

Mount Polley Mining Corporation

an Imperial Metals company

February 10, 2015

Early Life Stage Toxicity Test - Quesnel River Test Results

Mount Polley received results on January 29, 2015 for an early life stage toxicity test carried out using water samples from the Quesnel River taken at a monitoring station near the Quesnel River Research Centre. This 30-day test, which was carried out in accordance with Environment Canada protocol at an accredited laboratory, concluded that the water from the Quesnel River had no effect on the survival or normal development of rainbow trout eggs that were exposed to that water. The test starts immediately after fertilization and continues throughout embryo development up to the point of hatching and emergence as an alevin (a young hatchling that still has a yolk sac attached; *Figure 1*). Rainbow trout are members of the same family as all five species of pacific salmon (family Salmonidae) and share similar sensitivities to copper.



Figure 1. The embryo-alevin test measures the effect of test substances on the survival and normal development of a salmonid from the stage of a fertilized egg (left photo), a developing embryo (centre photo) and through to a hatched alevin (right photo).

Early life stage toxicity tests are used because of the sensitivity of these life stages to potentially toxic substances. During this susceptible period, there are numerous developmental events occurring at the cellular and subcellular level, providing many "targets" for toxic substances to interfere with those processes. However, using full strength Quesnel River water, the eggs developed normally through to hatched alevins.

The water samples were collected to coincide with egg availability which happened to also coincide with the period of greatest turbidity (cloudiness) in the Quesnel River, making this test particularly informative. The test was carried out during the approximate time frame as shown by the black bar on the turbidity data chart (*Figure 2*). Several members of the local community, First Nations and government officials expressed legitimate concerns about incubating eggs in the Quesnel River, particularly after lake overturn resulted in cloudy water in the river. The test results attached are part of our efforts to provide answers to those questions. This test has exposed incubating eggs directly to Quesnel River water during the peak turbidity period measured to date, and their development was unaffected by this water through to hatching. These data are directly relevant to the questions raised.

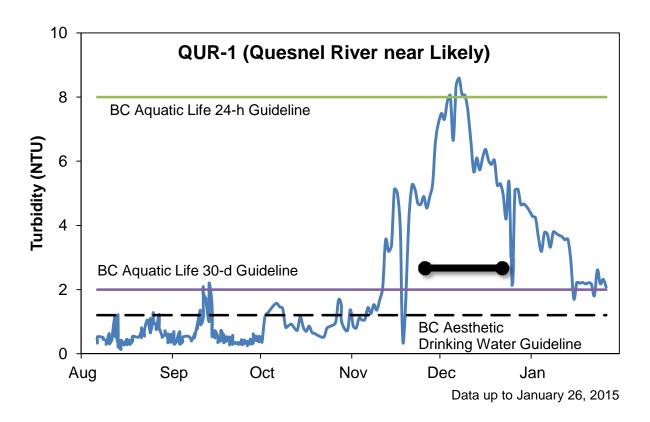


Figure 2. Turbidity data from water samples collected at the Quesnel River Research Centre since August. The black bar indicates the approximate period over which samples were collected for the early life stage toxicity test.

While the cloudiness of the water in the Quesnel River has been visually overt, the levels of turbidity in the river, even at the peak measured turbidity values, are similar to or lower than turbidity levels naturally present in many rivers in British Columbia where vigorous salmon populations exist. It is also lower than turbidity values measured downstream in the Quesnel River at the Gravelle Ferry site, which is influenced by an erosional section of the Quesnel River downstream of the Quesnel River Research Centre and other sources of turbidity. Similarly, sampling by Mount Polley and others shows that copper concentrations in the dissolved form have been below water quality guidelines. While total copper, associated with particulates, is above the guideline, this form is unlikely to be bioavailable (i.e., present in a form that is not absorbed). Thus, the results of this test showing no effect of the river water on early life stage development are not surprising based on the exposure data collected by Mount Polley.

Attachment: Nautilus Environmental Report dated January 29, 2015



Toxicity Testing of Sample QUR-1

Collected November 25 - December 22, 2014

Report date:

January 29, 2015

Submitted to:

Mount Polley Mining Corporation

Likely, BC

8664 Commerce Court Burnaby, BC V5A 4N7

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SIGNATURE PAGE

Yvonne Lam, B. Sc.

Laboratory Biologist

Armando Tang, R. Bio.

Laboratory Manager

This report has been prepared by Nautilus Environmental Company Inc. based on data and/or samples provided by our client and 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.

1.0 INTRODUCTION

Nautilus Environmental conducted a rainbow trout (*Oncorhynchus mykiss*) embryo-alevin toxicity test for Mount Polley Mining on a sample identified as QUR-1. The initial and refresh samples were collected between November 25 to December 22, 2014 and delivered on a weekly basis to the Nautilus Environmental laboratory in Burnaby, BC. The samples were collected in 20-L plastic containers. The samples were received at temperatures ranging from 3.0 to 6.9° C and were stored at $4 \pm 2^{\circ}$ C in the dark prior to and during testing.

This report describes the results of the toxicity test. Copies of laboratory data sheets and printouts of statistical analyses are provided in Appendix A. The chain-of-custody forms are provided in Appendix B.

2.0 METHODS

The methodology for the early life stage embryo-alevin test is summarized in Table 1. Testing was conducted according to procedures described by Environment Canada (1998) and Canaria et al. (1999). Statistical analyses were performed using CETIS (Tidepool Scientific Software, 2013).

Table 1. Summary of test conditions: rainbow trout embryo-alevin test.

Test organism Oncorhynchus mykiss

Test organism source Vancouver Island Trout Hatchery, Duncan, BC
Test organism age <30 min post fertilization, <24 h old gametes

Test type Static-renewal

Test duration 30 days

Test vessel 2-L plastic containers

Test solution volume 2L

Test treatments Laboratory control, 6.25, 12.5, 25, 50, and 100% sample

Test replicates 4 test replicates per treatment

No. of organisms 30 eggs per container

Control water Dechlorinated water (hardness 9-12 mg/L CaCO₃)

Test solution renewal Daily
Test temperature $14 \pm 1^{\circ}$ C
Feeding None

Light intensity Dark (low light during solution renewals)

Photoperiod 24-h dark

Aeration $6.5 \pm 1 \text{ mL/min/L}$

Test protocol Environment Canada (1998), EPS 1/RM/28; Canaria et al. (1999)

Statistical software CETIS (2013)

Test endpoint Survival, normal alevins
Test acceptability criteria for controls ≥65% normal alevins

Reference toxicant Sodium Dodecyl Sulphate (SDS)

3.0 RESULTS

Results of the embryo-alevin test with sample QUR-1 are provided below in Table 2. There were no adverse effects exhibited for either test endpoint, with embryo survival and normal hatched alevins in all the test treatments at >87% and >85%, respectively. Consequently, the EC25 and EC50 values for both survival and normality were >100% (v/v).

 Table 2.
 Results: rainbow trout embryo-alevin test.

Concentration	Survival (%)	Normal Alevins (%)
(º/o v/v)	[Mean ± SD]	[Mean ± SD]
Control	87.5 ± 16.2	85.0 ± 19.2
6.25	92.5 ± 7.4	92.5 ± 7.4
12.5	92.5 ± 6.9	88.3 ± 4.3
25	90.8 ± 5.7	87.5 ± 5.0
50	94.8 ± 4.6	93.2 ± 4.1
100	92.5 ± 6.3	92.5 ± 6.3
Test Endpoint	Survival (%)	Normal Alevins (%)
EC25	>100	>100
EC50	>100	>100

v/v = volume per volume, SD = Standard Deviation, EC = Effective Concentration.

4.0 QA/QC

The tests met control passing criterion of ≥65% normal hatched alevins specified in the Environment Canada protocol (1998). Water quality parameters remained within ranges specified in the protocol and there were no deviations from the test methodology. Uncertainty associated with these tests is best described by the standard deviation around the mean and/or where applicable, the confidence interval for point estimates.

Results of the reference toxicant test conducted during the testing program are summarized in Table 3. Results for this test fell within the range for organism performance of mean and range, based on historical results obtained by the laboratory with this test. Thus, the sensitivity of the embryos used in the toxicity test and evaluated with the concurrent SDS reference toxicant test was appropriate.

 Table 3.
 Reference toxicant result.

Test Species	Endpoint	Historical Mean (2 SD Range)	CV (%)	Test Date
O.mykiss (embryo)	Viability (EC50): 2.7 mg/L SDS	3.9 (2.0 – 7.3)	37	November 26, 2014

SD = Standard Deviation, CV = Coefficient of Variation, EC = Effective Concentration.

5.0 REFERENCES

Canaria, E.C., J.R. Elphick and H.C. Bailey. 1999. A simplified procedure for conducting small-scale short-term embryo toxicity tests with salmonids. *Environ. Toxicol.* 14:301-307.

Environment Canada. 1998. Biological test method: toxicity tests using early life stages of salmonid fish (rainbow trout). Environmental Protection Series EPS 1/RM/28. Second Edition, July 1998. Environment Canada, Method Development and Application Section, Environmental Technology Centre, Ottawa, ON. 102 pp.

Tidepool Scientific Software. 2013. CETIS comprehensive environmental toxicity information system, version 1.8.7.16 Tidepool Scientific Software, McKinleyville, CA. 222 pp.



Rainbow Trout Embryo Summary Sheet

Client:	Mount Polley	Start Date/	Fime: November	er 26, 2014 @ 16
Work Order No.:	14928	Test Spe	cies: Oncorhyno	chus mykiss
Sample Informat	ion:			
	QUR-1 Nov. 25, Dec. 2, Dec. 9, Nov. 26, Dec. 3, Dec. 10' '6, 5+201, 6+201	Dec 10, Dec 11, 12001, 15	6 /14, Dec 22/19 17/14 Dec 23/1 x 20/1 6 x 20	t 14 L
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Reference Toxical Reference Toxical	nt Mean and Range: 3.9 (nt CV (%): 31	(2.0-7.3) n	<u>YL SDS</u>	
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Reviewed by:

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Chronic Freshwater Toxicity Test Initial and Final Water Quality Measurements

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Chronic Freshwater Toxicity Test Water Quality Measurements

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Chronic Freshwater Toxicity Test Initial and Final Water Quality Measurements

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				\		980 A.A.D A.S. 60		SPA de investible dest 1650	See to section the section of	Carlo de como do describirado de la como de co	2 Thompson St.			Marie La tra Assignation	1

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	-			. 2					And a street to part of the last		- Sangar Pi V				1
	une						part to property to the same	To the same of the							
midals	1		-	71	1 <u>D</u>										j
						· · · · · · · · · · · · · · · · · · ·	Da	vs							1
Concentration	28	2	29		30 Red	31			2	3	3	3	4	35	1
	SOCIETATION CONTRACTORS	PARTICIPATION AND PROPERTY OF	59205975427565090	313000000000000000	COMMONSTRUCKINGAN	SCHOOLS AND	TO STATE OF THE PARTY OF THE PA	25,600 (2012) (1012) (1012)	A CONTRACTOR OF THE PARTY OF TH	SCHOOLS CONTRACTOR IN	060000000000000000000000000000000000000	THE RESIDENCE OF THE PARTY OF T	E=12200000000000000000000000000000000000	CONTRACTOR (CO.)	STIPSEN.
	The state of the s			Name of the second seco		350 4 p. 4 p. 16 p	di kambakan di di di	Shite limitared to Addition &	tid Standard (1974)	and the second second second second	DOM: Line of the	SENTALA ATALA BABBE	COT SOME OF COMMENTS		1
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		-			· · · · · · · · · · · · · · · · · · ·		Da	vs			· · · · · · ·]
ample ID: GUR- GUR							1								
	Stop Date & Time: December 26, 20 A			The street											
Temperature (°C)				1			and the same of th								
	99	9.8	9.2												1
рH	69	6.9	6.9	1											
Cond. (µS/cm)	_	Ġ	5 0	W. 4	556					na and and and and					
Initials	me	,	JW	Th	YB										
					-		Da	ys	,						
Concentration	28	2	9	3	10 Sim	31		32	2	33	3	34	1	35	
100	old	new	eile	7	300	тем	56	пем	0.0	new	old	(ris)(r	elei	new	
Temperature (°C)	145	14.5	14.5		14.0										
DO (mg/L)	9.9				9.3										
рН	7.3	7.2	7.2		7.5										
Cond. (µS/cm)	-	12	21	13	52										
Initials	mi	7	JW	JA	(B										
DO meter:		DO-1	}	pН	meter:	р	H-1 []		Cond	uctivity	meter:		C-1/-3		
	.Cor	ntrol	1.0	c Jec						Analyst	s:	JAB.	JW, Y	YL	
	(٩	6	0											
		1	2	50											
* mg/L as CaCO3									D	ate revi	ewed:	Jan	~26/1	1	
Sample Description	:	<u>clec</u>	ar 1	o col	ww.										
Comments:			,												-

Embryo-Alevin Toxicity Test Daily Mortality

Client:	mt. Polley	Start Date & Time:	November 26	, 201	401600
Sample ID:	QUR-1	Stop Date:			
Work Order #:	14928	Test Species:	Oncorhynchus mykis	\$	
•					

Concentration			Day of	Test	- No.	of Mo	rtalitio	es	Total	Total	Total No.	Total
(% VI)	Rep	1	2	3	4	5	6	7	Dead Eggs	Undeveloped	Embryo	Exposed
Control	1	0	e	2	0	0	0.	U	0	/	,	
	2	ì	1	1	,		1		0		ĺ	-
	3								0			
	4	\Box					1		0		1	
6.25	1			\sqcap			i		1			
	2					\sqcap	Ø	\sqcap	0			
	3		\top				1		0			
	4		1				10%	17.7	0			
12-5	1		1					1307	1		1	
	2		0				1		0			
	3						1		1			
	4						0		0			
25	1						3	1	0			
	2			\Box					0			
	3								0			•
	4								0			
50	1							100	0			
	2						17.52	136	0			
	3					1			O			
	4					1			1			
100	1					0			0			
	2					i			0			
	3			1 1			N 4	10	0			
	4	4	1		Ŋ	1	V	V	O		,	1
	1											
	2											
	3											
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	1											
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	3											
	4			1				्हें जी				
Tech Initials		SSD	SSD	P	1	SSD	SSD	SSI)	ym			

version 1.0 issued J	une 20, 2	2000						1				
/ersion 1.0 Issued J	upo 26 1	onne			7			1		J	Nautilu	s Environmenta
viewed by:		JOh						Date ı	eviewed:	 Jan.	26/15	
					-							
mments:							:					
ch Initials		SSD	SSD	A	1	SSD	SSD	22)	ym			
	4			<i>F</i> .				क्रिक				
 	3	1				<u> </u>						
	2					†				 		
	1					<u> </u>	-	-				
	3	ļ						<u> </u>		 		
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Embryo-Alevin Toxicity Test Daily Mortality

Client:	Mount polley	Start Date & Time: November 26, 204 @ 16:00
Sample ID:	QUR-1	Stop Date: December 26, 2014 @ 11:00
Work Order #:	14928	Test Species: Oncorhynchus mykiss

Concentration			Day of	Test	- No.	of Mo	rtalitie	S	Total	Total	Total No.	Total	
(% v/v)	Rep	8	9	10	11	12	13	14	Dead Eggs	Undeveloped	Embryo	Exposed	
Control	1	ø	0	9	0	6	0	0	O	1.	1	ì	
	2	1	1	1	1	1	1	1	1				
	3		0						0				
	4		1		1				0				
6.25	1				V			7	0		-		
- Windows	2		11	 	1				1				
	3		11		0		1		0				
	4				Ī		П		0				
12-5	1								0				
	2		1						0				
	3	\sqcap	2						2				
	4		10						O				
25	1		B		V				0				
	2		1		i				2				
	3		0		0				۵				
	4				0				0				
50	1				i				0				
	2								0				
	3								0				
	4								0				
lov	1								3				
	2								D				
	3							1	0		T		
	4	1	1	17	y	V	V	1	Ø				
	1							2.170.272	,				
	2		-	 					<i>₩</i>				
	3					1	<u> </u>						
×	4		1										
	1										1 1		
	2		1				1		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,				
	3		1	1				********					
· · · · · · · · · · · · · · · · · · ·	4	<u> </u>	<u> </u>	 	-	<u> </u>	-						
Tech Initials		SSD	mi	~		SSD	SSD	550	ww				

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	2								3,1				1		T
	3														
	4				×						7				1
Tech Initials		SSD	ww	7	_	65D	SSD	SSI)	www						
Comments:					······································		·								
Reviewed by:			J0	u			-	Date r	eviewed:		gan,				
Version 1.0 Issued	June 26, 1	2006						: '		•		' Na	autilus Er	nvironmenta	al
								:							

Chronic Toxicity Test Daily Mortality

Client:	Mt. Polley	Start Date & Time: November 26, 2014@16	: 0 0
Sample ID:	QUR-1	Stop Date: December 26, 2014 @ 11:	∞
Work Order #:	14928	Test Species: Oncorhynchus mykiss	

Treatments			Day of	Test	- No. (of Moi	rtalitie	s	Total Dead Eggs/		otal veloped/	Total	No	T	otal
(% vlu)	Rep	15	16	17	18	19	20	21	Embryos Alevins	Unh	atched bryos	Alevi			osed
Contro	1	0	0	0	0	0	ø	0	D	<u> </u>	1	1			1
	2	3	1	1		1	1	1	0		1				
	3			\sqcap					0		1				
,	4								0						
6.25	1								₀						
	2								O						
	3								0						
	4				П				Õ						
12-5	1					П			0						
	2						¥		0						
	3						4		1						
	4						ပ		0						1/
25	1				1		0		Ð						
	2						Î	İ	1		1				
	3						0		0						
	4						0		0						
50	1						1		٥						
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	3														-
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ech Initials		SSD	(83)	<u>_</u>	~	SSD	550	<u> \$5D_</u>	ww						

Tech Initials	SSD SSD A	~ SSD SS	D 550 WW		•
Comments:	<u> </u>		i	·	·
	70			20 21	
Reviewed by:	John		Date review	ved:	12

Chronic Toxicity Test Daily Mortality

Client:	M- polley	Start Date & Time:	November 26, 2014 (216:00
Sample ID:	aur-1 !	Stop Date:	December 26 294@ 11:00
Work Order #	14928	Test Species:	Oncorhynchus mykiss

Concentration			Day of	Test	- No.	of Mo	rtalitie	98	Total Dead		otal			l _	
			T	T		T	1	T	Eggs/		eloped/		al No.		tal
(1) 11.	Rep	22	23	24	25	26	27	28	Embryos	Unha	itched	Ale	vins	Exp	osed
(No N)				<u> </u>				<u> </u>	Alevins	Eml	orvos				
Control	1	0	0	0	0	i	0	0	l		1		<u> </u>		1
i	2			1		1			<u> </u>		<u> </u>				<u> </u>
	3					1	4	V	1				<u> </u>		<u> </u>
	4					8	1	2	11						
(O. V.S	1					0	O	0	0		l				
	2					į	1		ì						
	3					Ō			0						
	4		1			5		V	5						
125	1					2		1	3	·					
	2					1		ð	l						
	3		Ш			O			0				•		
	4					0			0						
25_	1					0	V	V	O						
,	2					O	ſ		2						
	3					l	9	1	2						
	4		1			5572	1	\bigcirc	2						
50	1					0		0	Ö						
	2							2	2						
	3							0	6		1				
	4		.**			V		0	0	1.					
100	1		4			1		0	S						
	2		<u> </u>	$oldsymbol{\perp}$		0) :	1						
	3		0	Li.		Ó		1	11						
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Tech Initials		95h	SSD	Δ	37%	55h	550	w	95D						

Tech Initials	95D	<i>9</i> 5D	Δ	37	55h	SSD	w	98	0				
Comments:													 · ·
_										,			
Reviewed by:		JO	<u> </u>				. 1	Date rev	riewed:	7	au. ?	6/15	

Chronic Toxicity Test Daily Mortality

Client:	Mt. polley	_ Start Date & Time:	November 26.	2014 @ 16700
Sample ID:	QUR-1	Stop Date:	December 26	,2014@11100
Work Order #:	14928	Test Species:	Oncorhynchus mykiss	

Concentration		[Day of	Test	- No. (of Mo	rtalitie	s	7-4-1 01	Total Abnamal	Total	Total
("(ov lu)	Rep	29	30	31	32	33	34	35	Total Dead Eggs/Alevins	Total Abnormal Alevins	Normal Alevins	Exposed
Control	1	0	0		i			7	0	0	29	30
	2	ĺ	i					1	0	10	28	30 31
	3								0	0.	28	29 30
	4						7	-	0	20	17	30
6.25	1		V				7		0	0	29	30
	2		1						1	0	27	30
	3		Ô				/		0	0	30	30
	4		I				/		0	0	30 25	30
125	1					,			0	10	25	3√0
	2								0	0	28	30
	3								0	0.	26	30
	4		V						0	36	27	30
25	1		t			/			1	20	27	30
	2		0						Ò	0	25	30
	3	4							Ò	0	28	30
	4	i	V						\\	20	25	30
50	1	1	1						2	13	27	30
	2	1	0						1	0	25	28 30
	3	D							0	10	29	
	4								Ø	0	29	30
(30	1							:	0	0	25	30
	2							-	0	0	29	30
	3							:	0	0	29	30
·	4	\	V	1					0	0	28	30
	1											
	2											
	3											
	4											
	_ 1											
	2											
	3											
	4							1				
Tech Initials		W	JAB						YM,	JAB	JAB	ww

	4							1				,
Tech Initials		WE	JAB						W.	JAB	JAB	ww
Comments:	ÓS	kelet	1 6	D fins	old,	skeli	etal C	D FM	Fold @ 1:sl	celetal 2: Finfo	ld 3: Finfo	ld rskeletal
Reviewed by:			J	'Oh			•		Date reviewed:	Jan. 21	e/15	

Report Date:

30 Dec-14 15:52 (p 1 of 2)

Test Code:

14928 | 20-1308-3890

											est oc	ue.		14920	20-1300-30
Salmo	nid Emi	oryo-Alevin Surv	vival an	d Develo	pmen	t Test							Na	utilus En	vironment
Analys Analyz		04-8978-2240 30 Dec-14 15:5		Endpoint Analysis:		vival Rate ear Interpola	ition (ICPIN)				/ersion: Results:	CETISv1 Yes	.8.7	
Batch	ID:	17-9788-0111	7	Test Type	: Sur	vival-Develo	pment			Α	nalyst	: Yvor	ne Lam		
Start D	ate:	26 Nov-14 16:00	0 F	Protocol	EC/	EPS 1/RM/	28			D	iluent	Dech	lorinated T	ap Water	
Ending	g Date:	26 Dec-14 11:00	0 \$	Species:	Ond	corhynchus	mykiss			В	rine:				
Duratio	on:	29d 19h	\$	Source:	Van	couver Islai	nd Trout Ha	chery	,	A	ge:				
Sample	e ID:	12-7843-5699	(Code:	4C3	336173				С	lient:	Mour	nt Polley		
Sampl	e Date:	25 Nov-14 10:30	0 1	Material:	Effl	uent				Р	roject				
Receiv	e Date:	26 Nov-14 09:05	5 \$	Source:	Mot	unt Polley (N	IT POLLEY) .							
Sampl	e Age:	29h	\$	Station:	QU	R-1									
Linear	Interpo	lation Options													
X Tran	sform	Y Transform		Seed	Res	amples	Exp 95%	CL	Meth	od					
Log(X+	-1)	Linear	. 1	1186027	200		Yes		Two-l	Point Int	erpola	tion			
Point E	Estimate	es											i		
Level	%	95% LCL	95% U	ICL TU		95% LCL	95% UCL								
EC5	>100	N/A	N/A	<1		NA	NA					-			
EC10	>100	N/A	N/A	<1		NA	NA								
EC15	>100	N/A	N/A	<1		NA	NA								
EC20	>100	N/A	N/A	<1		NA	NA								
EC25	>100	N/A	N/A	<1		NA	NA								
EC40	>100	N/A	N/A	<1		NA	NA								
EC50	>100	N/A	N/A	<1		NA ·	NA								
Surviv	al Rate	Summary					Calcu	lated	Variat	te(A/B)					•
C-%		ontrol Type	Count			Min	Max	Std	Err	Std De		V %	%Effect	Α	В
0	N	egative Control	4	0.87		0.6333	0.9667	0.08		0.1619		8.5%	0.0%	105	120
6.25			4	0.92		0.8333	1	0.03		0.0739		.99%	-5.68%	111	120
12.5			4	0.92		0.8667	1	0.03		0.0687		.43%	-5.68%	111	120
25 50			4 4	0.90 0.94		0.8333	0.9667 1	0.02		0.0569		.27%	-3.78%	109 112	120
50 100			4	0.92		0.8929 0.8333	0.9667	0.02		0.0450		.84% .82%	-8.34% -5.68%	111	118 120
			-	0.32			0.3007		100	0.0051		.02 /0	-0.00 /0		120
	al Rate			_	_		_								
C-%		ontrol Type	Rep 1	Rep		Rep 3	Rep 4								
0	N	egative Control	0.9667		55	0.9655	0.6333								
5.25			0.9667			1	0.8333								
12.5			0.8667			0.8667	1								
25			0.9667			0.9333	0.9								
50			0.9333			1	0.9667								
100			0.8333	0.96	07	0.9667	0.9333								
		Binomials													
C-%		Control Type	Rep 1	Rep		Rep 3	Rep 4			-					
)		Negative Control		29/3		28/29	19/30								
5.25			29/30	27/3		30/30	25/30								1
12.5			26/30	29/3		26/30	30/30								
25			29/30	25/3		28/30	27/30								
50			28/30	25/2		30/30	29/30								
100			25/30	29/3	0	29/30	28/30								

Report Date:

30 Dec-14 15:52 (p 2 of 2)

Test Code:

14928 | 20-1308-3890

Salmonid Embryo-Alevin Survival and Development Test

Nautilus Environmental

Analysis ID: Analyzed: 04-8978-2240

30 Dec-14 15:51

Endpoint: Survival Rate

Analysis:

Lines-Internal tion (ICD)

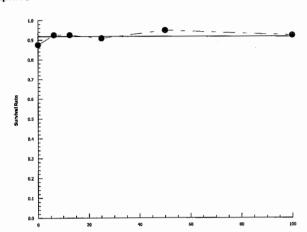
Linear Interpolation (ICPIN)

CETIS Version:

CETISv1.8.7

Official Results: Yes

Graphics



Report Date: Test Code: 30 Dec-14 15:52 (p 1 of 2)

14928 | 20-1308-3890

										ooue.			0-1000-00
Salmo	nid Emb	oryo-Alevin Surv	rival an	d Develop	ment Test	-					Na	utilus Env	rironment
Analys Analyz		20-6708-2793 30 Dec-14 15:5		Endpoint: Analysis:	Proportion Nor Linear Interpola)			S Version: ial Results		.8.7	
Batch	ID:	17-9788-0111	1	Test Type:	Survival-Devel	pment			Analy	st: Yvo	nne Lam		
Start D	ate:	26 Nov-14 16:00		Protocol:	EC/EPS 1/RM/			-	Dilue	nt: Dec	hlorinated T	ap Water	
Ending	Date:	26 Dec-14 11:00		Species:	Oncorhynchus	mykiss			Brine	:			
Duratio	on:	29d 19h	5	Source:	Vancouver Isla	nd Trout Ha	chery		Age:				
Sample	e ID:	12-7843-5699	(Code:	4C336173				Clien	t: Mou	ınt Polley		
Sample	e Date:	25 Nov-14 10:30		Material:	Effluent				Proje	ct:			
Receiv	e Date:	26 Nov-14 09:05	5	Source:	Mount Polley (I	MT POLLEY)						
Sample	e Age:	29h	8	Station:	QUR-1								
Linear	Interpo	lation Options											
X Tran	sform	Y Transform		Seed	Resamples	Exp 95%	CL M	ethod					
Log(X+	·1)	Linear	3	356308	200	Yes	Tv	vo-Point I	nterpo	olation			
Point E	Estimate	es											
Level	%	95% LCL	95% U	CL TU	95% LCL	95% UCL							
EC5	>100	N/A	N/A	<1	NA	NA							
EC10	>100	N/A	N/A	<1	NA	NA							
EC15	>100	N/A	N/A	<1	NA	NA							
EC20	>100	N/A	N/A	<1	NA	NA							
EC25	>100	N/A	N/A	<1	NA	NA							
EC40	>100	N/A	N/A N/A	<1 <1	NA NA	NA NA							
EC50	>100	N/A	N/A	<u> </u>	NA								
Propoi	rtion No	rmal Summary				Calcu		riate(A/B					
C-%		ontrol Type	Count			Max	Std Err			CV%	%Effect	Α	В
0	N	egative Control	4	0.850		0.9667	0.0957			22.52%	0.0%	102	120
6.25			4	0.925 0.883		1 0.9333	0.0369			7.99% 4.87%	-8.76% -3.86%	111 106	120 120
12.5 25			4 4	0.875		0.9333	0.0213	0.05		5.71%	-2.88%	105	120
50			4	0.931		0.9667	0.0203		066	4.36%	-9.53%	110	118
100			4	0.925		0.9667	0.0315			6.82%	-8.76%	111	120
Propor	rtion No	rmal Detail		0.100					•••				35.
C-%		ontrol Type	Rep 1	Rep	2 Rep 3	Rep 4							
0	Ne	egative Control	0.9667			0.5667							
6.25			0.9667		,1	0.8333				•			
12.5			0.8333		33 0.8667	0.9							
25			0.9	0.833		0.8333							
50			0.9	0.892	9 0.9667	0.9667							
100			0.8333	0.966	0.9667	0.9333							
Propor	tion No	rmal Binomials											
C-%		Control Type	Rep 1	Rep		Rep 4							
0		Negative Control	29/30	28/31		17/30							
6.25			29/30	27/30		25/30							
12.5			25/30	28/30		27/30							
25			27/30	25/30		25/30							
50			27/30	25/28		29/30							
100			25/30	29/30	29/30	28/30							

Report Date:

30 Dec-14 15:52 (p 2 of 2)

Test Code:

14928 | 20-1308-3890

Salmonid Embryo-Alevin Survival and Development Test

Nautilus Environmental

Analysis ID: Analyzed:

20-6708-2793 30 Dec-14 15:52 **Endpoint:** Proportion Normal

Linear Interpolation (ICPIN)

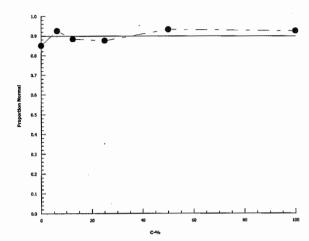
Analysis:

CETIS Version:

CETISv1.8.7

Official Results: Yes

Graphics



Client: Mount Polley

W.O.#: 14928

Hardness and Alkalinity Datasheet

			Alkalinity						
Sample ID	Sample Date	Sample Volume (mL)	(mL) 0.02N HCL/H ₂ SO ₄ used to pH 4.5	(mL) of 0.02N HCL/H ₂ SO ₄ used to pH 4.2	Total Alkalinity (mg/LCaCO ₃)	Sample Volume (mL)	Volume of 0.01M EDTA Used (mL)	Total Hardness (mg/L CaCO ₃)	Techniciar
	Nov 26/4	50	2.3	2.4	44	50	3.3	66	SSD
QUE-1	Dec 3/14		2.4	2.5	46	50	3.1	62	SSD
QUR-31	Deciola	50	2.3	2.4	44	50	3.0	60	550
QUR-1	Dec. 17 6714	50	2.3	2.4	44	50	2.9	58	SSD
QUR-1	Del -24 /14		2.6	2.7	56	50	3.0	60	SSD
Rechlor	Nov.26114	loo	1.1	1.2	10	(00	1.2	12	yu
İ	Dec-3114	100	0-9	1.0	ર	100	1-0	10	Ci22
	Dec-10/14	100	1.0	1-1	9	100	1.1	(1	w
	Dec-17/14	1	08	٥٠٩	7		७.३	q	44
	Decry14	V	0.8	0.9	7	V	09	9	you
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·						-		,	
		Notes:			<u> </u>		· ·		1
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Reviewed by:		۲	10h		_ Date Revie	wed:	Ja.	1-26/15	



Nautilus Environmental Chain of Custody (electronic) X British Columbia: 8664 Commerce Court, Burnaby, BC, V5A 4N7 25/11/2014 Page 1 of 1 ANALYSES REQUIRED Sample Collection By: McLean Donohoe Report to: Invoice to: Receipt Temperature (°C) Unfiltered Filtered Test Mount Polley Mining Corporation Company Mount Polley Mining Corporation Box 12 Address Box 12 EA Ceriodaphnia Ceriodaphnia Likely BC V0L 1N0 City/Prov/Postal Code Likely BC V0L 1N0 embry/alevin Contact Colleen Hughes Colleen Hughes/ (250) 790-2617 (250) 790-2617 Phone chughes@mountpolley.com chughes@mountpolley.com Email Day RBT CONTAINER SAMPLE IDY KLE # OF DATE TIME MATRIX COMMENTS TYPE CONTAINERS ZOL 12:45 QUL-66-40m-141125 Х 25/11/2014 water Χ 206 12:10 X Х QUL-66-20m-141125 25/11/2014 water 14 VS 11:40 Х Х QUL-66-0m-141125 25/11/2014 water 20L 6 X X QUR-1-141125 25/11/2014 10:30 water 10 SAMPLE RECEIPT RELIQUINSHED BY (CLIENT) RELIQUINSHED BY (COURIER) PROJECT INFORMATION Client: Mount Polley Mining Corporation Total # Containers: Signature: Signature: **Good Condition?** Print: Katie McMahen Print: P.O. No.: Company: MPMC Company: Matches Schedule? Shipped Via: Greyhound Time/Date: 25/11/2014 15:30:00 Time/Date: RECEIVED BY (LABORATORY) RECEIVED BY (COURIER) SPECIAL INSTRUCTIONS/COMMENTS: Signature: N Signature: Print: NAIR YAMAMO TO Company: NAUTIL US Time/Date: Nov 26/14 @ 09:05 Print: Company: Time/Date: Additional costs may be required for sample disposal or storage. Net 30 unless otherwise contracted.

Nautilus Environmental

Chain of Custody (electronic)

X British Columbia: 8664 Commerce Court, Burnaby, BC, V5A 4N7

wo#14928

02/12/2014 Page 1 of 1

						W0 7	F 17	120	•			02/12/2014 Page 1			
Sample Collection By:	Gabriel Holmes, Fernando John	1							ANA	ALYSE	SREC				
	Report to:				Invoice to:			ъ	Je d						့်
Company	Mount Polley Mining Corporatio	n			Mount Polley	Mining Corporation	-	Filtered	- Unfiltered			핞		1	<u>e</u>
Address	Box 12				Box 12	in in ing corporation	7	鹿	5			Test			atn
City/Prov/Postal Code	Likely BC V0L 1N0				Likely BC V0L	. 1N0	7	<u>ä</u> .				Ā			be
Contact	Colleen Hughes				Colleen Hugh		- i	년	ᇦ			ž			e.
Phone	(250) 790-2617				(250) 790-261	250) 790-2617			ဗွီ			ğ			1 =
Email	chughes@mountpolley.com				chughes@mountpolley.com			Ceriodaphnia	Ceriodaphnia		-	embry/alevin			Receipt Temperature (°C)
SAMPLE ID	DATE	TIME	MATRIX	CONTAINER TYPE	# OF CONTAINERS	COMMENTS		7 Day	7 Day			RBT e			1 %
QUR-1	02/12/2014	9:51	water	20L	5	100L total					X				3.0
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PROJE	CT INFORMATION	SA	MPLE REC	EIPT	RELIQUINSH	IED BY (CLIENT)		REL	IQUIN	SHED	BY (C	OURIEI	R)		
Client: Mount Polley M	ining Corporation	Total # Co	ontainers:	5	Signature:			Sign	nature:				-		
P.O. No.:		Good Cor	dition?	4	Print: Gabrie	l Holmes	••	Prin	t:						
Shipped Via: Greyhour	nd	Matches 9	Schedule?	4	Company: M			$\overline{}$	npany:						
				/		02/12/2014 15:30:00			e/Date						
SPECIAL INSTRUCTIO			RECEIVED E	BY (COURIER)						RATOR	Y)				
- rehe	sh sample =		Signature:					: N							
- 1990	<i>j</i>		Print:								10 K)			
-					Company:	Company: NAUTILUS									
					Time/Date:			Time/Date: DEC 03/14 @ 09:30)
				<u> </u>			0 2 0 0 7 0 0 7 0 0								

Additional costs may be required for sample disposal or storage. Net 30 unless otherwise contracted.

(09:30) MY

Nautilus Environmental

Chain of Custody (electronic)

X British Columbia: 8664 Commerce Court, Burnaby, BC, V5A 4N7

wo: 14928

9 2/12/2014 Page 1 of 1

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Sample Collection By:	Mclean Donohoe, Ira Pierce						ANALYSES REQUIRED									
	Report to:				Invoice to:	• ' .			, pa						ြ (၃)	
Company	Mount Polley Mining Corporation	n			Mount Polley	Mining Corporation		Filtered	Unfiltered			Test				
Address	Box 12				Box 12			1	: 5			Ĕ	.		rati	
City/Prov/Postal Code	Likely BC V0L 1N0				Likely BC V0L 1N0				<u>a</u>			EA			be	
Contact	Colleen Hughes				Colleen Hughes/			4	g			evir.			e.	
Phone	(250) 790-2617				(250) 790-261	17		1 2	ğ			y/al			T ta	
Email	chughes@mountpolley.com				chughes@mc	ountpolley.com		Cindachoire				embry/alevin			Receipt Temperature	
SAMPLE ID	DATE	TIME	MATRIX	CONTAINER TYPE	# OF CONTAINERS	COMMENTS		7 Day	7 Day			RBT e			N W	
QUR-1	09/12/2014	9:30	water	20L	6	120L total				ļ		Х			6.9	
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PROJE	CT INFORMATION	S	AMPLE REC	EIPT	RELIQUINSH	IED BY (CLIENT)		RE	LIQUI	NSHE	D BY (COURIE	R)			
Client: Mount Polley M	ining Corporation	Total # Co	ontainers:		Signature:	MonDol		Si	gnatur	e:						
P.O. No.:		Good Co	ndition?	al	Print: Mclear	n Donohoe		Pr	int:							
Shipped Via: Greyhour	nd	Matches	Schedule?		Company: M	IPMC		Co	mpan	<i>j</i> :						
Shipped via. Greyhodi	iu	Materies				09/12/2014 15:30:00			ne/Dat							
SPECIAL INSTRUCTIO			RECEIVED B	BY (COURIER)						RATOR						
O Sane	sample for both		Signature:			Si	gnatur	e: <i>fr</i>	1	A.						
	•		Print:	Print: Jacob Frank Company: Naufilus												
					Company:			C	mpan	/: <u>/</u> /	auti	105	1			
					Time/Date:			Ti	me/Dat	e: 5	Dec	10/	14 e	08	15	

Additional costs may be required for sample disposal or storage. Net 30 unless otherwise contracted.

lautilus Environmental

British Columbia: 8664 Commerce Court, Burnaby, BC, V5A 4N7

Chain of Custody (electronic)

#14928 WO#14972

92/12/2014 Page 1 of 3

Sample Collection By:	Shauna Litke, Fernando John						ANALYSES REQUIRED									
	Report to:				Invoice to:				pa						(°C)	
Company	Mount Polley Mining Corporation				Mount Polley	Mining Corporation		Filtered	Unfiltered		Test			ı	Receipt Temperature (°C)	
Address	Box 12				Box 12			ᅜ] -		A			1	šat	
City/Prov/Postal Code	Likely BC V0L 1N0				Likely BC V0L	1N0		<u>.</u>	<u> </u>		n EA				ğ	
Contact	Colleen Hughes			,	Colleen Hugh	es/		녍	혍		evi		1 1		<u>e</u>	
Phone	(250) 790-2617				(250) 790-261		jog	joj		y/al				pt_		
Email	chughes@mountpolley.com				chughes@mountpolley.com			Ceriodaphnia	Ceriodaphnia		embry/alevin				ecei	
SAMPLE ID	DATE	TIME	MATRIX	CONTAINER TYPE	# OF CONTAINERS	COMMENTS		7 Day	7 Day		RBTe				Ř	
D QUR-1-141210	10/12/2014	12:00	water	20L	6	120L total					Х				6.0	
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PROJE	CT INFORMATION	SA	MPLE REC	EIPT	RELIQUINSH		RELIQUINSHED BY (COURIER)									
Client: Mount Polley M	ining Corporation	Total # Co	ntainers:	6	Signature:			Signature:								
P.O. No.:		Good Cor	dition?	7	Print: Shauna	a Litke		Print:								
				1	Company: M	PMC		Con	Company:							
Shipped Via: Greyhour			Schedule?	1 7		0/12/2014 15:30:00			e/Date:							
SPECIAL INSTRUCTIO	NS/COMMENTS:				RECEIVED B	Y (COURIER)		REC	EIVED E	SY (LAB	ORATO	PRY)				
2 nd EA To	st Bank sample	for bol	h test	S-	Signature:		Signature: № У									
Morfreth of s	NS/COMMENTS: NAT 3 Same Sample Cample "QUR-1" Caflor, confirmed will cli				Print:			it: <i>NA</i>				၁				
~ 10011-21. 01 S	enfor confirmed w cl		Company:		Company: NAUTILUS											
- same s	Myc		Time/Date: Dec 11/14 @ 00						09:1	5						

Additional costs may be required for sample disposal or storage. Net 30 unless otherwise contracted

Nautilus Environmental X British Columbia: 8664 Commerce Court, Burnaby, BC, V5A 4N7

Chain of Custody (electronic)

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16/12/2014 Page 1 of 1

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Sample Collection By:	Shauna Litke, Ira Pierce										ANA		ES RE	QUIR	ED			1
	Report to:				Invoice to:			EA tes	EA tes	Fathead minnow survival and gro	Rainbow trout survival and growt	and reproductio						(C)
Company	Mount Polley Mining Corporation				Mount Polley	Mining Corporation		Ĭ	IT E	lar	pu	oro						an
Address	Box 12				Box 12			RBT	R	viva	al a	re						at
City/Prov/Postal Code	Likely BC V0L 1N0				Likely BC V0L		ြီ	er".	sun	Viv	and						<u> </u>	
Contact	Colleen Hughes				Colleen Hugh		in a	emt	NO.	sur	val					1	le l	
Phone	(250) 790-2617				(250) 790-261	17		"November")ec	inn	ont	survival						eceipt Temperature
Email	chughes@mountpolley.com				chughes@mo	ountpolley.com		٦.], "[шp	w tı							Se
				CONTAINER	# OF			iii fo	Refill for "December" RBT	hea	nbo	dubia						R.
SAMPLE ID	DATE	TIME	MATRIX	TYPE	CONTAINERS	COMMENTS		Refill for	Ref	Fat	Rai	ပ်						
QUR-1	16/12/2014	9:15	water	20L	15	300L total		Х	X	Х	Х	Х						4.5
2(3) POL-4	16/12/2014	9:45	water	20L	3	60L total				Х	X	Х						3.9
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,				,														
3																		
)																		
PROJE	CT INFORMATION	SA	MPLE REC	EIPT	RELIQUINSH		RELIQUINSHED BY (COURIER)											
Client: Mount Polley Mi	ining Corporation	Total # Co	ntainers:	18	Signature:				Signature:								./	
P.O. No.:		Good Cor	dition?	У	Print: Shaun	a Litke				Print	:							
			\ - L I - I - O	V	Company: N	IPMC		-		Com	pany:	:				4		
Shipped Via: Greyhour	1 d	Matches S	schedule?	Y	Time/Date: 1	16/12/2014 15:30:00				Time	/Date	:						
SPECIAL INSTRUCTION	NS/COMMENTS:				RECEIVED E	BY (COURIER)				REC	EIVE	BY.	(LAB	ORATO	ORY)			
Da - 201	المعالم المالية				Signature:					Sign	ature	: DE	Sen.	ex				
2) QUR-1-	carboy unlabelled refush water for peplacing POL-Z per required for sample disposal o	NOV-E	A Test a	and	Print:					Company: Nautilus Env								
9 40.0	jupies to the pro-	DEC-E	ATest	ANG	Company:					Com	pany		aut	1105	Enu	/		
3) POL-4 is	replacing POL-Z	-NY		· N [Time/Date:					Time	/Date	. 0	eci:	7/14	ec	830	٠	
Additional costs may b	e required for sample disposal o	r storage.	Net 30 unle	ss otherwise	contracted.													

Nautilus Environmental

Chain of Custody (electronic)

X British Columbia: 8664 Commerce Court, Burnaby, BC, V5A 4N7

22/12/2014 Page 1 of 1

Sample Collection By:	Gabriel Holmes, Mclean Donohoe						T	ANALYSES REQUIRED								
	Report to:				Invoice to:	·			T	(Dec			(0,0			
Company	Mount Polley Mining Corneration				Maynt Dallay	Mining Companyion	-			tt			, e			
Address	Mount Polley Mining Corporation Box 12				Box 12	Mining Corporation	-	1 .		Test	İ		Receipt Temperature			
City/Prov/Postal Code	Likely BC V0L 1N0	·			Likely BC V0I	110	-			E			er.			
Contact	Colleen Hughes						-						l m			
Phone	(250) 790-2617				Colleen Hughes/ (250) 790-2617					ae			l Ĕ			
Email	chughes@mountpolley.com				<u> </u>		-		·	embry/alevin			eib			
Ciliali	chagnes@mountpoliey.com				chughes@mountpolley.com					l e) Se			
SAMPLE ID	DATE	TIME	MATRIX	CONTAINER TYPE	# OF CONTAINERS	COMMENTS				RBT			I.E.			
① QUR-1	22/12/2014	9:45	water	20L	6	100L total				Х			3.6			
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										3						
PROJE	CT INFORMATION	SA	MPLE REC	EIPT	RELIQUINSH	IED, BY (CLIENT)		RELIQUIN	ISHED BY	(COUR	IER)					
Client: Mount Polley M	ining Corporation	Total # Co	ntainers:	6	Signature:	TYUMAL	\sim	Signature	: 🛝		2					
P.O. No.:	,	Good Con	dition?	yes	Print: Katie	McMahen		Print:		-			,			
Shipped Via: Greyhour	-d	Matches S	ahadula?	1	Company: N	IPMC		Company	.							
Shipped via: Greynour	ia	watches 5	criedule?	yes.	Time/Date: 2	2/12/2014 15:30:00		Time/Date	ə:							
SPECIAL INSTRUCTIO	NS/COMMENTS:	(w-			RECEIVED E	BY (COURIER)		RECEIVE	D BY (LAB	ORATO	RY)					
	nat is currently running. (2 nd)		Signature:		-	Signature	: /)						
U refr	est sample for - w# 14928 14972 (2 EA tests).	•	Print:			Print:	Emm	ar	nav	15	\rightarrow					
	- not 19928, 14972				Company:		Company: Nautilus thuramento									
	(2 EA 'tests).				Time/Date:			Time/Date		22	14 a	34	Oh			
Additional costs may b	e required for sample disposal o	r storage. N	let 30 unles	ss otherwise	vise contracted.											