Trip Blank Trip Blank::Blanc transport of Composite Sample Composite::Composite

Triplicate::Triplicata 04 Triplicate Sample Duplicate::Duplicata 03 Duplicate Sample 01 Discrete Sample Grab::Instantané

ENVIRODAT Sample Type Code/Code du type d'échantillon