



ENVIRONMENTAL DYNAMICS INC.
ATTN: Meghan Marjanovic
2195 - 2nd Ave
Whitehorse YT Y1A 3T8

Date Received: 15-MAY-15
Report Date: 29-MAY-15 17:57 (MT)
Version: FINAL

Client Phone: 867-393-4882

Certificate of Analysis

Lab Work Order #: L1612705
Project P.O. #: NOT SUBMITTED
Job Reference: MOUNT NANSEN 15-Y-0146
C of C Numbers: 1
Legal Site Desc:

Comments: LC50 Rainbow Trout analyses were sub-contracted to Nautilus Environmental Ltd., in Burnaby, BC. Please refer to the attached report for detail.

Can Dang
Senior Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 8081 Lougheed Hwy, Suite 100, Burnaby, BC V5A 1W9 Canada | Phone: +1 604 253 4188 | Fax: +1 604 253 6700
ALS CANADA LTD Part of the ALS Group A Campbell Brothers Limited Company

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID					
Grouping	Analyte				

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
---------------	--------	------------------	--------------------

** 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
----------------------------	---------------------

Chain of Custody Numbers:

1

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

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 of sample.

mg/L - milligrams per litre.

< - Less than.

D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).

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
ATTN: Can Dang
Suite 100-8081 Lougheed Hwy.
Burnaby, BC
V5A 1W9

Report Date: May 29, 2015
Work Order: 15402

Data Report

Species: Rainbow trout (*Oncorhynchus mykiss*)
Protocol: EPS 1/RM/13 (Second Ed. with 2007 amendments)

Table 1. Results for the 96-h rainbow trout acute toxicity test.

Sample ID	Collection Date and Time	96-h LC50 (%v/v)
L1612705-1 (0146-150513)	May 13, 2015 @ N/A	>100

The sample was received on May 19, 2015, outside of the 5-day holding time required under EPS 1/RM/13 test protocol. The client was contacted upon sample receipt for confirmation to proceed with testing.

The test met control performance criterion and there were no other deviations, other than the sample holding time exceedance, from the test method. The results relate only to the sample tested.

Josh Baker, M.Sc.
Environmental Chemist

Reviewed By:
Edmund Canaria, R.P.Bio.
Senior Reviewer

Rainbow Trout Summary Sheet

Client: ALS

Start Date/Time: May 19/15 @ 1145

Work Order No.: 15402

Test Species: Oncorhynchus mykiss

Sample Information:

Sample ID: L1612705-1 0146-150513
Sample Date: May 13/15
Date Received: May 19/15
Sample Volume: 2 x 20L
Other: —

Test Validity Criteria:

≥ 90% control survival

WQ Ranges:

T (°C) = 15 ± 1; DO (mg/L) = 7.0 to 10.3; pH = 5.5 to 8.5

Dilution Water:

Type: Dechlorinated Municipal Tap Water
Hardness (mg/L CaCO₃): 8
Alkalinity (mg/L CaCO₃): 6

Test Organism Information:

Batch No.: 042715
Source: Aqua Farms
No. Fish/Volume (L): 10/15L
Loading Density (g/L): 0.44
Mean Length ± SD (mm): 41 ± 2 Range: 38 - 45
Mean Weight ± SD (g): 0.66 ± 0.05 Range: 0.60 - 0.76

Zinc ^{SSD} Reference Toxicant Results:

Reference Toxicant ID: RTZn10
Stock Solution ID: 1SZn02
Date Initiated: May 21/15
96-h LC50 (95% CL): 48.9 (36.4 - 65.6) mg/L zinc

Reference Toxicant Mean and Historical Range: 65.7 (44.1 - 97.8) µg/L Zn
Reference Toxicant CV (%): 22%

Test Results: The 96-h LC50 is > 100% (v/v)

Reviewed by: [Signature] Date reviewed: May 28/15

96-Hour Rainbow Trout Toxicity Test Data Sheet

Client/Project#: ALS
 Sample I.D. L1612705-1 0146-150513
 W.O. # 15402
 RBT Batch #: 042215
 Date Collected/Time: May 13 / 15 @ 1740
 Date Setup/Time: May 19 / 15 @ 1145
 Sample Setup By: SSB

Number Fish/Volume: 10 / 15
 7-d % Mortality: 0
 Total Pre-aeration Time (mins): 30 min
 Aeration rate adjusted to 6.5 ± 1 mL/min/L? (Y/N): Yes

D.O. meter: DO-2
 pH meter: pH-1
 Cond. Meter: C-1

Undiluted Sample WQ			
Parameters	Initial WQ	Adjustment	30 min WQ
Temp °C	14.0	/	14.5
pH	6.8	/	6.8
D.O. (mg/L)	6.8	/	7.5
Cond. (µS/cm)	1324	/	1329

Concentration (% v/v)	# Survivors							Temperature (°C)					Dissolved Oxygen (mg/L)					pH					Conductivity (µS/cm)	
	1	2	4	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	96
Control				10	10	10	10	15.0	15.0	15.0	15.0	15.0	9.9	9.6	9.8	9.7	9.6	6.9	7.0	7.1	6.8	6.9	81	433 ^m
6.25				10	10	10	10	15.0	15.0	15.0	15.0	15.0	9.8	9.5	9.8	9.6	9.7	6.9	7.1	7.1	7.0	7.1	134	141
12.5				10	10	10	10	15.0	15.0	15.0	15.0	15.0	9.8	9.6	9.7	9.6	9.7	6.9	7.0	7.1	7.1	7.2	248	254
25				10	10	10	10	15.0	15.0	15.0	15.0	15.0	9.8	9.6	9.6	9.5	9.6	6.9	7.3	7.3	7.1	7.4	432	437
50				10	10	10	10	14.5	15.0	15.0	15.0	15.0	9.7	9.7	9.8	9.6	9.6	7.0	7.9	8.0	7.8	7.8	766	768
100				10	10	10	10	14.5	15.0	15.0	15.0	15.0	7.5	9.5	9.7	9.5	9.7	6.8	7.8	7.9	7.8	8.0	1329	1355
Initials				SSB	SSB	SSB	SSB	SSB	SSB	SSB	SSB	SSB	SSB	SSB	SSB	SSB	SSB	SSB	SSB	SSB	SSB	SSB	SSB	SSB

WQ Ranges: T (°C) = 15 ± 1; DO (mg/L) = 7.0 to 10.3; pH = 5.5 to 8.5

Sample Description/Comments: dark yellow

Fish Description at 96 h ok Number of Stressed Fish at 96 h 0

Other Observations: _____

Reviewed by: [Signature]

Date Reviewed: May 28/15



Josh Baker <josh@nautilusenvironmental.com>

L1612705

2 messages

Can Dang <Can.Dang@alsglobal.com>

Tue, May 19, 2015 at 10:18 AM

To: Josh Baker <josh@nautilusenvironmental.com>, "krysta@nautilusenvironmental.com" <krysta@nautilusenvironmental.com>

Hi Josh,

Thanks for your voice message regarding the water sample L1612705 for LC50 RT analysis. Please proceed with the analysis. Please confirm when you receive this email.

Thanks!

Take our short online customer survey for a chance to win a FREE iPad!

New employees? Sign them up for the FREE ALS Introduction Academy!

Can Dang

Senior Account Manager – Vancouver
ALS Life Sciences Division | Environmental

8081 Lougheed Highway,
Burnaby, BC, V5A 1W9 Canada

D +1 778 370 3232
T +1 604 253 4188
F +1 604 253 6700

<http://www.alsglobal.com/>



The information contained in this email is confidential. If the reader is not the intended recipient then you must notify the sender immediately by return email and then delete all copies of this email. You must not copy, distribute, print or otherwise use the information. Email may be stored by the Company to support operational activities. All information will be held in accordance with the Company's Privacy Policy which can be found on the Company's website - www.alsglobal.com.



L1612705

VANCOUVER

WO# 15402

Subcontract Request Form

Subcontract To:

NAUTILUS ENVIRONMENTAL

8664 COMMERCE COURT
BURNABY, BC V5A 4N7

Rainbow Trout LC50

NOTES: Please reference on final report and invoice: PO# L1612705
ALS requires QC data to be provided with your final results.

Please see enclosed 1 sample(s) in 2 Container(s)

SAMPLE NUMBER	ANALYTICAL REQUIRED	DATE SAMPLED	Priority Flag
		DUE DATE	
L1612705-1 0146-150513-LC 50	Special Request- Nautilus Environmental (SPECIAL REQUEST-NL 14)	5/13/2015 ^①	
		5/28/2015	

Subcontract Info Contact: Dorota Jamro (604) 253-4188
 Analysis and reporting info contact: Can Dang
 8081 LOUGHEED HWY
 SUITE 100
 BURNABY, BC V5A 1W9
 Phone: (604) 253-4188 Email: can.dang@alsglobal.com

Please email confirmation of receipt to: can.dang@alsglobal.com

Shipped By: Paul Date Shipped: May 19/2015
 Received By: JAB Date Received: May 15 2015
 Verified By: _____ Date Verified: _____
 Temperature: 5.2°C

Sample Integrity Issues: _____

① Sample exceeded holding time requirements. Proceed with testing per client communication



L1612705-COFC

Report To		Report Format / DI			Analysis Request													
Company: EDI		Select Report Format: <input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EXCEL <input type="checkbox"/> EDD (DIGITAL)			(Rush Turnaround Time (TAT) is not available for all tests) R <input checked="" type="checkbox"/> Regular (Standard TAT if received by 3 pm - business days) P <input type="checkbox"/> Priority (2-4 bus. days if received by 3pm) 50% surcharge - contact ALS to confirm TAT E <input type="checkbox"/> Emergency (1-2 bus. days if received by 3pm) 100% surcharge - contact ALS to confirm TAT E2 <input type="checkbox"/> Same day or weekend emergency - contact ALS to confirm TAT and surcharge													
Contact: Meghan Marjanovic		Quality Control (QC) Report with Report <input type="checkbox"/> Yes <input type="checkbox"/> No																
Address: 2195 - 2nd Avenue Whitehorse, YT Y1A 3T8		<input type="checkbox"/> Criteria on Report - provide details below if box checked																
Phone: 867-393-4882		Select Distribution: <input type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX			Specify Date Required for E2, E or P:													
Email 1 or Fax: mmarjanovic@edynamics.com		Email 2:																
Invoice To: Same as Report To <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		Invoice Distribution			Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below													
Copy of Invoice with Report <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		Select Invoice Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX																
Company: EDI		Email 1 or Fax: sjenner@edynamics.com																
Contact: S Jenner		Email 2: mmarjanovic@edynamics.com																
Project Information		Oil and Gas Required Fields (client use)																
ALS Quote #: Q49310		Approver ID:	Cost Center:															
Job #: MOUNT NANSEN 15-Y-0146		GL Account:	Routing Code:															
PO / AFE:		Activity Code:																
LSD:		Location:																
ALS Lab Work Order # (lab use only):		ALS Contact: Sean Sluggett	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	Rainbow Trout LCSO									Number of Containers			
0146-1505	13-LC 50		13-May-15	17:40	Water	R									2			
Drinking Water (DW) Samples¹ (client use)		Special Instructions / Specify Criteria to add on report (client Use)			SAMPLE CONDITION AS RECEIVED (lab use only)													
Are samples taken from a Regulated DW System? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					Frozen <input type="checkbox"/> SIF Observations Yes <input type="checkbox"/> No <input type="checkbox"/> Ice packs Yes <input type="checkbox"/> No <input type="checkbox"/> Custody seal intact Yes <input type="checkbox"/> No <input type="checkbox"/> Cooling initiated <input type="checkbox"/>													
Are samples for human drinking water use? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					INITIAL COOLER TEMPERATURES °C: 2.5 2.8 FINAL COOLER TEMPERATURES °C:													
SHIPMENT RELEASE (client use)		INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)													
Released by: <i>Dawn Marjanovic</i>	Date: 14 May 2015	Time: 15:12	Received by: <i>[Signature]</i>	Date: 15 May 15	Time: 9:00	Received by:	Date:	Time:										