

Acute Toxicity Test Results for ADC Wet Weather Water Quality Monitoring

Monitoring Period: February 2023

Prepared for:	Stantec
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	Honolulu, HI 96734

Testing Lab: Enthalpy Analytical 4340 Vandever Avenue San Diego, CA 92120

Submitted: April 10, 2023

Data Quality Assurance:

Data Verified by:

- Enthalpy Analytical (formerly Nautilus Environmental) is accredited in accordance with NELAP by the State of Oregon Environmental Laboratory Accreditation Program (Certificate No. 4053). It is also certified by the State of California Department of Health Services Environmental Laboratory Accreditation Program (Certificate No. 1802) and the State of Washington Department of Ecology (Lab ID C552).
- All data have been reviewed and verified.
- All test results have met minimum test acceptability criteria under their respective EPA protocols, unless otherwise noted in this report.
- All results have met internal Quality Assurance Program requirements, unless otherwise noted in this report.

Boul

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Introduction

Three samples were collected during a wet weather event for the ADC Kekaha Water Quality Monitoring. Samples were submitted by Stantec. Testing was conducted at the Enthalpy Analytical Laboratory in San Diego, California. Pacific topsmelt (*Atherinops affinis*), inland silverside (*Menidia beryllina*), and mysid shrimp (*Americamysis bahia*) 96-hour acute survival tests were used for the WW-2 sample. Fathead minnow (*Pimephales promelas*), water flea (*Ceriodaphnia dubia*), and freshwater amphipod (*Hyalella azteca*) 96-hour acute survival tests were used for the DW-1/WW-1 and WW-3 samples.

Materials and Methods

Sample Information

Client:	Stantec
Project Name:	ADC Kekaha Water Quality Monitoring
Sample IDs:	1. DW-1/WW-1
	2. WW-2
	3. WW-3
Sample Collection Dates, Times ^a :	1. 2/4/23, 18:00
	2. 2/4/23, 18:32
	3. 2/4/23, 19:07
Sample Receipt Dates, Times:	2/7/23, 10:05
Sample Material:	Wet weather sample
Sampling Method:	Grab

^a Collection times adjusted to Pacific Standard Time from Hawaii Standard Time.

Sample ID	рН	DO (mg/L)	Temp. (ºC)	Cond. (µS/cm)	Salinity (ppt)	Alkalinity (mg/L as CaCO ₃)	Hardness (mg/L as CaCO3)	Total Chlorine (mg/L)
DW-1/WW-1	7.38	9.5	2.2	883	0.4	nm	nm	nm
WW-2	7.30	7.3	2.2	nm	25.3	nm	nm	nm
WW-3	7.18	8.8	2.8	1,170	0.6	nm	nm	nm

Table 1. Water Quality Parameters Measured upon Sample Receipt

nm = not measured

Acute Toxicity Test Methods

Testing was conducted in accordance with methods published in US Environmental Protection Agency (USEPA) guidance (2002). Test specifications for all marine tests are summarized in Table 2, and test specifications for freshwater tests are summarized in Table 3.

Table 2. 96-hr Acute Survival Test Specifications - Marine Organisms

Pacific topsmelt test: 2/8/23, 14:30 to 2/12/23, 14:35	Species: <i>Atherinops affinis.</i> Source & Age: Aquatic Biosystems (Ft. Collins, CO), 15 days
Inland silverside test: 2/9/23, 16:00 to 2/13/23, 14:20	Species: <i>Menidia beryllina.</i> Source & Age: Aquatic Biosystems (Ft. Collins, CO), 12 days
Mysid shrimp test: 2/9/23, 16:10 to 2/13/23, 14:25	Species: <i>Americamysis bahia.</i> Source & Age: Aquatic Biosystems (Ft. Collins, CO), 4 days
Protocol Used:	Acute Manual (EPA/821/R-02/012), EPA 2002
Test Acceptability Criteria:	Control mean survival ≥ 90%
Test Concentration:	100% sample (WW-2)
Sample Manipulation:	Artificial salts (Instant Ocean®) were added to bring the salinity of the sample to 30±1 parts per thousand (ppt)
Lab Control Water:	20-µm filtered seawater (Source: Scripps Institution of Oceanography [SIO] Intake); diluted to 30 ppt with deionized water
Salt Control:	Salt Control – 30 ppt artificial saltwater (Instant Ocean®)

Table 3. 96-hr Acute Survival Test Specifications – Freshwater Organisms

Fathead minnow test: 2/9/23, 16:35 to 2/13/23, 14:55	Species: <i>Pimephales promelas.</i> Source & Age: Aquatic Biosystems (Ft. Collins, CO), 6 days
Water flea test: 2/8/23, 15:20 to 2/12/23, 15:05	Species: <i>Ceriodaphnia dubia.</i> Source & Age: Internal culture, < 24 hours
Freshwater amphipod test: 2/9/23, 16:35 to 2/13/23, 15:36	Species: <i>Hyalella azteca.</i> Source & Age: Aquatic Research Organisms (Hampton, NH), 13 days
Protocol Used:	Acute Manual (EPA/821/R-02/012), EPA 2002
Test Acceptability Criteria:	Control mean survival ≥ 90%
Test Concentration:	100% sample (DW-1/WW-1 and WW-3)
Lab Control Water:	Diluted mineral water (per EPA protocol) for <i>P. promelas</i> and <i>C. dubia</i> ; Carbon-filtered municipal water (Coast) for <i>H. azteca</i>

Statistical Analyses

Statistical analyses were conducted using EPA flowchart specifications as outlined in the test guidance manual (USEPA 2002). Organism performance in the sample was compared to that observed in the concurrent lab or salt control. Results were used to calculate whether a statistically significant effect was observed between the control and sample result. Comprehensive Environmental Toxicity Information System[™] (CETIS) software by Tidepool Scientific Software, version 2.1.2.3.

Results

No statistically significant effects were observed to any species that was exposed the WW-2 sample compared to the respective artificial salt controls. The artificial salt control for the mysid resulted in 85 percent mean survival, below the test acceptability criterion (TAC) of 90 percent (see QA section for further details). The lab control for this species resulted in 100 percent mean survival, which meets TAC. The WW-2 sample also resulted in no statistically significant effects to mysid survival compared to the lab control. A summary of results for the marine species tests is presented in Table 4.

The freshwater lab controls all met TAC. None of the freshwater species tested resulted in statistically significant mortality in the DW-1/WW-1 and WW-3 sample tests. Due to heavy debris, the water flea test was also performed after filtering the samples through a 0.45um nylon filter. The test resulted in 100 percent survival for both samples, indicating that the debris did not cause mortality. A summary of results for the freshwater tests is presented in Table 5.

Raw datasheets and complete statistical summaries for all tests are provided in Appendix A. Sample receipt information is provided in Appendix B, and a copy of the chain of custody form is presented in Appendix C.

Sample ID	Species Salt Control 100% Sample Result Result		Statistically Significant Effect? (Yes/No)	Percent Effect	
	Pacific topsmelt	100	95.0	No	5.0
WW-2	Inland silverside	90.0	95.0	No	-5.6
	Mysid shrimp	85.0ª	85.0	No	0.0

Table 4. Summary of Marine 96-hr Acute Survival Results

^a The salt control did not meet minimum test acceptability criterion; see QA section.

Percent effect from control is calculated as: ((mean response in salt control - mean response in undiluted sample)/mean response in salt control) *100. A negative value results when organism performance in the sample is greater than that in the salt control.

Sample ID	Species	Lab Control Result	100% Sample Result	Statistically Significant Effect? (Yes/No)	Percent Effect
	Fathead minnow	97.5	95.0	No	2.6
DW-1/WW-1	Water Flea	100	85.0	No	15
	Freshwater amphipod	97.5	82.5	No	15
	Fathead minnow	97.5	97.5	No	0.0
WW-3	Water Flea	100	90.0	No	10
	Freshwater amphipod	97.5	100	No	-2.6

Table 5.	Summary of	Freshwater 96-hr Acute Survival Results
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Percent effect from control is calculated as: ((mean response in lab control - mean response in undiluted sample)/mean response in lab control) *100. A negative value results when organism performance in the sample is greater than that in the lab control.

Quality Assurance

The samples were received via overnight delivery service three days after collection and within the range of 0-6 degrees Celsius (°C). Due to organism availability, all tests were initiated outside the maximum allowable holding time of 72 hours.

Mean control responses met minimum acceptability criteria for all tests, except for the mysid shrimp test. The mysid shrimp test had a mean survival of 85 percent in the artificial salt control, which is below the TAC of 90 percent. However, the lab control had 100 percent survival, indicating that the organisms were adequate for testing. There was no effect in the 100 percent samples when compared to either the salt or the lab control; therefore, the results is deemed acceptable for reporting.

Minor QA issues that were unlikely to have any bearing on the final test data, such as slight temperature deviations, are noted on the datasheets and a list of laboratory qualifier codes can be found in Appendix D.

Reference Toxicant Testing

Results for reference toxicant testing used to monitor laboratory performance and test organism sensitivity are summarized in Table 6. The reference toxicant tests for all species tested met all acceptability criteria. The median effect concentration value (EC_{50}) was within two standard deviations of the historical mean for all endpoints, indicating organisms exhibited typical sensitivity as historically observed in our laboratory. The control charts for the previous 20 reference toxicant tests are presented in Appendix E.

Species	NOEC (µg/L copper)	LC₅₀ (µg/L copper)	Historical LC ₅₀ ± 2 SD (μg/L copper)	CV (%)
Pacific Topsmelt	50	207	159 ± 93.2	29.3
Inland Silverside	100	198	183 ± 75.3	20.6
Mysid Shrimp	100	158	232 ± 73.5	15.9
Fathead Minnow	15	59.4	71.8 ± 62.0	43.2
Water Flea	20	26.0	18.6 ± 14.9	40.1
Freshwater Amphipod	200	619	431 ± 249	29.0

Table 6. Summary of 96-hr Acute Survival Reference Toxicant Test Results

NOEC = the highest concentration tested that results in no observed effect

 LC_{50} = the concentration expected to cause a lethal effect to 50 percent of the test organisms

Historical $LC_{50} \pm 2$ SD = the mean LC_{50} from the previous 20 tests performed by Enthalpy, plus or minus two standard deviations CV = Coefficient of Variation

References

- Tidepool Scientific Software. 2000-2022. CETIS Comprehensive Environmental Toxicity Information System Software, Version 2.1.2.3.
- USEPA. 2002. Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, Fifth Edition (EPA/821/R-02/012). US EPA Office of Water, Washington, DC.

Appendix A

Raw Data and Statistical Summaries

Marine Species

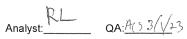
CETIS Summary	Report
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Test Accepta	bility					TAC I	_imits				
Analysis ID	Endpoint		Attribute	е	Test Stat	Lower	Upper	Overlap	Decision		
14-8895-3708	96h Survival R	ate	Control F	Resp	1	0.9	<<	Yes	Passes C	riteria	a daga ga di ka ka wa da ƙa a ya a ya ƙa ƙa
96h Survival	Rate Summary										
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
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0	SC	4	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
100		4	0.950	0.791	1.110	0.800	1.000	0.050	0.100	10.53%	5.00%
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Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4						
0	LC	1.000	1.000	1.000	1.000						
0	SC	1.000	1.000	1.000	1.000						
100		1.000	1.000	0.800	1.000						



Analyst: RL QA: <u>#(5 3/1/</u>23

Nautilus Environm Analysis ID: 14-8885-3708 Endpoint: 96h Survival Rate CETIS Version: CETISV1.1. Analysis ID: 14-8885-3708 Endpoint: 96h Survival Rate CETIS Version: CETISV1.1. Analysis ID: 14-8885-3708 Endpoint: 96h Survival Rate CETIS Version: CETISV1.1.2 Analysis ID: 14-8885-3708 CETIS Version: CETISV1.1.2 Analysis ID: 14-8885-3708 Cernsion Result Comparison Result Ant Hyp Comparison Result Angular (Corrected) C > T 100% passed 96h survival rate endpoint Wilcoxon Rank Sum Two-Sample Test Control 0.6 100% passed 96h survival rate endpoint Surree Control 0.6 1 Exact 0.6000 Non-Significant Effect Surree Mean Square DF F stat P-Value Decision(c:5%) Surree NonAsignificant Effect Surree Value <th>2 (p 1 of 1 2-4646-900</th>	2 (p 1 of 1 2-4646-900
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Marine Acute Bioassay Static-Renewal Conditions

Water Quality Measurements & Test Organism Survival

Client:	Stantec	Test Species: <u>A. affinis</u>			Teo	ch Init	ials	
Sample ID:	9W-1/WW-1 and WW-2	Start Date/Time: 2/8/23 1430		0	24	48	72	96
Sample Log-in No.: 2	23-6167	End Date/Time: 2/12/23 1435	Counts:	KR	WF	27	WF	DR
Test No.:	2309-2102		Readings:	64	GM	RT	WF	DR
_			Dilutions made by:	Fila	1	(Jr)	

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Lab Control	Α	5	5	5	5	S	36.2	20:7	30,9	31.0	31.4	20.3:	1.05	20.2	20,3	20.3	76	7.0	7,8	7.4	6.9	<i>1.</i> 92	7.79	\$.03	1.93	7,92
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WW-2	A	5	5	5	5		70.7			30.0	30.5	20.9			20.3	20.2	6.8	6.6		7.1	6.9	7.47			8.03	8.00
	в	5	5	5	5	5			\$1.1					20.4					73					5.11		
	С	5	5	5	4	4																				
	D	5	5	5	5	9																				
									1					 					 					1		
									ſ					f					f Page age to					f Statistics		
			ļ									1996) 1993 -														
			ļ	ļ							an Sec Second															
					ļ				 										 						4000-00	
									1										r Sets as S					T		
	ļ												-2008 1578 1													
							10000		6						8 18 18 10 L	1.15-53-52	1000	11.1.275.	6	20. NV .	10011500		T d AT.		223502	C. S. S. La
			ļ											ľ	52038 52038									24,2455		
					ļ						12.35															
	L _v																									
Initial Counts QC'd by: Initiated by:			eG						Er	viron	menta	al Chai	mber:		С	μ.		-								
Animal Source/Date	Rece	ived:		F	1B	5	21:	3/22	3		Age	at Initi	ation:		15	od_			-				Fee	ding T	imes	r
Animal Acclimation	Quali	fiers	(circl	e all t	that a	ppiy):	:			G	22) /	Q23	1	Q24	/ nc	one			-		A 88-	0	24 CGR0	48	72 37347	96
Comments:		i = ir	nitial r	eadin	g in fr	esh te	est solu	ution, f	f = fina	l read	ing in ·	test ch	amber	prior	to ren		~~~~			-	AM: PM:	WE -	0845		10010	1002
		Orga	anism	s fed	prior t	o initi	ation,	circle	one (<u>)</u> / г		- Aris	8B	02	171		<u> </u>	2 Q 18	2/8/	13				r 1_	~	
QC Check:	P	L	21	9-3	123						C	jài	180	5	2/=	123	3 6)	210	4 123 Fli	nal Re	view:	<u>Ar S</u>	_3/	1/2	3	

QC Check:

Enthalpy Analytical. 4340 Vandever Avenue. San Diego, CA 92120.

CETIS Sur	nmary Repo	ort					Report Test Co				25 (p 1 of 1) 5-1368-9168
Inland Silvers	side 96-h Acute	Survival T	est								nental (CA)
Batch ID: Start Date: Ending Date: Test Length:	07-7250-9827 09 Feb-23 16:0 13 Feb-23 14:2 94h	0 Pr 0 Sp	est Type: rotocol: pecies: axon:	Survival (96h) EPA/821/R-02- Menidia beryllir	· · ·		Anal Dilue Brin Sou	ent: Not e: Inst	Applicable ant Ocean latic Biosyst	tems, CO	Age: 12d
Receipt Date:	18-6314-7929 04 Feb-23 18:3 07 Feb-23 10:0 4d 21h (2.2 °C	2 ⁹⁵¹ Ma 5 ⁹⁵⁷ CA	ode: aterial: AS (PC): ient:	23-0167 Wet Weather S Stantec	ample		Proje Soui Stati	rce: Sta	C Kekaha W ntec パーン	/Q Monitoriı	ng
Analysis ID	arison Summar Endpoint 96h Survival Ra			arison Method Variance t Two-	Sample Tes	st.	P-Value 0.7315		son Result ssed 96h su		S 1
Test Acceptal	bility					TACI	_imits				
Analysis ID 15-6024-4781	Endpoint 96h Survival Ra	te	Attrib Contro	ute ol Resp	Test Stat 0.9		Upper <<	Overlap Yes	Decision Passes C	riteria	
96h Survival	Rate Summary										
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0 0 100	LC SC	4 4 4	0.900 0.900 0.950	0.582 0.716 0.791	1.220 1.080 1.110	0.600 0.800 0.800	1.000 1.000 1.000	0.100 0.058 0.050	0.200 0.115 0.100	22.22% 12.83% 10.53%	0.00% 0.00% -5.56%
96h Survival I	Rate Detail						MD	5: 858B8F5	2D53CAD7	EBDE6F6F	1BF219FF8
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4						
0 0	LC SC	0.600 0.800	1.000 0.800	1.000 1.000	1.000 1.000						
100		1.000	0.800	1.000	1.000						

alyst: <u>RL</u> QA: <u>A(5 3/1/</u>23

CETIS Ana	alytic	al Repo	ort					Report Test Co				15 (p 1 of 1))5-1368-9168
Inland Silver	side 96	-h Acute S	Survival Tes	st						Nautilu	s Environ	mental (CA)
Analysis ID: Analyzed: Edit Date:	23 Fe	24-4781 b-23 13:15 b-23 13:15	i Anal	ysis: Par	a Survival Ra ametric-Two 395185BB7E		2268B127	Stati	IS Version: us Level: or ID:	: CETISv2 1 007-803-		
Data Transfo	rm		Alt Hyp				Compari	son Result				PMSD
Angular (Corre	ected)		C > T				100% pa:	ssed 96h sur	vival rate e	ndpoint		16.44%
Equal Varian	ce t Tw	vo-Sample	Test			Ot Voren and and Calendaria						
Control	vs	Conc-%	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision	(α:5%)		
Salt Control		100	6	-0.655	1.94	0.177	CDF	0.7315	Non-Sign	ificant Effec	<u> </u>	
ANOVA Table)											
Source		Sum Squa	ares	Mean Squ	lare	DF	F Stat	P-Value	Decision	(a:5%)		
Between		0.0070885		0.0070885		1	0.429	0.5370		ificant Effec		
Error		0.0992388		0.0165398	}	6			ŕ			
Total		0.106327				7						
ANOVA Assu	mption	is Tests										
Attribute		Test				Test Stat	Critical	P-Value	Decision	(α:1%)		
Variance			Ratio F Test			1.33	47.5	0.8187	Equal Va			
Distribution		Shapiro-W	/ilk W Norma	ality Test		0.828	0.645	0.0570	Normal D	istribution		
96h Survival	Rate S	ummary										
Conc-%		Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0		SC	4	0.900	0.716	1.000	0.900	0.800	1.000	0.058	12.83%	0.00%
100			4	0.950	0.791	1.000	1.000	0.800	1.000	0.050	10.53%	-5.56%
Angular (Cori	rected)	Transform	ned Summa	ary								
Conc-%		Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0		SC	4	1.230	1.010	1.440	1.230	1.110	1.350	0.069	11.21%	0.00%
100			4	1.290	1.100	1.480	1.350	1.110	1.350	0.060	9.26%	-4.86%
Graphics										a an		
1.0 -		r					[]
0.9 -				•			0.15 -					
0.8 -							0.10 -				•/	•
				*****		▼	0.10					
- 7.0 - 7.0 - 0.6 - 0.7 - 0.7 - 0.7 - 0.4 -						٩	0.05 -		4	`		
i al						Corr. Angle	0.00 -					
0.5 -						hr. /	0.00		/			
0.4 - 40						၂ ပိ	-0.05 -					
							-0.10	/				
0.2 -							-0.10		۲			
0.1 -							-0.15 -					
0.0 -										1	· ·	l
		0 SC		100				-1.0	-0.5	0.0	0.5	1.0
			Conc-%	, 0					F	Rankits		

Analyst: RL QA: <u>A(5 3/1/</u>2-3

Marine Acute Bioassay Static-Renewal Conditions DM-001

Water Quality Measurements & Test Organism Survival

	0						
Client: Stantec	Test Species: - <u>A:- affinis</u> M. bevylling	_		Teo	ch Initi	ais	
Sample ID: _DW-1/WW-1-and WW-2	Start Date/Time: ⊋ /9/⋧3 1 600 '		0	24	48	72	96
Sample Log-in No.: <u>23- 010子</u>	End Date/Time: 2/13/23 1420	Counts:	PL	en	RT	HH	KR
Test No.: 3302 - 5103		Readings:	RT	P T	WF	DR	0R
		Dilutions made by:	HM		ζm		

Concentration (%)	Rep			iber c ganis	of Live sms)		:	Salinii (ppt)				Ter	npera (°C)	ture			Disso	lved ((mg/L		n			pH (units)	
ā.		0	24	48	72	96	0	24		72	96	0			72		o	24	48		96	0	24	48	72	96
Lab Control	A	5	3	3	3	3	30.2	31.2	30.9	32.6	33.8	24.1	25.6	2472	25.7	25.5	65	65			6.2	7.90	8.04			8.0
	В	5	5	5	5	5			f 32.6	,				25,4					6.3					f8.04		
	C	5	5	5	5	5		in the series																		
	D	5	5	5	5	5																				
Salt Control	Α	5	4	4	Ч	4	295	30,6			32.5	24.7				25,8	7.1				6.0	8.14	8.16	8.N	8.20	8.14
	в	5	4	4	Ч	Y			52,C					25.6					6.4					8,20		
	С	5	5	S	5	5																				
	D	5	5	5	5	5													1946 (S) 1945 (A)							
DW-1/WW-1	A	5				-	\sim		i					i					i					i		
	₿,	5							f				-	r			6	b	f					f		
	С	5	\geq	C														K								
	D	5																						/	/	
WW-2	A	5	\leq	5	5	5	30,0	30.7	30,3	31.Ŧ	32.7	24,3	25.7	i 25.7	25.8	25.8	6.7	6.5	8.2	6.2	6.1	7.60	8.11	1 7,49	9.13	8.1
	в	5	4	4	4	4			367					5.B					6.4					8.12		
	С	5	5	5	5	5																				
	D	5	5	5	5	5																				
									i					i					i					i		
									f					f					f					f		
									İ					i					i					Ì		
									f					f					f					f		
							100 M																			
									i					i					i					i		
									f					f					f					f		
nitial Counts QC'd by: Initiated by:		2	-	2000,000,000				<u>,</u>	Er	viron	menta	l Cha	mber:		A					uniter for find						
nimal Source/Date							AB	5			-		ation:		999	\						0	Feed	ling Ti 48	mes 72	96
nimal Acclimation	Qualif	iers	(circl	e all t	nat a	pply):				Q	22 /	(Q23	// (224	/ no	ne					A 88 -		0400			4
omments:		i = in	itial re	eading	g in fre	esh te	st solu	<u>tion, f</u>	= fina	l readi	ng in t	est ch	amber	prior t	o rene	wal					AM: PM:	150		<u>יי גי</u> י	<u>∽</u>	00
							ation, c		T	5			DT3 1										3/	1/2	3	
C Check:	RL		913	ઝોટ	.3														Fir	al Re	view:	<u>_''(_)</u>	/_	<u>ц</u> ,		

Enthalpy Analytical. 4340 Vandever Avenue. San Diego, CA 92120.

CETIS Sun	nmary Rep	ort					Report Test Co				05 (p 1 of 1) 7-0773-7844
Mysid 96-h Ac	cute Survival Te	est							Nautilu	s Environn	nental (CA)
Batch ID: Start Date: Ending Date: Test Length:	02-4784-8958 09 Feb-23 16:1 13 Feb-23 14:2 94h	0 5	Test Type: Protocol: Species: Taxon:	Survival (96h) EPA/821/R-02- Americamysis	. ,		Ana Dilu Brin Sou	ent: Ar e: In:	tificial Saltwa stant Ocean quatic Biosys		Age: 4d
Receipt Date:	17-5375-7853 04 Feb-23 18:3 07 Feb-23 10:0 4d 22h (2.2 °C	2 857 5 857	Code: Material: CAS (PC): Client:	23-0167 Wet Weather S Stantec	Sample		Proj Sou Stati	rce: St	DC Kekaha W antec W-2	/Q Monitori	ng
Single Compa	arison Summar	у									
Analysis ID	Endpoint		Comp	arison Method			P-Value	Compa	rison Result	:	s
11-8047-4833	96h Survival Ra	ate	Equal	Variance t Two-	Sample Tes	st	0.4207	100% pa	assed 96h su	rvival rate	
05-0517-0465	96h Survival Ra	ate	Unequ	ual Variance t Tv	vo-Sample 1	Fest	0.2113	100% pa	assed 96h su	rvival rate	1
Test Acceptat	oility					TAC	Limits				
Analysis ID	Endpoint		Attrib	ute	Test Stat		Upper	Overlap	Decision		
05-0517-0465	96h Survival Ra	ate	Contro	ol Resp	1	0.9	<<	Yes	Passes C	riteria	*****
11-8047-4833	96h Survival Ra	ate	Contro	ol Resp	0.85	0.9	<<	Yes	Below Cr	teria 🔍 I 5	
96h Survival F	Rate Summary										
Conc-%	Code	Count	. Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LC	4	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
0	SC	4	0.850	0.691	1.010	0.800	1.000	0.050	0.100	11.76%	15.00%
100		4	0.850	0.373	1.330	0.400	1.000	0.150	0.300	35.29%	15.00%
96h Survival F	Rate Detail						MD	5: 17632A	778C5A4D9	D26E6DDB	EC1F5CE9A
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4						
0	LC	1.000	1.000	1.000	1.000						
•			4 000	0.800	0.800						
0	SC	0.800	1.000	0.800	0.600						

QIS: Salt control did not meet test acceptability criteria of 90% survival. Lab control did meet test acceptability criteria ACS 3/1/23

Analyst:_____ QA:<u>A(\$3/1/</u>23

CETIS Ana	arytic		JIL					Report Test Co				05 (p 1 of 2 7-0773-784
Mysid 96-h A	cute Si	urvival Te	st							Nautilu	s Environr	nental (CA)
Analysis ID: Analyzed: Edit Date:	17 Fe	47-4833 b-23 9:48 b-23 9:47	Ana	lysis: Pa	n Survival Ra rametric-Two IC957C14FE	o Sample	3DA03CF1	Stat	IS Version us Level: or ID:	: CETISv2 1 007-803		
Data Transfo	rm		Alt Hyp				Compari	son Result				PMSD
Angular (Corre	ected)		C > T					ssed 96h su	rvival rate e	ndpoint		43.08%
Equal Varian	ce t Tw	o-Sample	e Test									
Control	vs	Conc-%	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision	(α:5%)		
Salt Control		100	5	0.211	2.02	0.397	CDF	0.4207	Non-Sign	ificant Effec	t	
ANOVA Table)											
Source		Sum Squ	ares	Mean Squ	Jare	DF	F Stat	P-Value	Decision	(a:5%)		
Between		0.0029649		0.0029649		1	0.0445	0.8413		ificant Effec	t	
Error		0.333427		0.0666854	1	5						
Total		0.336392				6						
ANOVA Assu	mption	s Tests										
Attribute		Test				Test Stat	Critical	P-Value	Decision			
Variance			Ratio F Test			10.3	49.8	0.0911	Equal Va			
Distribution		Shapiro-W	/ilk W Norm	ality lest		0.842	0.563	0.1045	Normal D	istribution		
96h Survival	Rate S	ummary										
Conc-%		Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0		SC	4	0.850	0.691	1.000	0.800	0.800	1.000	0.050	11.76%	0.00%
100			3	0.800	0.000	1.000	1.000	0.400	1.000	0.200	43.30%	5.88%
Angular (Cori	rected)	Transfor	med Summ	ary					·····			
Conc-%		Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0		sc	4	1.170	0.977	1.360	1.110	1.110	1.350	0.060	10.21%	0.00%
100			3	1.130	0.178	2.070	1.350	0.685	1.350	0.220	33.90%	3.56%
Graphics												
1.0 -							0.3 -		19492-114-94-74-7-98040400-4			
0.9							,					
0.8 -							0.2 -			0	/	
9 0.7 –							0.1 -					
0.6 -						gle	0.0 -					
0.5 -	******					Ang	0.0	٠	./			
0.7 - 0.6 - 0.6 - 0.6 - 0.6 - 0.6 - 0.6 - 0.6 - 0.6 - 0.4 - 0.6 - 0.4 -						▲ Corr. Angle	-0.1 -	-				
496 0.3 -							-0.2 -					
0.2 -												
0.1 -							-0.3 -					
0.0 -							-0.4 -					
~.~		1					19					
		0 SC		100				-1.0	-0.5	0.0	0.5	1.0

Analyst: RL QA: A(5 3/1/23

CETIS Ana	lytical Rep	oort				5 W112 W U12 CU21 C L L L	Report Test Co				05 (p 2 of 2 7-0773-784
Mysid 96-h A	cute Survival	lest .							Nautilu	ıs Environı	mental (CA
Analysis ID: Analyzed: Edit Date:	05-0517-0465 17 Feb-23 9:4 17 Feb-23 9:4	8 Ana	dpoint: 96l alysis: Pa 95 Hash: 718	rametric-Tw	o Sample	D90609FE	State	IS Version us Level: or ID:	1: CETISv 1 007-803		
Data Transfo	rm	Alt Hyp				Compari	son Result				PMSD
Angular (Corre	ected)	C > T				100% pa	sed 96h su	rvival rate e	endpoint		58.27%
Unequal Varia	ance t Two-Sa	mple Test									
Control	vs Conc-%	di	f Test Stat	Critical	MSD	P-Type	P-Value	Decisio	n(α:5%)		
Lab Control	100	2	1	2.92	0.643	CDF	0.2113	Non-Sig	nificant Effec	t	
ANOVA Table											
Source	Sum Sq	uares	Mean Sq	uare	DF	F Stat	P-Value	Decisio	n(α:5%)		
Between	0.08311		0.0831132		1	1.43	0.2856		nificant Effect	t	
Error	0.29089		0.0581793	3	5						
Total	0.37401				6						
ANOVA Assu	mptions Tests										
Attribute	Test				Test Stat	Critical	P-Value	Decisior	n(α:1%)		
Variance		e Ratio F Tes						Indeterm	inate		
Distribution	Shapiro-	Wilk W Norm	nality Test		0.787	0.563	0.0300	Normal [Distribution		
96h Survival I	Rate Summary	,									
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	LC	4	1.000	1.000	1.000	1.000	1.000	1.000	0.000	0.00%	0.00%
100		3	0.800	0.000	1.000	1.000	0.400	1.000	0.200	43.30%	20.00%
Angular (Corr	ected) Transfo	ormed Sumn	nary								
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	LC	4	1.350	1.340	1.350	1.350	1.350	1.350	0.000	0.00%	0.00%
100		3	1.130	0.178	2.070	1.350	0.685	1.350	0.220	33.90%	16.37%
Graphics											
1.0 -											
	•					-				•	
0.9 ~				· .		0.2 -					
0.8 -			enteren Mane	******		0.1 -					
0,4 - 0.4 -					0						
0.6 -					 ▲ Corr. Angle 	0.0 -	۲	*	× •		
2 0.5					r. A	-0.1 -					
i 0.4					Co ▼						
96 0.3 -						-0.2 -					
0.2 -						-0.3 -					
0.1 -											
0.0						-0.4 -					
	, 0 L(100				-1.0	-0.5	0.0	0.5	1.0
		Conc-									

Convergent Rounding (3 sf)

CETIS™ v2.1.2.3 (007-803-386-7)

Analyst:_____ QA:<u>A(5 3/1/2</u>3

Marine Acute Bioassay Static-Renewal Conditions DM-001

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Water Quality Measurements & Test Organism Survival

Final Review:

Client: Stantec	Test Species: <u>A. bahia</u>			Te	ch Initi	als	
Sample ID: <u>-DW-1/JAW-1-and WW-2</u>	Start Date/Time: <u>2/9/23</u> 6(0		0	24	48	72	96
Sample Log-in No.: <u>23- 0101</u>	End Date/Time: 2/13/23 1425	Counts:	WF	m	RT	HM	WSP
Test No.: <u>3302-5104</u>		Readings:	RT	R1	ŴF	HH DBODP	DR
		Dilutions made by:	HΜ		Sm		

Sample ID (100%)	Rep			iber c gani:	of Live sms)		\$	Salinit (ppt)				Ter	npera (°C)	ture			Disso	lved C (mg/L		n			pH (units)	
		0	24	48	72	96	0	24		72	96	0	24	48	72	96	0	24	48	72		0	24	48	72	96
Lab Control	A	5	5	5	5	5	30.1				31,4	24.2				15.3	6.6	6.7		6.3	6.2	793	8.05	7.98	8.03	3.0
	В	5	5	5	5	5			300				NU.	24.5	>				6.4					r 8.01		
	С	5	5	5	5	5																				
	D	5	5	5	5	5																				
Salt Control	A	5	5	5	5	4	29.4	(h.s.) (h.s.) (k.)		AND ADDRESS	31.2	24.2	25.0	24.8	25.C	25.2	71	6,5		6.2	6,3	8,15			8.16	8.17
	В	5	5	5	5	5			31.0				1	24.7					6.6					3.19		
	С	5	5	5	5	4					<u> </u>															
	D	5	5	4	4	4																				
DW-1700-1	A	5				<u>`</u>	\sim		1					1					i					i		
	В	5			O			and the second	t			<u> </u>	1	f				~	f					f		
	С	5			\geq											_	4	2								
	D	5			ļ		\geq	/													1		_			
WW-2	A	5	Qrz		5	5	30.4	30.8		10000000000000000000000000000000000000	51,0	24.3				25.2	71	6,6		6.1	6.2	7.56			8.06	9.06
	В	5		S	5	5			f 31.S					25.2					6.3					8.10		
	C	5	Ц.	Ч	4	2																	100			
	D	5	V	5	5	5													10.000 10.000							
				ļ				WebStefan	l f	N 450 600 Kg0				1	766-27627		20030300		1					1	and the second	-
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19995	<u> </u>																				- 1. an 1. 					
	 							1000000		NO-PORTAGE	3. A.H. (1945)		101224-1011	1	5			10002000	1		1015201348			1	C 120005-4415-	
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····																										
Initial Counts QC'd by Initiated by									En	viron	menta	l Char	nber:	<u></u>	ß											
Animal Source/Date	Recei	ived:	:	_A	вŚ	21	912	3			Age a	at Initia	ation:		46	ax							Feed	ling Ti	mes	
Animal Acclimation	Qualif	iers	(circl	e all t	hat a	oply):		44 U.		Q	22 /	(Q23	16	224	/ no	ne						0	24	48	72	96
												\cup	Ň	_							AM:		DAND	0840	0550	085
Comments:		i = in	nitial re	eading	g in fre	esh te	st solu	tion, f	= final	readi	ng in t	est cha	amber	prior t	o rene	ewal					PM:	150	1700	ms	1 ¹⁰	\angle
OC Check	RI			s fed रेडे		o initia	ation, c	ircle o		<u></u>)	Cĩ	<u>213</u>	BO	21	772	3					A(S	<u> </u>	<u> </u>	23	

Enthalpy Analytical. 4340 Vandever Avenue. San Diego, CA 92120.

QC Check:

Freshwater Species

CETIS Sur	nmary Repo	ort					Report Test Co				34 (p 1 of 1) 0-0202-4536
Fathead Minn	low 96-h Acute \$	Survival T	est						Nautilu	s Environn	nental (CA)
Batch ID: Start Date: Ending Date: Test Length:	11-1841-9659 09 Feb-23 16:33 13 Feb-23 14:55 94h	5 Pr 5 Sp	st Type: otocol: ecies: xon:	Survival (96h) EPA/821/R-02- Pimephales pro	, ,		Anal Dilue Brine Sour	ent: Not e: Not	i Applicable i Applicable uatic Biosyst	ems, CO	Age: 6d
Receipt Date:	09-6539-3596 04 Feb-23 18:08 07 Feb-23 10:08 4d 22h (2.2 °C)	3 ²⁵⁷ Ma 5 ²⁵⁷ CA	ode: aterial: AS (PC): ient:	23-0166 Wet Weather S Stantec	ample		Proje Sour Stati	rce: Sta	C Kekaha W ntec /-1/WW-1	/Q Monitori	ng
Analysis ID	arison Summary Endpoint 96h Survival Ra			oarison Method Variance t Two-	Sample Tes	t	P-Value 0.2685		son Result ssed 96h su		S 1
Test Acceptal	bility					TAC I	Limits				
Analysis ID 00-9849-8196	Endpoint 96h Survival Ra	te	Attrib Contro	ute ol Resp	Test Stat 0.975	Lower 0.9	Upper <<	Overlap Yes	Decision Passes C	riteria	
96h Survival I	Rate Summary										
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0 100	LC	4 4	0.975 0.950	0.895 0.858	1.050 1.040	0.900 0.900	1.000 1.000	0.025 0.029	0.050 0.058	5.13% 6.08%	0.00% 2.56%
96h Survival I	Rate Detail						MDS	5: 8CB944	71DC72497E	3A06707AF	-175083F0
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4						
0 100	LC	1.000 1.000	1.000 1.000	0.900 0.900	1.000 0.900						



Fathead Min	now 96-h Acut	e Survival Te	est					*********	Nautilu	s Environ	nental (CA
Analysis ID: Analyzed: Edit Date:	00-9849-8196 23 Feb-23 13 23 Feb-23 13	:34 An a	dpoint: 96h alysis: Par 95 Hash: 8Cl	ametric-Two	o Sample	07AF17508	State	IS Version us Level: or ID:	: CETISv2 1 007-803-		
Data Transfo	orm	Alt Hyp	****			Comparis	son Result				PMSD
Angular (Corr	rected)	C > T				100% pas	sed 96h su	vival rate e	endpoint		7.61%
Equal Variar	nce t Two-Sam	ple Test									
Control	vs Conc-%	6 d	f Test Stat	Critical	MSD	P-Type	P-Value	Decisior	n(α:5%)		
Lab Control	100	6	0.655	1.94	0.121	CDF	0.2685	Non-Sigr	nificant Effec	t	
ANOVA Tabl	e										
Source	Sum So	quares	Mean Squ	Jare	DF	F Stat	P-Value	Decisior	n(α:5%)		
Between	0.00331	199	0.0033199)	1	0.429	0.5370		nificant Effec	t	
Error	0.04647		0.0077465	5	6						
Total	0.04979) 87			7						
ANOVA Assı	umptions Tests	;									
Attribute	Test				Test Stat	Critical	P-Value	Decisior	n(α:1%)		
Variance	Varianc	e Ratio F Tes	t		1.33	47.5	0.8187	Equal Va	iriances		
Distribution	Shapiro	-Wilk W Norn	nality Test		0.828	0.645	0.0570	Normal E	Distribution		
96h Survival	Rate Summar	у									
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	LC	4	0.975	0.895	1.000	1.000	0.900	1.000	0.025	5.13%	0.00%
100		4	0.950	0.858	1.000	0.950	0.900	1.000	0.029	6.08%	2.56%
Angular (Cor	rrected) Transf	ormed Sumr	nary								
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	LC	4	1.370	1.240	1.500	1.410	1.250	1.410	0.041	5.94%	0.00%
100		4	1.330	1.180	1.480	1.330	1.250	1.410	0.047	7.07%	2.97%
Graphics											
Ciapinos				1		[/
1.0 -		ACCOUNTS OF ACCOUN	and the second s	BEREINST	-	0.10 -					
1.0 -					🛛						
1.0 - 0.9 -					•						
1.0 - 0.9 - 0.8 -		<u> </u>		 I	•	0.05 -					
1.0 - 0.9 - 0.8 -								1	••/		
1.0 - 0.9 - 0.8 -		I		I				ł	•		
1.0 - 0.9 - 0.8 -											
- 0.1 - 0.0 - 0.0 - 8.0 - 7.0 - 0.0 - 0.0 - 0.5 - 0.4 - 4.0					Corr. Angle	0.00 -			•		
1.0 - 0.9 - 0.8 - 0.7 - 0.6 - 0.5 - 0.5 - 0.4 - 0.3 - 0.3 -											
- 0.1 - 0.0 - 8.0 - 7.0 - 0.7 - 0.6 - 0.5 - 0.5 - 0.4 - 4.0						0.00 -					
1.0 - 0.9 - 0.0 - 0.7 - 0.0 - 0.5 - 0.4 - 0.4 - 0.3 -						0.00 -	•	•			
1.0 - 0.9 - 0.8 - 0.7 - 0.6 - 0.6 - 0.5 - 0.4 - 0.4 - 0.3 - 0.2 -				I		0.00 -	•	•			
1.0 - 0.9 - 0.8 - 0.7 - 0.6 - 0.5 - 0.4 - 0.3 - 0.2 - 0.1 -	, , 0 L	C	100			0.00 -	-1.0	-0.5	0.0	0.5	.0

	j						Test Co	ode/ID:	230)2-S105 / 1	8-7972-3864
Fathead Minn	now 96-h Acute	Survival	Test					Nautilu	s Environr	nental (CA)	
Batch ID: Start Date: Ending Date: Test Length:	14-2547-8115 09 Feb-23 16:3 13 Feb-23 14:5 94h	35 F 55 S	est Type: Protocol: Species: axon:	Survival (96h) EPA/821/R-02- Pimephales pro	` '		Anal Dilue Brin Soui	ent: No e: No	t Applicable t Applicable uatic Biosyst	ems, CO	Age: 6d
Receipt Date:	15-7629-0666 04 Feb-23 19:0 07 Feb-23 10:0 4d 21h (2.8 °C	07 #st N 05 PST C	Code: Naterial: CAS (PC): Client:	23-0168 Wet Weather S Stantec	ample		Proje Soui Stati	rce: Sta	0C Kekaha W antec <i>N-</i> 3	/Q Monitori	ng
Analysis ID	arison Summaı Endpoint 96h Survival R			oarison Method xon Rank Sum ไ		Test	P-Value 0.7857		ison Result issed 96h su		S
Test Acceptal Analysis ID 20-9374-5368	bility Endpoint 96h Survival R	ate	Attrib Contro	ute bl Resp	Test Stat		Limits Upper <<	Overlap Yes	Decision Passes C		
96h Survival	Rate Summary										
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0 100	LC	4 4	0.975 0.975	0.895 0.895	1.050 1.050	0.900 0.900	1.000 1.000	0.025 0.025	0.050 0.050	5.13% 5.13%	0.00% 0.00%
96h Survival	Rate Detail						MD	5: 277C74	9B01BD93E	1E12B4D7I	374D79A20
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4						
0 100	LC	1.000 0.900	1.000 1.000	0.900 1.000	1.000 1.000						

Report Date:

23 Feb-23 13:35 (p 1 of 1)

CETIS Summary Report

CETIS Ana	alytica	I Rep	ort					Report Test Co				3:35 (p 1 of 1 18-7972-3864
Fathead Minr	10w 96-h	Acute	Survival Te	est						Nautilu	s Enviror	nmental (CA)
Analysis ID: Analyzed: Edit Date:	20-9374 23 Feb- 23 Feb-	23 13:3	5 An a	alysis: No	h Survival Ra onparametric 7C749B01BI	-Two Sample		State	IS Version us Level: or ID:	: CETISv2 1 007-803		
Data Transfor	rm	******	Alt Hyp	1011 in 11-11 was an income of the 112-20			Compari	son Result				PMSD
Angular (Corre	ected)	*****	C > T				100% pa	ssed 96h su	vival rate e	ndpoint		7.07%
Wilcoxon Rar	nk Sum [·]	Two-Sa	mple Test									
Control	vs C	onc-%	ď	f Test Stat	Critical	Ties	P-Type	P-Value	Decision	(α:5%)		
Lab Control	1(00	6	18		2	Exact	0.7857		ificant Effec	t	
ANOVA Table))											
Source	S	um Squ	ares	Mean Sq	uare	DF	F Stat	P-Value	Decision	(a:5%)		
Between	0			0		1	0	1.0000		ificant Effec	t	****
Error		039839		0.006639	8	6	-					
Total	0.	039839				7						
ANOVA Assu	mptions	Tests										
Attribute	Te	est				Test Stat	Critical	P-Value	Decision	(α:1%)		
Variance			Ratio F Tes	-		1	47.5	1.0000	Equal Va	riances		
Distribution	S	hapiro-V	Vilk W Norn	nality Test	17-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-	0.566	0.645	6.3E-05	Non-Norr	nal Distribut	ion	
96h Survival	Rate Sur	nmary										
Conc-%	C	ode	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	L	2	4	0.975	0.895	1.000	1.000	0.900	1.000	0.025	5.13%	0.00%
100			4	0.975	0.895	1.000	1.000	0.900	1.000	0.025	5.13%	0.00%
Angular (Corr	rected) T	ransfor	med Sumn	nary							in a state and a state of the s	
Conc-%		ode	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	LC	2	4	1.370	1.240	1.500	1.410	1.250	1.410	0.041	5.94%	0.00%
100			4	1.370	1.240	1.500	1.410	1.250	1.410	0.041	5.94%	0.00%
Graphics											4444-0442-0442-0444-0444-0444-0444-0444	
1.0 -							[
0.9	Dia Dia				James and a second							
0.8 -							0.05 -				/	
									• •		• •	۲
Bat Sat						e						
- 7.0 - 7.0 - 0.0 - 0.7 - 0.7 - 0.7 - 0.4 -						Corr. Angle	0.00 -					
0.5 -						rr. A						
S 0.4 -						ပိ	-0.05 -	/				
0.2 -												
0.1 -							-0.10 -					
0.0 -							۵					
		0 LC		10	00			-1.0	-0.5	0.0	0.5	1.0

96-hour Freshwater Acute Bioassay

Static-Renewal Conditions

DF-006

Water Quality Measurements & Test Organism Survival

Client:	Stantec
Sample ID:	WW-3 + DW-1/WW-1
Sample Log-in No's.:	23-0166,73-0168
	2302-5099 · SIOS

Test Species: <u>P. promelas</u> Start Date/Time: 219123 1(035

Start Date/ Inne.	~ ["[]	San 1	110	21
End Date/Time:	2/13	23	14	55

		Te	ch Init	ials	
mar.	0	24	48	72	96
Counts:	WF	K12	RT	DR	H
Readings:	RT	RT	WF	DR	KR
Dilutions made by:	HH	(w		

Sample ID (100%)	Rep			ber o ganis)			nducti nhos/o		1		Ter	npera (°C)	ture		QIY		lved C (mg/L QV1)	n CHY			pH (units))	
		0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
Lab Control	Α	10	10	10	10	10	190	195	179	220	234	20.6	197	9.7	20.4	20.1	8.0	9.0	8.5	8.7	9.1	8.16	8.20	\$:23	7.86	8.24
	в	10	10	10	10	ιO			197					20.1					9.0					\$,22		
	с	10	iv	10	10	9																				
	D	10	10	10	10	10														i diang di						
100%	A	10	013	Q13	QB	10	876	845	342	917	915.	20.0	199	19.6	20.4	20.2	9.4	9.0	4.4	8.7	9.1	7.4)	7.82	7,51	7.49	7.82
DW-1/WW-1	в	10		1	1	0			831					20.1					f.9.9					7911		
	С	10			C	12g																				
	D	10	1	1	19	0																				
100.1.	A	10	013	Q13	Q13	9	1164	1131	101	1211	1192	20.1	199	19.6	20.4	20.2	9.2	90	4.4	8.7	q.1	7,25	7,75	7,35	7.44	7.77
WW-3	B	0		-		10			1118				1 ACC 201	f 20.0	10000				8.9					f 7.83		
	С	10				10																				
	D	0	Y	\checkmark	4	10																				
									i					i					i					i		
									f					f					f					f		
									i					i					i					i		
									f					f					f					f		
									i					i					i					i		
									f					f					f					f		
									i					i					i					i		
									f					f					f					f		
Initial Counts QC'd by: Initiated by:									En	viron	menta	l Chai	nber:	C							han an a			landin ini di sela la	un di sensi de	
Animal Source/Date R	eceiv	ed:		AC	35	21	a 2	-3-			Age a	t Initia	ation:	6	. 20	Y							Feed	ding Ti	nes	
Animal Acclimation Q	ualifie	ers (c	ircle	all th	at ap	piy):				Q	22 /	Q23	1 0	224	1 10	ne						0	24	48	72	96
															C	/ _					AM:			0940		
Comments:	-	i = ini	tial re	eading	in fre	esh te	st solu	tion, f	= final	readi	ng in t	est cha	amber	prior t	o rene	ewal					PM:					
	_	Orga	nisms	s fed p	orior to	rior to initiation, circle one (y) n) (x) (x) (x) (x) (x)																				

Final Review: 5041423

QC Check:

Als 2/22/23

CETIS Sur	nmary Repo	ort					Report Test Co				39 (p 1 of 1) 3-4205-9610
Ceriodaphnia	96-h Acute Sur	vival Test									nental (CA)
Batch ID: Start Date: Ending Date: Test Length:	06-5366-9439 08 Feb-23 15:20 12 Feb-23 15:05 96h) Pro	otocol:	Survival (96h) EPA/821/R-02- Ceriodaphnia d	()		Anal Dilu Brin Sou	ent: Not e: Not	: Applicable : Applicable louse Cultu	re	Age: <24ի
Receipt Date:	ple ID: 07-6002-3547 Code: 23-0166 ple Date: 04 Feb-23 18:08 % Material: Wet Weather Sample ipt Date: 07 Feb-23 10:05 % CAS (PC): ple Age: 93h (2.2 °C) Client: Stantec						Proje Soui Stati	r ce: Sta	C Kekaha W ntec /-1/WW-1	/Q Monitorir	ng
Analysis ID	arison Summary Endpoint 96h Survival Rat		·····	rison Method on Rank Sum T		Test	P-Value 0.5000		son Result		S 1
Test Acceptal Analysis ID	oility Endpoint		Attribu	te	Test Stat		Limits Upper	Overlap	Decision		
19-6025-9258	96h Survival Rat	е	Control	Resp	1	0.9	<<	Yes	Passes C	riteria	
Conc-%	Rate Summary Code	Count	Mean	95% LCL		Min	Max	Std Err	Std Dev	CV%	%Effect
0 100	LC	4 4	1.000 0.850	1.000 0.373	1.000 1.330	1.000 0.400	1.000 1.000	0.000 0.150	0.000 0.300	0.00% 35.29%	0.00% 15.00%
96h Survival I	Rate Detail						MD	5: 89F7FC7	7E57578493	A2E816F20)933D2F8
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4						
0 100	LC	1.000 1.000	1.000 1.000	1.000 0.400	1.000 1.000						



	lytical Rep			an a	1994) A. H. J. M.	1999 Mary 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 19	Report Test Co				39 (p 1 of 1 8-4205-961
Ceriodaphnia	96-h Acute Si	urvival Test							Nautilu	s Environr	nental (CA)
Analysis ID:	19-6025-9258		•	n Survival Ra				IS Version		2.1.2	
Analyzed: Edit Date:	23 Feb-23 13: 23 Feb-23 13:		-		-Two Sample 78493A2E81			us Level: or ID:	1 007-803	-386-7	
					10-100/ (2E0)					-500-1	
Data Transfor Angular (Corre		Alt Hyp C > T					son Result	winted rate of	ndnoint		27.00%
						100% pas	ssed 96h sur				27.00%
Wilcoxon Rar	nk Sum Two-S	ample Test									
Control	vs Conc-%				Ties	P-Type	P-Value	Decisio			
Lab Control	100	6	16		1	Exact	0.5000	Non-Sigi	nificant Effec	t	
ANOVA Table											
Source	Sum Sq	uares	Mean Sq	uare	DF	F Stat	P-Value	Decisio	n(α:5%)		
Between	0.05454		0.054543		1	1	0.3559	Non-Sig	nificant Effec	t	
Error Total	0.32725		0.054543		6 7	-					
				an an an tao an	,						
	nptions Tests										
Attribute Variance	Test	e Ratio F Test	L		Test Stat	Critical	P-Value	Decision			
Distribution		Wilk W Norm			0.706	0.645	0.0027	Indeterm Non-Nor	iinate mal Distribut	ion	

	Rate Summary									.	
Conc-%	LC LC	Count 4	Mean 1.000	95% LCL 1.000	95% UCL	Median 1.000	Min	Max	Std Err	CV%	%Effect 0.00%
100	10	4	0.850	0.373	1.000	1.000	1.000 0.400	1.000 1.000	0.000 0.150	0.00% 35.29%	0.00% 15.00%
	ected) Transfo		-	05% 1.01	0.5% 11.01						
Conc-%	Code LC	Count 4	Mean 1.350	95% LCL 1.340	95% UCL 1.350	Median 1.350	Min 1.350	Max 1.350	0.000	CV%	%Effect 0.00%
100	LO	4	1.180	0.655	1.350	1.350	0.685	1.350	0.000	0.00% 27.99%	0.00% 12.28%
Graphics											
Graphics											
1.0 -			1.559			~					
0.9 -						0.2 -			1	• *	•
0.8 -						0.1 -					
- 7.0 gte						0.0 -		<i>.</i>			
0.6					Corr. Angle	0.0 -	w.	~	·/ ·		
0.5 -					r. Ai	-0.1 -					
0.7 - 0.7 - 0.6 - 0.6 - 0.5 - 0.5 - 0.4 -			L		Cor	-0.2 -					
96 0.3 -											
0.2 -						-0.3 -					
0.1 -						-0.4 -					
0.0 -						-0.5 -					
	0 L	С	10	0			-1.0	-0.5	0.0	0.5 1	.0

Convergent Rounding (3 sf)

CETIS[™] v2.1.2.3 (007-803-386-7)

Analyst: _____ QA: A() 3/1/23

CETIS Sun	nmary Repo	ort				Report Test Co			Feb-23 13:4)2-S106 / 15			
Ceriodaphnia	96-h Acute Sur	vival Test							Nautilus	s Environm	ental (CA)
Batch ID: Start Date: Ending Date: Test Length:	08-9994-6704 08 Feb-23 15:20 12 Feb-23 15:05 96h) Pro	tocol: ecies:	Survival (96h) EPA/821/R-02- Ceriodaphnia d	,		Anal Dilue Brine Sour	ent: Not e: Not	Applicable Applicable louse Cultur	ē	Age:	<24h
	06-1076-7431 04 Feb-23 19:07 07 Feb-23 10:05 92h (2.8 °C)	. 1	erial: S (PC):	23-0168 Wet Weather S Stantec	ample		Proje Sour Stati	ce: Sta	C Kekaha W ntec /-3	Q Monitorir	ng	
Analysis ID	arison Summary Endpoint 96h Survival Rat			arison Method Jal Variance t Tv	vo-Sample 1	est	P-Value 0.0908		son Result ssed 96h su			S
Test Acceptal Analysis ID	oility Endpoint		Attrib	uto	Test Stat	TAC L Lower	imits Upper	Overlap	Decision			
	96h Survival Rat	e		ol Resp	1	0.9	<<	Yes	Passes C	riteria		
96h Survival I	Rate Summary											
Conc-% 0 100	Code LC	Count 4 4	Mean 1.000 0.900	95% LCL 1.000 0.716	95% UCL 1.000 1.080	Min 1.000 0.800	Max 1.000 1.000	Std Err 0.000 0.058	Std Dev 0.000 0.115	CV% 0.00% 12.83%	%Eff 0.00% 10.00	%
96h Survival I	Rate Detail						MD5	5: 8EFCB7	A73F934AC	933DE98E2	2ED07B	B4F
Conc-%	Code	Rep 1	Rep 2		Rep 4		******					
0 100	LC	1.000 0.800	1.000 1.000	1.000	1.000 0.800							

Analyst: _____ QA: A(1 3//23

CETIS Ana	alytical Rep	oort					Report Test Co				40 (p 1 of 5-8235-975
Ceriodaphni	a 96-h Acute Si	urvival Test							Nautilu	s Environi	nental (CA
Analysis ID: Analyzed: Edit Date:	00-6012-8177 23 Feb-23 13: 23 Feb-23 13:	40 An a	ipoint : 96h alysis: Par 5 Hash: 8El	ametric-Two	o Sample	E98E2ED07	Stat	IS Version us Level: or ID:	1 007-803		
Data Transfo	rm	Alt Hyp				Compari	son Result				PMSD
Angular (Corr	ected)	C > T	1997 <u>-</u> A				ssed 96h su	rvival rate e	endpoint		14.26%
Unequal Vari	ance t Two-Sa	mple Test									
Control	vs Conc-%		Test Stat	Critical	MSD	P-Type	P-Value	Decisio	ο(α·5%)		
Lab Control	100	3	1.73	2.35	0.162	CDF	0.0908		nificant Effec	t	
ANOVA Table)										
Source	Sum Sq	uares	Mean Squ	Jare	DF	F Stat	P-Value	Decisio	n(α:5%)		
Between	0.02835		0.028354		1	3	0.1340		nificant Effec	t	*****
Error	0.05670	79	0.0094513	3	6			-			
Total	0.08506	19			7						
ANOVA Assu	mptions Tests							00000 00000000000000000000000000000000			*****
Attribute	Test				Test Stat	Critical	P-Value	Decisior	η(α:1%)		
Variance	Variance	e Ratio F Test	t				1889) (Maining Construction of	Indeterm	*****		
Distribution	Shapiro-	Wilk W Norm	ality Test		0.849	0.645	0.0929	Normal [Distribution		
96h Survival	Rate Summary										
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	LC	4	1.000	1.000	1.000	1.000	1.000	1.000	0.000	0.00%	0.00%
100		4	0.900	0.716	1.000	0.900	0.800	1.000	0.058	12.83%	10.00%
Angular (Cor	rected) Transfo	ormed Summ	iary								· ·
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	LC	4	1.350	1.340	1.350	1.350	1.350	1.350	0.000	0.00%	0.00%
100		4	1.230	1.010	1.440	1.230	1.110	1.350	0.069	11.21%	8.85%
Graphics											
1.0 -	Sideration	No.2201922445				r					
0.9	۲					0.10				۲	•
0.8 -	****				v	0.10 -				/	
			Berner of the particular sectors								
Sa					0	0.05 -			/		
0.6 -					Corr. Angle						
0.5 -					LT. A	0.00 -				0	
้ รั รั รั รั					Co						
6 0.3 -						-0.05 -					
0.2 -											
0.1 -						-0.10 -					
0.0 -						-	•		1	······	,]
	0 LC	;	100				-1.0	-0.5	0.0	0.5 1	.0
		Conc-9	%						Rankits		

Convergent Rounding (3 sf)

CETIS™ v2.1.2.3 (007-803-386-7)

Analyst:_____ QA:<u>A(53/1/</u>23

96-hour Freshwater Acute Bioassay

Static-Renewal Conditions

DF-002

Water Quality Measurements & Test Organism Survival

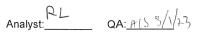
Client: Stantec	Test Species: C.dubia			Tee	ch Initi	als	
Sample ID: DW-1/WW-1 and WW-3	Start Date/Time: 2 8 23 1520		0	24	48	72	96
Sample Log-in No.: 23-0166, 23-0168	End Date/Time: 2/12/23 1505	Counts:	HН	НИ	RTI	GM	HH
Test No.: 2362-5100 @ 5106		Readings:	HH	RT	RT	RT	0P-
		Dilutions made by:	ζm		62)	

Concentration (%)	RAND #			iber c ganis	of Live sms	;			nduct nhos/				Ter	npera (°C)	ture		QIL		lved ((mg/L ହ୍ୟୁ	Dxyge .)	n			pH (units)	4
		0	24	48	72	96	0	24	48	72	96	0	24	48	72		0	24	48	72	96	0	24	48	72	96
Lab Control	12	5	5	5	5	5	202	127	เธน	16	220	19.9	20.6	20:3	20.8	10.1	82	\$.S	8.8	89	9.0	8.06	8.13	8.22	8.09	8,28
······································	3	5	5	5	5	5			189					19.7					\$.9					\$13		
	2	5	5	5	5	5																				
	6	5	5	5	5	5																				
100%	1	5	5	5	5	5	ave	31	548	942	909	19.5	20.3	19,8	Z0.0	20.1	9.1	89	42	9.0	8.9	7.2	7.5	57,45	7.66	1.8
DW-1/WW-1	11	5	5	5	5	5			833					19.9					¶.0					f.83		
	9	5	2	2	2	2																				
	8	5	5	5	5	5																	B	7.34		
100%	10	5	4	4	4	Ч	1202	1152	1,29	125	125	19.1	20.0	194	19,9	207	9.4	8,9	94	8.9	8,9.	h.00	7.48	7.00	7.55	7,50
WW-3	4	5	5	5	5	5			129					19.8					9.0					f.7.75	ł	
	5	5	5	5	5	5																				
	7	5	4	4	4	4																				<u>.</u>
100%	A	5	5	5	5	5	903	819	845	862	943	19.6	19.5	19.3	19.9	207	9.2	9.0	4.4	9.0	8.8	1.38	7,65	7.60	7.75	7.80
DW-1/WW-1	в	5	5	S	5	5			826					195					89					4.15		
Filtered	с	5	5	5	S	5																				
	D	5	5	5	5	5																				
100%	A	5	5	5	5	5	199	153	1140	1146	1304	19:5	199	19.1	43	20.7	9.5	89	43	9.0	8.8	1.19	1.70	4,34	7.69	7.79
BWY TANK P	в	5	5	5	5	5			104	1				19.3					fq.0					7.69		
Filtered	С	5	5	.5	5											1										
	D	5	5	5	5	5																				
	1								I					i					li					i		
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													Ī				1									
Initial Counts QC'd by: Initiated by:		<u> </u>							Ē	nviron	monta	l Cha	mber:	C	·		********					Generaliti	Accentita resources	<u></u>		
Animal Source/Date	Receiv	/ed:		Ind	ЬN	nal		٨	4		Ane	at Initi	ation.	V	711	hri	ς						Fee	ding T	imes	
				 	μ.L			10	11	-					<u>v~</u> 1	411	-					0	24	48	72	96
Comments:		i = ir	nitial re	eadin	g in fre	esh te	st solu	tion, f	= final	readi	ng in te	est cha	mber	prior t	o rene	wal				_				1440		
		Org	anism	s fed	prior	to initia	ation, c	ircle c	one () / n)	(D) (DIS.	ни	2/8	<u>z</u>	. (B(315 6	KZh	0173		-				
QC Check:	<u>A(S</u>	2/2	2/2	3								~~~	-			•	-		Fi	nal Re	eview:	B	o 41	100	123	

Enthalpy Analytical. 4340 Vandever Avenue. San Diego, CA 92120.

CETIS Sun	nmary Repo	ort				Report Date: 23 Feb-23 13:22 (p 1 of Test Code/ID: 2302-S101 / 15-0206-145							
Acute Amphip	ood Survival Tes	st							Nautilu	s Environm	ental (CA)		
Batch ID: Start Date: Ending Date: Test Length:	04-6621-0920 09 Feb-23 16:33 13 Feb-23 15:33 95h	5 Pro	otocol: i	Survival (96h) EPA/600/R-99/ Hyalella azteca	()	n an the second seco	Anal Dilue Brine Sour	ent: () Coa e: Not	Applicable Applicable Applicable atic Resear	Water ch Organis	Age: 13d		
Receipt Date:	02-6411-0739 04 Feb-23 18:08 07 Feb-23 10:08 4d 22h (2.2 °C)	3 २ ^{५१} Ma 5 २९१ CA		23-0166 Net Weather S	ample		Proje Sour Stati	ce: Sta		/Q Monitorir	ig		
Single Compa	arison Summary Endpoint	/	Compa	rison Method			P-Value	Comparis	son Result		s		
	96h Survival Ra	te	·····	/ariance t Two-	Sample Tes	t	0.0654	·····	sed 96h su		1		
Test Acceptal	oility					TAC	Limits						
Analysis ID	Endpoint		Attribu	te	Test Stat	Lower	Upper	Overlap	Decision				
05-8974-9213	96h Survival Ra	te	Control	Resp	0.975	0.9	<<	Yes	Passes C	riteria	а <u>рай с ал пре 2000 годи</u> и от стато <u>н</u> е от стато и от с		
96h Survival I	Rate Summary												
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect		
0	LC	4	0.975	0.895	1.050	0.900	1.000	0.025	0.050	5.13%	0.00%		
100		4	0.825	0.553	1.100	0.600	1.000	0.085	0.171	20.70%	15.38%		
96h Survival I	Rate Detail						MD5	5: 3D81862	AE343D123	395456D200)12F02C4		
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4								
0	LC	0.900	1.000	1.000	1.000	*****	annan an ann an ann an ann ann ann ann						
100		0.600	0.800	0.900	1.000								

Quistio 3/1/23



JE IIS Anal	ytical Rep	ort					Report Test Co				22 (p 1 of 1 5-0206-145
Acute Amphipo	od Survival T	est							Nautilu	s Environr	nental (CA)
Analyzed:	05-8974-9213 17 Feb-23 9:5: 17 Feb-23 9:5	2 Ana	l ysis: Par	n Survival Ra ametric-Two 31862AE343	o Sample	D20012F0	Stat	IS Version us Level: or ID:	: CETISv2 1 007-803		
Data Transform	1	Alt Hyp				Compari	son Result				PMSD
Angular (Correc	ted)	C > T				100% pas	ssed 96h su	rvival rate e	ndpoint		15.28%
Equal Variance	et Two-Samp	le Test		1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -							
Control v	/s Conc-%	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision	ı(α:5%)		
Lab Control	100	6	1.75	1.94	0.231	CDF	0.0654	Non-Sign	ificant Effec	t	
ANOVA Table											
Source	Sum Sq	uares	Mean Squ	lare	DF	F Stat	P-Value	Decision	ı(α:5%)		
Between	0.086279	99	0.0862799)	1	3.06	0.1308	****	ificant Effec	t	
Error	0.16913		0.0281895	5	6						
Total	0.25541	/			7			1992, 1992, 1992, 1992, 1992, 1992, 1992, 1992, 1992, 1992, 1992, 1992, 1992, 1992, 1992, 1992, 1992, 1992, 19			
ANOVA Assum	ptions Tests										
Attribute	Test				Test Stat		P-Value	Decision			kaan marka da ka marka da sa da ka
Variance Distribution		Ratio F Test			7.49	47.5	0.1323	Equal Va			
		Wilk W Norma			0.95	0.645	0.7154	Normal L	Distribution		
96h Survival Ra	ate Summary										
Conc-%	Code	Count	Mean	95% LCL		Median	Min	Мах	Std Err	CV%	%Effect
0 100	LC	4	0.975	0.895	1.000	1.000	0.900	1.000	0.025	5.13%	0.00%
100		4	0.825	0.553	1.000	0.850	0.600	1.000	0.085	20.70%	15.38%
Angular (Corre	cted) Transfo	ormed Summ	ary								
Conc-%	Code	Count	Mean	95% LCL			Min	Мах	Std Err	CV%	%Effect
0 100	LC	4 4	1.370 1.160	1.240 0.809	1.500 1.520	1.410 1.180	1.250 0.886	1.410	0.041	5.94%	0.00%
		4	1.100	0.809	1.520	1.100	0.000	1.410	0.112	19.17%	15.15%
Graphics											
1.0 -						1		****	Manana a se en		۲
0.9	L					0.2 -					
0.8 -				1988 29110	▼					/	
.9 0.7 -						0.1 -				_ •	
0.6 -					gle	4		۰		Þ	
- 0.7 - - 0.6 - - 0.5 - - 0.4 - - 0.4 - - 0.4 - - 0.4 - - 0.4 -					Corr. Angle	0.0 -		/			
ns 0.4 -					Con	-		•			
196 0.3 -						-0.1 -	•/				
0.2 -											
0.1 -						-0.2	/				
0.0						۲					
						Construction of the second sec			1	1	
	0 LC	;	100				-1.0	-0.5	0.0	0.5 1	.0

CETIS Sun	nmary Repo	ort				Report Date: 23 Feb-23 13:23 (p Test Code/ID: 2302-S107 / 14-515						
Acute Amphi	ood Survival Tes	st			**************************************		100000		••••••••••••••••••••••••••••••••••••••		nental (CA)	
Batch ID: Start Date: Ending Date: Test Length:	19-1557-7333 09 Feb-23 16:35 13 Feb-23 1 5:35 95h	5 Pro 5⊛ Spo	otocol: I	Survival (96h) EPA/600/R-99/ Hyalella azteca	()		Anal Dilue Brine Sour	ent: (*) Coa e: Not	Applicable a st Filtered V Applicable uatic Resear		Age: 13d	
Receipt Date:	13-7433-2775 04 Feb-23 19:07 07 Feb-23 10:05 4d 21h (2.8 °C)	PS ^F Ma		23-0168 Wet Weather S	ample		Proje Sour Stati	ce: Sta	C Kekaha W ntec /-3	/Q Monitoriı	ng	
Analysis ID	arison Summary Endpoint 96h Survival Rat			rison Method on Rank Sum T	⁻wo-Sample	Test	P-Value 1.0000		son Result ssed 96h su	****	S 1	
Test Acceptal Analysis ID	oility Endpoint		Attribu	te	Test Stat		Limits Upper	Overlap	Decision			
18-2754-1073	96h Survival Rat	e	Control	Resp	0.975	0.9	<<	Yes	Passes C	riteria		
96h Survival I Conc-%	Rate Summary Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect	
0 100	LC	4 4	0.975 1.000	0.895 1.000	1.050 1.000	0.900 1.000	1.000	0.025 0.000	0.050 0.000	5.13% 0.00%	0.00%	
96h Survival I	Rate Detail						MDS	5: 21D2680	C47692D55E	146784CC	9C677FF0	
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4							
0 100	LC	0.900 1.000	1.000 1.000	1.000 1.000	1.000 1.000							

() Q14 ALS 3/1/23

CETIS Analy	tical Rep	ort				MIG.441	Report Test Co				:23 (p 1 of 1 14-5156-028
Acute Amphipod	Survival T	est							Nautilu	s Enviror	mental (CA)
Analyzed: 23	-2754-1073 Feb-23 13: Feb-23 13:2	23 Ana	Iysis: No		ate -Two Sampl 2D55E14678		State	IS Version us Level: or ID:	: CETISv2 1 007-803		
Data Transform	1200728002800000000000000000000000000000	Alt Hyp				Compari	son Result				PMSD
Angular (Correcte	d)	C > T				100% pas	ssed 96h su	vival rate e	endpoint		5.20%
Wilcoxon Rank S	um Two-Sa	ample Test									
Control vs	Conc-%	df	Test Stat	Critical	Ties	P-Type	P-Value	Decisior	n(α:5%)		
Lab Control	100	6	20		1	Exact	1.0000	Non-Sigr	nificant Effec	t	
ANOVA Table											
Source	Sum Sq	uares	Mean Sq	uare	DF	F Stat	P-Value	Decisior	n(α:5%)		
Between	0.003319	99	0.003319	9	1	1	0.3559	Non-Sigr	nificant Effec	t	
Error	0.019919		0.003319	9	6						
Total	0.023239	94			7	17100 and a start and a start					
ANOVA Assumpt	ions Tests										
Attribute	Test				Test Stat	Critical	P-Value	Decisior	n(α:1%)		
Variance		Ratio F Test						Indeterm			
Distribution	Shapiro-	Wilk W Norm	ality Test		0.706	0.645	0.0027	Non-Nor	mal Distribut	ion	
96h Survival Rate	e Summary										
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Мах	Std Err	CV%	%Effect
0	LC	4	0.975	0.895	1.000	1.000	0.900	1.000	0.025	5.13%	0.00%
100		4	1.000	1.000	1.000	1.000	1.000	1.000	0.000	0.00%	-2.56%
Angular (Correct	ed) Transfo	rmed Summ	ary								
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	LC	4	1.370	1.240	1.500	1.410	1.250	1.410	0.041	5.94%	0.00%
100		4	1.410	1.410	1.410	1.410	1.410	1.410	0.000	0.00%	-2.97%
Graphics											
1.0 -			ana			0.06 -					
0.9 -	L					0.04 -				• *	
0.8 -						0.02 -					
- 7.0 te											
<u>a</u> 0.6 –					l ale	0.00	8				
- 7.0 36h Survival Rate - 0.0 - 0.5 - - 0.4 - - 0.4 -					Corr. Angle	-0.02 -					
ns 0.4 -					Cor						
196 0.3 -						-0.06 -					
0.2 -						-0.08 -					
0.1 -						-0.10 -					
0.0 -						-0.12 -					
	0 LC		10	0		Laisenaar	-1.0	-0.5	0.0	0.5	1.0
	0 20						1.0				

~

Analyst: _____ QA: M(5 3/1/23

96-hour Freshwater Acute Bioassay

Static-Renewal Conditions

DF-006

Water Quality Measurements & Test Organism Survival

Client:	Stantec
Sample ID:	WW-3 + DW-1/WW-1
Sample Log-in No's.:	23-0166, 23-0168
Test No's.:	2302-5101-5107

Test Species: <u>H. azteca</u> Start Date/Time: 2/9 23 1635 End Date/Time: 213 23 1536

		Te	ch Init	ials	
_	0	24	48	72	96
Counts:	M	KR	RT	DR	FL
- Readings:	RT	RT	WF	DR	KR.
Dilutions made by:	HH		in	1	

Sample ID (100%) Rep Organisms (µ						Conductivity (µmhos/cm)				Temperature (°C)				QIY		lved C (mg/L		n QU			pH (units)				
		0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
Lab Control	Α	10		9	9	9	424	922	886	990	964	19.6	19,8	20.0	20.7	20.2	9,0	9.0		8.7	9.1	8.41	8,20		8,45	8.37
(COAST)	в	10		10	10	<u>i0</u>			907					20.0					9.0					8.27		
	С	10	10	10	10	10																				
	D	10	10	10		10														i de lag			7.84			
100%	Α	10	8or	Q13	613		33Z	873		932	910	19.9	20.0	19:4	20,2	20.4	9.4	9.0	4.0	8.6	9.0	7.41		7.43	7.90	7.82
DW-1/WW-1	в	10	1 1		Q13				\$ \$\$					20.2					9,0			Ô	þ	193		
	С	10		-	Q13	9																				
	D	10	\downarrow	V	\$	10																				
(00.1.	A	10	013	Q13	Q13	Sho	1168	1152	1 1113	1240	1211	19.9	20.0	19.3	20.3	203	9,5	9.0	9.0	8.6	9.0	1.21	7.72	7.25	7.86	7.84
WW-3	B	10	i			10			1132	1200.000				f 20.1					8.9					f 7,75	1000000	
	0	10				10																				
	Q	D	\downarrow	V	Ą	Ø																				
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Initial Counts QC'd by:	<u>F</u> T	Ļ		L	L	I			L				L	11. 42.0	L	0	1		<u> </u>	<u> </u>	1.000.000	1			<u> </u>	
Initiated by:		h	_					. F	Er	viron	menta	d Cha	mber:			C			-			,				
Animal Source/Date F	Receiv	/ed:			AR	20	2	8-	13		Age a	at Initi	ation:		1	30	ay	5				ļ	Fee	ding T	imes	
Animal Acclimation Q	lualifi	ers (circle	all th	at ap	ply):				G	22 /	623	X	Q24	/ nc	one			-			0	24	48	72	96
																					AM:	-		084	0-	
Comments:							st solu		00	~	ing in t	est ch	amber	prior	to ren			1		-	PM:	-			 _	
		Orga	anism				ation, o		one((' y	y <u>}</u> r	ı)	C	20	J18	R	9 Z	/10/	23		-						
QC Check:	A()	2/2	4/1-	Ş		- 1	-											Fi	nal Re	view:	B	o 4	100	23	3

Appendix B

Sample Check-In Information

			1	. \	
Enthalpy Analytical	Client	: Stante	Cleveviou	sty Cardno)	Sample Check-In Information
4340 Vandever Avenue	Sample ID:	- SI	er Belou	~ ,	DC-005
San Diego, CA 92120	Test ID No(s).	230	2-5099	to 5107	Sample Description:
			- · · ·		Hf MYW-1: dark orange, opaque, no odor, heards
IDS .					www. Ight orange, stally opeque, oddition t
Sample (A, B, C):	DW-1/WW-1	WW-Z	WW-3		WW-3: dark orange, Opaque, no odor, light debin
Log-in No. (23-xxx):	0166	0167-	0168		debus
Sample Collection Date & Time:	214/231808	2/4/23 183285	2/4/23 1907 13		COÇ Complete (Y/N)?
Sample Receipt Date & Time:			2/3/231005	(c)	A B C
Number of Containers & Container Type:	Z.UL when	2,4L whe	2, YLWING	,	
Approx. Total Volume Received (L):		8	8		Filtration? $\langle \hat{\mathbf{Y}} \rangle$ N
Check-in Temperature (°C)	2.2	2.2	7.8		Initials: A)#(5000 60 B) C) A(5 000 60 Testand Pore Size: 0 45 (m)
Temperature OK? ¹	(Y) N	(Y) N	(Y) N	Y N	Pore Size: 0,45 cm
DO (mg/L)	9,5	0-4-7.3	8.8		Pore Size: 0.45 cm Organisms or Debris
pH (units)	7.38	7.30	7.18		Salinity Adjustment? Y (N)
Conductivity (µS/cm)	443	N25-	1170		Test: Source: Target ppt:
Salinity (ppt)		25.3	0.6		Test: Source: Target ppt:
Alkalinity (mg/L) ²		nm	nm		
Hardness (mg/L) ^{2, 3}	<u> </u>	nm			<u>^</u>
Total Chlorine (mg/L)			<u>nm</u>		pH Adjustment? Y N
Technician Initials	nn Vi	nn	m		
Performent Acute topsmelty		PC PC	ph		Initial pH:
			$\langle \rangle$		Amount of HCI added:
WW-Z Test Performed: WWIII OII a / WYSICA		Nater: 8:2 / Lal			Final pH:
		<u><u><u>7</u></u>17 Hardness or</u>			Cl ₂ Adjustment? Y N
DW-1/WW-1 Additional Control? (Y) N Acute fathead,	$= \underline{Capsvo}$	Alkalinity:	Hardness or	Salinity:	
HOUTE FATURED,			044 4 1 4 657	Other: Coast (hyo	APMa
WW-3 Test Performed: Ceriudaphnia, Hyalella	Alkalinity:	129 Hardness or	Salinity: 90	Other: Court 110	Final Free Cl ₂ :
	=	Alkalinity:	Hardness or Samily		
				Sainity.	Sample Aeration? Y (N)
Test Performed:	Control/Dilution	Nater: 8:2 / Lai	nSW / LahART	Other:	A B C
rest renormed.	Alkalinity:			ouldi.	Initial D.O.
Additional Control? Y N		Alkalinity:	Hardness or \$	 Salinity:	Duration & Rate
					Final D.O.
1-1					
Notes: ¹ Temperature of sample should	be 0-6°C, if receiv	ed more than 24 hou	irs past collection tir	me.	Measure NH3 via test strip (circle one)? Y
² mg/L as CaCO3, ³ Measured	for freshwater samp	oles only, NA = Not A	pplicable		NH3 Strip Result* A: B:C:
	0				*(if 6 or more, notify PM)
Additional Comments: <u>nm=no+measu</u>	red; Samp	Le too day	le and of	aque to detect	Subsamples for Additional Chemistry Required? Y (N)
10013 MV 2/7/	23 QPI	8 BO Z/7/23	BarrAcs 2		NH3 Other
(QII- samples arriv	ed out of hold	ling time; teste	it per elientis	request Als 2/224	(<u>)</u>] Tech Initials A B C
QC Check: A(5 2/22/23					Final Review: 1/10/23

Appendix C

Chain-of-Custody Form

Enthalpy Analytical - Environmental Toxicology

4340 Vandever Avenue San Diego, CA 92120 Phone 858.587.7333 infoSD@enthalpy.com

Chain of Cust

2/6/2023 Page 1 of 1

Comple Collection	P	8884- Will- y- Into Stankar Jugary							1				Date	Page 1	
Sample Collection	ву:		*******			1				.	· · · · ·		YSES R	EQUIRED	
Report to:						Invoice To:		Same as Report to			1			Enthalpy Matrix Codes:	
Company		Cardno-GS				Company								G = Grab	
Address		737 Bishop S	t Suite 3050		_	Address			_ _					C = Composite	
City/State/	Zip	Honolulu, HI			_	City/State	/Zip		rviva	ק	Val		vival	_	
Contact		Benjamin Ber			-	Contact			e Su	Survival	invi	NV N	Sur	$\overline{FW} = Freshwater$ $SW = Seawater$ $Sod = Sediment$	
Phone		808-476-006	7		_	Phone			Acut	te SI	ute	e SL	cute	Sed = Sediment	
Email		benjamin.ber	ridge@cardno-	<u>qs.com</u>		Email			96-hr Acute Survival	96-hr Acute	96-hr Acute Survival	A. affinis 6-hr Acute Survival	<i>beryllina</i> 6-hr Acute Survival	STRM = Stormwater	
			SAMPLE		MATRIX CODE	Contain	er		promelas	<i>ia</i> 96-	azteca 96	inis ⁶ -1	ryllinå	년 <u>GW</u> = Groundwater 안 WW = Wastewater	
SAMI	LE ID	Date	Time	Type (G or C)	(FW, SW, Sed, STRM, GW, WW, O)	Туре	Qty	COMMENTS	P. pro	C. dubia	H. azte	A. affi		$\frac{WW}{C}$ = Wastewater \dot{V} 0 = Other (specify)	
DW-1/WW	/-1	2-4-2023	16:00 HST	G	1	2.5 Gal Plastic	2	Analyze outside of holding time.	×	\times	×		R	X	7
WW-2		2-4-2023	16:32 HST	G	STRM - SW 23.58 PPT	2.5 Gal Plastic	2	Analyze outside of holding time.			1	x	x	x	22
WW-3		2-4-2023	17:07 HST	G	STRM - FW 0.47 PPT	2.5 Gal Plastic	2	Analyze outside of holding time.	X	x	x				
															ľ
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							+								F
															_
															Γ
										1	1				
PROJ	CT INFORMATIO	DN .		SAI	MPLE RECEIPT	L	1	1) RELINQUISHED BY (CLIENT)			2) REC	EIVED	BY (COURIER)	
Project Name:	ADC Water Qua Monitoring	ılity	То	tal No. of C	Containers	6	(Signature)	RiRA (Time) 14:00	(Signal	ure)		-		(Time)	
PO No.:			Rec	eived Good	Condition?	Ý	(Printed Na Ben Be	(1000)	(Printe	d Name)	- 4			(Date)	
Shipped Via:	FedEx			tches Test		V	(Company) Cardno	o/Stantec	(Comp	any) Fé	edEx - See	e Shippin	g Informatio	n	
PECIAL INSTRU	CTIONS/COMME	NTS:			A			3) RELINQUISHED BY (COURIER)			4) 1	RECE		Y (LABORATORY)	Alter
@ samp	e salinit	141.0	Ppt;T	hereto	ove, freshu	rates	(Signature)		(Signat	ure)U	1.1	Z	~	(Time) 1005	
specie	stested	60 2/7	123				(Printed Nar	me) (Date)	(Printe	J Name)	d l	<u>n</u>	ifac		<u></u>
							(Company)		(Compa	ылу)	$\frac{1}{2}$	7	-52	(Log-in #s)	<u></u>
dditional costa	by he required for	enmolo diente	al or storage	Dourse out	t 30 unless otherwise	a a seture at a d	<u> </u>				تلك الم			23-0166,	01

e required for sample disposal or storage. Payment net 30 unless otherwise contracted. Shaded areas are for lab use only

Report turn-around-time varies depending on length of test; please inquire with your project manager.

http://enthalpy.com/environmental-toxicology-2/

Appendix D

Qualifier Code Glossary

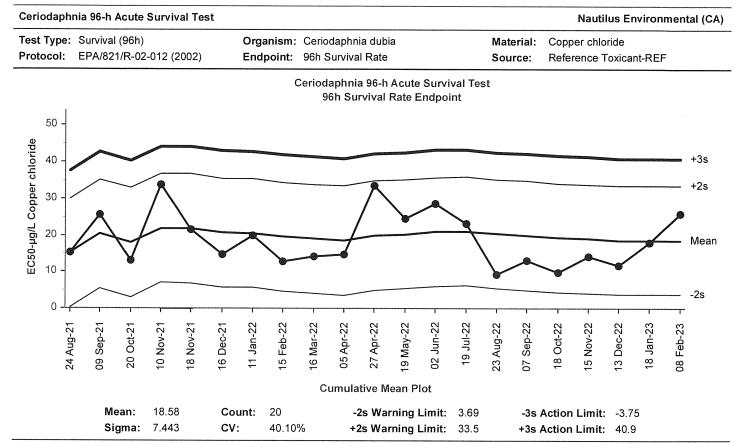
Glossary of Qualifier Codes

- Q1 Temperature out of recommended range; corrective action taken and recorded in Test Temperature Correction Log
- Q2 Temperature out of recommended range; no action taken, test terminated same day
- Q3 Sample pH adjusted to within range of 6-9 with reagent grade NaOH or HCl, as needed
- Q4 Test aerated; D.O. levels dropped below 4.0 mg/L
- Q5 Test initiated with continuous aeration due to an anticipated drop in D.O.
- Q6 Airline obstructed or fell out of replicate and replaced; drop in D.O. occurred
- Q7 Salinity out of recommended range
- Q8 Spilled test chamber/ Unable to recover test organism(s)
- Q9 Inadequate sample volume remaining, partial renewal performed
- Q10 Inadequate sample volume remaining, no renewal performed
- Q11 Sample out of holding time; refer to QA section of report
- Q12 Replicate(s) not initiated; excluded from data analysis
- Q13 Survival counts not recorded due to poor visibility or heavy debris
- Q14 D.O. percent saturation was checked and was ≤ 110%
- Q15 Did not meet minimum test acceptability criteria. Refer to QA section of report.
- Q16 Percent minimum significant difference (PMSD) was <u>below</u> the lower bound limit for acceptability. This indicates that statistics may be over-sensitive in detecting a difference from the control due to low variability in the data set. Test results were reviewed and reported in accordance with guidance found in EPA-833-R-00-003, 2000 unless otherwise specified.
- Q17 Percent minimum significant difference (PMSD) was <u>above</u> the upper bound limit for acceptability. This indicates that statistics may be under-sensitive in detecting a difference from the control due to high variability in the data set. Test results were reviewed and reported in accordance with EPA-833-R-00-003, 2000 guidance unless otherwise specified.
- Q18 Incorrect or illegible Entry
- Q19 Miscalculation
- Q20 PMSD criteria do not apply to the test of significant toxicity (TST) analysis
- Q21 Other (provide reason in comments section)
- Q22 Greater than 10% batch <u>mortality</u> observed upon receipt and/or in holding prior to test initiation. Organisms acclimated to test conditions at Enthalpy and ultimately deemed fit to use for testing.
- Q23 Test organisms experienced a <u>temperature</u> shift greater than 3°C within 1 day or were received at a temperature greater than 3°C outside the recommended test temperature range and had minimal time to acclimate prior to test initiation. However, due to age-specific protocol requirements and/or sample holding time constraints, the organisms were used to initiate test(s). Organisms were ultimately deemed fit to use for testing.
- Q24 Test organisms experienced a <u>salinity</u> shift greater than 3 ppt within 1 day or were received at a salinity greater than 3 ppt outside the recommended test salinity range and had minimal time to acclimate prior to test initiation. However, due to age-specific protocol requirements and/or sample holding time constraints, the organisms were used to initiate test(s). Organisms were ultimately deemed fit to use for testing.



Appendix E

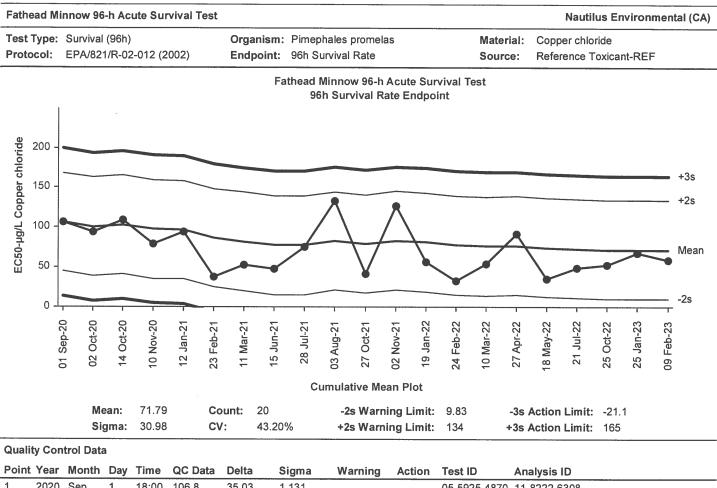
Reference Toxicant Test Control Charts



Quality Control Data

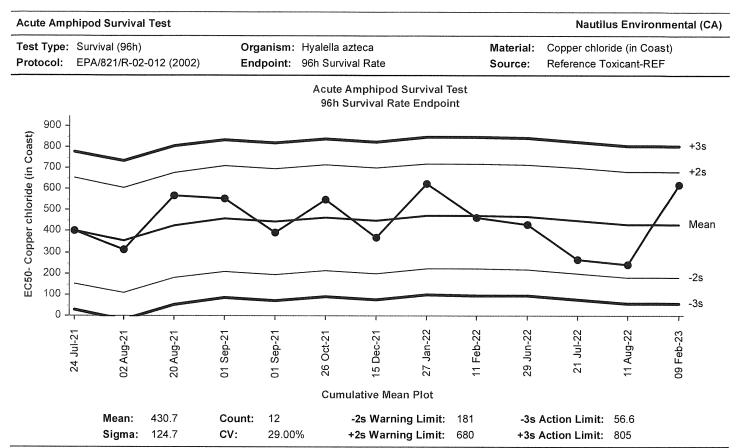
Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2021	Aug	24	14:30	15.16	-3.423	-0.4599			16-7751-9851	12-8178-8398
2		Sep	9	16:10	25.49	6.911	0.9286			20-4067-7008	08-9042-7975
3		Oct	20	15:35	13.2	-5.385	-0.7235			05-1097-3999	04-4068-7551
4		Nov	10	16:15	33.71	15.13	2.033	(+)		13-9846-9861	13-7049-3150
5			18	14:30	21.44	2.855	0.3836			17-9444-3715	09-3342-3577
6		Dec	16	17:20	14.6	-3.977	-0.5343			14-6159-9603	07-8985-1975
7	2022	Jan	11	15:00	20	1.42	0.1908			16-5501-6237	05-0045-3257
8		Feb	15	15:20	12.91	-5.674	-0.7623			19-8470-5266	12-1776-6242
9		Mar	16	15:00	14.14	-4.438	-0.5962			08-4939-9657	04-1675-6253
10		Apr	5	16:55	14.64	-3.939	-0.5292			15-6426-3206	15-2718-9221
11			27	15:15	33.64	15.06	2.023	(+)		08-4806-4027	01-7719-2285
12		May	19	15:15	24.62	6.035	0.8109			15-0414-1498	09-1011-4307
13		Jun	2	15:40	28.57	9.986	1.342			13-6497-5171	08-6278-4122
14		Jul	19	15:45	23.16	4:584	0.6158			03-1124-9631	00-8098-2495
15		Aug	23	15:50	9.33	-9.25	-1.243			20-3988-3287	11-6761-6164
16		Sep	7	15:00	13.2	-5.385	-0.7235			01-7106-9553	05-0730-6008
17		Oct	18	15:25	9.862	-8.718	-1.171			00-3320-6805	04-6100-3813
18		Nov	15	15:05	14.14	-4.438	-0.5962			00-5461-1467	19-6868-6561
19		Dec	13	15:05	11.7	-6.878	-0.9241			12-0086-6428	08-7195-5995
20	2023	Jan	18	13:55	18.03	-0.555	-0.07457			09-7538-0685	07-8161-1407
21		Feb	8	15:20	25.96	7.378	0.9912			17-7377-6097	02-7722-6792

Analyst: MI QA: 916123



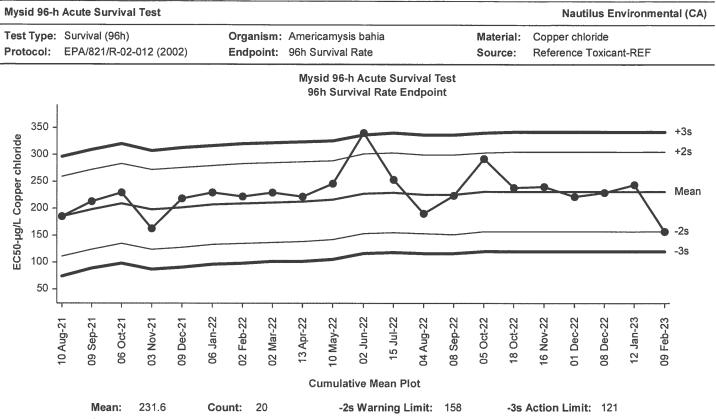
Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2020	Sep	1	18:00	106.8	35.03	1.131			05-5925-4870	11-8222-6308
2		Oct	2	14:35	94.56	22.77	0.735			10-6788-7581	10-0094-1709
3			14	15:55	108.9	37.12	1.198			16-9476-4319	04-8332-8963
4		Nov	10	15:50	79.05	7.26	0.2343			10-0925-3953	05-0925-4459
5	2021	Jan	12	16:10	93.54	21.75	0.7021			10-2818-5435	19-4959-1498
6		Feb	23	16:00	37.5	-34.29	-1.107			00-7897-7348	07-5099-8101
7		Mar	11	16:25	52.64	-19.15	-0.6182			20-0307-6488	03-1985-7497
8		Jun	15	17:10	47.63	-24.16	-0.78			13-1662-1659	03-5455-1927
9		Jul	28	17:30	75.92	4.127	0.1332			04-8837-0734	00-2418-4039
10		Aug	3	15:30	133.2	61.39	1.982			01-5905-1678	06-9846-1307
11		Oct	27	17:55	41.65	-30.14	-0.9729			04-8454-9323	21-2291-3266
12		Nov	2	14:55	126.6	54.78	1.768			02-5381-8973	13-3748-9296
13	2022	Jan	19	14:00	56.14	-15.65	-0.505			20-2049-9334	07-9545-0483
14		Feb	24	16:10	32.6	-39.19	-1.265			17-0760-7068	11-1555-4113
15		Mar	10	15:55	54.03	-17.76	-0.5733			12-1339-4334	02-2933-1085
16		Apr	27	15:10	91.63	19.84	0.6403			04-5378-2545	07-8420-2882
17		May	18	16:55	35.22	-36.57	-1.18			18-5661-4183	07-3447-2353
18		Jul	21	17:45	48.45	-23.34	-0.7535			07-1587-3363	06-2880-7627
19		Oct	25	15:50	52.4	-19.39	-0.626			06-6314-9915	03-2187-1829
20	2023	Jan	25	18:01	67.41	-4.379	-0.1413			19-0784-2205	08-9150-6242
21		Feb	9	16:50	59.42	-12.37	-0.3993			06-2469-6093	00-8217-4012

Analyst: RL QA: KS 2/22/23



Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2021	Jul	24	10:35	402.1	-28.64	-0.2297			01-9158-2894	04-9657-5582
2		Aug	2	18:10	311.1	-119.6	-0.9588			12-1293-8948	18-5258-0274
3			20	16:45	568.8	138.1	1.107			13-6419-6120	05-7250-0573
4		Sep	1	14:40	551	120.3	0.9649			16-9611-9317	12-1127-8026
5			1	16:00	393.8	-36.91	-0.296			05-5529-3044	09-1102-6160
6		Oct	26	19:00	549.6	118.9	0.9533			18-1063-1366	05-2379-1035
7		Dec	15	18:25	366.8	-63.9	-0.5124			20-2781-7958	18-9516-9975
8	2022	Jan	27	17:30	625.4	194.7	1.561			18-9392-5843	01-5172-6206
9		Feb	11	17:35	463.8	33.14	0.2658			14-7873-5968	19-5575-1394
10		Jun	29	17:00	431	0.3464	0.002778			03-3409-7356	15-5020-6688
11		Jul	21	16:27	264.5	-166.2	-1.333			05-1323-0021	05-5852-2990
12		Aug	11	18:55	240.4	-190.3	-1.526			20-9606-1183	03-0306-6180
13	2023	Feb	9	17:15	619.4	188.7	1.514			20-3293-9827	10-5332-3305

Quality Control Data

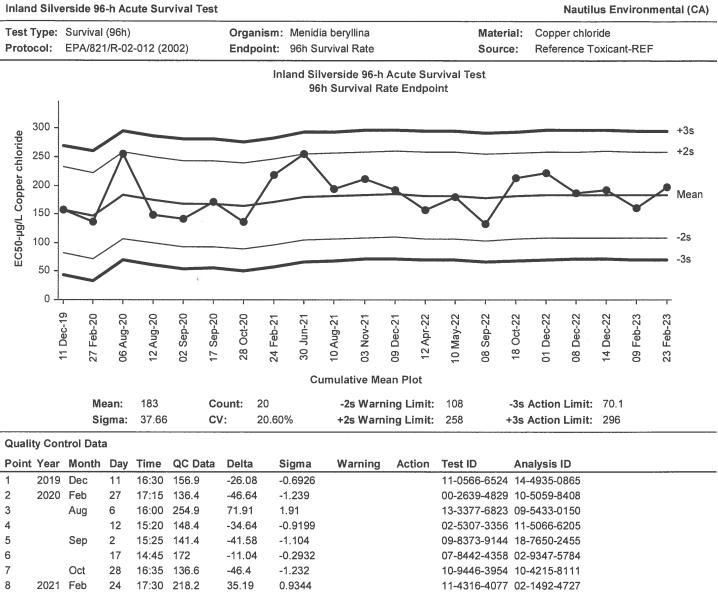


Mean:	231.6	Count:	20	-2s Warning Limit:	158	-3s Action Limit:	121
Sigma:	36.77	CV:	15.90%	+2s Warning Limit:	305	+3s Action Limit:	342

Quality Control Data 2

Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2021	Aug	10	17:15	184.6	-46.97	-1.277			01-4163-2041	16-5453-9162
2		Sep	9	16:50	212.2	-19.37	-0.5267			19-9503-3728	00-7298-1641
3		Oct	6	17:00	229.4	-2.204	-0.05995			21-3339-5883	18-5433-4447
4		Nov	3	17:40	163.6	-67.96	-1.848			03-0676-2868	02-4632-6423
5		Dec	9	16:55	219.1	-12.5	-0.34			14-6810-7407	12-0239-6176
6	2022	Jan	6	18:35	229.7	-1.86	-0.05059			08-4763-9809	17-4517-5950
7		Feb	2	15:43	221.9	-9.686	-0.2634			02-9039-0198	04-3775-7572
8		Mar	2	17:00	229.7	-1.86	-0.05059			19-5561-3648	03-3054-6534
9		Apr	13	14:15	221.2	-10.42	-0.2833			18-2705-2426	19-3047-8671
10		May	10	16:15	246.2	14.63	0.3978			14-0311-5896	14-7347-1987
11		Jun	2	15:42	339.4	107.8	2.933	(+)		02-6130-3312	02-8523-9304
12		Jul	15	20:05	253.5	21.92	0.5962			19-2711-8068	20-2053-7857
13		Aug	4	17:10	191.2	-40.42	-1.099			16-8325-4713	08-3952-4218
14		Sep	8	19:03	223.6	-7.985	-0.2172			10-7782-8177	04-6329-1845
15		Oct	5	17:45	292.8	61.22	1.665			04-2099-3213	17-6129-8612
16			18	15:35	237.8	6.241	0.1697			14-3446-1621	00-3715-4792
17		Nov	16	16:26	239.9	8.346	0.227			10-5407-6865	04-4771-5512
18		Dec	1	17:15	221.9	-9.686	-0.2634			12-7728-2441	03-3819-4975
19			8	17:00	229.7	-1.86	-0.05059			10-3057-7335	14-3192-0583
20	2023	Jan	12	16:40	243.5	11.88	0.323			06-4134-1621	13-1048-4946
21		Feb	9	16:00	158	-73.57	-2.001	(-)		20-3360-0175	15-2448-4691

Analyst:_____ QA: Ars 2/23/23



3		Aug	0	10.00	204.9	/1.91	1.91	13-3377-0823 09-3433-0130
4			12	15:20	148.4	-34.64	-0.9199	02-5307-3356 11-5066-6205
5		Sep	2	15:25	141.4	-41.58	-1.104	09-8373-9144 18-7650-2455
6			17	14:45	172	-11.04	-0.2932	07-8442-4358 02-9347-5784
7		Oct	28	16:35	136.6	-46.4	-1.232	10-9446-3954 10-4215-8111
8	2021	Feb	24	17:30	218.2	35.19	0.9344	11-4316-4077 02-1492-4727
9		Jun	30	16:05	254.9	71.91	1.91	01-4075-9626 19-2668-9340
10		Aug	10	14:30	193.2	10.19	0.2705	20-1130-3481 09-5748-8802
11		Nov	3	17:15	211.2	28.25	0.7501	01-2577-3416 13-6085-8539
12		Dec	9	17:20	192.4	9.445	0.2508	15-9690-9061 01-9685-6201
13	2022	Apr	12	17:35	156.9	-26.08	-0.6926	07-5453-0338 19-2336-1516
14		Мау	10	17:15	180.3	-2.75	-0.07302	13-4082-2694 00-0925-3219
15		Sep	8	18:45	132	-51.05	-1.356	01-2610-4728 13-4659-9428
16		Oct	18	15:45	213.3	30.27	0.8037	04-3098-2404 19-6506-1409
17		Dec	1	18:15	221.9	38.91	1.033	10-3325-3262 00-5431-5878
18			8	16:42	186.6	3.607	0.09577	14-7600-8927 07-7357-4624
19			14	17:05	192.4	9.445	0.2508	05-3190-6319 15-9199-6379
20	2023	Feb	9	15:55	160.8	-22.15	-0.5882	10-2868-1341 17-9597-6471
21			23	16:20	198.2	15.23	0.4044	20-7336-4922 10-8152-4222

Analyst: RL QA: A(S 3/123

CETIS™ v2.1.2.3



Pacific Topsmelt 96-h Acute Survival Test Nautilus Environmental (CA) Test Type: Survival (96h) Organism: Atherinops affinis Material: Copper chloride Protocol: EPA/821/R-02-012 (2002) Endpoint: 96h Survival Rate Source: Reference Toxicant-REF Pacific Topsmelt 96-h Acute Survival Test 96h Survival Rate Endpoint 350 EC50-µg/L Copper chloride 300 +3s 250 +2s 200 Mean 150 100 -2s 50 -3s 0 14 Aug-18 12 Sep-18 09 Jan-19 5 Feb-19 10 Oct-18 17 Apr-19 23 May-19 24 Jul-19 12 Aug-19 19 Aug-19 22 Aug-19 10 Sep-19 09 Oct-19 26 Feb-20 04 Mar-20 08 Feb-23 19 May-20 17 Sep-20 11 Oct-22 23 Feb-21 17 Nov-21 **Cumulative Mean Plot** Mean: 158.9 Count: 20 -2s Warning Limit: 65.7 -3s Action Limit: 19.1 Sigma: 46.61 CV: 29.30% +2s Warning Limit: 252 +3s Action Limit: 299 **Quality Control Data**

	······································										
Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2018	Aug	14	16:00	196.4	37.48	0.8042		****	15-6494-9229	17-8173-7294
2		Sep	12	14:00	105.6	-53.28	-1.143			16-1211-7168	05-2683-6884
3		Oct	10	16:55	168.2	9.279	0.1991			03-4460-7421	02-8297-4115
4	2019	Jan	9	16:00	146.4	-12.49	-0.268			16-8541-8400	01-0716-9806
5		Feb	15	16:10	134	-24.9	-0.5342			08-0425-5661	18-0762-3864
6		Apr	17	17:50	253.5	94.65	2.031	(+)		05-1475-1452	18-1058-7085
7		May	23	15:30	106.6	-52.27	-1.121			03-2154-6851	19-3512-2662
8		Jul	24	16:25	150.4	-8.491	-0.1822			02-4547-9337	03-4444-2456
9		Aug	12	16:15	176.5	17.57	0.377			05-6999-0080	19-2452-0933
10			19	19:30	158.7	-0.1599	-0.00343			00-1616-6988	16-4823-3084
11			22	16:45	232	73.13	1.569			14-6253-4066	09-6589-6472
12		Sep	10	11:15	246.2	87.33	1.874			01-3190-7470	00-5901-5932
13		Oct	9	15:40	149.6	-9.303	-0.1996			12-2483-9958	16-7314-6828
14	2020	Feb	26	15:20	129.7	-29.22	-0.6268			04-4275-3329	19-1366-8841
15		Mar	4	17:15	134.1	-24.82	-0.5325			09-0186-0501	09-2347-5750
16		May	19	17:20	96.59	-62.31	-1.337			09-8977-8612	01-6220-7123
17		Sep	17	14:25	118.9	-39.98	-0.8577			07-7701-0607	03-4458-7869
18	2021	Feb	23	16:10	107.2	-51.72	-1.11			15-2183-5128	00-7227-8818
19		Nov	17	17:00	174.1	15.21	0.3263			10-0193-2387	14-5680-1838
20	2022	Oct	11	16:07	193.2	34.29	0.7356			02-7625-1264	21-0421-1281
21	2023	Feb	8	14:45	207.1	48.15	1.033			19-6999-8482	14-7115-7109

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