

Developer's Assessment Report Jay Project Appendix 8H, Acute Toxicity Testing of Predicted Jay Project Effluent Composition October 2014

APPENDIX 8H

ACUTE TOXICITY TESTING OF PREDICTED JAY PROJECT EFFLUENT COMPOSITION



DATE August 22, 2014

PROJECT No. 1407256/4070/10

TO Eric Denholm Dominion Diamonds

FROM Peter M Chapman

EMAIL pmchapman@golder.com

ACUTE TOXICITY TESTING OF PREDICTED JAY PROJECT EFFLUENT COMPOSITION

Please find attached to this Memorandum the following two documents, which were prepared by James Elphick (Nautilus Environmental) and reviewed by Peter Chapman (Golder Associates Ltd.):

- Rainbow Trout (Oncorhynchus mykiss) and Daphnia magna acute toxicity testing based on the ionic balance of predicted effluent composition during "End of Open Pit Mining" and "Underground Mining" scenarios (Attachment A); and,
- Daphnia magna toxicity testing based on the ionic balance of predicted effluent composition during "End of Open Pit Mining" under open water and under-ice scenarios (Attachment B).

These two documents provide information on acute toxicity testing conducted to determine whether effluent discharged from the proposed Jay Project would be acutely toxic. The testing considered open pit mining as well as the potential for subsequent underground mining. Although underground mining is not currently being planned for the Project, it may be considered at a future date. Effluent composition used for the toxicity testing was based on predictions from conservative modelling whose uncertainty is highest for the underground mining. Modelling predictions will be refined as mining proceeds and additional data on open pit and potentially underground water quality become available.

The 96-h Rainbow Trout and 48-h *Daphnia magna* tests conducted are those presently required for assessing acute toxicity from existing Ekati Mine effluent discharges (Environment Canada 2000a,b). The testing detailed in Attachment A indicates that there will be no acute toxicity to Rainbow Trout during open pit mining (there is no effluent discharge during the first five years of open pit mining) or during underground mining, with either underice or open-water discharge (effluent with the highest predicted total dissolved solids [TDS] concentration was tested for underground mining). Mixing and dilution are lower with under-ice discharge than with open-water discharge. However, the testing detailed in Attachment A also indicated that, while there will be no acute toxicity to *D. magna* during open pit mining (83% survival at the end of open pit mining represents a lethal concentration to 50% of the tested fish [LC50] of >100% effluent), effluent predicted during underground mining was acutely toxic to *D. magna* (0% survival) with under-ice discharge.

Additional testing was conducted (Attachment B) with *D. magna* to further assess acute toxicity at the end of open pit mining considering both under-ice and open-water discharges (predicted under-ice effluent TDS concentrations were higher than open water concentrations), and additional effluent dilution. Additional testing





for underground mining was not conducted as both the possibility of underground mining following open pit mining and the quality of effluent that might be produced during underground mining remain highly uncertain. The additional testing indicated that acute toxicity (i.e., LC50 <100%) was more likely for *D. magna* at end of open pit mining (highest TDS concentrations for open pit mining) with under-ice discharge than with open-water discharge, and that a relatively low rate of effluent dilution resulted in 100% survival.

Effluent toxicity to *D. magna* at the end of open pit mining varied by less than a factor of two between the initial (Attachment A) and additional testing (Attachment B): 83% survival versus $45 \pm 35\%$ survival. This difference is not unreasonably large (Cherr et al. 1994). Given the conservatism of the modelling, it is likely that effluent produced during open pit mining of the Jay Pit will not be acutely toxic even during the maximum predicted effluent TDS concentrations the last year of mining. However, monitoring including chemical analyses and toxicity testing will be conducted from initiation through closure (i.e., end of open pit mining under the current mine plan) to provide early warning whether this could occur, such that appropriate management actions can be taken, as necessary and appropriate, to prevent the release of acutely toxic effluents.

We trust that this Memorandum and attachments provide you with the information you require. However, if you have any questions or require additional information, please do not hesitate to contact the undersigned.

ter M. Chapman

Peter M. Chapman, Ph.D. Principal, Technical Director PMC/cd



REFERENCES CITED

- Environment Canada. 2000a. Biological Test Method: Reference Method for Determining Acute Lethality of Effluents to Rainbow Trout. Environmental Protection Series. Report EPS 1/RM/13, Second Edition, including May 2007 amendments. Method Development and Application Section, Environmental Technology Centre, Ottawa, ON, Canada, 23 pp.
- Environment Canada. 2000b. Biological Test Method: Reference Method for Determining Acute Lethality of Effluents to *D. magna*. Environmental Protection Series. Report EPS 1/RM/14, Second Edition. Method Development and Application Section, Environmental Technology Centre, Ottawa, ON, Canada, 21 pp.
- Cherr G, Dinnel P, Caldwell R, Cardwell R, Chapman PM. 1994. West Coast Marine Species Chronic Protocol Variability Study: Criteria for Acceptable Variability of Marine Chronic Toxicity Test Methods. Washington State Biomonitoring Science Advisory Board Report No. 1. Washington Department of Ecology, Olympia, WA, USA.



Attachment A Rainbow Trout (*Oncorhynchus mykiss*) and *Daphnia magna* acute toxicity testing for predicted ionic balances





Rainbow Trout (Oncorhynchus mykiss) and Daphnia magna acute toxicity testing for predicted ionic balances

Final Report

Report date: August 20, 2014

Submitted to:

Golder Associates Ltd. Burnaby, BC

8664 Commerce Court Burnaby, BC V5A 4N7

TABLE OF CONTENTS

TAB	LE OF CONTENTS	.I
SIGN	JATURE PAGEI	Π
1.0	INTRODUCTION	1
2.0	METHODS	1
3.0	RESULTS	4
4.0	QA/QC	6
5.0	REFERENCES	7

LIST OF TABLES

Table 1.	Summary of test conditions: 96-h Rainbow Trout (Oncorhynchus mykiss) test	.2
Table 2.	Summary of test conditions: 48-h Daphnia magna test	.3
Table 3.	Results: 96-h Rainbow Trout (Oncorhynchus mykiss) survival	.4
Table 4.	Results: 48-h Daphnia magna survival.	.4
Table 5.	Ion concentrations (mg/L) for Year 6, Year 8, End of Open Pit Mining and	
	Underground Mining samples tested in the 96-h Rainbow Trout and 48-h	
	Daphnia magna survival tests. Nominal concentrations are presented in each	
	case followed by actual (measured) concentrations for each of the fish and	
	the daphnid	.5
Table 6.	Reference toxicant results	.6

LIST OF APPENDICES

APPENDIX A - Rainbow Trout Toxicity Test Data APPENDIX B - *Daphnia magna* Toxicity Test Data APPENDIX C – Analytical Chemistry Data

SIGNATURE PAGE

Brett Lucas, M.Sc. Environmental Scientist

James Elphick, R.P.Bio. Senior Reviewer

This report has been prepared by Nautilus Environmental Company Inc. based on data and/or samples provided by our client; the results of this study are for their sole benefit. Any reliance on the data by a third party is at the sole and exclusive risk of that party. The results presented here relate only to the samples tested.

Nautilus Environmental Work Order #14447 - 14448

1.0 INTRODUCTION

Nautilus Environmental conducted acute toxicity tests for Golder Associates Ltd. (Golder) to characterize the toxicity of four predicted water discharges from the Dominion Diamonds Jay Pit identified as: Year 6; Year 8; End of Open Pit Mining; and, Underground Mining.

The following acute toxicity tests were conducted on the laboratory-prepared waters:

- 96-h Rainbow Trout (*Oncorhynchus mykiss*) acute single concentration screening test; and,
- 48-h *Daphnia magna* acute single concentration screening test.

This report describes the results of these toxicity tests. Copies of raw laboratory data sheets and statistical analyses are provided in Appendices A and B for Rainbow Trout and *D. magna*, respectively. Results of analytical chemistry measurements are provided in Appendix C.

2.0 METHODS

Four water samples were prepared at the Nautilus Environmental laboratory in Burnaby, BC, using deionized water mixed with analytical grade salts (NaCl, KCl, MgCl₂.6H₂O, CaCl₂.2H₂O, CaSO₄, NaHCO₃, NaF and NaNO₃). Salts were added to achieve four blends of ions associated with four water types, as specified by Golder. The salts were stirred into the waters and the samples were then stored overnight in an environmental chamber at 15±1°C for Rainbow Trout and 20±2°C for *D. magna*, in order equilibriate prior to testing. The Rainbow Trout and *D. magna* tests were initiated on July 17 and August 11, 2014, respectively. Subsamples of the test waters were collected and analyzed by ALS laboratories (Burnaby, BC) for the ions that were added.

Procedures used for the toxicity tests on Rainbow Trout and *D. magna* are summarized in Tables 1 and 2, respectively. Testing was conducted according to procedures described by Environment Canada (2000a,b).

Test organism	Oncorhynchus mykiss
Test organism source	Campbell Lake Trout Farm, Little Fort, BC
Test organism age	Fry
Test type	Static
Test duration	96 hours
Test vessel	20 L glass aquarium
Test volume	10 L
Test replicates	1 test replicate per treatment
No. of organisms	10 per replicate
Control water	Dechlorinated municipal tapwater
Test solution renewal	None
Test temperature	$15 \pm 1^{\circ}C$
Feeding	None
Light intensity	100 to 500 lux
Photoperiod	16 hours light/8 hours dark
Aeration	$6.5 \pm 1 \text{ mL/min/L}$
Test protocol	Environment Canada (2000a), EPS 1/RM/13
Test endpoint	96-h survival
Test acceptability criteria for controls	Survival ≥ 90%
Reference toxicant	Sodium nitrite

Table 1.Summary of test conditions: 96-h Rainbow Trout (*Oncorhynchus mykiss*) test.

Test organism	Daphnia magna
Test organism source	In-house culture
Test organism age	<24 h
Test type	Static
Test duration	48 h
Test vessel	250 mL glass beakers
Test volume	200 mL
Test replicates	3 test replicates per treatment
No. of organisms	10 per replicate
Control water	Moderately hard reconstituted water
Test solution renewal	None
Test temperature	$20 \pm 2^{\circ}C$
Feeding	None
Light intensity	400 to 800 lux
Photoperiod	16 hours light/8 hours dark
Aeration	None
Test protocol	Environment Canada (2000b), EPS 1/RM/14
Test endpoint	48-h survival
Test acceptability criteria for controls	Survival \geq 90%
Reference toxicant	Sodium chloride

Table 2.Summary of test conditions: 48-h Daphnia magna test.

3.0 **RESULTS**

Results of the toxicity tests conducted using Rainbow Trout and *D. magna* are provided in Tables 3 and 4, respectively. There were no adverse effects on survival of Rainbow Trout in any of the test waters. Similarly, there were no adverse effects on survival of *D. magna* in the Year 6 and Year 8 samples; however, survival of *D. magna* was 83% and 0% in the End of Open Pit Mining and Underground Mining samples, respectively.

The targeted (nominal) and measured concentrations of ions in the Rainbow Trout and *D. magna* tests are shown in Table 5.

Table 3.Results: 96-h Rainbow Trout (Or	Dncorhynchus mykiss) survival.
---	--------------------------------

	Year 6	Year 8	End of Operation	Underground
Control	100	100	100	100
100% Sample	100	100	100	100

	Year 6	Year 8	End of Operation	Underground
Control	100	100	100	100
100% Sample	100	100	83	0

	Table 4.	Results: 48-h	Daphnia	magna	survival.
--	----------	---------------	---------	-------	-----------

Table 5.Ion concentrations (mg/L) for Year 6, Year 8, End of Open Pit Mining and
Underground Mining samples tested in the 96-h Rainbow Trout and 48-h
Daphnia magna survival tests. Nominal concentrations are presented in each case
followed by actual (measured) concentrations for each of the fish and the
daphnid.

		HCO ₃	Cl	F	SO_4	NO ₃ -N	Ca	Mg	Na	K
	Nominal	5.0	140	0.06	17.0	10.0	53	8.5	37	4.7
Year 6	O. mykiss	6.0	134	0.08	18.0	10.4	50	9.0	43	5.5
	D. magna	6.3	142	0.08	17.8	10.2	56	9.0	41	5.2
	Nominal	5.0	643	0.10	14.0	13.0	228	18.0	151	5.2
Year 8	O. mykiss	7.4	862	<0.40	15.0	19.0	294	17.8	163	5.2
	D. magna	6.3	652	<0.40	13.0	13.4	230	18.3	149	5.6
	Nominal	5.0	1728	0.13	17.0	20.0	606	34.0	387	6.3
End of Open Pit Mining	O. mykiss	4.7	1860	<1.00	<25.0	21.6	579	31.9	368	5.8
	D. magna	6.8	1700	1.20	18.4	20.0	589	34.3	394	6.8
	Nominal	5.0	5265	0.13	17.0	23.0	1836	75.0	1147	6.3
Underground Mining	O. mykiss	<2.4	4800	<1.0	<25.0	23.0	1320	68.0	1050	6.0
	D. magna	3.5	5170	0.16	17.7	22.8	1790	72.3	1190	6.3

Concentrations with a "<" symbol represent measured concentrations that were below the listed detection limit of the analytical test due to matrix-related effects.

4.0 QA/QC

The health history of the test organisms used in the exposures was acceptable and met the requirements of the Environment Canada (2000a,b) protocols. The tests met all control acceptability criteria and water quality parameters remained within ranges specified in the protocols throughout the tests. There were no deviations from the test methodologies.

In general, the targeted and measured concentrations were in good agreement in the tests although, as a result of matrix related effects, some of the analytes were reported as less than detection in a subset of samples (in particular, fluoride and sulphate). The fluoride concentration in the "End of Open Pit Mining" sample tested with *D. magna* was approximately ten-times higher than targeted; however, it appears likely that this was the result of an analytical error or interference, since fluoride was introduced in the same manner volumetrically using a stock solution of NaF into the "End of Open Pit Mining" and "Underground Mining" samples, and the latter sample had measured fluoride that was in good agreement with the targeted fluoride. In addition, the concentration of fluoride that was measured was below the chronic effects benchmark of 1.94 mg/L (McPherson et al. in press).

Results of the reference toxicant tests conducted during the testing program are summarized in Table 6. Results for these tests fell within the range for acceptable organism performance of mean \pm two standard deviations, based on historical results obtained by the laboratory with these tests. Thus, the sensitivity of the organisms used in these tests was appropriate.

Test Species	Endpoint	Historical Mean (2 SD Range)	CV (%)	Test Date
O. mykiss	LC50: 11.0 mg/L NO ₂	5.1 (2.1 - 12.6)	57	May 22, 2014
D. magna	LC50: 3.9 g/L NaCl	4.0 (3.7 - 4.3)	4.0	August 5, 2014

Table 6.	Reference toxicant results.
----------	-----------------------------

SD = Standard Deviation, CV = Coefficient of Variation, LC = Lethal Concentration.

5.0 REFERENCES

- Environment Canada. 2000a. Biological test method: reference method for determining acute lethality of effluents to rainbow trout. Environmental Protection Series. Report EPS 1/RM/13, Second Edition, including May 2007 amendments. Method Development and Application Section, Environmental Technology Centre, Ottawa, ON, Canada, 23 pp.
- Environment Canada. 2000b. Biological test method: reference method for determining acute lethality of effluents to *D. magna*. Environmental Protection Series. Report EPS 1/RM/14, Second Edition. Method Development and Application Section, Environmental Technology Centre, Ottawa, ON, Canada, 21 pp.
- McPherson C, Lee DHY, Chapman PM. In Press. Development of a fluoride chronic effects benchmark for aquatic life in freshwater. Environ Toxicol Chem DOI: 10.1002/etc.2724.

APPENDIX A - Rainbow Trout Toxicity Test Data

Rainbow Trout Summary Sheet

Client:

Golder 1444

Work Order No.:

Sample Information:

Sample ID: Sample Date: Date Received: Sample Volume: Other:

Start Date/Time: July 17, 2014@10:50

Test Species: Oncorhynchus mykiss

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

salts to could predicted site ion concentrations.

Dilution Water:

Туре:	Dechlorinated Municipal Tap Water
Hardness (mg/L CaCO ₃):	9
Alkalinity (mg/L CaCO ₃):	12

Test Organism Information:

Batch No.: Source: No. Fish/Volume (L): Loading Density (g/L): Mean Length ± SD (mm): Mean Weight ± SD (g):

061114	
Campbell Lake	Trout Farm
10/10L	
0.38	
$_{35 \pm 3}$	
0.38 ± 0.1	1

in-house

Uside

Range: <u>30 - 4 |</u> Range: <u>0.23 - 0.6|</u>

<u>)</u>,

NaNO2 Reference Toxicant Results:

Reference Toxicant II Stock Solution ID: Date Initiated: 96-h LC50 (95% CL):	14 N+ 01 June 26, 2014	2)
Reference Toxicant M Reference Toxicant C	Mean and Historical Range:	5.1 (2.1-12.6)
Test Results:	There was 100% -	survival in the 100% J/V sumple
Reviewed by:	JOL	BTL Date reviewed: July 30/14
Version 1.3; Issued May 12, 201	4.	Nautilus Environmental Company Inc.

96-Hour Rainbow Trout Toxicity Test Data Sheet

Client/Project# Sample I.D. W.O. # RBT Batch #: Date Collected Date Setup/Tin Sample Setup D.O. meter: pH meter: Cond. Meter:	14	2 2 2 2 2 2 2	14 14 7 7 7 7 7	3		'O: {	50			7-d % Tota Aera Undi Pa T	% Mo al Pre ation luted rame emp pH D. (m	Samı ters °C	y: hdjus ble W	Fime ted to	6.5 VQ	± 1 m		0. 30 1/L?(.? (Y/N): <u> </u>					
Concentration			# \$	Surviv			-	<u> </u>	Temp	eratu	re (°C			olved		gen (n	ng/L)			рH				uctivity
(% v/v)	1	2	2 4 24 48 72 96 0 24 48							48	72	96	0	24	48	72	96	0	24	48	72	96	(μS 0	5/cm) 96
Control				10	10	10		14.5														_	32	42
100				0	10	10															_		1885	
			-	ļ				_																
												<u> </u>												
												<u> </u>					-							
Initials			ţ,	JGF	зw	Kor	DBF	BT/	JBF-	JN	icju	JGF	BTC	SBF	JW	190	UBF	BTI	<u>১</u> β≠	JW	67	JBF	B7(ABF
WQ Ranges: T	(°C)	= 15	± 1; [00 (m	ig/L) =	= 7.0 1	to 10.	3; pH	= 5.5	to 8.	5													
Sample Descri	ption/	/Com	ment	s:	lon	CON	cent	nit for	sin	10	0%	5 50	unfl	k i	ere	<u>addi</u>	id in	the	lab	4	mit	th j	redicte	el field
Fish Descriptio	n at 9	96 h	<u> </u>	-			-																	
Other Observa	tions:							-																
-			.1	61,												D _4					h	ily	25/1	4

Other Observations	·			
Reviewed by:	Jou	Date Reviewed:	fulz	25

Version 2.2; Issued August 13, 2013.

Nautilus Environmental

Rainbow Trout Summary Sheet

Client:

Golder

Work Order No.:

Sample Information:

Sample ID: Sample Date: Date Received: Sample Volume: Other:

14447

End of Depention

mule in -hous

A mela

Start Date/Time: July 17, 2014 @ 16 :50

Test Species: Oncorhynchus mykiss

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

mule using salts to emulate predicted site ion concentrations.

Dilution Water:

ł

Dechlorinated Municipal Tap Water
9
12

Test Organism Information:

Batch No.: Source: No. Fish/Volume (L): Loading Density (g/L): Mean Length ± SD (mm): Mean Weight ± SD (g):

061114
Campbell Lake Trout Form
10/102
0.354 BTL
34 ± 2
0.34 ± 0.07

Range: <u>30-37</u> Range: <u>0.24-0.</u>

NaNO2 Reference Toxicant Results:

Reference Toxicant IE Stock Solution ID: Date Initiated: 96-h LC50 (95% CL):	RTN+63 14N+01 June 26, 2014 11.0 (7.7-18	.2)	
Reference Toxicant M Reference Toxicant C	ean and Historical Range: V (%): <u>57</u>	5.1 (2.1-12.6))
Test Results:	There was 100%	survival in the 100	% VIV sample
Reviewed by:	Jou	Date reviewed:	July 30 / 14
Version 1.3; Issued May 12, 2014	k.	Nauti	lus Environmental Company Inc.

96-Hour Rainbow Trout Toxicity Test Data Sheet

Client/Project#: $\overline{G_0/der}$ Sample I.D. $\overline{Frd.of}$ W.O. # 14447 RBT Batch #: 061114 Date Collected/Time: N/A Date Setup/Time: \overline{JMy} 7.2014 (*										7-d % Tota Aera	6 Mo I Pre- tion I	rtality aera rate a	tion 1 Idjust	fime (ted to	•	•		0 <u>//</u> 30 VL?(07			Y				
Date Setup/Ti					(7,	201'	4 (*		0:5	6			luted ramet		ole W	Q itial V		<u>۸</u>	livetr	ont	30	min V	NO			
Sample Setup	р Бу:		S	TL							•		emp [°]			5.5	vQ	AU	jusin	ijustment, 30 min WQ						
D.O. meter:				2	-							<u> </u>	pH	•	6.	5			/	/		6.5				
pH meter:				Z			-					D.C). (mg	g/L)		8			/	-		9.4				
Cond. Meter:				2	7		-					Con	d. (µS	5/cm)	2	390		/			4	:510	2			
Concentration			# :	Surviv	ors			-	Temp	eratu	re (°C	;)	Diss	olved	Oxy	gen (n	ng/L)			pН			Conductivity (µS/cm)			•
(% v/v)	1	2	4	24	48	72	96	0	24	48	72		0	24	48	72	96	0	24	48	72	96	0)	96	
Control				10	16	10	10	14.5	14,0	14.0	14.5	14.0	9.7	9.9	10-1	10.1	10,0	7.1	7.2	7.3			3-	-	45	
100				10	10	10	10	15.0	14.0	14.0	14-5	14.0		9.9	10.1	10-1	9,9	6.5	6,6	6.7	6-8	6.9	45	-10	4570	
													9.4 BTL										ļ			
		ļ					L																			
						<u> </u>	 									ļ	· .			<u> </u>						
				ļ	<u> </u>					L						`										
				ļ					ļ	<u> </u>															- T. De	
	 			100	(m),)		N2r	271	100		6-74-	185	077	205	- 7(a)	1170	12	in the second second	100		1070	000	187-	7	VOF	
Initials WQ Ranges: 1		= 15	+ 1.									JUF	010	ימנ		(0)	10	$[r] \subset$	100	1000		JBF	197	\sim	JBF	
C C												× .	/	1		11	1.	M		1,		11		· /.	1 Dial	1
Sample Descr	iption	/Com	ment	S:	100	· (C	SA CU	at hat	ions	11	00%	0 54	mill	° we	10 1	<u>A</u> UU	d (A	1/4	all.	1 to	and	an j	or <i>ea</i> l	CT E.	a treu	concentrati
Fish Description	on at s	96 h	All	કાંક	5h C	K					Nu	umber	of St	resse	ed Fis	h at 9	16 h	0								
Other Observa	ations																									
Reviewed by:			J(H			_		-							Date	Revie	ewed:			-(ful	η ²	5/	14	

Nautilus Environmental

Rainbow Trout Summary Sheet

Client:

<u>Golder</u> 14447

ernvou

in-house

sana a

Start Date/Time: July 17, 2014 @ 10:50

Test Species: Oncorhynchus mykiss

Sample Information:

Work Order No.:

Sample ID: Sample Date: Date Received: Sample Volume: 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

using salts to campate predicted site ion concententions.

Dilution Water:

Туре:	Dechlorinated Municipal Tap Water
Hardness (mg/L CaCO ₃):	9
Alkalinity (mg/L CaCO ₃):	12

inell

Test Organism Information:

Batch No.: Source: No. Fish/Volume (L): Loading Density (g/L): Mean Length ± SD (mm): Mean Weight ± SD (g):

061114
Campbell Luke Trout Farm
IO//OC
0.37
_35±4
0.37±0.11

Range: 28 - 4Range: 0.18 - 0.5

NaNO2 Reference Toxicant Results:

Reference Toxicant ID: Stock Solution ID: Date Initiated: 96-h LC50 (95% CL):	RTN+63 14N+01 June 26, 20 11.0 (7.7-17	14 8.2)	
Reference Toxicant Mea Reference Toxicant CV		-5.1 (2.1-12.	.6)
Test Results: <u>1</u>	here was 1009 Mowing a 96-h a	Vo survival in the expessive period.	100% J/V sample
Reviewed by:	Icu	Date reviewe	1 0 0 - 1
Version 1.3; Issued May 12, 2014.			Nautilus Environmental Company Inc.

96-Hour Rainbow Trout Toxicity Test Data Sheet

Client/Project Sample I.D. W.O. # RBT Batch #: Date Collecte		ne:	0 4 0	olde nder F44 611 N	910 F7 4 A						- - -	7-d % Tota	% Mo I Pre	rtalit -aera	Volun y: ition 7 adjus	lime :	•	•		•					
Date Setup/Ti				day 1	7,	201	<u>4 (</u>	/ 10): Ŝ	0	-	Undi	luted	Sam	ple W						_				
Sample Setur	o By:		ß	TL.									rame			itial V	VQ	Ac	ljustrr	ient	30	30 min WQ			
				~									emp	°C		.5						15.		4	
D.O. meter:				2			-						рН			<u>5.4</u>		<u> </u>	_/			6.6		-	
pH meter:				- 2			-					_	D. (mg	-		. 9	<u> </u>	\vdash			<u> </u>	9.4		-	
Cond. Meter:				2	-		-					Con	α. (με	5/CM	92		/					973	SU_{-}	1	
Concentration			# Survivors Temperature										Diss	olved	d Oxy	gen (r	ng/L)	Τ		pН				ductivity 5/cm)	
(% v/v)	1	2	4	24	48	72	96	0	24	48	72	96	0	24		72			24	48	72	96	0	96	
Control				10	10.	0	10	14.5	14,0	14.0	14.5	14.0	9.8	9.9	10.0	10.1	10.1	7.1	7.2	7.3	7.4	7.3	32	44	*
100				10	10	10	10	15,5	14.0	14.0	145	14.0	9.4	9.9	10.0	10.0	10.0	6.4	6.5	6.6	6.7	6,8	9730	9880	
																								1	
							1																		
	1						<u> </u>								1										
		 			1		_																	-	
																	<u> </u>								
							<u>-</u>			-								-	-						
Initials				NRE	7(5)	1CT	VRE	RT/	\Qi=	- 11.1	1L+L	ABE	27/	1 NRE	- JIN	KN	SP	271	IRC	712	10-1	RE	BTZ	ABF	
WQ Ranges:	L C (°C)	= 15	+ 1:[201	ijгс	100	1000	1,5	00	DIC		1000	1-5	1001	VIC		1
•				-										1			1	/	1	1	,	1		$\cdot 11$	
Sample Descr	iption	/Com	ment	s:	10A		<u>n Ceir</u>	6 ati	ons	<u>cx [</u>	00%	0 9	Samp	Ne .	WEVE	- AA	<u>Ald</u>	in T	We 1	иb т	8 NON	nit d	<u>n Fred</u>	1044 +	eld consiste
Fish Descriptio	on at 9	96 h	AI	Fish											ed Fis										
Other Observa	ations	:																							
			-10 ·																		0 .		1		
Reviewed by:		1	JOL	L			-									Date	Revi	ewed:		J	ule	125	/14		

Nautilus Environmental

Rainbow Trout Summary Sheet

Client:	Golder	Start Date/Time: <u>July (7,2014@10:5</u> 0
	1111	
Work Order No.:	1444 /	Test Species: Oncorhynchus mykiss
Sample Information	••	Toot Velidity Criterie
Sample Information	1.	Test Validity Criteria: ≥ 90% control survival
Sample ID:	Yerr 6	WQ Ranges:
Sample Date:	N/A male in-heas	
Date Received:	N/A more in-house	
Sample Volume:	151	
Other:	Sample made using Sala	to emulate predicted site ion concentrations
Dilution Water:		
Туре:	Dechlorinated Municip	al Tan Water
Hardness (mg/L Ca		
Alkalinity (mg/L CaC	······	
Test Organism Info	rmation:	
	α (1) 1	
Batch No.:	061114	- + -
Source:		e Trout Farm
No. Fish/Volume (L) Loading Density (g/L		
Mean Length ± SD (/	Bange: 31 - 37
Mean Weight ± SD (/	Range: 31 - 37 7 Range: 0.22 - 0.43
5 (o, <u></u>	
NaNO2 Reference	Foxicant Results:	
Defense Tesised	D 0+1/1/7	
Reference Toxicant Stock Solution ID:	ID: $RTN763$	
Date Initiated:	JUNE 26.70	
96-h LC50 (95% CL)		
Reference Toxicant	Mean and Historical Range:	5.1(2.1-12.6)
Reference Toxicant	CV (%): 5	7
Test Desults	where a look	% survival in the 100% u/v
Test Results:	CAMPLE LAND	a 26-h exposure period.
	JAN TOHOWING	a ron enposare perioa.
Reviewed by:	Joh	Date reviewed: July 25/14
-		
Version 1.3; Issued May 12, 20	114.	Nautilus Environmental Company Inc.

96-Hour Rainbow Trout Toxicity Test Data Sheet

Client/Project Sample I.D. W.O. # RBT Batch #: Date Collected	ample I.D. <u>Year 6</u> .0. # <u>14447</u>									Number Fish/Volume: 7-d % Mortality: Total Pre-aeration Time (mins): Aeration rate adjusted to 6.5 ± 1 m															
Date Setup/Ti			Ju	y 17		46	> 10	:50)		•	Undi	luted	Sam	ple W	Q									
Sample Setup	By:			<u>B1</u>	Ĺ						-		rame			itial V		Ac	ljustm	nent	30	min V			
				9									emp			<u>5.C</u> 6.						<u>15.8</u> 6.			
D.O. meter: pH meter:				2			-		7				<u>рН</u>). (m			<u>6.</u> 8	1	-	-			<u> </u>		•	
Cond. Meter:				22			-							9/ <u>-</u>) S/cm		50	>	$\overline{}$				57			
							-						\[/		-				I		/		
Concentration	Concentration # Survivors								Temperature (°C				Diss	solved	d Oxy	gen (n	ng/L)			pН			1	uctivity /cm)	
(% v/v)	1	2	4	24	48	72	96	0	24	48	72		0	24			96		24	48		96	0	96	
Control				10	10	10	10			14.0					10-1									42	
100				VO	10	10	10	ઉસ	19.0	14.0	14-5	14.5	9.4	9,8	6 10-1	(0.0	10.0	6.7	6.9	7.1	7.1	7,2	579	592	
													,					- <i>14</i> 0			,				
- ¹																									
																								a and	
																								1	
																ŀ								1000	
Initials												BTL	BF	JBF	- JM	Kyc	BTC	1304	1965	(JIV)	KJL	JBF	BTC	SBF	
WQ Ranges: T	(°C)	= 15	± 1; [DO (m	g/L) =	= 7.0 1	to 10.	3; pH	= 5.5	to 8.	5	فره م												,	
Sample Descri	ption/	'Comi	ment	S :	10	on c	OAC	enti	atio.	nsi		00	°/6	59	ngle	é w	ere	ada	led i	n ti	he la	<u>b to</u>	untch	piedicte	d field concentration
Fish Descriptio	n at 9	96 h	Al	1 <i>F</i> i'sl	n OK						. Nu				ed Fis									·····.	
Other Observa	tions:																								•
Reviewed by:			J	9h			-						·			Date	Revie	ewed:		Ju	ly	25/	/4	• •	

Nautilus Environmental

APPENDIX B - Daphnia magna Toxicity Test Data

Daphnia magna Summary Sheet

Associates

Client: Work Order No.:

Sample Information:

Sample ID: Sample Date: Date Received: Sample Volume:

Par 6 mule in-house

Start Date/Time: ______ [1/14 @ 16:35 Test Species: Daphnia magna Set up by:

Test Validity Criteria:

≥ 90% mean control survival (no more than 2 mortalities in any control replicate)

WQ Ranges:

 $T (^{\circ}C) = 20 \pm 2$; DO (mg/L) = 3.6 to 9.4; pH = 6 to 8.5

Test Organism Information:

Broodstock No.: Age of young (Day 0): Avg No. young per brood in previous 7 d: Mortality (%) in previous 7 d: Days to first brood:

072214A +B 24 h

NaCl Reference Toxicant Results:

Reference Toxicant ID: Stock Solution ID: Date Initiated: 48-h LC50 (95% CL):

Dm 124		
14 Na 01	-	
Aug 05/14 79 (22-55)		
3.7 (2.8-5.3)	g/LNaCL	

Reference Toxicant Mean and H	istorical Range: 4.0	(3.	7-4.3)g/L NaCL
Reference Toxicant CV (%):	4.0			

Test Results:

SaMD

Reviewed by:

(701 L

Date reviewed:

Freshwater Acute 48 Hour Toxicity Test Data Sheet

Client: Sample ID: Work Order No.:	6-2 Yei 14	lder av 6 505	As:	socates	Start Date/Time: Avg 11/14 @ 16:35 No. Organisms/volume: 10/200mL Test Organism: D.magna Set up by: BTC											
DO meter:	3				pH r	pH meter: <u>3</u> Conductivity meter: <u>3</u>										
Concentration		umber Organ		No. Immobilized	Ter	nperat (°C)	ure		lved o (mg/L	xygen)	~)	pН			uctivity /cm)	
		24	48	48	0	24	48	0	24	48	0)	24	48	0	48	
Control	Α	10	10	0	21.0	19.5	20.0	8.4	7,7	84	8.0	8.1	8.0	361	385	
	В	10	10	0	04.176. 2010 02.177. 2010 22.277.277. 2772								i todt, sider i Digit (digit)			
	С	10	10	0	CZNESSONYXXX NOTECONSTRUCT CONTROLOGICA CONSTRUCTION CONSTRUCTION CONSTRUCTION											
	D				COLLEXCOURSES										Construction of the second secon	
100	Α	10	10	0	20.0	19.0	19.5	8.8	7.7	8.6	6.7	7.3	7.1	612	644	
	В	10	10	0												
	С	10	10	0												
	D				CONCEPTION OF				220000.1000 - 2129-32-000	10.000045					Andreas Construction of the second seco	
	A			-	000000000000000000000000000000000000000		29920-052-02-02			15354540				enton analana ana		
	B															
	C									A CONTRACTOR OF A						
	D				CECCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC			000001107701 0000011107701				1. 1. 2. 3. V. S.			2 200000000000000000000000000000000000	
	A B															
	C							CONTRACTOR - 1700		Contractions of the second sec	Proposition of the action of the second seco				XOUCHARD AND AND AND AND AND AND AND AND AND AN	
	A				Bisidelli Panissi	hikonsense?					200000000000000000000000000000000000000	20000 (***1.	1. Director	ridariller, casocoolo	1 3000000000000000000000000000000000000	
	В															
	c															
	D						A CONTRACTOR OF A CONTRACT OF								A STATE OF A STAT	
	A															
	В										A					
	C				Concert Construction											
	D															
Technician In	itials	BTL	BTL	BTC	BTC	BTC	BTL	BTL	BTL	BTL	BTC	BTL	BTC	1370	BTL	
WQ Ranges: T (°C) = 20) ± 2; D	O (mg/	L) = 3.6 to 9.4;	рН = 6	6 to 8.	5	-								
	Hardness	*		Alkalinity*					I WQ	A	djustme	ent		Adjusted	WQ	
Conc.		_	/L as Ca	-		Temp	(°C)		<u>, 0</u>					/		
Control (MHW)	10	<u> </u>		70	-	DO (m	g/L)	8.	<u>8</u>				\vdash			
Highest conc.	15	8		2		рН		6.	<u>/</u>	-	\checkmark					
							µS/cm)		C			DA BTC	[
Sample Descript	ion:	Sam	de i	prepared to	o Ca	mlåt	e p	redic	fed	wi	ter "	Hud	47,5	pecH	iel by Gol	
Comments:	Batch#:	0722141	67-d pre	vious # young/bro	od: 15	118	Day of	1st Bro	od: 9/	10	Previo	us 7-d '	% Morta	ality: 10)/0	

Date reviewed:

Reviewed by:

Version 1.5; Issued March 13, 2014

J6h

Nautilus Environmental Company Inc.

18

4

fue

Daphnia magna Summary Sheet

Client: Work Order No.:

er Associates

Sample Information:

Sample ID: Sample Date: Date Received: Sample Volume:

male in house

Start Date/Time: Aug 11/14 @ 6:35 Test Species: . Daphnia magna Set up by:

Test Validity Criteria:

≥ 90% mean control survival (no more than 2 mortalities in any control replicate)

WQ Ranges:

T (°C) = 20 ± 2; DO (mg/L) = 3.6 to 9.4; pH = 6 to 8.5

Test Organism Information:

Broodstock No.: Age of young (Day 0): Avg No. young per brood in previous 7 d: Mortality (%) in previous 7 d: Days to first brood:

072214A + B	
<24 h	
15/18	
10/0	
9/10	

NaCl Reference Toxicant Results:

Reference Toxicant ID: Stock Solution ID: Date Initiated: 48-h LC50 (95% CL):	Dm 124 14Na OI Aug 05/14 3.9 (2.8-5.5)	g/LNaCL
Reference Toxicant Mean a Reference Toxicant CV (%)	nd Historical Range: 4.0 : 4.6	(3.7-4.7) g/L NaCL

Test Results:

There was 100 % survival in the 1 undituted sample following a 48-h expos

Reviewed by:

Jou

Aug. 18/14 Date reviewed: ____

Freshwater Acute 48 Hour Toxicity Test Data Sheet

Client: Sample ID: Work Order No.:	6-01 Xei	dev 1505	A	ssociate	rs	S Start Date/Time: <u>Aug II//4</u> @ 16.35 No. Organisms/volume: <u>10/200mL</u> Test Organism: <u>D.magna</u> Set up by: <u>BTC</u>												
DO meter:		3		•	pНı	meter:		5						3				
Concentration		lumber Organ		No. Immobilized	Ter	mpera (°C)	ture		lved o (mg/L		1	рН		Condu (µS	ictivity /cm)			
		24	48	48	0	24	48	0	24	48	0	24	48	0	48			
Control	A	10	10	0	Z1, C		20.0	8.4	7.7		8.0	8.1	8.0	357	375			
	В	10	10	0														
	С	10	10	0											No. 1 Control of Contr			
	D					2010/01/2010 2010/02/2010 2010/2010/2010						NNO NO						
100	A	10	10	0	20.0	18.5	19.5	8.9	7.8	8.6	6.7	7-0	7.0	2170	2230			
	В	10	10	0				os and Color glange i Pil										
	С	10	10	0								ogo donuni de la						
	D					2000/00/00/00/00/00/00/00 2000/00/00/00/00/00/00/00/00/00/00/00/00									A CANADA			
	A							MUNER LU- SE Sala - Mark LU-										
	B C										A CALLEAN MAN		n daya yayan ya Udaya yayan ya Shiniya yayan ya					
									D.C.Z									
	A				ANAPAS (SEC., C	000000000000000000000000000000000000000	sector 4646825 per	- and - a stand			a heren datudit	100000000000000000000000000000000000000	40012000000	terrer directo	3333656353333.14.			
	В																	
	c																	
	D												. A contra					
	А																	
	В														A CONTRACTOR OF A CONTRACTOR OF A CONTRACTOR OF A CONTRACTOR AND A CONTRAC	.*		
	С														Numinization of the second second			
	D										 A The last one will be a set of the last of the last							
	A						Servic . J. M. 14.	.c.m.uluisen			* **********	I REGISSERATOR	0000000000					
	В				TOTAL STREET,			na da sente Shoi Kabaka Na Kabaka										
	C																	
	D	1051	1-1	0+1	#11	RAI		671	1211	172-1	8+1	· Pro	2-1		Pr/			
Technician In WQ Ranges: T (BTL) ± 2; D					BTC 5	1310	1010	1576	1010	1010	610	BTC	DIC			
	Hardness	6*		Alkalinity*				Initia	al WQ	A	djustme	ent		Adjusted \	VQ			
Conc.			/L as Ca			Temp	(°C)	20), O						_			
Control (MHW)	10			70		DO (m	g/L)	8.	9									
Highest conc.	5	10		2		рН		6.	1									
Sample Descript	lion:	San	nle	preparal to	o em		(µS/cm)			ion	Conc	entra	tions	spec	fiel by	y Gol		
Comments:	Batch#:	077214A+	67-d pre	vious # young/bro	od: 157	/18	Day of	1st Bro	ood: 9/	/10	Previo	us 7-d 9	% Morta	lity: (O	10			
Reviewed by:	Batch#:0772114487-d previous # young/brood: 15/18 Day of 1st Brood: 9/10 Previous 7-d % Mortality: 10/0 JOU Date reviewed: Aup 18/19																	

Nautilus Environmental Company Inc.

Daphnia magna Summary Sheet

Client: Work Order No.:

Associates

Sample Information:

Sample ID: Sample Date: Date Received: Sample Volume:

house

16:35 Start Date/Time: Aug 11 Test Species: Daphnia magna Set up by:

Test Validity Criteria:

≥ 90% mean control survival (no more than 2 mortalities in any control replicate)

WQ Ranges:

T (°C) = 20 ± 2; DO (mg/L) = 3.6 to 9.4; pH = 6 to 8.5

Test Organism Information:

Broodstock No.: Age of young (Day 0): Avg No. young per brood in previous 7 d: Mortality (%) in previous 7 d: Days to first brood:

077714 A+R 24 h

NaCI Reference Toxicant Results:

Reference Toxicant ID:	Dm124
Stock Solution ID:	14Na 01
Date Initiated:	Aug 05/14
48-h LC50 (95% CL):	3.9(2.8-5.5) g/LNaCL

Reference Toxicant Mean and Historical Range: <u>4()(3.7-4.3)</u>_{g/L NaCL} Reference Toxicant CV (%): <u>4.0</u>

Test Results:

BTL ing æ < a mil

Reviewed by:

(761)

p. 18/14 Date reviewed:

Freshwater Acute 48 Hour Toxicity Test Data Sheet

Client: Sample ID: Work Order No.:	Fe End 14	$\frac{1}{100}$	r As pen	sociate- pit mini	s vy	-	No. C	Organis	sms/vo st Orga	olume:	<u> 10/2</u> <u> D.ma</u>	200mL gna		@1		
DO meter:		<u>}</u>	,		pН	meter:		3		. 0	Conduc	ctivity	meter:	5_		-
Concentration		lumber 9 Organ		No. Immobilized	Te	mpera (°C)	ture		lved o (mg/L	xygen)		рН			uctivity /cm)	
		24	48	48	0	24	48	0	24	48	0	24	48	0	48	
Control	Α	10	10	0	21.0	19.0	20.0	8.4	7.7	8.4	8.1	8.1	8.1	357	372	
	В	10	10	0				4888-9-115								
	С	10	10	0					1952 2010 2010 2010 2010 2010 2010 2010 20		z					
	D	1 -0		<u>^</u>		10.0	1.00	07	70	01		10	10	(TY)/TA	<u>()</u>	
100	A	10		0	20.0	18.5	17.5	9.4	1.8	8.6	6.7	6.7	6.8	5450	5600	, ,
	C B 10	90	8	0												
	D	<u>/</u>	0	-0		NO CONTRACTOR	Ú.									
	A									19 - 1 - 100 - 19 - 19	a system of	10.000	102 m (1.012 m.)			
	В															ľ
	С										NALL INSTAL	4. 1 . 16. 1991	r he tri si si si			
	D				00014-151											
	A						13030555561								-	
	B	-								journour of our			0000000000			
	C				2000000000		4444000000						0004			·
	D															1
	A B															
	C															
	D															
	Α															1
	В		-										N N N N N N N N N N N N N N N N N N N			
	<u> </u>	ļ	****													
	D								ر سر جر	241						
Technician In		BTZ	BTL	BTL	BTC	BTL		BIL	BTL	610	BIL	3TC	BIC	BTC	BTC]
WQ Ranges: T (*	'C) = 20 ዒ 3) ± 2; D(louting) (mg) שייק/ה	L) = 3.6 to 9.4; L) = 3.6 to 9.4;	рН = (. Дица	6 to 8.: hi \$5	Flou	113								
	Hardness			Alkalinity*	່				IWQ	A	djustme	ent		Adjusted \		1
Conc.			/L as Ca		1	Temp	(°C)	20	-		ajaoane				~	· ·
Control (MHW)	10	0	-	10		DO (m		9.	2			/				
Highest conc.	154	+0	4	2		рН		6.	7	L	\angle					
Sample Descripti	ion:	Sam	ple į	prepared t	D EW	Cond (M/M		<u> </u>	<u>.50</u> V ie	w a	SN Ci	tutio	<u>ns, s</u>	pečili	ed by	Golder.
Comments:	Batch#:()72214A4	7-d pre	vious # young/bro	iod: 15,	/18	Day of	1st Bro	od: 🔎	/(0	A .		1	lity: 10	/0	-
Reviewed by:			J	Gh		Da	te revi	ewed:			Ar	<u>y. 1</u>	<u>**/19</u>	1		-
Version 1.5; Issued	March 13.	2014										V Nautili	us Énviro:	nmental Com	ipany Inc.	

(

Daphnia magna Summary Sheet

Client: Work Order No.:

Associates

Sample Information:

Sample ID: Sample Date: Date Received: Sample Volume:

h na l

Start Date/Time: <u>Acry 11/14</u> @16:35 Test Species: Daphnia magna BI Set up by:

Test Validity Criteria:

≥ 90% mean control survival (no more than 2 mortalities in any control replicate)

WQ Ranges:

T (°C) = 20 ± 2; DO (mg/L) = 3.6 to 9.4; pH = 6 to 8.5

Test Organism Information:

Broodstock No.: Age of young (Day 0): Avg No. young per brood in previous 7 d: Mortality (%) in previous 7 d: Days to first brood:

077214A+B

NaCl Reference Toxicant Results:

Reference Toxicant ID:	Dm124
Stock Solution ID:	14 Na OI
Date Initiated:	Aug 05/14
48-h LC50 (95% CL):	3.2(2.8-5.5) g/LNaCL
	·

Reference Toxicant Mean and Historical Range: $4.0(3.7-4.3)_{g/L NaCL}$ Reference Toxicant CV (%): 4.0

Test Results:

SURVIVA 10 Samp following

Reviewed by:

JU

Date reviewed:

Freshwater Acute 48 Hour Toxicity Test Data Sheet

Client: Sample ID: Work Order No.:	Go Unde 10	lder Fgrei F50	As	sociate	5	Start Date/Time: <u>Aw 11/14 (2016:35</u> No. Organisms/volume: <u>10/200mL</u> Test Organism: <u>D.magna</u> Set up by: <u>BTC</u>															
DO meter:	3		•		рНı	pH meter: <u>3</u> Conductivity								neter: <u>3</u>							
Concentration	Live	lumber Organ		No. Immobilized	Temperature Dis (°C)			Dissolved oxygen (mg/L)			рН			ictivity /cm)							
	Rep	24	48	48	0	24	48	0	24	48	0	24	48	0	48						
Control	A	10	10	- 1 0			1	7.4		8.4	8.(8	8.1	-	375						
Conner	В	10	10	0																	
	c	10	10	0				2							A REPORT OF A REPO						
	D					XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX															
100	Α	¥6		<u> </u>	20.0	18.5	~	9.2	7.7	1	6.6	6.8	-	14880	15510						
	В	70	-								SALES - SALES										
	С	BTF ()	-																		
	D			-BIC																	
	Α																				
	В																				
	С			-																	
	D																				
	А																				
	В																				
	С																				
	D																				
	Α																				
	В																				
	c																				
	D																				
	A																				
······	В																				
	c	1																			
	D																				
Technician In	_	BTL	BTL	BTL	BT/	BTL	BTL	RTI	RTL	BTC	BTL	BIL	BTC	BTL	BTC						
WQ Ranges: T (1			1-1-2	1 . <i>i</i> . <i>i</i>									
	Hardness	*		Alkalinity*	1			Initia	al WQ		djustm	ent		Adjusted \	NO						
Conc.			ı ı/L as Ca		1	Temp	(°C)		<i>0.1</i> 0	 											
Control (MHW)	10	$\sim \mathcal{O}$		70	1	DO (m			9.20	r											
Highest conc.		00		4	1	pH	<u></u> /	6.6	-		/										
					Cond (µS/cm) 14880																
Sample Descript	tion:	Saw	yle i	prepured to	e Mi					n a	>ncei	itrati	ions,	speciti	ed by Gold						
Comments:	Batch#:	0722144	Ø-d pre	vious # young/bro	od: /5	/18	Day of	f 1st Bro	ood: 9	/10	Previo	ous 7-d °	% Morta	ality: 10	10						
Reviewed by:			JOL	1									Date reviewed: Ary . [8]14								

Version 1.5; Issued March 13, 2014

Nautilus Environmental Company Inc.

APPENDIX C – Analytical Chemistry Data



NAUTILUS ENVIRONMENTAL ATTN: Brett Lucus 8664 Commerce Court Imperial Square Lake City Burnaby BC V5A 4N7 Date Received:21-JUL-14Report Date:29-JUL-14 16:07 (MT)Version:FINAL

Client Phone: 604-420-8773

Certificate of Analysis

Lab Work Order #:

Project P.O. #: Job Reference: C of C Numbers:

Legal Site Desc:

#: NOT SUBMITTED

L1490080

Janie L

[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



www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNER

ALS ENVIRONMENTAL ANALYTICAL REPORT

L1490080 CONTD.... PAGE 2 of 5 29-JUL-14 16:07 (MT) Version: FINAL

Sample ID	1 4 400000 4				
Description Sampled Date Sampled Time Client ID	L1490080-1 water 21-JUL-14 10:00 YEAR 6-RAINBOW TROUT	L1490080-2 water 21-JUL-14 10:00 YEAR 8-RAINBOW TROUT	L1490080-3 water 21-JUL-14 10:00 END OF OPERATION- RAINBOW TROUT	L1490080-4 water 21-JUL-14 10:00 UNDERGROUND- RAINBOW TROUT	L1490080-5 water 21-JUL-14 10:00 YEAR 6-D.MAGNA NOT USEC
Analyte					
рН (рН)	6.91	6.93	6.79	6.65	7.01
Alkalinity, Bicarbonate (as CaCO3) (mg/L)	4.9	6.1	3.8	<2.0	5.9
	<2.0	<2.0	<2.0	<2.0	<2.0
	<2.0	<2.0	<2.0	<2.0	<2.0
	4.9	6.1	3.8	<2.0	5.9
	134	862	1860	4800	134
Fluoride (F) (mg/L)	0.077	<0.40	<1.0	<1.0	0.078
Nitrate (as N) (mg/L)	10.4	19.0	21.6	23.0	10.3
Sulfate (SO4) (mg/L)	18.0	15	<25	<25	17.8
Calcium (Ca)-Total (mg/L)	50.4	294	579	1320	49.7
Magnesium (Mg)-Total (mg/L)	9.00	17.8	31.9	68.0	8.71
Potassium (K)-Total (mg/L)	5.5	5.2	5.8	6.0	5.2
Sodium (Na)-Total (mg/L)	42.7	163	368	1050	40.5
	Client ID Analyte pH (pH) Alkalinity, Bicarbonate (as CaCO3) (mg/L) Alkalinity, Carbonate (as CaCO3) (mg/L) Alkalinity, Carbonate (as CaCO3) (mg/L) Alkalinity, Total (as CaCO3) (mg/L) Alkalinity, Total (as CaCO3) (mg/L) Chloride (Cl) (mg/L) Fluoride (F) (mg/L) Nitrate (as N) (mg/L) Sulfate (SO4) (mg/L) Calcium (Ca)-Total (mg/L) Magnesium (Mg)-Total (mg/L) Potassium (K)-Total (mg/L)	Client IDYEAR 6-RAINBOW TROUTAnalyte6.91pH (pH)6.91Alkalinity, Bicarbonate (as CaCO3) (mg/L)4.9Alkalinity, Carbonate (as CaCO3) (mg/L)<2.0	Client ID YEAR 6-RAINBOW TROUT YEAR 8-RAINBOW TROUT Analyte pH (pH) 6.91 6.93 Alkalinity, Bicarbonate (as CaCO3) (mg/L) 4.9 6.1 Alkalinity, Carbonate (as CaCO3) (mg/L) <2.0	Client ID YEAR 6-RAINBOW TROUT YEAR 8-RAINBOW TROUT YEAR 8-RAINBOW TROUT END OF OPERATION- RAINBOW TROUT Analyte 6.1 8-000 6.79 8-000 <t< td=""><td>Client ID YEAR 6-RAINBOW TROUT YEAR 8-RAINBOW TROUT YEAR 8-RAINBOW TROUT END OF OPERATION- RAINBOW TROUT UNDERGROUND- RAINBOW TROUT Analyte </td></t<>	Client ID YEAR 6-RAINBOW TROUT YEAR 8-RAINBOW TROUT YEAR 8-RAINBOW TROUT END OF OPERATION- RAINBOW TROUT UNDERGROUND- RAINBOW TROUT Analyte

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

QC Samples with Qualifiers & Comments:

VA

Qualifier		Sulfate (SO4)		
Qualifier			MS-B	L1490080-1, -2, -3, -4, -5, -6, -7, -8
	ndividual Parameters	Listed:		
	Description			
DLA	Detection Limit adjust	ed for required dilution		
DLM	Detection Limit Adjust	ted due to sample matrix effects.		
MS-B	Matrix Spike recovery	could not be accurately calculated du	e to high analyte l	background in sample.
st Method Re	eferences:			
LS Test Code	Matrix	Test Description		Method Reference**
LK-SCR-VA	Water	Alkalinity by colour or titration		EPA 310.2 OR APHA 2320
colourimetric me OR	ethod.			al Alkalinity is determined using the methyl orange
				thalein alkalinity and total alkalinity values.
NIONS-CL-IC-V		Chloride by Ion Chromatography		APHA 4110 B.
		edures adapted from APHA Method 41 Determination of Inorganic Anions by I		atography with Chemical Suppression of Eluent hy".
NIONS-F-IC-VA		Fluoride by Ion Chromatography		APHA 4110 B.
		edures adapted from APHA Method 41 Determination of Inorganic Anions by I		atography with Chemical Suppression of Eluent hy".
NIONS-NO3-IC-	-VA Water	Nitrate in Water by Ion Chromatogr	aphy	EPA 300.0
This analysis is detected by UV		edures adapted from EPA Method 300.	.0 "Determination	of Inorganic Anions by Ion Chromatography". Nitrate is
NIONS-SO4-IC-	-VA Water	Sulfate by Ion Chromatography		APHA 4110 B.
		edures adapted from APHA Method 41 Determination of Inorganic Anions by I		atography with Chemical Suppression of Eluent hy".
-SIE-VA	Water	Fluoride by SIE		APHA 4500-F "Fluoride"
				Fluoride is determined using a selective ion electrode. + is present in the sample at a concentration greater
-SIE-VA	Water	Fluoride by SIE		APHA 4500-F Fluoride
				Iuoride is determined using a selective ion electrode. + is present in the sample at a concentration greater
ET-TOT-ICP-VA	A Water	Total Metals in Water by ICPOES		EPA SW-846 3005A/6010B
American Public States Environm	c Health Association, an nental Protection Agen	nd with procedures adapted from "Tes cy (EPA). The procedures may involve	t Methods for Eva e preliminary sam	ation of Water and Wastewater" published by the aluating Solid Waste" SW-846 published by the United ple treatment by acid digestion, using either hotblock or a - optical emission spectrophotometry (EPA Method
H-PCT-VA	Water	pH by Meter (Automated)		APHA 4500-H "pH Value"
This analysis is electrode	carried out using proce	edures adapted from APHA Method 45	600-Н "pH Value".	The pH is determined in the laboratory using a pH
It is recommend	led that this analysis be	e conducted in the field.		
H-PCT-VA	Water	pH by Meter (Automated)		APHA 4500-H pH Value
This analysis is electrode	carried out using proce	edures adapted from APHA Method 45	600-Н "pH Value".	The pH is determined in the laboratory using a pH
It is recommend	led that this analysis be	e conducted in the field.		
ALS test method	ds may incorporate mo	difications from specified reference me	ethods to improve	performance.
he last two lette	rs of the above test co	de(s) indicate the laboratory that perfo	rmed analytical ar	nalysis for that test. Refer to the list below:
aboratory Defin	ition Code Lat	atory Location		

ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Chain of Custody Numbers:

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 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.

mg/kg wwt - milligrams per kilogram based on wet weight of sample.



NAUTILUS ENVIRONMENTAL ATTN: Brett Lucas 8664 Commerce Court Imperial Square Lake City Burnaby BC V5A 4N7 Date Received:11-AUG-14Report Date:19-AUG-14 09:55 (MT)Version:FINAL REV. 2

Client Phone: 604-420-8773

Certificate of Analysis

Lab Work Order #: L1500270

Legal Site Desc:

Project P.O. #: Job Reference: C of C Numbers:

NOT SUBMITTED

Comments: 19-AUG-2014 This report replaces and supersedes previously sent report. This report includes modified sulfate results for ALS identified samples L1500270-3 and L1500270-4.

Anie fr

[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



www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNER

ALS ENVIRONMENTAL ANALYTICAL REPORT

L1500270 CONTD.... PAGE 2 of 4 19-AUG-14 09:55 (MT) Version: FINAL REV. 2

					n: FINAL RE
Sample ID Description Sampled Date Sampled Time Client ID	L1500270-1 WATER 11-AUG-14 16:35 YEAR 6	L1500270-2 WATER 11-AUG-14 16:35 YEAR 8	L1500270-3 WATER 11-AUG-14 16:35 END OF OPEN PIT MINING	L1500270-4 WATER 11-AUG-14 16:35 UNDERGROUND	
Analyte					
-					
рН (рН)	6 46	7.24	7 28	7 10	
Alkalinity, Bicarbonate (as CaCO3) (mg/L)	5.2	5.2	5.6	2.9	
Alkalinity, Total (as CaCO3) (mg/L)	5.2	5.2	5.6	2.9	
Chloride (Cl) (mg/L)	142	652	1700	5170	
Fluoride (F) (mg/L)	0.081	<0.40	1.2	0.164	
Nitrate (as N) (mg/L)	10.2	13.4	20.0	22.8	
Sulfate (SO4) (mg/L)	17.8	13	18.4	17.7	
Calcium (Ca)-Total (mg/L)	56.2	230	589	1790	
Magnesium (Mg)-Total (mg/L)	8.96	18.3	34.3	72.3	
Potassium (K)-Total (mg/L)	5.2	5.6	6.8	6.3	
Sodium (Na)-Total (mg/L)	41.4	149	394	1190	
	Description Sampled Date Sampled Time Client ID Analyte pH (pH) Alkalinity, Bicarbonate (as CaCO3) (mg/L) Alkalinity, Total (as CaCO3) (mg/L) Chloride (Cl) (mg/L) Fluoride (F) (mg/L) Nitrate (as N) (mg/L) Sulfate (SO4) (mg/L) Calcium (Ca)-Total (mg/L) Magnesium (Mg)-Total (mg/L) Potassium (K)-Total (mg/L)	Description Sampled Date Sampled Time Client IDWATER 11-AUG-14 16:35 YEAR 6Analyte6.46PH (pH)6.46Alkalinity, Bicarbonate (as CaCO3) (mg/L)5.2Alkalinity, Total (as CaCO3) (mg/L)5.2Chloride (Cl) (mg/L)142Fluoride (F) (mg/L)0.081Nitrate (as N) (mg/L)10.2Sulfate (SO4) (mg/L)56.2Magnesium (Mg)-Total (mg/L)8.96Potassium (K)-Total (mg/L)5.2	Description Sampled Date Sampled Time Client IDWATER 11-AUG-14 16:35 YEAR 6WATER 11-AUG-14 16:35 YEAR 8AnalyteClient ID10-20 1000000000000000000000000000000000000	Description Sampled Date Sampled Time Client IDWATER 11-AUG-14 16:35 YEAR 6WATER 11-AUG-14 16:35 YEAR 8WATER 11-AUG-14 16:35 END OF OPEN PIT MININGAnalyteImage: Client IDImage: Client IDWATER 11-AUG-14 16:35 	Sample ID Description Sampled Date Sampled Time Client ID L1500270-1 WATER 11-AUG-14 16:35 YEAR 6 L1500270-2 WATER 11-AUG-14 16:35 YEAR 8 L1500270-3 WATER 11-AUG-14 16:35 END OF OPEN PIT MINING L1500270-4 WATER 11-AUG-14 16:35 END OF OPEN PIT MINING Analyte 11-AUG-14 16:35 YEAR 8 11-AUG-14 16:35 YEAR 8 11-AUG-14 16:35 END OF OPEN PIT MINING 11-AUG-14 16:35 END OF OPEN PIT MINING PH (pH) 6.46 7.24 7.28 7.19 Alkalinity, Bicarbonate (as CaCO3) (mg/L) 5.2 5.2 5.6 2.9 Alkalinity, Total (as CaCO3) (mg/L) 5.2 5.2 5.6 2.9 Chloride (Cl) (mg/L) 142 652 1700 5170 Fluoride (F) (mg/L) 0.081 -0.40 ^M 1.2 0.164 Nitrate (as N) (mg/L) 10.2 13.4 20.0 22.8 Sulfate (SO4) (mg/L) 56.2 230 589 1790 Magnesium (Mg)-Total (mg/L) 5.2 5.6 6.8 6.3

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Qualifier

Applies to Sample Number(s)

QC Samples with Qualifiers & Comments:

Parameter

QC Type Description

Duplicate	·	Chloride (CI)	DLM	L1500270-1, -2, -3, -4
		· · ·	DEWI	
	Individual Parameters	Listed:		
Qualifier	Description			
DLM	Detection Limit Adjus	ted due to sample matrix effects	i.	
est Method I	References:			
ALS Test Code	e Matrix	Test Description		Method Reference**
ALK-SCR-VA	Water	Alkalinity by colour or titration	ı	EPA 310.2 OR APHA 2320
colourimetric OR	method.		-	otal Alkalinity is determined using the methyl orange
				Fotal alkalinity is determined by potentiometric titration to a ohthalein alkalinity and total alkalinity values.
ANIONS-CL-IC	-VA Water	Chloride by Ion Chromatogra	phy	APHA 4110 B.
		edures adapted from APHA Meth Determination of Inorganic Anio		matography with Chemical Suppression of Eluent aphy".
ANIONS-F-IC-\	A Water	Fluoride by Ion Chromatogra	phy	APHA 4110 B.
		edures adapted from APHA Meth Determination of Inorganic Anio		matography with Chemical Suppression of Eluent aphy".
ANIONS-NO3-I	C-VA Water	Nitrate in Water by Ion Chron	natography	EPA 300.0
	is carried out using proce V absorbance.	edures adapted from EPA Metho	od 300.0 "Determinatio	n of Inorganic Anions by Ion Chromatography". Nitrate is
ANIONS-SO4-I	C-VA Water	Sulfate by Ion Chromatograp	hy	APHA 4110 B.
		edures adapted from APHA Meth Determination of Inorganic Anio		matography with Chemical Suppression of Eluent aphy".
F-SIE-VA	Water	Fluoride by SIE		APHA 4500-F "Fluoride"
	as a significant negative			Fluoride is determined using a selective ion electrode. 3+ is present in the sample at a concentration greater
F-SIE-VA	Water	Fluoride by SIE		APHA 4500-F Fluoride
	as a significant negative			Fluoride is determined using a selective ion electrode. 3+ is present in the sample at a concentration greater
MET-TOT-ICP-		Total Metals in Water by ICP	OES	EPA SW-846 3005A/6010B
American Put States Enviror	lic Health Association, a nmental Protection Agen	nd with procedures adapted from cy (EPA). The procedures may	n "Test Methods for Ev involve preliminary sa	nation of Water and Wastewater" published by the valuating Solid Waste" SW-846 published by the United mple treatment by acid digestion, using either hotblock or na - optical emission spectrophotometry (EPA Method
PH-PCT-VA	Water	pH by Meter (Automated)		APHA 4500-H "pH Value"
This analysis electrode	is carried out using proce	edures adapted from APHA Meth	nod 4500-H "pH Value"	". The pH is determined in the laboratory using a pH
It is recomme	nded that this analysis be	e conducted in the field.		
PH-PCT-VA	Water	pH by Meter (Automated)		APHA 4500-H pH Value
This analysis electrode	is carried out using proce	edures adapted from APHA Meth	hod 4500-H "pH Value"	". The pH is determined in the laboratory using a pH
It is recomme	nded that this analysis be	e conducted in the field.		
SO4-TUR-VA	Water	Sulfate(SO4) by Turbidity		APHA 4500-SO4 E. SULFATE
This analysis	is carried out using proce		hod 4500-SO4 "Sulfate	". Sulfate is determined using the turbidimetric method.
* AI S test meth	ods may incorporate mo	difications from specified referer	nce methods to improv	e performance.
	sas may meorporate mo	anoations nom specified referer	ise methods to implov	o ponomiano.

Laboratory Definition Code Laboratory Location

VA

Chain of Custody Numbers:

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 uet 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.

Attachment B Daphnia magna toxicity testing of "End of Open Pit Mining" predicted ion balance





Daphnia magna toxicity testing of "End of Open Pit Mining" predicted ion balance

Final Report

Report date: August 20, 2014

Submitted to:

Golder Associates Ltd. Burnaby, BC

8664 Commerce Court Burnaby, BC V5A 4N7

TABLE OF CONTENTS

TAB	LE OF CONTENTS	i
SIGN	NATURE PAGE	ii
1.0	INTRODUCTION	.1
2.0	METHODS	.1
3.0	RESULTS	.3
4.0	QA/QC	.4
5.0	REFERENCES	. 6

LIST OF TABLES

Table 1.	Summary of test conditions: 48-h Daphnia magna LC50 test.	2
Table 2.	Results: 48-h Daphnia magna LC50 test.	3
Table 3.	Targeted and measured ion concentrations (mg/L) in the test concentrations	4
Table 4.	Reference toxicant results for Daphnia magna testing	5

LIST OF APPENDICES

APPENDIX A - *Daphnia magna* toxicity test data APPENDIX B - Analytical chemistry data

SIGNATURE PAGE

Brett Lucas, M.Sc. Environmental Scientist

James Elphick, R.P.Bio. Senior Reviewer

This report has been prepared by Nautilus Environmental Company Inc. based on data and/or samples provided by our client; the results of this study are for their sole benefit. Any reliance on the data by a third party is at the sole and exclusive risk of that party. The results presented here relate only to the samples tested.

Nautilus Environmental Work Order #14481

1.0 INTRODUCTION

Nautilus Environmental conducted an acute LC50 test using *Daphnia magna* for Golder Associates Ltd. (Golder) to characterize the toxicity of a predicted water ion balance identified as "End of Open Pit Mining, Under Ice" for the Dominion Diamonds Jay Pit. This water ion balance was diluted such that toxicity testing included "End of Open Pit Mining, Open Water".

This report describes the results of the 48-h toxicity test. Copies of raw laboratory data sheets and statistical analyses are provided in Appendix A. Results of analytical chemistry are provided in Appendix B.

2.0 METHODS

One water sample was prepared at the Nautilus Environmental Laboratory in Burnaby, BC using deionized water mixed with analytical grade salts (NaCl, KCl, MgCl₂.6H₂O, CaCl₂.2H₂O, CaSO₄, NaHCO₃, NaF and NaNO₃). Salts were measured and added to the deionized water in order to achieve the desired ratio of ions to match predicted ion concentrations associated with the "End of Open Pit Mining, Under Ice" water type, as specified by Golder Associates. The water was thoroughly mixed and then stored at $4 \pm 1^{\circ}$ C prior to testing.

The sample was tested using a 48-h *D. magna* test to determine the LC50. The dilution series included the 100% undiluted sample, a 70.4% sample that was prepared to approximate ion concentrations of a sample "End of Open Pit Mining, Open Water" (as specified by Golder), and a 50%, 25%, and a 10% sample, with dilution being prepared using deionized water. The test was performed using two replicates for each concentration in order to increase the precision of the test. At the initiation of the test, a sub-sample from each dilution was collected and analyzed by ALS laboratories (Burnaby, BC) for the ions that were added.

The procedure used for the 48-h *D. magna* toxicity test is summarized in Table 1. Testing was conducted according to procedures described by Environment Canada protocols (2000). Statistical analysis for this test was performed using CETIS (Tidepool Scientific Software 2013).

Test organism	D. magna
Test organism source	In-house culture
Test organism age	<24 h
Test type	Static
Test duration	48 h
Test vessel	250 mL glass beakers
Test volume	200 mL
Test replicates	2 test replicate per treatment
No. of organisms	10 per replicate
Control water	Moderately hard reconstituted water
Test solution renewal	None
Dilution water	Deionized water
Test temperature	$20 \pm 2^{\circ}C$
Feeding	None
Light intensity	400 to 800 lux
Photoperiod	16 hours light/8 hours dark
Aeration	None
Test protocol	Environment Canada (2000), EPS 1/RM/14
Statistical software	Tidepool Scientific Software (2013)
Test endpoint	48-h LC50
Test acceptability criteria for controls	Survival \geq 90%
Reference toxicant	Sodium chloride

Table 1.Summary of test conditions: 48-h Daphnia magna LC50 test.

3.0 **RESULTS**

Results of the 48-h *D. magna* test are summarized in Table 2. The 48-h LC50 was calculated to be 89.0%.

The targeted (nominal) and measured concentrations of ions for the test are presented in Table 3; the TDS concentration in the full strength sample (i.e., End of Open Pit Mining, Under Ice) based on the measured values was 2740 mg/L, and in the 70.4% sample (i.e., End of Open Pit Mining, Open Water) was 1902 mg/L.

I able 2. Results. 46-11 Duphniu mughu Ly	Cou lest.
Concentration (% v/v)	Survival (%)
Control	100 ± 0
10	100 ± 0
25	100 ± 0
50	75 ± 7
70.4	60 ± 14
100	45 ± 35
Test endpoint	
LC50 (95% C.L.)	89.0 (60.4 - >100.00)

Table 2.Results: 48-h Daphnia magna LC50 test.

LC = Lethal Concentration, C.L. = Confidence Limits, * = statistically significant difference from the control (p < 0.05).

	· · ·		•	-			•		
Ion	HCO ₃	Cl	F	SO_4	NO ₃ -N	Ca	Mg	Na	K
Targeted 100.0%	5.0	1728	0.13	17.0	20.0	606	34.0	387	6.3
Measured									
100.0%	5.2	1740	< 0.40	16.0	20.6	548	31.8	375	6.1
70.4%	5.2	1230	< 0.40	10.0	14.7	371	20.8	249	4.1
50.0%	4.4	867	< 0.40	<10.0	10.3	278	15.5	186	3.1
25.0%	3.4	432	<0.20	<5.0	5.2	141	7.9	94	<2.0
10.0%	2.4	172	< 0.02	1.8	2.1	58	3.2	38	<2.0

Table 3.Targeted (nominal) and measured ion concentrations (mg/L) in the test
concentrations.

Concentrations with a "<" symbol represent measured concentrations that were below the listed detection limit of the analytical test due to matrix-related effects.

4.0 QA/QC

The health history of the test organisms used in the exposures was acceptable and met the requirements of the test protocol. The test control acceptability criteria and water quality parameters remained within ranges specified in the protocol (Environment Canada 2000) throughout the test. There were no deviations from the test methodology. Uncertainty associated with this test is best described by the confidence intervals around the LC50 estimate.

The measured concentrations were in good agreement with the targeted values for the full strength sample, although fluoride could not be measured as a result of matrix interference.

Results of the reference toxicant test conducted during the testing program are summarized in Table 4. Results for this test fell within the range for acceptable organism performance of mean ± two standard deviations, based on historical results obtained by the laboratory with these tests. Thus, the sensitivity of the organisms used in this test was appropriate.

Test Species	Endpoint	Historical Mean	CV	Test Date
		(2 SD Range)	(%)	
D. magna	Survival (LC50): 3.9 g/L NaCl	4.0 (3.7-4.3)	4.0	August 5, 2014

Table 4. Reference toxicant results for Daphnia magna testing.

= Standard Deviation, CV = Coefficient of Variation, LC = Lethal Concentration.

5.0 **REFERENCES**

- Environment Canada. 2000. Biological test method: reference method for determining acute lethality of effluents to *D. magna*. Environmental Protection Series. Report EPS 1/RM/14, Second Edition. Method Development and Application Section, Environmental Technology Centre, Ottawa, ON, Canada, 21 pp.
- Tidepool Scientific Software. 2013. CETIS comprehensive environmental toxicity information system, version 1.8.7.16 McKinleyville, CA, USA, 222 pp.

APPENDIX A - Daphnia magna toxicity test data

Daphnia magna Summary Sheet

Client: Work Order No.:

Sample Information:

Sample ID: Sample Date: Date Received: Sample Volume:

NEDAVE in-house

Start Date/Time: July 28/ 14:20 Test Species: Daphnia magna Set up by: B7

Test Validity Criteria:

≥ 90% mean control survival (no more than 2 mortalities in any control replicate)

WQ Ranges:

T (°C) = 20 ± 2 ; DO (mg/L) = 3.6 to 9.4; pH = 6 to 8.5

Test Organism Information:

Broodstock No.: Age of young (Day 0): Avg No. young per brood in previous 7 d: Mortality (%) in previous 7 d: Days to first brood:

070914A	
<24 h	
19	
0	_
9	_

NaCl Reference Toxicant Results:

Reference Toxicant ID:	Dm124
Stock Solution ID:	14 Na 01
Date Initiated:	Au 05/14
48-h LC50 (95% CL):	3.9 (2.8-5.5) g/LNaCL

 Reference Toxicant Mean and Historical Range: 4.0 (3. 7-4.5)g/L NaCL

 Reference Toxicant CV (%):

Test Results:

205Ure the LC50 was 20 of the full strength undiluted 1 95% confidence limits between 60.42% exposure the to be Operation sample with % Jôh Date reviewed:

Reviewed by:

Freshwater Acute 48 Hour Toxicity Test Data Sheet

Client: Sample ID: Work Order No.:	Go End 140	Idei +81	(Oper	ation		- - -	No. C	Organis	sms/vo st Orga	olume:	<u>10/2</u> D.mag	00mL gna	8/11	4@1	<u>4:2C</u>)
DO meter:		3			pН	pH meter: <u>3/4</u> Conductivity meter: <u>5</u>							3		×	
Concentration (°10)		umber Organi		No. Immobilized	Te	Temperature Dissolved (°C) (mg						pН			uctivity /cm)	
	nop	24	48	48	0 24 48			0	24	48 0		24	48	0	48	
Control	Α	10	10	0	19.5	19.5	19.0	8.6	8.7	8.5	7.9	8.0	8.1	355	368	
	В	10	10	0												
	С															
	D															
10	A	10	10	0	20.5	19.0	19.0	8.Z	8.8	8.7	6.4	6.7	6.8	614	631	
	В	10	10	0												
	C									CRAFT AND A						
25	D	10	10	0	210	190	100	~ 2	09	0 9	62	1.7	<u> </u>	1458	1/100	
	A B	10	10	\overline{o}	61.0		<u>17.0</u>	0.2	6./	8. /	0.2	0.1	6.0	<u>1750</u>	1470	
	C	μυ									00000000000					•••
	D									CONTRACTOR STATES						
50	A	io	8	0	20.5	19.0	190	85	20	89	6.5	6.8	6.6	2820	2870	
	В	10	7	Õ												
	С															
	D															
70.4	Α	10	7	0	20.0	19.5	19.0	7.6	9.0	89	6.5	7.0	6.7	3900	4010	
	В	10	5	0												
	С															
	D															
100	Α	10	2	0	19.0	19.5	19.0	9.1	9.0	8.9	6.6	7.0	6.7	5400	5580	
	В	9	7	_ 0_												
	<u> </u>				2000 (C) 2010 (C)			2			×					
T a basi a bas	D	271	271	8-1	DTI	DT1	151	RT/	PTI	5251	i a l	1271	1240	PT1	BTC	
			BTC	BTC	BTZ			עע	BTL	DIC	516	pic	1312	BTL	01-	
WQ Ranges: T (°C) = 20	± 2; D0	0 (mg/i	L) = 3.6 to 9.4;	рн = (5 to 8.5)									
r	Hardness	*		Alkalinity*	1			Initia			diuataaa	nt		Adjusted \		
Conc.	1	Temp (°C)	19.	n MQ M		djustme	<u>nı</u>		Adjusted \						
Control (MHW)						DO (m			ŏ		$\overline{}$					
Highest conc.						pH	<i>y _ / _</i>	6.7	7			\sim	/			
						Cond (uS/cm)	5,1	-50	\sim						
Sample Descript	ion:	Deie	niza	l unter 1	Mixe	lwi	th a	l'He	ent	salts	r to	achie	oul p	redicte	ed end	concentra
Comments:	Batch# /	709140	7-d prev	vious # young/bro	od: /	9	Day of	1st Bro	od:	9	Previo	us 7-d %	% Morta	ulity: 🔿) ION	CONCENTS
Reviewed by:			JG				te revi			ŀ	•	8/14	ł			
Version 1.5; Issued	d March 13,	2014									0	 Nautili	us Enviro	nmental Com	ipany Inc.	

CETIS Analytical Report

Report Date: Test Code:

Daphnia magna 48-h Acute Survival Test

Daphnia magr	na 48-h Acute Survi	val Test			Nautilus Environmental						
Analysis ID:	04-0637-5136	Endpoint:		CETIS Version:	CETISv1.8.7						
Analyzed:	30 Jul-14 14:06	Analysis:	Trimmed Spearman-Kärber	Official Results:	Yes						
Batch ID:	14-8024-5815	Test Type:	Survival	Analyst:							
Start Date:	28 Jul-14	Protocol:	EC/EPS 1/RM/14	Diluent:							
Ending Date:	30 Jul-14	Species:	Daphnia magna	Brine:							
Duration:	48h	Source:	In-House Culture	Age:							
Sample ID:	02-1953-1107	Code:	D15C763	Client:							
Sample Date:	25 Jul-14	Material:	Sodium chloride	Project:							
Receive Date:	25 Jul-14	Source:	Golder								
Sample Age:	72h	Station:	End of Operation LC+50								

Trimmed Spearman-Kärber Estimates

Threshold Option Control Threshold		Threshold	Trim	Mu	Sigma		EC50	95% LCL	95% UCL		
		0	45.00%	1.949	0.084		88.96	60.42	131		
Survival Rate Summary					Calc	ulated Varia	ite(A/B)				
C-gm/L Control Type		Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect	Α	в
0	Lab Water	2	1	1	1	0	0	0.0%	0.0%	20	20
10		2	1	1	1	0	0	0.0%	0.0%	20	20
25		2	1	1	1	0	0	0.0%	0.0%	20	20
50		2	0.75	0.7	0.8	0.05	0.07071	9.43%	25.0%	15	20
70.4		2	0.6	0.5	0.7	0.1	0.1414	23.57%	40.0%	12	20
100		2	0.45	0.2	0.7	0.25	0.3536	78.57%	55.0%	9	20

Survival Rate Detail

C-gm/L	Control Type	Rep 1	Rep 2					
0	Lab Water	1	1	_				
10		1	1					
25		1	1					
50		0.8	0.7					
70.4		0.7	0.5					
100		0.2	0.7					

Survival Rate Binomials

C-gm/L	Control Type	Rep 1	Rep 2
0	Lab Water	10/10	10/10
10		10/10	10/10
25		10/10	10/10
50		8/10	7/10
70.4		7/10	5/10
100		2/10	7/10

QA: JOL Ane & 1/4

Analyst:_

CETIS Ana	alytical Report				Report Date: Test Code:	30 Jul-14 14:09 (p 2 c 14481 18-7570-9	
Daphnia mag	yna 48-h Acute Survi	val Test				Nautilus Environme	
Analysis ID: Analyzed:	04-0637-5136 30 Jul-14 14:06	Endpoint: Analysis:		late Spearman-Kärber	CETIS Version: Official Results		
Graphics							
1.0							
0.9							
0.7					-		
Survival Rate							
≥ 0.5 c.4				•			
0.3							
0.2							
0.1	·			<u></u>			
D	20 40 C-gr	60 m/L	80 ·	100			
				ı			
		×	Ī		•		
						~	
		,				•	
00 460 407 4						Analyst 04. 16	1
00-469-187-1				CETIS™ v1.8.7.16		Analyst: QA: <u>_</u>]Q Ar	8

APPENDIX B - Analytical chemistry data



NAUTILUS ENVIRONMENTAL ATTN: Brett Lucas 8664 Commerce Court Imperial Square Lake City Burnaby BC V5A 4N7

Date Received: 28-JUL-14 Report Date: 01-AUG-14 16:53 (MT) Version: FINAL

Client Phone: 604-420-8773

Certificate of Analysis

L1493671 Lab Work Order #:

Project P.O. #: NOT SUBMITTED

Job Reference: C of C Numbers:

Legal Site Desc:

Janie J

[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



www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNER

ALS ENVIRONMENTAL ANALYTICAL REPORT

L1493671 CONTD.... PAGE 2 of 4 01-AUG-14 16:53 (MT) Version: FINAL

	Sample ID Description Sampled Date Sampled Time Client ID	L1493671-1 Water 28-JUL-14 14:00 END OF OPERATION(100%)	L1493671-2 water 28-JUL-14 14:00 END OF OPERATION (70.4%)	L1493671-3 Water 28-JUL-14 14:00 END OF OPERATION (50%)	L1493671-4 Water 28-JUL-14 14:00 END OF OPERATION (25%)	L1493671-5 Water 28-JUL-14 14:00 END OF OPERATION (10%
Grouping	Analyte					
WATER						
Physical Tests	рН (рН)	6.69	6.70	6.59	6.41	6.20
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	4.3	4.3	3.6	2.8	2.0
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)	4.3	4.3	3.6	2.8	2.0
	Chloride (Cl) (mg/L)	1740	1230	867	432	172
	Fluoride (F) (mg/L)	<0.40	ol.40	<0.40	<0.20	<0.020
	Nitrate (as N) (mg/L)	20.6	14.7	10.3	5.15	2.07
	Sulfate (SO4) (mg/L)	16	10	<10	олы сары сары сары сары сары сары сары сар	1.75
Total Metals	Calcium (Ca)-Total (mg/L)	548	371	278	141	58.5
	Magnesium (Mg)-Total (mg/L)	31.8	20.8	15.5	7.87	3.19
	Potassium (K)-Total (mg/L)	6.1	4.1	3.1	<2.0	<2.0
	Sodium (Na)-Total (mg/L)	375	249	186	94.5	38.0

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

QC Samples with Qualifiers & Comments:

QC Type Description		Parameter	Qualifier	Applies to Sample Number(s)
Duplicate		Fluoride (F)	DLM	L1493671-1, -2, -3, -4, -5
Duplicate		Nitrate (as N)	DLM	L1493671-1, -2, -3, -4, -5
Matrix Spike		Chloride (Cl)	MS-B	L1493671-1, -2, -3, -4, -5
Matrix Spike		Fluoride (F)	MS-B	L1493671-1, -2, -3, -4, -5
Matrix Spike		Nitrate (as N)	MS-B	L1493671-1, -2, -3, -4, -5
Qualifiers for Individua	al Parameters	Listed:		
Qualifier Descrip	ption			
DLM Detecti	ion Limit Adjus	ted due to sample matrix effects.		
MS-B Matrix	Spike recovery	could not be accurately calculated d	ue to high analyte	background in sample.
Fest Method Referenc	es:			
ALS Test Code	Matrix	Test Description		Method Reference**
ALK-SCR-VA	Water	Alkalinity by colour or titration		EPA 310.2 OR APHA 2320
This analysis is carried colourimetric method. OR	out using proce	edures adapted from EPA Method 31	0.2 "Alkalinity". Tot	al Alkalinity is determined using the methyl orange
				tal alkalinity is determined by potentiometric titration to a the transmitted by a state of the transmitted and total alkalinity values.
ANIONS-CL-IC-VA	Water	Chloride by Ion Chromatography		APHA 4110 B.
		edures adapted from APHA Method 4 Determination of Inorganic Anions by		atography with Chemical Suppression of Eluent hy".
ANIONS-F-IC-VA	Water	Fluoride by Ion Chromatography		APHA 4110 B.
		edures adapted from APHA Method 4 Determination of Inorganic Anions by		atography with Chemical Suppression of Eluent hy".
ANIONS-NO3-IC-VA	Water	Nitrate in Water by Ion Chromatog	graphy	EPA 300.0
This analysis is carried detected by UV absorba		edures adapted from EPA Method 30	0.0 "Determination	of Inorganic Anions by Ion Chromatography". Nitrate is
ANIONS-SO4-IC-VA	Water	Sulfate by Ion Chromatography		APHA 4110 B.
		edures adapted from APHA Method 4 Determination of Inorganic Anions by		atography with Chemical Suppression of Eluent ohy".
MET-TOT-ICP-VA	Water	Total Metals in Water by ICPOES		EPA SW-846 3005A/6010B
American Public Health States Environmental P	Association, a rotection Agen	nd with procedures adapted from "Te cy (EPA). The procedures may invol	est Methods for Eva	ation of Water and Wastewater" published by the aluating Solid Waste" SW-846 published by the United ple treatment by acid digestion, using either hotblock or a - optical emission spectrophotometry (EPA Method
PH-PCT-VA	Water	pH by Meter (Automated)		APHA 4500-H "pH Value"
This analysis is carried electrode	out using proce	edures adapted from APHA Method 4	!500-Н "pH Value".	The pH is determined in the laboratory using a pH
It is recommended that	this analysis be	e conducted in the field.		
PH-PCT-VA	Water	pH by Meter (Automated)		APHA 4500-H pH Value
			l500-Н "pH Value".	The pH is determined in the laboratory using a pH
It is recommended that	this analysis be	e conducted in the field.		
* ALS test methods may i	ncorporate mo	difications from specified reference n	nethods to improve	performance.
The last two letters of the	above test co	de(s) indicate the laboratory that perf	ormed analytical a	nalysis for that test. Refer to the list below:
Laboratory Definition C	ode Labor	atory Location		
VA	ALS E	NVIRONMENTAL - VANCOUVER, E	BRITISH COLUMBI	A, CANADA
				•

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.



Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

L1493671-COFC

DC Number: 14 -

Page <u>1</u> of <u>1</u>

Image: Number Service Select Report Format: Date //		www.alsglobal.com																					
Birst Local Deally Captro (C) Proof with Report IP have (1 + the captro (2 + the capt	Report To					Re	eport Format	/ Distributio															
BERS BER Commerce Court, Burnaby, BC, Canada, VSA 447 □ chans on states how in to achied E □ Temperor (2 - Sa. Sch Tifements too) (CML achieved ALS to achieve mit and the change - court ALS counts TT in a sch too in the court of achieved Data tool (CML achieved Data tool) howe 604-620-8773 Email of Fax. Emettigmenthuemvioonments.com Bench Data Reguest modes 50 - 100	Company:	Nautilus Environmental	Company Inc.		Select R	eport Format	i: ⊡PDF	EXCEL	EDD (DIGITAL)														
Buildings	Contact:	Brett Lucas			Quality C	Quality Control (QC) Report with Report 🛛 🖓 Yes 🗖 No																	
bone: 604-420-8773 Entail 1 or Fax: brait@pax.dlusen4commental.com Specify Date Required IV E.E. 6* P. Analysis Request Analysis Request Analysis Request Crey of Invoice wite Report To IV Yes No Sate of Invoice Distribution Index Preved IP (P Fibert and Prevend IP) (P Fibert an	Address:	8664 Commerce Court,	Burnaby, BC, Car	nada, V5A 4N7	Criteria	a on Report - pr	ovide details bek																
Emil 2 Invoke Distribution Analysis Reguest Copy of Invoice with Report Prevent 0 for Pr							- All and a second s		☐ FAX														
Value To Same as Report To If Yes No. Series Invoice Distribution In	Phone:	604-420-8773			Email 1 d	or Fax brett	@nautilusenvi	ronmental.com															
Copy of Invace with Report Project Project No. Select Invalue Distribution					Email 2																		
Conjunt Email 2 Email 2 conjunt Email 2 <	Invoice To	Same as Report To	Ves 🖉				Invoice Di	stribution		Indicate Filtered (F), Présérvéd (P) or Filtered and Preserved (F/P) below													
any 2 Outloct: Project Information Approvant (Dr. Goat Center: LS Quole #: Outloct: Outloct: <th col<="" td=""><td></td><td>Copy of Invoice with Re</td><td>port 🔽 Yes</td><td>Ti No</td><td>Select In</td><td>voice Distrib</td><td>ution: 🖸 E</td><td>MAIL MAIL</td><td>FAX</td><td></td><td></td><td><u> </u></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></th>	<td></td> <td>Copy of Invoice with Re</td> <td>port 🔽 Yes</td> <td>Ti No</td> <td>Select In</td> <td>voice Distrib</td> <td>ution: 🖸 E</td> <td>MAIL MAIL</td> <td>FAX</td> <td></td> <td></td> <td><u> </u></td> <td></td>		Copy of Invoice with Re	port 🔽 Yes	Ti No	Select In	voice Distrib	ution: 🖸 E	MAIL MAIL	FAX			<u> </u>										
Project Information Control # Operation	Company:				Email 1 (or Fax brett(@nautilusenv	ronmental.com			1												
ALS Lab Work Order # (lab use only) ALS Contact: Sampler: Image of the decipion will appear on the report) Image of the decipion will appe of the decipion will a	Contact:]]]								۲ ۲	
ALS Lab Work Order # (lab use only) ALS Contact: Sampler: Image of the decipion will appear on the report) Image of the decipion will appe of the decipion will a		Project	Information			Oll and	Gas Require	d Fleids (client i	196).									1				ai ai	
ALS Lab Work Order # (lab use only) ALS Contact: Sampler: Image of the decipion will appear on the report) Image of the decipion will appe of the decipion will a	ALS Quote #:					at a state to a second				ate)	i	1	1					1				out	
ALS Lab Work Order # (lab use only) ALS Contact: Sampler: Image of the decipion will appear on the report) Image of the decipion will appe of the decipion will a	Job #:				GL Acco	unt and all		Routing Code:	inthia dinana	Ď	5	6]									e G	
ALS Lab Work Order # (lab use only) ALS Contact: Sampler: Image of the decipion will appear on the report) Image of the decipion will appe of the decipion will a	PO / AFE:				Activity (ž,	្ទឹ	l ₽	1					1	1	- 1		ĕ	
ALS Lab Work Order # (lab use only) ALS Contact: Sampler: Image of the decipion will appear on the report) Image of the decipion will appe of the decipion will a	LSD:				Location		hista (Andria)	. Untripacification in	here and the second	sis 1	NG.	١ <u>ڊ</u>										mn y	
ALS Sample of (1b) description will appear on the report) Date (e4mmm y) (e4mmm y) Time (e4mmm y) (e4mmm y) Sample Type (fb,mm) Sample		rk Order # (leb use op)	w)		ALS CO	ntact		Sampler:		- Ster	¥	ι.Υ					i					~	
End of Operation (100%) 28/07/2014 14.00 water R <td></td> <td></td> <td>n. Fatto alto ca</td> <td>, ^Sadže Man_e.</td> <td>Sig.</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>Z</td> <td>\sim</td> <td></td>			n. Fatto alto ca	, ^S adže Man _e .	Sig.						Z	\sim											
End of Operation (100%) 28/07/2014 14.00 water R <td>ALS Sample #</td> <td>San</td> <td>nple Identification</td> <td>n and/or Coordina</td> <td>tes</td> <td></td> <td>Date</td> <td>Time</td> <td>Sample Type</td> <td>alini</td> <td>ions</td> <td>suo</td> <td></td> <td> </td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	ALS Sample #	San	nple Identification	n and/or Coordina	tes		Date	Time	Sample Type	alini	ions	suo											
End of Operation (70.4%) 28/07/2014 14.00 water R R R I 1 End of Operation (50%) 28/07/2014 14.00 water R R R I 1 End of Operation (25%) 28/07/2014 14.00 water R R R I 1 End of Operation (25%) 28/07/2014 14.00 water R R R I I End of Operation (10%) 28/07/2014 14.00 water R R R I I End of Operation (10%) 28/07/2014 14.00 water R R R I I Short Holding Time Image: Short Holding T	(lab use only)	(Tt	nis description will	appear on the repo	ort)	(d	ld-mmm-yy)	(hh:mm)	Campio 1765	, j	5	ani						-					
End of Operation (50%) 28/07/2014 14.00 water R R R 1 End of Operation (25%) 28/07/2014 14.00 water R R R 1 End of Operation (25%) 28/07/2014 14.00 water R R R 1 End of Operation (10%) 28/07/2014 14.00 water R R R 1 Short Holding Time	and Real	End of Operation (100%	6)			2	8/07/2014	14:00	water	R	R	R										1	
End of Operation (25%) 28/07/2014 14.00 water R R R 1 End of Operation (10%) 28/07/2014 14.00 water R R R 1 End of Operation (10%) 28/07/2014 14.00 water R R R 1 1 Short Holding Time Image: Short Holding Tima	. Baes S	End of Operation (70.4	%)			2	8/07/2014	14:00	water	R	R	R				_						1	
End of Operation (10%) 28/07/2014 14.00 water R R R Image: Construction (10%) Image: Constr	awar ass	End of Operation (50%))			2	8/07/2014	14:00	water	R	R	R										1	
Short Holding Time Rush Processing Drinking Water (DW) Samples' (client use) Special Instructione / Specify Criteria to add on report (client Use) Frozen Frozen Orinking Water (DW) Samples' (client use) Special Instructione / Specify Criteria to add on report (client Use) Frozen Frozen We samples taken from a Regulated DW System? Frozen Frozen Frozen Frozen Frozen ShiPMENT RELEASE (client use) ShiPMENT RELEASE (client use) ShiPMENT RELEASE (client use) ShiPMENT RELEASE (client use) Released by: Date: Time: Received by: Date: <td< td=""><td>Ś</td><td>End of Operation (25%)</td><td>)</td><td></td><td></td><td>2</td><td>8/07/2014</td><td>14:00</td><td>water</td><td>R</td><td>R</td><td>R</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>1</td></td<>	Ś	End of Operation (25%))			2	8/07/2014	14:00	water	R	R	R										1	
Short Holding Time Rush Processing Drinking Water (DW) Samples' (client use) Special instructions / Specify Criteria to add on report (client Use) Frozen SAMPLE CONDITION AS RECEIVED (lab use only) Ver samples taken from a Regulated DW System? F Yes No Ver samples for human drinking water use? F Yes F No SHIPMENT RELEASE (client use) INITIAL SHIPMENT RECEPTION (lab use only): SHIPMENT RELEASE (client use) INITIAL SHIPMENT RECEPTION (lab use only): SHIPMENT RELEASE (client use) INITIAL SHIPMENT RECEPTION (lab use only): Bate: Time: Received by: Date: Date: Time: Received by: Date: Date: Time: Received by: Date: MHITE - LABORATORY COPY YELLOW - CLIENT COPY Anterstand runk time Mental matrix	Sound Street	End of Operation (10%))			2	8/07/2014	14:00	water	R	R	R										1	
Short Holding Time Rush Processing Drinking Water (DW) Samples ¹ (client use) Special Instructions / Specify Criteria to add on report (client Use) Frozen Frozen SMMPLE CONDITION AS RECEIVED (lab use only) re samples taken from a Regulated DW System? Frozen Frozen Frozen SMIPMENT RELEASE (client use) SHIPMENT RELEASE (client use) SHIPMENT RECEPTION (lab use only) Released by: Date: Time: Received by: Date: WHITE - LABORATORY COPY YELLOW - CLIENT COPY	Standard.	:							_														
Rush Processing Drinking Water (DW) Samples' (client use) Special Instructions / Specify Criteria to add on report (client Use) Frozen SAMPLE CONDITION AS RECEIVED (lab use only) ve samples taken from a Regulated DW System? Yes Yes ShiPMENT RELEASE (client use) ShiPMENT RELEASE (client use) ShiPMENT RELEASE (client use) Image: Time: Received by: Date: Time: Received by: Date: Time: WHITE - LABORATORY COPY YELLOW - CLIENT COPY		· ·											L										
Rush Processing Drinking Water (DW) Samples' (client use) Special Instructions / Specify Criteria to add on report (client Use) Frozen SAMPLE CONDITION AS RECEIVED (lab use only) ve samples taken from a Regulated DW System? Yes Yes ShiPMENT RELEASE (client use) ShiPMENT RELEASE (client use) ShiPMENT RELEASE (client use) Image: Time: Received by: Date: Time: Received by: Date: Time: WHITE - LABORATORY COPY YELLOW - CLIENT COPY	n Astron	- Chart																					
RUSh Processing Still instructions / Special instructins / Special i	1000 Casar	- anore	ποιαι	ng rim	e —						-										T		
RUSh Processing Still instructions / Special instructins / Special i	States see as	†							1 · -											_			
Drinking Water (DW) Samples ¹ (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? Sife Observations Yes No Image: Sife Observations Yes </td <td>4041494911-1-2-12-2-2-2-2-2-2-2-2-2-2-2-2-2-2-2</td> <td>+ Rι</td> <td>ısh Proce</td> <td>essing</td> <td></td> <td><u> </u></td> <td></td> <td></td> <td></td> <td>1-</td> <td></td> <td>t</td> <td><u> </u></td> <td></td> <td></td> <td>r -</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>——[</td>	4041494911-1-2-12-2-2-2-2-2-2-2-2-2-2-2-2-2-2-2	+ Rι	ısh Proce	essing		<u> </u>				1-		t	<u> </u>			r -						——[
Drinking Water (DW) Samples ¹ (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? Frozen Sif Observations Yes No If Yes If No Are samples for human drinking water use? Initifial Cooler TEMPERATUREs *C Final Cooler TEMPERATURES *C Final Cooler TEMPERATURES *C SHIPMENT RELEASE (client use) INITIAL SHIPMENT RECEPTION (lab use only) Final Cooler TEMPERATURES *C Final Cooler TEMPERATURES *C SHIPMENT RELEASE (client use) Initifield ShiPMENT RECEPTION (lab use only) Final ShiPMENT RECEPTION (lab use only) Final ShiPMENT RECEPTION (lab use only) Final ShiPMENT RECEPTION (lab use only) Released by: Date: Time: Received by: Date: Time? Referent to BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION WHITE - LABORATORY COPY YELLOW - CLIENT COPY YELLOW - CLIENT COPY		╉╾、		U						+	-		╞──										
Drinking Water (DW) Samples ¹ (client use) Special Instructions / Specify Criteria to add on report (client Use) Frozen Sife Observations Yes No Image: Stree samples taken from a Regulated DW System? Image: Stree samples for human drinking water use? Image: Stree samples for human drinking	ger Hitta, Hi									+		<u> </u>	SAMP		NDITI		RECE		abuse	oniv)			
Image: State of the samples taken from a Regulated DW System? Image: State of the samples for human drinking water use? Image: State of the samples for human drinking water use? Image: State of the samples for human drinking water use? Image: State of the samples for human drinking water use? Image: State of the samples for human drinking water use? Image: State of the samples for human drinking water use? Image: State of the same	Drinking	g Water (DW) Samples ¹	(client use)	Spi	cial instructions	s / Specify Cr	iteria to add o	n report (client U	5 0)	Eroz										_	No		
Image: Property and set of the set	Are samples tak	en from a Regulated DW	System?		<u> </u>					-	1.00	Yes			diara.	11 NAA	at the losses				No	· · · · ·	
Are samples for human drinking water use? INIITIAL COOLER TEMPERATURES *C FINAL COOLER TEMPERATURES *C Yes IV IV IV IV SHIPMENT RELEASE (client use) IVITIAL SHIPMENT RECEPTION (lab use only) FINAL SHIPMENT RECEPTION (lab use only) Released by: Date: Time: Received by: Date: Time: Reference IVITIAL SHIPMENT RECEPTION (lab use only) WHITE - LABORATORY COPY YELLOW - CLIENT COPY Time: Cooler temperatures *C	-	•	-,													000.0	.,					1	
Image: Press Pres Pre														RATURE	S °C						C .		
SHIPMENT RELEASE (client use) INITIAL SHIPMENT RECEPTION (lab use only) FINAL SHIPMENT RECEPTION (lab use only) Released by: Date. Time: Received by: Date: Time: Pale: Time: Time: Pale: Time: Time: Pale: Time: Time: Time: Time: Time: Time: Time: Time: Time: Time: <t< td=""><td colspan="5"></td><td colspan="5"></td><td>1</td><td></td><td></td><td></td><td></td><td></td><td>11 11 11 11</td><td>1</td><td></td><td></td><td></td><td></td></t<>											1						11 11 11 11	1					
Released by: Date: Time: Received by: Date: Ti			etc	INITIAL SHIPMENT RECEPTION (at use only)					FINAL SHIPMENT RECEPTION (Iah use only) one														
REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION WHITE - LABORATORY COPY YELLOW - CLIENT COPY	Released by	STIFWENT KELEA		Time:															فستحص والمراجع والمراجع				
REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION WHITE - LABORATORY COPY YELLOW - CLIENT COPY						:(801)ara)		an Car		140	, delaye			imp.			July		199933	7.4	\bigcirc $_{23}$	949 - N	
	REFER TO BAC	K PAGE FOR ALS LOCAT	IONS AND SAMPLI	ING INFORMATION													بالأب	74-0326e v09 f	roni/04 Janue	ry 2014			

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 whit 1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form,