

Ms. Amy Storm
 Larry Walker Associates
 2151 Alessandro Dr., Suite 100
 Ventura, CA 93001

September 17, 2018

Dear Amy:

I have enclosed our report “Toxicity Characterization of Sediments Collected from the Calleguas Creek Watershed: Event 68” for samples collected August 7, 2018. As you will recall, the sediment samples were tested for toxicity to *Hyalella azteca*. The results of this testing are summarized below.

Effects of Calleguas Creek Sediments on *Hyalella azteca*

There were no significant reductions in survival in the Calleguas Creek sediments. There was a statistically significant reduction in growth in the in the 68-WOOD-317 sediment sample. There were no significant reductions in *Hyalella* growth in the remaining Calleguas Creek sediments.

Toxicity Summary for Calleguas Creek: Event 68 Sediments.		
Sample Station ID	Toxicity relative to the Lab Control treatment?	
	<i>Hyalella azteca</i>	
	Survival	Growth
68-PCH-301	no	no
68-UNIV-304	no	no
68-HOWAR-312	no	no
68-WOOD-317	no	Yes

If you have any questions regarding the performance and interpretation of these tests, feel free to contact my colleague Jeffrey Cotsifas or myself at (707) 207-7762.

Sincerely,

Michael McElroy
 Senior Project Manager



Pacific EcoRisk is accredited in accordance with NELAP (ORELAP ID 4043). Pacific EcoRisk certifies that the test results reported herein conform to the most current NELAP requirements for parameters for which accreditation is required and available. Any exceptions to NELAP requirements are noted, where applicable, in the body of the report. This report shall not be reproduced, except in full, without the written consent of Pacific EcoRisk. This testing was performed under Lab Order 29192.

A Toxicity Characterization Study of Sediments Collected from the Calleguas Creek Watershed: Event 68

(Sediment Samples Collected on August 7, 2018)

Prepared For

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Prepared By

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September 2018



PACIFIC ECORISK
ENVIRONMENTAL CONSULTING & TESTING

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1. INTRODUCTION

In support of the Calleguas Creek Watershed Monitoring Program, Larry Walker Associates (LWA) has contracted Pacific EcoRisk (PER) to evaluate the potential toxicity of sediments collected from within the Calleguas Creek Watershed. The toxicity evaluations consist of performing the 10-day survival sediment toxicity test with the amphipod *Hyalella azteca*.

In order to document that the test organisms were responding to toxic stress in a typical fashion, reference toxicant tests were also performed.

This report describes the performance and results of the Event 68 sediment toxicity testing performed in support of the Calleguas Creek Watershed Monitoring Program.

2. COLLECTION AND DELIVERY OF SEDIMENT SAMPLES

On August 7, 2018, Kinnetics Laboratories, Inc. (KLI) collected freshwater sediment samples from four locations within the Calleguas Creek watershed (Table 1). These samples were transported on ice and under chain-of-custody to the PER laboratory facility in Fairfield within 24 hrs of collection. The sediment samples were stored at 0-6°C. All sediment tests were initiated within 14 days of sample collection. The chain-of-custody records for the collection and delivery of these samples are provided in Appendix A.

Sample Station ID	Collection Date	Test Initiation Date
68-PCH-301	8/7/18	8/16/17
68-UNIV-304	8/7/18	8/16/17
68-HOWAR-312	8/7/18	8/16/17
68-WOOD-317	8/7/18	8/16/17

3. TOXICITY TEST PROCEDURES FOR SEDIMENTS

The Calleguas Creek ambient sediments were tested for toxicity using the 10-day survival sediment toxicity test with the amphipod *Hyalella azteca*. The method used in conducting these toxicity tests followed the US EPA guidelines “Methods for Measuring the Toxicity and Bioaccumulation of Sediment-Associated Contaminants with Freshwater Invertebrates, Second Edition” (EPA 600/R-99/064).

3.1 Solid-Phase Sediment Toxicity Testing with *Hyalella azteca*

The freshwater sediment toxicity test with *H. azteca* consists of exposing the amphipods to the bulk sediment for 10 days, after which effects on survival and growth are evaluated. The specific procedures used in these tests are described below.

The *H. azteca* used in these tests were obtained from a commercial supplier (Aquatic BioSystems, Fort Collins, CO). Upon receipt at the PER lab, the organisms were maintained in aerated tanks of EPA moderately-hard water at 23°C, and were fed *S. capricornutum* and *Spirulina*-amended YCT *ad libitum*.

At the time of test initiation, eight “replicates” of 10 randomly-selected organisms were collected, dried, and weighed to determine the mean dry weight of the test organisms at test initiation (Table 2). These mean dry weight test data are attached in Appendix B.

Table 2. Initial Mean Dry Weight of the <i>Hyalella azteca</i> Test Organisms.
Mean dry weight = 0.026 mg

Each of the site sediments was tested at the 100% concentration only. The Lab Control sediment consisted of a composited and homogenized mixture of sediments collected from several reference sites; this sediment has been continuously incubated in freshwater at 23°C for several months prior to use.

There were eight replicates for each test treatment. Each replicate container consisted of a 300-mL tall-form glass beaker with a 3-cm ribbon of 540 µm NITEX® mesh attached to the top of the beaker with silicone sealant. Approximately 24 hrs prior to test initiation, each of the sediment samples was homogenized, after which ~100 mL of the homogenized sediment was loaded into each test replicate. Each of the test replicates was then carefully filled with overlying water, which consisted of EPA synthetic moderately-hard water, modified for use with *H. azteca* as per the EPA test guidelines. The replicates with sediments and clean overlying water were established in temperature-controlled rooms at 23°C under cool-white fluorescent lighting on a 16:8 L:D photoperiod.

After this initial ~24 hr period, the overlying water in each replicate was flushed with two volumes of fresh overlying water medium. A small aliquot of the renewed overlying water from each of the eight replicates per sediment was then collected and composited for measurement of “initial” water quality characteristics (pH, D.O., conductivity, alkalinity, hardness, and total ammonia). The tests were initiated with the random allocation of ten 10-11 day old amphipods into each replicate, followed by the addition of 1.0 mL of *Spirulina*-amended YCT food. The test replicates were then returned to the temperature controlled rooms.

Each day, for the following nine days, each test replicate was examined for the presence of any dead amphipods. A small aliquot of the overlying water from each of the eight replicates was then collected as before for measurement of “old” D.O., after which each replicate was flushed with one volume of fresh water. Another small aliquot of the overlying water in each of the eight replicates was then collected as before for measurement of “new” D.O., after which each replicate was fed 1.0 mL of *Spirulina*-amended YCT.

After 10 days exposure, the tests were terminated. An aliquot of overlying water was collected from each replicate for analysis of the “final” water quality characteristics. The sediments in each replicate container were then carefully washed out and sieved, and the number of surviving amphipods determined. The surviving amphipods from each replicate were then euthanized in methanol, rinsed with de-ionized water, and transferred to a pre-dried and pre-tared weighing pan. These were then dried at 100°C for >24 hrs and re-weighed to determine the mean dry weight per individual organism. The survival and weight data for each site sediment treatment were analyzed and compared to the appropriate Lab Control treatment to determine whether or not any statistically significant reductions were observed. All statistical analyses were performed using CETIS® statistical software (TidePool Scientific, McKinleyville, CA).

3.1.1 Reference Toxicant Testing of the *Hyaella azteca*

In order to assess the sensitivity of the *H. azteca* test organisms to toxic stress, a concurrent reference toxicant test was performed. The reference toxicant test was performed similarly to the ambient water tests, except that test solutions consisted of the Lab Water Control medium spiked with KCl at concentrations of 0.1, 0.2, 0.4, 0.8, and 1.6 g/L. The resulting test response data were statistically analyzed to determine key concentration-response point estimates (e.g., EC50); all statistical analyses were performed using the CETIS® software. These response endpoints were then compared to the typical response range established by the mean \pm 2 SD of the point estimates generated by the 20 most-recent previous reference toxicant tests performed by this lab.

4. RESULTS OF BULK SEDIMENT TOXICITY TESTING

4.1 Effects of Calleguas Creek Sediment on *Hyalella azteca*

The results of these tests are summarized below in Table 3. There were no significant reductions in survival in the Calleguas Creek sediments. There was a statistically significant reduction in growth in the in the 68-WOOD-317 sediment sample. There were no significant reductions in *Hyalella* growth in the remaining Calleguas Creek sediments.

The test data and the summary of statistical analyses for these tests are presented in Appendix B.

Sediment Treatment	Mean % Survival	Mean Dry Weight (mg)
Lab Control	82.5	0.094
68-PCH-301	82.5	0.087
68-UNIV-304	72.5	0.085
68-HOWAR-312	87.5	0.104
68-WOOD-317	75	0.074*

* The test response at this treatment was significantly less than the Control treatment response ($p < 0.05$).

4.1.1 Reference Toxicant Toxicity to *Hyalella azteca*

The results of this test are summarized below in Table 4. The survival LC₅₀ for this test was consistent with the typical response range established by the reference toxicant test database for this species, indicating that these organisms were responding to toxic stress in a typical fashion. The test data and summary of statistical analyses for this test are presented in Appendix C.

KCl Treatment (g/L)	Mean % Survival
Lab Control	90
0.1	100
0.2	80
0.4	20*
0.8	0*
1.6	0*
Summary of Statistics	
Survival LC ₅₀ =	0.29 g/L KCl
Typical Response Range (mean \pm 2 SD)	0.28 – 0.55 g/L KCl

* - The response at this test treatment was significantly less than the Lab Control treatment response at $p < 0.05$.

5. SUMMARY AND CONCLUSIONS

A summary of the sediment testing performed on the Calleguas Creek Watershed Event 68 samples is presented below.

Effects of Calleguas Creek Sediments on *Hyalella azteca*

There were no significant reductions in survival in the Calleguas Creek sediments. There was a statistically significant reduction in growth in the in the 68-WOOD-317 sediment sample. There were no significant reductions in *Hyalella* growth in the remaining Calleguas Creek sediments.

Toxicity Summary for Calleguas Creek: Event 68 Sediments.		
Sample Station ID	Toxicity relative to the Lab Control treatment?	
	<i>Hyalella azteca</i>	
	Survival	Growth
68-PCH-301	no	no
68-UNIV-304	no	no
68-HOWAR-312	no	no
68-WOOD-317	no	Yes

5.1 QA/QC Summary

Test Conditions – All test conditions (pH, D.O., temperature, etc.) were within acceptable limits. All analyses were performed according to laboratory Standard Operating Procedures.

Negative Control – The biological responses for the test organisms in the Lab Control treatments were within acceptable limits.

Positive Control – The results for the reference toxicant test were consistent with the respective reference toxicant test databases for these species, indicating that the test organisms were responding to toxic stress in a typical fashion.

Concentration Response Relationships – The concentration-responses for these tests were evaluated as per EPA guidelines (EPA 8268-B-00-004), and were found to be acceptable.

Appendix A

Chain-of-Custody Record for the Collection and Delivery of the Calleguas Creek Sediment Samples

Appendix B

Test Data and Summary of Statistics for the Evaluation of the Acute Toxicity of the Calleguas Creek Sediments to *Hyalella azteca*

CETIS Summary Report

Report Date: 10 Sep-18 14:14 (p 1 of 2)

Test Code: CCWTMP_68HA_C1 | 15-1458-2509

Hyalella 10-d Survival and Growth Sediment Test Pacific EcoRisk

Batch ID: 07-4553-6689	Test Type: Survival-Growth (10 day)	Analyst: Ashleigh Findley
Start Date: 16 Aug-18 11:00	Protocol: EPA/600/R-99/064 (2000)	Diluent: Not Applicable
Ending Date: 26 Aug-18 11:30	Species: Hyalella azteca	Brine: Not Applicable
Duration: 10d 0h	Source: Aquatic Biosystems, CO	Age: 11

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
CCWTMP_68HA_C	03-9992-3841	16 Aug-18 11:00	16 Aug-18 11:00	n/a (22.5 °C)	Larry Walker Associates	29192
68-PCH-301	11-9125-4642	07 Aug-18 13:15	09 Aug-18 07:30	8d 22h (0 °C)		
68-UNIV-304	10-6571-2147	07 Aug-18 09:13	09 Aug-18 07:30	9d 2h (0 °C)		
68-HOWAR-312	19-7176-4100	07 Aug-18 10:45	09 Aug-18 07:30	9d 0h (0 °C)		
68-WOOD-317	18-4312-7501	07 Aug-18 12:10	09 Aug-18 07:30	8d 23h (0 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
CCWTMP_68HA_C	Control Sediment	Calleguas Creek	LABQA	
68-PCH-301	Sediment	Calleguas Creek	CCWTMP-68-PCH-301	
68-UNIV-304	Sediment	Calleguas Creek	CCWTMP-68-UNIV-304	
68-HOWAR-312	Sediment	Calleguas Creek	CCWTMP-68-HOWAR-312	
68-WOOD-317	Sediment	Calleguas Creek	CCWTMP-68-WOOD-317	

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result
20-3335-1554	Mean Dry Weight-mg	Equal Variance t Two-Sample Test	0.1955	68-PCH-301 passed mean dry weight-mg
09-8639-4513	Mean Dry Weight-mg	Equal Variance t Two-Sample Test	0.2251	68-UNIV-304 passed mean dry weight-mg
20-3307-7558	Mean Dry Weight-mg	Equal Variance t Two-Sample Test	0.9109	68-HOWAR-312 passed mean dry weight-mg
01-1471-6677	Mean Dry Weight-mg	Equal Variance t Two-Sample Test	0.0108	68-WOOD-317 failed mean dry weight-mg
08-2552-9173	Survival Rate	Equal Variance t Two-Sample Test	0.4862	68-PCH-301 passed survival rate
06-1584-1947	Survival Rate	Equal Variance t Two-Sample Test	0.0760	68-UNIV-304 passed survival rate
20-3377-9911	Survival Rate	Equal Variance t Two-Sample Test	0.7207	68-HOWAR-312 passed survival rate
02-7670-4277	Survival Rate	Equal Variance t Two-Sample Test	0.1090	68-WOOD-317 passed survival rate

Mean Dry Weight-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
CCWTMP_68HA_C	LW	8	0.0945	0.0798	0.109	0.0767	0.129	0.00621	0.0176	18.61%	0.00%
68-PCH-301		8	0.0868	0.0726	0.101	0.0656	0.11	0.00602	0.017	19.63%	8.11%
68-UNIV-304		8	0.0851	0.0609	0.109	0.0171	0.111	0.0102	0.029	34.03%	9.85%
68-HOWAR-312		8	0.104	0.0969	0.112	0.0912	0.116	0.00314	0.00888	8.52%	-10.45%
68-WOOD-317		8	0.0737	0.0617	0.0857	0.06	0.103	0.00508	0.0144	19.52%	21.99%

Survival Rate Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
CCWTMP_68HA_C	LW	8	0.825	0.678	0.972	0.500	1.000	0.062	0.175	21.24%	0.00%
68-PCH-301		8	0.825	0.693	0.957	0.600	1.000	0.056	0.158	19.17%	0.00%
68-UNIV-304		8	0.725	0.628	0.822	0.600	0.900	0.041	0.116	16.07%	12.12%
68-HOWAR-312		8	0.875	0.768	0.982	0.600	1.000	0.045	0.128	14.65%	-6.06%
68-WOOD-317		8	0.750	0.673	0.827	0.600	0.900	0.033	0.093	12.34%	9.09%

CETIS Summary Report

Report Date: 10 Sep-18 13:45 (p 2 of 2)

Test Code: CCWTMP_68HA_C1 | 15-1458-2509

Hyalella 10-d Survival and Growth Sediment Test									Pacific EcoRisk
Mean Dry Weight-mg Detail									
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
CCWTMP_68HA_C	LW	0.0843	0.102	0.089	0.0767	0.086	0.129	0.109	0.08
68-PCH-301		0.11	0.0733	0.0712	0.0922	0.11	0.0656	0.081	0.091
68-UNIV-304		0.0171	0.0883	0.0844	0.0917	0.103	0.0862	0.0988	0.111
68-HOWAR-312		0.0912	0.113	0.094	0.116	0.103	0.107	0.1	0.11
68-WOOD-317		0.085	0.0743	0.103	0.06	0.075	0.0656	0.0625	0.0643
Survival Rate Detail									
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
CCWTMP_68HA_C	LW	0.700	0.900	1.000	0.900	0.500	0.700	0.900	1.000
68-PCH-301		0.800	0.600	0.800	0.900	0.600	0.900	1.000	1.000
68-UNIV-304		0.700	0.600	0.900	0.600	0.600	0.800	0.800	0.800
68-HOWAR-312		0.800	0.900	1.000	1.000	0.600	0.900	0.900	0.900
68-WOOD-317		0.800	0.700	0.700	0.600	0.800	0.900	0.800	0.700
Survival Rate Binomials									
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
CCWTMP_68HA_C	LW	7/10	9/10	10/10	9/10	5/10	7/10	9/10	10/10
68-PCH-301		8/10	6/10	8/10	9/10	6/10	9/10	10/10	10/10
68-UNIV-304		7/10	6/10	9/10	6/10	6/10	8/10	8/10	8/10
68-HOWAR-312		8/10	9/10	10/10	10/10	6/10	9/10	9/10	9/10
68-WOOD-317		8/10	7/10	7/10	6/10	8/10	9/10	8/10	7/10

10-Day *Hyalella azteca* Sediment Toxicity Test Data

Client: LWA - Calleguas Creek
 Project#: 29192
 Test ID#: 79265-79268

Org. Supplier: ABS
 Org. Log #: 11134
 Org. Age/Size: 10-11 d

Day	Date	Test Material				Water Quality Measurements			Sign-off:
		Lab Control				Parameter	Value	Meter ID	
0	8/16/18	# Live Organisms				pH	7.73	PH19	AM Change: <i>MYL</i>
		A 10	B 10	C 10	D 10	D.O. (mg/L)	8.3	RD11	WQ: <i>MYL</i>
		E 10	F 10	G 10	H 10	Conductivity (µS/cm)	460	EC11	Initiation Time: 1100
						Alkalinity (mg/L)	✓ 45.2		Initiation Counts: <i>W</i>
						Hardness (mg/L)	485.2		Confirmation Counts: <i>SMC</i>
				Ammonia (mg/L)	21.00	DR3800	PM Feed: <i>6L</i>		
								Temp. (°C)	22.5
1	8/17/18	# of Mortalities				Old D.O. (mg/L)	6.7	RD10	AM Change: <i>MB</i> WQ: <i>MB</i>
		A 0	B 0	C 0	D 0	New D.O. (mg/L)	7.5	RD10	Mortality Count: <i>MB</i>
		E 0	F 0	G 0	H 0	Temp. (°C)	22.7	48A	PM Change: <i>F1</i> PM Feed: <i>F1</i>
						Old D.O. (mg/L)	7.4	RD10	AM Change: <i>MB</i> WQ: <i>MB</i>
						New D.O. (mg/L)	8.1	RD10	Mortality Count: <i>MB</i>
				Temp. (°C)	22.7	48A	PM Change: <i>MB</i> PM Feed: <i>MB</i>		
								Old D.O. (mg/L)	6.6
A 0	B 0	C 0	D 0					New D.O. (mg/L)	7.9
E 0	F 0	G 0	H 0	Temp. (°C)	22.7	48A	PM Change: <i>MYL</i> PM Feed: <i>MYL</i>		
4	8/20/18	# of Mortalities				Old D.O. (mg/L)	8.0	RD10	AM Change: <i>AR</i> WQ: <i>AR</i>
		A 0	B 0	C 0	D 0	New D.O. (mg/L)	8.2	RD10	Mortality Count: <i>AR</i>
		E 0	F 0	G 0	H 0	Temp. (°C)	22.9	48A	PM Change: <i>AR</i> PM Feed: <i>AR</i>
						Old D.O. (mg/L)	6.0	RD12	AM Change: <i>WQ</i> WQ: <i>WQ</i>
						New D.O. (mg/L)	7.3	RD12	Mortality Count: <i>WQ</i>
				Temp. (°C)	22.8	48A	PM Change: <i>WQ</i> PM Feed: <i>WQ</i>		
								Old D.O. (mg/L)	5.1
A 0	B 0	C 0	D 0					New D.O. (mg/L)	8.0
E 0	F 0	G 0	H 0	Temp. (°C)	23.4	48A	PM Change: <i>MB</i> PM Feed: <i>MB</i>		
7	8/23/18	# of Mortalities				Old D.O. (mg/L)	6.3	RD12	AM Change: <i>MYL</i> WQ: <i>MYL</i>
		A 0	B 0	C 0	D 0	New D.O. (mg/L)	8.2	RD12	Mortality Count: <i>MYL</i>
		E 0	F 0	G 0	H 0	Temp. (°C)	22.6	48A	PM Change: <i>WQ</i> PM Feed: <i>WQ</i>
						Old D.O. (mg/L)	6.5	RD10	AM Change: <i>AR</i> WQ: <i>AR</i>
						New D.O. (mg/L)	8.1	RD10	Mortality Count: <i>AR</i>
				Temp. (°C)	23.0	48A	PM Change: <i>AR</i> PM Feed: <i>AR</i>		
								Old D.O. (mg/L)	6.1
A 0	B 0	C 0	D 0					New D.O. (mg/L)	7.7
E 0	F 0	G 0	H 0	Temp. (°C)	23.1	48A	PM Change: <i>MYL</i> PM Feed: <i>MYL</i>		
10	8/26/18	# Alive				pH	7.74	PH25	WQ: <i>AR</i>
		A 7	B 9	C 10	D 9	D.O. (mg/L)	7.0	RD12	Termination Counts: <i>JL</i>
		E 5	F 7	G 9	H 10	Conductivity (µS/cm)	488	EC11	Termination Time: 1130
						Alkalinity (mg/L)	✓ 65.2		
						Hardness (mg/L)	✓ 136		
				Ammonia (mg/L)	✓ 51.00	DR3800			
								Temp. (°C)	22.9

CETIS Analytical Report

Report Date: 01 Sep-18 11:59 (p 5 of 8)
 Test Code: CCWTMP_68HA_C1 | 15-1458-2509

Hyalella 10-d Survival and Growth Sediment Test Pacific EcoRisk

Analysis ID: 08-2552-9173 Endpoint: Survival Rate CETIS Version: CETISv1.9.2
 Analyzed: 01 Sep-18 11:58 Analysis: Parametric-Two Sample Official Results: Yes

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	68-PCH-301 passed survival rate	16.60%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Water Control		68-PCH-301	0.0353	1.76	0.189	14	CDF	0.4862	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	5.740E-05	5.740E-05	1	0.00124	0.9724	Non-Significant Effect
Error	0.646156	0.046154	14			
Total	0.646213		15			

Distributional Tests

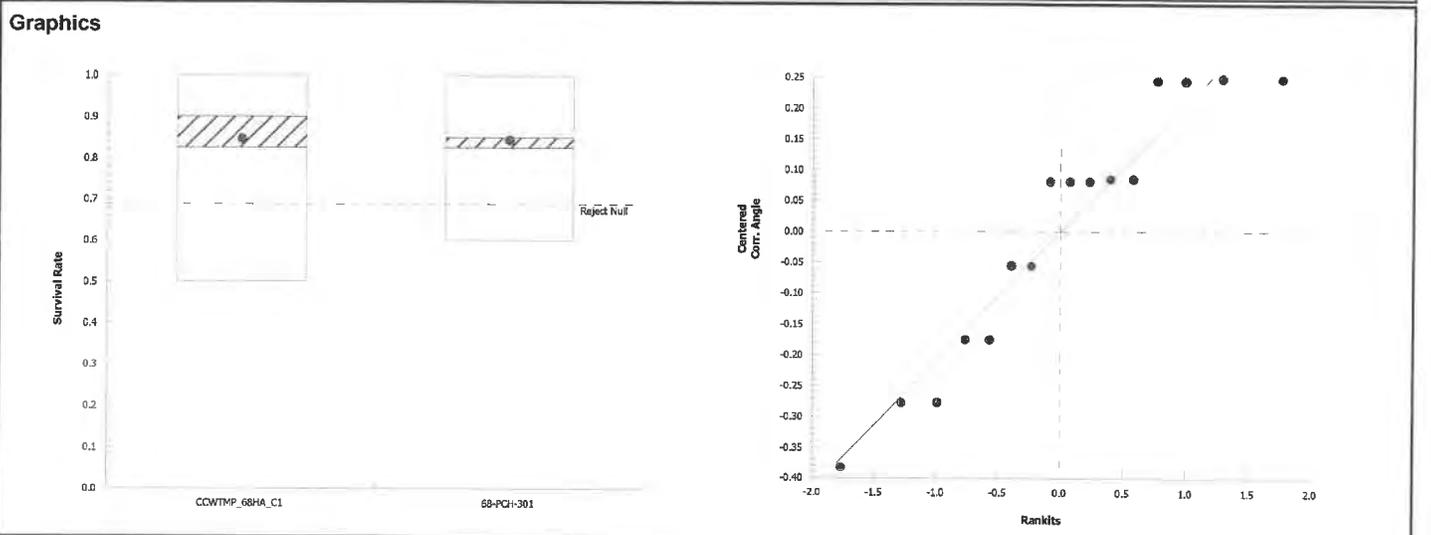
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F Test	1.17	8.89	0.8454	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.906	0.841	0.1017	Normal Distribution

Survival Rate Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
CCWTMP_68HA_C	LW	8	0.825	0.678	0.972	0.900	0.500	1.000	0.062	21.24%	0.00%
68-PCH-301		8	0.825	0.693	0.957	0.850	0.600	1.000	0.056	19.17%	0.00%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
CCWTMP_68HA_C	LW	8	1.17	0.981	1.35	1.25	0.785	1.41	0.0788	19.09%	0.00%
68-PCH-301		8	1.16	0.991	1.34	1.18	0.886	1.41	0.073	17.75%	0.32%



CETIS Analytical Report

Report Date: 01 Sep-18 11:59 (p 1 of 8)
 Test Code: CCWTMP_68HA_C1 | 15-1458-2509

Hyaella 10-d Survival and Growth Sediment Test **Pacific EcoRisk**

Analysis ID: 20-3335-1554 Endpoint: Mean Dry Weight-mg CETIS Version: CETISv1.9.2
 Analyzed: 01 Sep-18 11:59 Analysis: Parametric-Two Sample Official Results: Yes

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	68-PCH-301 passed mean dry weight-mg	16.14%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Water Control		68-PCH-301	0.885	1.76	0.015	14	CDF	0.1955	Non-Significant Effect

ANOVA Table

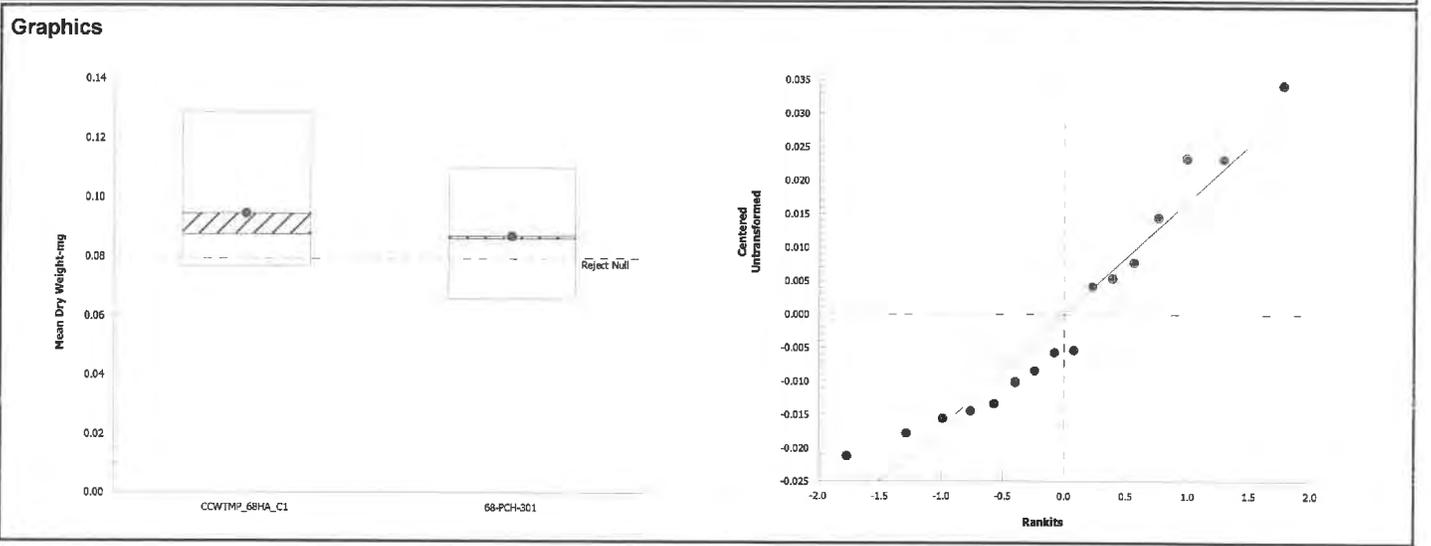
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0002347	0.0002347	1	0.783	0.3911	Non-Significant Effect
Error	0.0041943	0.0002996	14			
Total	0.004429		15			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F Test	1.06	8.89	0.9364	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.924	0.841	0.1929	Normal Distribution

Mean Dry Weight-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
CCWTMP_68HA_C	LW	8	0.0945	0.0798	0.109	0.0875	0.0767	0.129	0.00621	18.61%	0.00%
68-PCH-301		8	0.0868	0.0726	0.101	0.086	0.0656	0.11	0.00602	19.63%	8.11%



10-Day *Hyalella azteca* Sediment Toxicity Test Data

Client: LWA - Calleguas Creek
 Project#: 29192
 Test ID#: 79265

Org. Supplier: ABS
 Org. Log #: 11134
 Org. Age/Size: 10-11d

Day	Date	Test Material				Water Quality Measurements			Sign-off:
		CCWTMP-68-PCH-301				Parameter	Value	Meter ID	
0	8/16/18	# Live Organisms				pH	7.82	PH19	AM Change: <i>MYL</i>
		A 10	B 10	C 10	D 10	D.O. (mg/L)	8.2	RD11	WQ: <i>MYL</i>
		E 10	F 10	G 10	H 10	Conductivity (µS/cm)	447	EC11	Initiation Time: <i>1100</i>
						Alkalinity (mg/L)	✓ 46.4		Initiation Counts: <i>W</i>
						Hardness (mg/L)	✓ 179.5		Confirmation Counts: <i>SMC</i>
				Ammonia (mg/L)	4.00	DR3800	PM Feed: <i>W</i>		
								Temp. (°C)	22.7
1	8/17/18	# of Mortalities				Old D.O. (mg/L)	7.4	RD10	AM Change: <i>MB</i> WQ: <i>MB</i>
		A 0	B 0	C 0	D 0	New D.O. (mg/L)	7.7	RD10	Mortality Count: <i>MB</i>
		E 0	F 0	G 0	H 0	Temp. (°C)	22.5	48A	PM Change: <i>FT</i> PM Feed: <i>FT</i>
						Old D.O. (mg/L)	7.9	RD10	AM Change: <i>MB</i> WQ: <i>MB</i>
				Temp. (°C)	22.8				
				2	8/18/18	# of Mortalities			
A 0	B 0	C 0	D 0			New D.O. (mg/L)	8.2	RD10	Mortality Count: <i>MB</i>
E 0	F 0	G 0	H 0			Temp. (°C)	22.8	48A	PM Change: <i>MB</i> PM Feed: <i>MB</i>
						Old D.O. (mg/L)	7.8	RD11	AM Change: <i>MYL</i> WQ: <i>MYL</i>
				Temp. (°C)	22.8				
				3	8/19/18	# of Mortalities			
A 0	B 0	C 0	D 0			New D.O. (mg/L)	7.6	RD10	Mortality Count: <i>AR</i>
E 0	F 0	G 0	H 0			Temp. (°C)	22.8	48A	PM Change: <i>AR</i> PM Feed: <i>AR</i>
						Old D.O. (mg/L)	5.1	RD12	AM Change: <i>W</i> WQ: <i>W</i>
				Temp. (°C)	22.9				
				4	8/20/18	# of Mortalities			
A 0	B 0	C 0	D 0			New D.O. (mg/L)	8.0	RD12	Mortality Count: <i>MB</i>
E 0	F 0	G 0	H 0			Temp. (°C)	23.5	48A	PM Change: <i>MB</i> PM Feed: <i>MB</i>
						Old D.O. (mg/L)	6.9	RD12	AM Change: <i>MYL</i> WQ: <i>MYL</i>
				Temp. (°C)	22.7				
				5	8-21-18	# of Mortalities			
A 0	B 0	C 0	D 0			New D.O. (mg/L)	8.3	RD10	Mortality Count: <i>AR</i>
E 0	F 0	G 0	H 0			Temp. (°C)	22.9	48A	PM Change: <i>AR</i> PM Feed: <i>AR</i>
						Old D.O. (mg/L)	6.6	RD10	AM Change: <i>MYL</i> WQ: <i>MYL</i>
				Temp. (°C)	23.1				
				6	8/22/18	# of Mortalities			
A 0	B 0	C 0	D 0			D.O. (mg/L)	6.2	RD12	Termination Counts: <i>JL</i>
E 0	F 0	G 0	H 0			Conductivity (µS/cm)	823	EC11	Termination Time: <i>1215</i>
						Alkalinity (mg/L)	✓ 79.2		
				Ammonia (mg/L)	2.73				
								Temp. (°C)	22.9
7	8/23/18	# of Mortalities						Old D.O. (mg/L)	6.2
		A 0	B 0	C 0	D 0	New D.O. (mg/L)	8.3	RD10	Mortality Count: <i>AR</i>
		E 0	F 0	G 0	H 0	Temp. (°C)	22.9	48A	PM Change: <i>AR</i> PM Feed: <i>AR</i>
						Old D.O. (mg/L)	6.6	RD10	AM Change: <i>MYL</i> WQ: <i>MYL</i>
				Temp. (°C)	23.1				
				8	8/24/18	# of Mortalities			
A 0	B 0	C 0	D 0			New D.O. (mg/L)	8.3	RD10	Mortality Count: <i>AR</i>
E 0	F 0	G 0	H 0			Temp. (°C)	22.9	48A	PM Change: <i>AR</i> PM Feed: <i>AR</i>
						Old D.O. (mg/L)	6.6	RD10	AM Change: <i>MYL</i> WQ: <i>MYL</i>
				Temp. (°C)	23.1				
				9	8/25/18	# of Mortalities			
A 0	B 0	C 0	D 0			New D.O. (mg/L)	8.3	RD10	Mortality Count: <i>AR</i>
E 0	F 0	G 0	H 0			Temp. (°C)	22.9	48A	PM Change: <i>AR</i> PM Feed: <i>AR</i>
						Old D.O. (mg/L)	6.6	RD10	AM Change: <i>MYL</i> WQ: <i>MYL</i>
				Temp. (°C)	23.1				
				10	8/26/18	# Alive			
A 8	B 6	C 8	D 9			D.O. (mg/L)	6.2	RD12	Termination Counts: <i>JL</i>
E 6	F 9	G 10	H 10			Conductivity (µS/cm)	823	EC11	Termination Time: <i>1215</i>
						Alkalinity (mg/L)	✓ 79.2		
				Ammonia (mg/L)	2.73				
								Temp. (°C)	22.9

Hyaella azteca Weight Data Sheets

Client: LWA - Calleguas Creek Project #: 29192 Balance ID: BAL04
 Sample ID: CCWTMP-68-PCH-301 Tare Wt Date: 8/18/18 Sign-Off: M4L
 Test ID #: 79265 Final Wt Date: 8/29/18 Sign-Off: JF

Pan	Concentration Replicate	Initial Weight. (mg)	Final Weight. (mg)	# organisms	Ave Weight (mg)
1	Control A	72.61	73.20	7	0.0843
2	Sediment B	61.53	62.45	9	0.1022
3	C	63.99	64.88	10	0.0890
4	D	57.46	58.15	9	0.0767
5	E	65.56	65.99	5	0.0860
6	F	65.24	66.14	7	0.1286
7	G	63.20	64.18	9	0.1089
8	H	65.56	66.36	10	0.0800
9	CCWTMP-68-PCH-301 A	61.96	62.84	8	0.1100
10	B	64.51	64.95	6	0.0733
11	C	60.14	60.71	8	0.0713
12	D	64.74	65.57	9	0.0922
13	E	62.54	63.20	6	0.1100
14	F	67.38	67.97	9	0.0656
15	G	54.77	55.58	10	0.0810
16	H	66.11	67.02	10	0.0910
QA#1		54.93	54.91		

M4L 8/29/18

CETIS Analytical Report

Report Date: 01 Sep-18 11:59 (p 6 of 8)

Test Code: CCWTMP_68HA_C1 | 15-1458-2509

Hyalella 10-d Survival and Growth Sediment Test **Pacific EcoRisk**

Analysis ID: 06-1584-1947	Endpoint: Survival Rate	CETIS Version: CETISv1.9.2
Analyzed: 01 Sep-18 11:58	Analysis: Parametric-Two Sample	Official Results: Yes

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	68-UNIV-304 passed survival rate	13.65%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Water Control		68-UNIV-304	1.52	1.76	0.163	14	CDF	0.0760	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0782602	0.0782602	1	2.3	0.1519	Non-Significant Effect
Error	0.477157	0.0340827	14			
Total	0.555418		15			

Distributional Tests

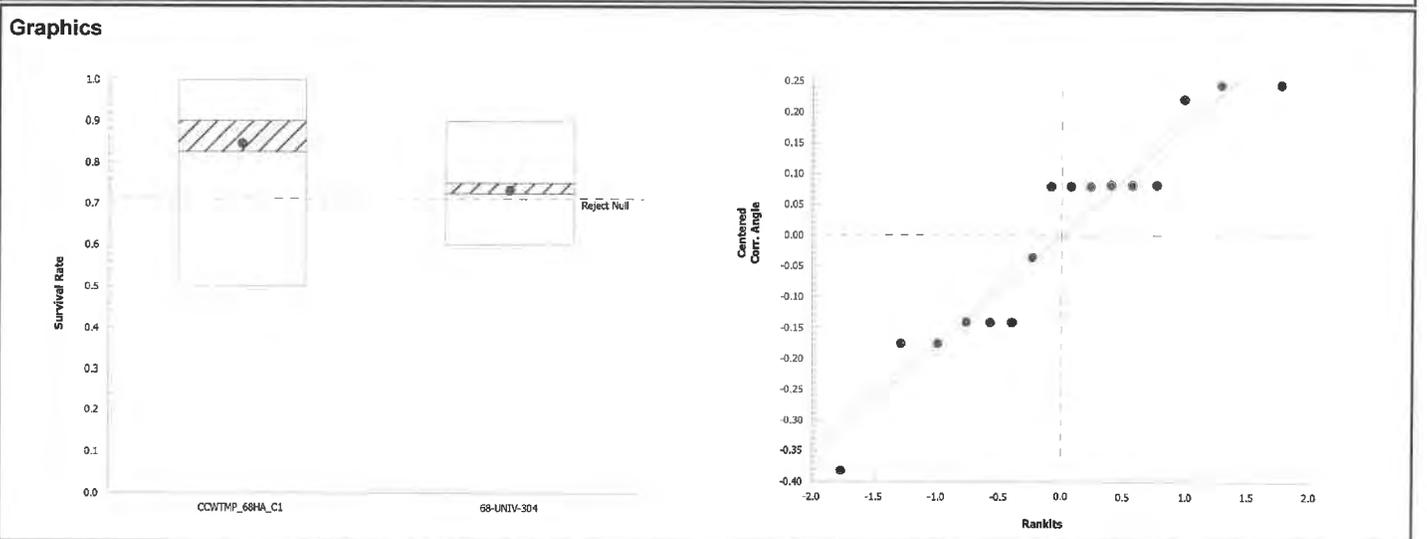
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F Test	2.69	8.89	0.2157	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.914	0.841	0.1351	Normal Distribution

Survival Rate Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
CCWTMP_68HA_C	LW	8	0.825	0.678	0.972	0.900	0.500	1.000	0.062	21.24%	0.00%
68-UNIV-304		8	0.725	0.628	0.822	0.750	0.600	0.900	0.041	16.07%	12.12%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
CCWTMP_68HA_C	LW	8	1.17	0.981	1.35	1.25	0.785	1.41	0.0788	19.09%	0.00%
68-UNIV-304		8	1.03	0.914	1.14	1.05	0.886	1.25	0.0481	13.23%	11.98%



CETIS Analytical Report

Report Date: 01 Sep-18 11:59 (p 2 of 8)
 Test Code: CCWTMP_68HA_C1 | 15-1458-2509

Hyalella 10-d Survival and Growth Sediment Test Pacific EcoRisk

Analysis ID: 09-8639-4513	Endpoint: Mean Dry Weight-mg	CETIS Version: CETISv1.9.2
Analyzed: 01 Sep-18 11:59	Analysis: Parametric-Two Sample	Official Results: Yes

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	68-UNIV-304 passed mean dry weight-mg	22.34%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Water Control		68-UNIV-304	0.777	1.76	0.021	14	CDF	0.2251	Non-Significant Effect

ANOVA Table

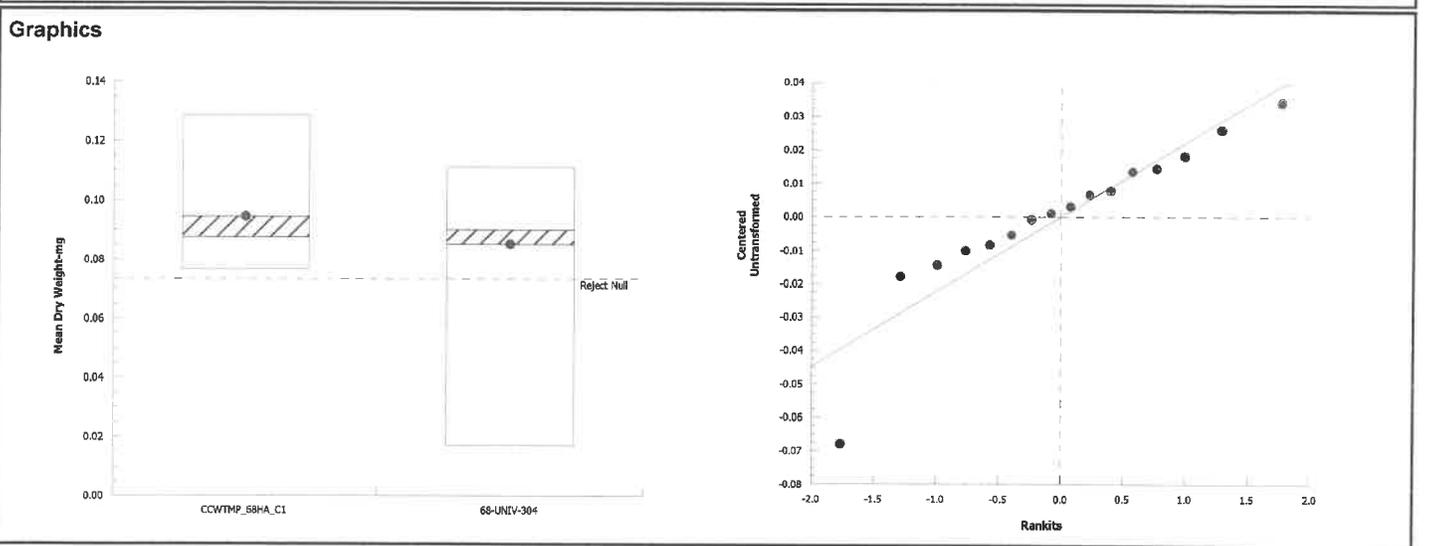
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0003466	0.0003466	1	0.604	0.4502	Non-Significant Effect
Error	0.0080388	0.0005742	14			
Total	0.0083853		15			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F Test	2.72	8.89	0.2106	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.879	0.841	0.0376	Normal Distribution

Mean Dry Weight-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
CCWTMP_68HA_C	LW	8	0.0945	0.0798	0.109	0.0875	0.0767	0.129	0.00621	18.61%	0.00%
68-UNIV-304		8	0.0851	0.0609	0.109	0.09	0.0171	0.111	0.0102	34.03%	9.85%



10-Day *Hyaella azteca* Sediment Toxicity Test Data

Client: LWA - Calleguas Creek
 Project#: 29192
 Test ID#: 79266

Org. Supplier: ABS
 Org. Log #: 1134
 Org. Age/Size: 10-11d

Day	Date	Test Material				Water Quality Measurements			Sign-off:
		CCWTMP-68-UNIV-304				Parameter	Value	Meter ID	
0	8/16/18	# Live Organisms				pH	7.72	PH19	AM Change: <i>myl</i>
		A 10	B 10	C 10	D 10	D.O. (mg/L)	7.7	RD11	WQ: <i>myl</i>
		E 10	F 10	G 10	H 10	Conductivity (µS/cm)	422	EC11	Initiation Time: 1100
						Alkalinity (mg/L)	✓ 50		Initiation Counts: <i>w</i>
						Hardness (mg/L)	✓ 126		Confirmation Counts: <i>smc</i>
				Ammonia (mg/L)	4.00	DR3800	PM Feed: <i>w</i>		
				Temp. (°C)	22.6	107A			
1	8/17/18	# of Mortalities				Old D.O. (mg/L)	6.3	RD10	AM Change: <i>MB</i> WQ: <i>MB</i>
		A 0	B 0	C 0	D 0	New D.O. (mg/L)	6.8	RD10	Mortality Count: <i>MB</i>
		E 0	F 0	G 0	H 0	Temp. (°C)	22.5	48A	PM Change: <i>F1</i> PM Feed: <i>F1</i>
						Old D.O. (mg/L)	6.5	RD10	AM Change: <i>MB</i> WQ: <i>MB</i>
						New D.O. (mg/L)	7.5	RD10	Mortality Count: <i>MB</i>
2	8/18/18	# of Mortalities				Old D.O. (mg/L)	6.5	RD10	AM Change: <i>MB</i> WQ: <i>MB</i>
		A 0	B 0	C 0	D 0	New D.O. (mg/L)	7.5	RD10	Mortality Count: <i>MB</i>
		E 0	F 0	G 0	H 0	Temp. (°C)	22.7	48A	PM Change: <i>MB</i> PM Feed: <i>MB</i>
						Old D.O. (mg/L)	6.5	RD11	AM Change: <i>myl</i> WQ: <i>myl</i>
						New D.O. (mg/L)	7.5	RD11	Mortality Count: <i>myl</i>
3	8/19/18	# of Mortalities				Old D.O. (mg/L)	6.5	RD11	AM Change: <i>myl</i> WQ: <i>myl</i>
		A 0	B 0	C 0	D 0	New D.O. (mg/L)	7.5	RD11	Mortality Count: <i>myl</i>
		E 0	F 0	G 0	H 0	Temp. (°C)	22.7	48A	PM Change: <i>myl</i> PM Feed: <i>myl</i>
						Old D.O. (mg/L)	4.9	RD10	AM Change: <i>AR</i> WQ: <i>AR</i>
						New D.O. (mg/L)	7.7	RD10	Mortality Count: <i>AR</i>
4	8/20/18	# of Mortalities				Old D.O. (mg/L)	4.9	RD10	AM Change: <i>AR</i> WQ: <i>AR</i>
		A 0	B 0	C 0	D 0	New D.O. (mg/L)	7.7	RD10	Mortality Count: <i>AR</i>
		E 0	F 0	G 0	H 0	Temp. (°C)	22.8	48A	PM Change: <i>AR</i> PM Feed: <i>AR</i>
						Old D.O. (mg/L)	3.5	RD12	AM Change: <i>myl</i> WQ: <i>myl</i>
						New D.O. (mg/L)	7.5	RD12	Mortality Count: <i>myl</i>
5	8-21-18	# of Mortalities				Old D.O. (mg/L)	3.5	RD12	AM Change: <i>myl</i> WQ: <i>myl</i>
		A 0	B 0	C 0	D 0	New D.O. (mg/L)	7.5	RD12	Mortality Count: <i>myl</i>
		E 0	F 0	G 0	H 0	Temp. (°C)	22.8	48A	PM Change: <i>myl</i> PM Feed: <i>myl</i>
						Old D.O. (mg/L)	5.3	RD12	AM Change: <i>MB</i> WQ: <i>MB</i>
						New D.O. (mg/L)	7.9	RD12	Mortality Count: <i>MB</i>
6	8/22/18	# of Mortalities				Old D.O. (mg/L)	5.3	RD12	AM Change: <i>MB</i> WQ: <i>MB</i>
		A 0	B 0	C 0	D 0	New D.O. (mg/L)	7.9	RD12	Mortality Count: <i>MB</i>
		E 0	F 0	G 0	H 0	Temp. (°C)	23.8	48A	PM Change: <i>MB</i> PM Feed: <i>MB</i>
						Old D.O. (mg/L)	5.6	RD12	AM Change: <i>myl</i> WQ: <i>myl</i>
						New D.O. (mg/L)	7.7	RD12	Mortality Count: <i>myl</i>
7	8/23/18	# of Mortalities				Old D.O. (mg/L)	5.6	RD12	AM Change: <i>myl</i> WQ: <i>myl</i>
		A 0	B 0	C 0	D 0	New D.O. (mg/L)	7.7	RD12	Mortality Count: <i>myl</i>
		E 0	F 0	G 0	H 0	Temp. (°C)	22.7	48A	PM Change: <i>myl</i> PM Feed: <i>myl</i>
						Old D.O. (mg/L)	6.5	RD10	AM Change: <i>AR</i> WQ: <i>AR</i>
						New D.O. (mg/L)	8.1	RD10	Mortality Count: <i>AR</i>
8	8/24/18	# of Mortalities				Old D.O. (mg/L)	6.5	RD10	AM Change: <i>AR</i> WQ: <i>AR</i>
		A 0	B 0	C 0	D 0	New D.O. (mg/L)	8.1	RD10	Mortality Count: <i>AR</i>
		E 0	F 0	G 0	H 0	Temp. (°C)	22.9	48A	PM Change: <i>AR</i> PM Feed: <i>AR</i>
						Old D.O. (mg/L)	6.2	RD10	AM Change: <i>myl</i> WQ: <i>myl</i>
						New D.O. (mg/L)	7.5	RD10	Mortality Count: <i>myl</i>
9	8/25/18	# of Mortalities				Old D.O. (mg/L)	6.2	RD10	AM Change: <i>myl</i> WQ: <i>myl</i>
		A 0	B 0	C 0	D 0	New D.O. (mg/L)	7.5	RD10	Mortality Count: <i>myl</i>
		E 0	F 0	G 0	H 0	Temp. (°C)	23.0	48A	PM Change: <i>myl</i> PM Feed: <i>myl</i>
						pH	7.51	PH25	WQ: <i>AR</i>
						D.O. (mg/L)	5.8	RD12	Termination Counts: <i>BV</i>
10	8/26/18	# Alive				Conductivity (µS/cm)	442	EC11	Termination Time: 1130
		A 7	B 6	C 9	D 6	Alkalinity (mg/L)	✓ 75.6		
		E 10	F 8	G 8	H 8	Hardness (mg/L)	✓ 142		
						Ammonia (mg/L)	1.13	DR3800	
						Temp. (°C)	22.9	48A	

Hyaella azteca Weight Data Sheets

Client: LWA - Calleguas Creek Project #: 29192 Balance ID: BAL04
 Sample ID: CCWTMP-68-UNIV-304 Tare Wt Date: 8/18/18 Sign-Off: myl
 Test ID #: 79266 Final Wt Date: 8/29/18 Sign-Off: zj

Pan	Concentration		Initial Weight. (mg)	Final Weight. (mg)	# organisms	Ave Weight (mg)
1	Control	A	72.61	73.20	7	0.0843
2	Sediment	B	61.53	62.45	9	0.1022
3		C	63.99	64.88	10	0.0890
4		D	57.46	58.15	9	0.0767
5		E	65.56	65.99	5	0.0860
6		F	65.24	66.14	7	0.1286
7		G	63.20	64.18	9	0.1089
8		H	65.56	66.36	10	0.0800
17	CCWTMP-68-UNIV-304	A	60.61	60.73	7	0.0171
18		B	65.91	66.44	6	0.0883
19		C	64.47	65.23	9	0.0844
20		D	55.95	56.50	6	0.0917
21		E	67.60	68.22	6	0.1033
22		F	75.41	76.10	8	0.0862
23		G	61.71	62.50	8	0.0957
24		H	60.94	61.83	8	0.1113
QA32			61.56	61.54		

myl 8/21/18

CETIS Analytical Report

Report Date: 01 Sep-18 11:59 (p 7 of 8)
 Test Code: CCWTMP_68HA_C1 | 15-1458-2509

Hyalella 10-d Survival and Growth Sediment Test Pacific EcoRisk

Analysis ID: 20-3377-9911 Endpoint: Survival Rate CETIS Version: CETISv1.9.2
 Analyzed: 01 Sep-18 11:58 Analysis: Parametric-Two Sample Official Results: Yes

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	68-HOWAR-312 passed survival rate	14.95%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Water Control		68-HOWAR-312	-0.599	1.76	0.174	14	CDF	0.7207	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0140755	0.0140755	1	0.359	0.5586	Non-Significant Effect
Error	0.548719	0.0391942	14			
Total	0.562794		15			

Distributional Tests

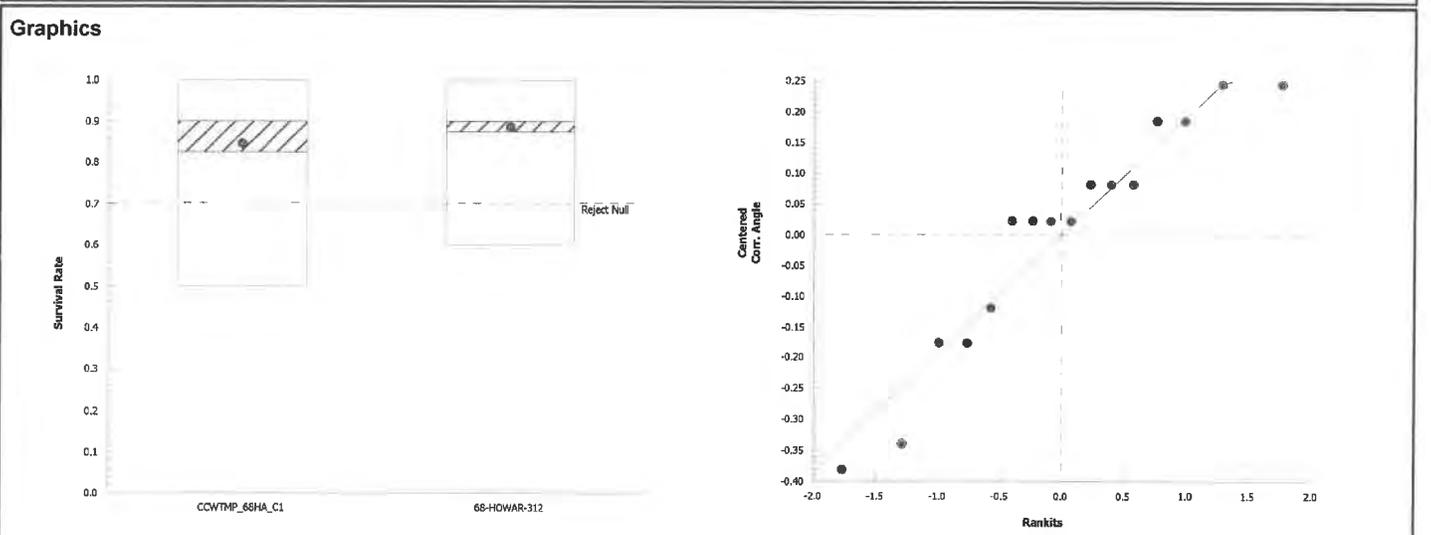
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F Test	1.73	8.89	0.4867	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.917	0.841	0.1497	Normal Distribution

Survival Rate Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
CCWTMP_68HA_C	LW	8	0.825	0.678	0.972	0.900	0.500	1.000	0.062	21.24%	0.00%
68-HOWAR-312		8	0.875	0.768	0.982	0.900	0.600	1.000	0.045	14.65%	-6.06%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
CCWTMP_68HA_C	LW	8	1.17	0.981	1.35	1.25	0.785	1.41	0.0788	19.09%	0.00%
68-HOWAR-312		8	1.23	1.09	1.37	1.25	0.886	1.41	0.0599	13.81%	-5.08%



CETIS Analytical Report

Report Date: 01 Sep-18 11:59 (p 3 of 8)
 Test Code: CCWTMP_68HA_C1 | 15-1458-2509

Hyalella 10-d Survival and Growth Sediment Test Pacific EcoRisk

Analysis ID: 20-3307-7558 Endpoint: Mean Dry Weight-mg CETIS Version: CETISv1.9.2
 Analyzed: 01 Sep-18 11:59 Analysis: Parametric-Two Sample Official Results: Yes

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	68-HOWAR-312 passed mean dry weight-mg	12.98%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Water Control		68-HOWAR-312	-1.42	1.76	0.012	14	CDF	0.9109	Non-Significant Effect

ANOVA Table

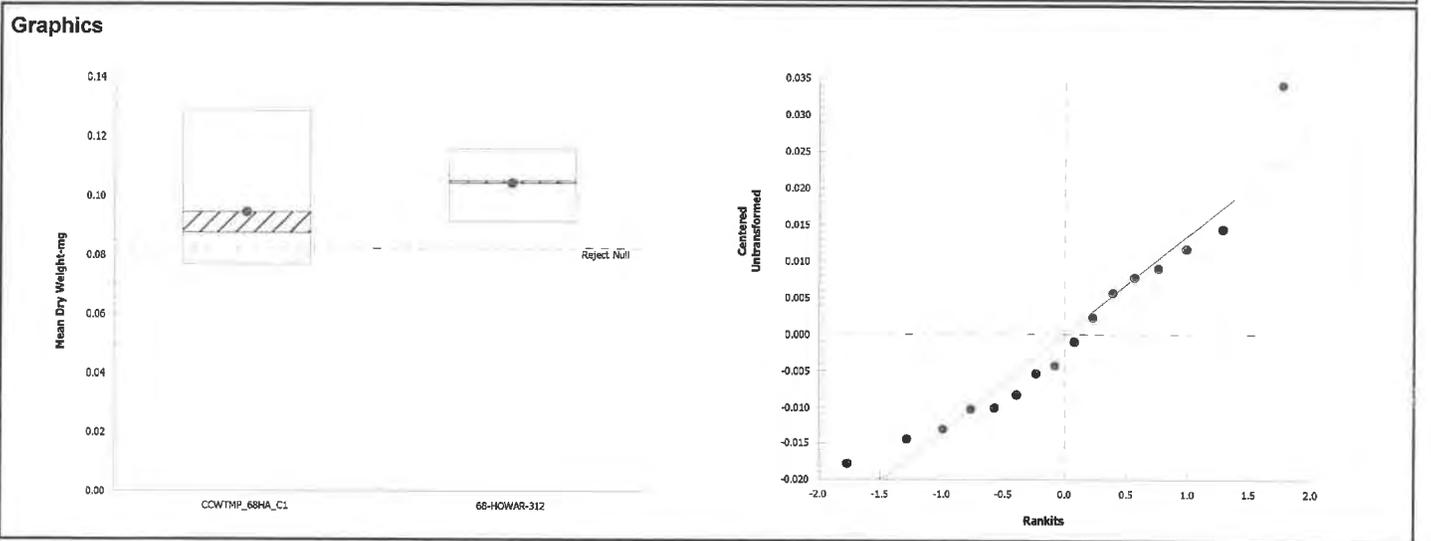
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0003896	0.0003896	1	2.01	0.1783	Non-Significant Effect
Error	0.0027151	0.0001939	14			
Total	0.0031046		15			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F Test	3.91	8.89	0.0923	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.931	0.841	0.2544	Normal Distribution

Mean Dry Weight-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
CCWTMP_68HA_C	LW	8	0.0945	0.0798	0.109	0.0875	0.0767	0.129	0.00621	18.61%	0.00%
68-HOWAR-312		8	0.104	0.0969	0.112	0.105	0.0912	0.116	0.00314	8.52%	-10.45%



10-Day *Hyaella azteca* Sediment Toxicity Test Data

Client: LWA - Calleguas Creek
 Project#: 29192
 Test ID#: 79267

Org. Supplier: ABS
 Org. Log #: 11134
 Org. Age/Size: 10-11d

Day	Date	Test Material				Water Quality Measurements			Sign-off:
		CCWTMP-68-HOWAR-312				Parameter	Value	Meter ID	
0	8/16/18	# Live Organisms				pH	7.70	PH19	AM Change: <i>myl</i>
		A 10	B 10	C 10	D 10	D.O. (mg/L)	7.8	RD11	WQ: <i>myl</i>
		E 10	F 10	G 10	H 10	Conductivity (µS/cm)	420	EC11	Initiation Time: 1100
						Alkalinity (mg/L)	✓ 47.6		Initiation Counts: <i>✓</i>
						Hardness (mg/L)	✓ 142		Confirmation Counts: <i>SMC</i>
				Ammonia (mg/L)	21.00	DR3800	PM Feed: <i>✓</i>		
				Temp. (°C)	22.7	107A			
1	8/17/18	# of Mortalities				Old D.O. (mg/L)	10.4	RD10	AM Change: <i>MB WQ MB</i>
		A 0	B 0	C 0	D 0	New D.O. (mg/L)	✓ 7.0	RD10	Mortality Count: <i>MB</i>
		E 0	F 0	G 0	H 0	Temp. (°C)	22.7	48A	PM Change: <i>FT</i> PM Feed: <i>FT</i>
						Old D.O. (mg/L)	7.4	RD10	AM Change: <i>MB WQ MB</i>
						New D.O. (mg/L)	7.8	RD10	Mortality Count: <i>MB</i>
				Temp. (°C)	22.7	48A	PM Change: <i>MB</i> PM Feed: <i>MB</i>		
				2	8/18/18	# of Mortalities			
A 0	B 0	C 0	D 0			New D.O. (mg/L)	7.7	RD11	Mortality Count: <i>myl</i>
E 0	F 0	G 0	H 0			Temp. (°C)	22.9	48A	PM Change: <i>myl</i> PM Feed: <i>myl</i>
						Old D.O. (mg/L)	6.0	RD10	AM Change: <i>AR WQ AR</i>
						New D.O. (mg/L)	7.8	RD10	Mortality Count: <i>AR</i>
				Temp. (°C)	22.9	48A	PM Change: <i>AR</i> PM Feed: <i>AR</i>		
				3	8/19/18	# of Mortalities			
A 0	B 0	C 0	D 0			New D.O. (mg/L)	7.4	RD12	Mortality Count: <i>myl</i>
E 0	F 0	G 0	H 0			Temp. (°C)	22.9	48A	PM Change: <i>myl</i> PM Feed: <i>myl</i>
						Old D.O. (mg/L)	6.7	RD12	AM Change: <i>MB WQ MB</i>
						New D.O. (mg/L)	8.2	RD12	Mortality Count: <i>MB</i>
				Temp. (°C)	23.9	48A	PM Change: <i>MB</i> PM Feed: <i>MB</i>		
				4	8/20/18	# of Mortalities			
A 0	B 0	C 0	D 0			New D.O. (mg/L)	7.8	RD12	Mortality Count: <i>myl</i>
E 0	F 0	G 0	H 0			Temp. (°C)	22.8	48A	PM Change: <i>myl</i> PM Feed: <i>myl</i>
						Old D.O. (mg/L)	6.9	RD10	AM Change: <i>AR WQ AR</i>
						New D.O. (mg/L)	8.3	RD10	Mortality Count: <i>AR</i>
				Temp. (°C)	23.0	48A	PM Change: <i>AR</i> PM Feed: <i>AR</i>		
				5	8/21/18	# of Mortalities			
A 0	B 0	C 0	D 0			New D.O. (mg/L)	7.7	RD10	Mortality Count: <i>myl</i>
E 0	F 0	G 0	H 0			Temp. (°C)	23.0	48A	PM Change: <i>myl</i> PM Feed: <i>myl</i>
						Old D.O. (mg/L)	6.7	RD10	AM Change: <i>myl WQ myl</i>
						New D.O. (mg/L)	7.7	RD10	Mortality Count: <i>myl</i>
				Temp. (°C)	23.0	48A	PM Change: <i>myl</i> PM Feed: <i>myl</i>		
				6	8/22/18	# of Mortalities			
A 0	B 0	C 0	D 0			D.O. (mg/L)	6.1	RD12	Termination Counts: <i>2</i>
E 0	F 0	G 0	H 0			Conductivity (µS/cm)	463	EC11	Termination Time: <i>1247</i>
						Alkalinity (mg/L)	✓ 69.6		
						Hardness (mg/L)	✓ 142		
				Ammonia (mg/L)	< 1.00	DR3800			
				Temp. (°C)	22.9	48A			

Hyaella azteca Weight Data Sheets

Client: LWA - Calleguas Creek Project #: 29192 Balance ID: BALD4
 Sample ID: CCWTMP-68-HOWAR-312 Tare Wt Date: 8/18/18 Sign-Off: MYL
 Test ID #: 79267 Final Wt Date: 8/24/18 Sign-Off: JF

Pan	Concentration Replicate	Initial Weight. (mg)	Final Weight. (mg)	# organisms	Ave Weight (mg)
1	Control A	72.61	73.28	7	0.0843
2	Sediment B	61.53	62.45	9	0.1022
3	C	63.99	64.88	10	0.0890
4	D	57.46	58.15	9	0.0767
5	E	65.56	65.99	5	0.0860
6	F	65.24	66.14	7	0.1281
7	G	63.20	64.18	9	0.1089
8	H	65.56	66.36	10	0.0800
25	CCWTMP-68-HOWAR-312 A	59.00	59.73	8	0.0912
26	B	65.60	66.62	9	0.1133
27	C	73.14	74.08	10	0.0940
28	D	56.26	57.42	10	0.1160
29	E	61.59	62.21	6	0.1033
30	F	63.10	64.06	9	0.1067
31	G	64.94	65.84	9	0.1000
32	H	71.31	72.30	9	0.1100
QA3		67.77	67.77		

CETIS Analytical Report

Report Date: 01 Sep-18 11:59 (p 8 of 8)

Test Code: CCWTMP_68HA_C1 | 15-1458-2509

Hyalella 10-d Survival and Growth Sediment Test **Pacific EcoRisk**

Analysis ID: 02-7670-4277 Endpoint: Survival Rate CETIS Version: CETISv1.9.2
 Analyzed: 01 Sep-18 11:58 Analysis: Parametric-Two Sample Official Results: Yes

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	68-WOOD-317 passed survival rate	12.83%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Water Control		68-WOOD-317	1.29	1.76	0.155	14	CDF	0.1090	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0516246	0.0516246	1	1.66	0.2179	Non-Significant Effect
Error	0.434284	0.0310203	14			
Total	0.485908		15			

Distributional Tests

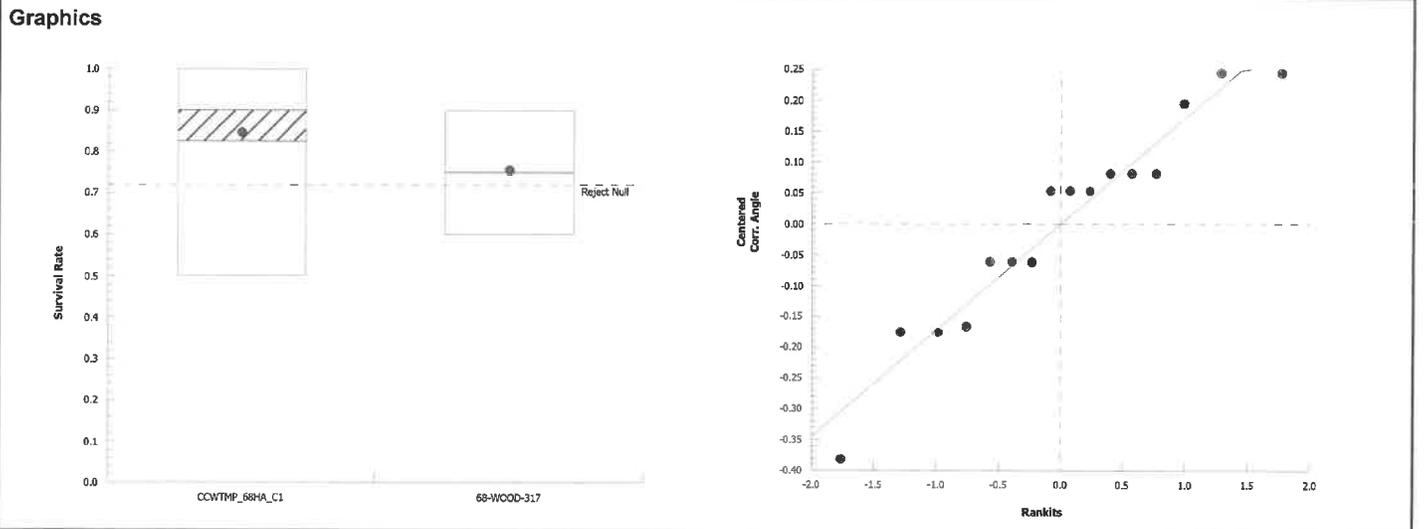
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F Test	4.02	8.89	0.0867	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.942	0.841	0.3716	Normal Distribution

Survival Rate Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
CCWTMP_68HA_C	LW	8	0.825	0.678	0.972	0.900	0.500	1.000	0.062	21.24%	0.00%
68-WOOD-317		8	0.750	0.673	0.827	0.750	0.600	0.900	0.033	12.34%	9.09%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
CCWTMP_68HA_C	LW	8	1.17	0.981	1.35	1.25	0.785	1.41	0.0788	19.09%	0.00%
68-WOOD-317		8	1.05	0.961	1.15	1.05	0.886	1.25	0.0393	10.55%	9.73%



CETIS Analytical Report

Report Date: 10 Sep-18 13:45 (p 1 of 1)
 Test Code: CCWTMP_68HA_C1 | 15-1458-2509

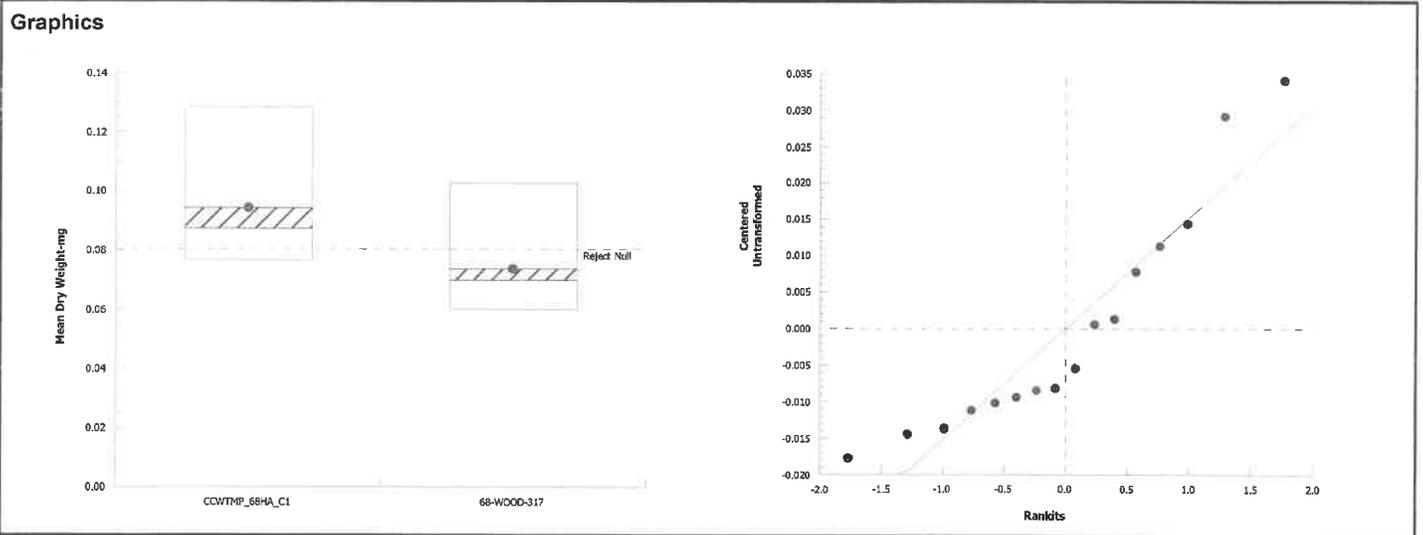
Hyalella 10-d Survival and Growth Sediment Test			Pacific EcoRisk		
Analysis ID: 01-1471-6677	Endpoint: Mean Dry Weight-mg	CETIS Version: CETISv1.9.2			
Analyzed: 10 Sep-18 13:44	Analysis: Parametric-Two Sample	Official Results: Yes			
Data Transform	Alt Hyp	Comparison Result		PMSD	
Untransformed	C > T	68-WOOD-317 failed mean dry weight-mg		14.97%	

Equal Variance t Two-Sample Test									
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Water Control		68-WOOD-317*	2.59	1.76	0.014	14	CDF	0.0108	Significant Effect

ANOVA Table						
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0017254	0.0017254	1	6.69	0.0215	Significant Effect
Error	0.0036106	0.0002579	14			
Total	0.005336		15			

Distributional Tests						
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)	
Variances	Variance Ratio F Test	1.49	8.89	0.6097	Equal Variances	
Distribution	Shapiro-Wilk W Normality Test	0.878	0.841	0.0366	Normal Distribution	

Mean Dry Weight-mg Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
CCWTMP_68HA_C	LW	8	0.0945	0.0798	0.109	0.0875	0.0767	0.129	0.00621	18.61%	0.00%
68-WOOD-317		8	0.0737	0.0617	0.0857	0.0699	0.06	0.103	0.00508	19.52%	21.99%



10-Day *Hyaella azteca* Sediment Toxicity Test Data

Client: LWA - Calleguas Creek
 Project#: 29192
 Test ID#: 7926/8

Org. Supplier: ABS
 Org. Log #: 11134
 Org. Age/Size: 10-11d

Day	Date	Test Material				Water Quality Measurements			Sign-off:
		CCWTMP-68-WOOD-317				Parameter	Value	Meter ID	
0	8/16/18	# Live Organisms				pH	7.78	PH19	AM Change: MYL
		A 10	B 10	C 10	D 10	D.O. (mg/L)	7.7	RD11	WQ: MYL
		E 10	F 10	G 10	H 10	Conductivity (µS/cm)	439	EC11	Initiation Time: 1100
						Alkalinity (mg/L)	✓ 57.2		Initiation Counts: W
						Hardness (mg/L)	✓ 109.5		Confirmation Counts: SMC
				Ammonia (mg/L)	41.00	DR3800	PM Feed: W		
				Temp. (°C)	22.7	107A			
1	8/17/18	# of Mortalities				Old D.O. (mg/L)	7.0	RD10	AM Change: MB ^{WQ} MB
		A 0	B 0	C 0	D 0	New D.O. (mg/L)	7.5	RD10	Mortality Count: MB
		E 0	F 0	G 0	H 0	Temp. (°C)	22.7	48A	PM Change: F1 PM Feed: F1
						Old D.O. (mg/L)	7.0	RD10	AM Change: MB ^{WQ} MB
						New D.O. (mg/L)	7.6	RD10	Mortality Count: MB
2	8/18/18	# of Mortalities				Old D.O. (mg/L)	7.0	RD10	AM Change: MB ^{WQ} MB
		A 0	B 0	C 0	D 0	New D.O. (mg/L)	7.6	RD10	Mortality Count: MB
		E 0	F 0	G 0	H 0	Temp. (°C)	22.9	48A	PM Change: MB PM Feed: MB
						Old D.O. (mg/L)	6.9	RD11	AM Change: MYL ^{WQ} MYL
						New D.O. (mg/L)	7.7	RD11	Mortality Count: MYL
3	8/19/18	# of Mortalities				Old D.O. (mg/L)	6.9	RD11	AM Change: MYL ^{WQ} MYL
		A 0	B 0	C 0	D 0	New D.O. (mg/L)	7.7	RD11	Mortality Count: MYL
		E 0	F 0	G 0	H 0	Temp. (°C)	22.9	48A	PM Change: MYL PM Feed: MYL
						Old D.O. (mg/L)	5.8	RD10	AM Change: AR ^{WQ} AR
						New D.O. (mg/L)	8.0	RD10	Mortality Count: AR
4	8/20/18	# of Mortalities				Old D.O. (mg/L)	5.8	RD10	AM Change: AR ^{WQ} AR
		A 0	B 0	C 0	D 0	New D.O. (mg/L)	8.0	RD10	Mortality Count: AR
		E 0	F 0	G 0	H 0	Temp. (°C)	22.9	48A	PM Change: AR PM Feed: AR
						Old D.O. (mg/L)	6.0	RD12	AM Change: MYL ^{WQ} MYL
						New D.O. (mg/L)	7.4	RD12	Mortality Count: MYL
5	8-21-18	# of Mortalities				Old D.O. (mg/L)	6.0	RD12	AM Change: MYL ^{WQ} MYL
		A 0	B 0	C 0	D 0	New D.O. (mg/L)	7.4	RD12	Mortality Count: MYL
		E 0	F 0	G 0	H 0	Temp. (°C)	22.9	48A	PM Change: MYL PM Feed: MYL
						Old D.O. (mg/L)	6.0	RD12	AM Change: MB ^{WQ} MB
						New D.O. (mg/L)	8.2	RD12	Mortality Count: MB
6	8/22/18	# of Mortalities				Old D.O. (mg/L)	6.0	RD12	AM Change: MB ^{WQ} MB
		A 0	B 0	C 0	D 0	New D.O. (mg/L)	8.2	RD12	Mortality Count: MB
		E 0	F 0	G 0	H 0	Temp. (°C)	23.0	48A	PM Change: MB PM Feed: MB
						Old D.O. (mg/L)	6.4	RD12	AM Change: MYL ^{WQ} MYL
						New D.O. (mg/L)	7.9	RD12	Mortality Count: MYL
7	8/23/18	# of Mortalities				Old D.O. (mg/L)	6.4	RD12	AM Change: MYL ^{WQ} MYL
		A 0	B 0	C 0	D 0	New D.O. (mg/L)	7.9	RD12	Mortality Count: MYL
		E 0	F 0	G 0	H 0	Temp. (°C)	22.9	48A	PM Change: MYL PM Feed: MYL
						Old D.O. (mg/L)	5.9	RD10	AM Change: AR ^{WQ} AR
						New D.O. (mg/L)	8.2	RD10	Mortality Count: AR
8	8/24/18	# of Mortalities				Old D.O. (mg/L)	5.9	RD10	AM Change: AR ^{WQ} AR
		A 0	B 0	C 0	D 0	New D.O. (mg/L)	8.2	RD10	Mortality Count: AR
		E 0	F 0	G 0	H 0	Temp. (°C)	23.0	48A	PM Change: AR PM Feed: AR
						Old D.O. (mg/L)	6.3	RD10	AM Change: MYL ^{WQ} MYL
						New D.O. (mg/L)	7.9	RD10	Mortality Count: MYL
9	8/25/18	# of Mortalities				Old D.O. (mg/L)	6.3	RD10	AM Change: MYL ^{WQ} MYL
		A 0	B 0	C 0	D 0	New D.O. (mg/L)	7.9	RD10	Mortality Count: MYL
		E 0	F 0	G 0	H 0	Temp. (°C)	22.9	48A	PM Change: MYL PM Feed: MYL
						pH	7.74	PH25	WQ: AR
						D.O. (mg/L)	6.5	RD12	Termination Counts: BV
10	8/26/18	# Alive				Conductivity (µS/cm)	487	EC11	Termination Time: 1130
		A 9	B 7	C 7	D 6	Alkalinity (mg/L)	✓ 92		
		E 9	F 9	G 9	H 7	Hardness (mg/L)	✓ 162		
						Ammonia (mg/L)	<1.00	DR3800	
						Temp. (°C)	22.9	48A	

***Hyaella azteca* Weight Data Sheets**

Client: LWA - Calleguas Creek Project #: 29192 Balance ID: BAL04
 Sample ID: CCWTMP-68-WOOD-317 Tare Wt Date: 8/18/18 Sign-Off: MYL
 Test ID #: 79268 Final Wt Date: 8/29/18 Sign-Off: ZJ

Pan	Concentration Replicate	Initial Weight. (mg)	Final Weight. (mg)	# organisms	Ave Weight (mg)
1	Control A	72.61	73.26	7	0.0843
2	Sediment B	61.53	62.45	9	0.1022
3	C	63.99	64.88	10	0.0890
4	D	57.46	58.15	9	0.0767
5	E	65.56	65.99	5	0.0860
6	F	65.24	66.14	7	0.1286
7	G	63.20	64.18	9	0.1089
8	H	65.56	66.36	10	0.0800
33	CCWTMP-68-WOOD-317 A	64.36	65.04	8	0.0850
34	B	64.18	64.70	7	0.0743
35	C	58.13	58.85	7	0.1029
36	D	62.34	62.37	6	0.0600
37	E	68.82	69.42	9	0.0750
38	F	60.82	61.41	9	0.0656
39	G	59.98	60.48	8	0.06765
40	H	59.07	59.52	7	0.0643
QA3		67.77	67.77		

Hyalella azteca Weight Data Sheets

Client: LWA- Calleguas Creek Test Init Date: ^{MSL 8-10-18} 8/10/18 Balance ID: BAL04
 Sample ID: 811612 F10 TO Tare Wt Date: 8/10/18 Sign-Off: MYL
 Test ID: 79265 - 79268 Final Wt Date: 8-17-18 Sign-Off: YU
 Project #: 29192

Pan	Concentration Replicate	Initial Weight (mg)	Final Weight (mg)	# Organisms	Ave Weight (mg)
1	Control Sed. A	62.77	62.99	10	0.022
2	B	64.91	65.1821	10	0.030
3	C	66.11	66.37	10	0.026 ^{MSL 8-27-18} 0.026 0.028
4	D	62.73	63.01	10	0.026 ^{MSL 8-27-18} 0.026 0.028
5	E	61.35	61.64	10	0.025 ^{MSL 8-27-18} 0.025 0.029
6	F	57.45	57.70	10	0.026 ^{MSL 8-27-18} 0.026 0.025
7	G	64.49	64.75	10	0.026
8	H	67.75	67.99	10	0.024
QA		62.71	62.68		

$\bar{x} = 0.0263$

Appendix C

Test Data and Summary of Statistics for the Reference Toxicant Evaluation of the *Hyalella azteca*

CETIS Summary Report

Report Date: 27 Aug-18 16:21 (p 1 of 1)
 Test Code: 79426 | 12-7542-2334

Hyalella 96-h Acute Survival Test **Pacific EcoRisk**

Batch ID: 01-1876-5473	Test Type: Survival (96h)	Analyst: Stevi Vasquez
Start Date: 16 Aug-18 11:27	Protocol: EPA-821-R-02-012 (2002)	Diluent: Laboratory Water
Ending Date: 20 Aug-18 11:24	Species: Hyalella azteca	Brine: Not Applicable
Duration: 96h	Source: Aquatic Biosystems, CO	Age: 11

Sample ID: 01-3463-9003	Code: KCI	Client: Reference Toxicant
Sample Date: 16 Aug-18 11:27	Material: Potassium chloride	Project: 29276
Receipt Date: 16 Aug-18 11:27	Source: Reference Toxicant	
Sample Age: n/a (23.8 °C)	Station: In House	

Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	NOEL	LOEL	TOEL	TU	PMSD ✓
06-8790-2026	96h Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.2	0.4	0.2828		n/a

Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	Level	g/L	95% LCL	95% UCL	TU	✓
14-0979-7400	96h Survival Rate	Regression: Log-Normal (Probit)	EC5	0.162	0.0315	0.23		
			EC10	0.185	0.0478	0.253		
			EC15	0.202	0.0631	0.27		
			EC20	0.217	0.0785	0.286		
			EC25	0.23	0.0942	0.301		
			EC40	0.268	0.146	0.352		
			EC50	0.294	0.184	0.398		

96h Survival Rate Summary

Conc-g/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	10	0.900	0.674	1.000	0.000	1.000	0.100	0.316	35.14%	0.00%
0.1		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	-11.11%
0.2		10	0.800	0.498	1.000	0.000	1.000	0.133	0.422	52.70%	11.11%
0.4		10	0.200	0.000	0.502	0.000	1.000	0.133	0.422	210.82%	77.78%
0.8		10	0.000	0.000	0.000	0.000	0.000	0.000	0.000		100.00%
1.6		10	0.000	0.000	0.000	0.000	0.000	0.000	0.000		100.00%

96h Survival Rate Detail

Conc-g/L	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	1.000	1.000	1.000	1.000	0.000	1.000	1.000	1.000	1.000	1.000
0.1		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
0.2		1.000	1.000	1.000	1.000	1.000	1.000	0.000	0.000	1.000	1.000
0.4		0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000	1.000	0.000
0.8		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1.6		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

96h Survival Rate Binomials

Conc-g/L	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	1/1	1/1	1/1	1/1	0/1	1/1	1/1	1/1	1/1	1/1
0.1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
0.2		1/1	1/1	1/1	1/1	1/1	1/1	0/1	0/1	1/1	1/1
0.4		0/1	0/1	0/1	0/1	1/1	0/1	0/1	0/1	1/1	0/1
0.8		0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1
1.6		0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1

Hyaella 96-h Acute Survival Test

Pacific EcoRisk

Test Type: Survival (96h)

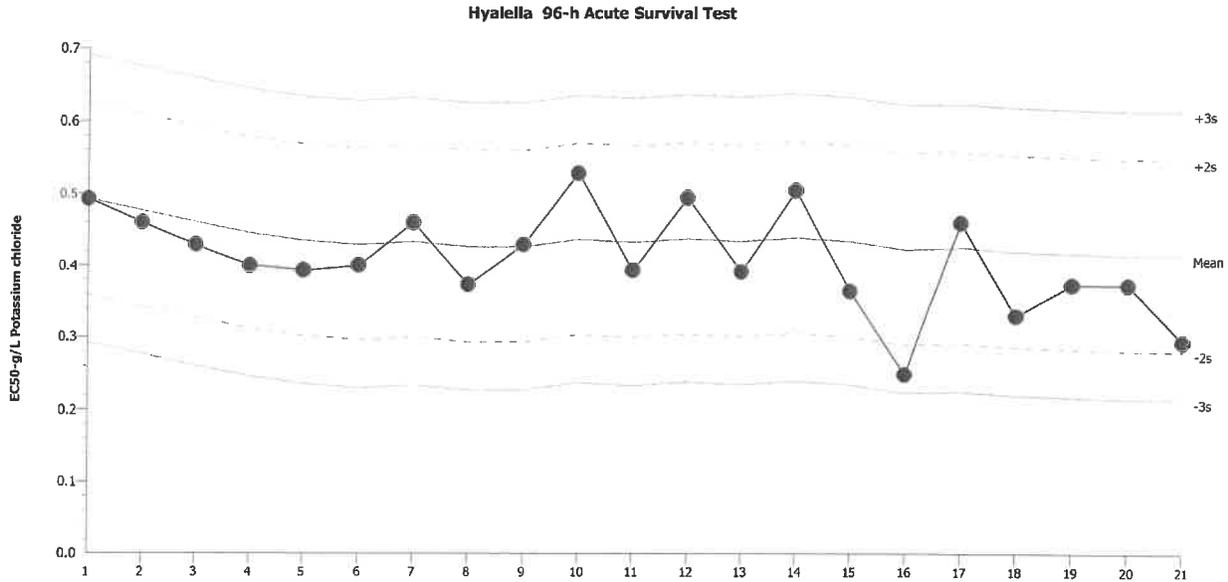
Organism: Hyaella azteca (Freshwater Amphip)

Material: Potassium chloride

Protocol: EPA-821-R-02-012 (2002)

Endpoint: 96h Survival Rate

Source: Reference Toxicant-REF



Mean: 0.4147 Count: 20 -2s Warning Limit: 0.2818 -3s Action Limit: 0.2154
 Sigma: 0.06643 CV: 16.00% +2s Warning Limit: 0.5475 +3s Action Limit: 0.614

Quality Control Data

Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2017	Aug	10	15:58	0.4925	0.07776	1.171			08-4781-5295	04-7807-7811
2			13	14:00	0.4595	0.04478	0.6741			03-2555-5005	07-3822-0721
3		Sep	2	12:45	0.4287	0.01401	0.2109			00-8891-9372	16-8329-5833
4			12	16:53	0.4	-0.0147	-0.2213			12-7066-3429	06-8588-1925
5			24	16:23	0.3931	-0.02157	-0.3247			05-3672-3483	11-7202-5835
6		Oct	23	15:20	0.4	-0.0147	-0.2213			05-6411-1970	13-8116-2372
7		Nov	8	16:16	0.4595	0.04478	0.6741			19-7659-7997	01-3839-2915
8			17	16:00	0.3732	-0.04149	-0.6245			17-6978-3883	17-5467-8698
9			25	14:10	0.4287	0.01401	0.2109			11-3183-2495	08-9083-9227
10		Dec	4	16:30	0.5278	0.1131	1.703			09-9590-2070	18-7306-3573
11	2018	Jan	9	19:13	0.3931	-0.02157	-0.3247			05-2232-4768	00-9328-2087
12			17	15:40	0.4938	0.07915	1.191			17-7568-9822	12-5928-4930
13		Feb	8	15:57	0.391	-0.02366	-0.3562			13-6969-1958	02-2461-7172
14		Mar	2	17:52	0.5037	0.08897	1.339			10-1610-0738	05-9100-3645
15		Apr	8	13:38	0.3642	-0.05054	-0.7608			14-6470-8596	05-1973-4354
16		May	16	17:55	0.2486	-0.1661	-2.5	(-)		05-9866-1037	11-2195-3653
17		Jun	14	16:35	0.4595	0.04478	0.6741			18-1605-2758	14-8406-0239
18		Jul	18	16:20	0.3299	-0.08476	-1.276			11-4094-7394	20-3811-7615
19		Aug	6	14:44	0.3732	-0.04149	-0.6245			16-9077-3352	08-2793-0151
20			9	17:00	0.3732	-0.04149	-0.6245			14-1761-7282	03-9488-5843
21			16	11:27	0.2941	-0.1206	-1.815			12-7542-2334	14-0979-7400

96 Hour *Hyaella azteca* Reference Toxicant Test Data

Client: Pacific EcoRisk
 Test Material: Potassium Chloride
 Test ID#: 79426 Project #: 29276
 Test Date: 8/16/18 Randomization: 10.75
 Feeding T0 Time: 0845 Initials: TK

Organism Log #: 11134 Age: 10-11 days
 Organism Supplier: A.B.S
 Control/Diluent: SAM-5
 Control Water Batch: 343
 Feeding T46 Time: 1155 Initials: TK

Treatment (g/L)	Temp (°C)	pH	D.O. (mg/L)	Conductivity (µS/cm)	# Live Animals										Sign-Off
					A	B	C	D	E	F	G	H	I	J	
Control	23.8	7.95	8.7	407	1	1	1	1	1	1	1	1	1	1	Test Solution Prep: <u>SMC</u>
0.1	23.7	7.96	8.8	596	1	1	1	1	1	1	1	1	1	1	New WQ: <u>OD</u>
0.2	23.9	7.92	9.0	781	1	1	1	1	1	1	1	1	1	1	Initiation Date: <u>8/16/18</u>
0.4	23.6	7.92	9.3	1142	1	1	1	1	1	1	1	1	1	1	Initiation Time: <u>1127</u>
0.8	23.6	7.88	9.7	1852	1	1	1	1	1	1	1	1	1	1	Initiation Signoff: <u>SMC</u>
1.6	23.4	7.85	10.4	3328	1	1	1	1	1	1	1	1	1	1	RT Batch #: <u>20</u>
Meter ID	107A	PH24	RD12	EC13											
Control	22.6				1	1	1	1	1	1	1	1	1	1	Count Date: <u>8/17/18</u>
0.1	22.7				1	1	1	1	1	1	1	1	1	1	Count Time: <u>0949</u>
0.2	22.6				1	1	1	1	1	1	1	1	1	1	Count Signoff: <u>JO</u>
0.4	22.6				1	1	1	1	1	1	1	1	1	1	
0.8	22.6				0	0	0	0	0	0	0	0	0	0	
1.6	22.6				0	0	0	0	0	0	0	0	0	0	
Meter ID	107A														
Control	22.8				1	1	1	1	1	1	1	1	1	1	Count Date: <u>8/18/18</u>
0.1	22.9				1	1	1	1	1	1	1	1	1	1	Count Time: <u>1055</u>
0.2	23.0				1	1	1	1	1	1	0	1	1	1	Count Signoff: <u>TK</u>
0.4	22.7				0	0	1	1	1	0	0	1	1	1	
0.8	22.8				-	-	-	-	-	-	-	-	-	-	
1.6	22.8				-	-	-	-	-	-	-	-	-	-	
Meter ID	100A														
Control	22.5				1	1	1	1	0	1	1	1	1	1	Count Date: <u>8/19/18</u>
0.1	22.7				1	1	1	1	1	1	1	1	1	1	Count Time: <u>1339</u>
0.2	22.7				1	1	1	1	1	1	0	-	1	1	Count Signoff: <u>EP</u>
0.4	22.8				-	-	0	0	1	-	-	0	0	0	
0.8	-				-	-	-	-	-	-	-	-	-	-	
1.6	-				-	-	-	-	-	-	-	-	-	-	
Meter ID	81A														
Control	22.4	7.81	8.3	424	1	1	1	1	-	1	1	1	1	1	Termination Date: <u>8/20/18</u>
0.1	22.5	7.80	8.2	634	1	1	1	1	1	1	1	1	1	1	Termination Time: <u>1124</u>
0.2	22.6	7.70	8.0	834	1	1	1	1	1	1	-	-	1	1	Termination Signoff: <u>TK</u>
0.4	22.3	7.81	8.1	1181	-	-	0	0	1	-	-	-	1	-	Old WQ: <u>ER</u>
0.8	22.4	7.78	7.9	1872	-	-	0	0	1	-	-	-	-	-	
1.6	22.4	7.80	7.9	3354	-	-	-	-	-	-	-	-	-	-	
Meter ID	40A	PH25	RD12	EC13											

Ms. Amy Storm
 Larry Walker Associates
 2151 Alessandro Dr., Suite 100
 Ventura, CA 93001

September 17, 2018

Dear Amy:

I have enclosed our report “A Toxicity Characterization Study of Ambient Waters Collected from the Calleguas Creek Watershed: Event 68” for samples collected August 8, 2018. The results of our evaluation are summarized below.

Effects of Calleguas Creek Ambient Waters on *Ceriodaphnia dubia*

There were no significant reductions in survival or reproduction in the Calleguas Creek ambient water samples tested with this species.

Effects of Calleguas Creek Ambient Waters on *Hyaella azteca*

The 68-WOOD-119 ambient water was the only sample tested with this species; there were no significant reductions in survival in this sample.

Toxicity Summary for Calleguas Creek: Event 68 Ambient Waters.			
Sample Station ID	Toxicity relative to the Lab Control treatment?		
	<i>Ceriodaphnia dubia</i>		<i>Hyaella azteca</i>
	Survival	Reproduction	Survival
68-UNIV-029	no	no	testing with this species was not performed
68-ADOLF-067	no	no	testing with this species was not performed
68-HITCH-158	no	no	testing with this species was not performed
68-GATE-219	no	no	testing with this species was not performed
68-BELT-222	no	no	testing with this species was not performed
68-WOOD-119	testing with this species was not performed		no

If you have any questions regarding the performance and interpretation of these tests, feel free to contact my colleague Jeffrey Cotsifas or myself at (707) 207-7763.

Sincerely,

Michael McElroy
 Senior Project Manager



Pacific EcoRisk is accredited in accordance with NELAP (ORELAP ID 4043). Pacific EcoRisk certifies that the test results reported herein conform to the most current NELAP requirements for parameters for which accreditation is required and available. Any exceptions to NELAP requirements are noted, where applicable, in the body of the report. This report shall not be reproduced, except in full, without the written consent of Pacific EcoRisk. This testing was performed under Lab Order 29192.

**A Toxicity Characterization Study of Ambient Waters
Collected from the Calleguas Creek Watershed**

(Water Samples Collected on August 8, 2018)

Event 68

Prepared For

Larry Walker Associates
720 Wilshire Blvd., Suite 207
Santa Monica, CA 90401

Prepared By

Pacific EcoRisk
2250 Cordelia Rd.
Fairfield, CA 94534

September 2018



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Appendix F	Test Data and Summary of Statistics for the Reference Toxicant Evaluation of the <i>Hyalella azteca</i>

1. INTRODUCTION

In support of the Calleguas Creek Watershed Monitoring Program, Larry Walker Associates (LWA) has contracted Pacific EcoRisk (PER) to evaluate the potential toxicity of surface waters and sediments collected from within the Calleguas Creek Watershed. The current evaluation, which comprises Event 68 of the overall study, consisted of performing the following U.S. EPA toxicity tests:

- 3-brood (6-8 day) survival and reproduction chronic toxicity test with the crustacean *Ceriodaphnia dubia*; and
- For ambient water samples with a conductivity >3000 $\mu\text{S}/\text{cm}$ but <15 ppt salinity, the 10-day survival test with the freshwater amphipod, *Hyalella azteca* was performed in place of the *C. dubia* test.

In order to evaluate the magnitude of any observed toxicity, all water samples were tested using a series of sample dilutions (100%, 50%, 25%, 12.5%, and 6.25%). In order to document that the test organisms were responding to toxic stress in a typical fashion, reference toxicant tests were also performed. This report describes and summarizes the performance and results of the Event 68 surface water toxicity testing performed in support of the Calleguas Creek Watershed Monitoring Program.

2. COLLECTION AND DELIVERY OF AMBIENT WATER SAMPLES

On August 8, 2018, Kinnetic Laboratories, Inc. (KLI) collected ambient water samples from six locations within the Calleguas Creek watershed (Table 1). Each water sample was collected into two pre-cleaned 5-gallon fluorocarbon-lined polyethylene jerricans. The samples were transported on ice and under chain-of-custody to the PER laboratory facility in Fairfield, CA, arriving approximately 24 hrs after collection. Upon receipt at the testing laboratory, aliquots of each water sample were collected for analysis of initial water quality characteristics (Table 2). The remainder of the water samples were stored at 0-6°C. All initial surface water tests were initiated within 36 hrs of sample collection. The chain-of-custody record for the collection and delivery of these samples is presented in Appendix A.

Station Code	Sample Collection Date (Time)	Test Initiation Date (Time)
UNIV	8/8/18 (0830)	8/9/18 (1625)
ADOLF	8/8/18 (0920)	8/9/18 (1550)
HITCH	8/8/18 (1745)	8/9/18 (1520)
GATE	8/8/18 (1320)	8/9/18 (1558)
BELT	8/8/18 (1435)	8/9/18 (1642)
WOOD	8/8/18 (1520)	8/9/18 (1547)

Sample ID	Temp (°C)	pH	D.O. (mg/L)	Alkalinity (mg/L as CaCO ₃)	Hardness (mg/L as CaCO ₃)	Conductivity (µS/cm)	Salinity (ppt)	Total Ammonia (mg/L)
68-UNIV-029	0.7	8.05	7.0	201	396	1726	0.9	<1.0
68-ADOLF-067	0.6	8.03	8.1	137	253	1044	0.5	<1.0
68-HITCH-158	3.8	8.00	8.1	197	560	1754	0.9	<1.0
68-GATE-219	2.0	7.80	7.8	114	224	968	0.5	<1.0
68-BELT-222	1.4	8.38	8.6	227	470	1299	0.7	<1.0
68-WOOD-119	1.5	8.60	10.1	165	1440	4213	2.3	<1.0

3. TOXICITY TEST PROCEDURES FOR AMBIENT WATERS

The Calleguas Creek ambient waters were tested for toxicity using the following chronic toxicity tests:

- Water samples with a conductivity <3000 µS/cm were tested using the 3-brood (6-8 day) survival and reproduction test with the freshwater crustacean *C. dubia*; and
- Water samples with a conductivity >3000 µS/cm but <15 ppt salinity were tested using the 10-day survival test with the amphipod *H. azteca*.

The methods used in conducting the chronic toxicity tests (and any follow-up TIEs) followed the guidance established by the following EPA manuals:

- Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, Fourth Edition" (EPA-821-R-02-013); and
- A Surface Water Ambient Monitoring Program (SWAMP) test protocol based on a modification of the US EPA guidelines, "Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated Contaminants with Freshwater Invertebrates" (EPA/630/R-99/064).

3.1 Survival and Reproduction Chronic Toxicity Testing with *Ceriodaphnia dubia*

The chronic toxicity test with *C. dubia* consists of exposing individual females to the ambient water samples for the length of time it takes for the Lab Control treatment females to produce three broods (typically 6-8 days), after which effects on survival and reproduction are evaluated. The specific procedures used in these tests are described below.

The Lab Water Control medium for this test consisted of a modified EPA moderately-hard water. For each water sample, the Lab Control water and 100% water sample were used to prepare test solutions at additional interim test treatment concentrations of 6.25%, 12.5%, 25%, and 50% ambient water. For each treatment, 200 mL aliquots of test solution were amended with the alga *Selenastrum capricornutum* and Yeast-Cerophyll®-Trout Food (YCT) to provide food for the test

organisms. “New” water quality characteristics (pH, D.O., and conductivity) were measured on these food-amended test solutions prior to use in these tests.

There were 10 replicates each for each test treatment, each replicate consisting of 15 mL of test solution in a 30-mL plastic cup. These “3-brood” tests were initiated by allocating one neonate (<24 hrs old, and within 8 hours of age) *C. dubia*, obtained from in-house laboratory cultures, into each replicate cup. The replicate cups were placed into a temperature-controlled room at 25°C, under cool-white fluorescent lighting on a 16L:8D photoperiod.

Each test replicate cup was examined daily, with surviving organisms being transferred to the corresponding new cup containing fresh test solution. The contents of each remaining “old” replicate cup were carefully examined, and the number of neonate offspring produced by each original organism was determined, after which “old” water quality characteristics (pH, D.O., and conductivity) were measured for the “old” test solution from one randomly-selected replicate at each treatment.

After it was determined that $\geq 60\%$ of the *C. dubia* in a Lab Water Control treatment had produced their third brood of offspring, the corresponding ambient water test was terminated. The resulting survival and reproduction (number of offspring) data were analyzed to evaluate any impairment(s) caused by the effluent sample; all statistical analyses were made using the CETIS[®] statistical software (TidePool Scientific, McKinleyville, CA).

3.1.1 Reference Toxicant Testing of the *Ceriodaphnia dubia*

In order to assess the sensitivity of the *C. dubia* test organisms to toxic stress, a concurrent reference toxicant test was performed. This reference toxicant test was performed similarly to the ambient water test except that test solutions consisted of Lab Water Control medium spiked with NaCl at test concentrations of 500, 1000, 1500, 2000, and 2500 mg/L. The resulting test response data were statistically analyzed to determine key concentration-response point estimates (e.g., EC50); all statistical analyses were made using the CETIS[®] software. These response endpoints were then compared to the typical response range established by the mean ± 2 SD of the point estimates generated by the most recent previous reference toxicant tests performed by this lab.

3.2 Survival Toxicity Testing of Ambient Waters with *Hyaella azteca*

This test consists of exposing individual *H. azteca* to the ambient water samples for 10 days, after which effects on survival are evaluated. The specific procedures used in this testing are described below.

The *H. azteca* used in this testing were obtained from a commercial supplier (Aquatic BioSystems, CO); upon receipt at the lab, the test organisms were held in aerated tanks containing Lab Control water, and were fed *S. capricornutum* and *Spirulina*-amended YCT *ad libitum* during this pre-test holding period.

The Lab Water Control medium for this testing consisted of EPA synthetic moderately-hard water, modified for use with *H. azteca* as per EPA test guidelines, and adjusted to the conductivity of the site water via addition of an artificial sea salt (Crystal Seas[®]- bioassay grade). For each ambient water sample, the Lab Control water and 100% ambient water sample were used to prepare test solutions at additional interim test treatment concentrations of 6.25%, 12.5%, 25%, and 50% ambient water. A “Culture” Control, consisting of *H. azteca* culture water was also prepared and tested. “New” water quality characteristics (pH, D.O., and conductivity) were measured on these test solutions prior to use in the test(s).

There were five replicates for each test treatment, each replicate consisting of a 250-mL glass beaker containing 100 mL of test solution; a small (~1 cm x 2 cm) piece of NITEX[®] mesh was placed in the beaker to provide an attachment substrate for the thigmotactic amphipods. Testing was initiated by allocating ten 8-9 day old *H. azteca*, into each replicate. The replicate beakers were placed into a temperature-controlled room at 23°C, under cool-white fluorescent lighting on a 16L:8D photoperiod.

Each day of the test(s), each replicate beaker was examined and the number of surviving organisms determined; ‘old’ water quality characteristics of the test solutions were measured in one randomly-selected beaker at each test treatment at this time. On Days 2, 4, 6, and 8 of the tests, 1.0 mL of *Spirulina*-amended YCT food was added to each test replicate to provide food for the test organisms.

On Day 5 of the 10-day test(s), fresh test solutions were prepared and characterized as before. Each replicate was examined, with any dead animals, uneaten food, wastes, and other detritus being removed. The number of live organisms in each replicate was determined and then approximately 80% of the old test solution in each beaker was carefully poured out and replaced with fresh test solution. “Old” water quality characteristics (pH, D.O., and conductivity) were measured on the old test solution that had been discarded from one randomly-selected replicate at each treatment.

After 10 days of exposure, testing was terminated and the number of live organisms in each replicate was recorded. The resulting survival data were analyzed to evaluate any impairment(s) caused by the ambient water sample; all statistical analyses were made using the CETIS[®] statistical software.

3.2.1 Reference Toxicant Testing of the *Hyaella azteca*

In order to assess the sensitivity of the *H. azteca* test organisms to toxic stress, a concurrent reference toxicant test was performed. The reference toxicant test was performed similarly to the ambient water tests, except that test solutions consisted of the Lab Water Control medium spiked with KCl at concentrations of 0.1, 0.2, 0.4, 0.8, and 1.6 g/L. The resulting test response data were statistically analyzed to determine key concentration-response point estimates (e.g., EC₅₀); all statistical analyses were performed using the CETIS[®] software. These response endpoints were

then compared to the typical response range established by the mean \pm 2 SD of the point estimates generated by the 20 most-recent previous reference toxicant tests performed by this lab.

4. RESULTS OF THE AMBIENT WATER TOXICITY EVALUATIONS

4.1 Effects of Calleguas Creek Ambient Water on *Ceriodaphnia dubia*

The results of the ambient water tests with *C. dubia* are summarized below in Tables 3 through 7. There were no significant reductions in survival or reproduction in the Calleguas Creek ambient water samples tested with this species.

The test data and summary of statistical analyses for these tests, excluding statistical outliers where appropriate, are presented in Appendix B; the summary of statistical analyses for these tests, including statistical outliers, is presented in Appendix C.

Table 3. Effects of Ambient Water 68-UNIV-029 on <i>Ceriodaphnia dubia</i> .		
Ambient Water Treatment	% Survival	Reproduction (# neonates /female)
Lab Water Control	100	31.6 ^b
6.25%	90	17.9 ^c
12.5%	100	26.7
25%	90	21.2
50%	100	30.2
100%	100	30.9
Summary of Statistics		
No Observable Effect Concentration (NOEC) =	100% ambient water	100% ambient water
TUc (where TUc = 100/NOEC) =	1	1
Survival EC25 or Reproduction IC25 =	>100% ambient water ^a	>100% ambient water
Survival EC50 or Reproduction IC50 =	>100% ambient water ^a	>100% ambient water
TUc (where TUc = 100/EC50 or 100/IC50) =	<1	<1

a - Due to the absence of significant mortalities, the EC point estimates could not be calculated, but can be determined by inspection to be >100% ambient water.

b - The reproduction response for one of the replicates at this test treatment was determined to be a statistical outlier, and the results reported above are for the analysis of the test data excluding this outlier. As per EPA guidelines, the test data were analyzed both with and without the outlier, and the results of both sets of analyses are reported in the appendices.

c - There was an interrupted concentration-response with a statistically significant reduction in reproduction at this ambient water concentration. However, as there were no significant reductions in reproduction at the higher 12.5, 25, 50, and 100% concentrations, the reduction at this interim concentration is not considered toxicologically significant.

Table 4. Effects of Ambient Water 68-ADOLF-067 on <i>Ceriodaphnia dubia</i> .		
Ambient Water Treatment	% Survival	Reproduction
Lab Water Control	100	32.6
6.25%	100	32.3
12.5%	100	27.3
25%	100	25.5 ^b
50%	100	28.6 ^{b,c}
100%	100	32.2
Summary of Key Statistics		
No Observable Effect Concentration (NOEC) =	100% ambient water	100% ambient water
TUc (where TUc = 100/NOEC) =	1	1
Survival EC25 or Reproduction IC25 =	>100% ambient water ^a	>100% ambient water
Survival EC50 or Reproduction IC50 =	>100% ambient water ^a	>100% ambient water
TUc (where TUc = 100/EC50 or 100/IC50) =	<1	<1

- a - Due to the absence of significant mortalities, the EC point estimates could not be calculated, but can be determined by inspection to be >100% ambient water.
- b - There was an interrupted concentration-response with a statistically significant reduction in reproduction at this ambient water concentration. However, as there was no significant reduction in reproduction at the higher 100% concentration, the reduction at this interim concentration is not considered toxicologically significant.
- c - The reproduction response for one of the replicates at this test treatment was determined to be a statistical outlier, and the results reported above are for the analysis of the test data excluding this outlier. As per EPA guidelines, the test data were analyzed both with and without the outlier, and the results of both sets of analyses are reported in the appendices.

Table 5. Effects of Ambient Water 68-HITCH-158 on <i>Ceriodaphnia dubia</i> .		
Ambient Water Treatment	% Survival	Reproduction
Lab Water Control	90	28.0
6.25%	100	22.2
12.5%	100	23.8
25%	100	13.8 ^b
50%	100	14.6 ^b
100%	100	19.9
Summary of Key Statistics		
No Observable Effect Concentration (NOEC) =	100% ambient water	100% ambient water
TUc (where TUc = 100/NOEC) =	1	1
Survival EC25 or Reproduction IC25 =	>100% ambient water ^a	16.1% ambient water
Survival EC50 or Reproduction IC50 =	>100% ambient water ^a	>100% ambient water
TUc (where TUc = 100/EC50 or 100/IC50) =	<1	<1

- a - Due to the absence of significant mortalities, the EC point estimates could not be calculated, but can be determined by inspection to be >100% ambient water.
- b - There was an interrupted concentration-response with a statistically significant reduction in reproduction at this ambient water concentration. However, as there was no significant reduction in reproduction at the higher 100% concentration, the reduction at this interim concentration is not considered toxicologically significant.

Table 6. Effects of Ambient Water 68-GATE-219 on <i>Ceriodaphnia dubia</i> .		
Ambient Water Treatment	% Survival	Reproduction
Lab Water Control	100	27.9
6.25%	100	15.9 ^b
12.5%	100	19.5 ^b
25%	100	14.4 ^b
50%	100	19.1 ^b
100%	100	28.4
Summary of Key Statistics		
No Observable Effect Concentration (NOEC) =	100% ambient water	100% ambient water
TUc (where TUc = 100/NOEC) =	1	1
Survival EC25 or Reproduction IC25 =	>100% ambient water ^a	5.17% ambient water
Survival EC50 or Reproduction IC50 =	>100% ambient water ^a	>100% ambient water
TUc (where TUc = 100/EC50 or 100/IC50) =	<1	<1

a - Due to the absence of significant mortalities, the EC point estimates could not be calculated, but can be determined by inspection to be >100% ambient water.

b - There was an interrupted concentration-response with a statistically significant reduction in reproduction at this ambient water concentration. However, as there was no significant reduction in reproduction at the higher 100% concentration, the reduction at this interim concentration is not considered toxicologically significant.

Table 7. Effects of Ambient Water 68-BELT-222 on <i>Ceriodaphnia dubia</i> .		
Ambient Water Treatment	Mean % Survival	Mean Reproduction
Lab Water Control	100	20.5
6.25%	100	18.2
12.5%	100	20.6
25%	100	20.6
50%	100	29.6
100%	80	24.9
Summary of Key Statistics		
No Observable Effect Concentration (NOEC) =	100% ambient water	100% ambient water
TUc (where TUc = 100/NOEC) =	1	1
Survival EC25 or Reproduction IC25 =	>100% ambient water ^a	>100% ambient water
Survival EC50 or Reproduction IC50 =	>100% ambient water ^a	>100% ambient water
TUc (where TUc = 100/EC50 or 100/IC50) =	<1	<1

a - Due to the absence of significant mortalities, the EC point estimates could not be calculated, but can be determined by inspection to be >100% ambient water.

4.1.2 Reference Toxicant Toxicity to *Ceriodaphnia dubia*

The results of this test are summarized in Table 8. The EC₅₀ and IC₅₀ for these tests were both consistent with the typical response ranges established by the reference toxicant test database for this species, thus providing further evidence that the organisms used for ambient water testing were responding to toxic stress in a typical and consistent fashion. The test data and summary of statistical analyses for this test are presented in Appendix D.

NaCl Treatment (mg/L)	Mean % Survival	Mean Reproduction (# neonates/female)
Lab Water Control	100	34.3
500	100	32.4
1000	100	26.6*
1500	100	20.2*
2000	60	2.3*
2500	0*	-
Summary of Statistics		
Survival EC ₅₀ or Reproduction IC ₅₀ =	2020 mg/L NaCl	1590 mg/L NaCl
Typical Response Range (mean ± 2 SD)	1751-2303 mg/L NaCl	1198-1787 mg/L NaCl

* The response at this test treatment was significantly less than the Lab Control treatment response at p<0.05

4.2 Effects of Calleguas Creek Ambient Water on *Hyalella azteca*

The results of this test are summarized below in Table 9. The 68-WOOD-119 ambient water sample was the only sample tested with this species; there were no significant reductions in survival in this sample. The test data and summary of statistical analyses for this test are presented in Appendix E.

Table 9. Effects of Ambient Water 68-WOOD-119 on <i>Hyalella azteca</i> Survival.	
Ambient Water Treatment	10-Day Mean % Survival
Lab Control	100
6.25%	96.7
12.5%	98.0
25%	98.0
50%	92.0
100%	90.0
Culture Control	100
Summary of Key Statistics	
No Observable Effect Concentration (NOEC) =	100% ambient water
TUc (where TUc = 100/NOEC) =	1
Survival EC25 =	>100% ambient water ^a
Survival EC50 =	>100% ambient water ^a
TUc (where TUc = 100/EC50) =	<1

a - Due to the absence of significant mortalities, the EC point estimates could not be calculated, but can be determined by inspection to be >100% ambient water.

4.2.1 Reference Toxicant Toxicity to *Hyaella azteca*

The results of this test are summarized below in Table 10. The LC₅₀ for this test was consistent with the typical response range established by the reference toxicant test database for this species, thus providing further evidence that the organisms used for ambient water testing were responding to toxic stress in a typical and consistent fashion. The test data and summary of statistical analyses for this test are presented in Appendix F.

Table 10. Reference Toxicant Testing: Effects of KCl on <i>Hyaella azteca</i> .	
KCl Treatment (g/L)	Mean % Survival
Lab Control	100
0.1	100
0.2	100
0.4	40*
0.8	0*
1.6	0*
Summary of Statistics	
Survival LC ₅₀ =	0.37 g/L KCl
Typical Response Range (mean ± 2 SD)	0.29 – 0.55 g/L KCl

* - The response at this test treatment was significantly less than the Lab Control treatment response at $p < 0.05$.

5. SUMMARY AND CONCLUSIONS

Effects of Calleguas Creek Ambient Waters on *Ceriodaphnia dubia*

There were no significant reductions in survival or reproduction in the Calleguas Creek ambient water samples tested with this species.

Effects of Calleguas Creek Ambient Waters on *Hyalella azteca*

The 68-WOOD-119 ambient water was the only sample tested with this species; there were no significant reductions in survival in this sample.

Toxicity Summary for Calleguas Creek: Event 63 Ambient Waters.			
Sample Station ID	Toxicity relative to the Lab Control treatment?		
	<i>Ceriodaphnia dubia</i>		<i>Hyalella azteca</i>
	Survival	Reproduction	Survival
68-UNIV-029	no	no	testing with this species was not performed
68-ADOLF-067	no	no	testing with this species was not performed
68-HITCH-158	no	no	testing with this species was not performed
68-GATE-219	no	no	testing with this species was not performed
68-BELT-222	no	no	testing with this species was not performed
68-WOOD-119	testing with this species was not performed		no

5.1 QA/QC Summary

Test Conditions – All test conditions (pH, D.O., temperature, etc.) were all within acceptable limits during testing. All test analyses were performed according to laboratory Standard Operating Procedures.

Negative Control – The biological responses for the test organisms in the Lab Control treatments were within acceptable limits.

Positive Control – All reference toxicant test results were consistent with the “typical response” ranges established by the reference toxicant test database, indicating that these test organisms were responding to toxic stress in a typical fashion.

Concentration Response Relationships – The concentration-response relationships for these tests were evaluated as per EPA guidelines (EPA-821-B-00-004), and were determined to be acceptable.

Appendix A

Chain-of-Custody Record for the Collection and Delivery of the Calleguas Creek Ambient Water Samples

Appendix B

Test Data and Summary of Statistics for the Evaluation of the Chronic Toxicity of the Calleguas Creek Ambient Waters to *Ceriodaphnia dubia*: Data Analyses Excluding Statistical Outliers

CETIS Summary Report

Report Date: 21 Aug-18 10:50 (p 1 of 2)
 Test Code: 79258 | 17-8303-4899

Ceriodaphnia Survival and Reproduction Test **Pacific EcoRisk**

Batch ID: 20-4812-1806	Test Type: Reproduction-Survival (7d)	Analyst: Jessica Okutsu
Start Date: 09 Aug-18 16:25	Protocol: EPA-821-R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 15 Aug-18 14:38	Species: Ceriodaphnia dubia	Brine: Not Applicable
Duration: 5d 22h	Source: In-House Culture	Age: 1

Sample ID: 11-5389-0433	Code: 38-UNIV-029	Client: Larry Walker Associates
Sample Date: 08 Aug-18 08:30	Material: Ambient Water	Project: 29192
Receipt Date: 09 Aug-18 07:30	Source: Calleguas Creek	
Sample Age: 32h (0.7 °C)	Station: UNIV	

Comments:
 Stats excluding reproductive outlier Lab Water Control - replicate A.

Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	NOEL	LOEL	TOEL	TU	PMSD ✓
09-3122-8277	Reproduction	Wilcoxon/Bonferroni Adj Test	100	> 100	n/a	1	27.3%
09-4037-0861	Survival	Fisher Exact/Bonferroni-Holm Test	100	> 100	n/a	1	n/a

Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	Level	%	95% LCL	95% UCL	TU	✓
16-0388-5191	Reproduction	Linear Interpolation (ICPIN)	IC5	1.6	1.12	3.11	62.63	
			IC10	3.19	2.23	6.21	31.31	
			IC15	4.79	3.35	n/a	20.88	
			IC20	>100	n/a	n/a	<1	
			IC25	>100	n/a	n/a	<1	
			IC40	>100	n/a	n/a	<1	
			IC50	>100	n/a	n/a	<1	

Reproduction Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	9	31.6	29.4	33.7	27	36	0.93	2.79	8.84%	0.00%
6.25		10	17.9	10	25.8	0	36	3.49	11	61.68%	43.27%
12.5		10	26.7	21	32.4	14	35	2.53	8	29.97%	15.39%
25		10	21.2	13.3	29.1	0	35	3.5	11.1	52.19%	32.82%
50		10	30.2	27.6	32.8	24	37	1.14	3.61	11.97%	4.30%
100		10	30.9	26.9	34.9	19	36	1.78	5.63	18.21%	2.08%

Survival Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
6.25		10	0.900	0.674	1.000	0.000	1.000	0.100	0.316	35.14%	10.00%
12.5		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
25		10	0.900	0.674	1.000	0.000	1.000	0.100	0.316	35.14%	10.00%
50		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
100		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%

CETIS Summary Report

Report Date:

21 Aug-18 10:50 (p 2 of 2)

Test Code:

79258 | 17-8303-4899

Ceriodaphnia Survival and Reproduction Test											Pacific EcoRisk
Reproduction Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW		27	33	31	36	34	31	28	32	32
6.25		29	12	0	36	12	31	11	15	13	20
12.5		32	32	16	35	14	35	28	29	29	17
25		26	19	16	0	30	35	29	13	12	32
50		30	31	37	28	30	32	34	24	28	28
100		35	35	35	36	19	28	32	34	24	31
Survival Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
6.25		1.000	1.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
12.5		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
25		1.000	1.000	1.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000
50		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
100		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Survival Binomials											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
6.25		1/1	1/1	0/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
12.5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
25		1/1	1/1	1/1	0/1	1/1	1/1	1/1	1/1	1/1	1/1
50		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
100		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1

CETIS Analytical Report

Report Date: 21 Aug-18 10:03 (p 1 of 1)
 Test Code: 79258 | 17-8303-4899

Ceriodaphnia Survival and Reproduction Test Pacific EcoRisk

Analysis ID: 09-4037-0861 Endpoint: Survival CETIS Version: CETISv1.9.2
 Analyzed: 21 Aug-18 10:01 Analysis: STP 2xK Contingency Tables Official Results: Yes

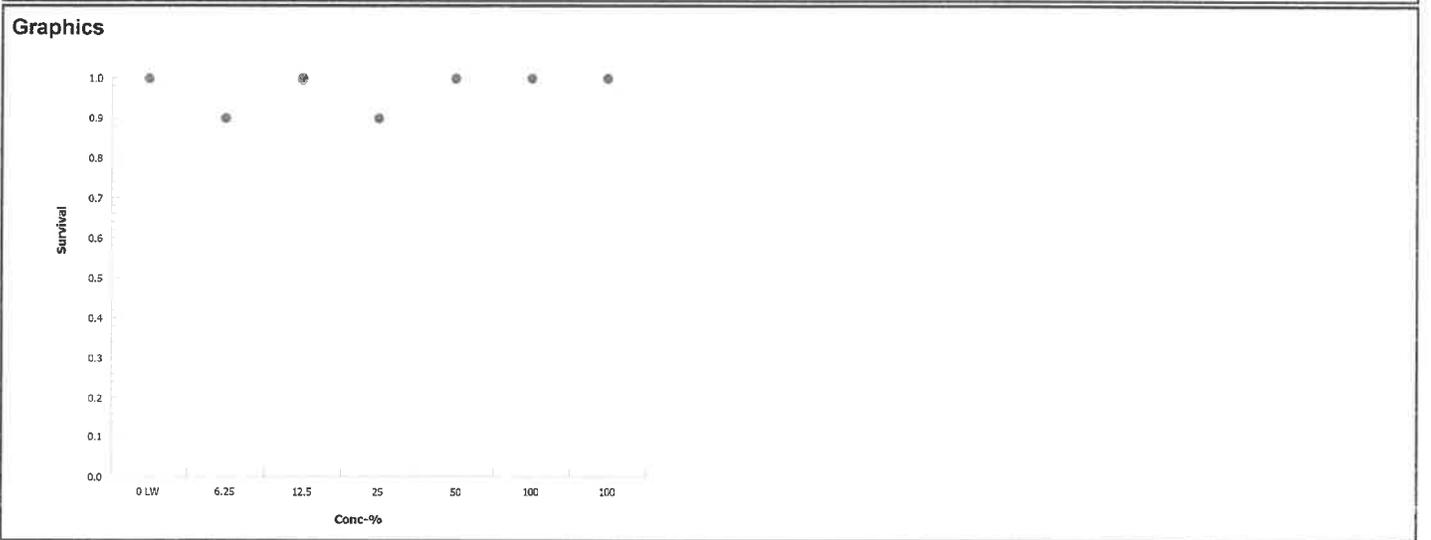
Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU
Untransformed	C > T	100	> 100	n/a	1

Fisher Exact/Bonferroni-Holm Test

Control	vs	Group	Test Stat	P-Type	P-Value	Decision(α:5%)
Lab Water Contr		6.25	0.500	Exact	1.0000	Non-Significant Effect
		12.5	1.000	Exact	1.0000	Non-Significant Effect
		25	0.500	Exact	1.0000	Non-Significant Effect
		50	1.000	Exact	1.0000	Non-Significant Effect
		100	1.000	Exact	1.0000	Non-Significant Effect

Data Summary

Conc-%	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
0	LW	10	0	10	1	0	0.0%
6.25		9	1	10	0.9	0.1	10.0%
12.5		10	0	10	1	0	0.0%
25		9	1	10	0.9	0.1	10.0%
50		10	0	10	1	0	0.0%
100		10	0	10	1	0	0.0%



CETIS Analytical Report

Report Date: 21 Aug-18 10:03 (p 1 of 1)
 Test Code: 79258 | 17-8303-4899

Ceriodaphnia Survival and Reproduction Test **Pacific EcoRisk**

Analysis ID: 09-3122-8277 Endpoint: Reproduction CETIS Version: CETISv1.9.2
 Analyzed: 21 Aug-18 10:01 Analysis: Nonparametric-Multiple Comparison Official Results: Yes

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	C > T	100	> 100	n/a	1	27.31%

Wilcoxon/Bonferroni Adj Test

Control	vs	Control II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Lab Water Contr		6.25*	68.5	n/a	2	17	Exact	0.0202	Significant Effect
		12.5	86.5	n/a	2	17	Exact	0.7091	Non-Significant Effect
		25	72	n/a	1	17	Exact	0.0510	Non-Significant Effect
		50	88	n/a	4	17	Exact	0.8652	Non-Significant Effect
		100	104	n/a	5	17	Exact	1.0000	Non-Significant Effect

ANOVA Table

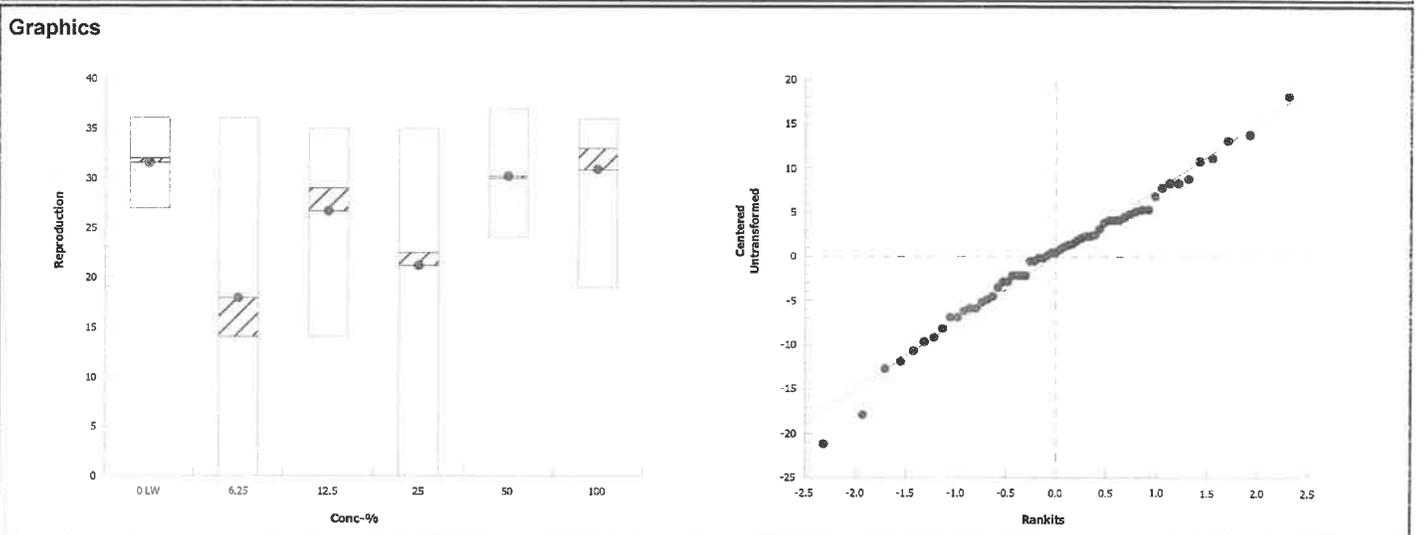
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	1579.56	315.912	5	5.17	6.2E-04	Significant Effect
Error	3239.32	61.1193	53			
Total	4818.88		58			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	22.4	15.1	4.3E-04	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.988	0.945	0.8289	Normal Distribution

Reproduction Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	LW	9	31.6	29.4	33.7	32	27	36	0.93	8.84%	0.00%
6.25		10	17.9	10	25.8	14	0	36	3.49	61.68%	43.27%
12.5		10	26.7	21	32.4	29	14	35	2.53	29.97%	15.39%
25		10	21.2	13.3	29.1	22.5	0	35	3.5	52.19%	32.82%
50		10	30.2	27.6	32.8	30	24	37	1.14	11.97%	4.30%
100		10	30.9	26.9	34.9	33	19	36	1.78	18.21%	2.08%



CETIS Analytical Report

Report Date: 21 Aug-18 10:03 (p 1 of 1)
Test Code: 79258 | 17-8303-4899

Ceriodaphnia Survival and Reproduction Test **Pacific EcoRisk**

Analysis ID: 16-0388-5191 **Endpoint:** Reproduction **CETIS Version:** CETISv1.9.2
Analyzed: 21 Aug-18 10:02 **Analysis:** Linear Interpolation (ICPIN) **Official Results:** Yes

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	593427	200	Yes	Two-Point Interpolation

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	1.6	1.12	3.11	62.63	32.2	89.6
IC10	3.19	2.23	6.21	31.31	16.1	44.8
IC15	4.79	3.35	n/a	20.88	n/a	29.87
IC20	>100	n/a	n/a	<1	n/a	n/a
IC25	>100	n/a	n/a	<1	n/a	n/a
IC40	>100	n/a	n/a	<1	n/a	n/a
IC50	>100	n/a	n/a	<1	n/a	n/a

Reproduction Summary **Calculated Variate**

Conc-%	Code	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	9	31.6	27	36	0.93	2.79	8.84%	0.0%
6.25		10	17.9	0	36	3.49	11	61.70%	43.3%
12.5		10	26.7	14	35	2.53	8	30.00%	15.4%
25		10	21.2	0	35	3.5	11.1	52.20%	32.8%
50		10	30.2	24	37	1.14	3.61	12.00%	4.3%
100		10	30.9	19	36	1.78	5.63	18.20%	2.08%

Graphics



Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: LWA - Calleguas Creek Material: CCTMP-68-UNIV-029 Test Date: 8/9/18
 Project #: 29192 Test ID: 79258 Randomization: 10.7.3 Control Water: Mod EPAMH

	Day	pH		D.O.		Cond. (µS/cm)	Temp (°C)	Survival / Reproduction										SIGN-OFF				
		New	Old	New	Old			A	B	C	D	E	F	G	H	I	J	Date:	New WQ:	Test Init.:		
Lab Water Control	0	7.99		7.2		351	24.5	0	0	0	0	0	0	0	0	0	0	0	0	0	Date: <u>8/9/18</u> New WQ: <u>TF</u> Test Init.: <u>26</u>	Sol'n Prep: <u>TF</u> Time: <u>1615</u>
	1	7.98	7.72	8.1	6.6	353	24.3	0	0	0	0	0	0	0	0	0	0	0	0	0	Date: <u>8/10/18</u> New WQ: <u>TA</u> Counts: <u>26</u>	Sol'n Prep: <u>APF</u> Old WQ: <u>SB</u> Time: <u>1001</u>
	2	7.88	7.13	7.7	8.1	354	26.0	0	0	0	0	0	0	0	0	0	0	0	0	0	Date: <u>8/11/18</u> New WQ: <u>NB</u> Counts: <u>00</u>	Sol'n Prep: <u>SMC</u> Old WQ: <u>RAP</u> Time: <u>1217</u>
	3	7.91	7.87	7.9	8.0	355	24.7	0	0	0	0	0	0	0	0	0	0	0	0	0	Date: <u>8/12/18</u> New WQ: <u>RR</u> Counts: <u>00</u>	Sol'n Prep: <u>ERL</u> Old WQ: <u>MAL</u> Time: <u>1354</u>
	4	7.99	7.77	7.4	6.5	350	24.8	4	7	6	7	6	7	7	5	5	6				Date: <u>8/13/18</u> New WQ: <u>DM</u> Counts: <u>26</u>	Sol'n Prep: <u>B1</u> Old WQ: <u>RR</u> Time: <u>1313</u>
	5	7.82	7.81	8.9	7.9	357	24.0	9	8	12	9	12	10	9	10	9	11				Date: <u>8/14/18</u> New WQ: <u>TA</u> Counts: <u>26</u>	Sol'n Prep: <u>B1</u> Old WQ: <u>TA</u> Time: <u>1349</u>
	6	-	7.85	-	5.0	383	24.1	0	12	15	15	17	15	13	18	15					Date: <u>8/15/18</u> New WQ: <u>TA</u> Counts: <u>26</u>	Sol'n Prep: <u>-</u> Old WQ: <u>TA</u> Time: <u>1438</u>
	7									15		18	17									Date: <u>8/15/18</u> New WQ: <u>TA</u> Counts: <u>26</u>
8																					Date: <u>8/15/18</u> New WQ: <u>TA</u> Counts: <u>26</u>	Sol'n Prep: <u>-</u> Old WQ: <u>TA</u> Time: <u>1438</u>
Total=							13	27	33	31	36	34	31	28	32	32	Mean Neonates/Female = 29.7					
	Day	pH		D.O.		Cond. (µS/cm)	Temp (°C)	Survival / Reproduction										Sample ID				
		New	Old	New	Old			A	B	C	D	E	F	G	H	I	J					
6.25%	0	7.96		7.3		446	24.4	0	0	0	0	0	0	0	0	0	0	0	0	0	50513	
	1	8.03	7.87	8.1	7.5	447	24.5	0	0	0	0	0	0	0	0	0	0	0	0	0	50513	
	2	7.93	8.02	7.8	8.1	444	25.3	0	0	0	0	0	0	0	0	0	0	0	0	0	50513	
	3	7.92	7.92	8.1	7.8	441	24.2	0	0	%	0	0	0	0	0	0	0	0	0	0	50513	
	4	8.00	7.88	7.6	7.2	439	25.9	3	4	-	8	4	6	3	6	4	7				50513	
	5	7.86	7.93	9.0	7.9	453	24.4	11	0	-	12	8	11	8	9	9	13				50513	
	6	-	7.81	-	6.0	482	24.6	15	8	-	16	0	14	0	0	0	0				-	
	7																					
8																						
Total=							29	12	%	36	12	31	11	15	13	20	Mean Neonates/Female = 17.9					

Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: LWA - Calleguas Creek Material: CCTMP-68-UNIV-029 Test Date: 8/19/18
 Project #: 29192 Test ID: 79258 Control Water: Mod EPAMH

Day	pH		D.O.		Cond. (µS/cm)	Temp (°C)	Survival / Reproduction										SIGN-OFF		
	New	Old	New	Old			A	B	C	D	E	F	G	H	I	J			
12.5%	0	7.96		7.5		539	24.3	0	0	0	0	0	0	0	0	0	0	0	
	1	8.06	7.88	8.2	7.4	543	24.7	0	0	0	0	0	0	0	0	0	0	0	
	2	7.97	8.05	7.9	8.1	533	25.4	0	0	0	0	0	0	0	0	0	0	0	
	3	7.96	7.96	8.1	7.8	543	25.3	0	0	0	0	0	0	0	0	0	0	0	
	4	8.04	7.88	7.8	7.2	531	25.9	5	7	5	6	4	7	2	5	4	6		
	5	7.89	7.97	9.0	7.8	544	25.0	12	11	11	9	10	11	11	10	10	11		
	6	-	7.87	-	5.7	580	24.7	15	14	0	20	0	17	15	14	15	0		
	8																		
Total=							32	32	16	35	14	35	28	29	29	17	Mean Neonates/Female = 26.7		
Day	pH		D.O.		Cond. (µS/cm)	Temp (°C)	Survival / Reproduction										SIGN-OFF		
	New	Old	New	Old			A	B	C	D	E	F	G	H	I	J			
25%	0	7.95		7.5		704	24.3	0	0	0	0	0	0	0	0	0	0	0	
	1	8.08	8.01	8.1	7.6	704	24.8	0	0	0	4/0	0	0	0	0	0	0	0	
	2	7.99	8.16	7.9	8.1	697	25.5	0	0	0	-	0	0	0	0	0	0	0	
	3	8.00	8.06	7.7	7.9	710	25.3	0	0	0	-	0	0	0	0	0	0	0	
	4	8.08	8.00	7.7	7.7	707	25.8	6	7	0	-	4	6	5	4	3	4		
	5	7.94	8.00	9.0	7.4	703	25.4	8	12	0	-	9	9	9	9	9	10		
	6	-	7.90	-	6.0	769	24.1	12	0	16	-	17	20	15	0	0	18		
	8																		
Total=							26	19	16	4/0	30	35	29	13	12	32	Mean Neonates/Female = 21.2		

Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: LWA - Calleguas Creek Material: CCTMP-68-UNIV-029 Test Date: 8/9/18
 Project #: 29192 Test ID: 79258 Control Water: Mod EPAMH

Day	pH		D.O.		Cond. (µS/cm)	Temp (°C)	Survival / Reproduction										SIGN-OFF
	New	Old	New	Old			A	B	C	D	E	F	G	H	I	J	
0	7.90		7.5		1050	24.3	0	0	0	0	0	0	0	0	0	0	
1	8.08	8.11	8.2	7.7	1050	24.9	0	0	0	0	0	0	0	0	0	0	
2	7.99	8.29	8.1	8.0	1035	25.9	0	0	0	0	0	0	0	0	0	0	
3	8.03	8.2	8.0	7.9	1057	25.4	0	0	0	0	0	0	0	0	0	0	
4	8.08	8.21	7.7	7.9	1048	26.0	6	5	6	4	5	5	4	4	4	4	
5	7.96	8.21	9.0	7.9	1050	25.5	10	11	10	9	10	10	12	8	8	9	
6	—	8.11	—	6.8	1106	24.3	14	15	21	15	15	17	18	12	16	15	
7																	
8																	
Total=							30	31	37	28	30	32	34	24	28	28	Mean Neonates/Female = 30.2
Day	pH		D.O.		Cond. (µS/cm)	Temp (°C)	Survival / Reproduction										SIGN-OFF
	New	Old	New	Old			A	B	C	D	E	F	G	H	I	J	
0	7.83		7.3		1711	24.3	0	0	0	0	0	0	0	0	0	0	
1	8.08	8.27	8.3	7.1	1723	24.9	0	0	0	0	0	0	0	0	0	0	
2	7.97	8.47	8.2	8.0	1703	25.7	0	0	0	0	0	0	0	0	0	0	
3	8.03	8.39	8.6	7.7	1715	25.3	0	0	0	0	0	0	0	0	0	0	
4	8.08	8.38	7.9	7.8	1698	25.9	6	7	7	7	6	7	6	5	0	3	
5	7.97	8.42	8.9	7.7	1718	25.6	11	10	12	13	6	8	10	13	8	9	
6	—	8.30	—	7.5	1803	25.1	16	18	16	16	12	13	16	16	16	19	
7																	
8																	
Total=							35	35	35	36	19	28	32	34	24	31	Mean Neonates/Female = 22.5 30.9

30.9^{R6} 8/25/18

CETIS Summary Report

Report Date: 25 Aug-18 09:14 (p 1 of 2)
Test Code: 79259 | 16-3645-9239

Ceriodaphnia Survival and Reproduction Test **Pacific EcoRisk**

Batch ID: 09-8772-2331	Test Type: Reproduction-Survival (7d)	Analyst: Jessica Okutsu
Start Date: 09 Aug-18 15:50	Protocol: EPA-821-R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 15 Aug-18 16:05	Species: Ceriodaphnia dubia	Brine: Not Applicable
Duration: 6d 0h	Source: In-House Culture	Age: 1

Sample ID: 21-0301-4145	Code: 38-ADOLF-067	Client: Larry Walker Associates
Sample Date: 08 Aug-18 09:20	Material: Ambient Water	Project: 29192
Receipt Date: 09 Aug-18 07:30	Source: Calleguas Creek	
Sample Age: 30h (0.6 °C)	Station: ADOLF	

Comments:
 Stats exclude reproduction outlier 50-B

Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	NOEL	LOEL	TOEL	TU	PMSD ✓
10-6375-2121	Reproduction	Wilcoxon/Bonferroni Adj Test	100	> 100	n/a	1	17.1%
13-0532-4504	Survival	Fisher Exact/Bonferroni-Holm Test	100	> 100	n/a	1	n/a

Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	Level	%	95% LCL	95% UCL	TU	✓
12-5460-7299	Reproduction	Linear Interpolation (ICPIN)	IC5	8.38	3.2	11.5	11.94	
			IC10	11	6.59	n/a	9.107	
			IC15	>100	n/a	n/a	<1	
			IC20	>100	n/a	n/a	<1	
			IC25	>100	n/a	n/a	<1	
			IC40	>100	n/a	n/a	<1	
			IC50	>100	n/a	n/a	<1	

Reproduction Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	10	32.6	30.7	34.5	29	36	0.846	2.67	8.21%	0.00%
6.25		10	32.3	28.8	35.8	22	39	1.56	4.95	15.31%	0.92%
12.5		10	27.3	22.1	32.5	15	34	2.31	7.3	26.75%	16.26%
25		10	25.5	20.5	30.5	16	36	2.23	7.04	27.62%	21.78%
50		9	28.6	26.8	30.3	25	32	0.766	2.3	8.05%	12.41%
100		10	32.2	29.1	35.3	25	39	1.39	4.39	13.64%	1.23%

Survival Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
6.25		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
12.5		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
25		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
50		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
100		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%

CETIS Summary Report

Report Date: 25 Aug-18 09:14 (p 2 of 2)
 Test Code: 79259 | 16-3645-9239

Ceriodaphnia Survival and Reproduction Test											Pacific EcoRisk
Reproduction Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	34	36	30	34	30	31	35	31	29	36
6.25		38	31	34	39	34	28	22	31	31	35
12.5		27	15	33	30	34	21	32	32	16	33
25		30	28	30	29	36	28	26	16	16	16
50		28		29	32	29	25	25	30	30	29
100		25	33	33	25	35	32	39	32	32	36
Survival Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
6.25		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
12.5		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
25		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
50		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
100		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Survival Binomials											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
6.25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
12.5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
50		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
100		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1

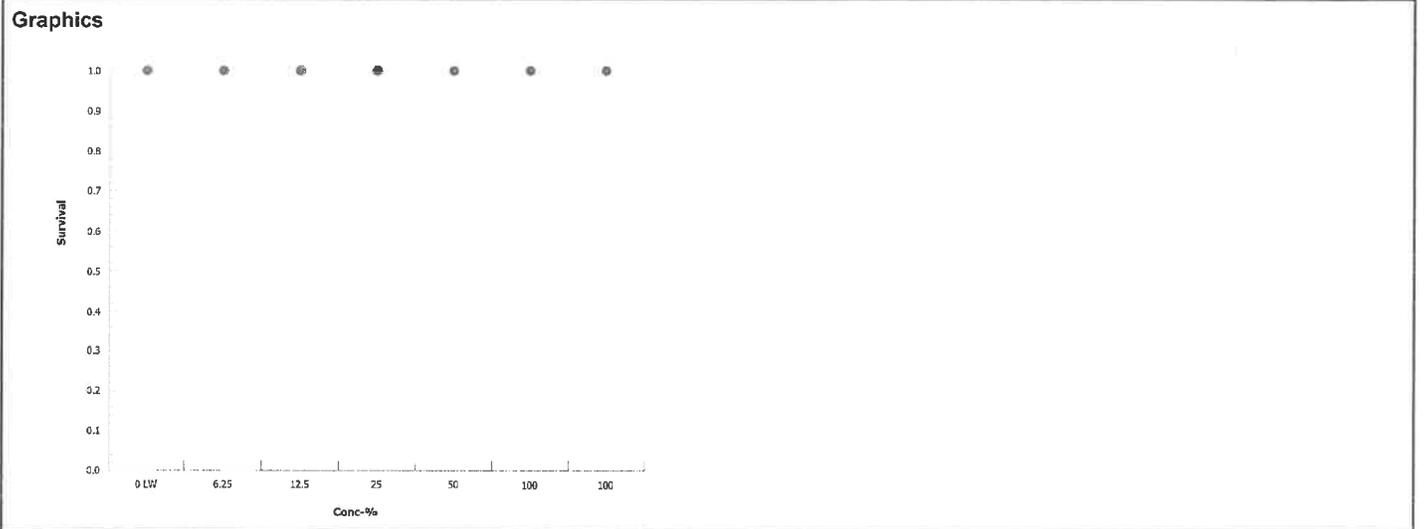
CETIS Analytical Report

Report Date: 25 Aug-18 09:14 (p 1 of 1)
 Test Code: 79259 | 16-3645-9239

Ceriodaphnia Survival and Reproduction Test				Pacific EcoRisk	
Analysis ID: 13-0532-4504	Endpoint: Survival	CETIS Version: CETISv1.9.2		Official Results: Yes	
Analyzed: 21 Aug-18 10:45	Analysis: STP 2xK Contingency Tables				
Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU
Untransformed	C > T	100	> 100	n/a	1

Fisher Exact/Bonferroni-Holm Test						
Control	vs	Group	Test Stat	P-Type	P-Value	Decision(α:5%)
Lab Water Contr		6.25	1.000	Exact	1.0000	Non-Significant Effect
		12.5	1.000	Exact	1.0000	Non-Significant Effect
		25	1.000	Exact	1.0000	Non-Significant Effect
		50	1.000	Exact	1.0000	Non-Significant Effect
		100	1.000	Exact	1.0000	Non-Significant Effect

Data Summary							
Conc-%	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
0	LW	10	0	10	1	0	0.0%
6.25		10	0	10	1	0	0.0%
12.5		10	0	10	1	0	0.0%
25		10	0	10	1	0	0.0%
50		10	0	10	1	0	0.0%
100		10	0	10	1	0	0.0%



CETIS Analytical Report

Report Date: 25 Aug-18 09:13 (p 1 of 1)
 Test Code: 79259 | 16-3645-9239

Ceriodaphnia Survival and Reproduction Test **Pacific EcoRisk**

Analysis ID: 10-6375-2121 Endpoint: Reproduction CETIS Version: CETISv1.9.2
 Analyzed: 25 Aug-18 9:13 Analysis: Nonparametric-Multiple Comparison Official Results: Yes

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	C > T	100	> 100	n/a	1	17.07%

Wilcoxon/Bonferroni Adj Test

Control	vs	Conc-%	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Lab Water Contr		6.25	106	n/a	3	18	Exact	1.0000	Non-Significant Effect
		12.5	83	n/a	2	18	Exact	0.2494	Non-Significant Effect
		25*	68.5	n/a	4	18	Exact	0.0112	Significant Effect
		50*	55.5	n/a	2	17	Exact	0.0073	Significant Effect
		100	106	n/a	3	18	Exact	1.0000	Non-Significant Effect

ANOVA Table

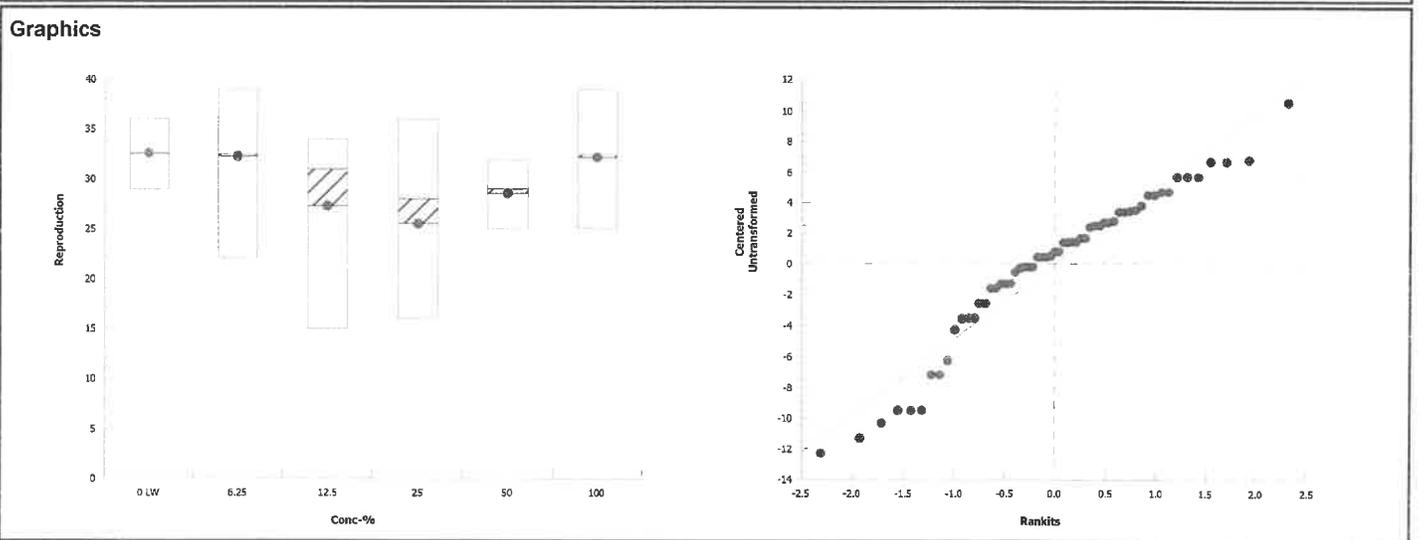
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	459.756	91.9511	5	3.42	0.0095	Significant Effect
Error	1426.92	26.9231	53			
Total	1886.68		58			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	16.4	15.1	0.0057	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.947	0.945	0.0118	Normal Distribution

Reproduction Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	LW	10	32.6	30.7	34.5	32.5	29	36	0.846	8.21%	0.00%
6.25		10	32.3	28.8	35.8	32.5	22	39	1.56	15.31%	0.92%
12.5		10	27.3	22.1	32.5	31	15	34	2.31	26.75%	16.26%
25		10	25.5	20.5	30.5	28	16	36	2.23	27.62%	21.78%
50		9	28.6	26.8	30.3	29	25	32	0.766	8.05%	12.41%
100		10	32.2	29.1	35.3	32.5	25	39	1.39	13.64%	1.23%



CETIS Analytical Report

Report Date: 25 Aug-18 09:13 (p 1 of 1)
 Test Code: 79259 | 16-3645-9239

Ceriodaphnia Survival and Reproduction Test **Pacific EcoRisk**

Analysis ID: 12-5460-7299 Endpoint: Reproduction CETIS Version: CETISv1.9.2
 Analyzed: 25 Aug-18 9:13 Analysis: Linear Interpolation (ICPIN) Official Results: Yes

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	758208	200	Yes	Two-Point Interpolation

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	8.38	3.2	11.5	11.94	8.709	31.22
IC10	11	6.59	n/a	9.107	n/a	15.17
IC15	>100	n/a	n/a	<1	n/a	n/a
IC20	>100	n/a	n/a	<1	n/a	n/a
IC25	>100	n/a	n/a	<1	n/a	n/a
IC40	>100	n/a	n/a	<1	n/a	n/a
IC50	>100	n/a	n/a	<1	n/a	n/a

Reproduction Summary **Calculated Variate**

Conc-%	Code	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	10	32.6	29	36	0.846	2.67	8.21%	0.0%
6.25		10	32.3	22	39	1.56	4.95	15.30%	0.92%
12.5		10	27.3	15	34	2.31	7.3	26.80%	16.3%
25		10	25.5	16	36	2.23	7.04	27.60%	21.8%
50		9	28.6	25	32	0.766	2.3	8.05%	12.4%
100		10	32.2	25	39	1.39	4.39	13.60%	1.23%

Graphics



Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: LWA - Calleguas Creek Material: CCTMP-68-ADOLF-067 Test Date: 8/9/12
 Project #: 29192 Test ID: 79259 Randomization: 10.7.1 Control Water: Mod EPAMH

Day	pH		D.O.		Cond. (µS/cm)	Temp (°C)	Survival / Reproduction										SIGN-OFF	
	New	Old	New	Old			A	B	C	D	E	F	G	H	I	J		
0	7.92		7.4		349	25.0	0	0	0	0	0	0	0	0	0	0	0	Date: <u>8/11/12</u> New WQ: <u>TA</u> Test Init.: <u>02:55</u> Sol'n Prep: <u>SK TF</u> Time: <u>1:50</u>
1	8.15	7.72	8.2	6.8	355	26.0	0	0	0	0	0	0	0	0	0	0	0	Date: <u>8/11/12</u> New WQ: <u>TA</u> Counts: <u>15</u> Sol'n Prep: <u>TF</u> Old WQ: <u>AR</u> Time: <u>1:02</u>
2	7.85	7.95	8.1	8.2	350	24.6	0	0	0	0	0	0	0	0	0	0	0	Date: <u>8/11/12</u> New WQ: <u>UB</u> Counts: <u>00</u> Sol'n Prep: <u>SMC</u> Old WQ: <u>TA</u> Time: <u>1:40</u>
3	7.99	7.87	7.8	7.2	359	25.1	0	0	0	0	0	0	0	0	0	0	0	Date: <u>8/12/12</u> New WQ: <u>msu</u> Counts: <u>02</u> Sol'n Prep: <u>CR</u> Old WQ: <u>MYL</u> Time: <u>1:20</u>
4	7.86	7.90	7.6	7.7	352	25.2	5	8	6	6	6	7	4	3	7			Date: <u>8/13/12</u> New WQ: <u>SK</u> Counts: <u>02</u> Sol'n Prep: <u>SV</u> Old WQ: <u>KL</u> Time: <u>1:24</u>
5	7.83	7.65	9.0	7.2	350	24.7	11	12	12	13	12	11	12	12	13			Date: <u>8/14/12</u> New WQ: <u>TA</u> Counts: <u>15</u> Sol'n Prep: <u>SV</u> Old WQ: <u>AR</u> Time: <u>1:15</u>
6	-	7.81	-	6.6	374	24.8	18	16	12	15	12	14	16	15	14	16		Date: <u>8/15/12</u> New WQ: <u>-</u> Counts: <u>12</u> Sol'n Prep: <u>MB</u> Old WQ: <u>TA</u> Time: <u>1:05</u>
7																		Date: <u></u> New WQ: <u></u> Counts: <u></u> Sol'n Prep: <u></u> Old WQ: <u></u> Time: <u></u>
8																		Date: <u></u> Old WQ: <u></u> Counts: <u></u> Time: <u></u>
Total=							34	36	30	34	30	31	35	31	29	36		Mean Neonates/Female = <u>32.4</u>
Day	pH		D.O.		Cond. (µS/cm)	Temp (°C)	Survival / Reproduction										Sample ID	
	New	Old	New	Old			A	B	C	D	E	F	G	H	I	J		
0	7.94		7.7		399	25.1	0	0	0	0	0	0	0	0	0	0	0	50514
1	8.10	7.72	8.3	7.6	399	26.2	0	0	0	0	0	0	0	0	0	0	0	50514
2	7.89	8.03	8.0	8.3	402	24.9	0	0	0	0	0	0	0	0	0	0	0	50514
3	8.08	7.94	8.0	7.6	401	24.9	0	0	0	0	0	0	0	0	0	0	0	50514
4	7.88	8.00	7.7	8.0	396	25.3	6	6	5	7	6	0	2	5	5	4		50514
5	7.88	7.71	8.9	7.2	402	24.7	15	12	12	13	12	13	12	11	13			50514
6	-	7.84	-	7.1	419	24.8	17	13	17	19	16	15	11	14	15	18		50514
7																		
8																		
Total=							38	31	34	39	34	28	22	31	31	35		Mean Neonates/Female = <u>32.3</u>

Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: LWA - Calleguas Creek Material: CCTMP-68-ADOLF-067 Test Date: 8/9/18
 Project #: 29192 Test ID: 79259 Control Water: Mod EPAMH

Day	pH		D.O.		Cond. (µS/cm)	Temp (°C)	Survival / Reproduction										SIGN-OFF
	New	Old	New	Old			A	B	C	D	E	F	G	H	I	J	
0	7.95		7.9		445	24.9	0	0	0	0	0	0	0	0	0	0	
1	8.09	7.82	8.2	7.8	446	26.4	0	0	0	0	0	0	0	0	0	0	
2	7.93	8.06	8.0	8.3	444	24.8	0	0	0	0	0	0	0	0	0	0	
3	8.11	7.97	8.1	7.7	446	25.0	0	0	0	0	0	0	0	0	0	0	
4	7.91	7.95	7.7	8.1	445	25.3	5	5	6	7	5	0	6	6	4	5	
5	7.90	7.92	8.9	7.9	448	24.6	11	10	12	10	12	10	13	11	12	12	
6	—	7.86	—	7.0	476	25.0	11	0	15	13	17	11	13	15	0	16	
7																	
8																	
Total=							27	15	33	30	34	21	32	32	16	33	Mean Neonates/Female = 27.3
Day	pH		D.O.		Cond. (µS/cm)	Temp (°C)	Survival / Reproduction										SIGN-OFF
	New	Old	New	Old			A	B	C	D	E	F	G	H	I	J	
0	7.93		7.9		526	24.9	0	0	0	0	0	0	0	0	0	0	
1	8.08	7.87	8.3	8.3	524	26.2	0	0	0	0	0	0	0	0	0	0	
2	7.94	8.07	8.0	8.2	523	24.7	0	0	0	0	0	0	0	0	0	0	
3	8.11	8.03	8.3	7.8	533	25.0	0	0	0	0	0	0	0	0	0	0	
4	7.95	7.99	7.6	8.1	527	25.4	4	4	5	5	6	4	4	5	6	5	
5	7.93	7.92	9.1	7.9	534	24.3	9	8	10	10	13	11	9	11	10	11	
6	—	7.92	—	6.6	561	24.9	17	16	15	14	17	13	13	0	0	0	
7																	
8																	
Total=							30	28	30	29	36	28	26	16	16	16	Mean Neonates/Female = 25.5

Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: LWA - Calleguas Creek Material: CCTMP-68-ADOLF-067 Test Date: 8/9/12
 Project #: 29192 Test ID: 79259 Control Water: Mod EPAMH

Day	pH		D.O.		Cond. (µS/cm)	Temp (°C)	Survival / Reproduction										SIGN-OFF
	New	Old	New	Old			A	B	C	D	E	F	G	H	I	J	
0	7.90		8.1		700	25.0	0	0	0	0	0	0	0	0	0	0	
1	8.06	7.99	8.4	8.1	700	26.3	6	0	0	0	0	0	0	0	0	0	
2	7.92	8.18	8.4	8.1	703	24.7	0	0	0	0	0	0	0	0	0	0	
3	8.10	8.12	8.6	7.8	704	24.8	0	0	0	0	0	0	0	0	0	0	
4	7.98	8.01	7.7	8.1	700	25.3	5	4	5	6	6	1	4	4	5	5	
5	7.96	8.04	9.1	8.0	700	24.5	10	11	10	11	10	12	9	11	11	9	
6	—	8.02	—	7.3	731	24.8	13	0	14	15	13	12	12	15	14	15	
7																	
8																	
Total=							28	15	29	32	29	25	25	30	30	29	Mean Neonates/Female = 27.2
Day	pH		D.O.		Cond. (µS/cm)	Temp (°C)	Survival / Reproduction										SIGN-OFF
	New	Old	New	Old			A	B	C	D	E	F	G	H	I	J	
0	7.85		9.0		1039	25.0	0	0	0	0	0	0	0	0	0	0	
1	8.07	8.15	8.5	7.9	1040	26.3	0	0	0	0	0	0	0	0	0	0	
2	7.92	8.32	8.9	8.2	1033	24.7	0	0	0	0	0	0	0	0	0	0	
3	8.07	8.24	9.4	7.8	1039	24.7	0	0	0	0	0	0	0	0	0	0	
4	8.03	8.20	7.9	8.1	1036	24.8	4	6	6	6	7	6	6	6	4	7	
5	7.97	8.25	9.3	7.8	1037	24.8	9	12	11	4	12	13	13	11	14	11	
6	—	8.24	—	7.6	1087	24.9	12	15	16	15	15	13	20	15	14	18	
7							12/21/12	12/21/12	12/21/12	12	12/21/12	12/21/12	12/21/12				
8																	
Total=							25	33	33	25	35	32	39	32	32	30	Mean Neonates/Female = 32.2

CETIS Summary Report

Report Date: 21 Aug-18 11:08 (p 1 of 2)
 Test Code: 79262 | 17-8841-9933

Ceriodaphnia Survival and Reproduction Test **Pacific EcoRisk**

Batch ID: 07-3491-2627	Test Type: Reproduction-Survival (7d)	Analyst: Jessica Okutsu
Start Date: 09 Aug-18 15:20	Protocol: EPA-821-R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 15 Aug-18 15:35	Species: Ceriodaphnia dubia	Brine: Not Applicable
Duration: 6d 0h	Source: In-House Culture	Age: 1

Sample ID: 17-4346-4046	Code: 68-HITCH-158	Client: Larry Walker Associates
Sample Date: 08 Aug-18 17:45	Material: Ambient Water	Project: 29192
Receipt Date: 09 Aug-18 07:30	Source: Calleguas Creek	
Sample Age: 22h (3.8 °C)	Station: HITCH	

Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	NOEL	LOEL	TOEL	TU	PMSD ✓
14-9129-0722	Reproduction	Dunnett Multiple Comparison Test	100	> 100	n/a	1	34.4%
18-8759-6009	Survival	Fisher Exact/Bonferroni-Holm Test	100	> 100	n/a	1	n/a

Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	Level	%	95% LCL	95% UCL	TU	✓
12-5253-2436	Reproduction	Linear Interpolation (ICPIN)	IC5	1.75	0.967	14.9	57.14	
			IC10	3.5	1.93	17.5	28.57	
			IC15	5.25	2.9	20.2	19.05	
			IC20	13.6	3.87	22.9	7.36	
			IC25	16.1	4.83	n/a	6.202	
			IC40	23.7	13.9	n/a	4.214	
IC50	>100	n/a	n/a	<1				

Reproduction Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	10	28	19.7	36.3	0	39	3.66	11.6	41.31%	0.00%
6.25		10	22.2	17.4	27	11	31	2.13	6.75	30.39%	20.71%
12.5		10	23.8	17.5	30.1	4	33	2.78	8.8	36.99%	15.00%
25		10	13.8	5.79	21.8	0	31	3.54	11.2	81.18%	50.71%
50		10	14.6	9.63	19.6	4	25	2.2	6.95	47.59%	47.86%
100		10	19.9	12.7	27.1	0	33	3.16	10	50.28%	28.93%

Survival Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	10	0.900	0.674	1.000	0.000	1.000	0.100	0.316	35.14%	0.00%
6.25		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	-11.11%
12.5		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	-11.11%
25		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	-11.11%
50		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	-11.11%
100		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	-11.11%

CETIS Summary Report

Report Date: 21 Aug-18 11:08 (p 2 of 2)
 Test Code: 79262 | 17-8841-9933

Ceriodaphnia Survival and Reproduction Test											Pacific EcoRisk
Reproduction Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	16	29	32	32	32	0	37	39	31	32
6.25		31	18	28	20	31	27	19	21	11	16
12.5		28	23	4	27	24	33	33	29	22	15
25		1	19	7	26	31	21	21	2	0	10
50		18	22	13	25	13	21	4	15	7	8
100		33	8	23	14	22	0	27	28	19	25
Survival Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	1.000	1.000	1.000	1.000	1.000	0.000	1.000	1.000	1.000	1.000
6.25		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
12.5		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
25		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
50		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
100		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Survival Binomials											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	1/1	1/1	1/1	1/1	1/1	0/1	1/1	1/1	1/1	1/1
6.25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
12.5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
50		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
100		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1

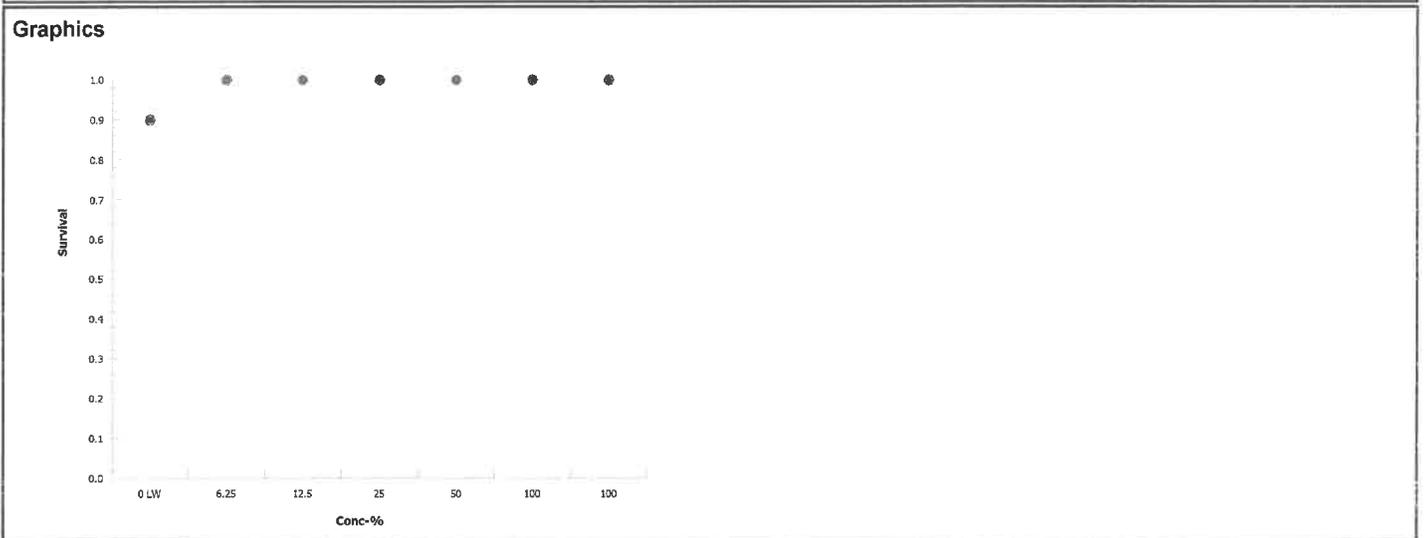
CETIS Analytical Report

Report Date: 21 Aug-18 11:08 (p 1 of 1)
 Test Code: 79262 | 17-8841-9933

Ceriodaphnia Survival and Reproduction Test			Pacific EcoRisk			
Analysis ID: 18-8759-6009	Endpoint: Survival	CETIS Version: CETISv1.9.2		Official Results: Yes		
Analyzed: 21 Aug-18 11:07	Analysis: STP 2xK Contingency Tables					
Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	
Untransformed	C > T	100	> 100	n/a	1	

Fisher Exact/Bonferroni-Holm Test						
Control	vs	Group	Test Stat	P-Type	P-Value	Decision(α:5%)
Lab Water Contr		6.25	1.000	Exact	1.0000	Non-Significant Effect
		12.5	1.000	Exact	1.0000	Non-Significant Effect
		25	1.000	Exact	1.0000	Non-Significant Effect
		50	1.000	Exact	1.0000	Non-Significant Effect
		100	1.000	Exact	1.0000	Non-Significant Effect

Data Summary							
Conc-%	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
0	LW	9	1	10	0.9	0.1	0.0%
6.25		10	0	10	1	0	-11.1%
12.5		10	0	10	1	0	-11.1%
25		10	0	10	1	0	-11.1%
50		10	0	10	1	0	-11.1%
100		10	0	10	1	0	-11.1%



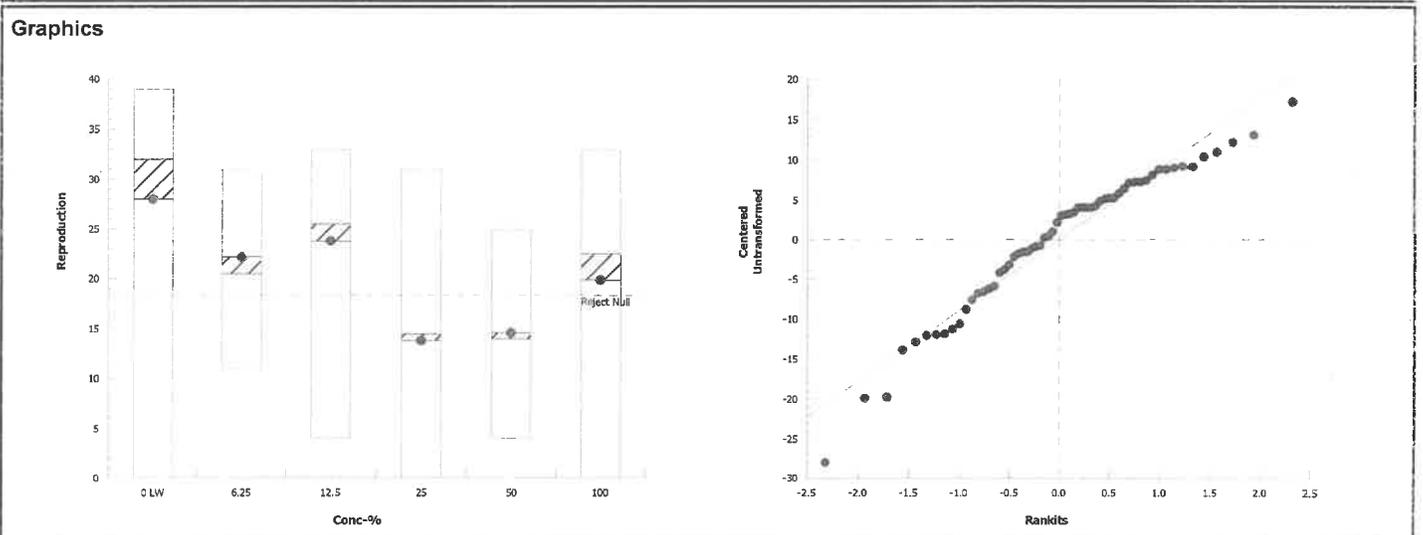
Ceriodaphnia Survival and Reproduction Test				Pacific EcoRisk		
Analysis ID: 14-9129-0722	Endpoint: Reproduction	CETIS Version: CETISv1.9.2		Official Results: Yes		
Analyzed: 21 Aug-18 11:07	Analysis: Parametric-Control vs Treatments					
Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	C > T	100	> 100	n/a	1	34.39%

Dunnett Multiple Comparison Test									
Control	vs	Conc-%	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Water Contr		6.25	1.38	2.29	9.63	18	CDF	0.2594	Non-Significant Effect
		12.5	0.999	2.29	9.63	18	CDF	0.4172	Non-Significant Effect
		25*	3.38	2.29	9.63	18	CDF	0.0031	Significant Effect
		50*	3.19	2.29	9.63	18	CDF	0.0053	Significant Effect
		100	1.93	2.29	9.63	18	CDF	0.1049	Non-Significant Effect

ANOVA Table						
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	1500.08	300.017	5	3.39	0.0098	Significant Effect
Error	4776.1	88.4463	54			
Total	6276.18		59			

Distributional Tests						
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)	
Variances	Bartlett Equality of Variance Test	4.44	15.1	0.4881	Equal Variances	
Distribution	Shapiro-Wilk W Normality Test	0.954	0.946	0.0242	Normal Distribution	

Reproduction Summary											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	LW	10	28	19.7	36.3	32	0	39	3.66	41.31%	0.00%
6.25		10	22.2	17.4	27	20.5	11	31	2.13	30.39%	20.71%
12.5		10	23.8	17.5	30.1	25.5	4	33	2.78	36.99%	15.00%
25		10	13.8	5.79	21.8	14.5	0	31	3.54	81.18%	50.71%
50		10	14.6	9.63	19.6	14	4	25	2.2	47.59%	47.86%
100		10	19.9	12.7	27.1	22.5	0	33	3.16	50.28%	28.93%



CETIS Analytical Report

Report Date: 21 Aug-18 11:08 (p 1 of 1)
 Test Code: 79262 | 17-8841-9933

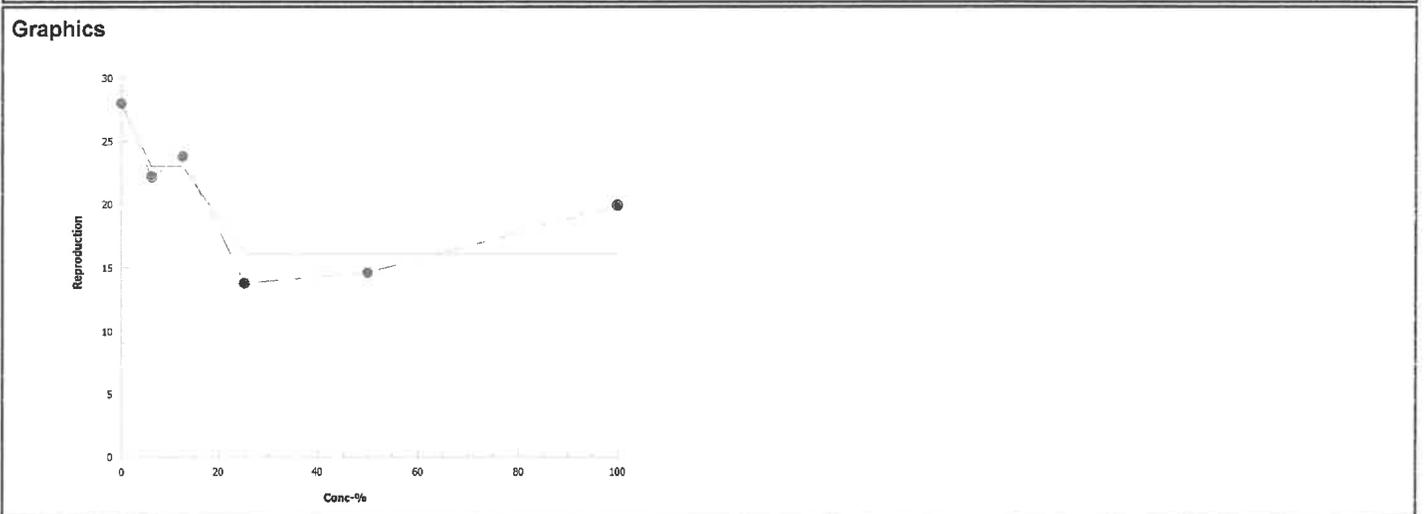
Ceriodaphnia Survival and Reproduction Test **Pacific EcoRisk**

Analysis ID: 12-5253-2436	Endpoint: Reproduction	CETIS Version: CETISv1.9.2
Analyzed: 21 Aug-18 11:07	Analysis: Linear Interpolation (ICPIN)	Official Results: Yes

Linear Interpolation Options					
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	1790227	200	Yes	Two-Point Interpolation

Point Estimates						
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	1.75	0.967	14.9	57.14	6.697	103.4
IC10	3.5	1.93	17.5	28.57	5.708	51.72
IC15	5.25	2.9	20.2	19.05	4.95	34.48
IC20	13.6	3.87	22.9	7.36	4.373	25.86
IC25	16.1	4.83	n/a	6.202	n/a	20.69
IC40	23.7	13.9	n/a	4.214	n/a	7.215
IC50	>100	n/a	n/a	<1	n/a	n/a

Reproduction Summary			Calculated Variate						
Conc-%	Code	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	10	28	0	39	3.66	11.6	41.30%	0.0%
6.25		10	22.2	11	31	2.13	6.75	30.40%	20.7%
12.5		10	23.8	4	33	2.78	8.8	37.00%	15.0%
25		10	13.8	0	31	3.54	11.2	81.20%	50.7%
50		10	14.6	4	25	2.2	6.95	47.60%	47.9%
100		10	19.9	0	33	3.16	10	50.30%	28.9%



Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: LWA - Calleguas Creek Material: CCTMP-68-Hitch-158 Test Date: 8/9/18
 Project #: 29192 Test ID: 79262 Randomization: 10.7.3 Control Water: Mod EPAMH

Day	pH		D.O.		Cond. (µS/cm)	Temp (°C)	Survival / Reproduction										SIGN-OFF		
	New	Old	New	Old			A	B	C	D	E	F	G	H	I	J			
0	7.92		7.2		348	24.3	0	0	0	0	0	0	0	0	0	0	0	0	Date: 8/9/18 New WQ: Sol'n Prep: SF TF Time: 1520
1	7.99	7.96	7.7	6.0	359	25.3	0	0	0	0	0	0	0	0	0	0	0	0	Date: 8/10/18 New WQ: TA Counts: 23 Sol'n Prep: AEF Old WQ: SB Time: 1534
2	7.94	8.05	7.4	8.3	350	24.6	0	0	0	0	0	0	0	0	0	0	0	0	Date: 8/11/18 New WQ: MYU Counts: 26 Sol'n Prep: SMC Old WQ: RAP Time: 0945
3	8.05	7.92	7.9	7.7	360	25.6	0	0	0	0	0	0	0	0	0	0	0	0	Date: 8/12/18 New WQ: MBO Counts: ER Sol'n Prep: ER Old WQ: MYU Time: 1500
4	7.91	7.97	8.5	7.3	355	25.0	5	5	6	6	5	-	8	7	5	5			Date: 8/13/18 New WQ: WZ Counts: ER Sol'n Prep: A Old WQ: KB Time: 1529
5	7.82	7.88	8.9	8.0	359	25.3	11	9	10	9	12	-	11	12	10	11			Date: 8/14/18 New WQ: TA Counts: 26 Sol'n Prep: A Old WQ: TF Time: 1507
6	-	7.78	-	7.9	381	24.2	0	15	16	17	15	-	18	20	16	16			Date: 8/15/18 New WQ: - Counts: 26 Sol'n Prep: M5 Old WQ: RAP Time: 1535
7								15											Date: New WQ: Counts: Sol'n Prep: Old WQ: Time:
8								21/15											Date: Old WQ: Counts: Time:
Total=							16	29	32	32	32	70	37	39	31	32	Mean Neonates/Female = 28.0		

Day	pH		D.O.		Cond. (µS/cm)	Temp (°C)	Survival / Reproduction										Sample ID		
	New	Old	New	Old			A	B	C	D	E	F	G	H	I	J			
0	7.94		7.4		451	24.3	0	0	0	0	0	0	0	0	0	0	0	0	50516
1	7.93	7.95	7.9	6.8	454	24.6	0	0	0	0	0	0	0	0	0	0	0	0	50516
2	7.92	8.05	7.8	8.4	447	25.4	0	0	0	0	0	0	0	0	0	0	0	0	50516
3	8.08	7.99	8.0	7.5	456	24.9	0	0	0	0	0	0	0	0	0	0	0	0	50516
4	7.92	7.94	8.5	7.4	452	24.7	6	5	5	5	6	6	3	6	2	6			50516
5	7.90	8.00	8.9	8.1	460	24.8	13	12	8	0	10	9	10	9	9	10			50516
6	-	7.88	-	7.9	489	24.0	12	1	15	15	12	6	6	0	0				50516 RC 8/14/18
7										15									
8																			
Total=							31	18	28	20	31	27	19	21	11	16	Mean Neonates/Female = 22.2		

Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: LWA - Calleguas Creek Material: CCTMP-68-Hitch-158 Test Date: 8/9/18
 Project #: 29192 Test ID: 79262 Control Water: Mod EPAMH

Day	pH		D.O.		Cond. (µS/cm)	Temp (°C)	Survival / Reproduction										SIGN-OFF			
	New	Old	New	Old			A	B	C	D	E	F	G	H	I	J				
12.5%	0	7.94		7.5		554	24.3	0	0	0	0	0	0	0	0	0	0	0	0	
	1	8.02	8.04	8.1	6.7	551	24.5	0	0	0	0	0	0	0	0	0	0	0	0	
	2	7.93	8.10	8.0	8.3	550	24.9	0	0	0	0	0	0	0	0	0	0	0	0	
	3	8.09	7.98	8.3	7.2	555	25.4	0	0	0	0	0	0	0	0	0	0	0	0	
	4	7.96	7.95	8.6	7.0	549	24.6	1	1	1	3	5	3	1	4	6	6			
	5	7.93	8.01	8.8	8.0	557	24.8	11	9	3	10	9	12	11	11	10	9			
	6	—	7.93	—	8.0	595	24.2	16	13	0	14	10	18	21	14	6	0			
	7																			
	8																			
Total=							33	23	4	27	24	33	33	29	22	15	Mean Neonates/Female = 24.3			
25%	0	7.91		7.8		728	24.2	0	0	0	0	0	0	0	0	0	0	0	0	
	1	8.02	8.07	8.2	6.5	728	25.4	0	0	0	0	0	0	0	0	0	0	0	0	
	2	7.90	8.14	8.1	8.3	721	24.9	0	0	0	0	0	0	0	0	0	0	0	0	
	3	8.07	8.06	8.2	7.0	726	25.5	0	0	0	0	0	0	0	0	0	0	0	0	
	4	7.98	7.95	8.7	7.3	719	24.8	0	4	6	6	5	6	2	2	0	1			
	5	7.96	8.07	8.8	7.8	724	24.6	0	0	0	6	9	4	8	0	0	7			
	6	—	8.00	—	8.1	782	24.1	1	15	1	14	17	11	11	0	0	2			
	7																			
	8																			
Total=							1	19	7	26	31	21	21	2	0	10	Mean Neonates/Female = 13.8			

26 8/25/18

Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: LWA - Calleguas Creek Material: CCTMP-68-Hitch-158 Test Date: 8/19/18
 Project #: 29192 Test ID: 79262 Control Water: Mod EPAMH

Day	pH		D.O.		Cond. (µS/cm)	Temp (°C)	Survival / Reproduction										SIGN-OFF		
	New	Old	New	Old			A	B	C	D	E	F	G	H	I	J			
50%	0	7.88		8.0		1077	24.3	0	0	0	0	0	0	0	0	0	0	0	
	1	8.01	8.4	8.4	7.0	1073	25.3	0	0	0	0	0	0	0	0	0	0	0	
	2	7.87	8.33	8.6	8.5	1064	25.5	0	0	0	0	0	0	0	0	0	0	0	
	3	8.05	8.23	8.5	7.5	1079	25.1	0	0	0	0	0	0	0	0	0	0	0	
	4	7.99	8.10	8.8	7.0	1064	24.8	4	0	0	6	6	0	0	5	0	0		
	5	8.00	8.24	9.0	7.8	1065	26.0	2	10	1	8	0	5	0	9	5	4		
	6	—	8.05	—	7.9	1120	24.1	12	12	12	11	7	16	4	1	2	4		
	7																		
	8																		
Total=							18	22	13	25	13	21	4	15	7	8	Mean Neonates/Female = 14.6		
100%	0	7.83		8.3		1733	24.0	0	0	0	0	0	0	0	0	0	0	0	
	1	8.00	8.29	9.0	6.7	1744	25.0	0	0	0	0	0	0	0	0	0	0	0	
	2	7.79	8.46	9.7	8.5	1747	25.5	0	0	0	0	0	0	0	0	0	0	0	
	3	8.03	8.41	9.0	7.6	1738	25.1	0	0	0	0	0	0	0	0	0	0	0	
	4	7.98	8.28	9.0	7.8	1718	24.5	6	4	7	6	4	0	4	7	5	0		
	5	7.97	8.40	9.1	7.9	1745	25.6	12	1	5	2	11	0	10	6	0	7		
	6	—	8.24	—	7.9	1811	24.3	15	3	11	6	7	0	13	15	14	18		
	7																		
	8																		
Total=							33	58	23	14	22	0	27	28	19	25	Mean Neonates/Female = 19.8		

8/15/18

19.9
26 8/15/18

CETIS Summary Report

Report Date: 21 Aug-18 10:53 (p 1 of 2)
 Test Code: 79263 | 17-4198-5350

Ceriodaphnia Survival and Reproduction Test **Pacific EcoRisk**

Batch ID: 18-7931-5944	Test Type: Reproduction-Survival (7d)	Analyst: Jessica Okutsu
Start Date: 09 Aug-18 15:58	Protocol: EPA-821-R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 15 Aug-18 17:04	Species: Ceriodaphnia dubia	Brine: Not Applicable
Duration: 6d 1h	Source: In-House Culture	Age: 1

Sample ID: 14-1729-6107	Code: 68-GATE-219	Client: Larry Walker Associates
Sample Date: 08 Aug-18 13:20	Material: Ambient Water	Project: 29192
Receipt Date: 09 Aug-18 07:30	Source: Calleguas Creek	
Sample Age: 27h (2 °C)	Station: GATE	

Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	NOEL	LOEL	TOEL	TU	PMSD ✓
05-8148-0906	Reproduction	Dunnett Multiple Comparison Test	100	> 100	n/a	1	24.0%
20-5503-5044	Survival	Fisher Exact/Bonferroni-Holm Test	100	> 100	n/a	1	n/a

Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	Level	%	95% LCL	95% UCL	TU	✓
18-4480-9506	Reproduction	Linear Interpolation (ICPIN)	IC5	1.03	0.773	1.75	96.8	
			IC10	2.07	1.55	3.51	48.4	
			IC15	3.1	2.32	5.26	32.27	
			IC20	4.13	3.09	n/a	24.2	
			IC25	5.17	3.86	n/a	19.36	
			IC40	>100	n/a	n/a	<1	
			IC50	>100	n/a	n/a	<1	

Reproduction Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	10	27.9	23	32.8	15	35	2.18	6.89	24.69%	0.00%
6.25		10	15.9	11.3	20.5	7	25	2.05	6.49	40.81%	43.01%
12.5		10	19.5	14.6	24.4	8	28	2.18	6.88	35.30%	30.11%
25		10	14.4	10.1	18.7	9	28	1.89	5.97	41.43%	48.39%
50		10	19.1	14.5	23.7	7	26	2.04	6.45	33.79%	31.54%
100		10	28.4	23.8	33	17	36	2.05	6.48	22.83%	-1.79%

Survival Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
6.25		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
12.5		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
25		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
50		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
100		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%

CETIS Summary Report

Report Date: 21 Aug-18 10:53 (p 2 of 2)
 Test Code: 79263 | 17-4198-5350

Ceriodaphnia Survival and Reproduction Test											Pacific EcoRisk
Reproduction Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	16	28	35	30	32	30	29	30	15	34
6.25		15	7	12	25	25	24	14	15	11	11
12.5		12	25	26	22	8	28	16	26	18	14
25		9	13	15	11	28	20	9	9	16	14
50		18	24	22	25	24	26	12	13	20	7
100		36	36	26	30	34	17	27	29	30	19
Survival Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
6.25		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
12.5		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
25		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
50		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
100		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Survival Binomials											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
6.25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
12.5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
50		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
100		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1

CETIS Analytical Report

Report Date: 21 Aug-18 09:36 (p 1 of 1)
 Test Code: 79263 | 17-4198-5350

Ceriodaphnia Survival and Reproduction Test Pacific EcoRisk

Analysis ID: 20-5503-5044 Endpoint: Survival CETIS Version: CETISv1.9.2
 Analyzed: 21 Aug-18 9:35 Analysis: STP 2xK Contingency Tables Official Results: Yes

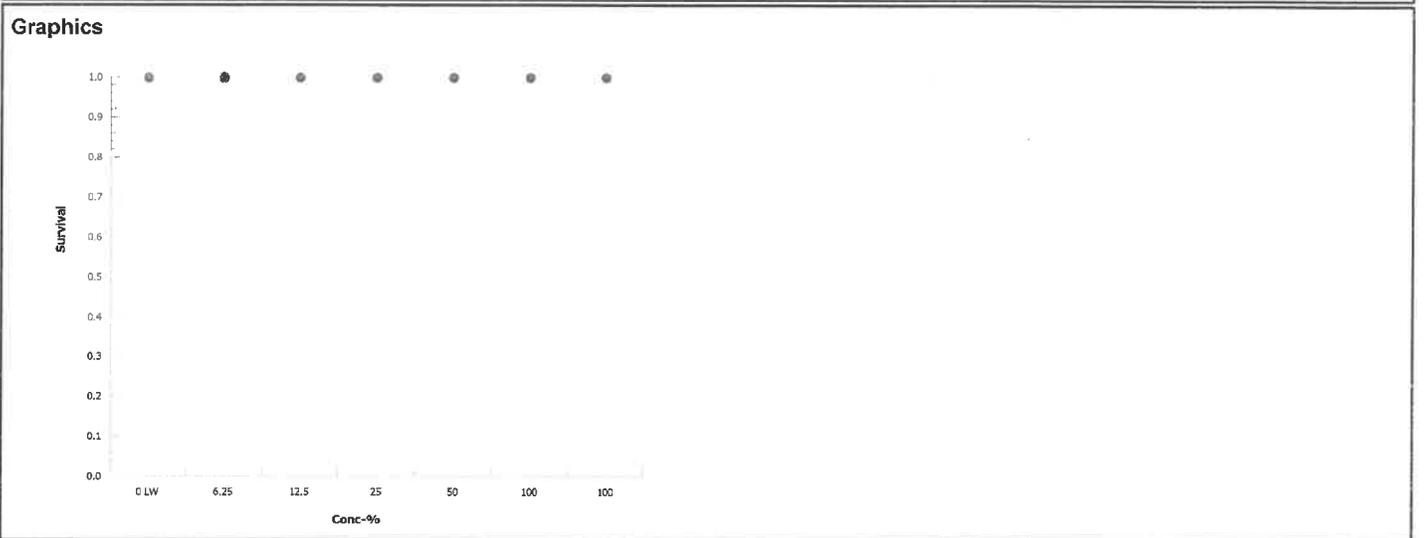
Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU
Untransformed	C > T	100	> 100	n/a	1

Fisher Exact/Bonferroni-Holm Test

Control	vs	Group	Test Stat	P-Type	P-Value	Decision(α:5%)
Lab Water Contr		6.25	1.000	Exact	1.0000	Non-Significant Effect
		12.5	1.000	Exact	1.0000	Non-Significant Effect
		25	1.000	Exact	1.0000	Non-Significant Effect
		50	1.000	Exact	1.0000	Non-Significant Effect
		100	1.000	Exact	1.0000	Non-Significant Effect

Data Summary

Conc-%	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
0	LW	10	0	10	1	0	0.0%
6.25		10	0	10	1	0	0.0%
12.5		10	0	10	1	0	0.0%
25		10	0	10	1	0	0.0%
50		10	0	10	1	0	0.0%
100		10	0	10	1	0	0.0%



CETIS Analytical Report

Report Date: 21 Aug-18 09:36 (p 1 of 1)
 Test Code: 79263 | 17-4198-5350

Ceriodaphnia Survival and Reproduction Test Pacific EcoRisk

Analysis ID: 05-8148-0906	Endpoint: Reproduction	CETIS Version: CETISv1.9.2	
Analyzed: 21 Aug-18 9:36	Analysis: Parametric-Control vs Treatments	Official Results: Yes	

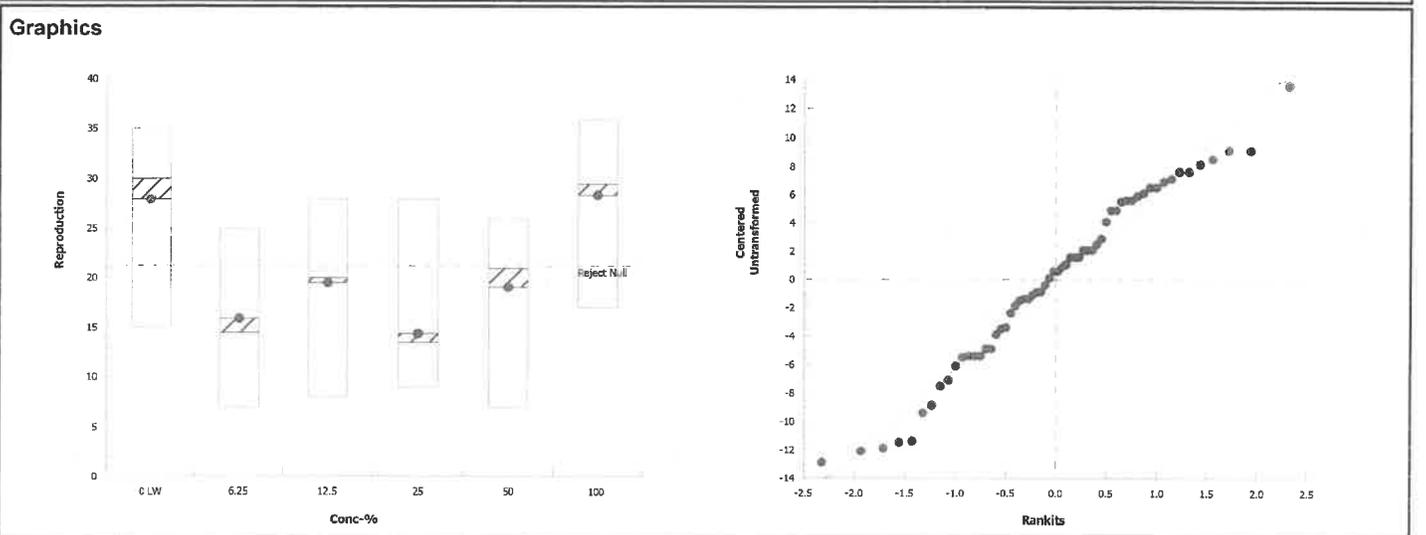
Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	C > T	100	> 100	n/a	1	23.98%

Dunnett Multiple Comparison Test									
Control	vs	Control II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Water Contr		6.25*	4.11	2.29	6.69	18	CDF	3.2E-04	Significant Effect
		12.5*	2.87	2.29	6.69	18	CDF	0.0123	Significant Effect
		25*	4.62	2.29	6.69	18	CDF	5.9E-05	Significant Effect
		50*	3.01	2.29	6.69	18	CDF	0.0085	Significant Effect
		100	-0.171	2.29	6.69	18	CDF	0.8792	Non-Significant Effect

ANOVA Table						
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	1776.93	355.387	5	8.32	6.9E-06	Significant Effect
Error	2306	42.7037	54			
Total	4082.93		59			

Distributional Tests						
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)	
Variances	Bartlett Equality of Variance Test	0.237	15.1	0.9987	Equal Variances	
Distribution	Shapiro-Wilk W Normality Test	0.974	0.946	0.2405	Normal Distribution	

Reproduction Summary											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	LW	10	27.9	23	32.8	30	15	35	2.18	24.69%	0.00%
6.25		10	15.9	11.3	20.5	14.5	7	25	2.05	40.81%	43.01%
12.5		10	19.5	14.6	24.4	20	8	28	2.18	35.30%	30.11%
25		10	14.4	10.1	18.7	13.5	9	28	1.89	41.43%	48.39%
50		10	19.1	14.5	23.7	21	7	26	2.04	33.79%	31.54%
100		10	28.4	23.8	33	29.5	17	36	2.05	22.83%	-1.79%



CETIS Analytical Report

Report Date: 21 Aug-18 09:36 (p 1 of 1)
 Test Code: 79263 | 17-4198-5350

Ceriodaphnia Survival and Reproduction Test **Pacific EcoRisk**

Analysis ID: 18-4480-9506 Endpoint: Reproduction CETIS Version: CETISv1.9.2
 Analyzed: 21 Aug-18 9:36 Analysis: Linear Interpolation (ICPIN) Official Results: Yes

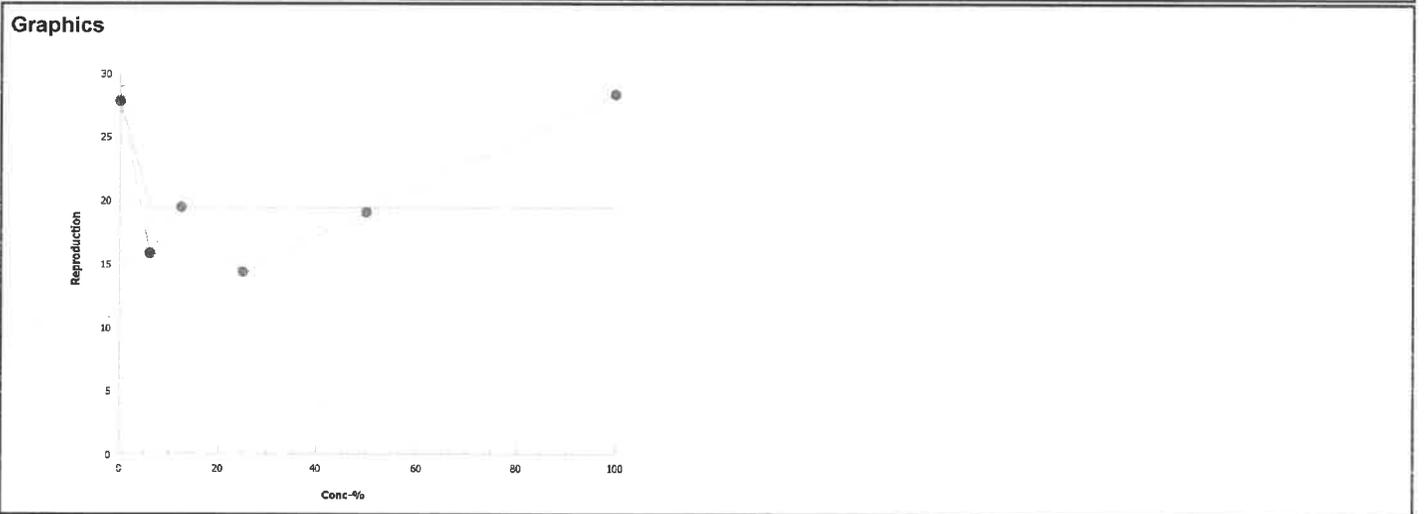
Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	1412103	200	Yes	Two-Point Interpolation

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	1.03	0.773	1.75	96.8	57.01	129.4
IC10	2.07	1.55	3.51	48.4	28.51	64.71
IC15	3.1	2.32	5.26	32.27	19	43.14
IC20	4.13	3.09	n/a	24.2	n/a	32.35
IC25	5.17	3.86	n/a	19.36	n/a	25.88
IC40	>100	n/a	n/a	<1	n/a	n/a
IC50	>100	n/a	n/a	<1	n/a	n/a

Reproduction Summary			Calculated Variate						
Conc-%	Code	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	10	27.9	15	35	2.18	6.89	24.70%	0.0%
6.25		10	15.9	7	25	2.05	6.49	40.80%	43.0%
12.5		10	19.5	8	28	2.18	6.88	35.30%	30.1%
25		10	14.4	9	28	1.89	5.97	41.40%	48.4%
50		10	19.1	7	26	2.04	6.45	33.80%	31.5%
100		10	28.4	17	36	2.05	6.48	22.80%	-1.79%



Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: LWA - Calleguas Creek Material: CCTMP-68-GATE-219 Test Date: 8/9/18
 Project #: 29192 Test ID: 79263 Randomization: 10.7.3 Control Water: Mod EPAMH

Day	pH		D.O.		Cond. (µS/cm)	Temp (°C)	Survival / Reproduction										SIGN-OFF	
	New	Old	New	Old			A	B	C	D	E	F	G	H	I	J		
0	7.95		7.4		347	24.0	0	0	0	0	0	0	0	0	0	0	0	Date: 8/11/18 New WQ: <u>TA</u> Test Init.: <u>ARF</u> Sol'n Prep: <u>ST TF</u> Time: <u>1538</u>
1	8.02	7.94	8.1	6.1	351	25.3	0	0	0	0	0	0	0	0	0	0	0	Date: 8/11/18 New WQ: <u>TA</u> Counts: <u>MS</u> Sol'n Prep: <u>AF</u> Old WQ: <u>SB</u> Time: <u>1244</u>
2	7.90	7.80	7.7	6.5	406	24.2	0	0	0	0	0	0	0	0	0	0	0	Date: 8/11/18 New WQ: <u>MYA</u> Counts: <u>30</u> Sol'n Prep: <u>SMC</u> Old WQ: <u>RAF</u> Time: <u>1534</u>
3	7.89	7.84	7.7	6.8	354	25.0	0	0	0	0	0	0	0	0	0	0	0	Date: 8/12/18 New WQ: <u>AR</u> Counts: <u>44</u> Sol'n Prep: <u>ER</u> Old WQ: <u>MYA</u> Time: <u>1450</u>
4	7.96	7.71	8.4	6.6	355	25.4	4	4	6	4	6	6	5	6	5	7		Date: 8/13/18 New WQ: <u>W</u> Counts: <u>44</u> Sol'n Prep: <u>BU</u> Old WQ: <u>RA</u> Time: <u>1524</u>
5	7.91	7.74	8.5	7.2	355	24.9	12	11	12	12	10	11	12	11	10	13		Date: 8/14/18 New WQ: <u>MS</u> Counts: <u>42</u> Sol'n Prep: <u>BV</u> Old WQ: <u>AR</u> Time: <u>1350</u>
6	8.06	7.91	8.4	7.7	353	24.0	0	13	17	14	16	13	12	13	0	14		Date: 8/15/18 New WQ: <u>RAF</u> Counts: <u>104</u> Sol'n Prep: <u>UB</u> Old WQ: <u>DM</u> Time: <u>ARF</u>
7																		Date: New WQ: Counts: Sol'n Prep: Old WQ: Time:
8																		Date: Old WQ: Counts: Time:
Total=							16	28	35	30	32	30	29	30	15	34	Mean Neonates/Female = 27.9	

Day	pH		D.O.		Cond. (µS/cm)	Temp (°C)	Survival / Reproduction										Sample ID	
	New	Old	New	Old			A	B	C	D	E	F	G	H	I	J		
0	7.90		7.5		394	24.0	0	0	0	0	0	0	0	0	0	0	0	50517
1	8.02	7.76	8.1	6.6	394	25.5	0	0	0	0	0	0	0	0	0	0	0	50517
2	7.95	7.83	7.7	6.1	403	24.0	0	0	0	0	0	0	0	0	0	0	0	50517
3	7.90	7.79	7.7	7.0	392	25.1	0	0	0	0	0	0	0	0	0	0	0	50517
4	7.96	7.74	8.5	6.9	394	25.3	5	1	3	2	5	3	4	4	2	1		50517
5	7.91	7.82	8.6	7.5	396	24.6	10	6	0	9	10	8	10	11	9	10		50517
6	8.04	7.86	8.5	7.6	393	24.1	0	0	9	14	10	13	0	0	0	0		50517
7																		
8																		
Total=							15	7	12	25	25	24	14	15	11	11	Mean Neonates/Female = 15.9	

Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: LWA - Calleguas Creek Material: CCTMP-68-GATE-219 Test Date: 01/11/18
 Project #: 29192 Test ID: 79263 Control Water: Mod EPAMH

Day	pH		D.O.		Cond. (µS/cm)	Temp (°C)	Survival / Reproduction										SIGN-OFF	
	New	Old	New	Old			A	B	C	D	E	F	G	H	I	J		
12.5%	0	7.88		7.5		436	24.0	0	0	0	0	0	0	0	0	0	0	
	1	8.02	7.91	8.2	7.6	433	25.4	0	0	0	0	0	0	0	0	0	0	
	2	7.93	7.83	7.9	6.3	435	24.0	0	0	0	0	0	0	0	0	0	0	
	3	7.91	7.83	7.9	7.0	437	25.2	0	0	0	0	0	0	0	0	0	0	
	4	7.95	7.77	8.6	7.2	435	25.3	2	4	5	1	0	4	5	3	5	5	
	5	7.88	7.84	8.8	7.5	435	24.8	10	11	10	11	8	12	11	12	13	2	
	6	8.01	7.86	8.5	7.6	436	24.1	0	10	11	10	0	12	0	11	0	7	
	7																	
	8																	
Total=							12	25	26	22	8	28	16	26	18	14	Mean Neonates/Female = 19.5	
25%	0	7.83		7.5		505	24.2	0	0	0	0	0	0	0	0	0	0	
	1	8.00	7.95	8.3	7.7	509	25.2	0	0	0	0	0	0	0	0	0	0	
	2	7.88	7.81	8.0	6.7	510	24.0	0	0	0	0	0	0	0	0	0	0	
	3	7.88	7.89	7.9	7.3	510	25.2	0	0	0	0	0	0	0	0	0	0	
	4	7.93	7.92	8.7	7.5	512	25.2	0	3	4	0	4	3	0	0	1	3	
	5	7.88	7.88	8.8	7.6	507	24.9	9	10	11	11	10	11	9	9	10	11	
	6	7.99	7.80	8.6	7.2	511	24.0	0	0	0	0	14	0	0	0	5	0	
	7																	
	8																	
Total=							9	13	15	11	28	20	9	9	16	14	Mean Neonates/Female = 14.4	

Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: LWA - Calleguas Creek Material: CCTMP-68-GATE-219 Test Date: 8/9/16
 Project #: 29192 Test ID: 79263 Control Water: Mod EPAMH

Day	pH		D.O.		Cond. (µS/cm)	Temp (°C)	Survival / Reproduction										SIGN-OFF		
	New	Old	New	Old			A	B	C	D	E	F	G	H	I	J			
50%	0	7.74		7.6		662	24.2	0	0	0	0	0	0	0	0	0	0	0	
	1	7.96	8.0	8.4	7.8	664	25.3	0	0	0	0	0	0	0	0	0	0	0	
	2	7.81	7.90	8.1	6.4	657	24.0	0	0	0	0	0	0	0	0	0	0	0	
	3	7.81	7.94	8.2	7.2	662	25.2	0	0	0	0	0	0	0	0	0	0	0	
	4	7.84	7.99	8.7	7.8	659	24.9	0	1	2	3	2	3	2	5	1	0		
	5	7.89	7.98	7.8	7.9	660	24.4	8	9	8	9	9	8	10	8	10	7		
	6	7.94	7.94	8.9	7.8	662	24.0	10	14	12	13	15	0	0	9	0			
	7																		
	8																		
Total=							816	16 ²⁴	16 ²²	17 ²⁵	17 ²⁴	17 ²⁴	12 ¹²	13 ¹³	14 ²⁰	27	Mean Neonates/Female = 10.5 (17.1)		
100%	0	7.61		7.9		962	25.1	0	0	0	0	0	0	0	0	0	0	0	
	1	7.86	8.0	8.7	8.0	971	25.4	0	0	0	0	0	0	0	0	0	0	0	
	2	7.70	8.10	8.9	7.3	964	24.1	0	0	0	0	0	0	0	0	0	0	0	
	3	7.71	8.05	9.1	7.0	962	25.3	0	0	0	0	0	0	0	0	0	0	0	
	4	7.79	8.12	9.1	7.6	964	24.9	7	7	3	7	6	6	2	5	5	6		
	5	7.86	8.18	8.9	7.8	955	24.6	15	14	11	10	12	11	11	12	13	13		
	6	7.84	8.11	9.3	8.1	975	24.0	14	15	12	13	16	0	14	12	12	0		
	7																		
	8																		
Total=							36	36	26	30	34	17	27	29	30	19	Mean Neonates/Female = 28.4		

CETIS Summary Report

Report Date: 25 Aug-18 08:34 (p 1 of 2)
 Test Code: 79264 | 17-1680-4907

Ceriodaphnia Survival and Reproduction Test **Pacific EcoRisk**

Batch ID: 17-9339-8214	Test Type: Reproduction-Survival (7d)	Analyst: Jessica Okutsu
Start Date: 09 Aug-18 16:42	Protocol: EPA-821-R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 15 Aug-18 15:30	Species: Ceriodaphnia dubia	Brine: Not Applicable
Duration: 5d 23h	Source: In-House Culture	Age: 1

Sample ID: 06-6599-1097	Code: 68-BELT-222	Client: Larry Walker Associates
Sample Date: 08 Aug-18 14:35	Material: Ambient Water	Project: 29192
Receipt Date: 09 Aug-18 07:30	Source: Calleguas Creek	
Sample Age: 26h (1.4 °C)	Station: BELT	

Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	NOEL	LOEL	TOEL	TU	PMSD ✓
08-0128-1783	Reproduction	Steel Many-One Rank Sum Test	100	> 100	n/a	1	49.6%
12-5644-8695	Survival	Fisher Exact/Bonferroni-Holm Test	100	> 100	n/a	1	n/a

Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	Level	%	95% LCL	95% UCL	TU	✓
09-4920-2491	Reproduction	Linear Interpolation (ICPIN)	IC5	>100	n/a	n/a	<1	
			IC10	>100	n/a	n/a	<1	
			IC15	>100	n/a	n/a	<1	
			IC20	>100	n/a	n/a	<1	
			IC25	>100	n/a	n/a	<1	
			IC40	>100	n/a	n/a	<1	
			IC50	>100	n/a	n/a	<1	

Reproduction Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	10	20.5	15.2	25.8	11	31	2.35	7.43	36.23%	0.00%
6.25		10	18.2	12.2	24.2	9	30	2.67	8.44	46.39%	11.22%
12.5		10	20.6	15.1	26.1	12	30	2.45	7.73	37.55%	-0.49%
25		10	20.6	14.2	27	8	33	2.82	8.92	43.31%	-0.49%
50		10	29.6	22.6	36.6	9	37	3.08	9.75	32.96%	-44.39%
100		10	24.9	14.1	35.7	0	40	4.79	15.2	60.89%	-21.46%

Survival Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
6.25		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
12.5		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
25		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
50		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
100		10	0.800	0.498	1.000	0.000	1.000	0.133	0.422	52.70%	20.00%

CETIS Summary Report

Report Date: 25 Aug-18 08:34 (p 2 of 2)
 Test Code: 79264 | 17-1680-4907

Ceriodaphnia Survival and Reproduction Test											Pacific EcoRisk
Reproduction Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	13	11	25	23	31	26	27	24	13	12
6.25		27	12	12	29	12	30	25	9	11	15
12.5		15	28	13	25	13	30	29	27	12	14
25		16	13	31	8	28	30	33	16	16	15
50		33	35	35	32	37	36	9	32	33	14
100		40	0	36	36	39	19	0	23	35	21
Survival Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
6.25		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
12.5		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
25		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
50		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
100		1.000	0.000	1.000	1.000	1.000	1.000	0.000	1.000	1.000	1.000
Survival Binomials											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
6.25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
12.5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
50		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
100		1/1	0/1	1/1	1/1	1/1	1/1	0/1	1/1	1/1	1/1

CETIS Analytical Report

Report Date: 21 Aug-18 11:23 (p 1 of 1)
 Test Code: 79264 | 17-1680-4907

Ceriodaphnia Survival and Reproduction Test **Pacific EcoRisk**

Analysis ID: 12-5644-8695 Endpoint: Survival CETIS Version: CETISv1.9.2
 Analyzed: 21 Aug-18 11:22 Analysis: STP 2xK Contingency Tables Official Results: Yes

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU
Untransformed	C > T	100	> 100	n/a	1

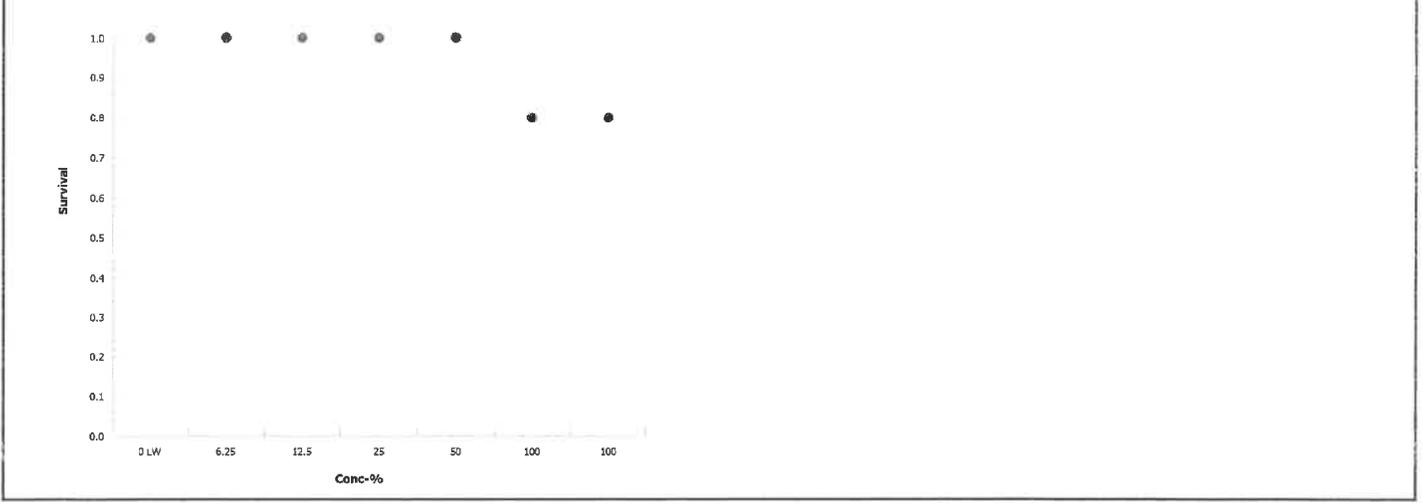
Fisher Exact/Bonferroni-Holm Test

Control	vs	Group	Test Stat	P-Type	P-Value	Decision(α:5%)
Lab Water Contr		6.25	1.000	Exact	1.0000	Non-Significant Effect
		12.5	1.000	Exact	1.0000	Non-Significant Effect
		25	1.000	Exact	1.0000	Non-Significant Effect
		50	1.000	Exact	1.0000	Non-Significant Effect
		100	0.237	Exact	1.0000	Non-Significant Effect

Data Summary

Conc-%	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
0	LW	10	0	10	1	0	0.0%
6.25		10	0	10	1	0	0.0%
12.5		10	0	10	1	0	0.0%
25		10	0	10	1	0	0.0%
50		10	0	10	1	0	0.0%
100		8	2	10	0.8	0.2	20.0%

Graphics



CETIS Analytical Report

Report Date: 25 Aug-18 08:35 (p 1 of 1)
 Test Code: 79264 | 17-1680-4907

Ceriodaphnia Survival and Reproduction Test **Pacific EcoRisk**

Analysis ID: 08-0128-1783 Endpoint: Reproduction CETIS Version: CETISv1.9.2
 Analyzed: 25 Aug-18 8:34 Analysis: Nonparametric-Control vs Treatments Official Results: Yes

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	C > T	100	> 100	n/a	1	49.56%

Steel Many-One Rank Sum Test

Control	vs	Conc-%	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Lab Water Contr		6.25	97	75	4	18	Asymp	0.5980	Non-Significant Effect
		12.5	112	75	4	18	Asymp	0.9503	Non-Significant Effect
		25	112	75	2	18	Asymp	0.9403	Non-Significant Effect
		50	139	75	0	18	Asymp	1.0000	Non-Significant Effect
		100	118	75	1	18	Asymp	0.9824	Non-Significant Effect

ANOVA Table

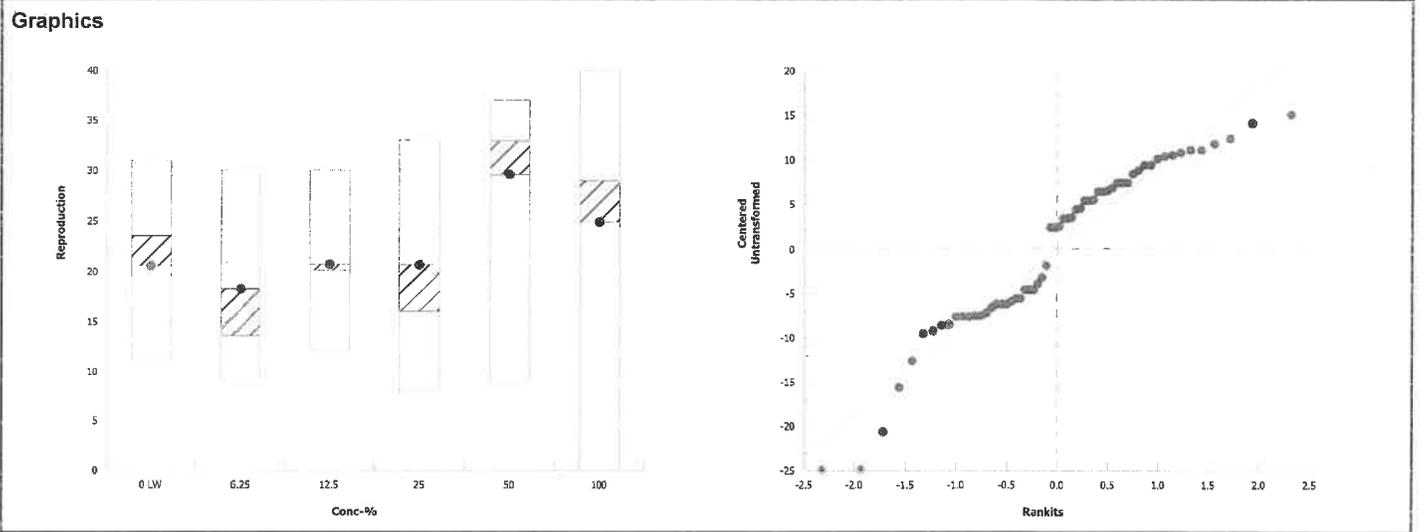
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	858.2	171.64	5	1.74	0.1406	Non-Significant Effect
Error	5318.2	98.4852	54			
Total	6176.4		59			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	6.91	15.1	0.2275	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.935	0.946	0.0032	Non-Normal Distribution

Reproduction Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	LW	10	20.5	15.2	25.8	23.5	11	31	2.35	36.23%	0.00%
6.25		10	18.2	12.2	24.2	13.5	9	30	2.67	46.39%	11.22%
12.5		10	20.6	15.1	26.1	20	12	30	2.45	37.55%	-0.49%
25		10	20.6	14.2	27	16	8	33	2.82	43.31%	-0.49%
50		10	29.6	22.6	36.6	33	9	37	3.08	32.96%	-44.39%
100		10	24.9	14.1	35.7	29	0	40	4.79	60.89%	-21.46%



CETIS Analytical Report

Report Date: 25 Aug-18 08:35 (p 1 of 1)
 Test Code: 79264 | 17-1680-4907

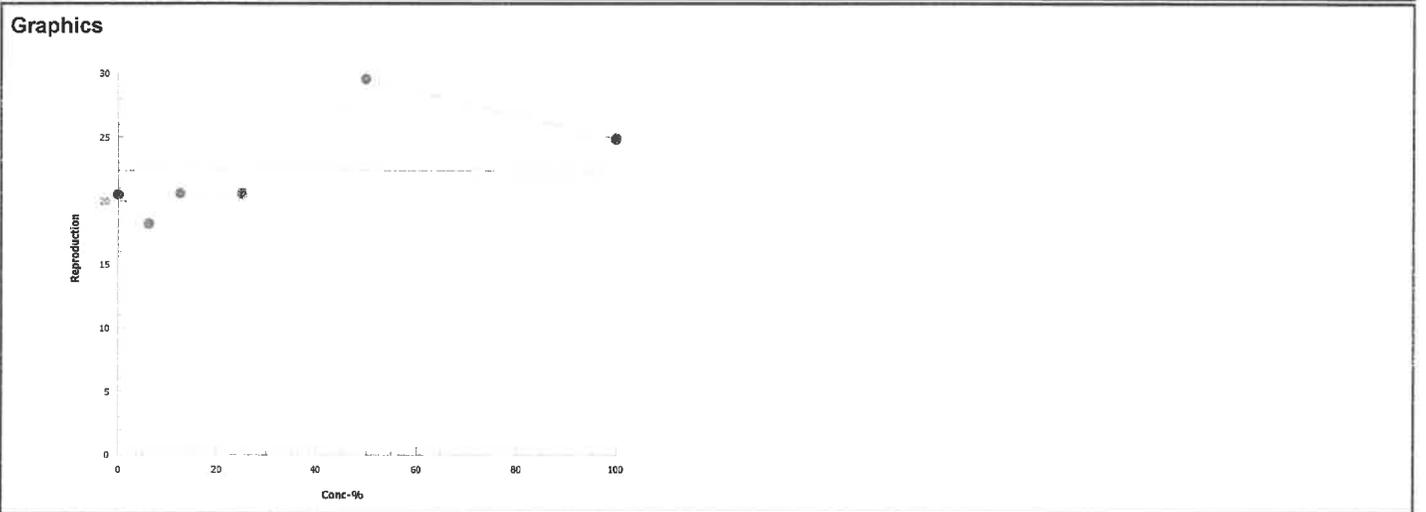
Ceriodaphnia Survival and Reproduction Test **Pacific EcoRisk**

Analysis ID: 09-4920-2491	Endpoint: Reproduction	CETIS Version: CETISv1.9.2
Analyzed: 25 Aug-18 8:34	Analysis: Linear Interpolation (ICPIN)	Official Results: Yes

Linear Interpolation Options					
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	856044	200	Yes	Two-Point Interpolation

Point Estimates						
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	>100	n/a	n/a	<1	n/a	n/a
IC10	>100	n/a	n/a	<1	n/a	n/a
IC15	>100	n/a	n/a	<1	n/a	n/a
IC20	>100	n/a	n/a	<1	n/a	n/a
IC25	>100	n/a	n/a	<1	n/a	n/a
IC40	>100	n/a	n/a	<1	n/a	n/a
IC50	>100	n/a	n/a	<1	n/a	n/a

Reproduction Summary			Calculated Variate						
Conc-%	Code	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	10	20.5	11	31	2.35	7.43	36.20%	0.0%
6.25		10	18.2	9	30	2.67	8.44	46.40%	11.2%
12.5		10	20.6	12	30	2.45	7.73	37.50%	-0.49%
25		10	20.6	8	33	2.82	8.92	43.30%	-0.49%
50		10	29.6	9	37	3.08	9.75	33.00%	-44.4%
100		10	24.9	0	40	4.79	15.2	60.90%	-21.5%



Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: LWA - Calleguas Creek Material: CCTMP-68-BELT-222 Test Date: 8/19/18
 Project #: 29192 Test ID: 79264 Randomization: 10.7.3 Control Water: Mod EPAMH

Day	pH		D.O.		Cond. (µS/cm)	Temp (°C)	Survival / Reproduction										SIGN-OFF							
	New	Old	New	Old			A	B	C	D	E	F	G	H	I	J	Date:	New WQ:	Test Init.:					
Lab Water Control	0	7.93		7.5		351	24.5	0	0	0	0	0	0	0	0	0	0	0	0	0	Date: 8/11/18	New WQ: TF	Test Init.: AF	
	1	8.01	7.93	8.1	5.8	353	24.1	0	0	0	0	0	0	0	0	0	0	0	0	0	Date: 8/10/18	New WQ: TA	Counts: RL	
	2	7.94	7.86	7.5	7.2	402	24.2	0	0	0	0	0	0	0	0	0	0	0	0	0	Date: 8/11/18	New WQ: MYL	Counts: 50	
	3	7.96	7.80	7.9	6.8	360	24.1	0	0	0	0	0	0	0	0	0	0	0	0	0	Date: 8/12/18	New WQ: AR	Counts: 62	
	4	7.93	7.83	8.0	6.7	362	24.1	5	2	4	3	6	5	6	5	5	4				Date: 8/13/18	New WQ: DM	Counts: 10	
	5	7.77	7.83	9.0	7.9	355	24.6	8	9	8	7	10	8	9	8	8	8				Date: 8/14/18	New WQ: BR	Counts: 62	
	6	8.06	7.86	8.4	7.9	352	24.0	12	0	13	13	15	13	12	11	0	0				Date: 8/15/18	New WQ: RA	Counts: 10	
	7																					Date:	New WQ:	Counts:
	8																					Date:	Old WQ:	Counts:
Total=							13	11	25	23	31	26	27	24	13	12	Mean Neonates/Female = 20.5							
Day	pH		D.O.		Cond. (µS/cm)	Temp (°C)	Survival / Reproduction										Sample ID							
	New	Old	New	Old			A	B	C	D	E	F	G	H	I	J								
6.25%	0	7.99		7.5		418	24.4	0	0	0	0	0	0	0	0	0	0	0	0	0	50518			
	1	8.07	7.95	8.2	6.5	419	24.3	0	0	0	0	0	0	0	0	0	0	0	0	0	50518			
	2	8.02	7.91	7.8	7.1	422	24.4	0	0	0	0	0	0	0	0	0	0	0	0	0	50518			
	3	8.02	7.86	8.0	6.6	415	24.2	0	0	0	0	0	0	0	0	0	0	0	0	0	50518			
	4	7.92	7.90	8.0	6.1	418	24.1	5	3	4	5	4	5	4	2	4	4				50518			
	5	7.90	7.96	9.1	8.0	419	25.4	8	9	8	9	8	9	8	0	7	0				50518			
	6	8.12	7.97	8.6	7.9	419	24.2	14	0	0	15	0	16	13	7	0	11				50518			
	7																							
	8																							
Total=							27	12	12	29	12	30	25	9	11	15	Mean Neonates/Female = 18.2							

Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: LWA - Calleguas Creek Material: CCTMP-68-BELT-222 Test Date: 8/19/18
 Project #: 29192 Test ID: 79264 Control Water: Mod EPAMH

	Day	pH		D.O.		Cond. (µS/cm)	Temp (°C)	Survival / Reproduction										SIGN-OFF
		New	Old	New	Old			A	B	C	D	E	F	G	H	I	J	
12.5%	0	8.08		7.4		482	24.3	0	0	0	0	0	0	0	0	0	0	
	1	8.09	8.04	8.1	6.5	484	24.7	0	0	0	0	0	0	0	0	0	0	
	2	8.07	8.01	7.8	6.9	498	24.6	0	0	0	0	0	0	0	0	0	0	
	3	8.08	7.93	7.8	6.8	480	25.1	0	0	0	0	0	0	0	0	0	0	
	4	7.86	7.90	8.2	6.3	496	24.2	5	5	4	4	5	5	5	3	4	4	
	5	7.91	7.99	9.3	8.0	482	25.5	10	9	9	8	8	10	8	9	8	0	
	6	8.17	8.02	8.5	8.0	484	24.4	0	14	0	13	0	15	16	15	0	10	
	7																	
	8																	
Total=							15	28	13	25	13	30	29	27	12	14	Mean Neonates/Female = 20.6	
25%	0	8.12		7.7		597	24.3	0	0	0	0	0	0	0	0	0	0	
	1	8.24	8.15	8.3	6.9	602	24.9	0	0	0	0	0	0	0	0	0	0	
	2	8.18	8.10	8.2	7.0	609	24.7	0	0	0	0	0	0	0	0	0	0	
	3	8.17	8.05	8.1	6.7	590	24.4	0	0	0	0	0	0	0	0	0	0	
	4	7.99	7.98	8.2	6.4	598	24.2	5	5	4	0	3	5	6	6	5	5	
	5	8.10	8.17	9.4	8.2	598	25.0	11	8	10	8	9	10	11	10	0	10	
	6	8.22	8.12	8.6	8.0	602	24.0	0	0	17	0	16	15	16	0	11	0	
	7																	
	8																	
Total=							16	13	31	8	28	30	33	16	16	15	Mean Neonates/Female = 20.6	

Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: LWA - Calleguas Creek Material: CCTMP-68-BELT-222 Test Date: 8/19/18
 Project #: 29192 Test ID: 79264 Control Water: Mod EPAMH

Day	pH		D.O.		Cond. (µS/cm)	Temp (°C)	Survival / Reproduction										SIGN-OFF		
	New	Old	New	Old			A	B	C	D	E	F	G	H	I	J			
50%	0	8.20		7.9		837	24.2	0	0	0	0	0	0	0	0	0	0	0	
	1	8.32	8.31	8.7	7.2	839	25.0	0	0	0	0	0	0	0	0	0	0	0	
	2	8.27	8.28	8.9	7.0	848	24.7	0	0	0	0	0	0	0	0	0	0	0	
	3	8.26	8.23	8.4	6.9	827	25.2	0	0	0	0	0	0	0	0	0	0	0	
	4	8.10	8.22	8.6	6.3	819	24.3	5	6	4	5	6	5	4	6	6	5		
	5	8.20	8.32	9.7	8.1	825	25.7	11	11	12	10	12	12	9	10	10	9		
	6	8.29	8.28	9.1	8.0	840	24.3	17	18	19	17	19	19	16	17	0			
	7																		
	8																		
Total=							33	35	35	32	37	36	9	32	33	14	Mean Neonates/Female = 29.6		
100%	0	8.21		9.2		1286	24.2	0	0	0	0	0	0	0	0	0	0	0	
	1	8.37	8.44	9.5	6.6	1289	25.1	0	0	0	0	0	0	0	0	0	0	0	
	2	8.32	8.48	10.2	7.3	1302	24.7	0	0	0	0	0	0	0	0	0	0	0	
	3	8.32	8.45	9.8	6.8	1270	24.8	0	1/6	0	0	0	0	1/6	0	0	0		
	4	8.24	8.43	9.1	6.0	1286	24.4	7	-	5	6	7	5	-	0	6	7		
	5	8.27	8.50	9.9	8.0	1269	25.2	14	-	11	12	14	14	-	10	10	14		
	6	8.33	8.44	9.7	7.3	1304	24.5	19	-	20	18	18	0	-	13	19	0		
	7								-					-					
	8								-					-					
Total=							46	1/6	36	36	39	19	1/6	23	35	21	Mean Neonates/Female = 24.9		

Appendix C

Test Data and Summary of Statistics for the Evaluation of the Chronic Toxicity of the Calleguas Creek Ambient Waters to *Ceriodaphnia dubia*: Data Analyses Including Statistical Outliers

CETIS Summary Report

Report Date: 25 Aug-18 08:46 (p 1 of 2)
 Test Code: 79258 | 17-8303-4899

Ceriodaphnia Survival and Reproduction Test **Pacific EcoRisk**

Batch ID: 20-4812-1806	Test Type: Reproduction-Survival (7d)	Analyst: Jessica Okutsu
Start Date: 09 Aug-18 16:25	Protocol: EPA-821-R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 15 Aug-18 14:38	Species: Ceriodaphnia dubia	Brine: Not Applicable
Duration: 5d 22h	Source: In-House Culture	Age: 1

Sample ID: 11-5389-0433	Code: 38-UNIV-029	Client: Larry Walker Associates
Sample Date: 08 Aug-18 08:30	Material: Ambient Water	Project: 29192
Receipt Date: 09 Aug-18 07:30	Source: Calleguas Creek	
Sample Age: 32h (0.7 °C)	Station: UNIV	

Comments:
 Stats including reproductive outlier Lab Water Control - replicate A.

Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	NOEL	LOEL	TOEL	TU	PMSD ✓
18-3874-4327	Reproduction	Dunnett Multiple Comparison Test	100	> 100	n/a	1	27.9%
12-9297-8484	Survival	Fisher Exact/Bonferroni-Holm Test	100	> 100	n/a	1	n/a

Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	Level	%	95% LCL	95% UCL	TU ✓
16-1037-1157	Reproduction	Linear Interpolation (ICPIN)	IC5	2.15	1.22	n/a	46.55
			IC10	4.3	2.43	n/a	23.27
			IC15	>100	n/a	n/a	<1
			IC20	>100	n/a	n/a	<1
			IC25	>100	n/a	n/a	<1
			IC40	>100	n/a	n/a	<1
			IC50	>100	n/a	n/a	<1

Reproduction Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	10	29.7	25.1	34.3	13	36	2.03	6.43	21.65%	0.00%
6.25		10	17.9	10	25.8	0	36	3.49	11	61.68%	39.73%
12.5		10	26.7	21	32.4	14	35	2.53	8	29.97%	10.10%
25		10	21.2	13.3	29.1	0	35	3.5	11.1	52.19%	28.62%
50		10	30.2	27.6	32.8	24	37	1.14	3.61	11.97%	-1.68%
100		10	30.9	26.9	34.9	19	36	1.78	5.63	18.21%	-4.04%

Survival Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
6.25		10	0.900	0.674	1.000	0.000	1.000	0.100	0.316	35.14%	10.00%
12.5		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
25		10	0.900	0.674	1.000	0.000	1.000	0.100	0.316	35.14%	10.00%
50		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
100		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%

CETIS Summary Report

Report Date: 25 Aug-18 08:46 (p 2 of 2)
 Test Code: 79258 | 17-8303-4899

Ceriodaphnia Survival and Reproduction Test											Pacific EcoRisk
Reproduction Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	13	27	33	31	36	34	31	28	32	32
6.25		29	12	0	36	12	31	11	15	13	20
12.5		32	32	16	35	14	35	28	29	29	17
25		26	19	16	0	30	35	29	13	12	32
50		30	31	37	28	30	32	34	24	28	28
100		35	35	35	36	19	28	32	34	24	31
Survival Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
6.25		1.000	1.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
12.5		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
25		1.000	1.000	1.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000
50		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
100		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Survival Binomials											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
6.25		1/1	1/1	0/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
12.5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
25		1/1	1/1	1/1	0/1	1/1	1/1	1/1	1/1	1/1	1/1
50		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
100		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1

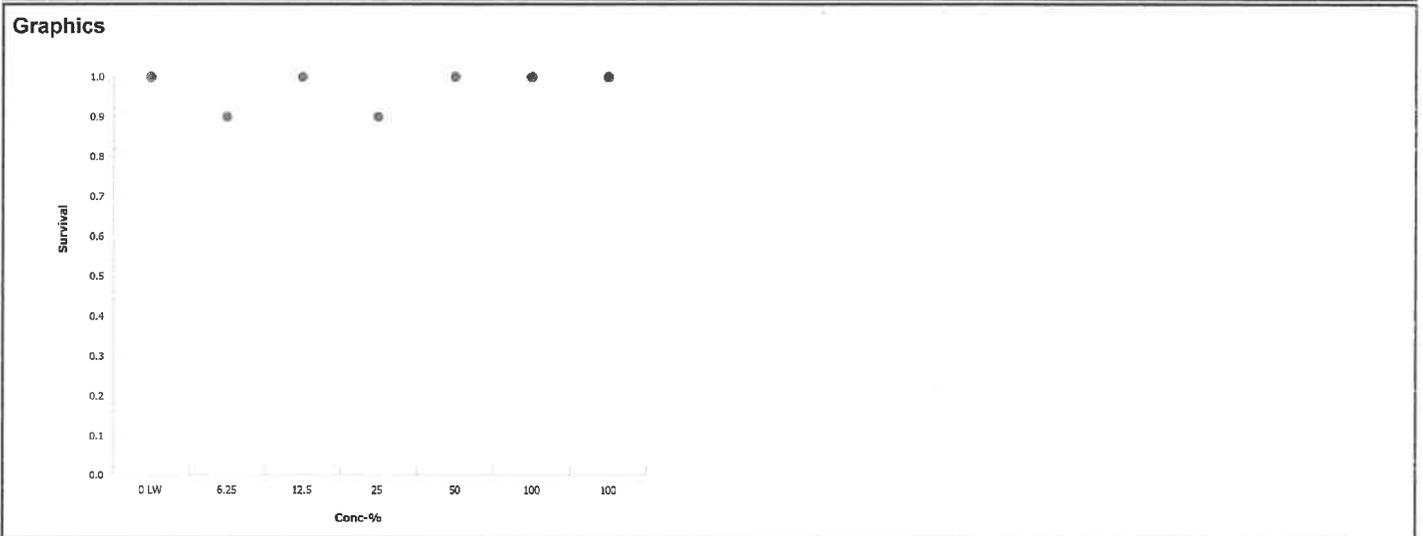
CETIS Analytical Report

Report Date: 21 Aug-18 09:48 (p 1 of 1)
 Test Code: 79258 | 17-8303-4899

Ceriodaphnia Survival and Reproduction Test				Pacific EcoRisk	
Analysis ID: 12-9297-8484	Endpoint: Survival	CETIS Version: CETISv1.9.2		Official Results: Yes	
Analyzed: 21 Aug-18 9:48	Analysis: STP 2xK Contingency Tables				
Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU
Untransformed	C > T	100	> 100	n/a	1

Fisher Exact/Bonferroni-Holm Test						
Control	vs	Group	Test Stat	P-Type	P-Value	Decision(α:5%)
Lab Water Contr		6.25	0.500	Exact	1.0000	Non-Significant Effect
		12.5	1.000	Exact	1.0000	Non-Significant Effect
		25	0.500	Exact	1.0000	Non-Significant Effect
		50	1.000	Exact	1.0000	Non-Significant Effect
		100	1.000	Exact	1.0000	Non-Significant Effect

Data Summary							
Conc-%	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
0	LW	10	0	10	1	0	0.0%
6.25		9	1	10	0.9	0.1	10.0%
12.5		10	0	10	1	0	0.0%
25		9	1	10	0.9	0.1	10.0%
50		10	0	10	1	0	0.0%
100		10	0	10	1	0	0.0%



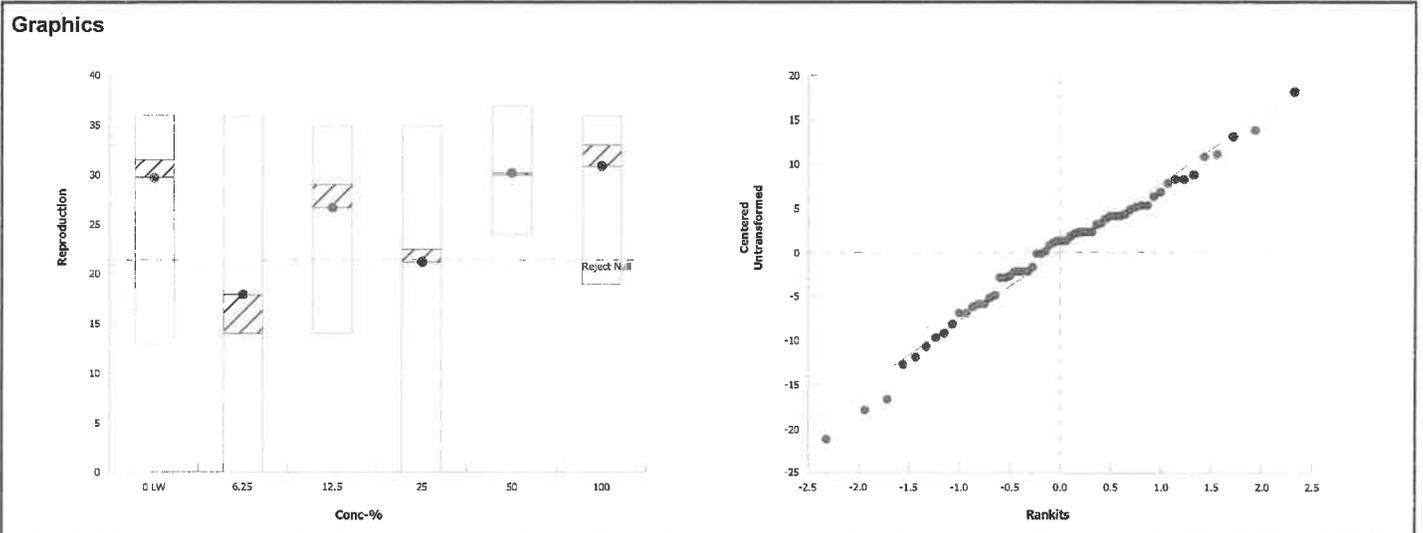
Ceriodaphnia Survival and Reproduction Test				Pacific EcoRisk			
Analysis ID:	18-3874-4327	Endpoint:	Reproduction	CETIS Version:	CETISv1.9.2		
Analyzed:	21 Aug-18 9:48	Analysis:	Parametric-Control vs Treatments	Official Results:	Yes		
Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	PMSD	
Untransformed	C > T	100	> 100	n/a	1	27.95%	

Dunnett Multiple Comparison Test									
Control	vs	Control II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Water Contr		6.25*	3.25	2.29	8.3	18	CDF	0.0044	Significant Effect
		12.5	0.827	2.29	8.3	18	CDF	0.4960	Non-Significant Effect
		25*	2.34	2.29	8.3	18	CDF	0.0443	Significant Effect
		50	-0.138	2.29	8.3	18	CDF	0.8711	Non-Significant Effect
		100	-0.331	2.29	8.3	18	CDF	0.9133	Non-Significant Effect

ANOVA Table						
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	1444.2	288.84	5	4.39	0.0020	Significant Effect
Error	3549.2	65.7259	54			
Total	4993.4		59			

Distributional Tests						
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)	
Variances	Bartlett Equality of Variance Test	13.8	15.1	0.0171	Equal Variances	
Distribution	Shapiro-Wilk W Normality Test	0.981	0.946	0.4810	Normal Distribution	

Reproduction Summary											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	LW	10	29.7	25.1	34.3	31.5	13	36	2.03	21.65%	0.00%
6.25		10	17.9	10	25.8	14	0	36	3.49	61.68%	39.73%
12.5		10	26.7	21	32.4	29	14	35	2.53	29.97%	10.10%
25		10	21.2	13.3	29.1	22.5	0	35	3.5	52.19%	28.62%
50		10	30.2	27.6	32.8	30	24	37	1.14	11.97%	-1.68%
100		10	30.9	26.9	34.9	33	19	36	1.78	18.21%	-4.04%



CETIS Analytical Report

Report Date: 21 Aug-18 09:48 (p 1 of 1)
 Test Code: 79258 | 17-8303-4899

Ceriodaphnia Survival and Reproduction Test **Pacific EcoRisk**

Analysis ID: 16-1037-1157	Endpoint: Reproduction	CETIS Version: CETISv1.9.2
Analyzed: 21 Aug-18 9:48	Analysis: Linear Interpolation (ICPIN)	Official Results: Yes

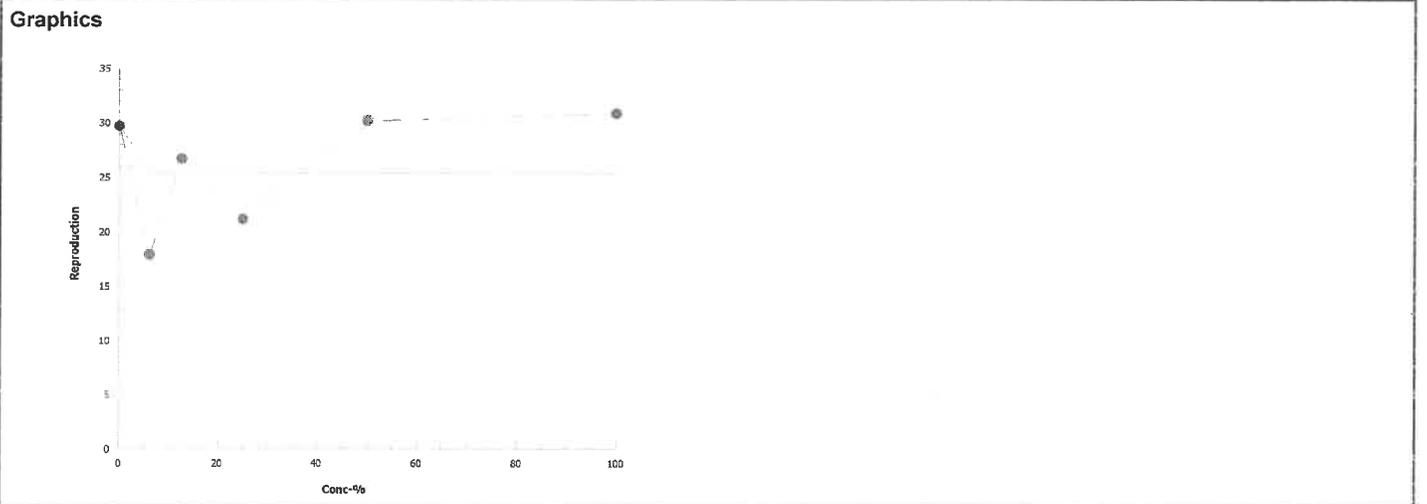
Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	226735	200	Yes	Two-Point Interpolation

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	2.15	1.22	n/a	46.55	n/a	82.14
IC10	4.3	2.43	n/a	23.27	n/a	41.07
IC15	>100	n/a	n/a	<1	n/a	n/a
IC20	>100	n/a	n/a	<1	n/a	n/a
IC25	>100	n/a	n/a	<1	n/a	n/a
IC40	>100	n/a	n/a	<1	n/a	n/a
IC50	>100	n/a	n/a	<1	n/a	n/a

Reproduction Summary			Calculated Variate						
Conc-%	Code	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	10	29.7	13	36	2.03	6.43	21.60%	0.0%
6.25		10	17.9	0	36	3.49	11	61.70%	39.7%
12.5		10	26.7	14	35	2.53	8	30.00%	10.1%
25		10	21.2	0	35	3.5	11.1	52.20%	28.6%
50		10	30.2	24	37	1.14	3.61	12.00%	-1.68%
100		10	30.9	19	36	1.78	5.63	18.20%	-4.04%



CETIS Summary Report

Report Date: 25 Aug-18 09:11 (p 1 of 2)
 Test Code: 79259 | 16-3645-9239

Ceriodaphnia Survival and Reproduction Test **Pacific EcoRisk**

Batch ID: 09-8772-2331	Test Type: Reproduction-Survival (7d)	Analyst: Jessica Okutsu
Start Date: 09 Aug-18 15:50	Protocol: EPA-821-R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 15 Aug-18 16:05	Species: Ceriodaphnia dubia	Brine: Not Applicable
Duration: 6d 0h	Source: In-House Culture	Age: 1

Sample ID: 21-0301-4145	Code: 38-ADOLF-067	Client: Larry Walker Associates
Sample Date: 08 Aug-18 09:20	Material: Ambient Water	Project: 29192
Receipt Date: 09 Aug-18 07:30	Source: Calleguas Creek	
Sample Age: 30h (0.6 °C)	Station: ADOLF	

Comments:
 Stats include reproduction outlier 50-B

Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	NOEL	LOEL	TOEL	TU	PMSD ✓
05-7414-6420	Reproduction	Steel Many-One Rank Sum Test	100	> 100	n/a	1	17.1%
13-0532-4504	Survival	Fisher Exact/Bonferroni-Holm Test	100	> 100	n/a	1	n/a

Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	Level	%	95% LCL	95% UCL	TU	✓
15-8406-9044	Reproduction	Linear Interpolation (ICPIN)	IC5	8.21	3.02	12.8	12.19	
			IC10	10.6	6.05	n/a	9.431	
			IC15	>100	n/a	n/a	<1	
			IC20	>100	n/a	n/a	<1	
			IC25	>100	n/a	n/a	<1	
			IC40	>100	n/a	n/a	<1	
			IC50	>100	n/a	n/a	<1	

Reproduction Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	10	32.6	30.7	34.5	29	36	0.846	2.67	8.21%	0.00%
6.25		10	32.3	28.8	35.8	22	39	1.56	4.95	15.31%	0.92%
12.5		10	27.3	22.1	32.5	15	34	2.31	7.3	26.75%	16.26%
25		10	25.5	20.5	30.5	16	36	2.23	7.04	27.62%	21.78%
50		10	27.2	23.8	30.6	15	32	1.52	4.8	17.66%	16.56%
100		10	32.2	29.1	35.3	25	39	1.39	4.39	13.64%	1.23%

Survival Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
6.25		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
12.5		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
25		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
50		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
100		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%

CETIS Summary Report

Report Date:

25 Aug-18 09:11 (p 2 of 2)

Test Code:

79259 | 16-3645-9239

Ceriodaphnia Survival and Reproduction Test											Pacific EcoRisk
Reproduction Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	34	36	30	34	30	31	35	31	29	36
6.25		38	31	34	39	34	28	22	31	31	35
12.5		27	15	33	30	34	21	32	32	16	33
25		30	28	30	29	36	28	26	16	16	16
50		28	15	29	32	29	25	25	30	30	29
100		25	33	33	25	35	32	39	32	32	36
Survival Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
6.25		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
12.5		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
25		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
50		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
100		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Survival Binomials											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
6.25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
12.5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
50		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
100		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1

CETIS Analytical Report

Report Date: 21 Aug-18 10:46 (p 1 of 1)
 Test Code: 79259 | 16-3645-9239

Ceriodaphnia Survival and Reproduction Test **Pacific EcoRisk**

Analysis ID: 13-0532-4504 Endpoint: Survival CETIS Version: CETISv1.9.2
 Analyzed: 21 Aug-18 10:45 Analysis: STP 2xK Contingency Tables Official Results: Yes

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU
Untransformed	C > T	100	> 100	n/a	1

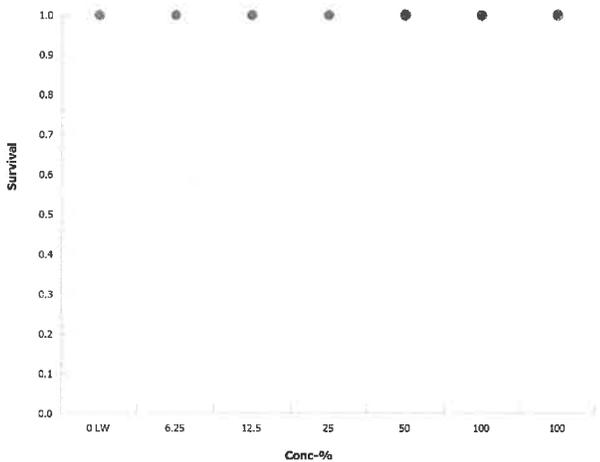
Fisher Exact/Bonferroni-Holm Test

Control	vs	Group	Test Stat	P-Type	P-Value	Decision(α:5%)
Lab Water Contr		6.25	1.000	Exact	1.0000	Non-Significant Effect
		12.5	1.000	Exact	1.0000	Non-Significant Effect
		25	1.000	Exact	1.0000	Non-Significant Effect
		50	1.000	Exact	1.0000	Non-Significant Effect
		100	1.000	Exact	1.0000	Non-Significant Effect

Data Summary

Conc-%	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
0	LW	10	0	10	1	0	0.0%
6.25		10	0	10	1	0	0.0%
12.5		10	0	10	1	0	0.0%
25		10	0	10	1	0	0.0%
50		10	0	10	1	0	0.0%
100		10	0	10	1	0	0.0%

Graphics



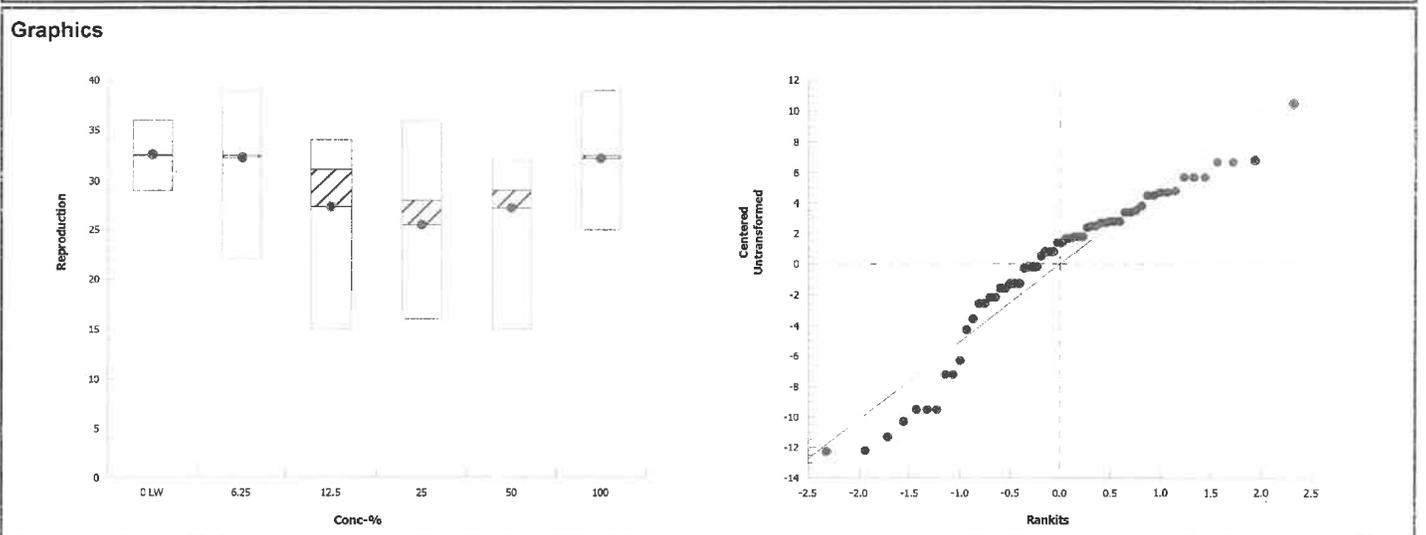
Ceriodaphnia Survival and Reproduction Test				Pacific EcoRisk		
Analysis ID: 05-7414-6420	Endpoint: Reproduction	CETIS Version: CETISv1.9.2		Official Results: Yes		
Analyzed: 21 Aug-18 10:46	Analysis: Nonparametric-Control vs Treatments					
Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	C > T	100	> 100	n/a	1	17.05%

Steel Many-One Rank Sum Test									
Control	vs	Conc-%	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Lab Water Contr		6.25	106	75	3	18	Asymp	0.8650	Non-Significant Effect
		12.5	83	75	2	18	Asymp	0.1611	Non-Significant Effect
		25*	68.5	75	4	18	Asymp	0.0126	Significant Effect
		50*	65.5	75	2	18	Asymp	0.0063	Significant Effect
		100	106	75	3	18	Asymp	0.8650	Non-Significant Effect

ANOVA Table						
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	508.683	101.737	5	3.45	0.0089	Significant Effect
Error	1592.3	29.487	54			
Total	2100.98		59			

Distributional Tests						
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)	
Variances	Bartlett Equality of Variance Test	10	15.1	0.0750	Equal Variances	
Distribution	Shapiro-Wilk W Normality Test	0.928	0.946	0.0016	Non-Normal Distribution	

Reproduction Summary											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	LW	10	32.6	30.7	34.5	32.5	29	36	0.846	8.21%	0.00%
6.25		10	32.3	28.8	35.8	32.5	22	39	1.56	15.31%	0.92%
12.5		10	27.3	22.1	32.5	31	15	34	2.31	26.75%	16.26%
25		10	25.5	20.5	30.5	28	16	36	2.23	27.62%	21.78%
50		10	27.2	23.8	30.6	29	15	32	1.52	17.66%	16.56%
100		10	32.2	29.1	35.3	32.5	25	39	1.39	13.64%	1.23%



CETIS Analytical Report

Report Date: 21 Aug-18 10:46 (p 1 of 1)
 Test Code: 79259 | 16-3645-9239

Ceriodaphnia Survival and Reproduction Test **Pacific EcoRisk**

Analysis ID: 15-8406-9044 Endpoint: Reproduction CETIS Version: CETISv1.9.2
 Analyzed: 21 Aug-18 10:46 Analysis: Linear Interpolation (ICPIN) Official Results: Yes

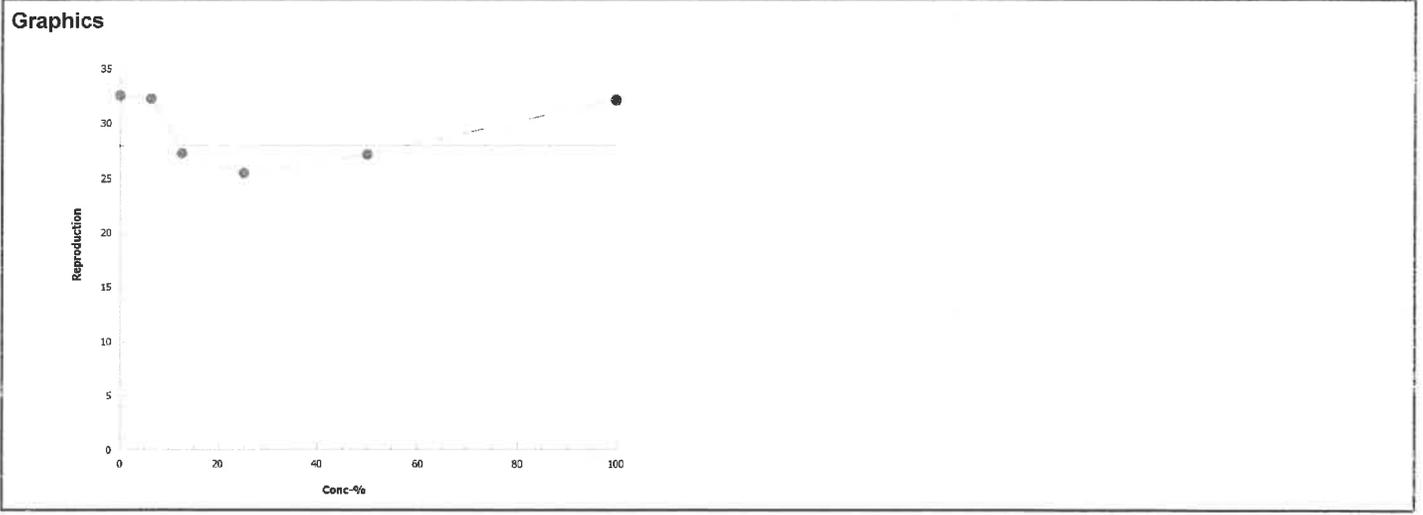
Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	566922	200	Yes	Two-Point Interpolation

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	8.21	3.02	12.8	12.19	7.814	33.07
IC10	10.6	6.05	n/a	9.431	n/a	16.53
IC15	>100	n/a	n/a	<1	n/a	n/a
IC20	>100	n/a	n/a	<1	n/a	n/a
IC25	>100	n/a	n/a	<1	n/a	n/a
IC40	>100	n/a	n/a	<1	n/a	n/a
IC50	>100	n/a	n/a	<1	n/a	n/a

Reproduction Summary			Calculated Variate						
Conc-%	Code	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	10	32.6	29	36	0.846	2.67	8.21%	0.0%
6.25		10	32.3	22	39	1.56	4.95	15.30%	0.92%
12.5		10	27.3	15	34	2.31	7.3	26.80%	16.3%
25		10	25.5	16	36	2.23	7.04	27.60%	21.8%
50		10	27.2	15	32	1.52	4.8	17.70%	16.6%
100		10	32.2	25	39	1.39	4.39	13.60%	1.23%



Appendix D

Test Data and Summary of Statistics for the Reference Toxicant Evaluation of the *Ceriodaphnia dubia*

CETIS Summary Report

Report Date: 20 Aug-18 15:59 (p 1 of 2)
 Test Code: 77556 | 09-0694-5539

Ceriodaphnia Survival and Reproduction Test							Pacific EcoRisk				
Batch ID: 07-3124-5846	Test Type: Reproduction-Survival (7d)	Analyst: Natalie Lynch									
Start Date: 09 Aug-18 13:10	Protocol: EPA-821-R-02-013 (2002)	Diluent: Laboratory Water									
Ending Date: 15 Aug-18 13:20	Species: Ceriodaphnia dubia	Brine: Not Applicable									
Duration: 6d 0h	Source: In-House Culture	Age: 1									
Sample ID: 20-3435-5351	Code: NaCl	Client: Reference Toxicant									
Sample Date: 09 Aug-18 13:10	Material: Sodium chloride	Project: 28694									
Receipt Date: 09 Aug-18 13:10	Source: Reference Toxicant										
Sample Age: n/a (24.5 °C)	Station: In House										
Multiple Comparison Summary											
Analysis ID	Endpoint	Comparison Method	NOEL	LOEL	TOEL	TU	PMSD				
20-4536-6999	Reproduction	Steel Many-One Rank Sum Test	500	1000	707.1		13.9%				
14-0437-8553	Survival	Fisher Exact/Bonferroni-Holm Test	2000	> 2000	n/a		n/a				
Point Estimate Summary											
Analysis ID	Endpoint	Point Estimate Method	Level	mg/L	95% LCL	95% UCL	TU				
21-1613-8729	Reproduction	Linear Interpolation (ICPIN)	IC5	451	215	671					
			IC10	632	431	965					
			IC15	780	599	1080					
			IC20	928	710	1180					
			IC25	1070	809	1290					
			IC40	1470	1180	1560					
07-7427-3644	Survival	Spearman-Kärber	EC50	2020	1870	2190					
Reproduction Summary											
Conc-mg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	10	34.3	31.8	36.8	27	38	1.09	3.43	10.01%	0.00%
500		10	32.4	30.9	33.9	29	35	0.653	2.07	6.38%	5.54%
1000		10	26.6	20.9	32.3	5	33	2.5	7.9	29.72%	22.45%
1500		10	20.2	16.5	23.9	7	26	1.63	5.16	25.54%	41.11%
2000		10	2.3	0.0618	4.54	0	10	0.989	3.13	136.03%	93.29%
2500		10	0	0	0	0	0	0	0		100.00%
Survival Summary											
Conc-mg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
500		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
1000		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
1500		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
2000		10	0.600	0.231	0.969	0.000	1.000	0.163	0.516	86.07%	40.00%
2500		10	0.000	0.000	0.000	0.000	0.000	0.000	0.000		100.00%

CETIS Summary Report

Report Date: 20 Aug-18 15:59 (p 2 of 2)

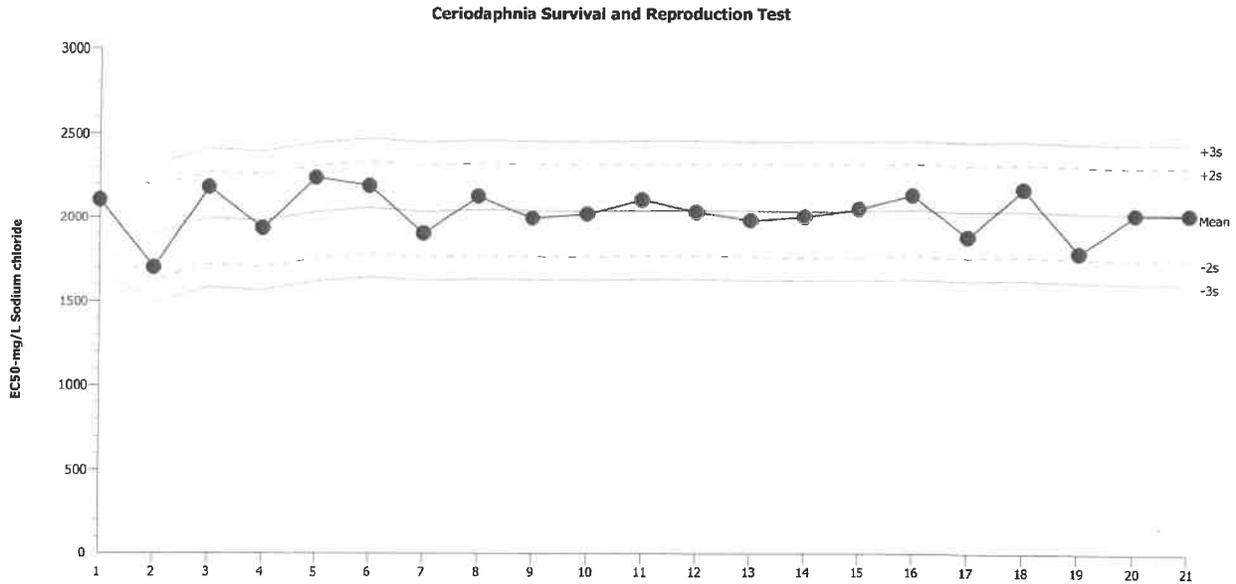
Test Code: 77556 | 09-0694-5539

Ceriodaphnia Survival and Reproduction Test											Pacific EcoRisk
Reproduction Detail											
Conc-mg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	27	36	37	34	38	34	34	30	37	36
500		35	34	30	32	33	29	34	34	33	30
1000		26	27	31	27	5	30	33	28	28	31
1500		20	21	22	20	23	7	26	24	21	18
2000		2	1	4	0	4	0	0	0	10	2
2500		0	0	0	0	0	0	0	0	0	0
Survival Detail											
Conc-mg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
500		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1000		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1500		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2000		1.000	1.000	1.000	0.000	1.000	0.000	0.000	0.000	1.000	1.000
2500		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Survival Binomials											
Conc-mg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
500		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
1000		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
1500		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
2000		1/1	1/1	1/1	0/1	1/1	0/1	0/1	0/1	1/1	1/1
2500		0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1

Ceriodaphnia Survival and Reproduction Test

Pacific EcoRisk

Test Type: Reproduction-Survival (7d) Organism: Ceriodaphnia dubia (Water Flea) Material: Sodium chloride
 Protocol: EPA-821-R-02-013 (2002) Endpoint: Survival Source: Reference Toxicant-REF



Mean: 2027 Count: 20 -2s Warning Limit: 1751 -3s Action Limit: 1613
 Sigma: 137.9 CV: 6.80% +2s Warning Limit: 2303 +3s Action Limit: 2441

Quality Control Data

Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2018	May	15	13:30	2105	78.43	0.5688			16-4268-6120	20-7219-2293
2			16	16:20	1699	-328	-2.378	(-)		20-5222-9935	20-8130-5363
3			22	10:35	2180	152.7	1.107			20-7596-9858	09-4058-4083
4			29	11:37	1932	-94.57	-0.6858			09-8749-9744	04-2627-6300
5		Jun	5	14:08	2236	209.1	1.516			04-5822-6675	02-2081-1071
6			7	11:31	2187	160.2	1.162			08-4916-1928	13-5513-7455
7			12	11:41	1901	-126	-0.914			14-4745-2011	18-9035-3977
8			13	14:25	2125	97.71	0.7086			19-2393-8522	07-5834-3927
9			19	14:34	1993	-34.1	-0.2473			03-7063-4652	04-3563-8944
10			26	16:28	2019	-8.098	-0.05872			09-6580-2317	07-9413-5393
11			27	14:43	2105	78.43	0.5688			03-9707-5652	20-4809-0982
12			28	13:15	2031	4.473	0.03244			16-4401-3277	19-4921-0162
13		Jul	4	9:42	1979	-48.09	-0.3487			13-9510-4137	10-4592-1027
14			10	13:24	2003	-23.9	-0.1733			01-4657-2498	01-5796-5182
15			19	10:56	2050	22.88	0.1659			18-6392-3673	18-4330-1296
16			24	13:59	2133	106.1	0.7691			13-3663-2790	12-3150-8357
17			26	15:50	1882	-145.2	-1.053			01-7685-3194	04-2471-7658
18			31	11:58	2170	142.8	1.035			06-2404-4020	09-7719-1196
19		Aug	7	13:57	1788	-238.9	-1.733			01-0160-7769	18-8978-8811
20			8	9:55	2019	-8.098	-0.05872			01-0572-3154	15-4606-8444
21			9	13:10	2019	-8.098	-0.05872			09-0694-5539	07-7427-3644

Ceriodaphnia Survival and Reproduction Test

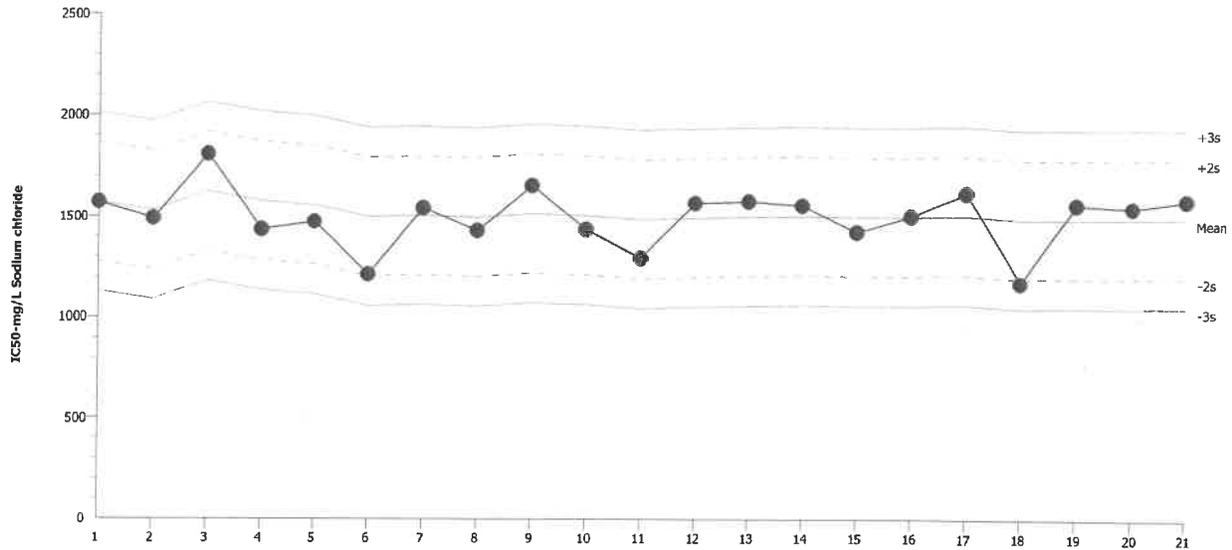
Pacific EcoRisk

Test Type: Reproduction-Survival (7d)
Protocol: EPA-821-R-02-013 (2002)

Organism: Ceriodaphnia dubia (Water Flea)
Endpoint: Reproduction

Material: Sodium chloride
Source: Reference Toxicant-REF

Ceriodaphnia Survival and Reproduction Test



Mean: 1493 Count: 20 -2s Warning Limit: 1198 -3s Action Limit: 1051
Sigma: 147.1 CV: 9.85% +2s Warning Limit: 1787 +3s Action Limit: 1934

Quality Control Data

Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2018	May	15	13:30	1572	78.84	0.536			16-4268-6120	12-4013-1950
2			16	16:20	1489	-3.563	-0.02422			20-5222-9935	15-6036-6555
3			22	10:35	1807	314.3	2.137	(+)		20-7596-9858	13-3271-6615
4			29	11:37	1434	-59	-0.4011			09-8749-9744	08-7109-7854
5		Jun	5	14:08	1472	-21.04	-0.143			04-5822-6675	13-8948-8302
6			7	11:31	1212	-281.3	-1.912			08-4916-1928	00-1438-9970
7			12	11:41	1542	49.02	0.3332			14-4745-2011	12-8648-9916
8			13	14:25	1428	-65.03	-0.4421			19-2393-8522	21-4567-7885
9			19	14:34	1652	159.5	1.084			03-7063-4652	11-3261-1315
10			26	16:28	1434	-58.53	-0.3979			09-6580-2317	16-2552-7203
11			27	14:43	1293	-199.5	-1.356			03-9707-5652	10-7898-6671
12			28	13:15	1567	73.9	0.5024			16-4401-3277	16-4152-8097
13		Jul	4	9:42	1575	81.64	0.555			13-9510-4137	19-4211-3444
14			10	13:24	1555	61.82	0.4203			01-4657-2498	02-2185-2355
15			19	10:56	1421	-71.75	-0.4878			18-6392-3673	06-5513-3930
16			24	13:59	1500	7	0.04759			13-3663-2790	13-8151-7318
17			26	15:50	1616	123.4	0.8386			01-7685-3194	13-4137-5261
18			31	11:58	1171	-321.7	-2.187	(-)		06-2404-4020	03-7705-2658
19		Aug	7	13:57	1562	68.64	0.4666			01-0160-7769	01-7843-4848
20			8	9:55	1547	54.1	0.3678			01-0572-3154	07-9535-1554
21			9	13:10	1585	92.2	0.6268			09-0694-5539	21-1613-8729

Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: _____ Reference Toxicant: _____ Material: Sodium Chloride Test Date: 8/9/18
 Project #: 28694 Test ID: 77556 Randomization: 10.7.1 Control Water: Mod EPAMH

Day	pH		D.O.		Cond. (µS/cm)		Temp (°C)	Survival / Reproduction										SIGN-OFF		
	New	Old	New	Old	New	Old		A	B	C	D	E	F	G	H	I	J			
0	8.00		7.4		346		24.5	0	0	0	0	0	0	0	0	0	0	Date: 8/9/18 Sol'n Prep: MB	New WQ: TF Old WQ: TF	Test Init: OK Time: 1316
1	8.00	7.74	8.2	7.4	352	371	25.6	0	0	0	0	0	0	0	0	0	0	Date: 8/10/18 Sol'n Prep: MB	New WQ: TA Old WQ: mtl	Counts: MS Time: 1307
2	7.95	7.86	8.3	7.2	354	373	24.1	0	0	0	0	0	0	0	0	0	0	Date: 8/11/18 Sol'n Prep: SD	New WQ: NB Old WQ: mtl	Counts: SD Time: 1635
3	7.91	7.92	8.2	6.9	363	371	24.6	0	0	0	0	5	0	0	0	0	0	Date: 8/12/18 Sol'n Prep: BV	New WQ: SF Old WQ: mtl	Counts: CR Time: 1612
4	8.01	7.75	8.2	6.5	362	368	24.7	6	6	7	7	7	0	6	7	6	6	Date: 8/13/18 Sol'n Prep: BV	New WQ: SF Old WQ: AR	Counts: TR Time: 1412
5	7.77	7.81	8.0	7.5	351	367	25.1	11	13	14	13	14	13	13	12	15	13	Date: 8/14/18 Sol'n Prep: MB	New WQ: NB Old WQ: AR	Counts: SL Time: 1615
6	8.25	7.90	6.7	7.7	356	374	24.0	10	17	16	14	17	16	15	11	16	17	Date: 8/15/18 Sol'n Prep: SL	New WQ: TA Old WQ: DH	Counts: SD Time: 1320
7																		Date: _____ Sol'n Prep: _____	New WQ: _____ Old WQ: _____	Counts: _____ Time: _____
8																		Date: _____ Sol'n Prep: _____	New WQ: _____ Old WQ: _____	Counts: _____ Time: _____
Total=								27	36	37	34	38	34	34	30	37	36	Mean Neonates/Female = 34.3		

Day	pH		D.O.		Cond. (µS/cm)		Temp (°C)	Survival / Reproduction										RT BATCH NUMBER
	New	Old	New	Old	New	Old		A	B	C	D	E	F	G	H	I	J	
0	8.00		7.4		1321		24.4	0	0	0	0	0	0	0	0	0	0	280
1	7.99	7.75	8.3	7.7	1337	1375	25.5	0	0	0	0	0	0	0	0	0	0	280/281
2	7.89	7.86	8.4	7.5	1268	1432	24.3	0	0	0	0	0	0	0	0	0	0	281
3	7.91	7.90	8.1	6.6	1364	1384	24.9	0	0	0	0	5	0	0	0	0	0	281
4	7.90	7.79	8.0	6.5	1305	1412	24.5	5	6	5	6	7	0	7	7	6	5	281
5	7.78	7.83	8.9	7.8	1310	1350	24.9	12	14	14	11	12	11	12	11	13	12	281
6	8.15	7.93	7.2	7.8	1257	1400	24.1	18	14	11	15	14	13	15	16	14	13	281
7																		
8																		
Total=								35	34	30	32	33	34	34	33	30	Mean Neonates/Female = 31.4	

Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: _____ Reference Toxicant: _____ Material: Sodium Chloride Test Date: 8/9/18
 Project #: 28694 Test ID: 77556 Randomization: 10,7,1 Control Water: Mod EPAMH

	Day	pH		D.O.		Cond. (µS/cm)		Temp (°C)	Survival / Reproduction											
		New	Old	New	Old	New	Old		A	B	C	D	E	F	G	H	I	J		
1000 mg/L	0	7.89		7.9		2264		24.7	0	0	0	0	0	0	0	0	0	0	0	
	1	7.99	7.74	8.5	7.5	2225	2366	25.7	0	0	0	0	0	0	0	0	0	0	0	
	2	7.86	7.84	8.5	7.6	2268	2374	24.1	0	0	0	0	0	0	0	0	0	0	0	
	3	7.90	7.85	8.1	7.5	2292	2357	24.7	0	0	0	0	3	6	0	0	0	0		
	4	7.87	7.79	8.8	6.4	2302	2370	24.7	5	5	5	5	0	0	7	6	3	7		
	5	7.77	7.80	9.4	7.9	2284	2367	24.8	13	10	13	11	2	11	12	10	11	12		
	6	8.09	7.88	7.6	7.8	2201	2371	24.0	8	12	13	11	0	13	14	12	14	12		
	7																			
	8																			
Total=									26	27	31	27	5	30	33	28	28	31	Mean Neonates/Female = 26.6	
1500 mg/L	0	7.85		8.2		3199		24.7	0	0	0	0	0	0	0	0	0	0		
	1	7.98	7.71	8.7	7.5	3240	3324	25.8	0	0	0	0	0	0	0	0	0	0		
	2	7.84	7.81	8.6	7.4	3195	3376	24.2	0	0	0	0	0	0	0	0	0	0		
	3	7.40	7.76	8.3	6.9	3200	3341	24.7	0	0	0	0	3	0	0	2	0			
	4	7.84	7.76	9.1	6.6	3207	3183	24.6	3	3	3	1	1	0	4	4	0	2		
	5	7.75	7.84	9.5	7.9	3141	3357	24.9	7	9	8	10	9	0	9	10	8	7		
	6	8.04	7.84	7.9	7.7	3080	3323	24.1	10	9	11	9	13	4	13	10	11	9		
	7																			
	8																			
Total=									20	21	22	20	23	7	26	24	21	18	Mean Neonates/Female = 20.2	

Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: _____ Reference Toxicant: _____ Material: Sodium Chloride Test Date: 8/9/12
 Project #: 28694 Test ID: 77556 Randomization: 10.7.1 Control Water: Mod EPAMH

	Day	pH		D.O.		Cond. (µS/cm)		Temp (°C)	Survival / Reproduction										
		New	Old	New	Old	New	Old		A	B	C	D	E	F	G	H	I	J	
2000 mg/L	0	7.82		8.6		4146		24.8	0	0	0	0	0	0	0	0	0	0	
	1	7.96	7.72	8.9	7.7	4149	4379	25.6	0	0	0	x/0	0	0	x/0	x/0	0	0	
	2	7.83	7.79	8.7	7.5	4084	4445	24.6	0	0	0	-	0	0	-	-	0	0	
	3	7.89	7.71	8.6	6.7	4138	4275	25.0	0	0	0	-	0	x/0	-	-	0	0	
	4	7.83	7.73	9.3	6.2	4118	3952	24.8	0	0	0	-	0	-	-	-	0	0	
	5	7.78	7.81	9.7	8.0	4142	4236	24.8	2	1	0	-	0	-	-	-	3	2	
	6	7.99	7.81	8.3	7.6	4065	4270	24.1	0	0	4	-	4	-	-	-	7	0	
	7												-	-	-	-			
	8												-	-	-	-			
Total=									2	1	4	x/0	4	x/0	x/0	x/0	10	2	Mean Neonates/Female = 2.3
2500 mg/L	0	7.79		8.9		5037		24.6	0	0	0	0	0	0	0	0	0	0	
	1	7.94	7.71	9.2	7.5	5042	5215	25.4	x/0	x/0	x/0	x/0	x/0	x/0	x/0	x/0	x/0	x/0	
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	7																		
	8																		
Total=									x/0	x/0	x/0	x/0	x/0	x/0	x/0	x/0	x/0	x/0	Mean Neonates/Female = 0.0

Appendix E

Test Data and Summary of Statistics for the Evaluation of the Toxicity of the Calleguas Creek Ambient Waters to *Hyalella azteca*

CETIS Summary Report

Report Date: 28 Aug-18 14:57 (p 1 of 1)
 Test Code: 79260 | 14-3407-2701

Hyalella Survival and Growth Test Pacific EcoRisk

Batch ID: 17-6135-1557	Test Type: Survival	Analyst: Jessica Okutsu
Start Date: 09 Aug-18 15:47	Protocol: EPA/600/R-99/064 M	Diluent: Laboratory Water
Ending Date: 19 Aug-18 12:47	Species: Hyalella azteca	Brine: Not Applicable
Duration: 9d 21h	Source: Aquatic Biosystems, CO	Age: 9

Sample ID: 12-6507-7001	Code: 68-WOOD-119	Client: Larry Walker Associates
Sample Date: 08 Aug-18 15:20	Material: Ambient Water	Project: 29192
Receipt Date: 09 Aug-18 07:30	Source: Calleguas Creek	
Sample Age: 24h (1.5 °C)	Station: WOOD	

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result
19-9809-0156	Survival Rate	Wilcoxon Rank Sum Two-Sample Test	1.0000	Culture Control passed survival rate

Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	NOEL	LOEL	TOEL	TU	PMSD ✓
11-8768-6983	Survival Rate	Steel Many-One Rank Sum Test	100	> 100	n/a	1	11.7%

Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	cu	5	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
0	LW	5	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
6.25		5	0.967	0.874	1.000	0.833	1.000	0.033	0.075	7.71%	3.33%
12.5		5	0.980	0.924	1.000	0.900	1.000	0.020	0.045	4.56%	2.00%
25		5	0.980	0.924	1.000	0.900	1.000	0.020	0.045	4.56%	2.00%
50		5	0.920	0.758	1.000	0.700	1.000	0.058	0.130	14.17%	8.00%
100		5	0.900	0.724	1.000	0.700	1.000	0.063	0.141	15.71%	10.00%

Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	cu	1.000	1.000	1.000	1.000	1.000
0	LW	1.000	1.000	1.000	1.000	1.000
6.25		1.000	1.000	1.000	0.833	1.000
12.5		1.000	1.000	0.900	1.000	1.000
25		1.000	1.000	0.900	1.000	1.000
50		1.000	0.700	0.900	1.000	1.000
100		1.000	0.800	0.700	1.000	1.000

Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	cu	10/10	10/10	10/10	10/10	10/10
0	LW	10/10	10/10	10/10	11/11	10/10
6.25		10/10	10/10	10/10	10/12	10/10
12.5		10/10	10/10	9/10	10/10	10/10
25		10/10	10/10	9/10	10/10	10/10
50		10/10	7/10	9/10	10/10	10/10
100		10/10	8/10	7/10	10/10	10/10

CETIS Analytical Report

Report Date: 21 Aug-18 09:22 (p 1 of 3)
 Test Code: 79260 | 14-3407-2701

Hyalella Survival and Growth Test Pacific EcoRisk

Analysis ID: 19-9809-0156 Endpoint: Survival Rate CETIS Version: CETISv1.9.2
 Analyzed: 21 Aug-18 9:20 Analysis: Nonparametric-Two Sample Official Results: Yes

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	Culture Control passed survival rate	2.54%

Wilcoxon Rank Sum Two-Sample Test

Control	vs	Control II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Lab Water Contr		Culture Control	27.5	n/a	1	8	Exact	1.0000	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	5.547E-06	5.547E-06	1	1	0.3466	Non-Significant Effect
Error	4.437E-05	5.547E-06	8			
Total	4.992E-05		9			

Distributional Tests

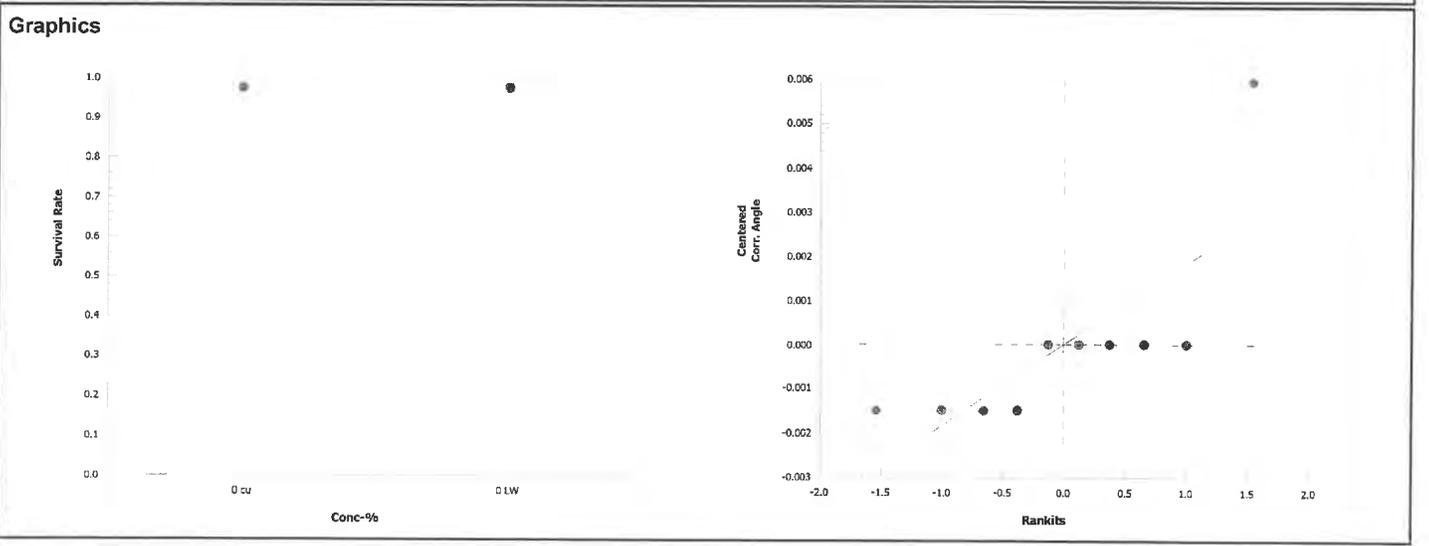
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Levene Equality of Variance Test	7.11	11.3	0.0285	Equal Variances
Variances	Mod Levene Equality of Variance Test	1	13.7	0.3559	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.625	0.741	1.1E-04	Non-Normal Distribution

Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	cu	5	1.000	1.000	1.000	1.000	1.000	1.000	0.000	0.00%	0.00%
0	LW	5	1.000	1.000	1.000	1.000	1.000	1.000	0.000	0.00%	0.00%

Angular (Corrected) Transformed Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	cu	5	1.41	1.41	1.41	1.41	1.41	1.41	0	0.00%	0.00%
0	LW	5	1.41	1.41	1.42	1.41	1.41	1.42	0.00149	0.24%	-0.11%



CETIS Analytical Report

Report Date: 21 Aug-18 09:22 (p 2 of 3)
 Test Code: 79260 | 14-3407-2701

Hyaella Survival and Growth Test						Pacific EcoRisk		
Analysis ID: 11-8768-6983		Endpoint: Survival Rate		CETIS Version: CETISv1.9.2				
Analyzed: 21 Aug-18 9:21		Analysis: Nonparametric-Control vs Treatments		Official Results: Yes				
Data Transform		Alt Hyp		NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T		100	> 100	n/a	1	11.73%

Steel Many-One Rank Sum Test									
Control	vs	Conc-%	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Lab Water Contr		6.25	25	16	1	8	Asymp	0.6353	Non-Significant Effect
		12.5	25	16	1	8	Asymp	0.6353	Non-Significant Effect
		25	25	16	1	8	Asymp	0.6353	Non-Significant Effect
		50	22.5	16	1	8	Asymp	0.3937	Non-Significant Effect
		100	22.5	16	1	8	Asymp	0.3937	Non-Significant Effect

ANOVA Table						
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0787999	0.01576	5	0.951	0.4666	Non-Significant Effect
Error	0.397593	0.0165664	24			
Total	0.476393		29			

Distributional Tests						
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)	
Variances	Bartlett Equality of Variance Test	29.7	15.1	1.7E-05	Unequal Variances	
Distribution	Shapiro-Wilk W Normality Test	0.859	0.903	9.5E-04	Non-Normal Distribution	

Survival Rate Summary											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	LW	5	1.000	1.000	1.000	1.000	1.000	1.000	0.000	0.00%	0.00%
6.25		5	0.967	0.874	1.000	1.000	0.833	1.000	0.033	7.71%	3.33%
12.5		5	0.980	0.924	1.000	1.000	0.900	1.000	0.020	4.56%	2.00%
25		5	0.980	0.924	1.000	1.000	0.900	1.000	0.020	4.56%	2.00%
50		5	0.920	0.758	1.000	1.000	0.700	1.000	0.058	14.17%	8.00%
100		5	0.900	0.724	1.000	1.000	0.700	1.000	0.063	15.71%	10.00%

Angular (Corrected) Transformed Summary											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	LW	5	1.41	1.41	1.42	1.41	1.41	1.42	0.00149	0.24%	0.00%
6.25		5	1.36	1.21	1.51	1.41	1.15	1.41	0.0524	8.61%	3.81%
12.5		5	1.38	1.29	1.47	1.41	1.25	1.41	0.0326	5.28%	2.41%
25		5	1.38	1.29	1.47	1.41	1.25	1.41	0.0326	5.28%	2.41%
50		5	1.3	1.07	1.52	1.41	0.991	1.41	0.0823	14.21%	8.37%
100		5	1.27	1.01	1.52	1.41	0.991	1.41	0.0908	16.02%	10.37%

Hyalella Survival and Growth Test

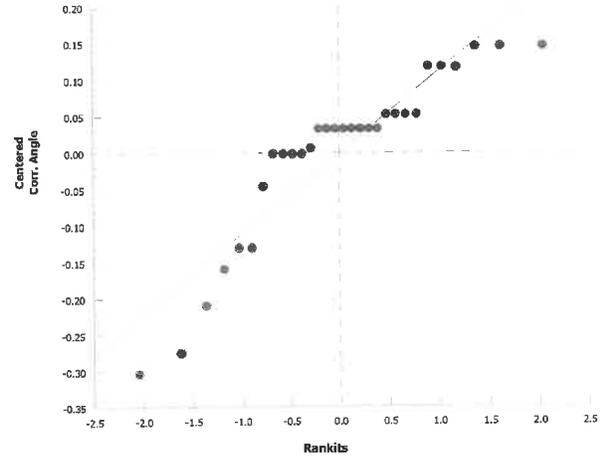
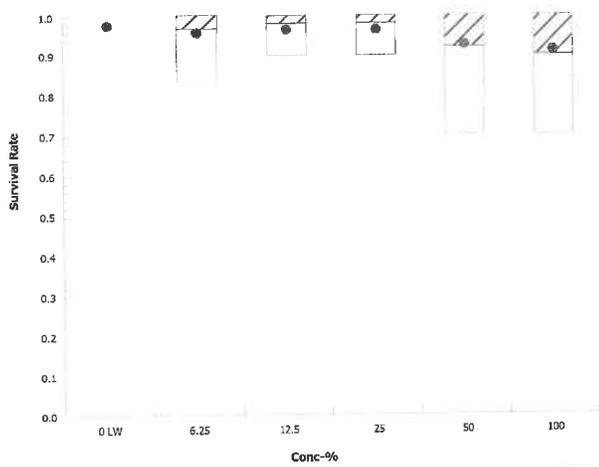
Pacific EcoRisk

Analysis ID: 11-8768-6983
Analyzed: 21 Aug-18 9:21

Endpoint: Survival Rate
Analysis: Nonparametric-Control vs Treatments

CETIS Version: CETISv1.9.2
Official Results: Yes

Graphics



10 Day Acute *Hyaella azteca* Toxicity Test Data

Client: LWA-Calleguas Creek Organism Log#: 1127 Age: 8-9 d
 Test Material: Controls Organism Supplier: ABS
 Test ID#: - Project #: 29192 Control/Diluent: SAM 5 (Conductivity Adjusted)
 Test Date: 8/9/18 Control Water Batch: 343

Treatment	Temp (°C)	pH		D.O. (mg/L)		Conductivity (µS/cm)	# Live Organisms					S/JN-OFF
		new	old	new	old		A	B	C	D	E	
Lab Control (Cond. Adj.)	23.2	7.79		7.3		4240	10	10	10	10	10	Date: 8/9/18 Sample ID: 50515
Culture Control	22.4	7.96		7.7		398	10	10	10	10	10	Test Solution Prep: BV New WQ: 7F
Meter ID	1134	PH19		RD10		EC13						Initiation Time: 1547 Initiation Signoff: NB
Lab Control (Cond. Adj.)	22.0			7.7			10	10	10	10	10	Date: 8/10/18 Count Time: 0946
Culture Control	22.0			7.6			10	10	10	10	10	Count Signoff: AEC Old WQ: SB
Meter ID	110A			RD11								
Lab Control (Cond. Adj.)	22.9			6.0			10	10	10	10	10	Date: 8/11/18 Count Time: 0817
Culture Control	22.9			6.8			10	10	10	10	10	Count Signoff: RB Old WQ: RAP
Meter ID	1104			RD13								Feed: RB
Lab Control (Cond. Adj.)	23.1			6.5			10	10	10	11	10	Date: 8/12/18 Count Time: 1021
Culture Control	23.1			6.4			10	10	10	10	10	Count Signoff: BV Old WQ: RM
Meter ID	81A			RD11								
Lab Control (Cond. Adj.)	23.3			2.6			10	10	10	11	10	Date: 8/13/18 Count Time: 1024
Culture Control	23.1			2.7			10	10	10	10	10	Count Signoff: BV Old WQ: RF
Meter ID	81A			RD10								Feed: RBV
Lab Control (Cond. Adj.)	22.9	7.82	7.83	8.6	8.1	4236	10	10	10	10	10	Date: 8/14/18 Sample ID: -
Culture Control	23.0	7.93	7.84	8.5	7.8	411	10	10	10	10	10	Test Solution Prep: LB New WQ: BR
Meter ID	40A	PH25	PH28	RD11	RD11	EC11						Renewal Time: 1656 Renewal Signoff: SMC Old WQ: KL
Lab Control (Cond. Adj.)	23.1			6.5			10	10	10	11	10	Date: 8/15/18 Count Time: 1020
Culture Control	23.1			6.6			10	10	10	10	10	Count Signoff: SF Old WQ: DH
Meter ID	40A			RD11								Feed: SF
Lab Control (Cond. Adj.)	23.3			5.2			10	10	10	11	10	Date: 8/16/18 Count Time: 1420
Culture Control	23.3			4.8			10	10	10	10	10	Count Signoff: SV Old WQ: DM
Meter ID	42A			RD12								
Lab Control (Cond. Adj.)	23.4			5.0			10	10	10	11	10	Date: 8/17/18 Count Time: 1020
Culture Control	23.3			4.1			10	10	10	10	10	Count Signoff: JO Old WQ: SMC
Meter ID	107A			RD10								Feed: JO
Lab Control (Cond. Adj.)	22.7			7.5			10	10	10	11	10	Date: 8/18/18 Count Time: 1637
Culture Control	22.4			7.5			10	10	10	10	10	Count Signoff: AP Old WQ: MJC
Meter ID	107A			RD11								
Lab Control (Cond. Adj.)	23.3		7.78	7.6		4879	10	10	10	11	10	Date: 8/19/18 Termination Time: 1247
Culture Control	23.7		7.82	7.7		493	10	10	10	10	10	Termination Signoff: MJC Old WQ: MJC
Meter ID	81A		PH24	RD11		EC10						

10 Day Acute *Hyaella azteca* Toxicity Test Data

Client: LWA-Calleguas Creek Organism Log#: 11127 Age: 89d
 Test Material: CCWTMP-68-WOOD-119 Organism Supplier: ABS
 Test ID#: 79260 Project #: 29192 Control/Diluent: SAM 5 (Conductivity Adjusted)
 Test Date: 8/9/18 Control Water Batch: 343

Treatment	Temp (°C)	pH		D.O. (mg/L)		Conductivity (µS/cm)	# Live Organisms					SIGN-OFF
		new	old	new	old		A	B	C	D	E	
Lab Control (Cond. Adj.)	23.2	7.79		7.3		4240	10	10	10	10	10	Date: 8/9/18 Sample ID: 50515
6.25%	22.3	7.94		7.8		4221	10	10	10	10	10	Test Solution Prep: BV New WQ: TF
12.5%	22.3	8.10		7.9		4290	10	10	10	10	10	Initiation Time: 1547 Initiation Signoff: JB
25%	22.3	8.26		8.1		4285	10	10	10	10	10	
50%	22.4	8.39		8.4		4310 4320	10	10	10	10	10	
100%	22.4	8.47		10.4		4240	10	10	10	10	10	
Meter ID	115A	PH19		RD10		EC17						
Lab Control (Cond. Adj.)	22.0			7.7			10	10	10	10	10	Date: 8/10/18 Count Time: 0846
6.25%	22.0			7.4			10	10	10	10	10	Count Signoff: ADF Old WQ: SB
12.5%	22.0			7.6			10	10	10	10	10	
25%	22.0			7.7			10	10	10	10	10	
50%	22.1			8.4			10	10	10	10	10	
100%	22.0			8.2			10	10	10	10	10	
Meter ID	110A			RD2								
Lab Control (Cond. Adj.)	22.9			6.0			10	10	10	10	10	Date: 8/14/18 Count Time: 0817
6.25%	22.9			5.1			10	10	10	12	10	Count Signoff: RB Old WQ: RAP
12.5%	22.8			5.4			10	10	10	10	10	Feed: RB
25%	22.8			5.4			10	10	10	10	10	
50%	22.9			5.5			10	10	10	10	10	
100%	22.8			5.8			10	10	10	10	10	
Meter ID	110D			RD3								
Lab Control (Cond. Adj.)	23.1			6.5			10	10	10	11	10	Date: 8/12/18 Count Time: 1021
6.25%	23.2			6.4			10	10	10	11	10	Count Signoff: BV Old WQ: RM
12.5%	23.5			6.4			10	10	9	10	10	
25%	23.6			6.6			10	10	10	10	10	
50%	23.2			6.5			10	9	10	10	10	
100%	23.0			6.2			10	9	9	10	10	
Meter ID	81A			RD11								

10 Day Acute *Hyalella azteca* Toxicity Test Data

Client: LWA-Calleguas Creek Organism Log#: 11127 Age: 8-9d
 Test Material: CCWTMP-68-WOOD-119 Organism Supplier: ABS
 Test ID#: 79260 Project #: 29192 Control/Diluent: SAM 5 (Conductivity Adjusted)
 Test Date: 8/9/18 Control Water Batch: 343

Treatment	Temp (°C)	pH		D.O. (mg/L)		Conductivity (µS/cm)	# Live Organisms					SIGN-OFF
		new	old	new	old		A	B	C	D	E	
Lab Control (Cond. Adj.)	23.3					2.6	10	10	10	11	10	Date: 8/13/18 Count Time: 1024 Count Signoff: RBV Old WQ: # Feed: BV
6.25%	23.5					2.5	10	10	10	10	10	
12.5%	23.5					2.9	10	10	9	10	10	
25%	23.6					3.1	10	10	10	10	10	
50%	23.5					3.3	10	9	10	10	10	
100%	23.3					2.9	10	8	8	10	10	
Meter ID	91A					RD10						
Lab Control (Cond. Adj.)	22.9	7.82	7.83	8.6	8.1	4236	10	10	10	11	10	Date: 8/14/18 Sample ID: 50515 Test Solution Prep: LZ New WQ: EP Renewal Time: 1656 Renewal Signoff: SMC Old WQ: KL
6.25%	22.9	7.99	7.80	8.8	7.7	4258	10	10	10	10	10	
12.5%	23.0	8.17	7.90	8.8	7.8	4282	10	10	9	10	10	
25%	23.1	8.28	8.61	9.0	8.0	4325	10	10	10	10	10	
50%	23.1	8.40	8.08	9.2	7.8	4322	10	9	10	10	10	
100%	23.0	8.48	8.32	10.1	8.0	4205	10	8	8	10	10	
Meter ID	40A	MZS	PHCS	Roll	RD1	6CU						
Lab Control (Cond. Adj.)	23.1					6.5	10	10	10	11	10	Date: 8/15/18 Count Time: 1020 Count Signoff: SF Old WQ: DH Feed: SF
6.25%	23.1					7.2	10	10	10	10	10	
12.5%	23.2					7.4	10	10	9	10	10	
25%	23.3					7.2	10	10	10	10	10	
50%	23.1					7.2	10	9	10	10	10	
100%	23.2					7.3	10	8	8	10	10	
Meter ID	40A					RD11						
Lab Control (Cond. Adj.)	23.3					5.2	10	10	10	11	10	Date: 8/16/18 Count Time: 1420 Count Signoff: SF Old WQ: VM
6.25%	23.3					4.8	10	10	10	10	10	
12.5%	23.3					5.5	10	10	9	10	10	
25%	23.4					5.6	10	10	10	10	10	
50%	23.3					5.6	10	9	9	10	10	
100%	23.3					5.8	10	8	8	10	10	
Meter ID	40A					RD12						

10 Day Acute *Hyaella azteca* Toxicity Test Data

Client: LWA-Calleguas Creek
 Test Material: CCWTMP-68-WOOD-119
 Test ID#: 79260 Project #: 29192
 Test Date: 8/19/18

Organism Log#: 11127 Age: 8-9d
 Organism Supplier: ABS
 Control/Diluent: SAM 5 (Conductivity Adjusted)
 Control Water Batch: 343

Treatment	Temp (°C)	pH		D.O. (mg/L)		Conductivity (µS/cm)	# Live Organisms					SIGN-OFF
		new	old	new	old		A	B	C	D	E	
Lab Control (Cond. Adj.)	23.4				5.0		10	10	10	11	10	Date: 8/17/18 Count Time: 1020 Count Signoff: JO Old WQ: SMC
6.25%	23.2				4.3		10	10	10	10	10	Feed: 80
12.5%	23.6				4.5		10	10	9	10	10	
25%	23.5				4.6		10	10	10	10	10	
50%	23.4				4.9		10	7	9	10	10	
100%	23.3				4.5		10	8	7	10	10	
Meter ID	107A				RD10							
Lab Control (Cond. Adj.)	22.7				7.5		10	10	10	11	10	Date: 8/18/18 Count Time: 1637 Count Signoff: AP Old WQ: MSL
6.25%	22.7				7.6		10	10	10	10	10	
12.5%	22.9				7.7		10	10	9	10	10	
25%	22.8				7.8		10	10	9	10	10	
50%	22.7				7.7		10	7	9	10	10	
100%	22.6				7.7		10	8	7	10	10	
Meter ID	107A				RD11							
Lab Control (Cond. Adj.)	23.3		7.78		7.6	4879	10	10	10	11	10	Date: 8/19/18 Termination Time: 1247 Termination Signoff: EP Old WQ: MSL
6.25%	23.4		7.82		7.7	4758	10	10	10	10	10	
12.5%	23.6		7.93		7.7	4931	10	10	9	10	10	
25%	23.8		7.81		6.7	5006	10	10	9	10	10	
50%	23.5		8.15		7.5	5030	10	7	9	10	10	
100%	23.4		8.32		7.6	4862	10	8	7	10	10	
Meter ID	81A		PH24		RD11	EC10						

Appendix F

Test Data and Summary of Statistics for the Reference Toxicant Evaluation of the *Hyalella azteca*

CETIS Summary Report

Report Date: 19 Aug-18 09:59 (p 1 of 1)

Test Code: 79270 | 14-1761-7282

Hyalella 96-h Acute Survival Test											Pacific EcoRisk	
Batch ID:	07-1269-3570	Test Type:	Survival (96h)	Analyst:	Bella Volpatti							
Start Date:	09 Aug-18 17:00	Protocol:	EPA-821-R-02-012 (2002)	Diluent:	Laboratory Water							
Ending Date:	13 Aug-18 16:05	Species:	Hyalella azteca	Brine:	Not Applicable							
Duration:	95h	Source:	Aquatic Biosystems, CO	Age:	9							
Sample ID:	05-5893-1130	Code:	KCl	Client:	Reference Toxicant							
Sample Date:	09 Aug-18 17:00	Material:	Potassium chloride	Project:	29293							
Receipt Date:	09 Aug-18 17:00	Source:	Reference Toxicant									
Sample Age:	n/a (22.1 °C)	Station:	In House									
Multiple Comparison Summary												
Analysis ID	Endpoint	Comparison Method				NOEL	LOEL	TOEL	TU	PMSD ✓		
20-5434-0420	96h Survival Rate	Fisher Exact/Bonferroni-Holm Test				0.2	0.4	0.2828		n/a		
Point Estimate Summary												
Analysis ID	Endpoint	Point Estimate Method				Level	g/L	95% LCL	95% UCL	TU	✓	
03-9488-5843	96h Survival Rate	Spearman-Kärber				EC50	0.373	0.301	0.463			
96h Survival Rate Summary												
Conc-g/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect	
0	LW	10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%	
0.1		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%	
0.2		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%	
0.4		10	0.400	0.031	0.769	0.000	1.000	0.163	0.516	129.10%	60.00%	
0.8		10	0.000	0.000	0.000	0.000	0.000	0.000	0.000		100.00%	
1.6		10	0.000	0.000	0.000	0.000	0.000	0.000	0.000		100.00%	
96h Survival Rate Detail												
Conc-g/L	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10	
0	LW	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
0.1		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
0.2		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
0.4		0.000	0.000	0.000	1.000	1.000	0.000	0.000	0.000	1.000	1.000	
0.8		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
1.6		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
96h Survival Rate Binomials												
Conc-g/L	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10	
0	LW	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	
0.1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	
0.2		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	
0.4		0/1	0/1	0/1	1/1	1/1	0/1	0/1	0/1	1/1	1/1	
0.8		0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	
1.6		0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	

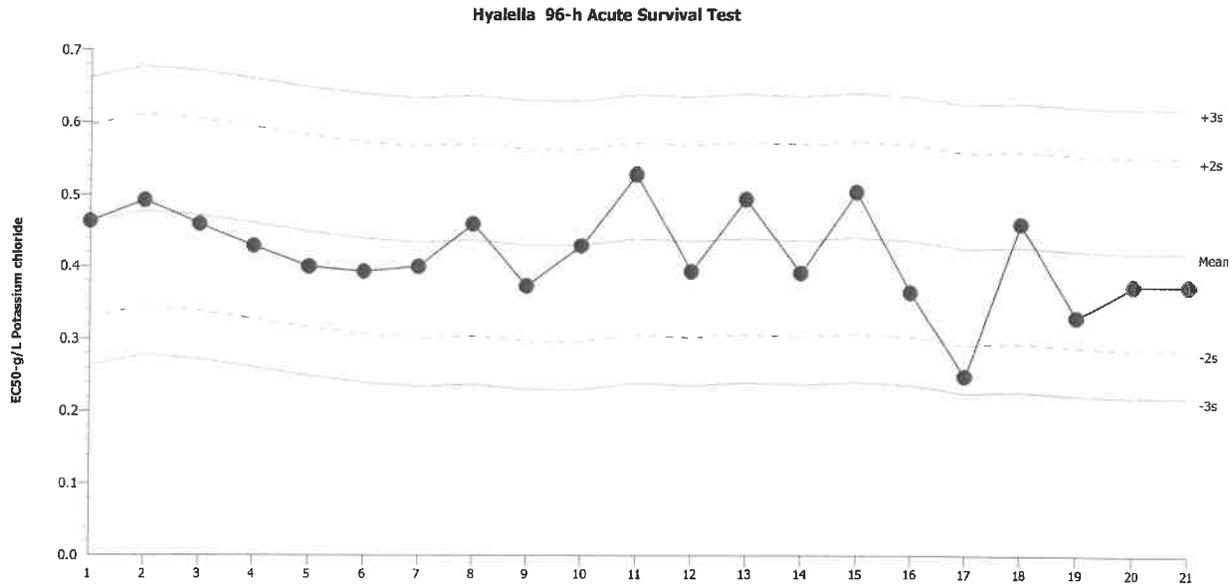
Hyalella 96-h Acute Survival Test

Pacific EcoRisk

Test Type: Survival (96h)
 Protocol: EPA-821-R-02-012 (2002)

Organism: Hyalella azteca (Freshwater Amphip)
 Endpoint: 96h Survival Rate

Material: Potassium chloride
 Source: Reference Toxicant-REF



Mean: 0.4192 Count: 20 -2s Warning Limit: 0.2861 -3s Action Limit: 0.2196
 Sigma: 0.06653 CV: 15.90% +2s Warning Limit: 0.5522 +3s Action Limit: 0.6188

Quality Control Data

Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2017	Aug	9	15:25	0.4634	0.04423	0.6648			18-4403-8702	13-5000-0166
2			10	15:58	0.4925	0.07326	1.101			08-4781-5295	04-7807-7811
3			13	14:00	0.4595	0.04028	0.6054			03-2555-5005	07-3822-0721
4		Sep	2	12:45	0.4287	0.009509	0.1429			00-8891-9372	16-8329-5833
5			12	16:53	0.4	-0.0192	-0.2886			12-7066-3429	06-8588-1925
6			24	16:23	0.3931	-0.02607	-0.3919			05-3672-3483	11-7202-5835
7		Oct	23	15:20	0.4	-0.0192	-0.2886			05-6411-1970	13-8116-2372
8		Nov	8	16:16	0.4595	0.04028	0.6054			19-7659-7997	01-3839-2915
9			17	16:00	0.3732	-0.04599	-0.6912			17-6978-3883	17-5467-8698
10			25	14:10	0.4287	0.009509	0.1429			11-3183-2495	08-9083-9227
11		Dec	4	16:30	0.5278	0.1086	1.632			09-9590-2070	18-7306-3573
12	2018	Jan	9	19:13	0.3931	-0.02607	-0.3919			05-2232-4768	00-9328-2087
13			17	15:40	0.4938	0.07465	1.122			17-7568-9822	12-5928-4930
14		Feb	8	15:57	0.391	-0.02816	-0.4233			13-6969-1958	02-2461-7172
15		Mar	2	17:52	0.5037	0.08447	1.27			10-1610-0738	05-9100-3645
16		Apr	8	13:38	0.3642	-0.05504	-0.8273			14-6470-8596	05-1973-4354
17		May	16	17:55	0.2486	-0.1706	-2.564	(-)		05-9866-1037	11-2195-3653
18		Jun	14	16:35	0.4595	0.04028	0.6054			18-1605-2758	14-8406-0239
19		Jul	18	16:20	0.3299	-0.08926	-1.342			11-4094-7394	20-3811-7615
20		Aug	6	14:44	0.3732	-0.04599	-0.6912			16-9077-3352	08-2793-0151
21			9	17:00	0.3732	-0.04599	-0.6912			14-1761-7282	03-9488-5843

96 Hour *Hyaella azteca* Reference Toxicant Test Data

Client: Reference Toxicant
 Test Material: Potassium Chloride
 Test ID#: 79270 Project # 29293
 Test Date: 8/7/18 Randomization: 10.6.1
 Feeding T-2 Time: 0900 Initials: KL

Organism Log #: 1127 Age: 8-9 days
 Organism Supplier: ABS
 Control/Diluent: SAM-5
 Control Water Batch: 343
 Feeding T48 Time: 0850 Initials: AF

Treatment (g/L)	Temp (°C)	pH	D.O. (mg/L)	Conductivity (µS/cm)	# Live Animals											Sign-Off	
					A	B	C	D	E	F	G	H	I	J			
Control	22.1	7.96	8.0	401	/	/	/	/	/	/	/	/	/	/	/	/	Test Solution Prep: <u>JD</u>
0.1	22.0	7.92	8.0	589	/	/	/	/	/	/	/	/	/	/	/	/	New WQ: <u>TF</u>
0.2	22.0	7.88	8.1	779	/	/	/	/	/	/	/	/	/	/	/	/	Initiation Date: <u>8/9/18</u>
0.4	22.0	7.86	8.3	1146	/	/	/	/	/	/	/	/	/	/	/	/	Initiation Time: <u>1700</u>
0.8	22.0	7.81	8.9	1910	/	/	/	/	/	/	/	/	/	/	/	/	Initiation Signoff: <u>JD</u>
1.6	22.1	7.74	10.7	3328	/	/	/	/	/	/	/	/	/	/	/	/	RT Batch #: <u>20</u>
Meter ID	110A	pH19	RD10	EC13													
Control	22.0				/	/	/	/	/	/	/	/	/	/	/	/	Count Date: <u>8/10/18</u>
0.1	21.4				/	/	/	/	/	/	/	/	/	/	/	/	Count Time: <u>0857</u>
0.2	21.6				/	/	/	/	/	/	/	/	/	/	/	/	Count Signoff: <u>APF</u>
0.4	21.5				/	/	/	/	/	/	/	/	/	/	/	/	
0.8	21.9				0	0	0	0	0	0	0	0	0	0	0	0	
1.6	21.9				0	0	0	0	0	0	0	0	0	0	0	0	
Meter ID	110A																
Control	22.0				/	/	/	/	/	/	/	/	/	/	/	/	Count Date: <u>8/11/18</u>
0.1	21.7				/	/	/	/	/	/	/	/	/	/	/	/	Count Time: <u>0848</u>
0.2	21.8				/	/	/	/	/	/	/	/	/	/	/	/	Count Signoff: <u>APF</u>
0.4	21.9				/	/	/	/	10	0	0	0	/	/	/	/	
0.8	22.0				-	-	-	-	-	-	-	-	-	-	-	-	
1.6	22.0				-	-	-	-	-	-	-	-	-	-	-	-	
Meter ID	107A																
Control	22.1				/	/	/	/	/	/	/	/	/	/	/	/	Count Date: <u>8/12/18</u>
0.1	22.2				/	/	/	/	/	/	/	/	/	/	/	/	Count Time: <u>1545</u>
0.2	22.1				/	/	/	/	/	/	/	/	/	/	/	/	Count Signoff: <u>TK</u>
0.4	22.0				/	0	0	/	/	-	-	-	/	/	/	/	
0.8	22.0				-	-	-	-	-	-	-	-	-	-	-	-	
1.6	22.1				-	-	-	-	-	-	-	-	-	-	-	-	
Meter ID	40A																
Control	22.1	7.66	8.2	468	/	/	/	/	/	/	/	/	/	/	/	/	Termination Date: <u>8/13/18</u>
0.1	22.2	7.61	8.1	669	/	/	/	/	/	/	/	/	/	/	/	/	Termination Time: <u>1605</u>
0.2	22.1	7.62	8.1	825	/	/	/	/	/	/	/	/	/	/	/	/	Termination Signoff: <u>SK</u>
0.4	22.3	7.58	8.1	1212	0	-	-	/	/	-	-	-	/	/	/	/	Old WQ: <u>TK</u>
0.8	22.1	7.62	8.2	2038	-	-	-	-	-	-	-	-	-	-	-	-	
1.6	22.3	7.62	8.3	3521	-	-	-	-	-	-	-	-	-	-	-	-	
Meter ID	81A	pH24	RD10	EC12													



Ms. Amy Storm
Larry Walker Associates
2151 Alessandro Dr., Suite 100
Ventura, CA 93001

November 26, 2018

Dear Amy:

I have enclosed our report “A Toxicity Characterization Study of Ambient Waters Collected from the Calleguas Creek Watershed: Event 69” for samples collected November 7, 2018. The results of our evaluation are summarized below.

Effects of Calleguas Creek Ambient Waters on *Ceriodaphnia dubia*

There were no significant reductions in survival in the Calleguas Creek ambient water samples tested. There were significant reductions in reproduction in the following Calleguas Creek water samples tested:

- 69-UNIV-029
- 69-ADOLF-045
- 69-HITCH-150, and
- 69-GATE-202.

There were no significant reductions in reproduction in the remaining Calleguas Creek ambient water sample tested with this species.

Effects of Calleguas Creek Ambient Waters on *Hyalella azteca*

The 69-WOOD-097 ambient water was the only sample tested with this species; there were no significant reductions in survival in this sample.

Toxicity Summary for Calleguas Creek: Event 69 Ambient Waters.			
Sample Station ID	Toxicity relative to the Lab Control treatment?		
	<i>Ceriodaphnia dubia</i>		<i>Hyalella azteca</i>
	Survival	Reproduction	Survival
69-UNIV-029	no	yes	testing with this species was not performed
69-ADOLF-045	no	yes	testing with this species was not performed
69-HITCH-150	no	yes	testing with this species was not performed
69-GATE-202	no	yes	testing with this species was not performed
69-BELT-208	no	no	testing with this species was not performed
69-WOOD-097	testing with this species was not performed		no

If you have any questions regarding the performance and interpretation of these tests, feel free to contact my colleague Jeffrey Cotsifas or myself at (707) 207-7763.

Sincerely,

Michael McElroy
Senior Project Manager



Pacific EcoRisk is accredited in accordance with NELAP (ORELAP ID 4043). Pacific EcoRisk certifies that the test results reported herein conform to the most current NELAP requirements for parameters for which accreditation is required and available. Any exceptions to NELAP requirements are noted, where applicable, in the body of the report. This report shall not be reproduced, except in full, without the written consent of Pacific EcoRisk. This testing was performed under Lab Order 29418.

**A Toxicity Characterization Study of Ambient Waters
Collected from the Calleguas Creek Watershed**

(Water Samples Collected on November 7, 2018)

Event 69

Prepared For

Larry Walker Associates
720 Wilshire Blvd., Suite 207
Santa Monica, CA 90401

Prepared By

Pacific EcoRisk
2250 Cordelia Rd.
Fairfield, CA 94534

November 2018



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Appendix F	Test Data and Summary of Statistics for the Reference Toxicant Evaluation of the <i>Hyalella azteca</i>

1. INTRODUCTION

In support of the Calleguas Creek Watershed Monitoring Program, Larry Walker Associates (LWA) has contracted Pacific EcoRisk (PER) to evaluate the potential toxicity of surface waters and sediments collected from within the Calleguas Creek Watershed. The current evaluation, which comprises Event 69 of the overall study, consisted of performing the following U.S. EPA toxicity tests:

- 3-brood (6-8 day) survival and reproduction chronic toxicity test with the crustacean *Ceriodaphnia dubia*; and
- For ambient water samples with a conductivity >3000 $\mu\text{S}/\text{cm}$ but <15 ppt salinity, the 10-day survival test with the freshwater amphipod, *Hyalella azteca* was performed in place of the *C. dubia* test.

In order to evaluate the magnitude of any observed toxicity, all water samples were tested using a series of sample dilutions (100%, 50%, 25%, 12.5%, and 6.25%). In order to document that the test organisms were responding to toxic stress in a typical fashion, reference toxicant tests were also performed. This report describes and summarizes the performance and results of the Event 69 surface water toxicity testing performed in support of the Calleguas Creek Watershed Monitoring Program.

2. COLLECTION AND DELIVERY OF AMBIENT WATER SAMPLES

On November 7, 2018, Kinnetic Laboratories, Inc. (KLI) collected ambient water samples from six locations within the Calleguas Creek watershed (Table 1). Each water sample was collected into two pre-cleaned 5-gallon fluorocarbon-lined polyethylene jerricans. The samples were transported on ice and under chain-of-custody to the PER laboratory facility in Fairfield, CA, arriving approximately 24 hrs after collection. Upon receipt at the testing laboratory, aliquots of each water sample were collected for analysis of initial water quality characteristics (Table 2). The remainder of the water samples were stored at 0-6°C. All initial surface water tests were initiated within 36 hrs of sample collection. The chain-of-custody record for the collection and delivery of these samples is presented in Appendix A.

Station Code	Sample Collection Date (Time)	Test Initiation Date (Time)
UNIV	11/7/18 (1525)	11/8/18 (1305)
ADOLF	11/7/18 (0845)	11/8/18 (1509)
HITCH	11/7/18 (1650)	11/8/18 (1510)
GATE	11/7/18 (1300)	11/8/18 (1518)
BELT	11/7/18 (1410)	11/8/18 (1410)
WOOD	11/7/18 (1215)	11/8/18 (1635)

Sample ID	Temp (°C)	pH	D.O. (mg/L)	Alkalinity (mg/L as CaCO ₃)	Hardness (mg/L as CaCO ₃)	Conductivity (µS/cm)	Salinity (ppt)	Total Ammonia (mg/L)
69-UNIV-029	2.7	8.06	10.0	227	380	1698	0.9	<1.0
69-ADOLF-045	0.6	8.05	9.7	146	256	1102	0.6	<1.0
69-HITCH-150	0.8	7.87	9.3	189	556	1740	0.9	<1.0
69-GATE-202	0.6	7.84	9.1	125	222	1026	0.6	<1.0
69-BELT-208	0.5	8.25	9.9	266	505	1362	0.7	<1.0
69-WOOD-097	2.1	8.29	10.8	251	1650	3922	2.1	<1.0

3. TOXICITY TEST PROCEDURES FOR AMBIENT WATERS

The Calleguas Creek ambient waters were tested for toxicity using the following chronic toxicity tests:

- Water samples with a conductivity <3000 µS/cm were tested using the 3-brood (6-8 day) survival and reproduction test with the freshwater crustacean *C. dubia*; and
- Water samples with a conductivity >3000 µS/cm but <15 ppt salinity were tested using the 10-day survival test with the amphipod *H. azteca*.

The methods used in conducting the chronic toxicity tests (and any follow-up TIEs) followed the guidance established by the following EPA manuals:

- Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, Fourth Edition" (EPA-821-R-02-013); and
- A Surface Water Ambient Monitoring Program (SWAMP) test protocol based on a modification of the US EPA guidelines, "Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated Contaminants with Freshwater Invertebrates" (EPA/630/R-99/064).

3.1 Survival and Reproduction Chronic Toxicity Testing with *Ceriodaphnia dubia*

The chronic toxicity test with *C. dubia* consists of exposing individual females to the ambient water samples for the length of time it takes for the Lab Control treatment females to produce three broods (typically 6-8 days), after which effects on survival and reproduction are evaluated. The specific procedures used in these tests are described below.

The Lab Water Control medium for this test consisted of a modified EPA moderately-hard water. For each water sample, the Lab Control water and 100% water sample were used to prepare test solutions at additional interim test treatment concentrations of 6.25%, 12.5%, 25%, and 50% ambient water. For each treatment, 200 mL aliquots of test solution were amended with the alga *Selenastrum capricornutum* and Yeast-Cerophyll®-Trout Food (YCT) to provide food for the test

organisms. “New” water quality characteristics (pH, D.O., and conductivity) were measured on these food-amended test solutions prior to use in these tests.

There were 10 replicates each for each test treatment, each replicate consisting of 15 mL of test solution in a 30-mL plastic cup. These “3-brood” tests were initiated by allocating one neonate (<24 hrs old, and within 8 hours of age) *C. dubia*, obtained from in-house laboratory cultures, into each replicate cup. The replicate cups were placed into a temperature-controlled room at 25°C, under cool-white fluorescent lighting on a 16L:8D photoperiod.

Each test replicate cup was examined daily, with surviving organisms being transferred to the corresponding new cup containing fresh test solution. The contents of each remaining “old” replicate cup were carefully examined, and the number of neonate offspring produced by each original organism was determined, after which “old” water quality characteristics (pH, D.O., and conductivity) were measured for the “old” test solution from one randomly-selected replicate at each treatment.

After it was determined that $\geq 60\%$ of the *C. dubia* in a Lab Water Control treatment had produced their third brood of offspring, the corresponding ambient water test was terminated. The resulting survival and reproduction (number of offspring) data were analyzed to evaluate any impairment(s) caused by the effluent sample; all statistical analyses were made using the CETIS[®] statistical software (TidePool Scientific, McKinleyville, CA).

3.1.1 Reference Toxicant Testing of the *Ceriodaphnia dubia*

In order to assess the sensitivity of the *C. dubia* test organisms to toxic stress, a concurrent reference toxicant test was performed. This reference toxicant test was performed similarly to the ambient water test except that test solutions consisted of Lab Water Control medium spiked with NaCl at test concentrations of 500, 1000, 1500, 2000, and 2500 mg/L. The resulting test response data were statistically analyzed to determine key concentration-response point estimates (e.g., EC50); all statistical analyses were made using the CETIS[®] software. These response endpoints were then compared to the typical response range established by the mean \pm 2 SD of the point estimates generated by the most recent previous reference toxicant tests performed by this lab.

3.2 Survival Toxicity Testing of Ambient Waters with *Hyaella azteca*

This test consists of exposing individual *H. azteca* to the ambient water samples for 10 days, after which effects on survival are evaluated. The specific procedures used in this testing are described below.

The *H. azteca* used in this testing were obtained from a commercial supplier (Aquatic BioSystems, CO); upon receipt at the lab, the test organisms were held in aerated tanks containing Lab Control water, and were fed *S. capricornutum* and *Spirulina*-amended YCT *ad libitum* during this pre-test holding period.

The Lab Water Control medium for this testing consisted of EPA synthetic moderately-hard water, modified for use with *H. azteca* as per EPA test guidelines, and adjusted to the conductivity of the site water via addition of an artificial sea salt (Crystal Seas[®]- bioassay grade). For each ambient water sample, the Lab Control water and 100% ambient water sample were used to prepare test solutions at additional interim test treatment concentrations of 6.25%, 12.5%, 25%, and 50% ambient water. A “Culture” Control, consisting of *H. azteca* culture water was also prepared and tested. “New” water quality characteristics (pH, D.O., and conductivity) were measured on these test solutions prior to use in the test(s).

There were five replicates for each test treatment, each replicate consisting of a 250-mL glass beaker containing 100 mL of test solution; a small (~1 cm x 2 cm) piece of NITEX[®] mesh was placed in the beaker to provide an attachment substrate for the thigmotactic amphipods. Testing was initiated by allocating ten 12-13 day old *H. azteca*, into each replicate. The replicate beakers were placed into a temperature-controlled room at 23°C, under cool-white fluorescent lighting on a 16L:8D photoperiod.

Each day of the test(s), each replicate beaker was examined and the number of surviving organisms determined; ‘old’ water quality characteristics of the test solutions were measured in one randomly-selected beaker at each test treatment at this time. On Days 2, 4, 6, and 8 of the tests, 1.0 mL of *Spirulina*-amended YCT food was added to each test replicate to provide food for the test organisms.

On Day 5 of the 10-day test(s), fresh test solutions were prepared and characterized as before. Each replicate was examined, with any dead animals, uneaten food, wastes, and other detritus being removed. The number of live organisms in each replicate was determined and then approximately 80% of the old test solution in each beaker was carefully poured out and replaced with fresh test solution. “Old” water quality characteristics (pH, D.O., and conductivity) were measured on the old test solution that had been discarded from one randomly-selected replicate at each treatment.

After 10 days of exposure, testing was terminated and the number of live organisms in each replicate was recorded. The resulting survival data were analyzed to evaluate any impairment(s) caused by the ambient water sample; all statistical analyses were made using the CETIS[®] statistical software.

3.2.1 Reference Toxicant Testing of the *Hyaella azteca*

In order to assess the sensitivity of the *H. azteca* test organisms to toxic stress, a concurrent reference toxicant test was performed. The reference toxicant test was performed similarly to the ambient water tests, except that test solutions consisted of the Lab Water Control medium spiked with KCl at concentrations of 0.1, 0.2, 0.4, 0.8, and 1.6 g/L. The resulting test response data were statistically analyzed to determine key concentration-response point estimates (e.g., EC50); all statistical analyses were performed using the CETIS[®] software. These response endpoints were

then compared to the typical response range established by the mean \pm 2 SD of the point estimates generated by the 20 most-recent previous reference toxicant tests performed by this lab.

4. RESULTS OF THE AMBIENT WATER TOXICITY EVALUATIONS

4.1 Effects of Calleguas Creek Ambient Water on *Ceriodaphnia dubia*

The results of the ambient water tests with *C. dubia* are summarized below in Tables 3 through 7. There were no significant reductions in survival in the Calleguas Creek ambient water samples tested. There were significant reductions in reproduction in the following Calleguas Creek water samples tested:

- 69-UNIV-029
- 69-ADOLF-045
- 69-HITCH-150, and
- 69-GATE-202.

There were no significant reductions in reproduction in the remaining Calleguas Creek ambient water sample tested with this species.

The test data and summary of statistical analyses for these tests, excluding statistical outliers where appropriate, are presented in Appendix B; the summary of statistical analyses for these tests, including statistical outliers, is presented in Appendix C.

Table 3. Effects of Ambient Water 69-UNIV-029 on <i>Ceriodaphnia dubia</i> .		
Ambient Water Treatment	% Survival	Reproduction (# neonates /female)
Lab Water Control	100	35.9 ^b
6.25%	100	28.7 ^{b,c}
12.5%	100	29.8 ^{b,c}
25%	100	29.9 ^{b,c}
50%	100	34.4
100%	100	30.9*
Summary of Statistics		
No Observable Effect Concentration (NOEC) =	100% ambient water	50% ambient water
TUc (where TUc = 100/NOEC) =	1	2
Survival EC25 or Reproduction IC25 =	>100% ambient water ^a	>100% ambient water
Survival EC50 or Reproduction IC50 =	>100% ambient water ^a	>100% ambient water
TUc (where TUc = 100/EC50 or 100/IC50) =	<1	<1

* - The test response at this treatment was significantly less than the Control treatment response ($p < 0.05$).

a - Due to the absence of significant mortalities, the EC point estimates could not be calculated, but can be determined by inspection to be >100% ambient water.

b - The reproduction response for one of the replicates at this test treatment was determined to be a statistical outlier, and the results reported above are for the analysis of the test data excluding this outlier. As per EPA guidelines, the test data were analyzed both with and without the outlier, and the results of both sets of analyses are reported in the appendices.

c - There was an interrupted concentration-response with a statistically significant reduction in reproduction at this ambient water concentration. However, as there was no significant reduction in reproduction at the higher 50% concentration, the reduction at these interim concentrations are not considered toxicologically significant.

Table 4. Effects of Ambient Water 69-ADOLF-045 on <i>Ceriodaphnia dubia</i> .		
Ambient Water Treatment	% Survival	Reproduction
Lab Water Control	100	31.6
6.25%	100	29.0 ^b
12.5%	100	27.5
25%	100	29.8 ^b
50%	100	23.4
100%	100	23.0*
Summary of Key Statistics		
No Observable Effect Concentration (NOEC) =	100% ambient water	50% ambient water
TUc (where TUc = 100/NOEC) =	1	2
Survival EC25 or Reproduction IC25 =	>100% ambient water ^a	48.6% ambient water
Survival EC50 or Reproduction IC50 =	>100% ambient water ^a	>100% ambient water
TUc (where TUc = 100/EC50 or 100/IC50) =	<1	<1

* - The test response at this treatment was significantly less than the Control treatment response ($p < 0.05$).

a - Due to the absence of significant mortalities, the EC point estimates could not be calculated, but can be determined by inspection to be >100% ambient water.

b - The reproduction response for one of the replicates at this test treatment was determined to be a statistical outlier, and the results reported above are for the analysis of the test data excluding this outlier. As per EPA guidelines, the test data were analyzed both with and without the outlier, and the results of both sets of analyses are reported in the appendices.

Table 5. Effects of Ambient Water 69-HITCH-150 on <i>Ceriodaphnia dubia</i> .		
Ambient Water Treatment	% Survival	Reproduction
Lab Water Control	100	34.0
6.25%	100	28.6
12.5%	100	27.4
25%	100	29.9
50%	100	26.0
100%	100	25.6*
Summary of Key Statistics		
No Observable Effect Concentration (NOEC) =	100% ambient water	50% ambient water
TUc (where TUc = 100/NOEC) =	1	2
Survival EC25 or Reproduction IC25 =	>100% ambient water ^a	>100% ambient water
Survival EC50 or Reproduction IC50 =	>100% ambient water ^a	>100% ambient water
TUc (where TUc = 100/EC50 or 100/IC50) =	<1	<1

* - The test response at this treatment was significantly less than the Control treatment response ($p < 0.05$).

a - Due to the absence of significant mortalities, the EC point estimates could not be calculated, but can be determined by inspection to be >100% ambient water.

Table 6. Effects of Ambient Water 69-GATE-202 on <i>Ceriodaphnia dubia</i> .		
Ambient Water Treatment	% Survival	Reproduction
Lab Water Control	100	32.8
6.25%	100	24.9
12.5%	100	16.3 ^b
25%	100	26.2
50%	100	23.5*
100%	100	22.1*
Summary of Key Statistics		
No Observable Effect Concentration (NOEC) =	100% ambient water	25% ambient water
TUc (where TUc = 100/NOEC) =	1	4
Survival EC25 or Reproduction IC25 =	>100% ambient water ^a	6.9% ambient water
Survival EC50 or Reproduction IC50 =	>100% ambient water ^a	>100% ambient water
TUc (where TUc = 100/EC50 or 100/IC50) =	<1	<1

* - The test response at this treatment was significantly less than the Control treatment response ($p < 0.05$).

a - Due to the absence of significant mortalities, the EC point estimates could not be calculated, but can be determined by inspection to be >100% ambient water.

b - There was an interrupted concentration-response with a statistically significant reduction in reproduction at this ambient water concentration. However, as there was no significant reduction in reproduction at the higher 25% concentration, the reduction at this interim concentration is not considered toxicologically significant.

Table 7. Effects of Ambient Water 69-BELT-208 on <i>Ceriodaphnia dubia</i> .		
Ambient Water Treatment	Mean % Survival	Mean Reproduction
Lab Water Control	100	31.9
6.25%	100	33.7
12.5%	100	32.0
25%	100	34.7
50%	100	30.9
100%	100	32.6
Summary of Key Statistics		
No Observable Effect Concentration (NOEC) =	100% ambient water	100% ambient water
TUc (where TUc = 100/NOEC) =	1	1
Survival EC25 or Reproduction IC25 =	>100% ambient water ^a	>100% ambient water
Survival EC50 or Reproduction IC50 =	>100% ambient water ^a	>100% ambient water
TUc (where TUc = 100/EC50 or 100/IC50) =	<1	<1

a - Due to the absence of significant mortalities, the EC point estimates could not be calculated, but can be determined by inspection to be >100% ambient water.

4.1.2 Reference Toxicant Toxicity to *Ceriodaphnia dubia*

The results of this test are summarized below in Table 8. The EC₅₀ and IC₅₀ for these tests were both consistent with the typical response ranges established by the reference toxicant test database for this species, thus providing further evidence that the organisms used for ambient water testing were responding to toxic stress in a typical and consistent fashion. The test data and summary of statistical analyses for this test are presented in Appendix D.

Table 8. Reference toxicant testing: effects of NaCl on <i>Ceriodaphnia dubia</i> .		
NaCl Treatment (mg/L)	Mean % Survival	Mean Reproduction (# neonates/female)
Lab Water Control	100	28.7
500	100	30.8
1000	100	21.1
1500	90	14.1*
2000	100	8.7*
2500	0*	-
Summary of Statistics		
Survival EC ₅₀ or Reproduction IC ₅₀ =	2170 mg/L NaCl	1440 mg/L NaCl
Typical Response Range (mean ± 2 SD)	1657 - 2405 mg/L NaCl	1373 - 1841 mg/L NaCl

* The response at this test treatment was significantly less than the Lab Control treatment response at p<0.05

4.2 Effects of Calleguas Creek Ambient Water on *Hyalella azteca*

The results of this test are summarized below in Table 9. The 69-WOOD-097 ambient water sample was the only sample tested with this species; there were no significant reductions in survival in this sample. The test data and summary of statistical analyses for this test are presented in Appendix E.

Table 9. Effects of Ambient Water 69-WOOD-097 on <i>Hyalella azteca</i> Survival.	
Ambient Water Treatment	10-Day Mean % Survival
Lab Control	98
6.25%	94
12.5%	94
25%	96
50%	100
100%	92
Culture Control	98
Summary of Key Statistics	
No Observable Effect Concentration (NOEC) =	100% ambient water
TUc (where TUc = 100/NOEC) =	1
Survival EC25 =	>100% ambient water ^a
Survival EC50 =	>100% ambient water ^a
TUc (where TUc = 100/EC50) =	<1

a - Due to the absence of significant mortalities, the EC point estimates could not be calculated, but can be determined by inspection to be >100% ambient water.

4.2.1 Reference Toxicant Toxicity to *Hyaella azteca*

The results of this test are summarized below in Table 10. The LC50 for this test was consistent with the typical response range established by the reference toxicant test database for this species, thus providing further evidence that the organisms used for ambient water testing were responding to toxic stress in a typical and consistent fashion. The test data and summary of statistical analyses for this test are presented in Appendix F.

Table 10. Reference Toxicant Testing: Effects of KCl on <i>Hyaella azteca</i> .	
KCl Treatment (g/L)	Mean % Survival
Lab Control	100
0.1	100
0.2	90
0.4	20*
0.8	0*
1.6	0*
Summary of Statistics	
Survival LC50 =	0.30 g/L KCl
Typical Response Range (mean ± 2 SD)	0.23 - 0.54 g/L KCl

* - The response at this test treatment was significantly less than the Lab Control treatment response at $p < 0.05$.

5. SUMMARY AND CONCLUSIONS

Effects of Calleguas Creek Ambient Waters on *Ceriodaphnia dubia*

There were no significant reductions in survival in the Calleguas Creek ambient water samples tested. There were significant reductions in reproduction in the following Calleguas Creek water samples tested:

- 69-UNIV-029
- 69-ADOLF-045
- 69-HITCH-150, and
- 69-GATE-202.

There were no significant reductions in reproduction in the remaining Calleguas Creek ambient water sample tested with this species.

Effects of Calleguas Creek Ambient Waters on *Hyalella azteca*

The 69-WOOD-097 ambient water was the only sample tested with this species; there were no significant reductions in survival in this sample.

Toxicity Summary for Calleguas Creek: Event 69 Ambient Waters.			
Sample Station ID	Toxicity relative to the Lab Control treatment?		
	<i>Ceriodaphnia dubia</i>		<i>Hyalella azteca</i>
	Survival	Reproduction	Survival
69-UNIV-029	no	yes	testing with this species was not performed
69-ADOLF-045	no	yes	testing with this species was not performed
69-HITCH-150	no	yes	testing with this species was not performed
69-GATE-202	no	yes	testing with this species was not performed
69-BELT-208	no	no	testing with this species was not performed
69-WOOD-097	testing with this species was not performed		no

5.1 QA/QC Summary

Test Conditions – All test conditions (pH, D.O., temperature, etc.) were all within acceptable limits during testing. All test analyses were performed according to laboratory Standard Operating Procedures.

Negative Control – The biological responses for the test organisms in the Lab Control treatments were within acceptable limits.

Positive Control – All reference toxicant test results were consistent with the “typical response” ranges established by the reference toxicant test database, indicating that these test organisms were responding to toxic stress in a typical fashion.

Concentration Response Relationships – The concentration-response relationships for these tests were evaluated as per EPA guidelines (EPA-821-B-00-004), and were determined to be acceptable.

Appendix A

Chain-of-Custody Record for the Collection and Delivery of the Calleguas Creek Ambient Water Samples

Appendix B

Test Data and Summary of Statistics for the Evaluation of the Chronic Toxicity of the Calleguas Creek Ambient Waters to *Ceriodaphnia dubia*: Data Analyses Excluding Statistical Outliers

CETIS Summary Report

Report Date: 16 Nov-18 15:17 (p 1 of 2)

Test Code: 80638 | 14-4434-5511

Ceriodaphnia Survival and Reproduction Test **Pacific EcoRisk**

Batch ID: 04-4203-1345	Test Type: Reproduction-Survival (7d)	Analyst: Mike McElroy
Start Date: 08 Nov-18 13:05	Protocol: EPA-821-R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 15 Nov-18 13:25	Species: Ceriodaphnia dubia	Brine: Not Applicable
Duration: 7d 0h	Source: In-House Culture	Age: 1

Sample ID: 00-9280-2736	Code: 69-UNIV-029	Client: Larry Walker Associates
Sample Date: 07 Nov-18 15:25	Material: Ambient Water	Project: 29418
Receipt Date: 08 Nov-18 07:37	Source: Calleguas Creek	
Sample Age: 22h (2.7 °C)	Station: UNIV	

Comments:
Excludes reproduction outliers (Lab Control-E, 6.25%-J, 12.5%-J, and 25% E)

Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	NOEL	LOEL	TOEL	TU	PMSD ✓
17-5507-1194	Reproduction	Bonferroni Adj t Test	50	100	70.71	2	12.8%
16-3822-8615	Survival	Fisher Exact/Bonferroni-Holm Test	100	> 100	n/a	1	n/a

Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	Level	%	95% LCL	95% UCL	TU	✓
01-8718-6241	Reproduction	Linear Interpolation (ICPIN)	IC5	2.17	1.73	3.86	46.03	
			IC10	4.35	3.45	72.4	23.01	
			IC15	>100	n/a	n/a	<1	
			IC20	>100	n/a	n/a	<1	
			IC25	>100	n/a	n/a	<1	
			IC40	>100	n/a	n/a	<1	
			IC50	>100	n/a	n/a	<1	

Reproduction Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	9	35.9	33.9	37.9	33	41	0.873	2.62	7.30%	0.00%
6.25		9	28.7	24.4	32.9	19	34	1.86	5.57	19.42%	20.12%
12.5		9	29.8	27.2	32.4	24	36	1.13	3.38	11.36%	17.03%
25		9	29.9	26.9	32.9	25	36	1.32	3.95	13.22%	16.72%
50		10	34.4	31.3	37.5	28	43	1.37	4.33	12.57%	4.15%
100		10	30.9	27.8	34	26	39	1.39	4.38	14.18%	13.90%

Survival Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
6.25		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
12.5		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
25		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
50		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
100		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%

CETIS Summary Report

Report Date: 16 Nov-18 15:17 (p 2 of 2)
 Test Code: 80638 | 14-4434-5511

Ceriodaphnia Survival and Reproduction Test											Pacific EcoRisk
Reproduction Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	35	37	38	35	41	34	33	33	37	
6.25		19	32	25	31	34	34	23	34	26	
12.5		30	26	30	24	32	36	30	30	30	
25		26	30	29	35	36	33	28	25	27	
50		35	31	32	43	30	37	36	35	28	37
100		39	27	32	37	27	26	29	32	28	32
Survival Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
6.25		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
12.5		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
25		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
50		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
100		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Survival Binomials											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
6.25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
12.5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
50		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
100		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1

CETIS Analytical Report

Report Date: 16 Nov-18 15:17 (p 1 of 1)
 Test Code: 80638 | 14-4434-5511

Ceriodaphnia Survival and Reproduction Test **Pacific EcoRisk**

Analysis ID: 16-3822-8615 Endpoint: Survival CETIS Version: CETISv1.9.2
 Analyzed: 16 Nov-18 14:35 Analysis: STP 2xK Contingency Tables Official Results: Yes

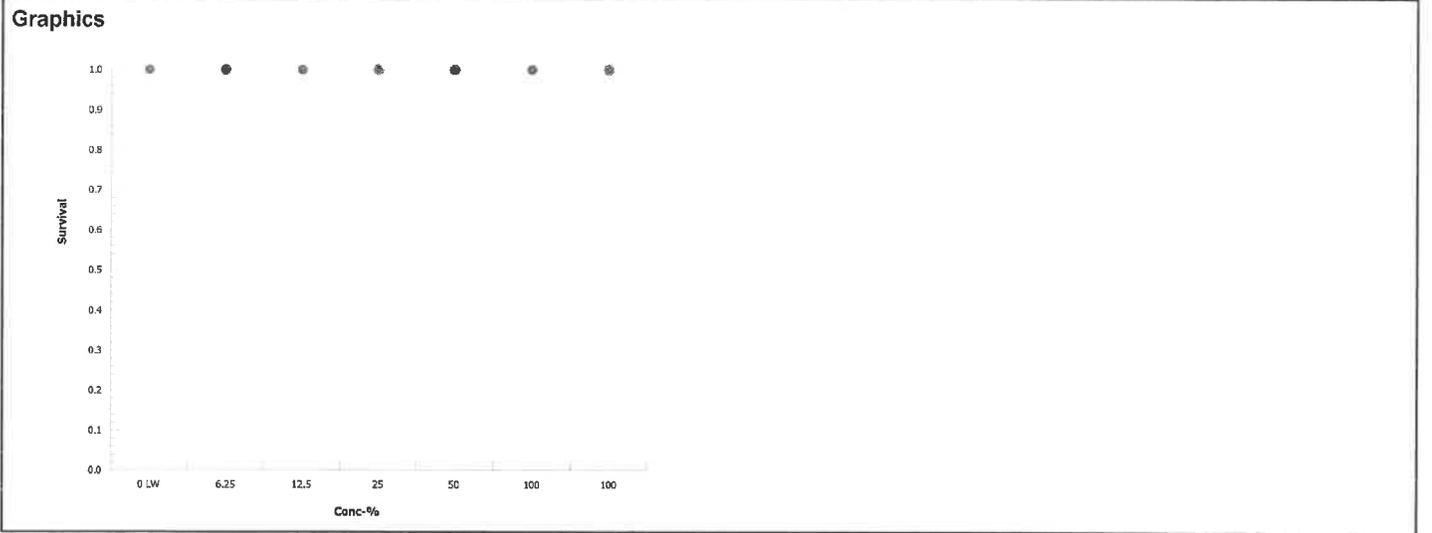
Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU
Untransformed	C > T	100	> 100	n/a	1

Fisher Exact/Bonferroni-Holm Test

Control	vs	Group	Test Stat	P-Type	P-Value	Decision(α:5%)
Lab Water Contr		6.25	1.000	Exact	1.0000	Non-Significant Effect
		12.5	1.000	Exact	1.0000	Non-Significant Effect
		25	1.000	Exact	1.0000	Non-Significant Effect
		50	1.000	Exact	1.0000	Non-Significant Effect
		100	1.000	Exact	1.0000	Non-Significant Effect

Data Summary

Conc-%	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
0	LW	10	0	10	1	0	0.0%
6.25		10	0	10	1	0	0.0%
12.5		10	0	10	1	0	0.0%
25		10	0	10	1	0	0.0%
50		10	0	10	1	0	0.0%
100		10	0	10	1	0	0.0%



CETIS Analytical Report

Report Date: 16 Nov-18 15:17 (p 1 of 1)
 Test Code: 80638 | 14-4434-5511

Ceriodaphnia Survival and Reproduction Test Pacific EcoRisk

Analysis ID: 17-5507-1194 Endpoint: Reproduction CETIS Version: CETISv1.9.2
 Analyzed: 16 Nov-18 15:17 Analysis: Parametric-Multiple Comparison Official Results: Yes

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	C > T	50	100	70.71	2	12.77%

Bonferroni Adj t Test

Control	vs	Control II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Water Contr		6.25*	3.69	2.4	4.7	16	CDF	0.0014	Significant Effect
		12.5*	3.12	2.4	4.7	16	CDF	0.0074	Significant Effect
		25*	3.07	2.4	4.7	16	CDF	0.0087	Significant Effect
		50	0.781	2.4	4.58	17	CDF	1.0000	Non-Significant Effect
		100*	2.62	2.4	4.58	17	CDF	0.0292	Significant Effect

ANOVA Table

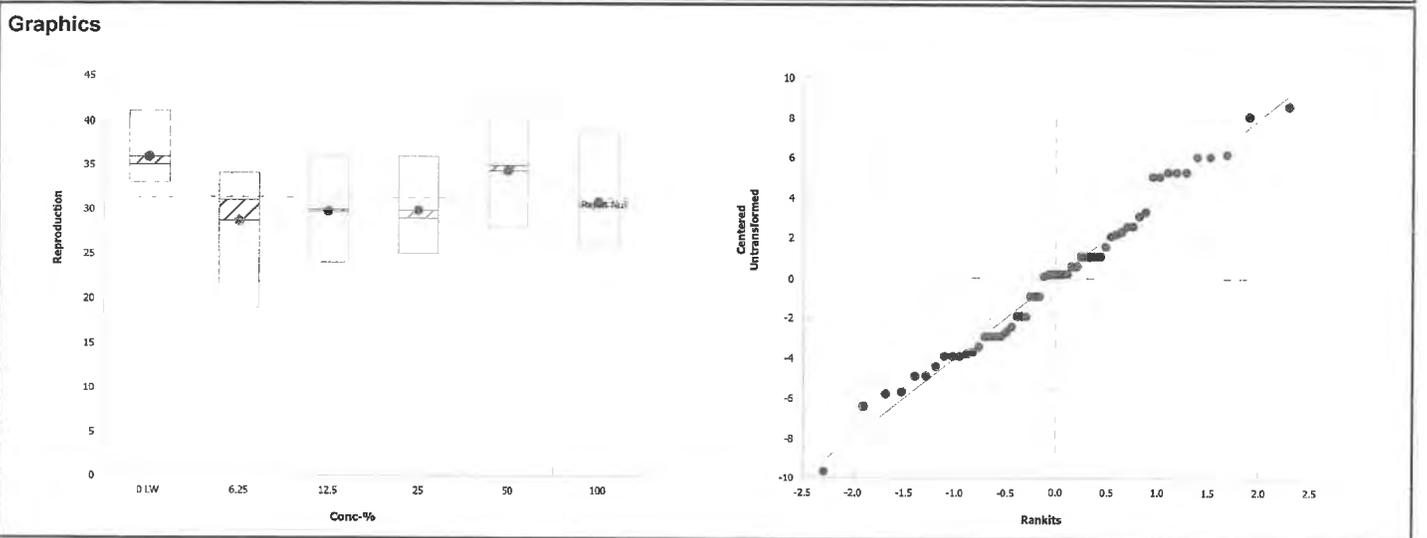
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	382.492	76.4983	5	4.44	0.0020	Significant Effect
Error	860.633	17.2127	50			
Total	1243.13		55			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	4.74	15.1	0.4489	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.982	0.943	0.5817	Normal Distribution

Reproduction Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	LW	9	35.9	33.9	37.9	35	33	41	0.873	7.30%	0.00%
6.25		9	28.7	24.4	32.9	31	19	34	1.86	19.42%	20.12%
12.5		9	29.8	27.2	32.4	30	24	36	1.13	11.36%	17.03%
25		9	29.9	26.9	32.9	29	25	36	1.32	13.22%	16.72%
50		10	34.4	31.3	37.5	35	28	43	1.37	12.57%	4.15%
100		10	30.9	27.8	34	30.5	26	39	1.39	14.18%	13.90%



Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: LWA: Calleguas Creek Material: CCWTMP-69-UNIV-029 Test Date: 11/8/18
 Project #: 29418 Test ID: 80638 Randomization: 10.7.6 Control Water: Mod EPAMH

Day	pH		D.O.		Cond. (µS/cm)	Temp (°C)	Survival / Reproduction										SIGN-OFF	
	New	Old	New	Old			A	B	C	D	E	F	G	H	I	J		
0	7.94		8.0		352	25.1	0	0	0	0	0	0	0	0	0	0	0	Date: 11/8/18 New WQ: <u>ARC</u> Test Init.: <u>ARC</u> Sol'n Prep: <u>SMC</u> Time: <u>1308</u>
1	7.94	8.10	10.8	8.1	354	24.2	0	0	0	0	0	0	0	0	0	0	0	Date: 11/9/18 New WQ: <u>RC</u> Counts: <u>ED</u> Sol'n Prep: <u>RC</u> Old WQ: <u>SD</u> Time: <u>1347</u>
2	7.96	7.87	9.6	8.4	364	24.8	0	0	0	0	0	0	0	0	0	0	0	Date: 11/10/18 New WQ: <u>SD</u> Counts: <u>EP</u> Sol'n Prep: <u>SMC</u> Old WQ: <u>SD</u> Time: <u>1339</u>
3	8.06	7.95	9.6	7.4	355	24.0	0	0	0	0	0	6	0	0	0	0	0	Date: 11/11/18 New WQ: <u>TP</u> Counts: <u>BI</u> Sol'n Prep: <u>BJ</u> Old WQ: <u>TP</u> Time: <u>2230</u>
4	7.84	7.84	10.5	8.2	353	24.6	6	7	8	6	8	8	0	8	7	6	0	Date: 11/12/18 New WQ: <u>AR</u> Counts: <u>ER</u> Sol'n Prep: <u>JL</u> Old WQ: <u>JL</u> Time: <u>1448</u>
5	7.75	7.75	10.2	8.0	376	25.4	12	14	13	11	13	14	12	11	10	13	0	Date: 11/13/18 New WQ: <u>TD</u> Counts: <u>CR</u> Sol'n Prep: <u>SMC</u> Old WQ: <u>TA</u> Time: <u>1350</u>
6	7.64	7.79	9.2	8.5	360	24.3	0	0	17	18	3	19	16	14	0	0	0	Date: 11/14/18 New WQ: <u>AR</u> Counts: <u>TF</u> Sol'n Prep: <u>BN</u> Old WQ: <u>KB</u> Time: <u>1639</u>
7	—	8.80	—	8.2	391	25.2	17	16	0	0	0	0	16*	0	16	18	0	Date: 11/15/18 New WQ: <u>—</u> Counts: <u>LB</u> Sol'n Prep: <u>—</u> Old WQ: <u>JB</u> Time: <u>1321</u>
8																		Date: Old WQ: Counts: Time:
Total=							18	21	38	35	24	41	34	33	33	37		Mean Neonates/Female = <u>34.7</u> <u>33.7</u> <u>6.0</u>
Day	pH		D.O.		Cond. (µS/cm)	Temp (°C)	Survival / Reproduction										Sample ID	
	New	Old	New	Old			A	B	C	D	E	F	G	H	I	J		
0	7.99		8.0		440	24.4	0	0	0	0	0	0	0	0	0	0	0	51276
1	7.95	8.14	10.9	8.2	443	24.3	0	0	0	0	0	0	0	0	0	0	0	51276
2	7.95	7.91	9.6	8.3	450	24.7	0	0	0	0	0	0	0	0	0	0	0	51276
3	8.05	8.01	9.9	8.0	442	24.1	0	0	0	0	0	0	0	0	0	0	0	51276
4	7.88	7.88	10.9	8.0	442	25.3	7	6	7	6	9	7	4	6	3	0	0	51276
5	7.95	7.72	10.4	7.5	445	24.6	0	10	7	11	12	14	13	12	7	0	0	51276
6	7.79	7.75	9.5	7.5	449	24.3	14	0	12	13	16	11	2	0	12	0	0	51276
7	—	8.43	—	7.5	492	25.5	0	15	0	0	0	0	1	18	1	0	0	—
8																		
Total=							19	32	25	31	34	34	23	34	20	3		Mean Neonates/Female = <u>76.0</u> <u>26.1</u>

* 4th brood. Remove from reproduction statistics.

Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: LWA: Calleguas Creek Material: CCWTMP-69-UNIV-029 Test Date: 11/8/18
 Project #: 29418 Test ID: 80638 Control Water: Mod EPAMH

Day	pH		D.O.		Cond. (µS/cm)	Temp (°C)	Survival / Reproduction										SIGN-OFF	
	New	Old	New	Old			A	B	C	D	E	F	G	H	I	J		
12.5%	0	7.97		8.0		528	25.0	0	0	0	0	0	0	0	0	0	0	
	1	7.95	8.20	10.9	8.1	505	24.6	0	0	0	0	0	0	0	0	0	0	
	2	7.98	7.95	9.9	8.2	530	24.8	0	0	0	0	0	0	0	0	0	0	
	3	8.06	8.04	10.0	7.9	531	25.0	0	0	0	0	0	0	0	0	0	0	
	4	7.93	7.94	10.8	8.1	531	25.5	0	1	7	6	6	6	7	2	5	0	
	5	7.94	7.84	10.6	7.5	538	25.7	10	11	7	13	11	15	8	11	12	0	
	6	7.83	7.68	9.6	6.3	538	24.3	0	14	16	5	15	15	15	17	13	0	
	7	—	8.36	—	7.7	581	25.7	20	0	0	0	17	0	0	0	0	0	
	8																	
Total=							30	26	30	24	32	36	30	30	30	0	Mean Neonates/Female = 26.8	
25%	0	7.96		8.1		700	25.5	0	0	0	0	0	0	0	0	0	0	
	1	7.95	8.20	10.9	8.1	680	24.5	0	0	0	0	0	0	0	0	0	0	
	2	7.99	8.00	9.9	8.3	700	24.8	0	0	0	0	0	0	0	0	0	0	
	3	8.08	8.12	10.1	8.0	678	24.9	0	0	0	0	0	0	0	0	0	0	
	4	7.95	7.97	10.9	7.9	693	24.8	1	6	0	8	5	5	5	7	7	0	
	5	8.01	7.84	10.8	7.6	710	25.5	7	10	12	13	10	13	13	5	7	12	
	6	7.87	7.73	9.7	5.5	700	24.3	0	13	0	14	0	18	15	14	11	15	
	7	—	8.36	—	7.8	747	25.5	18	1	17	0	0	21*	20*	0	0	0	
	8																	
Total=							26	30	29	35	15	36	33	28	25	27	Mean Neonates/Female = 28.4	

* 4th brood. Exclude from reproduction statistics.

Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: LWA: Calleguas Creek Material: CCWTMP-69-UNIV-029 Test Date: 11/8/18
 Project #: 29418 Test ID: 80638 Control Water: Mod EPAMH

	Day	pH		D.O.		Cond. (µS/cm)	Temp (°C)	Survival / Reproduction										SIGN-OFF	
		New	Old	New	Old			A	B	C	D	E	F	G	H	I	J		
50%	0	7.98		8.4		1034	25.1	0	0	0	0	0	0	0	0	0	0	0	
	1	7.98	8.35	10.9	8.2	1605	24.6	0	0	0	0	0	0	0	0	0	0	0	
	2	8.01	8.10	9.9	8.3	1023	24.9	0	0	0	0	0	0	0	0	0	0	0	
	3	8.12	8.24	9.9	7.9	1016	25.0	0	0	0	0	0	0	0	0	0	0	0	
	4	8.03	8.04	10.6	7.8	997	24.8	7	8	7	9	4	7	6	8	7	4	5	
	5	8.05	8.03	10.4	7.3	1625	25.6	11	7	15	16	15	17	12	14	11	12		
	6	7.97	7.98	9.9	6.6	1028	24.3	17	16	10	18	11	13	16	14	13	0		
	7	—	8.47	—	8.1	1126	25.4	0	0	0	0	20	0	0	0	0	20		
	8																		
Total=							35	31	32	43	30	37	36	35	28	37	Mean Neonates/Female = 34.4		
100%	0	7.95		8.9		1678	25.0	0	0	6	0	0	0	0	0	0	0		
	1	7.98	8.58	10.8	8.1	1653	24.7	0	0	0	0	0	0	0	0	0	0		
	2	8.05	8.27	9.9	8.3	1671	25.0	0	0	0	0	0	0	0	0	0	0		
	3	8.20	8.47	9.9	8.0	1658	24.5	0	0	0	0	0	6	0	0	0			
	4	7.99	8.34	10.5	7.9	1610	24.7	6	1	7	6	3	0	0	4	2	1		
	5	8.04	8.18	10.5	6.8	1679	25.1	14	10	10	13	10	10	3	13	8	14		
	6	7.99	8.24	10.6	7.4	1672	24.3	19	16	15	17	14	16	20	15	18	17		
	7	—	8.47	—	8.2	1764	25.9	0	0	0	1	0	0	2	0	0	0		
	8																		
Total=							39	27	32	37	27	26	29	32	28	32	Mean Neonates/Female = 30.9		

* 4th brood. Exclude from statistics.

CETIS Summary Report

Report Date: 16 Nov-18 11:59 (p 1 of 2)
Test Code: 80639 | 09-8502-3333

Ceriodaphnia Survival and Reproduction Test **Pacific EcoRisk**

Batch ID: 12-3530-4939	Test Type: Reproduction-Survival (7d)	Analyst: Jessica Okutsu
Start Date: 08 Nov-18 15:09	Protocol: EPA-821-R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 14 Nov-18 15:30	Species: Ceriodaphnia dubia	Brine: Not Applicable
Duration: 6d 0h	Source: In-House Culture	Age: 1

Sample ID: 16-6131-6900	Code: 69-ADOLF-045	Client: Larry Walker Associates
Sample Date: 07 Nov-18 08:45	Material: Ambient Water	Project: 29418
Receipt Date: 08 Nov-18 07:37	Source: Calleguas Creek	
Sample Age: 30h (0.6 °C)	Station: ADOLF	

Comments:
 Stats excluding reproductive outliers 6.25%-J and 25%-J.

Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	NOEL	LOEL	TOEL	TU	PMSD ✓
11-3872-8815	Reproduction	Wilcoxon/Bonferroni Adj Test	50	100	70.71	2	21.8%
17-5227-9364	Survival	Fisher Exact/Bonferroni-Holm Test	100	> 100	n/a	1	n/a

Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	Level	%	95% LCL	95% UCL	TU	✓
11-2812-8711	Reproduction	Linear Interpolation (ICPIN)	IC5	3.8	1.72	36	26.33	
			IC10	25.9	3.44	49.1	3.854	
			IC15	33.5	5.16	78.2	2.986	
			IC20	41	12.1	n/a	2.437	
			IC25	48.6	33	n/a	2.059	
			IC40	>100	n/a	n/a	<1	
IC50	>100	n/a	n/a	<1				

Reproduction Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	10	31.6	26.1	37.1	18	39	2.41	7.62	24.11%	0.00%
6.25		9	29	25.1	32.9	17	34	1.71	5.12	17.67%	8.23%
12.5		10	27.5	22.9	32.1	17	36	2.04	6.45	23.46%	12.97%
25		9	29.8	28.7	30.8	28	32	0.465	1.39	4.68%	5.77%
50		10	23.4	17.3	29.5	11	39	2.7	8.55	36.55%	25.95%
100		10	23	18.5	27.5	11	30	1.98	6.25	27.19%	27.22%

Survival Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
6.25		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
12.5		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
25		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
50		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
100		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%

CETIS Summary Report

Report Date: 16 Nov-18 11:59 (p 2 of 2)
 Test Code: 80639 | 09-8502-3333

Ceriodaphnia Survival and Reproduction Test											Pacific EcoRisk
Reproduction Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	18	39	31	36	38	31	34	18	35	36
6.25		27	31	31	33	27	32	34	29	17	
12.5		29	17	27	36	26	26	31	34	17	32
25		30	32	31	29	29	30	31	28	28	
50		18	14	11	17	39	30	23	27	25	30
100		15	30	27	27	11	28	28	20	23	21
Survival Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
6.25		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
12.5		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
25		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
50		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
100		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Survival Binomials											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
6.25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
12.5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
50		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
100		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1

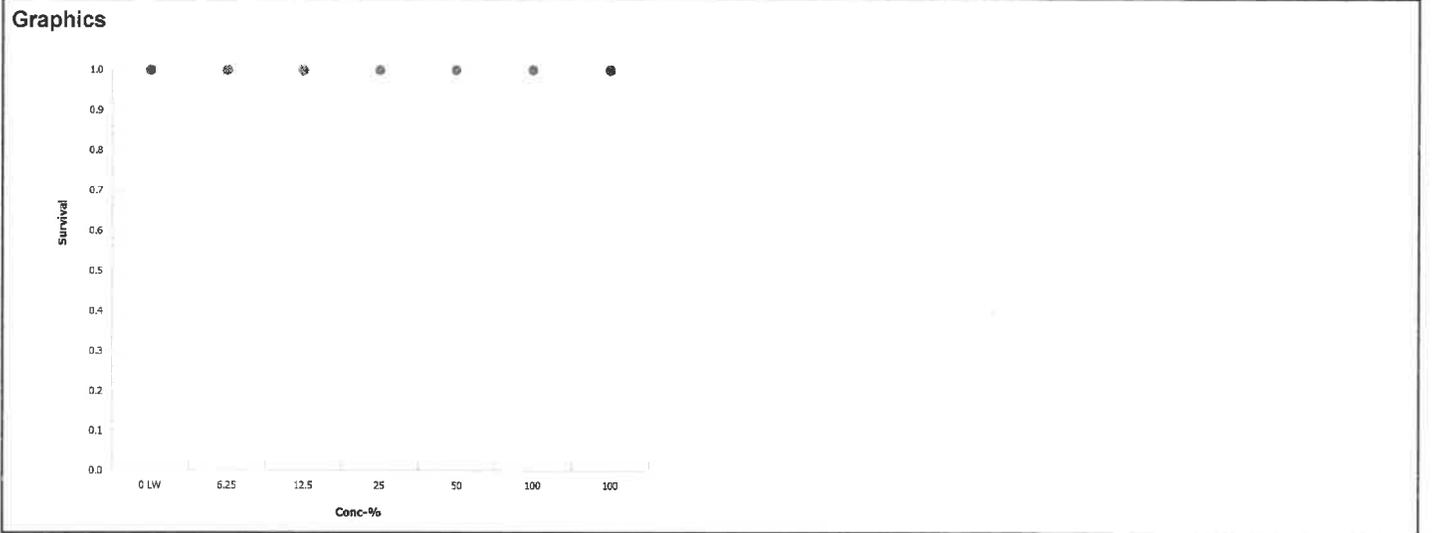
CETIS Analytical Report

Report Date: 16 Nov-18 11:59 (p 1 of 1)
 Test Code: 80639 | 09-8502-3333

Ceriodaphnia Survival and Reproduction Test				Pacific EcoRisk			
Analysis ID: 17-5227-9364	Endpoint: Survival			CETIS Version: CETISv1.9.2			
Analyzed: 16 Nov-18 11:52	Analysis: STP 2xK Contingency Tables			Official Results: Yes			
Data Transform	Alt Hyp			NOEL	LOEL	TOEL	TU
Untransformed	C > T			100	> 100	n/a	1

Fisher Exact/Bonferroni-Holm Test						
Control	vs	Group	Test Stat	P-Type	P-Value	Decision(α:5%)
Lab Water Contr		6.25	1.000	Exact	1.0000	Non-Significant Effect
		12.5	1.000	Exact	1.0000	Non-Significant Effect
		25	1.000	Exact	1.0000	Non-Significant Effect
		50	1.000	Exact	1.0000	Non-Significant Effect
		100	1.000	Exact	1.0000	Non-Significant Effect

Data Summary							
Conc-%	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
0	LW	10	0	10	1	0	0.0%
6.25		10	0	10	1	0	0.0%
12.5		10	0	10	1	0	0.0%
25		10	0	10	1	0	0.0%
50		10	0	10	1	0	0.0%
100		10	0	10	1	0	0.0%



CETIS Analytical Report

Report Date: 16 Nov-18 11:59 (p 1 of 1)
 Test Code: 80639 | 09-8502-3333

Ceriodaphnia Survival and Reproduction Test **Pacific EcoRisk**

Analysis ID: 11-3872-8815 Endpoint: Reproduction CETIS Version: CETISv1.9.2
 Analyzed: 16 Nov-18 11:58 Analysis: Nonparametric-Multiple Comparison Official Results: Yes

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	C > T	50	100	70.71	2	21.75%

Wilcoxon/Bonferroni Adj Test

Control	vs	Conc-%	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Lab Water Contr		6.25	69.5	n/a	2	17	Exact	0.2420	Non-Significant Effect
		12.5	81.5	n/a	3	18	Exact	0.1970	Non-Significant Effect
		25	67	n/a	1	17	Exact	0.1513	Non-Significant Effect
		50	75.5	n/a	2	18	Exact	0.0598	Non-Significant Effect
		100*	71	n/a	0	18	Exact	0.0206	Significant Effect

ANOVA Table

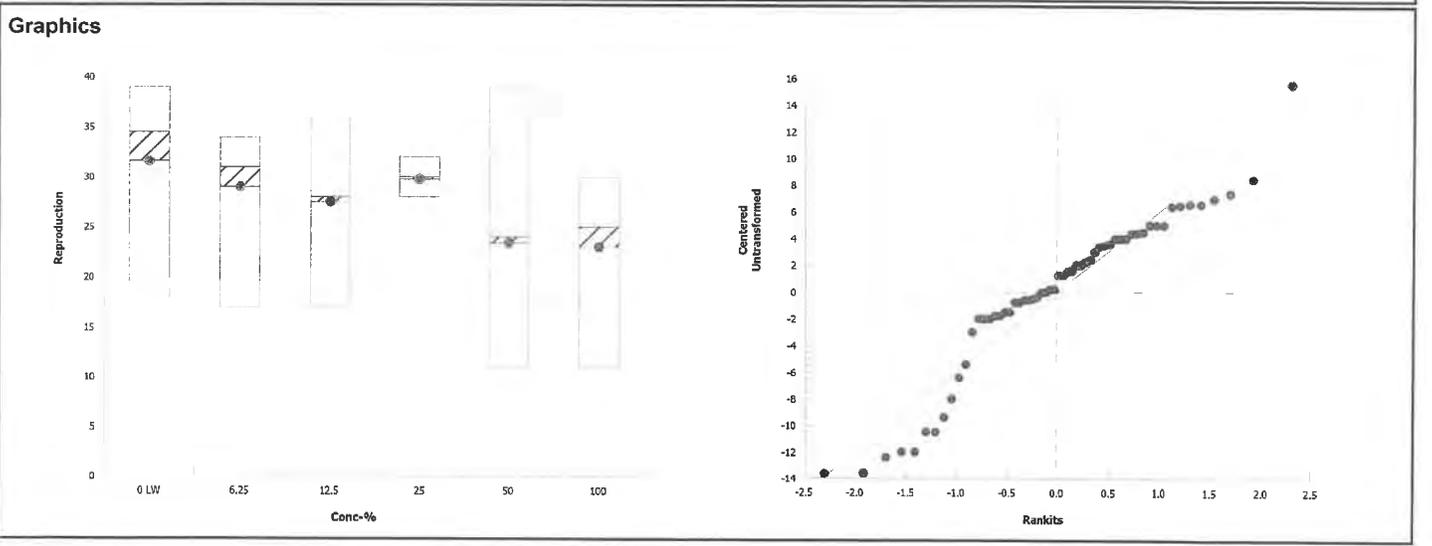
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	603.558	120.712	5	2.94	0.0206	Significant Effect
Error	2132.86	41.0165	52			
Total	2736.41		57			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	19.1	15.1	0.0019	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.934	0.944	0.0036	Non-Normal Distribution

Reproduction Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	LW	10	31.6	26.1	37.1	34.5	18	39	2.41	24.11%	0.00%
6.25		9	29	25.1	32.9	31	17	34	1.71	17.67%	8.23%
12.5		10	27.5	22.9	32.1	28	17	36	2.04	23.46%	12.97%
25		9	29.8	28.7	30.8	30	28	32	0.465	4.68%	5.77%
50		10	23.4	17.3	29.5	24	11	39	2.7	36.55%	25.95%
100		10	23	18.5	27.5	25	11	30	1.98	27.19%	27.22%



CETIS Analytical Report

Report Date: 16 Nov-18 11:59 (p 1 of 1)
 Test Code: 80639 | 09-8502-3333

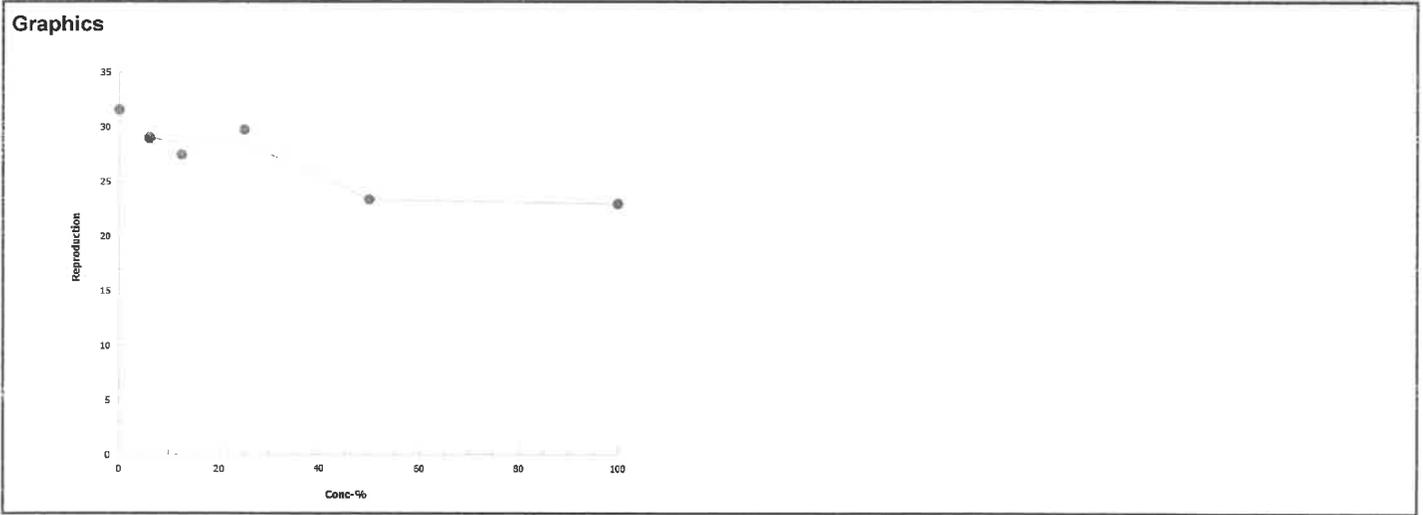
Ceriodaphnia Survival and Reproduction Test Pacific EcoRisk

Analysis ID: 11-2812-8711 Endpoint: Reproduction CETIS Version: CETISv1.9.2
 Analyzed: 16 Nov-18 11:58 Analysis: Linear Interpolation (ICPIN) Official Results: Yes

Linear Interpolation Options					
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	1226804	200	Yes	Two-Point Interpolation

Point Estimates						
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	3.8	1.72	36	26.33	2.78	58.17
IC10	25.9	3.44	49.1	3.854	2.036	29.08
IC15	33.5	5.16	78.2	2.986	1.279	19.39
IC20	41	12.1	n/a	2.437	n/a	8.238
IC25	48.6	33	n/a	2.059	n/a	3.033
IC40	>100	n/a	n/a	<1	n/a	n/a
IC50	>100	n/a	n/a	<1	n/a	n/a

Reproduction Summary			Calculated Variate						
Conc-%	Code	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	10	31.6	18	39	2.41	7.62	24.10%	0.0%
6.25		9	29	17	34	1.71	5.12	17.70%	8.23%
12.5		10	27.5	17	36	2.04	6.45	23.50%	13.0%
25		9	29.8	28	32	0.465	1.39	4.68%	5.77%
50		10	23.4	11	39	2.7	8.55	36.60%	25.9%
100		10	23	11	30	1.98	6.25	27.20%	27.2%



Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: LWA: Calleguas Creek Material: CCWTMP-69-ADOLF-045 Test Date: 11/8/18
 Project #: 29418 Test ID: 80639 Randomization: 10, 7, 1 Control Water: Mod EPAMH

Day	pH		D.O.		Cond. (µS/cm)	Temp (°C)	Survival / Reproduction										SIGN-OFF				
	New	Old	New	Old			A	B	C	D	E	F	G	H	I	J	Date:	New WQ:	Test Init.:		
0	7.94		8.8		354	25.9	0	0	0	0	0	0	0	0	0	0	0	0	Date: 11/8/18	New WQ: smc TA	Test Init.: TF
1	8.02	7.85	10.9	8.0	349	24.4	0	0	0	0	0	0	0	0	0	0	0	0	Date: 11/9/18	New WQ: TA	Counts: TF
2	8.06	7.88	9.9	8.4	354	25.1	0	0	0	0	0	0	0	0	0	0	0	0	Date: 11/10/18	New WQ: SD	Counts: EP
3	7.93	7.86	9.8	7.8	348	24.4	0	0	0	0	0	0	0	0	0	0	0	0	Date: 11/11/18	New WQ: TP	Counts: SV
4	7.90	7.88	11.2	10.8	346	24.1	7	8	8	7	8	7	6	6	7	8			Date: 11/12/18	New WQ: SF	Counts: SF
5	7.83	7.75	10.2	8.3	359	24.8	0	16	9	11	13	11	12	12	12	14			Date: 11/13/18	New WQ: ID	Counts: TF
6	-	7.74	-	8.5	403	24.1	11	15	14	18	17	13	16	0	16	14			Date: 11/14/18	New WQ: L	Counts: SF
7																			Date:	New WQ:	Counts:
8																			Date:	Old WQ:	Counts:
Total=						18	39	31	36	38	31	34	18	35	36	Mean Neonates/Female = 31.6					
Day	pH		D.O.		Cond. (µS/cm)	Temp (°C)	Survival / Reproduction										Sample ID				
	New	Old	New	Old			A	B	C	D	E	F	G	H	I	J	Date:	New WQ:	Test Init.:		
0	7.94		8.7		402	24.9	0	0	0	0	0	0	0	0	0	0	0	0			51277
1	8.08	7.92	10.6	8.1	397	24.6	0	0	0	0	0	0	0	0	0	0	0	0			51277
2	8.05	7.96	10.0	8.3	407	24.9	0	0	0	0	0	0	0	0	0	0	0	0			51277
3	7.95	7.95	9.8	8.0	400	24.3	0	0	0	0	0	0	0	0	0	0	0	0			51277
4	7.91	7.91	11.0	7.1	392	24.1	6	5	7	4	6	5	7	3	7	0					51277
5	7.89	7.76	10.4	8.2	397	25.1	10	13	11	12	12	11	12	10	0						51277
6	-	7.91	-	8.1	448	24.6	11	13	13	17	9	15	16	14	0	0					-
7																					
8																					
Total=						27	31	31	33	27	32	34	29	17	0	Mean Neonates/Female = 26.1					

Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: LWA: Calleguas Creek Material: CCWTMP-69-ADOLF-045 Test Date: 11/8/18

Project #: 29418 Test ID: 80639 Control Water: Mod EPAMH

Day	pH		D.O.		Cond. (µS/cm)	Temp (°C)	Survival / Reproduction										SIGN-OFF	
	New	Old	New	Old			A	B	C	D	E	F	G	H	I	J		
0	7.95		8.7		457	24.8	0	0	0	0	0	0	0	0	0	0	0	
1	8.06	7.96	10.7	8.2	439	24.6	0	0	0	0	0	0	0	0	0	0	0	
2	8.01	7.99	10.3	8.1	446	24.8	0	0	0	0	0	0	0	0	0	0	0	
3	7.99	7.96	9.6	7.9	450	24.9	0	0	0	0	0	0	0	0	0	0	0	
4	7.91	7.89	11.0	7.2	440	24.6	7	6	5	6	6	5	5	8	4	6		
5	7.92	7.72	10.7	6.8	453	25.3	10	11	8	12	6	7	13	14	13	11		
6	-	7.58	-	6.4	511	24.6	12	0	14	18	14	14	13	12	0	15		
7																		
8																		
Total=							29	17	27	36	26	24	31	34	17	32	Mean Neonates/Female = 27.5	
Day	pH		D.O.		Cond. (µS/cm)	Temp (°C)	Survival / Reproduction										SIGN-OFF	
	New	Old	New	Old			A	B	C	D	E	F	G	H	I	J		
0	7.95		8.7		541	24.5	0	0	0	0	0	0	0	0	0	0	0	
1	8.05	8.00	10.8	8.2	530	24.7	0	0	0	0	0	0	0	0	0	0	0	
2	7.99	8.01	10.3	8.3	531	25.0	0	0	0	0	0	0	0	0	0	0	0	
3	7.99	8.01	9.8	8.0	585	24.8	0	0	0	0	0	0	0	0	0	0	0	
4	7.92	7.92	11.1	7.0	526	24.4	6	8	5	7	6	5	7	6	5	6		
5	7.91	7.69	10.9	6.2	545	25.2	13	11	10	10	9	11	13	11	9	0		
6	-	7.73	-	7.3	591	24.6	11	13	16	12	14	14	12	11	14	13		
7																		
8																		
Total=							30	32	31	29	29	30	31	28	28	19	Mean Neonates/Female = 28.7	

Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: LWA: Calleguas Creek Material: CCWTMP-69-ADOLF-045 Test Date: 11/8/18
 Project #: 29418 Test ID: 80639 Control Water: Mod EPAMH

Day	pH		D.O.		Cond. (µS/cm)	Temp (°C)	Survival / Reproduction										SIGN-OFF	
	New	Old	New	Old			A	B	C	D	E	F	G	H	I	J		
50%	0	7.93		8.8		724	24.9	0	0	0	0	0	0	0	0	0	0	
	1	8.06	8.05	10.8	8.2	713	24.2	0	0	0	0	0	0	0	0	0	0	
	2	7.94	8.05	10.2	8.1	710	24.9	0	0	0	0	0	0	0	0	0	0	
	3	8.02	8.06	9.9	8.0	718	24.4	0	0	0	0	0	0	0	0	0	0	
	4	7.89	8.04	10.9	7.1	700	24.6	6	3	0	6	7	8	0	6	4	6	
	5	7.89	7.85	10.9	6.8	725	24.6	12	11	10	11	16	10	9	12	10	11	
	6	-	7.74	-	7.4	850	24.6	0	0	1	0	16	12	14	9	11	13	
	7																	
	8																	
Total=							18	14	11	17	39	30	23	27	25	30	Mean Neonates/Female = 23.4	
100%	0	7.93		9.4		1098	24.2	0	0	0	0	0	0	0	0	0	0	
	1	8.02	7.92	10.7	8.6	1081	24.6	0	0	0	0	0	0	0	0	0	0	
	2	8.03	8.04	9.7	8.0	1086	24.8	0	0	0	0	0	0	0	0	0	0	
	3	8.01	8.17	10.0	7.9	1085	24.1	0	0	0	0	0	0	0	0	0	0	
	4	7.85	8.14	11.0	7.2	1044	24.4	6	4	5	4	4	4	0	5	7	7	
	5	7.88	7.73	10.7	4.3	1089	25.3	9	14	10	10	7	7	11	10	9	8	
	6	-	7.85	-	7.3	1229	24.6	0	12	12	13	4	17	17	5	7	6	
	7																	
	8																	
Total=							15	30	27	27	11	28	28	20	23	21	Mean Neonates/Female = 23.0	

CETIS Summary Report

Report Date: 16 Nov-18 14:41 (p 1 of 2)

Test Code: 80641 | 07-4972-9453

Ceriodaphnia Survival and Reproduction Test	Pacific EcoRisk
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Batch ID: 16-2355-6672	Test Type: Reproduction-Survival (7d)	Analyst: Jessica Okutsu
Start Date: 08 Nov-18 15:10	Protocol: EPA-821-R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 14 Nov-18 15:15	Species: Ceriodaphnia dubia	Brine: Not Applicable
Duration: 6d 0h	Source: In-House Culture	Age: 1

Sample ID: 14-9038-7350	Code: 69-HITCH-150	Client: Larry Walker Associates
Sample Date: 07 Nov-18 16:50	Material: Ambient Water	Project: 29418
Receipt Date: 08 Nov-18 07:37	Source: Calleguas Creek	
Sample Age: 22h (0.8 °C)	Station: HITCH	

Multiple Comparison Summary							
Analysis ID	Endpoint	Comparison Method	NOEL	LOEL	TOEL	TU	PMSD ✓
05-5260-4390	Reproduction	Dunnett Multiple Comparison Test	50	100	70.71	2	24.6%
19-4006-2721	Survival	Fisher Exact/Bonferroni-Holm Test	100	> 100	n/a	1	n/a

Point Estimate Summary							
Analysis ID	Endpoint	Point Estimate Method	Level	%	95% LCL	95% UCL	TU ✓
02-8259-8407	Reproduction	Linear Interpolation (ICPIN)	IC5	1.98	1.38	11	50.51
			IC10	3.96	2.75	36	25.25
			IC15	5.94	4.13	n/a	16.84
			IC20	38.6	5.51	n/a	2.59
			IC25	>100	n/a	n/a	<1
			IC40	>100	n/a	n/a	<1
			IC50	>100	n/a	n/a	<1

Reproduction Summary											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	10	34	31.5	36.5	28	40	1.11	3.5	10.28%	0.00%
6.25		10	28.6	23.9	33.3	19	36	2.07	6.54	22.85%	15.88%
12.5		10	27.4	21.3	33.5	18	40	2.71	8.57	31.26%	19.41%
25		10	29.9	23.3	36.5	12	40	2.93	9.27	30.99%	12.06%
50		10	26	18.6	33.4	9	40	3.29	10.4	39.97%	23.53%
100		10	25.6	19.2	32	9	38	2.82	8.92	34.85%	24.71%

Survival Summary											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
6.25		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
12.5		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
25		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
50		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
100		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%

CETIS Summary Report

Report Date: 16 Nov-18 11:42 (p 2 of 2)
 Test Code: 80641 | 07-4972-9453

Ceriodaphnia Survival and Reproduction Test											Pacific EcoRisk
Reproduction Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	36	36	36	35	28	40	32	30	35	32
6.25		30	19	35	24	31	36	21	36	32	22
12.5		20	25	40	19	22	35	18	22	37	36
25		34	36	18	40	12	22	36	31	36	34
50		9	31	28	34	34	40	10	18	29	27
100		27	19	38	22	37	21	9	26	23	34
Survival Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
6.25		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
12.5		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
25		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
50		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
100		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Survival Binomials											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
6.25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
12.5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
50		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
100		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1

CETIS Analytical Report

Report Date: 16 Nov-18 11:42 (p 1 of 1)
 Test Code: 80641 | 07-4972-9453

Ceriodaphnia Survival and Reproduction Test Pacific EcoRisk

Analysis ID: 19-4006-2721 Endpoint: Survival CETIS Version: CETISv1.9.2
 Analyzed: 16 Nov-18 11:35 Analysis: STP 2xK Contingency Tables Official Results: Yes

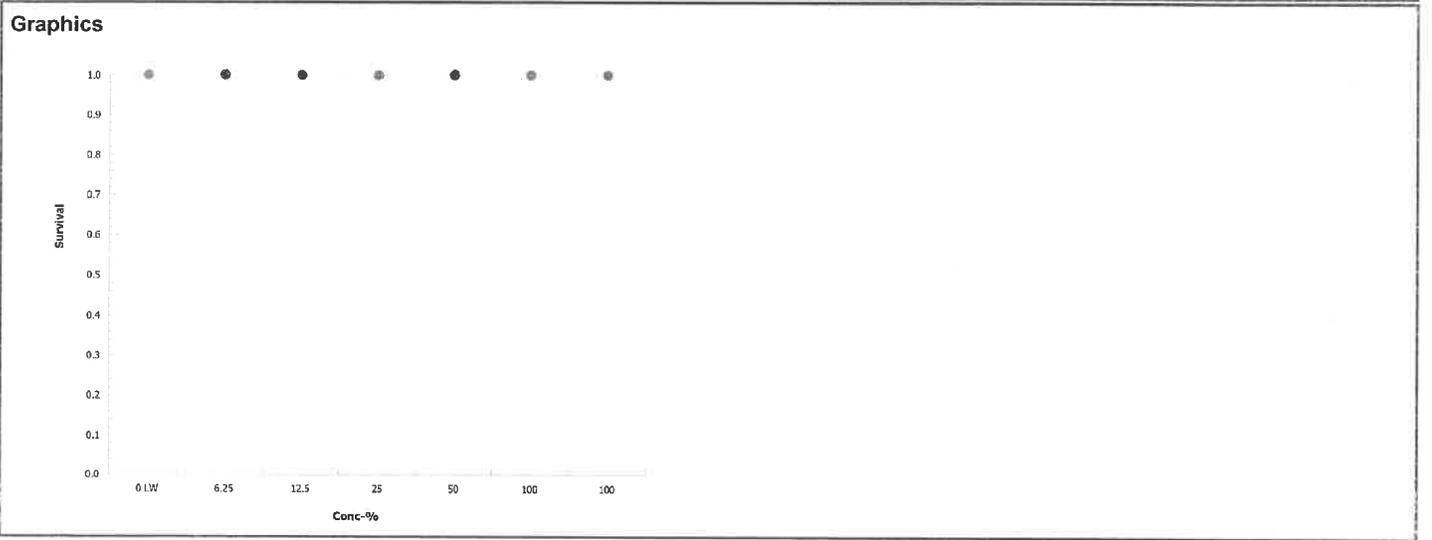
Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU
Untransformed	C > T	100	> 100	n/a	1

Fisher Exact/Bonferroni-Holm Test

Control	vs	Group	Test Stat	P-Type	P-Value	Decision(α:5%)
Lab Water Contr		6.25	1.000	Exact	1.0000	Non-Significant Effect
		12.5	1.000	Exact	1.0000	Non-Significant Effect
		25	1.000	Exact	1.0000	Non-Significant Effect
		50	1.000	Exact	1.0000	Non-Significant Effect
		100	1.000	Exact	1.0000	Non-Significant Effect

Data Summary

Conc-%	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
0	LW	10	0	10	1	0	0.0%
6.25		10	0	10	1	0	0.0%
12.5		10	0	10	1	0	0.0%
25		10	0	10	1	0	0.0%
50		10	0	10	1	0	0.0%
100		10	0	10	1	0	0.0%



Ceriodaphnia Survival and Reproduction Test Pacific EcoRisk

Analysis ID: 05-5260-4390 Endpoint: Reproduction CETIS Version: CETISv1.9.2
 Analyzed: 16 Nov-18 11:35 Analysis: Parametric-Control vs Treatments Official Results: Yes

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	C > T	50	100	70.71	2	24.64%

Dunnett Multiple Comparison Test

Control	vs	Conc-%	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Water Contr		6.25	1.48	2.29	8.38	18	CDF	0.2253	Non-Significant Effect
		12.5	1.8	2.29	8.38	18	CDF	0.1314	Non-Significant Effect
		25	1.12	2.29	8.38	18	CDF	0.3634	Non-Significant Effect
		50	2.19	2.29	8.38	18	CDF	0.0624	Non-Significant Effect
		100*	2.3	2.29	8.38	18	CDF	0.0493	Significant Effect

ANOVA Table

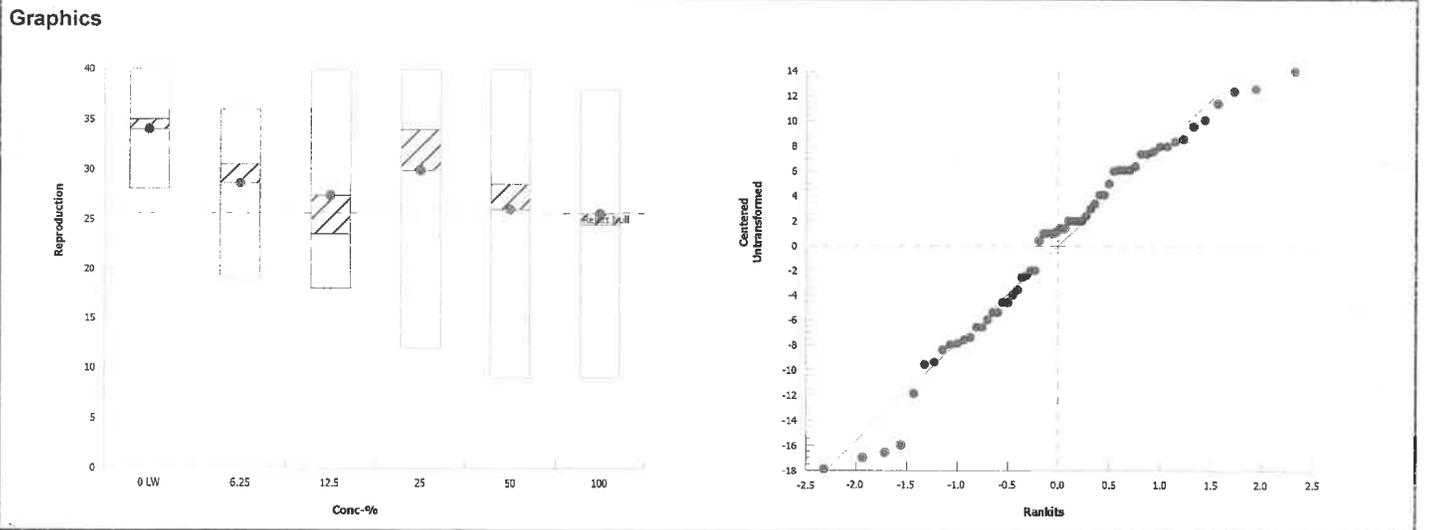
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	480.483	96.0967	5	1.44	0.2266	Non-Significant Effect
Error	3616.1	66.9648	54			
Total	4096.58		59			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	10	15.1	0.0751	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.969	0.946	0.1278	Normal Distribution

Reproduction Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	LW	10	34	31.5	36.5	35	28	40	1.11	10.28%	0.00%
6.25		10	28.6	23.9	33.3	30.5	19	36	2.07	22.85%	15.88%
12.5		10	27.4	21.3	33.5	23.5	18	40	2.71	31.26%	19.41%
25		10	29.9	23.3	36.5	34	12	40	2.93	30.99%	12.06%
50		10	26	18.6	33.4	28.5	9	40	3.29	39.97%	23.53%
100		10	25.6	19.2	32	24.5	9	38	2.82	34.85%	24.71%



CETIS Analytical Report

Report Date: 16 Nov-18 11:42 (p 1 of 1)
 Test Code: 80641 | 07-4972-9453

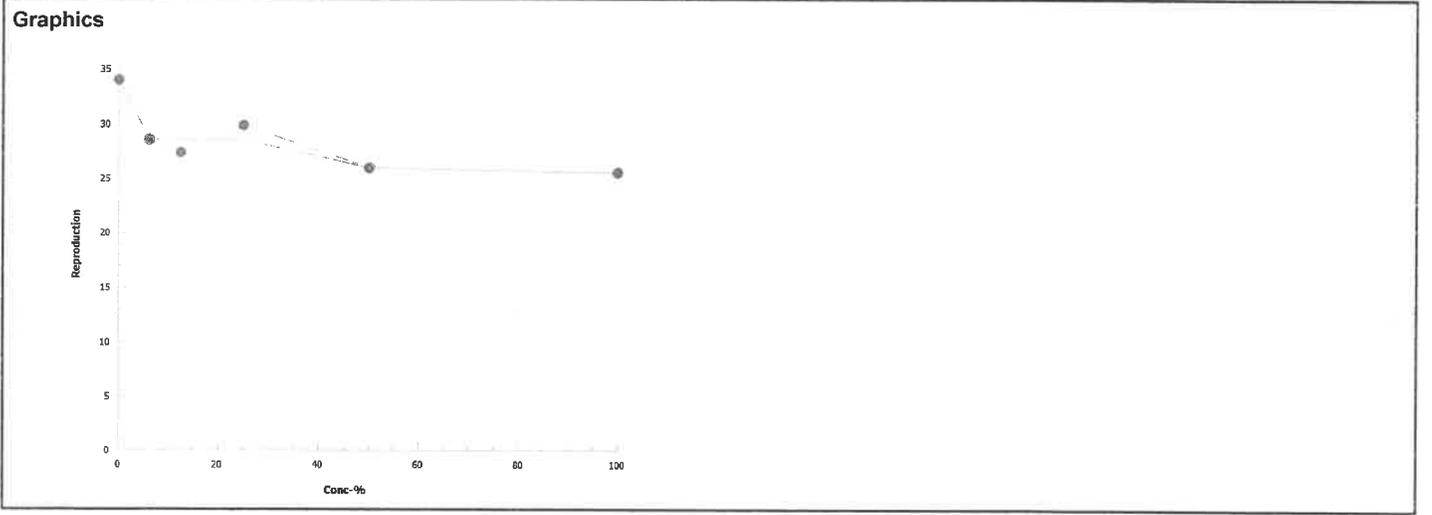
Ceriodaphnia Survival and Reproduction Test **Pacific EcoRisk**

Analysis ID: 02-8259-8407 Endpoint: Reproduction CETIS Version: CETISv1.9.2
 Analyzed: 16 Nov-18 11:35 Analysis: Linear Interpolation (ICPIN) Official Results: Yes

Linear Interpolation Options					
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	1770989	200	Yes	Two-Point Interpolation

Point Estimates						
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	1.98	1.38	11	50.51	9.101	72.64
IC10	3.96	2.75	36	25.25	2.781	36.32
IC15	5.94	4.13	n/a	16.84	n/a	24.21
IC20	38.6	5.51	n/a	2.59	n/a	18.16
IC25	>100	n/a	n/a	<1	n/a	n/a
IC40	>100	n/a	n/a	<1	n/a	n/a
IC50	>100	n/a	n/a	<1	n/a	n/a

Reproduction Summary			Calculated Variate						
Conc-%	Code	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	10	34	28	40	1.11	3.5	10.30%	0.0%
6.25		10	28.6	19	36	2.07	6.54	22.90%	15.9%
12.5		10	27.4	18	40	2.71	8.57	31.30%	19.4%
25		10	29.9	12	40	2.93	9.27	31.00%	12.1%
50		10	26	9	40	3.29	10.4	40.00%	23.5%
100		10	25.6	9	38	2.82	8.92	34.90%	24.7%



Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: LWA: Calleguas Creek Material: CCWTMP-69-HITCH-150 Test Date: 11/8/18
 Project #: 29418 Test ID: 80641 Randomization: 10,7,1 Control Water: Mod EPAMH

Day	pH		D.O.		Cond. (µS/cm)	Temp (°C)	Survival / Reproduction										SIGN-OFF	
	New	Old	New	Old			A	B	C	D	E	F	G	H	I	J		
0	7.72		8.5		356	24.2	0	0	0	0	0	0	0	0	0	0	0	Date: 11/8/18 New WQ: <u>CD</u> Test Init. Time: <u>1510</u>
1	8.04	8.11	10.3	8.1	358	25.2	0	0	0	0	0	0	0	0	0	0	0	Date: 11/11/18 New WQ: <u>SR</u> Counts: <u>CD</u>
2	7.90	7.78	9.8	8.3	348	24.0	0	0	0	0	0	0	0	0	0	0	0	Date: 11/10/18 New WQ: <u>SD</u> Counts: <u>AR</u>
3	8.12	8.01	9.8	8.0	350	24.6	0	0	6	0	3	8	0	0	7	0	0	Date: 11/11/18 New WQ: <u>SD</u> Counts: <u>AR</u>
4	7.88	8.12	11.3	8.1	348	24.9	5	8	0	8	5	0	6	7	0	8	0	Date: 11/12/18 New WQ: <u>TP</u> Counts: <u>AR</u>
5	7.86	7.76	10.7	8.0	357	25.2	13	13	14	13	13	15	12	10	13	11	0	Date: 11/14/18 New WQ: <u>TP</u> Counts: <u>AR</u>
6	-	7.61	-	8.5	341	25.6	18	15	16	14	7	17	14	13	15	13	0	Date: 11/14/18 New WQ: <u>TP</u> Counts: <u>AR</u>
7																		Date: New WQ: Counts:
8																		Date: Old WQ: Counts:
Total=							36	36	36	35	28	40	32	30	35	32	0	Mean Neonates/Female = <u>34.0</u>
Day	pH		D.O.		Cond. (µS/cm)	Temp (°C)	Survival / Reproduction										Sample ID	
	New	Old	New	Old			A	B	C	D	E	F	G	H	I	J		
0	7.77		8.4		446	25.5	0	0	0	0	0	0	0	0	0	0	0	51279
1	8.07	8.18	9.6	8.1	442	24.9	0	0	0	0	0	0	0	0	0	0	0	51279
2	7.88	7.87	9.9	8.2	450	24.0	0	0	0	0	0	0	0	0	0	0	0	51279
3	8.03	8.06	10.1	8.1	453	24.5	5	8	7	0	0	7	0	0	6	0	0	51279
4	7.86	8.05	11.0	8.1	454	24.8	6	8	0	0	4	0	7	6	0	6	0	51279
5	7.89	7.84	10.9	8.1	448	25.1	13	11	13	8	10	13	0	14	9	9	0	51279
6	-	7.68	-	8.2	468	25.6	12	0	15	16	17	16	14	16	17	7	0	-
7																		
8																		
Total=							30	19	35	24	31	36	21	36	32	22	0	Mean Neonates/Female = <u>28.6</u>

Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: LWA: Calleguas Creek Material: CCWTMP-69-HITCH-150 Test Date: 11/8/18
 Project #: 29418 Test ID: 80641 Control Water: Mod EPAMH

Day	pH		D.O.		Cond. (µS/cm)	Temp (°C)	Survival / Reproduction										SIGN-OFF	
	New	Old	New	Old			A	B	C	D	E	F	G	H	I	J		
0	7.81		8.5		556	24.7	0	0	0	0	0	0	0	0	0	0	0	
1	8.11	8.21	9.4	8.1	527	25.1	0	0	0	0	0	0	0	0	0	0	0	
2	7.88	7.91	10.1	8.3	535	24.0	0	0	0	0	0	0	0	0	0	0	0	
3	8.02	7.99	10.2	7.6	542	25.1	6	0	7	0	0	7	0	0	0	0	0	
4	7.85	8.09	11.2	8.1	543	25.0	0	6	0	6	6	0	7	7	7	8		
5	7.90	7.85	11.0	8.0	543	25.3	11	4	15	13	12	12	8	2	13	10		
6	-	7.70	-	8.0	564	25.4	3	15	18	0	4	16	3	13	17	18		
7																		
8																		
Total=							20	25	40	19	22	35	18	22	37	36	Mean Neonates/Female = 27.4	
Day	pH		D.O.		Cond. (µS/cm)	Temp (°C)	Survival / Reproduction										SIGN-OFF	
	New	Old	New	Old			A	B	C	D	E	F	G	H	I	J		
0	7.83		8.6		725	24.9	0	0	0	0	0	0	0	0	0	0	0	
1	8.13	8.24	9.4	8.1	702	25.3	0	0	0	0	0	0	0	0	0	0	0	
2	7.89	7.94	10.2	8.3	723	24.0	0	0	0	0	0	0	0	0	0	0	0	
3	7.99	8.15	10.2	7.9	722	25.4	7	0	6	0	0	6	0	0	4	0		
4	7.84	8.12	11.1	8.1	709	24.1	0	6	0	7	6	0	6	5	0	6		
5	7.89	7.90	11.1	8.1	723	24.9	10	14	12	13	6	11	13	11	15	13		
6	-	7.70	-	7.8	755	26.6	17	16	0	20	0	5	17	15	17	15		
7																		
8																		
Total=							34	36	18	40	12	22	36	31	36	34	Mean Neonates/Female = 29.9	

Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: LWA: Calleguas Creek Material: CCWTMP-69-HITCH-150 Test Date: 11/8/18
 Project #: 29418 Test ID: 80641 Control Water: Mod EPAMH

Day	pH		D.O.		Cond. (µS/cm)	Temp (°C)	Survival / Reproduction										SIGN-OFF	
	New	Old	New	Old			A	B	C	D	E	F	G	H	I	J		
50%	0	7.87		8.6		1049	25.0	0	0	0	0	0	0	0	0	0	0	
	1	8.14	8.32	9.2	8.2	1033	25.3	0	0	0	0	0	0	0	0	0	0	
	2	7.84	8.03	10.1	8.3	1068	24.0	0	0	0	0	0	0	0	0	0	0	
	3	8.00	8.24	10.1	7.9	1042	25.2	0	0	0	0	6	0	0	0	0	0	
	4	7.90	8.11	10.7	7.7	1030	24.8	0	4	5	4	0	8	5	6	4	0	
	5	7.90	8.00	10.9	7.9	1073	25.3	9	11	10	13	12	14	2	12	12	14	
	6	-	7.77	-	7.0	1153	25.4	0	16	13	17	16	18	3	0	13	7	
	7																	
	8																	
Total=							9	31	28	34	34	40	10	18	29	27	Mean Neonates/Female = 260	
100%	0	7.87		8.9		1719	25.0	0	0	0	0	0	0	0	0	0	0	
	1	8.16	8.46	9.1	8.1	1683	25.2	0	0	0	0	0	0	0	0	0	0	
	2	7.84	8.12	9.7	8.4	1723	24.0	0	0	0	0	0	0	0	0	0	0	
	3	7.91	8.40	9.7	8.0	1710	24.9	0	0	0	0	0	0	0	1	3		
	4	7.82	8.30	10.2	7.8	1679	24.9	0	0	0	2	7	1	3	5	0	0	
	5	7.84	8.16	10.4	7.3	1727	25.5	14	10	12	10	12	15	3	0	15	12	
	6	-	7.99	-	7.4	1777	25.6	7	9	20	16	18	5	3	21	7	19	
	7																	
	8																	
Total=							27	19	38	22	37	21	69	26	23	34	Mean Neonates/Female = 253 25.6	

CETIS Summary Report

Report Date: 26 Nov-18 09:48 (p 1 of 2)
 Test Code: 80642 | 01-7159-0088

Ceriodaphnia Survival and Reproduction Test **Pacific EcoRisk**

Batch ID: 09-8326-0482	Test Type: Reproduction-Survival (7d)	Analyst: Jessica Okutsu
Start Date: 08 Nov-18 15:18	Protocol: EPA-821-R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 14 Nov-18 16:34	Species: Ceriodaphnia dubia	Brine: Not Applicable
Duration: 6d 1h	Source: In-House Culture	Age: 1

Sample ID: 20-0689-8905	Code: 69-GATE-202	Client: Larry Walker Associates
Sample Date: 07 Nov-18 13:00	Material: Ambient Water	Project: 29418
Receipt Date: 08 Nov-18 07:37	Source: Calleguas Creek	
Sample Age: 26h (0.6 °C)	Station: GATE	

Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	NOEL	LOEL	TOEL	TU	PMSD ✓
13-3783-3496	Reproduction	Dunnett Multiple Comparison Test	25	50	35.36	4	26.7%
15-3880-5173	Survival	Fisher Exact/Bonferroni-Holm Test	100	> 100	n/a	1	n/a

Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	Level	%	95% LCL	95% UCL	TU	✓
03-7239-2020	Reproduction	Linear Interpolation (ICPIN)	IC5	1.3	0.807	6.8	77.07	
			IC10	2.59	1.61	8.17	38.54	
			IC15	3.89	2.42	11.9	25.69	
			IC20	5.19	3.23	73.3	19.27	
			IC25	6.9	4.04	n/a	14.49	
			IC40	>100	n/a	n/a	<1	
			IC50	>100	n/a	n/a	<1	

Reproduction Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	10	32.8	26.8	38.8	18	42	2.65	8.38	25.54%	0.00%
6.25		10	24.9	19.2	30.6	13	35	2.5	7.91	31.76%	24.09%
12.5		10	16.3	10.9	21.7	6	32	2.37	7.48	45.91%	50.30%
25		10	26.2	21.2	31.2	13	36	2.21	6.97	26.61%	20.12%
50		10	23.5	16.7	30.3	3	36	2.99	9.44	40.18%	28.35%
100		10	22.1	14.5	29.7	9	37	3.37	10.7	48.29%	32.62%

Survival Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
6.25		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
12.5		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
25		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
50		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
100		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%

CETIS Summary Report

Report Date: 26 Nov-18 09:48 (p 2 of 2)
 Test Code: 80642 | 01-7159-0088

Ceriodaphnia Survival and Reproduction Test											Pacific EcoRisk
Reproduction Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	42	37	33	35	34	41	33	37	18	18
6.25		15	13	32	27	29	35	24	34	23	17
12.5		13	9	22	18	12	6	13	32	21	17
25		22	31	19	29	28	31	36	13	31	22
50		26	28	31	36	29	18	3	19	28	17
100		37	10	9	20	32	13	13	36	26	25
Survival Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
6.25		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
12.5		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
25		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
50		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
100		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Survival Binomials											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
6.25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
12.5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
50		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
100		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1

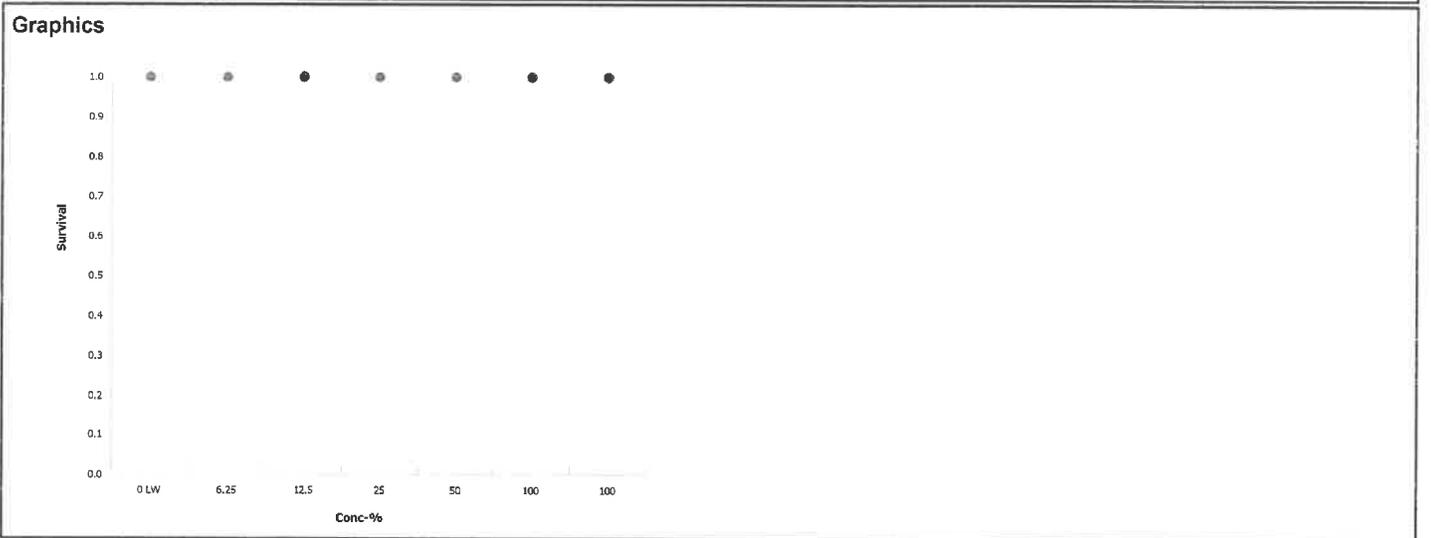
CETIS Analytical Report

Report Date: 26 Nov-18 09:48 (p 1 of 1)
 Test Code: 80642 | 01-7159-0088

Ceriodaphnia Survival and Reproduction Test				Pacific EcoRisk	
Analysis ID: 15-3880-5173	Endpoint: Survival	CETIS Version: CETISv1.9.2			
Analyzed: 16 Nov-18 12:14	Analysis: STP 2xK Contingency Tables	Official Results: Yes			
Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU
Untransformed	C > T	100	> 100	n/a	1

Fisher Exact/Bonferroni-Holm Test						
Control	vs	Group	Test Stat	P-Type	P-Value	Decision(α:5%)
Lab Water Contr		6.25	1.000	Exact	1.0000	Non-Significant Effect
		12.5	1.000	Exact	1.0000	Non-Significant Effect
		25	1.000	Exact	1.0000	Non-Significant Effect
		50	1.000	Exact	1.0000	Non-Significant Effect
		100	1.000	Exact	1.0000	Non-Significant Effect

Data Summary							
Conc-%	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
0	LW	10	0	10	1	0	0.0%
6.25		10	0	10	1	0	0.0%
12.5		10	0	10	1	0	0.0%
25		10	0	10	1	0	0.0%
50		10	0	10	1	0	0.0%
100		10	0	10	1	0	0.0%



Ceriodaphnia Survival and Reproduction Test Pacific EcoRisk

Analysis ID: 13-3783-3496 Endpoint: Reproduction CETIS Version: CETISv1.9.2
 Analyzed: 16 Nov-18 12:14 Analysis: Parametric-Control vs Treatments Official Results: Yes

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	C > T	25	50	35.36	4	26.74%

Dunnett Multiple Comparison Test

Control	vs	Conc-%	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Water Contr		6.25	2.06	2.29	8.77	18	CDF	0.0805	Non-Significant Effect
		12.5*	4.31	2.29	8.77	18	CDF	1.7E-04	Significant Effect
		25	1.72	2.29	8.77	18	CDF	0.1514	Non-Significant Effect
		50*	2.43	2.29	8.77	18	CDF	0.0367	Significant Effect
		100*	2.79	2.29	8.77	18	CDF	0.0151	Significant Effect

ANOVA Table

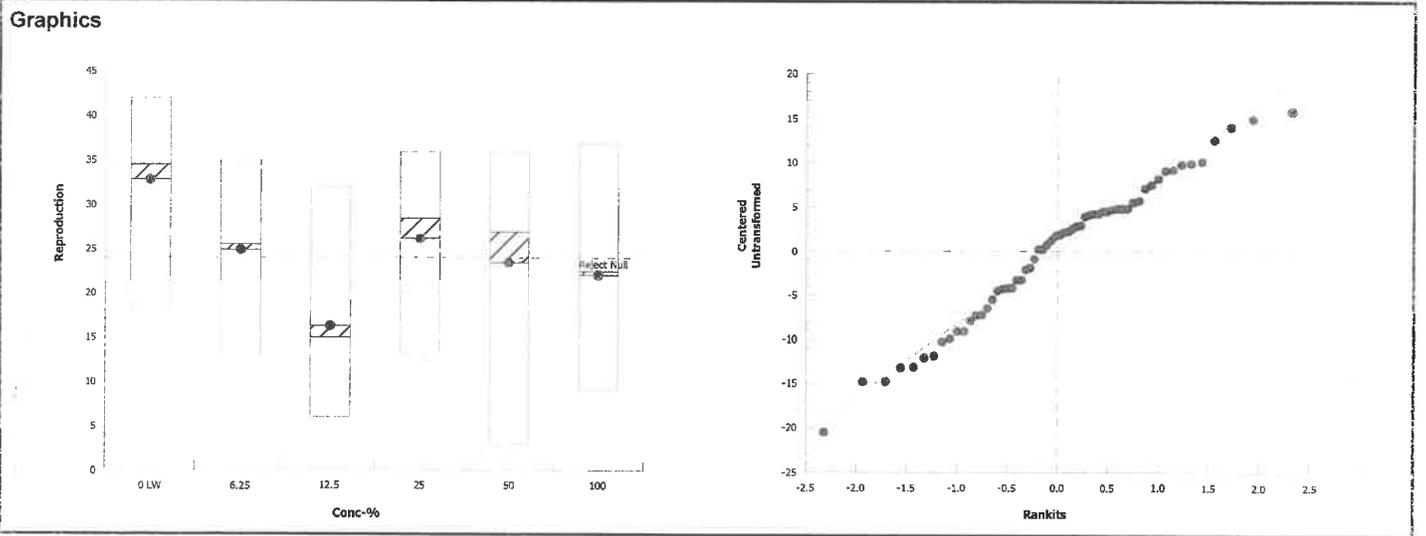
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	1457	291.4	5	3.97	0.0039	Significant Effect
Error	3963.6	73.4	54			
Total	5420.6		59			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	2.19	15.1	0.8229	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.979	0.946	0.3709	Normal Distribution

Reproduction Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	LW	10	32.8	26.8	38.8	34.5	18	42	2.65	25.54%	0.00%
6.25		10	24.9	19.2	30.6	25.5	13	35	2.5	31.76%	24.09%
12.5		10	16.3	10.9	21.7	15	6	32	2.37	45.91%	50.30%
25		10	26.2	21.2	31.2	28.5	13	36	2.21	26.61%	20.12%
50		10	23.5	16.7	30.3	27	3	36	2.99	40.18%	28.35%
100		10	22.1	14.5	29.7	22.5	9	37	3.37	48.29%	32.62%



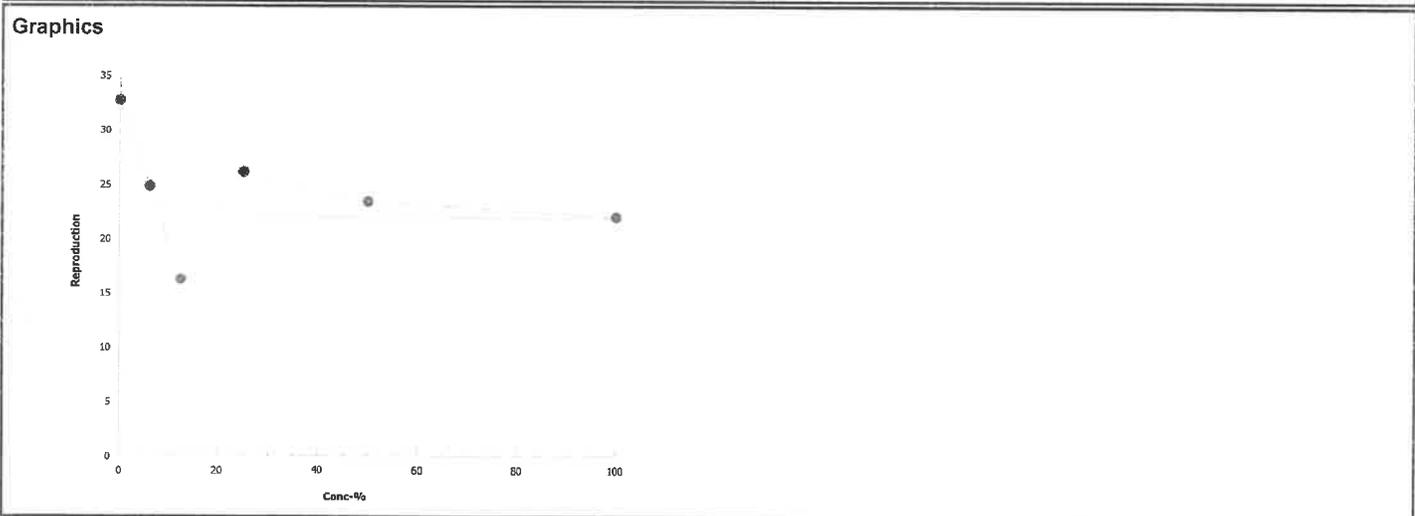
Ceriodaphnia Survival and Reproduction Test **Pacific EcoRisk**

Analysis ID: 03-7239-2020 Endpoint: Reproduction CETIS Version: CETISv1.9.2
 Analyzed: 16 Nov-18 12:14 Analysis: Linear Interpolation (ICPIN) Official Results: Yes

Linear Interpolation Options					
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	1782271	200	Yes	Two-Point Interpolation

Point Estimates						
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	1.3	0.807	6.8	77.07	14.7	123.8
IC10	2.59	1.61	8.17	38.54	12.24	61.92
IC15	3.89	2.42	11.9	25.69	8.401	41.28
IC20	5.19	3.23	73.3	19.27	1.365	30.96
IC25	6.9	4.04	n/a	14.49	n/a	24.77
IC40	>100	n/a	n/a	<1	n/a	n/a
IC50	>100	n/a	n/a	<1	n/a	n/a

Reproduction Summary			Calculated Variate						
Conc-%	Code	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	10	32.8	18	42	2.65	8.38	25.50%	0.0%
6.25		10	24.9	13	35	2.5	7.91	31.80%	24.1%
12.5		10	16.3	6	32	2.37	7.48	45.90%	50.3%
25		10	26.2	13	36	2.21	6.97	26.60%	20.1%
50		10	23.5	3	36	2.99	9.44	40.20%	28.4%
100		10	22.1	9	37	3.37	10.7	48.30%	32.6%



Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: LWA: Calleguas Creek Material: CCWTMP-69-GATE-202 Test Date: 11/8/18

Project #: 29418 Test ID: 80642 Randomization: 10.7.5 Control Water: Mod EPAMH

Day	pH		D.O.		Cond. (µS/cm)	Temp (°C)	Survival / Reproduction										SIGN-OFF	
	New	Old	New	Old			A	B	C	D	E	F	G	H	I	J		
0	7.90		8.5		352	24.1	0	0	0	0	0	0	0	0	0	0	0	Date: 11/8/18 New WQ: <u>TA</u> Test Init: <u>CR</u> Sol'n Prep: <u>SMC</u> TA Time: <u>1518</u>
1	8.17	8.08	10.0	8.0	361	25.4	0	0	0	0	0	0	0	0	0	0	0	Date: 11/16/18 New WQ: <u>TA</u> Counts: <u>CD</u> Sol'n Prep: <u>RO</u> Old WQ: <u>SD</u> Time: <u>1407</u>
2	7.91	7.79	10.1	8.4	355	25.5	0	0	0	0	0	0	0	0	0	0	0	Date: 11/16/18 New WQ: <u>SD</u> Counts: <u>LZ</u> Sol'n Prep: <u>SMC</u> Old WQ: <u>TA</u> Time: <u>1010</u>
3	8.01	8.09	9.5	8.0	349	24.7	0	0	0	0	0	0	0	0	0	0	0	Date: 11/16/18 New WQ: <u>TP</u> Counts: <u>SF</u> Sol'n Prep: <u>BU</u> Old WQ: <u>AR</u> Time: <u>1230</u>
4	8.00	7.93	10.9	8.1	346	24.7	7	5	6	7	8	7	8	5	6	6	6	Date: 11/21/18 New WQ: <u>SF</u> Counts: <u>KL</u> Sol'n Prep: <u>JL</u> Old WQ: <u>SF</u> Time: <u>1520</u>
5	7.83	7.69	10.9	8.0	356	24.0	14	11	9	11	11	13	10	14	12	12	12	Date: 11/21/18 New WQ: <u>BU</u> Counts: <u>JP</u> Sol'n Prep: <u>SMC</u> Old WQ: <u>IO</u> Time: <u>1521</u>
6	—	7.65	—	8.2	409	24.7	21	21	18	17	15	21	15	18	0	0	0	Date: 11/21/18 New WQ: <u>—</u> Counts: <u>RL</u> Sol'n Prep: <u>—</u> Old WQ: <u>IOB</u> Time: <u>1457</u>
7																		Date: <u>—</u> New WQ: <u>—</u> Counts: <u>—</u> Sol'n Prep: <u>—</u> Old WQ: <u>—</u> Time: <u>—</u>
8																		Date: <u>—</u> Old WQ: <u>—</u> Counts: <u>—</u> Time: <u>—</u>
Total=							42	37	33	35	34	41	33	37	18	18	18	Mean Neonates/Female = <u>32.8</u>
Day	pH		D.O.		Cond. (µS/cm)	Survival / Reproduction										Sample ID		
	New	Old	New	Old		A	B	C	D	E	F	G	H	I	J			
0	7.92		8.6		397	24.6	0	0	0	0	0	0	0	0	0	0	0	51280
1	8.13	8.10	10.0	8.0	392	24.7	0	0	0	0	0	0	0	0	0	0	0	51280
2	7.91	7.91	10.1	8.6	397	25.9	0	0	0	0	0	0	0	0	0	0	0	51280
3	7.99	8.04	10.0	8.4	397	24.6	0	0	0	0	0	0	0	0	0	0	0	51280
4	7.96	7.87	10.8	8.2	385	24.3	4	0	7	6	6	8	7	7	6	6	6	51280
5	7.84	7.64	11.1	7.5	394	24.0	11	13	8	10	10	12	0	9	7	11	11	51280
6	—	7.59	—	7.1	433	24.6	0	0	17	11	13	15	17	18	15	0	0	—
7																		
8																		
Total=							15	13	32	27	29	35	24	34	23	17	17	Mean Neonates/Female = <u>24.9</u>

2011/14/18
1634

24
2011/14/18

Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: LWA: Calleguas Creek Material: CCWTMP-69-GATE-202 Test Date: 11/8/18

Project #: 29418 Test ID: 80642 Control Water: Mod EPAMH

	Day	pH		D.O.		Cond. (µS/cm)	Temp (°C)	Survival / Reproduction										SIGN-OFF	
		New	Old	New	Old			A	B	C	D	E	F	G	H	I	J		
12.5%	0	7.92		8.6		435	24.8	0	0	0	0	0	0	0	0	0	0	0	
	1	8.11	8.12	9.9	8.1	432	24.9	0	0	0	0	0	0	0	0	0	0	0	
	2	7.90	7.90	10.1	8.6	459	25.2	0	0	0	0	0	0	0	0	0	0	0	
	3	7.96	8.09	9.9	8.4	440	24.6	0	0	0	0	0	0	0	0	0	0	0	
	4	7.91	7.89	10.7	8.1	430	24.6	6	0	6	6	5	6	5	7	6	5		
	5	7.83	7.65	11.1	7.0	441	24.0	7	9	12	12	5	0	8	10	0	12		
	6	-	7.61	-	6.9	471	24.0	0	0	4	0	2	0	0	15	15	0		
	7																		
	8																		
							Total=	13	9	22	18	12	6	13	32	21	17	Mean Neonates/Female = 16.3	
25%	0	7.90		8.7		525	25.4	0	0	0	0	0	0	0	0	0	0	0	
	1	8.08	8.13	9.8	8.1	509	25.3	0	0	0	0	0	0	0	0	0	0	0	
	2	7.87	7.95	10.1	8.5	523	25.4	0	0	0	0	0	0	0	0	0	0	0	
	3	7.92	8.11	10.1	8.5	521	24.7	0	0	0	0	0	0	0	0	0	0	0	
	4	7.86	7.91	10.7	8.1	513	24.7	5	4	3	5	5	6	3	3	4	0		
	5	7.81	7.58	11.1	5.4	516	24.0	2	8	9	8	8	10	13	10	9	11		
	6	-	7.66	-	7.1	548	24.2	15	19	7	16	15	15	20	0	18	11		
	7																		
	8																		
							Total=	22	31	19	29	28	31	36	13	31	22	Mean Neonates/Female = 26.2	

Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: LWA: Calleguas Creek Material: CCWTMP-69-GATE- 202 Test Date: 11/8/18

Project #: 29418 Test ID: 80642 Control Water: Mod EPAMH

Day	pH		D.O.		Cond. (µS/cm)	Temp (°C)	Survival / Reproduction										SIGN-OFF		
	New	Old	New	Old			A	B	C	D	E	F	G	H	I	J			
50%	0	7.89		8.8		687	24.8	0	0	0	0	0	0	0	0	0	0	0	
	1	8.00	8.16	9.7	8.1	681	25.2	0	0	0	0	0	0	0	0	0	0	0	
	2	7.84	8.01	10.0	8.5	687	24.9	0	0	0	0	0	0	0	0	0	0	0	
	3	7.87	8.07	9.9	8.6	679	24.5	0	0	0	0	0	0	0	0	0	0	0	
	4	7.79	7.94	10.6	8.3	666	24.3	6	5	6	4	3	4	0	5	5	4		
	5	7.75	7.67	10.7	6.1	682	24.0	5	4	5	13	7	7	3	1	7	1		
	6	—	7.76	—	7.8	749	24.3	2 ¹⁵	19	20	19	19	7	0	13	16	12		
	7							26/11	14/13										
	8																		
Total=							26	28	31	36	29	18	3	19	28	17		Mean Neonates/Female = 22.5 23.5	
100%	0	7.83		9.1		1019	25.7	0	0	0	0	0	0	0	0	0	0		
	1	7.88	8.17	9.4	8.2	1011	25.0	0	0	0	0	0	0	0	0	0	0		
	2	7.73	8.02	9.4	8.4	1020	24.9	0	0	0	0	0	0	0	0	0	0		
	3	7.78	8.14	9.3	8.4	1006	24.4	0	0	4	0	0	0	0	0	0	0		
	4	7.69	7.97	10.4	8.1	978	24.3	4	0	0	6	5	1	0	4	3	6		
	5	7.67	7.83	10.1	7.4	1008	24.0	11	6	4	14	12	12	1	13	9	5		
	6	—	7.77	—	7.6	1088	24.4	22	4	1	0	15	0	12	19	14	14		
	7																		
	8																		
Total=							37	10	9	20	32	13	13	36	26	25		Mean Neonates/Female = 22.1	

CETIS Summary Report

Report Date: 16 Nov-18 14:47 (p 1 of 2)

Test Code: 80644 | 15-6236-7441

Ceriodaphnia Survival and Reproduction Test	Pacific EcoRisk
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Batch ID: 13-3768-2325	Test Type: Reproduction-Survival (7d)	Analyst: Mike McElroy
Start Date: 08 Nov-18 14:10	Protocol: EPA-821-R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 14 Nov-18 14:42	Species: Ceriodaphnia dubia	Brine: Not Applicable
Duration: 6d 1h	Source: In-House Culture	Age: 1

Sample ID: 00-6126-7957	Code: 69-BELT-208	Client: Larry Walker Associates
Sample Date: 07 Nov-18 14:10	Material: Ambient Water	Project: 29418
Receipt Date: 08 Nov-18 07:37	Source: Calleguas Creek	
Sample Age: 24h (0.5 °C)	Station: BELT	

Multiple Comparison Summary							
Analysis ID	Endpoint	Comparison Method	NOEL	LOEL	TOEL	TU	PMSD ✓
17-7174-7477	Reproduction	Bonferroni Adj t Test	100	> 100	n/a	1	15.3%
01-3183-4633	Survival	Fisher Exact/Bonferroni-Holm Test	100	> 100	n/a	1	n/a

Point Estimate Summary							
Analysis ID	Endpoint	Point Estimate Method	Level	%	95% LCL	95% UCL	TU ✓
10-6762-1909	Reproduction	Linear Interpolation (ICPIN)	IC5	>100	n/a	n/a	<1
			IC10	>100	n/a	n/a	<1
			IC15	>100	n/a	n/a	<1
			IC20	>100	n/a	n/a	<1
			IC25	>100	n/a	n/a	<1
			IC40	>100	n/a	n/a	<1
			IC50	>100	n/a	n/a	<1

Reproduction Summary											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max ^o	Std Err	Std Dev	CV%	%Effect
0	LW	10	31.9	29.2	34.6	27	37	1.19	3.75	11.77%	0.00%
6.25		9	33.7	31.1	36.3	29	39	1.13	3.39	10.07%	-5.54%
12.5		10	32	29.7	34.3	26	36	1.03	3.27	10.21%	-0.31%
25		10	34.7	32.2	37.2	30	41	1.09	3.43	9.89%	-8.78%
50		10	30.9	27.4	34.4	21	38	1.57	4.95	16.03%	3.13%
100		10	32.6	27.5	37.7	22	42	2.26	7.15	21.94%	-2.19%

Survival Summary											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
6.25		9	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
12.5		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
25		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
50		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
100		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%

CETIS Summary Report

Report Date: 16 Nov-18 14:47 (p 2 of 2)
 Test Code: 80644 | 15-6236-7441

Ceriodaphnia Survival and Reproduction Test											Pacific EcoRisk
Reproduction Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	27	37	32	27	29	34	31	35	30	37
6.25		35	34	32	36	29	37	31	30	39	
12.5		32	31	36	31	36	32	29	31	26	36
25		32	38	34	38	34	35	30	31	34	41
50		25	34	30	31	31	32	36	38	21	31
100		30	23	22	26	39	40	34	37	33	42
Survival Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
6.25		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
12.5		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
25		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
50		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
100		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Survival Binomials											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
6.25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	
12.5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
50		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
100		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1

CETIS Analytical Report

Report Date: 16 Nov-18 14:45 (p 1 of 1)
 Test Code: 80644 | 15-6236-7441

Ceriodaphnia Survival and Reproduction Test **Pacific EcoRisk**

Analysis ID: 17-7174-7477 Endpoint: Reproduction CETIS Version: CETISv1.9.2
 Analyzed: 16 Nov-18 14:44 Analysis: Parametric-Multiple Comparison Official Results: Yes

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	C > T	100	> 100	n/a	1	15.34%

Bonferroni Adj t Test

Control	vs	Conc-%	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Water Contr		6.25	-0.843	2.4	5.03	17	CDF	1.0000	Non-Significant Effect
		12.5	-0.049	2.4	4.89	18	CDF	1.0000	Non-Significant Effect
		25	-1.37	2.4	4.89	18	CDF	1.0000	Non-Significant Effect
		50	0.49	2.4	4.89	18	CDF	1.0000	Non-Significant Effect
		100	-0.343	2.4	4.89	18	CDF	1.0000	Non-Significant Effect

ANOVA Table

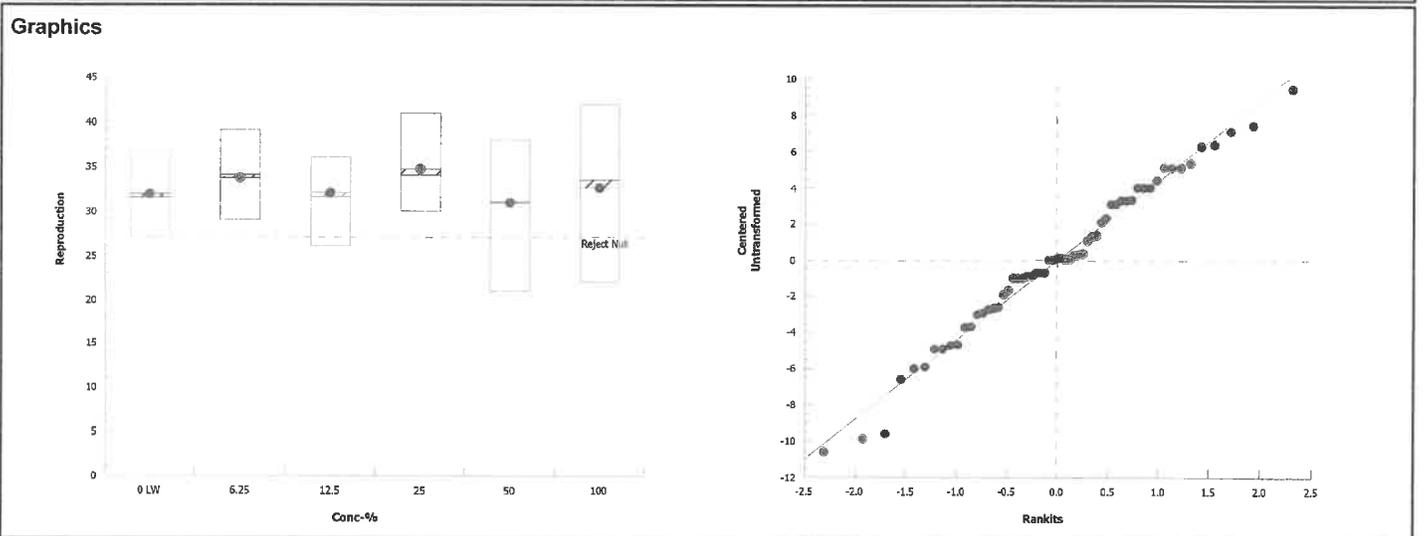
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	91.7339	18.3468	5	0.882	0.4996	Non-Significant Effect
Error	1102.3	20.7981	53			
Total	1194.03		58			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	9.35	15.1	0.0958	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.984	0.945	0.6168	Normal Distribution

Reproduction Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	LW	10	31.9	29.2	34.6	31.5	27	37	1.19	11.77%	0.00%
6.25		9	33.7	31.1	36.3	34	29	39	1.13	10.07%	-5.54%
12.5		10	32	29.7	34.3	31.5	26	36	1.03	10.21%	-0.31%
25		10	34.7	32.2	37.2	34	30	41	1.09	9.89%	-8.78%
50		10	30.9	27.4	34.4	31	21	38	1.57	16.03%	3.13%
100		10	32.6	27.5	37.7	33.5	22	42	2.26	21.94%	-2.19%



Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: LWA: Calleguas Creek Material: CCWTMP-69-BELT-208 Test Date: 11/18/18
 Project #: 29418 Test ID: 80644 Randomization: 10.7-3 Control Water: Mod EPAMH

	Day	pH		D.O.		Cond. (µS/cm)	Temp (°C)	Survival / Reproduction										SIGN-OFF		
		New	Old	New	Old			A	B	C	D	E	F	G	H	I	J	Date	Time	
Lab Water Control	0	7.90		7.9		349	24.9	0	0	0	0	0	0	0	0	0	0	0	0	Date: 11/18/18 New WQ: <u>TP</u> Test Init.: <u>TP</u> Sol'n Prep: <u>SMC</u> <u>APP</u> Time: <u>1440</u>
	1	7.63	8.13	10.7	8.2	355	25.5	0	0	0	0	0	0	0	0	0	0	0	0	Date: 11/19/18 New WQ: <u>TP</u> Counts: <u>0</u> Sol'n Prep: <u>RG</u> Old WQ: <u>TA</u> Time: <u>1445</u>
	2	7.99	7.86	9.8	8.4	366	24.0	0	0	0	0	0	0	0	0	0	0	0	0	Date: 11/19/18 New WQ: <u>SD</u> Counts: <u>14</u> Sol'n Prep: <u>SMC</u> Old WQ: <u>TA</u> Time: <u>1400</u>
	3	7.90	7.89	9.7	8.0	351	25.5	6	7	7	7	7	7	7	7	7	7	7	7	Date: 11/11/18 New WQ: <u>TP</u> Counts: <u>6</u> Sol'n Prep: <u>B</u> Old WQ: <u>TP</u> Time: <u>1441</u>
	4	7.87	7.89	10.9	8.1	352	24.6	10	0	12	0	9	0	0	0	0	0	0	0	Date: 11/21/18 New WQ: <u>AR</u> Counts: <u>3</u> Sol'n Prep: <u>2</u> Old WQ: <u>UC</u> Time: <u>1345</u>
	5	7.93	7.73	10.3	8.2	354	24.6	0	15	0	10	0	12	11	14	11	14	14	14	Date: 11/18/18 New WQ: <u>PH</u> Counts: <u>126</u> Sol'n Prep: <u>SMC</u> Old WQ: <u>TA</u> Time: <u>1250</u>
	6	-	8.08	-	6.9	364	22.7	11	15	13	10	13	15	13	14	12	16	16	16	Date: 11/19/18 New WQ: <u>-</u> Counts: <u>173</u> Sol'n Prep: <u>-</u> Old WQ: <u>B</u> Time: <u>1442</u>
	7																			Date: <u>-</u> New WQ: <u>-</u> Counts: <u>-</u> Sol'n Prep: <u>-</u> Old WQ: <u>-</u> Time: <u>-</u>
	8																			Date: <u>-</u> Old WQ: <u>-</u> Counts: <u>-</u> Time: <u>-</u>
Total=							27	37	32	27	29	34	31	35	30	37	Mean Neonates/Female = <u>31.9</u>			
	Day	pH		D.O.		Cond. (µS/cm)		Survival / Reproduction										Sample ID		
		New	Old	New	Old			A	B	C	D	E	F	G	H	I	J	Date	Time	
6.25%	0	7.98		7.8		422	24.5	0	0	0	0	0	0	0	0	0	0	0	0	51275
	1	7.79	8.07	10.6	8.2	418	25.7	0	-	0	0	0	0	0	0	0	0	0	0	51275
	2	8.00	7.92	9.8	8.4	422	24.0	0	-	0	0	0	0	0	0	0	0	0	0	51275
	3	7.98	7.74	9.8	7.8	422	24.8	8	-	7	6	7	6	7	5	6	8	8	8	51275
	4	7.94	7.94	11.1	8.2	419	24.7	11	-	11	12	0	10	0	0	0	0	0	0	51275
	5	7.92	7.79	10.8	8.1	423	24.6	0	-	0	0	14	0	14	9	12	14	14	14	51275
	6	-	8.03	-	7.0	435	22.4	10	-	10	14	15	13	16	17	12	17	17	17	-
	7																			
	8																			
Total=							35	-	34	32	36	29	37	31	30	39	Mean Neonates/Female = <u>33.7</u>			

Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: LWA: Calleguas Creek Material: CCWTMP-69-BELT- 208 Test Date: 11/8/18
 Project #: 29418 Test ID: 80644 Control Water: Mod EPAMH

Day	pH		D.O.		Cond. (µS/cm)	Temp (°C)	Survival / Reproduction										SIGN-OFF	
	New	Old	New	Old			A	B	C	D	E	F	G	H	I	J		
12.5%	0	8.02		8.0		486	24.3	0	0	0	0	0	0	0	0	0	0	
	1	7.84	8.08	9.9	8.0	476	25.7	0	0	0	0	0	0	0	0	0	0	
	2	8.01	8.00	9.8	8.4	485	24.0	0	0	0	0	0	0	0	0	0	0	
	3	8.05	8.03	9.8	7.9	489	24.4	8	4	8	6	7	6	7	5	6	8	
	4	8.01	8.01	11.1	8.0	480	24.6	10	11	13	0	0	11	10	12	0	0	
	5	7.98	7.83	10.9	8.1	491	24.8	0	0	0	12	12	0	0	0	10	13	
	6	-	8.02	-	7.1	502	22.9	14	16	15	13	17	15	12	14	10	15	
	7																	
	8																	
Total=							32	31	36	31	36	32	29	31	26	36	Mean Neonates/Female = 32.0	
25%	0	8.07		8.2		615	24.3	0	0	0	0	0	0	0	0	0	0	
	1	7.96	8.13	10.7	8.1	614	25.6	0	0	0	0	0	0	0	0	0	0	
	2	8.05	8.12	9.7	8.4	622	24.0	0	0	0	0	0	0	0	0	0	0	
	3	8.12	8.09	10.0	7.7	605	25.2	7	6	7	7	7	6	7	5	6	8	
	4	8.08	8.09	11.1	8.1	612	24.6	12	0	13	0	11	0	10	0	0	0	
	5	8.03	7.97	10.9	8.1	622	24.6	0	14	0	12	0	13	0	12	13	16	
	6	-	8.03	-	7.3	639	22.2	13	18	14	19	16	16	13	14	15	17	
	7																	
	8																	
Total=							32	38	34	38	34	35	30	31	34	41	Mean Neonates/Female = 34.7	

Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: LWA: Calleguas Creek Material: CCWTMP-69-BELT- 206 Test Date: 11/8/18
 Project #: 29418 Test ID: 80644 Control Water: Mod EPAMH

Day	pH		D.O.		Cond. (µS/cm)	Temp (°C)	Survival / Reproduction										SIGN-OFF	
	New	Old	New	Old			A	B	C	D	E	F	G	H	I	J		
50%	0	8.09		8.5		870	24.3	0	0	0	0	0	0	0	0	0	0	
	1	8.05	8.28	10.9	8.2	854	25.7	0	0	0	0	0	0	0	0	0	0	
	2	8.10	8.27	9.8	8.3	864	24.0	0	0	0	0	0	0	0	0	0	0	
	3	8.22	8.31	9.8	7.8	858	25.3	0	7	8	7	8	6	5	7	5	7	
	4	8.18	8.25	11.2	8.1	839	22.6	11	0	11	10	9	0	0	0	0	0	
	5	8.10	8.14	10.9	8.0	862	24.7	0	13	11	0	0	9	12	15	14	4	
	6	—	8.24	—	7.1	894	22.3	14	14	0	14	14	17	19	16	2	20	
	7																	
	8																	
Total=							25	34	30	31	31	32	36	38	21	31	Mean Neonates/Female = 30.9	
100%	0	8.09		9.1		1352	24.2	0	0	0	0	0	0	0	0	0	0	
	1	8.13	8.41	11.2	8.2	1333	25.9	0	0	0	0	0	0	0	0	0	0	
	2	8.13	8.42	9.9	8.1	1323	24.0	0	0	0	0	0	0	0	0	0	0	
	3	8.29	8.50	10.0	7.9	1336	25.2	6	8	6	7	7	8	8	7	4	7	
	4	8.20	8.40	11.1	7.6	1317	24.7	11	0	12	11	0	0	7	0	0	0	
	5	8.16	8.34	10.8	7.3	1351	24.9	0	10	0	0	15	15	0	13	11	15	
	6	—	8.44	—	6.2	1381	22.8	13	5	4	8	17	17	19	17	18	20	
	7																	
	8																	
Total=							30	23	22	26	39	40	34	37	33	42	Mean Neonates/Female = 32.6	

Appendix C

Test Data and Summary of Statistics for the Evaluation of the Chronic Toxicity of the Calleguas Creek Ambient Waters to *Ceriodaphnia dubia*: Data Analyses Including Statistical Outliers

CETIS Summary Report

Report Date: 16 Nov-18 15:15 (p 1 of 2)
Test Code: 80638 | 14-4434-5511

Ceriodaphnia Survival and Reproduction Test			Pacific EcoRisk
Batch ID: 04-4203-1345	Test Type: Reproduction-Survival (7d)	Analyst: Mike McElroy	
Start Date: 08 Nov-18 13:05	Protocol: EPA-821-R-02-013 (2002)	Diluent: Laboratory Water	
Ending Date: 15 Nov-18 13:25	Species: Ceriodaphnia dubia	Brine: Not Applicable	
Duration: 7d 0h	Source: In-House Culture	Age: 1	
Sample ID: 00-9280-2736	Code: 69-UNIV-029	Client: Larry Walker Associates	
Sample Date: 07 Nov-18 15:25	Material: Ambient Water	Project: 29418	
Receipt Date: 08 Nov-18 07:37	Source: Calleguas Creek		
Sample Age: 22h (2.7 °C)	Station: UNIV		

Comments:
 Includes reproduction outliers (Lab Control-E, 6.25%-J, 12.5%-J, and 25% E)

Multiple Comparison Summary							
Analysis ID	Endpoint	Comparison Method	NOEL	LOEL	TOEL	TU	PMSD ✓
12-2081-9541	Reproduction	Steel Many-One Rank Sum Test	100	> 100	n/a	1	20.4%
16-3822-8615	Survival	Fisher Exact/Bonferroni-Holm Test	100	> 100	n/a	1	n/a

Point Estimate Summary							
Analysis ID	Endpoint	Point Estimate Method	Level	%	95% LCL	95% UCL	TU ✓
02-3854-4486	Reproduction	Linear Interpolation (ICPIN)	IC5	2.02	1.4	6.14	49.61
			IC10	4.03	2.79	n/a	24.81
			IC15	6.05	4.19	n/a	16.54
			IC20	>100	n/a	n/a	<1
			IC25	>100	n/a	n/a	<1
			IC40	>100	n/a	n/a	<1
			IC50	>100	n/a	n/a	<1

Reproduction Summary											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	10	34.7	31.5	37.9	24	41	1.42	4.5	12.96%	0.00%
6.25		10	26.1	19.2	33	3	34	3.06	9.67	37.03%	24.78%
12.5		10	26.8	19.7	33.9	0	36	3.14	9.94	37.10%	22.77%
25		10	28.4	24.1	32.7	15	36	1.9	6	21.14%	18.16%
50		10	34.4	31.3	37.5	28	43	1.37	4.33	12.57%	0.86%
100		10	30.9	27.8	34	26	39	1.39	4.38	14.18%	10.95%

Survival Summary											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
6.25		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
12.5		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
25		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
50		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
100		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%

CETIS Summary Report

Report Date: 16 Nov-18 15:15 (p 2 of 2)
Test Code: 80638 | 14-4434-5511

Ceriodaphnia Survival and Reproduction Test											Pacific EcoRisk
Reproduction Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	35	37	38	35	24	41	34	33	33	37
6.25		19	32	25	31	34	34	23	34	26	3
12.5		30	26	30	24	32	36	30	30	30	0
25		26	30	29	35	15	36	33	28	25	27
50		35	31	32	43	30	37	36	35	28	37
100		39	27	32	37	27	26	29	32	28	32
Survival Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
6.25		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
12.5		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
25		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
50		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
100		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Survival Binomials											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
6.25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
12.5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
50		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
100		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1

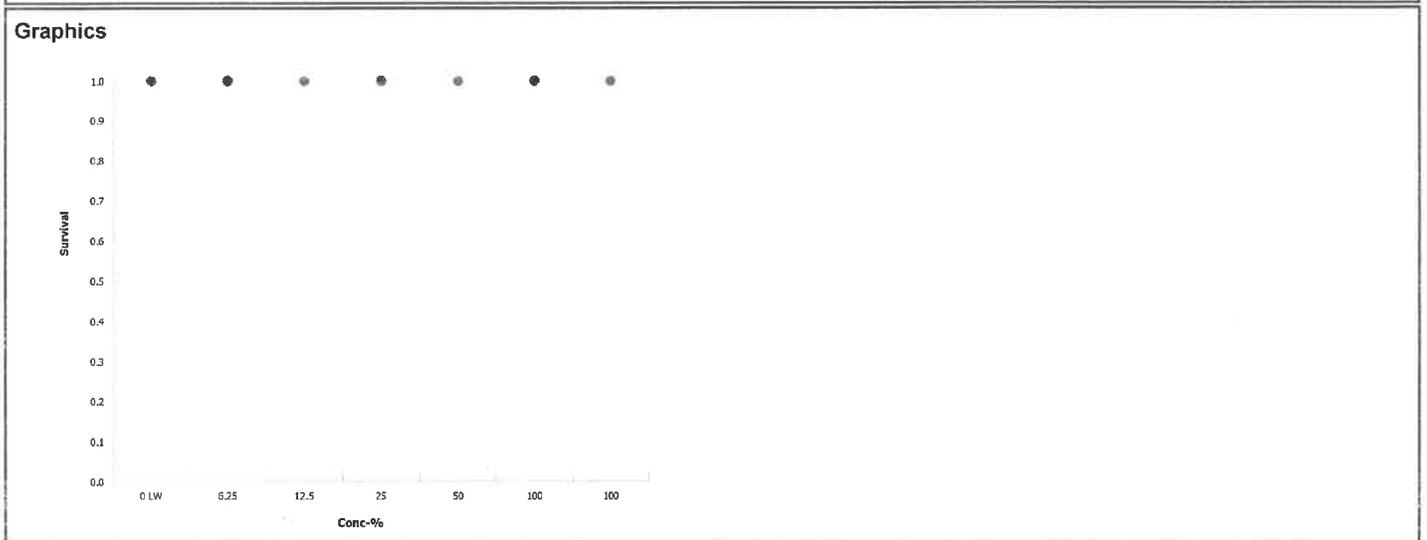
CETIS Analytical Report

Report Date: 16 Nov-18 14:36 (p 1 of 1)
 Test Code: 80638 | 14-4434-5511

Ceriodaphnia Survival and Reproduction Test				Pacific EcoRisk	
Analysis ID: 16-3822-8615	Endpoint: Survival	CETIS Version: CETISv1.9.2			
Analyzed: 16 Nov-18 14:35	Analysis: STP 2xK Contingency Tables	Official Results: Yes			
Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU
Untransformed	C > T	100	> 100	n/a	1

Fisher Exact/Bonferroni-Holm Test						
Control	vs	Group	Test Stat	P-Type	P-Value	Decision(α:5%)
Lab Water Contr		6.25	1.000	Exact	1.0000	Non-Significant Effect
		12.5	1.000	Exact	1.0000	Non-Significant Effect
		25	1.000	Exact	1.0000	Non-Significant Effect
		50	1.000	Exact	1.0000	Non-Significant Effect
		100	1.000	Exact	1.0000	Non-Significant Effect

Data Summary							
Conc-%	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
0	LW	10	0	10	1	0	0.0%
6.25		10	0	10	1	0	0.0%
12.5		10	0	10	1	0	0.0%
25		10	0	10	1	0	0.0%
50		10	0	10	1	0	0.0%
100		10	0	10	1	0	0.0%



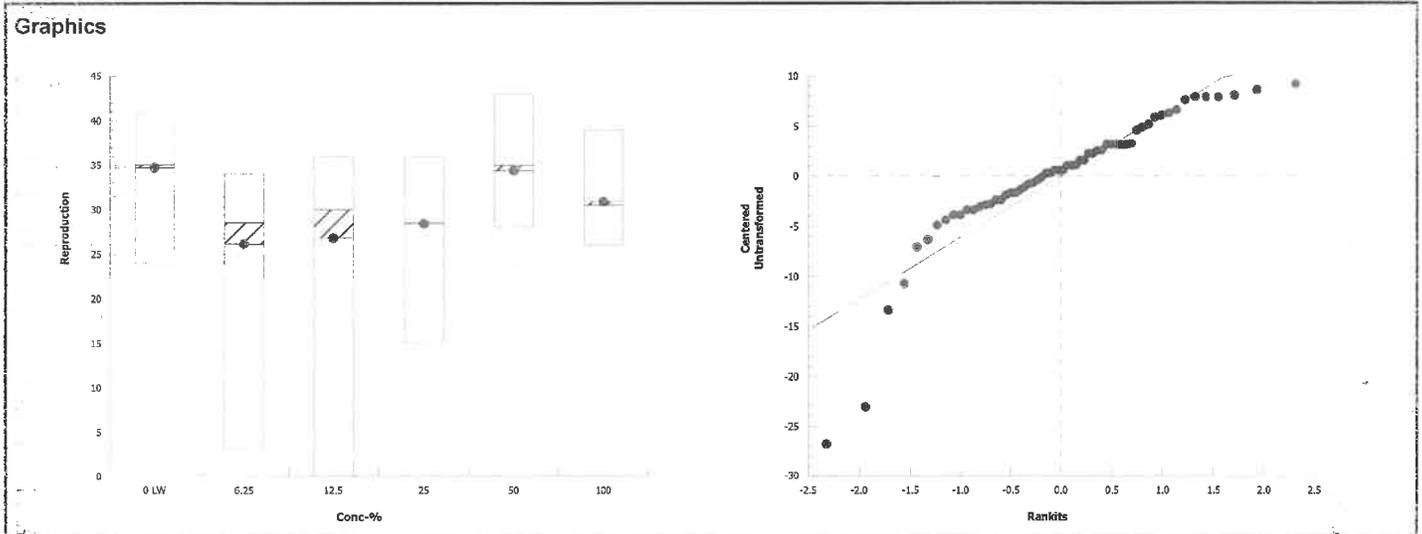
Ceriodaphnia Survival and Reproduction Test						Pacific EcoRisk	
Analysis ID:	12-2081-9541	Endpoint:	Reproduction	CETIS Version:	CETISv1.9.2		
Analyzed:	16 Nov-18 14:36	Analysis:	Nonparametric-Control vs Treatments	Official Results:	Yes		
Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	PMSD	
Untransformed	C > T	100	> 100	n/a	1	20.39%	

Steel Many-One Rank Sum Test									
Control	vs	Control II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Lab Water Contr		6.25*	69.5	75	1	18	Asymp	0.0156	Significant Effect
		12.5*	68.5	75	1	18	Asymp	0.0126	Significant Effect
		25*	74	75	2	18	Asymp	0.0384	Significant Effect
		50	99	75	2	18	Asymp	0.6654	Non-Significant Effect
		100	79	75	1	18	Asymp	0.0904	Non-Significant Effect

ANOVA Table						
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	699.883	139.977	5	2.93	0.0206	Significant Effect
Error	2578.3	47.7463	54			
Total	3278.18		59			

Distributional Tests						
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)	
Variances	Bartlett Equality of Variance Test	13.7	15.1	0.0176	Equal Variances	
Distribution	Shapiro-Wilk W Normality Test	0.848	0.946	2.6E-06	Non-Normal Distribution	

Reproduction Summary											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	LW	10	34.7	31.5	37.9	35	24	41	1.42	12.96%	0.00%
6.25		10	26.1	19.2	33	28.5	3	34	3.06	37.03%	24.78%
12.5		10	26.8	19.7	33.9	30	0	36	3.14	37.10%	22.77%
25		10	28.4	24.1	32.7	28.5	15	36	1.9	21.14%	18.16%
50		10	34.4	31.3	37.5	35	28	43	1.37	12.57%	0.86%
100		10	30.9	27.8	34	30.5	26	39	1.39	14.18%	10.95%



CETIS Analytical Report

Report Date: 16 Nov-18 14:36 (p 1 of 1)
 Test Code: 80638 | 14-4434-5511

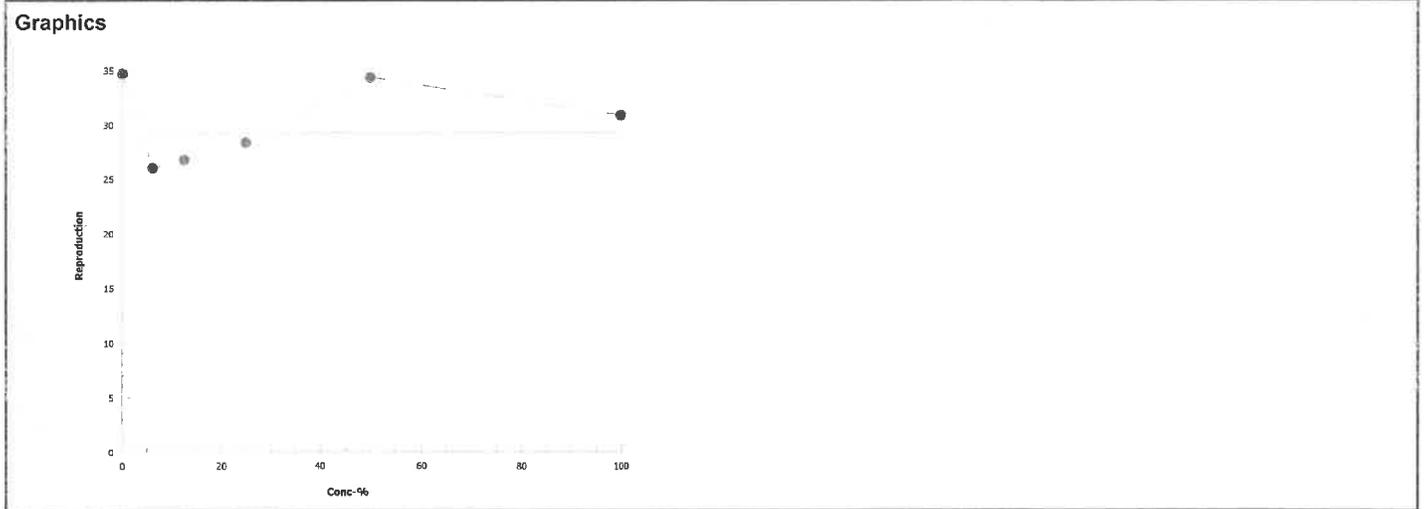
Ceriodaphnia Survival and Reproduction Test **Pacific EcoRisk**

Analysis ID: 02-3854-4486 Endpoint: Reproduction CETIS Version: CETISv1.9.2
 Analyzed: 16 Nov-18 14:36 Analysis: Linear Interpolation (ICPIN) Official Results: Yes

Linear Interpolation Options					
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	88555	200	Yes	Two-Point Interpolation

Point Estimates						
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	2.02	1.4	6.14	49.61	16.29	71.58
IC10	4.03	2.79	n/a	24.81	n/a	35.79
IC15	6.05	4.19	n/a	16.54	n/a	23.86
IC20	>100	n/a	n/a	<1	n/a	n/a
IC25	>100	n/a	n/a	<1	n/a	n/a
IC40	>100	n/a	n/a	<1	n/a	n/a
IC50	>100	n/a	n/a	<1	n/a	n/a

Reproduction Summary			Calculated Variate						
Conc-%	Code	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	10	34.7	24	41	1.42	4.5	13.00%	0.0%
6.25		10	26.1	3	34	3.06	9.67	37.00%	24.8%
12.5		10	26.8	0	36	3.14	9.94	37.10%	22.8%
25		10	28.4	15	36	1.9	6	21.10%	18.2%
50		10	34.4	28	43	1.37	4.33	12.60%	0.87%
100		10	30.9	26	39	1.39	4.38	14.20%	11.0%



CETIS Summary Report

Report Date: 16 Nov-18 11:57 (p 1 of 2)
Test Code: 80639 | 09-8502-3333

Ceriodaphnia Survival and Reproduction Test **Pacific EcoRisk**

Batch ID: 12-3530-4939	Test Type: Reproduction-Survival (7d)	Analyst: Jessica Okutsu
Start Date: 08 Nov-18 15:09	Protocol: EPA-821-R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 14 Nov-18 15:30	Species: Ceriodaphnia dubia	Brine: Not Applicable
Duration: 6d 0h	Source: In-House Culture	Age: 1

Sample ID: 16-6131-6900	Code: 69-ADOLF-045	Client: Larry Walker Associates
Sample Date: 07 Nov-18 08:45	Material: Ambient Water	Project: 29418
Receipt Date: 08 Nov-18 07:37	Source: Calleguas Creek	
Sample Age: 30h (0.6 °C)	Station: ADOLF	

Comments:
 Stats including reproductive outliers 6.25%-J and 25%-J.

Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	NOEL	LOEL	TOEL	TU	PMSD ✓
05-6678-1190	Reproduction	Steel Many-One Rank Sum Test	50	100	70.71	2	24.1%
17-5227-9364	Survival	Fisher Exact/Bonferroni-Holm Test	100	> 100	n/a	1	n/a

Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	Level	%	95% LCL	95% UCL	TU	✓
06-0657-3735	Reproduction	Linear Interpolation (ICPIN)	IC5	2.37	1.26	33.5	42.19	
			IC10	4.74	2.53	52.9	21.1	
			IC15	28.6	3.79	n/a	3.502	
			IC20	38.3	5.05	n/a	2.608	
			IC25	48.1	11.1	n/a	2.077	
			IC40	>100	n/a	n/a	<1	
IC50	>100	n/a	n/a	<1				

Reproduction Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	10	31.6	26.1	37.1	18	39	2.41	7.62	24.11%	0.00%
6.25		10	26.1	18.7	33.5	0	34	3.28	10.4	39.71%	17.41%
12.5		10	27.5	22.9	32.1	17	36	2.04	6.45	23.46%	12.97%
25		10	28.7	26.1	31.3	19	32	1.16	3.65	12.73%	9.18%
50		10	23.4	17.3	29.5	11	39	2.7	8.55	36.55%	25.95%
100		10	23	18.5	27.5	11	30	1.98	6.25	27.19%	27.22%

Survival Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
6.25		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
12.5		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
25		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
50		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
100		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%

CETIS Summary Report

Report Date:
Test Code:

16 Nov-18 11:57 (p 2 of 2)
80639 | 09-8502-3333

Ceriodaphnia Survival and Reproduction Test											Pacific EcoRisk
Reproduction Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	18	39	31	36	38	31	34	18	35	36
6.25		27	31	31	33	27	32	34	29	17	0
12.5		29	17	27	36	26	26	31	34	17	32
25		30	32	31	29	29	30	31	28	28	19
50		18	14	11	17	39	30	23	27	25	30
100		15	30	27	27	11	28	28	20	23	21
Survival Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
6.25		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
12.5		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
25		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
50		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
100		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Survival Binomials											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
6.25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
12.5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
50		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
100		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1

CETIS Analytical Report

Report Date: 16 Nov-18 11:57 (p 1 of 1)
 Test Code: 80639 | 09-8502-3333

Ceriodaphnia Survival and Reproduction Test **Pacific EcoRisk**

Analysis ID: 17-5227-9364 Endpoint: Survival CETIS Version: CETISv1.9.2
 Analyzed: 16 Nov-18 11:52 Analysis: STP 2xK Contingency Tables Official Results: Yes

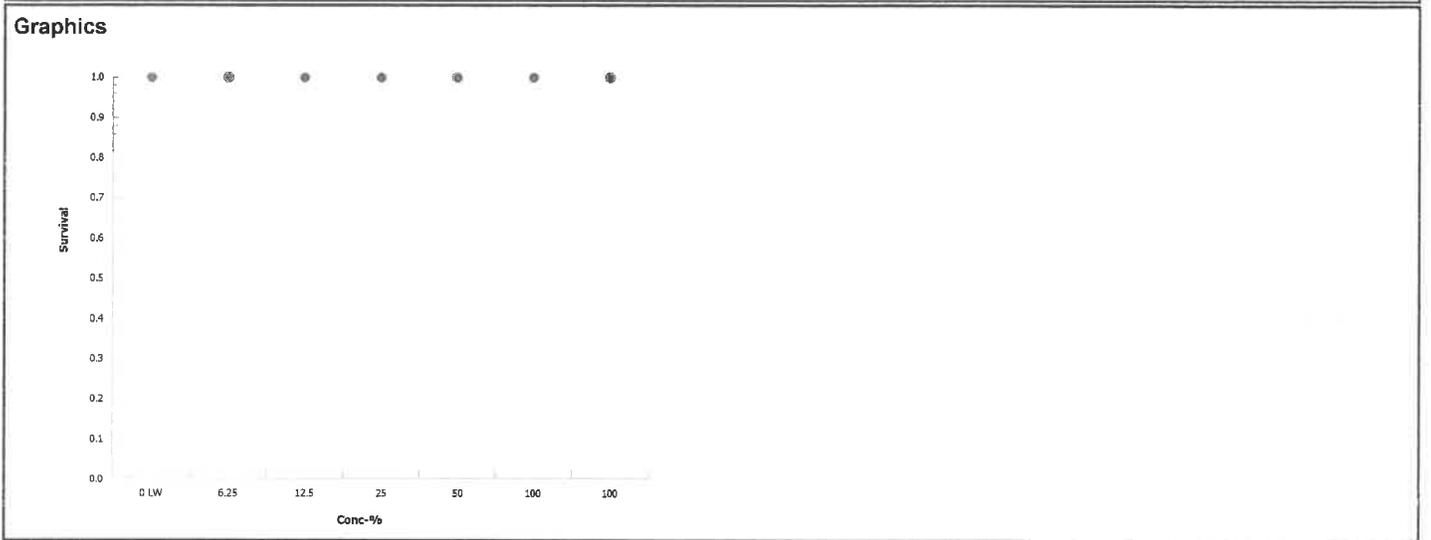
Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU
Untransformed	C > T	100	> 100	n/a	1

Fisher Exact/Bonferroni-Holm Test

Control	vs	Group	Test Stat	P-Type	P-Value	Decision(α:5%)
Lab Water Contr		6.25	1.000	Exact	1.0000	Non-Significant Effect
		12.5	1.000	Exact	1.0000	Non-Significant Effect
		25	1.000	Exact	1.0000	Non-Significant Effect
		50	1.000	Exact	1.0000	Non-Significant Effect
		100	1.000	Exact	1.0000	Non-Significant Effect

Data Summary

Conc-%	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
0	LW	10	0	10	1	0	0.0%
6.25		10	0	10	1	0	0.0%
12.5		10	0	10	1	0	0.0%
25		10	0	10	1	0	0.0%
50		10	0	10	1	0	0.0%
100		10	0	10	1	0	0.0%



CETIS Analytical Report

Report Date: 16 Nov-18 11:57 (p 1 of 1)
 Test Code: 80639 | 09-8502-3333

Ceriodaphnia Survival and Reproduction Test **Pacific EcoRisk**

Analysis ID: 05-6678-1190 Endpoint: Reproduction CETIS Version: CETISv1.9.2
 Analyzed: 16 Nov-18 11:52 Analysis: Nonparametric-Control vs Treatments Official Results: Yes

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	C > T	50	100	70.71	2	24.12%

Steel Many-One Rank Sum Test

Control	vs	Conc-%	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Lab Water Contr		6.25	79.5	75	2	18	Asymp	0.0977	Non-Significant Effect
		12.5	81.5	75	3	18	Asymp	0.1312	Non-Significant Effect
		25	79	75	1	18	Asymp	0.0904	Non-Significant Effect
		50	75.5	75	2	18	Asymp	0.0505	Non-Significant Effect
		100*	71	75	0	18	Asymp	0.0214	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	535.883	107.177	5	1.93	0.1039	Non-Significant Effect
Error	2994.3	55.45	54			
Total	3530.18		59			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	9.29	15.1	0.0982	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.906	0.946	2.2E-04	Non-Normal Distribution

Reproduction Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	LW	10	31.6	26.1	37.1	34.5	18	39	2.41	24.11%	0.00%
6.25		10	26.1	18.7	33.5	30	0	34	3.28	39.71%	17.41%
12.5		10	27.5	22.9	32.1	28	17	36	2.04	23.46%	12.97%
25		10	28.7	26.1	31.3	29.5	19	32	1.16	12.73%	9.18%
50		10	23.4	17.3	29.5	24	11	39	2.7	36.55%	25.95%
100		10	23	18.5	27.5	25	11	30	1.98	27.19%	27.22%

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CETIS Analytical Report

Report Date: 16 Nov-18 11:57 (p 1 of 1)
 Test Code: 80639 | 09-8502-3333

Ceriodaphnia Survival and Reproduction Test **Pacific EcoRisk**

Analysis ID: 06-0657-3735 Endpoint: Reproduction CETIS Version: CETISv1.9.2
 Analyzed: 16 Nov-18 11:52 Analysis: Linear Interpolation (ICPIN) Official Results: Yes

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	2066013	200	Yes	Two-Point Interpolation

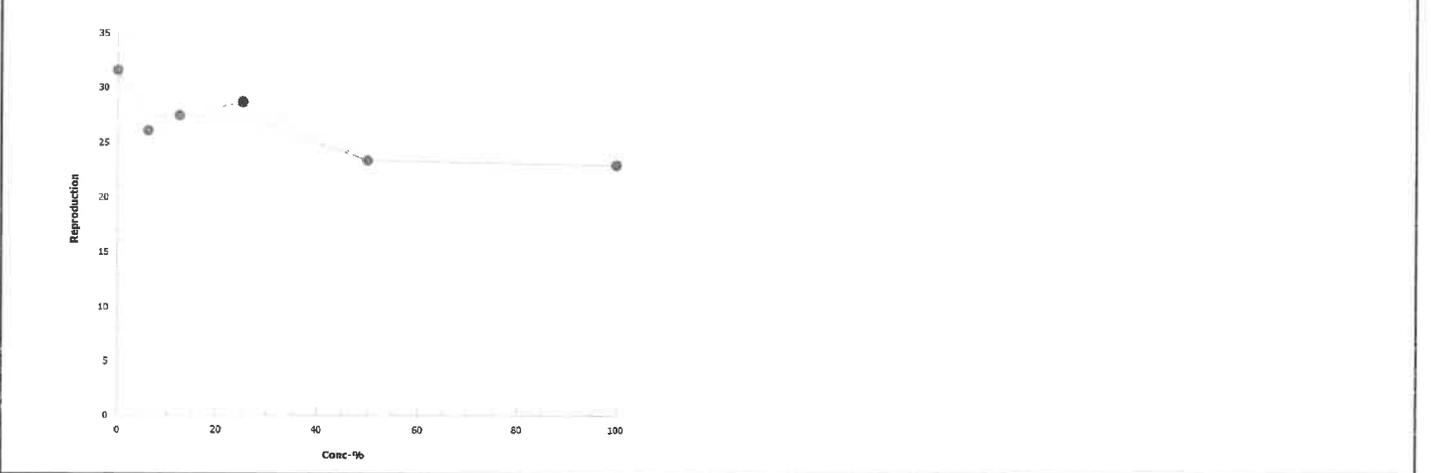
Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	2.37	1.26	33.5	42.19	2.984	79.19
IC10	4.74	2.53	52.9	21.1	1.889	39.59
IC15	28.6	3.79	n/a	3.502	n/a	26.4
IC20	38.3	5.05	n/a	2.608	n/a	19.8
IC25	48.1	11.1	n/a	2.077	n/a	9.026
IC40	>100	n/a	n/a	<1	n/a	n/a
IC50	>100	n/a	n/a	<1	n/a	n/a

Reproduction Summary **Calculated Variate**

Conc-%	Code	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	10	31.6	18	39	2.41	7.62	24.10%	0.0%
6.25		10	26.1	0	34	3.28	10.4	39.70%	17.4%
12.5		10	27.5	17	36	2.04	6.45	23.50%	13.0%
25		10	28.7	19	32	1.16	3.65	12.70%	9.18%
50		10	23.4	11	39	2.7	8.55	36.60%	25.9%
100		10	23	11	30	1.98	6.25	27.20%	27.2%

Graphics



Appendix D

Test Data and Summary of Statistics for the Reference Toxicant Evaluation of the *Ceriodaphnia dubia*

CETIS Summary Report

Report Date: 16 Nov-18 09:18 (p 1 of 2)
 Test Code: 80523 | 07-3988-3316

Ceriodaphnia Survival and Reproduction Test			Pacific EcoRisk
Batch ID: 10-3237-5975	Test Type: Reproduction-Survival (7d)	Analyst: Jessica Okutsu	
Start Date: 08 Nov-18 16:11	Protocol: EPA-821-R-02-013 (2002)	Diluent: Laboratory Water	
Ending Date: 14 Nov-18 15:23	Species: Ceriodaphnia dubia	Brine: Not Applicable	
Duration: 5d 23h	Source: In-House Culture	Age: 1	
Sample ID: 06-0772-9697	Code: NaCl	Client: Reference Toxicant	
Sample Date: 08 Nov-18 16:11	Material: Sodium chloride	Project: 29535	
Receipt Date: 08 Nov-18 16:11	Source: Reference Toxicant		
Sample Age: n/a (25.1 °C)	Station: In House		

Multiple Comparison Summary							
Analysis ID	Endpoint	Comparison Method	NOEL	LOEL	TOEL	TU	PMSD ✓
12-2108-4697	Reproduction	Steel Many-One Rank Sum Test	1000	1500	1225		24.6%
07-7902-8110	Survival	Fisher Exact/Bonferroni-Holm Test	2000	> 2000	n/a		n/a

Point Estimate Summary							
Analysis ID	Endpoint	Point Estimate Method	Level	mg/L	95% LCL	95% UCL	TU ✓
04-7517-9392	Reproduction	Linear Interpolation (ICPIN)	IC5	586	143	682	
			IC10	672	287	864	
			IC15	758	430	1020	
			IC20	844	583	1090	
			IC25	930	681	1170	
			IC40	1230	929	1520	
08-3419-0126	Survival	Spearman-Kärber	EC50	2170	2040	2300	

Reproduction Summary											
Conc-mg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	10	28.7	22.7	34.7	14	36	2.66	8.42	29.34%	0.00%
500		10	30.8	25	36.6	16	39	2.59	8.18	26.54%	-7.32%
1000		10	21.1	16.1	26.1	14	30	2.22	7.02	33.25%	26.48%
1500		10	14.1	8.8	19.4	0	22	2.34	7.42	52.59%	50.87%
2000		10	8.7	6.34	11.1	5	14	1.04	3.3	37.95%	69.69%
2500		10	0	0	0	0	0	0	0		100.00%

Survival Summary											
Conc-mg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
500		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
1000		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
1500		10	0.900	0.674	1.000	0.000	1.000	0.100	0.316	35.14%	10.00%
2000		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
2500		10	0.000	0.000	0.000	0.000	0.000	0.000	0.000		100.00%

CETIS Summary Report

Report Date: 16 Nov-18 09:18 (p 2 of 2)
 Test Code: 80523 | 07-3988-3316

Ceriodaphnia Survival and Reproduction Test											Pacific EcoRisk
Reproduction Detail											
Conc-mg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	36	17	33	35	27	33	35	36	21	14
500		34	37	16	36	32	28	39	37	32	17
1000		14	29	25	14	28	15	30	14	26	16
1500		0	8	21	12	22	18	8	21	20	11
2000		9	7	7	14	13	12	5	9	5	6
2500		0	0	0	0	0	0	0	0	0	0
Survival Detail											
Conc-mg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
500		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1000		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1500		0.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2000		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2500		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Survival Binomials											
Conc-mg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
500		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
1000		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
1500		0/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
2000		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
2500		0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1

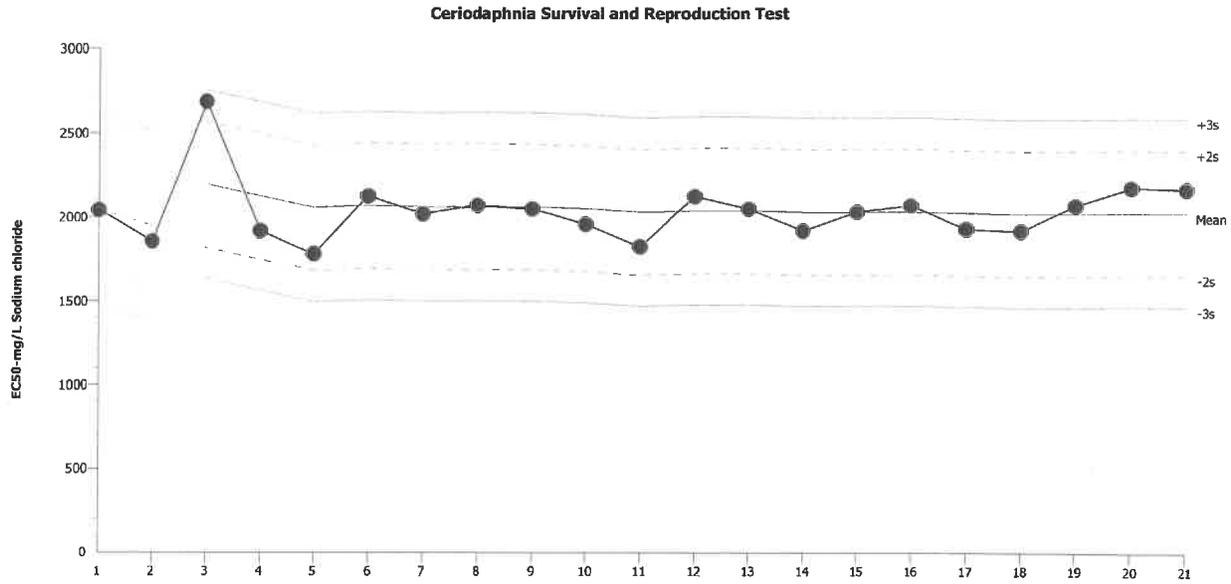
Ceriodaphnia Survival and Reproduction Test

Pacific EcoRisk

Test Type: Reproduction-Survival (7d)
 Protocol: EPA-821-R-02-013 (2002)

Organism: Ceriodaphnia dubia (Water Flea)
 Endpoint: Survival

Material: Sodium chloride
 Source: Reference Toxicant-REF



Mean: 2031 Count: 20 -2s Warning Limit: 1657 -3s Action Limit: 1470
 Sigma: 187 CV: 9.21% +2s Warning Limit: 2405 +3s Action Limit: 2592

Quality Control Data

Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2018	Aug	10	14:10	2043	12	0.06419			03-5579-8214	07-2599-0973
2			14	16:20	1855	-176.1	-0.9415			02-7663-9913	12-7365-5677
3			21	13:35	2686	655.1	3.503	(+)	(+)	13-4099-7080	12-0540-2436
4			28	14:48	1918	-112.6	-0.6023			06-2614-3668	06-1377-5657
5			29	14:50	1780	-250.7	-1.34			03-9264-7933	02-8153-7063
6		Sep	11	14:40	2125	93.71	0.5011			17-7763-6788	12-2919-7286
7			12	14:04	2019	-12.1	-0.06469			17-4569-5270	18-9812-2558
8			18	12:26	2071	40.13	0.2146			20-2968-4066	17-1744-5971
9			19	11:34	2050	18.88	0.101			16-4284-4765	03-9142-8586
10			25	17:25	1957	-73.58	-0.3935			14-3900-9954	21-1313-3142
11		Oct	3	15:35	1825	-206	-1.102			07-6007-9059	16-4049-1493
12			9	16:46	2125	93.71	0.5011			04-5469-0891	20-3055-9291
13			11	14:50	2050	18.88	0.101			20-2439-9413	10-4540-0750
14			16	13:11	1918	-112.6	-0.6023			03-5850-8111	20-6659-7771
15			18	15:16	2032	0.6381	0.003412			05-8033-5759	02-3631-3458
16			19	15:05	2071	40.13	0.2146			02-1441-2791	17-1340-7957
17			23	15:40	1930	-100.5	-0.5376			10-7048-8617	14-7553-0745
18			30	10:35	1918	-112.6	-0.6023			05-8645-6876	01-6608-5367
19			31	14:47	2071	40.13	0.2146			15-6701-8818	10-0650-6684
20		Nov	6	15:55	2180	148.7	0.7951			06-4622-5066	07-3608-9199
21			8	16:11	2170	138.8	0.7421			07-3988-3316	08-3419-0126

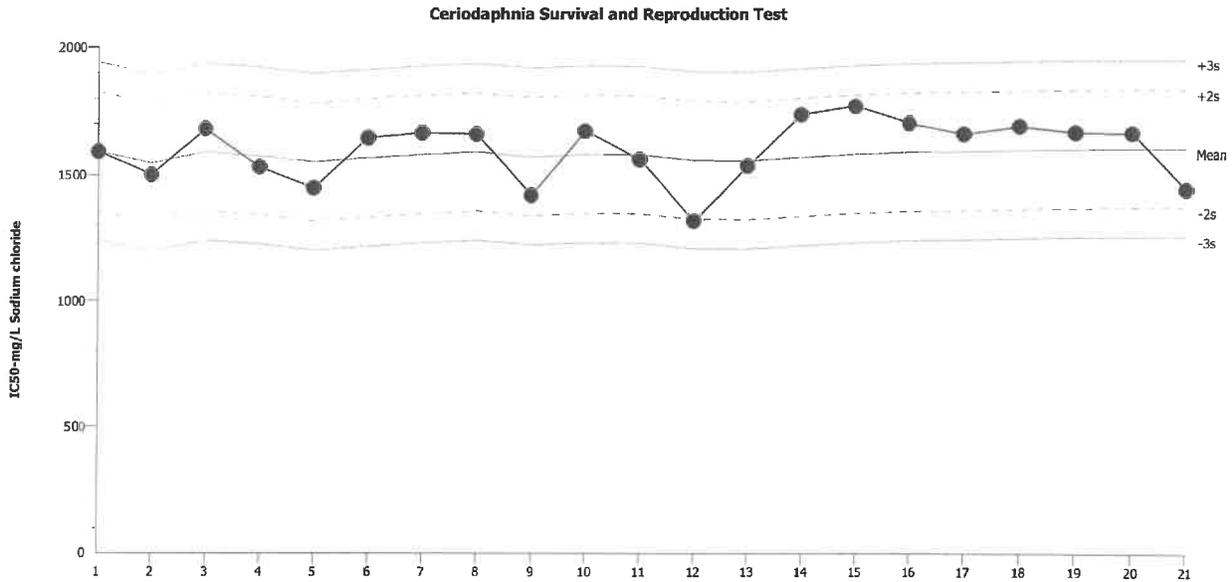
Ceriodaphnia Survival and Reproduction Test

Pacific EcoRisk

Test Type: Reproduction-Survival (7d)
 Protocol: EPA-821-R-02-013 (2002)

Organism: Ceriodaphnia dubia (Water Flea)
 Endpoint: Reproduction

Material: Sodium chloride
 Source: Reference Toxicant-REF



Mean: 1607 Count: 20 -2s Warning Limit: 1373 -3s Action Limit: 1256
 Sigma: 117.1 CV: 7.29% +2s Warning Limit: 1841 +3s Action Limit: 1958

Quality Control Data

Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2018	Aug	10	14:10	1592	-15.09	-0.1288			03-5579-8214	04-8905-8154
2			14	16:20	1500	-107	-0.9137			02-7663-9913	03-5731-3515
3			21	13:35	1683	75.75	0.6469			13-4099-7080	08-6153-3008
4			28	14:48	1531	-76.18	-0.6505			06-2614-3668	05-2952-0377
5			29	14:50	1447	-160.1	-1.367			03-9264-7933	16-8090-8266
6		Sep	11	14:40	1646	39.43	0.3367			17-7763-6788	12-3840-6964
7			12	14:04	1666	58.78	0.5019			17-4569-5270	09-7553-7941
8			18	12:26	1660	53.12	0.4537			20-2968-4066	11-3715-5377
9			19	11:34	1418	-188.9	-1.613			16-4284-4765	11-9866-6961
10			25	17:25	1673	66.42	0.5672			14-3900-9954	18-5535-4978
11		Oct	3	15:35	1561	-46.21	-0.3946			07-6007-9059	08-5057-3824
12			9	16:46	1317	-290.2	-2.478	(-)		04-5469-0891	07-2283-5254
13			11	14:50	1535	-71.65	-0.6118			20-2439-9413	04-4179-5524
14			16	13:11	1738	131.1	1.12			03-5850-8111	05-4684-8364
15			18	15:16	1772	164.7	1.407			05-8033-5759	10-5626-5735
16			19	15:05	1704	96.95	0.8279			02-1441-2791	18-9658-3991
17			23	15:40	1663	56.4	0.4816			10-7048-8617	19-2272-0008
18			30	10:35	1694	86.9	0.7421			05-8645-6876	20-8136-4320
19			31	14:47	1670	63.45	0.5419			15-6701-8818	09-4862-8045
20		Nov	6	15:55	1669	61.63	0.5263			06-4622-5066	01-6239-3016
21			8	16:11	1445	-162.4	-1.386			07-3988-3316	04-7517-9392

Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: _____ Reference Toxicant: _____ Material: Sodium Chloride Test Date: 11/8/18
 Project #: 29535 Test ID: 80523 Randomization: 10.7.2 Control Water: Mod EPAMH

Day	pH		D.O.		Cond. (µS/cm)		Temp (°C)	Survival / Reproduction										SIGN-OFF				
	New	Old	New	Old	New	Old		A	B	C	D	E	F	G	H	I	J	Date:	New WQ:	Test Init:		
0	7.76		8.8		357		21.1	0	0	0	0	0	0	0	0	0	0	0	0	Date: 11/8/18	New WQ: <u>RG</u>	Test Init: <u>TF</u>
1	8.12	7.98	10.1	8.4	354	382	24.5	0	0	0	0	0	0	0	0	0	0	0	0	Date: 11/9/18	New WQ: <u>TA</u>	Counts: <u>12</u>
2	8.03	7.93	10.5	8.4	354	385	24.0	0	0	0	0	0	0	0	0	0	0	0	0	Date: 11/10/18	New WQ: <u>TA</u>	Counts: <u>50</u>
3	7.93	7.90	12.0	7.9	360	377	24.8	0	0	7	0	0	6	7	0	0	0	0	0	Date: 11/11/18	New WQ: <u>TP</u>	Counts: <u>EP</u>
4	7.90	7.88	10.9	8.5	352	361	24.1	7	6	1	7	3	0	0	6	4	7	7	Date: 11/12/18	New WQ: <u>AR</u>	Counts: <u>46</u>	
5	7.92	7.93	10.4	6.1	375	401	24.4	12	11	10	12	7	12	11	12	8	7	7	Date: 11/13/18	New WQ: <u>ID</u>	Counts: <u>26</u>	
6	-	7.76	-	8.6	-	450	24.0	17	0	16	16	17	15	17	18	9	0	0	Date: 11/14/18	New WQ: <u>-</u>	Counts: <u>222</u>	
7																				Date:	New WQ:	Counts:
8																				Date:	Old WQ:	Counts:
Total=								36	17	33	35	27	33	35	36	21	14	Mean Neonates/Female = <u>28.7</u>				

Day	pH		D.O.		Cond. (µS/cm)		Temp (°C)	Survival / Reproduction										RT BATCH NUMBER				
	New	Old	New	Old	New	Old		A	B	C	D	E	F	G	H	I	J					
0	7.73		8.3		1356		24.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	287
1	8.05	8.04	10.5	8.2	1318	1400	24.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	287
2	7.95	7.90	10.1	8.5	1368	1418	24.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	287
3	7.92	7.88	11.9	7.8	1328	1482	24.9	6	0	0	0	0	0	0	0	0	0	0	0	0	0	287
4	7.84	7.84	10.6	8.5	1338	1373	24.0	0	7	7	6	6	6	7	6	6	6	6	6	6	6	287
5	7.94	7.91	10.3	6.8	1330	1550	24.4	13	14	9	13	12	9	14	15	11	11	11	11	11	11	287
6	-	7.80	-	8.2	-	1452	24.0	15	16	0	17	14	13	18	16	15	0	0	0	0	0	
7																						
8																						
Total=								34	37	16	36	32	28	39	37	32	17	Mean Neonates/Female = <u>30.8</u>				

Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: _____ Reference Toxicant: _____ Material: Sodium Chloride Test Date: 11/8/18
 Project #: 29535 Test ID: 80523 Randomization: 10.7.2 Control Water: Mod EPAMH

Day	pH		D.O.		Cond. (µS/cm)		Temp (°C)	Survival / Reproduction										SIGN-OFF	
	New	Old	New	Old	New	Old		A	B	C	D	E	F	G	H	I	J		
1000 mg/L	0	7.78		8.7		2378		24.6	0	0	0	0	0	0	0	0	0	0	
	1	8.04	8.01	10.6	8.1	2307	2560	24.8	0	0	0	0	0	0	0	0	0	0	
	2	7.89	7.88	10.1	8.4	2319	2475	24.0	0	0	0	0	0	0	0	0	0	0	
	3	7.80	7.81	11.8	7.4	2327	2527	25.0	0	0	0	0	6	0	6	0	0	0	
	4	7.82	7.83	11.1	8.6	2227	2415	24.2	6	7	5	6	0	6	0	6	6	7	
	5	7.94	7.90	11.0	7.2	2334	2489	24.1	8	11	9	8	10	9	11	8	10	9	
	6	-	7.79	-	8.3	-	2661	24.0	0	11	11	0	12	0	13	0	10	0	
	7																		
	8																		
Total=								14	29	25	14	28	15	30	14	26	16	Mean Neonates/Female = 21.1	
1500 mg/L	0	7.78		8.7		3265		25.9	0	0	0	0	0	0	0	0	0	0	
	1	7.93	7.99	10.6	8.0	3226	3572	24.9	0	0	0	0	0	0	0	0	0	0	
	2	7.84	7.85	10.4	8.4	3249	3469	24.0	-	0	0	0	0	0	0	0	0	0	
	3	7.87	7.79	11.6	7.5	3297	3470	24.7	-	0	0	0	0	0	0	0	0	0	
	4	7.81	7.77	11.2	8.5	3220	3395	24.6	-	4	3	6	4	4	3	5	3	5	
	5	7.92	7.88	11.2	7.6	3278	3477	24.0	-	4	8	6	9	6	5	6	8	6	
	6	-	7.80	-	8.4	-	3647	24.0	-	0	10	0	9	8	0	10	9	0	
	7																		
	8																		
Total=								0	8	21	12	22	18	8	21	20	11	Mean Neonates/Female = 14.1	

Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: _____ Reference Toxicant: _____ Material: Sodium Chloride Test Date: 11/18/13
 Project #: 29535 Test ID: 80523 Randomization: 10.7.2 Control Water: Mod EPAMH

	Day	pH		D.O.		Cond. (µS/cm)		Temp (°C)	Survival / Reproduction										SIGN-OFF	
		New	Old	New	Old	New	Old		A	B	C	D	E	F	G	H	I	J		
2000 mg/L	0	7.68		8.9		4021		25.9	0	0	0	0	0	0	0	0	0	0	0	
	1	7.98	8.00	10.5	8.0	4115	4164	24.9	0	0	0	0	0	0	0	0	0	0	0	
	2	7.83	7.81	10.4	8.4	4182	4454	24.0	0	0	0	0	0	0	0	0	0	0	0	
	3	7.84	7.82	11.7	7.6	4243	4766	25.0	0	0	0	0	0	0	0	0	0	0	0	
	4	7.80	7.73	11.2	8.5	4022	4291	24.5	3	2	2	3	4	3	0	3	0	3		
	5	7.89	7.87	11.3	7.6	4221	4448	24.2	6	5	5	4	5	3	5	0	0	3		
	6	-	7.80	-	8.4	-	4652	24.0	0	0	0	7	4	6	0	6	5	0		
	7																			
	8																			
Total=									9	7	7	14	13	12	5	9	5	6	Mean Neonates/Female = 8.7	
2500 mg/L	0	7.72		8.9		5085		24.5	0	0	0	0	0	0	0	0	0	0		
	1	7.96	7.95	10.5	7.9	5082	5321	25.1	0	0	0	0	0	0	0	0	0	0	0	
	2	7.77	7.78	10.5	8.3	5126	5555	24.0	%	%	%	%	%	%	%	%	%	%	%	
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Total=									%	%	%	%	%	%	%	%	%	%	Mean Neonates/Female = 0.0	

Appendix E

Test Data and Summary of Statistics for the Evaluation of the Toxicity of the Calleguas Creek Ambient Waters to *Hyalella azteca*

CETIS Summary Report

Report Date: 19 Nov-18 09:28 (p 1 of 1)
 Test Code: 80640 | 08-1263-9556

Hyalella azteca 10-Day Water Toxicity Test **Pacific EcoRisk**

Batch ID: 13-0826-3340	Test Type: Survival	Analyst: James Lem
Start Date: 08 Nov-18 16:35	Protocol: EPA/600/R-99/064 M	Diluent: Laboratory Water
Ending Date: 18 Nov-18 15:09	Species: Hyalella azteca	Brine: Not Applicable
Duration: 9d 23h	Source: Aquatic Biosystems, CO	Age: 12

Sample ID: 20-4262-4811	Code: 69-WOOD-097	Client: Larry Walker Associates
Sample Date: 07 Nov-18 12:15	Material: Ambient Water	Project: 29418
Receipt Date: 08 Nov-18 07:37	Source: Calleguas Creek	
Sample Age: 28h (2.1 °C)	Station: WOOD	

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result
00-8065-8938	Survival Rate	Wilcoxon Rank Sum Two-Sample Test	0.7778	Culture Control passed survival rate

Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	NOEL	LOEL	TOEL	TU	PMSD ✓
13-3030-5653	Survival Rate	Dunnett Multiple Comparison Test	100	> 100	n/a	1	9.1%

Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	cu	5	0.980	0.924	1.000	0.900	1.000	0.020	0.045	4.56%	0.00%
0	LW	5	0.980	0.924	1.000	0.900	1.000	0.020	0.045	4.56%	0.00%
6.25		5	0.940	0.829	1.000	0.800	1.000	0.040	0.089	9.52%	4.08%
12.5		5	0.940	0.872	1.000	0.900	1.000	0.025	0.055	5.83%	4.08%
25		5	0.960	0.892	1.000	0.900	1.000	0.025	0.055	5.71%	2.04%
50		5	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	-2.04%
100		5	0.920	0.816	1.000	0.800	1.000	0.037	0.084	9.09%	6.12%

Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	cu	1.000	0.900	1.000	1.000	1.000
0	LW	1.000	0.900	1.000	1.000	1.000
6.25		1.000	1.000	0.900	0.800	1.000
12.5		0.900	1.000	1.000	0.900	0.900
25		0.900	1.000	1.000	0.900	1.000
50		1.000	1.000	1.000	1.000	1.000
100		0.900	1.000	1.000	0.900	0.800

Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	cu	10/10	9/10	10/10	10/10	10/10
0	LW	10/10	9/10	10/10	10/10	10/10
6.25		10/10	10/10	9/10	8/10	10/10
12.5		9/10	10/10	10/10	9/10	9/10
25		9/10	10/10	10/10	9/10	10/10
50		10/10	10/10	10/10	10/10	10/10
100		9/10	10/10	10/10	9/10	8/10

CETIS Analytical Report

Report Date: 19 Nov-18 09:28 (p 1 of 3)
 Test Code: 80640 | 08-1263-9556

Hyalella azteca 10-Day Water Toxicity Test Pacific EcoRisk

Analysis ID: 13-3030-5653 Endpoint: Survival Rate CETIS Version: CETISv1.9.2
 Analyzed: 19 Nov-18 9:27 Analysis: Parametric-Control vs Treatments Official Results: Yes

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)	C > T	100	> 100	n/a	1	9.10%

Dunnett Multiple Comparison Test

Control	vs	Conc-%	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Water Contr		6.25	0.991	2.36	0.145	8	CDF	0.4240	Non-Significant Effect
		12.5	1.06	2.36	0.145	8	CDF	0.3938	Non-Significant Effect
		25	0.53	2.36	0.145	8	CDF	0.6339	Non-Significant Effect
		50	-0.53	2.36	0.145	8	CDF	0.9441	Non-Significant Effect
		100	1.52	2.36	0.145	8	CDF	0.2174	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0540004	0.0108001	5	1.14	0.3663	Non-Significant Effect
Error	0.227198	0.0094666	24			
Total	0.281198		29			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Levene Equality of Variance Test	5.06	3.9	0.0026	Unequal Variances
Variances	Mod Levene Equality of Variance Test	0.956	4.25	0.4700	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.949	0.903	0.1615	Normal Distribution

Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	LW	5	0.980	0.924	1.000	1.000	0.900	1.000	0.020	4.56%	0.00%
6.25		5	0.940	0.829	1.000	1.000	0.800	1.000	0.040	9.52%	4.08%
12.5		5	0.940	0.872	1.000	0.900	0.900	1.000	0.025	5.83%	4.08%
25		5	0.960	0.892	1.000	1.000	0.900	1.000	0.025	5.71%	2.04%
50		5	1.000	1.000	1.000	1.000	1.000	1.000	0.000	0.00%	-2.04%
100		5	0.920	0.816	1.000	0.900	0.800	1.000	0.037	9.09%	6.12%

Angular (Corrected) Transformed Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	LW	5	1.38	1.29	1.47	1.41	1.25	1.41	0.0326	5.28%	0.00%
6.25		5	1.32	1.15	1.49	1.41	1.11	1.41	0.0615	10.44%	4.42%
12.5		5	1.31	1.2	1.43	1.25	1.25	1.41	0.0399	6.79%	4.73%
25		5	1.35	1.24	1.46	1.41	1.25	1.41	0.0399	6.63%	2.36%
50		5	1.41	1.41	1.41	1.41	1.41	1.41	0	0.00%	-2.36%
100		5	1.29	1.13	1.45	1.25	1.11	1.41	0.0577	10.03%	6.78%

CETIS Analytical Report

Report Date: 19 Nov-18 09:28 (p 3 of 3)
 Test Code: 80640 | 08-1263-9556

Hyalella azteca 10-Day Water Toxicity Test **Pacific EcoRisk**

Analysis ID: 00-8065-8938 Endpoint: Survival Rate CETIS Version: CETISv1.9.2
 Analyzed: 19 Nov-18 9:28 Analysis: Nonparametric-Two Sample Official Results: Yes

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	Culture Control passed survival rate	5.60%

Wilcoxon Rank Sum Two-Sample Test

Control	vs	Control II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Lab Water Contr		Culture Control	27.5	n/a	2	8	Exact	0.7778	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0	0	1	0	1.0000	Non-Significant Effect
Error	0.0424949	0.0053119	8			
Total	0.0424949		9			

Distributional Tests

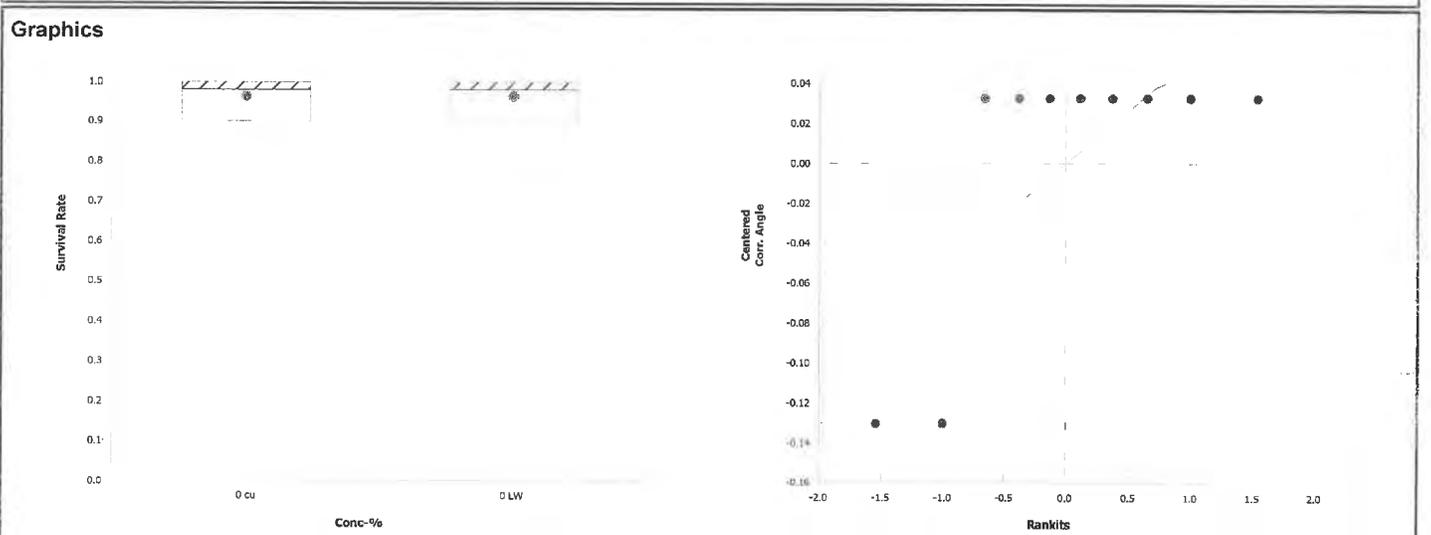
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F Test	1	23.2	1.0000	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.509	0.741	4.7E-06	Non-Normal Distribution

Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	cu	5	0.980	0.924	1.000	1.000	0.900	1.000	0.020	4.56%	0.00%
0	LW	5	0.980	0.924	1.000	1.000	0.900	1.000	0.020	4.56%	0.00%

Angular (Corrected) Transformed Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	cu	5	1.38	1.29	1.47	1.41	1.25	1.41	0.0326	5.28%	0.00%
0	LW	5	1.38	1.29	1.47	1.41	1.25	1.41	0.0326	5.28%	0.00%



10 Day Acute *Hyalella azteca* Toxicity Test Data

Client: LWA-Calleguas Creek Organism Log#: 11270 Age: 12-13 days
 Test Material: Controls Organism Supplier: ABS
 Test ID#: - Project #: 29418 Control/Diluent: SAM 5 (Conductivity Adjusted)
 Test Date: 11/8/18 Control Water Batch: #362

Treatment	Temp (°C)	pH		D.O. (mg/L)		Conductivity (µS/cm)	# Live Organisms					SIGN-OFF
		new	old	new	old		A	B	C	D	E	
Lab Control (Cond. Adj.)	22.5	7.74		8.7		410	10	10	10	10	10	Date: 11/8/18 Sample ID: - Test Solution Prep: SMC New WQ: TA Initiation Time: 1635 Initiation Signoff: AEF
EP 11/2/18 Culture Control (Cond. Adj.)	22.5	7.70		8.7		3878	10	10	10	10	10	Date: 11/9/18 Count Time: 1448 Count Signoff: EP Old WQ: SD
Meter ID	100A	PH25		RD11		EC11						
Lab Control (Cond. Adj.)	22.8				8.4		10	10	10	10	10	Date: 11/9/18 Count Time: 1448 Count Signoff: EP Old WQ: SD
EP 11/2/18 Culture Control (Cond. Adj.)	22.6				8.4		10	10	10	10	10	Date: 11/10/18 Count Time: 0852 Count Signoff: AEF Old WQ: EP Feed: AEF
Meter ID	23				RD13							
Lab Control (Cond. Adj.)	22.5				8.6		10	10	10	10	10	Date: 11/10/18 Count Time: 0852 Count Signoff: AEF Old WQ: EP Feed: AEF
EP 11/2/18 Culture Control (Cond. Adj.)	22.6				8.8		10	10	10	10	10	Date: 11/11/18 Count Time: 0940 Count Signoff: BV Old WQ: EP
Meter ID	81A				RD10							
Lab Control (Cond. Adj.)	22.9				8.5		10	10	10	10	10	Date: 11/11/18 Count Time: 0940 Count Signoff: BV Old WQ: EP
EP 11/2/18 Culture Control (Cond. Adj.)	23.0				8.5		10	10	10	10	10	Date: 11/12/18 Count Time: 1319 Count Signoff: EP Old WQ: WC Feed: EP
Meter ID	59A				RD11							
Lab Control (Cond. Adj.)	22.8				8.3		10	10	10	10	10	Date: 11/12/18 Count Time: 1319 Count Signoff: EP Old WQ: WC Feed: EP
EP 11/2/18 Culture Control (Cond. Adj.)	22.8				8.2		10	9	10	10	10	Date: 11/13/18 Sample ID: - Test Solution Prep: SMC New WQ: DH Renewal Time: 1400 Renewal Signoff: JF Old WQ: ZU
Meter ID	100A				RD11							
Lab Control (Cond. Adj.)	22.8	7.72	7.45	8.8	7.2	428	10	10	10	10	10	Date: 11/13/18 Sample ID: - Test Solution Prep: SMC New WQ: DH Renewal Time: 1400 Renewal Signoff: JF Old WQ: ZU
EP 11/2/18 Culture Control (Cond. Adj.)	23.0	7.71	7.36	8.9	7.0	3871	10	9	10	10	10	Date: 11/14/18 Count Time: 1030 Count Signoff: KB Old WQ: WC Feed: KB
Meter ID	93A	PH15	PH25	RD11	RD11	EC11						
Lab Control (Cond. Adj.)	22.7				3.7		10	10	10	10	10	Date: 11/15/18 Count Time: 1338 Count Signoff: JR Old WQ: TK
EP 11/2/18 Culture Control (Cond. Adj.)	22.7				4.0		10	9	10	10	10	Date: 11/16/18 Count Time: 1515 Count Signoff: JO Old WQ: SP Feed: JO
Meter ID	81A				RD13							
Lab Control (Cond. Adj.)	22.6				7.4		10	9	10	10	10	Date: 11/17/18 Count Time: 1103 Count Signoff: JE Old WQ: SP
EP 11/2/18 Culture Control (Cond. Adj.)	22.7				8.0		10	9	10	10	10	Date: 11/18/18 Termination Time: 1509 Termination Signoff: BR Old WQ: TK
Meter ID	23				RD10							
Lab Control (Cond. Adj.)	22.1				8.5		10	9	10	10	10	Date: 11/18/18 Termination Time: 1509 Termination Signoff: BR Old WQ: TK
EP 11/2/18 Culture Control (Cond. Adj.)	22.5				8.6		10	9	10	10	10	Date: 11/18/18 Termination Time: 1509 Termination Signoff: BR Old WQ: TK
Meter ID	99A				RD11							
Lab Control (Cond. Adj.)	22.2				8.1		10	9	10	10	10	Date: 11/18/18 Termination Time: 1509 Termination Signoff: BR Old WQ: TK
EP 11/2/18 Culture Control (Cond. Adj.)	22.5				8.3		10	9	10	10	10	Date: 11/18/18 Termination Time: 1509 Termination Signoff: BR Old WQ: TK
Meter ID	107A				RD13							
Lab Control (Cond. Adj.)	22.6		7.72		8.5	448	10	9	10	10	10	Date: 11/18/18 Termination Time: 1509 Termination Signoff: BR Old WQ: TK
EP 11/2/18 Culture Control (Cond. Adj.)	22.3		7.73		8.5	3991	10	9	10	10	10	Date: 11/18/18 Termination Time: 1509 Termination Signoff: BR Old WQ: TK
Meter ID	105A		PH24		RD13	EC13						

10 Day Acute *Hyalella azteca* Toxicity Test Data

Client: LWA-Calleguas Creek Organism Log#: 11270 Age: 12-13 Days
 Test Material: CCWTMP-69-WOOD- Organism Supplier: AMS
 Test ID#: 80640 Project #: 29418 Control/Diluent: SAM 5 (Conductivity Adjusted)
 Test Date: 11/8/18 Control Water Batch: # 362

EP
11/12/18

EP
11/12/18

EP
11/12/18

EP
11/12/18

Treatment	Temp (°C)	pH		D.O. (mg/L)		Conductivity (µS/cm)	# Live Organisms					SIGN-OFF
		new	old	new	old		A	B	C	D	E	
Lab Control (Cond-Adj.)	22.5	7.74		8.7		410	10	10	10	10	10	Date: 11/8/18 Sample ID: 51278
6.25%	22.5	7.98		8.8		686	10	10	10	10	10	Test Solution Prep: SMC New WQ: TA
12.5%	22.5	8.06		8.9		957	10	10	10	10	10	Initiation Time: 1635 Initiation Signoff: APF
25%	22.5	8.16		9.2		1390	10	10	10	10	10	
50%	22.2	8.24		9.8		2280	10	10	10	10	10	
100%	23.0	8.25		11.4		3900	10	10	10	10	10	
Meter ID	100A	PM25		RS11		EC1						
Lab Control (Cond-Adj.)	22.8			8.4			10	10	10	10	10	Date: 11/9/18 Count Time: 1448
6.25%	22.7			8.5			10	10	10	10	10	Count Signoff: EP Old WQ: SD
12.5%	22.6			8.4			10	10	10	10	10	
25%	22.6			8.4			10	10	10	10	10	
50%	22.6			8.4			10	10	10	10	10	
100%	22.6			8.3			10	10	10	10	10	
Meter ID	23			PD13								
Lab Control (Cond-Adj.)	22.5			8.6			10	10	10	10	10	Date: 11/10/18 Count Time: 0956
6.25%	22.7			8.8			10	10	10	10	10	Count Signoff: EP APF Old WQ: EP APF
12.5%	22.7			8.9			10	10	10	10	10	Feed: APF
25%	22.5			9.0			10	10	10	10	10	
50%	22.6			9.0			10	10	10	10	10	
100%	22.5			9.1			10	10	10	10	10	
Meter ID	81A			AD10								
Lab Control (Cond-Adj.)	22.9			8.6			10	10	10	10	10	Date: 11/11/18 Count Time: 0940
6.25%	23.0			8.6			10	10	10	10	10	Count Signoff: BV Old WQ: EP
12.5%	22.9			8.7			10	10	10	10	10	
25%	22.9			8.6			10	10	10	10	10	
50%	22.9			8.6			10	10	10	10	10	
100%	22.8			8.6			9	10	10	10	9	
Meter ID	59A			LD11								

10 Day Acute *Hyalella azteca* Toxicity Test Data

Client: LWA-Calleguas Creek
 Test Material: CCWTMP-69-WOOD-
 Test ID#: 80640 Project #: 29418
 Test Date: 11/8/18

Organism Log#: 11270 Age: 12-13 days
 Organism Supplier: ABS
 Control/Diluent: SAM 5 (Conductivity Adjusted)
 Control Water Batch: # 822

Treatment	Temp (°C)	pH		D.O. (mg/L)		Conductivity (µS/cm)	# Live Organisms					SIGN-OFF
		new	old	new	old		A	B	C	D	E	
EP 11/12/18 Lab Control (Cond. Adj.)	22.8					8.3	10	10	10	10	10	Date: 11/12/18 Count Time: 1319 Count Signoff: EP Old WQ: EP Feed: EP
6.25%	23.0					8.4	10	10	10	10	10	
12.5%	22.9					8.5	10	10	10	10	10	
25%	22.9					8.3	10	10	10	10	10	
50%	22.9					8.3	10	10	10	10	10	
100%	22.8					8.2	9	10	10	10	8	
Meter ID	100A					RD10						
EP 11/12/18 Lab Control (Cond. Adj.)	22.8	7.72	7.45	8.8	7.2	428	10	10	10	10	10	Date: 11/13/18 Sample ID: 51278 Test Solution Prep: SMC New WQ: DH Renewal Time: 1400 Renewal Signoff: JPF Old WQ: SV
6.25%	23.0	7.92	7.54	9.0	7.1	692	10	10	10	10	10	
12.5%	23.1	8.03	7.45	9.1	5.4	952	9	10	10	10	10	
25%	23.1	8.12	7.55	9.5	5.1	1459	10	10	10	10	10	
50%	23.1	8.15	7.71	10.1	5.3	2321	10	10	10	10	10	
100%	22.7	8.16	7.50	11.5	5.4	3875	9	10	10	10	8	
Meter ID	938	PH15	PH25	RD11	RD11	EC11						
EP 11/12/18 Lab Control (Cond. Adj.)	22.7					3.7	10	10	10	10	10	Date: 11/14/18 Count Time: 1030 Count Signoff: KB Old WQ: m Feed: KB
6.25%	22.7					4.5	10	10	10	9	10	
12.5%	22.8					4.6	9	10	10	10	10	
25%	22.9					4.8	10	10	10	10	10	
50%	22.8					4.8	10	10	10	10	10	
100%	22.8					4.5	9	10	10	10	8	
Meter ID	81A					RD13						
EP 11/12/18 Lab Control (Cond. Adj.)	22.6					7.4	10	9	10	10	10	Date: 11/15/18 Count Time: 1338 Count Signoff: JK Old WQ: TK
6.25%	22.4					7.7	10	10	10	9	10	
12.5%	22.6					7.4	9	10	10	10	9	
25%	22.6					7.5	10	10	10	10	10	
50%	22.7					7.3	10	10	10	10	10	
100%	22.6					6.8	8 ⁹	10	10	10	8	
Meter ID	23					RD10						

10 Day Acute *Hyaella azteca* Toxicity Test Data

Client: LWA-Calleguas Creek
 Test Material: CCWTMP-69-WOOD-
 Test ID#: 80640 Project #: 29418
 Test Date: 11/9/18

Organism Log#: 11270 Age: 12-13 days
 Organism Supplier: ABS
 Control/Diluent: SAM 5 (Conductivity Adjusted)
 Control Water Batch: #362

Treatment	Temp (°C)	pH		D.O. (mg/L)		Conductivity (µS/cm)	# Live Organisms					SIGN-OFF
		new	old	new	old		A	B	C	D	E	
EP 11/12/18 Lab Control (Cond. Adj.)	22.1					8.5	10	9	10	10	10	Date: 11/16/18 Count Time: 1515 Count Signoff: JP Old WQ: JR Feed: JO
6.25%	22.2					8.5	10	10	9	9	10	
12.5%	22.0					8.5	9	10	10	9	9	
25%	22.1					8.4	9	10	10	10	10	
50%	22.2					8.5	10	10	10	10	10	
100%	22.3					8.4	9	10	10	9	8	
Meter ID	99A					8011						
EP 11/12/18 Lab Control (Cond. Adj.)	22.2					8.1	10	9	10	10	10	Date: 11/17/18 Count Time: 1103 Count Signoff: BT Old WQ: JR
6.25%	22.6					8.4	10	10	9	8	10	
12.5%	22.6					8.2	9	10	10	9	9	
25%	22.6					8.0	9	10	10	10	10	
50%	22.6					8.1	10	10	10	10	10	
100%	22.6					8.2	9	10	10	9	8	
Meter ID	107A					8013						
EP 11/12/18 Lab Control (Cond. Adj.)	22.6		7.72			8.5	448	10	9	10	10	Date: 11/10/18 Termination Time: 1509 Termination Signoff: ER Old WQ: TK
6.25%	22.4		7.92			8.4	649	10	10	9	8	10
12.5%	22.3		7.94			8.6	1100	9	10	10	9	9
25%	22.3		8.08			8.5	1569	9	10	10	10	10
50%	22.3		8.28			8.4	2580	10	10	10	10	10
100%	22.3		8.25			8.2	4420	9	10	10	9	8
Meter ID	105A		PH24			PH12	642					

Appendix F

Test Data and Summary of Statistics for the Reference Toxicant Evaluation of the *Hyalella azteca*

CETIS Summary Report

Report Date: 16 Nov-18 10:58 (p 1 of 1)
 Test Code: 80637 | 20-3402-4533

Hyalella 96-h Acute Survival Test			Pacific EcoRisk		
Batch ID: 20-2131-6975	Test Type: Survival (96h)	Analyst: Jessica Okutsu			
Start Date: 08 Nov-18 16:10	Protocol: EPA-821-R-02-012 (2002)	Diluent: Laboratory Water			
Ending Date: 12 Nov-18 14:40	Species: Hyalella azteca	Brine: Not Applicable			
Duration: 94h	Source: Aquatic Biosystems, CO	Age: 13			
Sample ID: 20-0108-1403	Code: KCI	Client: Reference Toxicant			
Sample Date: 08 Nov-18 16:10	Material: Potassium chloride	Project: 29588			
Receipt Date: 08 Nov-18 16:10	Source: Reference Toxicant				
Sample Age: n/a (22.1 °C)	Station: In House				

Multiple Comparison Summary							
Analysis ID	Endpoint	Comparison Method	NOEL	LOEL	TOEL	TU	PMSD ✓
11-5847-6923	96h Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.2	0.4	0.2828		n/a

Point Estimate Summary								
Analysis ID	Endpoint	Point Estimate Method	Level	g/L	95% LCL	95% UCL	TU	✓
15-9735-9663	96h Survival Rate	Spearman-Kärber	EC50	0.303	0.243	0.377		

96h Survival Rate Summary											
Conc-g/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
0.1		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
0.2		10	0.900	0.674	1.000	0.000	1.000	0.100	0.316	35.14%	10.00%
0.4		10	0.200	0.000	0.502	0.000	1.000	0.133	0.422	210.82%	80.00%
0.8		10	0.000	0.000	0.000	0.000	0.000	0.000	0.000		100.00%
1.6		10	0.000	0.000	0.000	0.000	0.000	0.000	0.000		100.00%

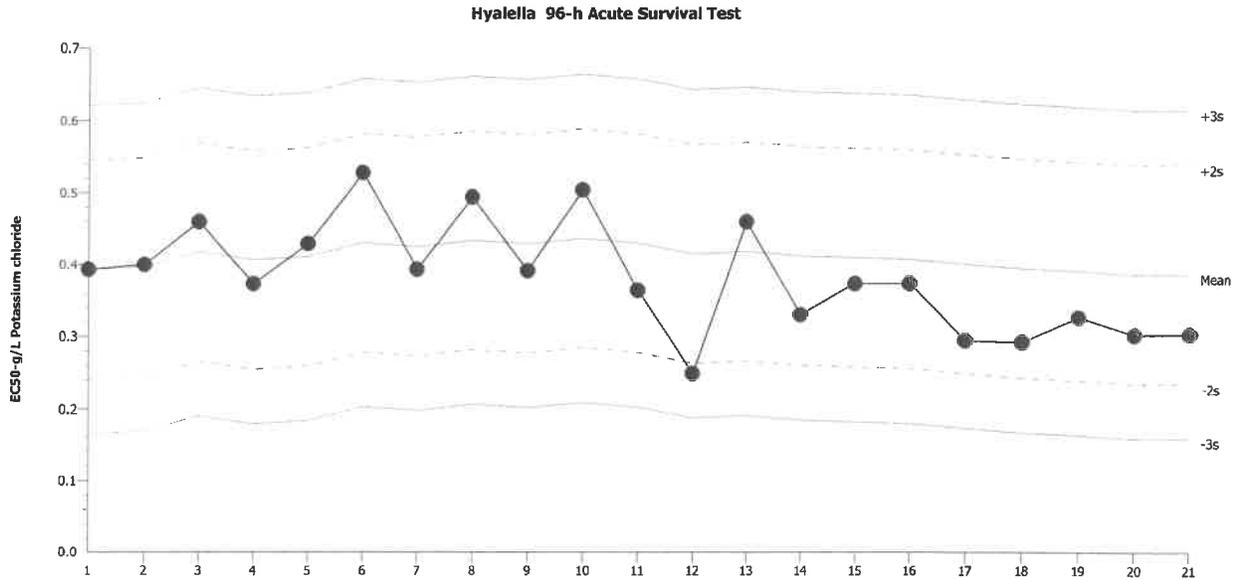
96h Survival Rate Detail											
Conc-g/L	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
0.1		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
0.2		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.000	1.000
0.4		0.000	1.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000
0.8		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1.6		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

96h Survival Rate Binomials											
Conc-g/L	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
0.1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
0.2		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	0/1	1/1
0.4		0/1	1/1	0/1	0/1	0/1	0/1	0/1	1/1	0/1	0/1
0.8		0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1
1.6		0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1

Hyalella 96-h Acute Survival Test

Pacific EcoRisk

Test Type: Survival (96h) Organism: Hyalella azteca (Freshwater Amphip) Material: Potassium chloride
 Protocol: EPA-821-R-02-012 (2002) Endpoint: 96h Survival Rate Source: Reference Toxicant-REF



Mean: 0.3864 Count: 20 -2s Warning Limit: 0.2347 -3s Action Limit: 0.1588
 Sigma: 0.07586 CV: 19.60% +2s Warning Limit: 0.5381 +3s Action Limit: 0.614

Quality Control Data

Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2017	Sep	24	16:23	0.3931	0.006728	0.08869			05-3672-3483	11-7202-5835
2		Oct	23	15:20	0.4	0.0136	0.1793			05-6411-1970	13-8116-2372
3		Nov	8	16:16	0.4595	0.07308	0.9633			19-7659-7997	01-3839-2915
4			17	16:00	0.3732	-0.01319	-0.1738			17-6978-3883	17-5467-8698
5			25	14:10	0.4287	0.04231	0.5577			11-3183-2495	08-9083-9227
6		Dec	4	16:30	0.5278	0.1414	1.864			09-9590-2070	18-7306-3573
7	2018	Jan	9	19:13	0.3931	0.006728	0.08869			05-2232-4768	00-9328-2087
8			17	15:40	0.4938	0.1074	1.416			17-7568-9822	12-5928-4930
9		Feb	8	15:57	0.391	0.004636	0.06111			13-6969-1958	02-2461-7172
10		Mar	2	17:52	0.5037	0.1173	1.546			10-1610-0738	05-9100-3645
11		Apr	8	13:38	0.3642	-0.02224	-0.2931			14-6470-8596	05-1973-4354
12		May	16	17:55	0.2486	-0.1378	-1.817			05-9866-1037	11-2195-3653
13		Jun	14	16:35	0.4595	0.07308	0.9633			18-1605-2758	14-8406-0239
14		Jul	18	16:20	0.3299	-0.05646	-0.7442			11-4094-7394	20-3811-7615
15		Aug	6	14:44	0.3732	-0.01319	-0.1738			16-9077-3352	08-2793-0151
16			9	17:00	0.3732	-0.01319	-0.1738			14-1761-7282	03-9488-5843
17			16	11:27	0.2941	-0.09228	-1.217			12-7542-2334	14-0979-7400
18			21	16:03	0.2922	-0.09422	-1.242			19-3911-4177	09-8363-6416
19		Sep	4	14:11	0.3265	-0.05994	-0.7902			00-7654-6742	11-6933-8211
20		Oct	22	15:45	0.3021	-0.08431	-1.111			08-4484-9174	20-9708-5657
21		Nov	8	16:10	0.3031	-0.08326	-1.098			20-3402-4533	15-9735-9663

96 Hour *Hyaella azteca* Reference Toxicant Test Data

Client: Reference Toxicant
 Test Material: Potassium Chloride
 Test ID#: 80637 Project # 29588
 Test Date: 11/8/18 Randomization: 10.7.6
 Feeding T-2 Time: 0840 Initials: SMC

Organism Log #: 11270 Age: 12-13 days
 Organism Supplier: ABS
 Control/Diluent: SAM-5
 Control Water Batch: 362
 Feeding T48 Time: 0915 Initials: ARF

Treatment (g/L)	Temp (°C)	pH	D.O. (mg/L)	Conductivity (µS/cm)	# Live Animals										Sign-Off
					A	B	C	D	E	F	G	H	I	J	
Control	22.1	7.60	8.6	410	1	1	1	1	1	1	1	1	1	1	Test Solution Prep: TK
0.1	22.0	7.60	8.6	607	1	1	1	1	1	1	1	1	1	1	New WQ: TA
0.2	22.0	7.58	8.7	804	1	1	1	1	1	1	1	1	1	1	Initiation Date: 11/8/18
0.4	22.1	7.63	8.8	1153	1	1	1	1	1	1	1	1	1	1	Initiation Time: 1610
0.8	22.0	7.62	9.4	1918	1	1	1	1	1	1	1	1	1	1	Initiation Signoff: CO
1.6	22.0	7.62	10.7	3396	1	1	1	1	1	1	1	1	1	1	RT Batch #: 20
Meter ID	100A	PH25	RDI1	EC1											
Control	23.3				1	1	1	1	1	1	1	1	1	1	Count Date: 11/9/18
0.1	23.5				1	1	1	1	1	1	1	1	1	1	Count Time: 1300
0.2	23.6				1	1	1	1	1	1	1	1	1	1	Count Signoff: EP
0.4	23.6				1	1	1	1	1	1	1	1	1	1	
0.8	23.6				0	0	0	0	0	0	0	0	0	0	
1.6	23.6				0	0	0	0	0	0	0	0	0	0	
Meter ID	5														
Control	23.4				1	1	1	1	1	1	1	1	1	1	Count Date: 11/10/18
0.1	23.6				1	1	1	1	1	1	1	1	1	1	Count Time: 0913
0.2	23.4				1	1	1	1	1	1	1	1	1	1	Count Signoff: ARF
0.4	23.5				1	1	1	1	0	0	0	1	0	1	
0.8	-				-	-	-	-	-	-	-	-	-	-	
1.6	-				-	-	-	-	-	-	-	-	-	-	
Meter ID	81A														
Control	23.3				1	1	1	1	1	1	1	1	1	1	Count Date: 11/11/18
0.1	23.3				1	1	1	1	1	1	1	1	1	1	Count Time: 0907
0.2	23.5				1	1	1	1	1	1	1	0	1	1	Count Signoff: EP
0.4	23.8				0	1	0	0	-	-	-	1	-	0	
0.8	-				-	-	-	-	-	-	-	-	-	-	
1.6	-				-	-	-	-	-	-	-	-	-	-	
Meter ID	81A														
Control	22.3	7.70	7.8	619	1	1	1	1	1	1	1	1	1	1	Termination Date: 11/12/18
0.1	22.2	7.73	7.8	729	1	1	1	1	1	1	1	1	1	1	Termination Time: 1440
0.2	22.3	7.73	7.8	915	1	1	1	1	1	1	1	1	1	1	Termination Signoff: EP
0.4	22.2	7.68	7.5	1488	-	1	-	-	-	-	-	1	-	-	Old WQ: KB
0.8	-	7.76	7.6	2199	-	-	-	-	-	-	-	-	-	-	
1.6	-	7.72	7.5	3822	-	-	-	-	-	-	-	-	-	-	
Meter ID	100A	PH25	RDB	EC3											

Ms. Amy Storm
 Larry Walker Associates
 2151 Alessandro Dr., Suite 100
 Ventura, CA 93001

December 14, 2018

Dear Amy:

I have enclosed our report “A Toxicity Characterization Study of Ambient Waters Collected from the Calleguas Creek Watershed: Event 70” for samples collected November 29, 2018. The results of our evaluation are summarized below.

Effects of Calleguas Creek Ambient Waters on *Ceriodaphnia dubia*

There was a significant reduction in survival and reproduction in the 70-WOOD-097 Calleguas Creek ambient water sample.

There were no significant reductions in survival or reproduction in the remaining Calleguas Creek ambient waters.

Toxicity Summary for Calleguas Creek: Event 70 Ambient Waters.		
Sample Station ID	Toxicity relative to the Lab Control treatment?	
	<i>Ceriodaphnia dubia</i>	
	Survival	Reproduction
70-UNIV-029	no	no
70-ADOLF-045	no	no
70-WOOD-097	YES	YES
70-UPLAND-144	no	no
70-HITCH-150	no	no
70-GATE-202	no	no
70-BELT-208	no	no

If you have any questions regarding the performance and interpretation of these tests, feel free to contact my colleague Jeffrey Cotsifas or myself at (707) 207-7763.

Sincerely,

Michael McElroy
 Senior Project Manager



Pacific EcoRisk is accredited in accordance with NELAP (ORELAP ID 4043). Pacific EcoRisk certifies that the test results reported herein conform to the most current NELAP requirements for parameters for which accreditation is required and available. Any exceptions to NELAP requirements are noted, where applicable, in the body of the report. This report shall not be reproduced, except in full, without the written consent of Pacific EcoRisk. This testing was performed under Lab Order 29633.

A Toxicity Characterization Study of Ambient Waters Collected from the Calleguas Creek Watershed

(Water Samples Collected on November 29, 2018)

Event 70

Prepared For

Larry Walker Associates
720 Wilshire Blvd., Suite 207
Santa Monica, CA 90401

Prepared By

Pacific EcoRisk
2250 Cordelia Rd.
Fairfield, CA 94534

December 2018



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Appendices

Appendix A	Chain-of-Custody Record for the Collection and Delivery of the Calleguas Creek Ambient Water Samples
Appendix B	Test Data and Summary of Statistics for the Evaluation of the Chronic Toxicity of the Calleguas Creek Ambient Waters to <i>Ceriodaphnia dubia</i> : Data Analyses Excluding Statistical Outliers
Appendix C	Test Data and Summary of Statistics for the Evaluation of the Chronic Toxicity of the Calleguas Creek Ambient Waters to <i>Ceriodaphnia dubia</i> : Data Analyses Including Statistical Outliers
Appendix D	Test Data and Summary of Statistics for the Reference Toxicant Evaluation of the <i>Ceriodaphnia dubia</i>

1. INTRODUCTION

In support of the Calleguas Creek Watershed Monitoring Program, Larry Walker Associates (LWA) has contracted Pacific EcoRisk (PER) to evaluate the potential toxicity of surface waters and sediments collected from within the Calleguas Creek Watershed. The current evaluation, which comprises Event 70 of the overall study, consisted of performing the following U.S. EPA toxicity test:

- 3-brood (6-8 day) survival and reproduction chronic toxicity test with the crustacean *Ceriodaphnia dubia*.

In order to evaluate the magnitude of any observed toxicity, all water samples were tested using a series of sample dilutions (100%, 50%, 25%, 12.5%, and 6.25%). In order to document that the test organisms were responding to toxic stress in a typical fashion, reference toxicant tests were also performed. This report describes and summarizes the performance and results of the Event 70 surface water toxicity testing performed in support of the Calleguas Creek Watershed Monitoring Program.

2. COLLECTION AND DELIVERY OF AMBIENT WATER SAMPLES

On November 29, 2018, Kinnetic Laboratories, Inc. (KLI) collected ambient water samples from six locations within the Calleguas Creek watershed (Table 1). Each water sample was collected into two pre-cleaned 5-gallon fluorocarbon-lined polyethylene jerricans. The samples were transported on ice and under chain-of-custody to the PER laboratory facility in Fairfield, CA, arriving approximately 24 hrs after collection. Upon receipt at the testing laboratory, aliquots of each water sample were collected for analysis of initial water quality characteristics (Table 2). The remainder of the water samples were stored at 0-6°C. All initial surface water tests were initiated within 36 hrs of sample collection. The chain-of-custody record for the collection and delivery of these samples is presented in Appendix A.

Station Code	Sample Collection Date (Time)	Test Initiation Date (Time)
UNIV	11/29/18 (0845)	11/30/18 (1303)
ADOLF	11/29/18 (1140)	11/30/18 (1337)
WOOD	11/29/18 (0700)	11/30/18 (1349)
UPLAND	11/29/18 (1125)	11/30/18 (1417)
HITCH	11/29/18 (1010)	11/30/18 (1313)
GATE	11/29/18 (1015)	11/30/18 (1400)
BELT	11/29/18 (0915)	11/30/18 (1402)

Sample ID	Temp (°C)	pH	D.O. (mg/L)	Alkalinity (mg/L as CaCO ₃)	Hardness (mg/L as CaCO ₃)	Conductivity (µS/cm)	Salinity (ppt)	Total Ammonia (mg/L)
70-UNIV-029	0.4	7.78	8.8	100	196	801	0.4	<1.0
70-ADOLF-045	0.6	7.89	9.5	181	346	1102	0.6	<1.0
70-WOOD-097	1.2	7.70	7.2	143	765	2598	1.4	<1.0
70-UPLAND-144	1.0	7.79	8.6	99	278	717	0.4	<1.0
70-HITCH-150	0.3	7.77	11.4	92	200	730	0.4	<1.0
70-GATE-202	0.5	7.80	11.1	78	160	456	0.3	<1.0
70-BELT-208	0.8	7.89	10.9	77	119	333	0.2	<1.0

3. TOXICITY TEST PROCEDURES FOR AMBIENT WATERS

The Calleguas Creek ambient waters were tested for toxicity using the following chronic toxicity test:

- Water samples with a conductivity <3000 µS/cm were tested using the 3-brood (6-8 day) survival and reproduction test with the freshwater crustacean *C. dubia*.

The methods used in conducting the chronic toxicity tests (and any follow-up TIEs) followed the guidance established by the following EPA manual:

- Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, Fourth Edition" (EPA-821-R-02-013).

3.1 Survival and Reproduction Chronic Toxicity Testing with *Ceriodaphnia dubia*

The chronic toxicity test with *C. dubia* consists of exposing individual females to the ambient water samples for the length of time it takes for the Lab Control treatment females to produce three broods (typically 6-8 days), after which effects on survival and reproduction are evaluated. The specific procedures used in these tests are described below.

The Lab Water Control medium for this test consisted of a modified EPA moderately-hard water. For each water sample, the Lab Control water and 100% water sample were used to prepare test solutions at additional interim test treatment concentrations of 6.25%, 12.5%, 25%, and 50% ambient water. For each treatment, 200 mL aliquots of test solution were amended with the alga *Selenastrum capricornutum* and Yeast-Cerophyll®-Trout Food (YCT) to provide food for the test organisms. "New" water quality characteristics (pH, D.O., and conductivity) were measured on these food-amended test solutions prior to use in these tests.

There were 10 replicates each for each test treatment, each replicate consisting of 15 mL of test solution in a 30-mL plastic cup. These "3-brood" tests were initiated by allocating one neonate

(<24 hrs old, and within 8 hours of age) *C. dubia*, obtained from in-house laboratory cultures, into each replicate cup. The replicate cups were placed into a temperature-controlled room at 25°C, under cool-white fluorescent lighting on a 16L:8D photoperiod.

Each test replicate cup was examined daily, with surviving organisms being transferred to the corresponding new cup containing fresh test solution. The contents of each remaining “old” replicate cup were carefully examined, and the number of neonate offspring produced by each original organism was determined, after which “old” water quality characteristics (pH, D.O., and conductivity) were measured for the “old” test solution from one randomly-selected replicate at each treatment.

After it was determined that $\geq 60\%$ of the *C. dubia* in a Lab Water Control treatment had produced their third brood of offspring, the corresponding ambient water test was terminated. The resulting survival and reproduction (number of offspring) data were analyzed to evaluate any impairment(s) caused by the effluent sample; all statistical analyses were made using CETIS® (TidePool Scientific Software, McKinleyville, CA).

3.1.1 Reference Toxicant Testing of the *Ceriodaphnia dubia*

In order to assess the sensitivity of the *C. dubia* test organisms to toxic stress, a concurrent reference toxicant test was performed. This reference toxicant test was performed similarly to the ambient water test except that test solutions consisted of Lab Water Control medium spiked with NaCl at test concentrations of 500, 1000, 1500, 2000, and 2500 mg/L. The resulting test response data were statistically analyzed to determine key concentration-response point estimates (e.g., EC50); all statistical analyses were made using CETIS®. These response endpoints were then compared to the typical response range established by the mean ± 2 SD of the point estimates generated by the most recent previous reference toxicant tests performed by this lab.

4. RESULTS OF THE AMBIENT WATER TOXICITY EVALUATIONS

4.1 Effects of Calleguas Creek Ambient Water on *Ceriodaphnia dubia*

The results of the ambient water tests with *C. dubia* are summarized below in Tables 3 through 9. There was a significant reduction in survival and reproduction in the 70-WOOD-097 Calleguas Creek ambient water sample.

The test data and summary of statistical analyses for these tests, excluding statistical outliers where appropriate, are presented in Appendix B; the summary of statistical analyses for these tests, including statistical outliers, is presented in Appendix C.

Table 3. Effects of Ambient Water 70-UNIV-029 on <i>Ceriodaphnia dubia</i> .		
Ambient Water Treatment	% Survival	Reproduction (# neonates /female)
Lab Water Control	100	24.3
6.25%	100	28.6
12.5%	100	31.6 ^b
25%	90	28.1
50%	80	24.3
100%	90	30.9 ^b
Summary of Statistics		
No Observable Effect Concentration (NOEC) =	100% ambient water	100% ambient water
TUc (where TUc = 100/NOEC) =	1	1
Survival EC25 or Reproduction IC25 =	>100% ambient water ^a	>100% ambient water
Survival EC50 or Reproduction IC50 =	>100% ambient water ^a	>100% ambient water
TUc (where TUc = 100/EC50 or 100/IC50) =	<1	<1

a - Due to the absence of significant mortalities, the EC point estimates could not be calculated, but can be determined by inspection to be >100% ambient water.

b - The reproduction response for one of the replicates at this test treatment was determined to be a statistical outlier, and the results reported above are for the analysis of the test data excluding this outlier. As per EPA guidelines, the test data were analyzed both with and without the outlier, and the results of both sets of analyses are reported in the appendices.

Ambient Water Treatment	% Survival	Reproduction (# neonates /female)
Lab Water Control	100	30.5
6.25%	100	35.1
12.5%	90	34.2 ^b
25%	100	34.1
50%	100	32.1
100%	90	28.2
Summary of Key Statistics		
No Observable Effect Concentration (NOEC) =	100% ambient water	100% ambient water
TUc (where TUc = 100/NOEC) =	1	1
Survival EC25 or Reproduction IC25 =	>100% ambient water ^a	>100% ambient water
Survival EC50 or Reproduction IC50 =	>100% ambient water ^a	>100% ambient water
TUc (where TUc = 100/EC50 or 100/IC50) =	<1	<1

a - Due to the absence of significant mortalities, the EC point estimates could not be calculated, but can be determined by inspection to be >100% ambient water.

b - The reproduction response for one of the replicates at this test treatment was determined to be a statistical outlier, and the results reported above are for the analysis of the test data excluding this outlier. As per EPA guidelines, the test data were analyzed both with and without the outlier, and the results of both sets of analyses are reported in the appendices.

Ambient Water Treatment	% Survival	Reproduction (# neonates /female)
Lab Water Control	100	28.9
6.25%	100	31.8
12.5%	100	34.3
25%	100	31
50%	100	32.7 ^b
100%	0*	-
Summary of Key Statistics		
No Observable Effect Concentration (NOEC) =	50% ambient water	50% ambient water
TUc (where TUc = 100/NOEC) =	2	2
Survival EC25 or Reproduction IC25 =	>50% ambient water ^a	62.5% ambient water
Survival EC50 or Reproduction IC50 =	>50% ambient water ^a	75% ambient water
TUc (where TUc = 100/EC50 or 100/IC50) =	<2	1.3

* - The test response at this treatment was significantly less than the Control treatment response ($p < 0.05$).

a - Due to the data distribution, the EC25 could not be calculated.

b - The reproduction response for one of the replicates at this test treatment was determined to be a statistical outlier, and the results reported above are for the analysis of the test data excluding this outlier. As per EPA guidelines, the test data were analyzed both with and without the outlier, and the results of both sets of analyses are reported in the appendices.

Table 6. Effects of Ambient Water 70-UPLAND-144 on <i>Ceriodaphnia dubia</i> .		
Ambient Water Treatment	% Survival	Reproduction (# neonates /female)
Lab Water Control	100	31.8
6.25%	100	34.7 ^b
12.5%	100	32.1
25%	100	32
50%	100	30.4
100%	100	34.2 ^b
Summary of Key Statistics		
No Observable Effect Concentration (NOEC) =	100% ambient water	100% ambient water
TUc (where TUc = 100/NOEC) =	1	1
Survival EC25 or Reproduction IC25 =	>100% ambient water ^a	>100% ambient water
Survival EC50 or Reproduction IC50 =	>100% ambient water ^a	>100% ambient water
TUc (where TUc = 100/EC50 or 100/IC50) =	<1	<1

a - Due to the absence of significant mortalities, the EC point estimates could not be calculated, but can be determined by inspection to be >100% ambient water.

b - The reproduction response for one of the replicates at this test treatment was determined to be a statistical outlier, and the results reported above are for the analysis of the test data excluding this outlier. As per EPA guidelines, the test data were analyzed both with and without the outlier, and the results of both sets of analyses are reported in the appendices.

Table 7. Effects of Ambient Water 70-HITCH-150 on <i>Ceriodaphnia dubia</i> .		
Ambient Water Treatment	Mean % Survival	Mean Reproduction (# neonates/female)
Lab Water Control	100	30.2
6.25%	100	33.3
12.5%	100	33.2 ^b
25%	100	33.7
50%	100	34
100%	100	34.1
Summary of Key Statistics		
No Observable Effect Concentration (NOEC) =	100% ambient water	100% ambient water
TUc (where TUc = 100/NOEC) =	1	1
Survival EC25 or Reproduction IC25 =	>100% ambient water ^a	>100% ambient water
Survival EC50 or Reproduction IC50 =	>100% ambient water ^a	>100% ambient water
TUc (where TUc = 100/EC50 or 100/IC50) =	<1	<1

a - Due to the absence of significant mortalities, the EC point estimates could not be calculated, but can be determined by inspection to be >100% ambient water.

b - The reproduction response for one of the replicates at this test treatment was determined to be a statistical outlier, and the results reported above are for the analysis of the test data excluding this outlier. As per EPA guidelines, the test data were analyzed both with and without the outlier, and the results of both sets of analyses are reported in the appendices.

Table 8. Effects of Ambient Water 70-GATE-202 on <i>Ceriodaphnia dubia</i> .		
Ambient Water Treatment	Mean % Survival	Mean Reproduction (# neonates/female)
Lab Water Control	100	30.6
6.25%	100	33.7
12.5%	100	32.1
25%	90	31.6
50%	100	29.5
100%	100	30.6
Summary of Key Statistics		
No Observable Effect Concentration (NOEC) =	100% ambient water	100% ambient water
TUc (where TUc = 100/NOEC) =	1	1
Survival EC25 or Reproduction IC25 =	>100% ambient water ^a	>100% ambient water
Survival EC50 or Reproduction IC50 =	>100% ambient water ^a	>100% ambient water
TUc (where TUc = 100/EC50 or 100/IC50) =	<1	<1

a - Due to the absence of significant mortalities, the EC point estimates could not be calculated, but can be determined by inspection to be >100% ambient water.

Table 9. Effects of Ambient Water 70-BELT-208 on <i>Ceriodaphnia dubia</i> .		
Ambient Water Treatment	Mean % Survival	Mean Reproduction (# neonates/female)
Lab Water Control	100	30.8
6.25%	100	35
12.5%	100	36.4 ^b
25%	100	35.1
50%	100	37.3
100%	100	37.8
Summary of Key Statistics		
No Observable Effect Concentration (NOEC) =	100% ambient water	100% ambient water
TUc (where TUc = 100/NOEC) =	1	1
Survival EC25 or Reproduction IC25 =	>100% ambient water ^a	>100% ambient water
Survival EC50 or Reproduction IC50 =	>100% ambient water ^a	>100% ambient water
TUc (where TUc = 100/EC50 or 100/IC50) =	<1	<1

a - Due to the absence of significant mortalities, the EC point estimates could not be calculated, but can be determined by inspection to be >100% ambient water.

b - The reproduction response for one of the replicates at this test treatment was determined to be a statistical outlier, and the results reported above are for the analysis of the test data excluding this outlier. As per EPA guidelines, the test data were analyzed both with and without the outlier, and the results of both sets of analyses are reported in the appendices.

4.1.2 Reference Toxicant Toxicity to *Ceriodaphnia dubia*

The results of this test are summarized below in Table 8. The EC₅₀ and IC₅₀ for these tests were both consistent with the typical response ranges established by the reference toxicant test database for this species, thus providing further evidence that the organisms used for ambient water testing were responding to toxic stress in a typical and consistent fashion. The test data and summary of statistical analyses for this test are presented in Appendix D.

Table 8. Reference toxicant testing: effects of NaCl on <i>Ceriodaphnia dubia</i> .		
NaCl Treatment (mg/L)	Mean % Survival	Mean Reproduction (# neonates/female)
Lab Water Control	100	32.6
500	90	26.2
1000	100	27.5*
1500	90	17.9*
2000	30*	1.4
2500	0*	-
Summary of Statistics		
Survival EC ₅₀ or Reproduction IC ₅₀ =	1860 mg/L NaCl	1550 mg/L NaCl
Typical Response Range (mean ± 2 SD)	1785 - 2227 mg/L NaCl	1354 - 1840 mg/L NaCl

* The response at this test treatment was significantly less than the Lab Control treatment response at p<0.05

5. SUMMARY AND CONCLUSIONS

Effects of Calleguas Creek Ambient Waters on *Ceriodaphnia dubia*

There was a significant reduction in survival and reproduction in the 70-WOOD-097 Calleguas Creek ambient water sample.

There were no significant reductions in survival or reproduction in the remaining Calleguas Creek ambient waters.

Toxicity Summary for Calleguas Creek: Event 70 Ambient Waters.		
Sample Station ID	Toxicity relative to the Lab Control treatment?	
	<i>Ceriodaphnia dubia</i>	
	Survival	Reproduction
70-UNIV-029	no	no
70-ADOLF-045	no	no
70-WOOD-097	YES	YES
70-UPLAND-144	no	no
70-HITCH-150	no	no
70-GATE-202	no	no
70-BELT-208	no	no

5.1 QA/QC Summary

Test Conditions – All test conditions (pH, D.O., temperature, etc.) were all within acceptable limits during testing. All test analyses were performed according to laboratory Standard Operating Procedures.

Negative Control – The biological responses for the test organisms in the Lab Control treatments were within acceptable limits.

Positive Control – All reference toxicant test results were consistent with the “typical response” ranges established by the reference toxicant test database, indicating that these test organisms were responding to toxic stress in a typical fashion.

Concentration Response Relationships – The concentration-response relationships for these tests were evaluated as per EPA guidelines (EPA-821-B-00-004), and were determined to be acceptable.

Appendix A

Chain-of-Custody Record for the Collection and Delivery of the Calleguas Creek Ambient Water Samples

Appendix B

Test Data and Summary of Statistics for the Evaluation of the Chronic Toxicity of the Calleguas Creek Ambient Waters to *Ceriodaphnia dubia*: Data Analyses Excluding Statistical Outliers

CETIS Summary Report

Report Date: 08 Dec-18 16:31 (p 1 of 2)
 Test Code: 80713 | 09-4943-1982

Ceriodaphnia Survival and Reproduction Test **Pacific EcoRisk**

Batch ID: 07-4716-3371	Test Type: Reproduction-Survival (7d)	Analyst: Kristin Robertson
Start Date: 30 Nov-18 13:03	Protocol: EPA-821-R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 06 Dec-18 15:00	Species: Ceriodaphnia dubia	Brine: Not Applicable
Duration: 6d 2h	Source: In-House Culture	Age: 1

Sample ID: 07-6720-5968	Code: 70-UNIV-029	Client: Larry Walker Associates
Sample Date: 29 Nov-18 08:45	Material: Ambient Water	Project: 29633
Receipt Date: 30 Nov-18 09:03	Source: Calleguas Creek	
Sample Age: 28h (0.4 °C)	Station: UNIV	

Comments:
 Statistice excluding reproductive outliers 12.5G and 100D

Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	NOEL	LOEL	TOEL	TU	PMSD ✓
02-7164-6118	Reproduction	Wilcoxon/Bonferroni Adj Test	100	> 100	n/a	1	26.4%
18-4465-5826	Survival	Fisher Exact/Bonferroni-Holm Test	100	> 100	n/a	1	n/a

Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	Level	%	95% LCL	95% UCL	TU	✓
18-3897-3189	Reproduction	Linear Interpolation (ICPIN)	IC5	>100	n/a	n/a	<1	
			IC10	>100	n/a	n/a	<1	
			IC15	>100	n/a	n/a	<1	
			IC20	>100	n/a	n/a	<1	
			IC25	>100	n/a	n/a	<1	
			IC40	>100	n/a	n/a	<1	
			IC50	>100	n/a	n/a	<1	

Reproduction Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	10	24.3	21.7	26.9	17	30	1.14	3.59	14.78%	0.00%
6.25		10	28.6	25.8	31.4	23	36	1.25	3.95	13.81%	-17.70%
12.5		8	31.6	29.7	33.5	28	34	0.8	2.26	7.16%	-30.14%
25		10	28.1	23.9	32.3	16	34	1.84	5.82	20.71%	-15.64%
50		10	24.3	16.6	32	3	34	3.42	10.8	44.49%	0.00%
100		9	30.9	28.5	33.3	25	36	1.05	3.14	10.17%	-27.11%

Survival Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
6.25		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
12.5		9	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
25		10	0.900	0.674	1.000	0.000	1.000	0.100	0.316	35.14%	10.00%
50		10	0.800	0.498	1.000	0.000	1.000	0.133	0.422	52.70%	20.00%
100		10	0.900	0.674	1.000	0.000	1.000	0.100	0.316	35.14%	10.00%

CETIS Summary Report

Report Date: 08 Dec-18 16:31 (p 2 of 2)
 Test Code: 80713 | 09-4943-1982

Ceriodaphnia Survival and Reproduction Test											Pacific EcoRisk
Reproduction Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	22	21	30	17	27	25	26	25	24	26
6.25		27	23	28	30	33	24	29	30	26	36
12.5		34	30	34	31	32	34		28	30	
25		25	34	33	31	32	33	29	26	16	22
50		32	28	14	12	33	29	3	34	25	33
100		33	29	29		33	31	30	25	32	36
Survival Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
6.25		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
12.5		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
25		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.000	1.000
50		1.000	1.000	0.000	1.000	1.000	1.000	0.000	1.000	1.000	1.000
100		1.000	1.000	1.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000
Survival Binomials											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
6.25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
12.5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	0/1	1/1
50		1/1	1/1	0/1	1/1	1/1	1/1	0/1	1/1	1/1	1/1
100		1/1	1/1	1/1	0/1	1/1	1/1	1/1	1/1	1/1	1/1

CETIS Analytical Report

Report Date: 08 Dec-18 16:31 (p 1 of 1)
 Test Code: 80713 | 09-4943-1982

Ceriodaphnia Survival and Reproduction Test Pacific EcoRisk

Analysis ID: 02-7164-6118 Endpoint: Reproduction CETIS Version: CETISv1.9.2
 Analyzed: 08 Dec-18 16:30 Analysis: Nonparametric-Multiple Comparison Official Results: Yes

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	C > T	100	> 100	n/a	1	26.44%

Wilcoxon/Bonferroni Adj Test

Control	vs	Conc-%	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Lab Water Contr		6.25	134	n/a	4	18	Exact	1.0000	Non-Significant Effect
		12.5	114	n/a	1	16	Exact	1.0000	Non-Significant Effect
		25	128	n/a	3	18	Exact	1.0000	Non-Significant Effect
		50	118	n/a	1	18	Exact	1.0000	Non-Significant Effect
		100	128	n/a	2	17	Exact	1.0000	Non-Significant Effect

ANOVA Table

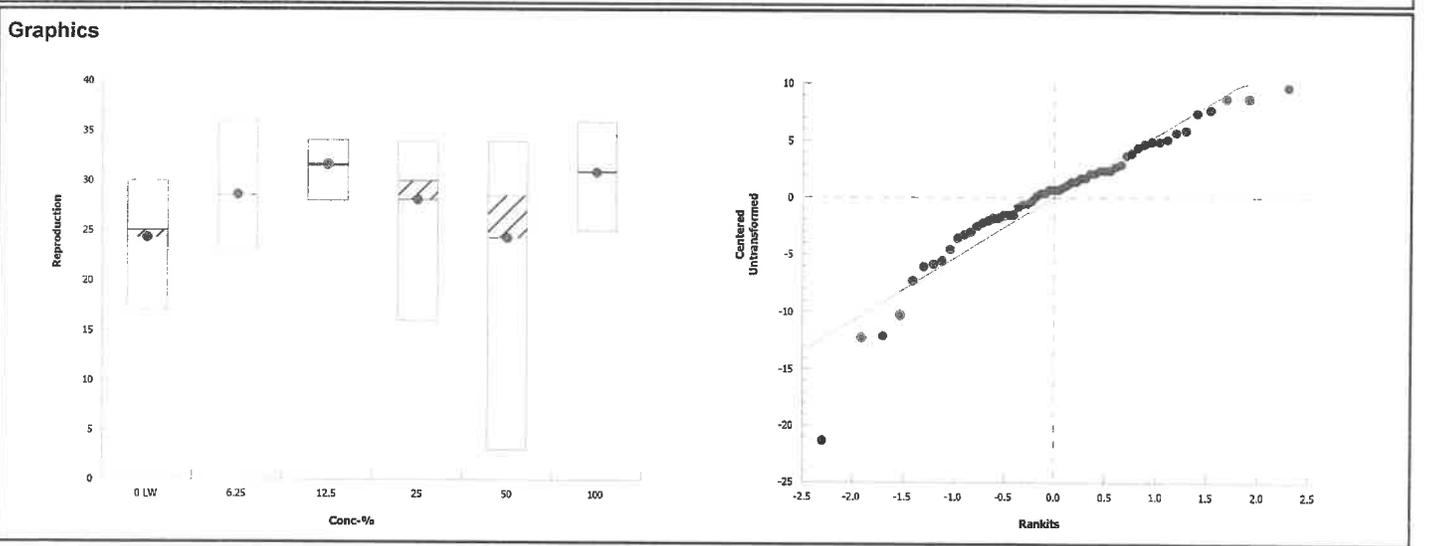
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	455.21	91.042	5	2.69	0.0313	Significant Effect
Error	1728.26	33.8875	51			
Total	2183.47		56			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	26.4	15.1	7.4E-05	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.925	0.943	0.0017	Non-Normal Distribution

Reproduction Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	LW	10	24.3	21.7	26.9	25	17	30	1.14	14.78%	0.00%
6.25		10	28.6	25.8	31.4	28.5	23	36	1.25	13.81%	-17.70%
12.5		8	31.6	29.7	33.5	31.5	28	34	0.8	7.16%	-30.14%
25		10	28.1	23.9	32.3	30	16	34	1.84	20.71%	-15.64%
50		10	24.3	16.6	32	28.5	3	34	3.42	44.49%	0.00%
100		9	30.9	28.5	33.3	31	25	36	1.05	10.17%	-27.11%



CETIS Analytical Report

Report Date: 08 Dec-18 16:31 (p 1 of 1)
 Test Code: 80713 | 09-4943-1982

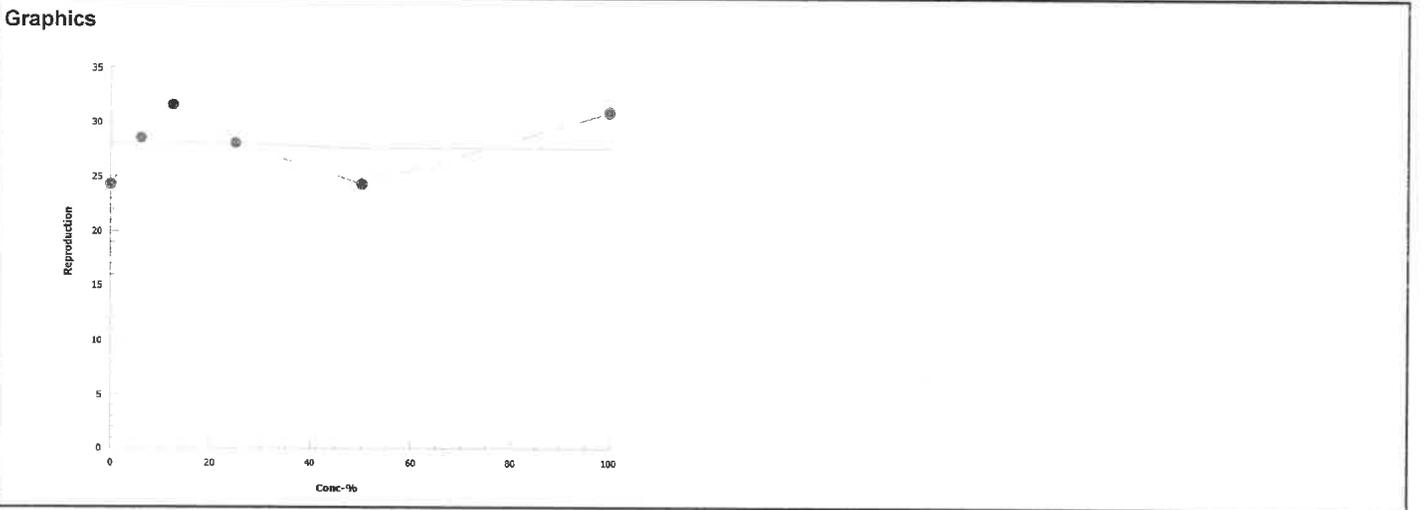
Ceriodaphnia Survival and Reproduction Test Pacific EcoRisk

Analysis ID: 18-3897-3189 Endpoint: Reproduction CETIS Version: CETISv1.9.2
 Analyzed: 08 Dec-18 16:30 Analysis: Linear Interpolation (ICPIN) Official Results: Yes

Linear Interpolation Options					
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	349536	200	Yes	Two-Point Interpolation

Point Estimates						
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	>100	n/a	n/a	<1	n/a	n/a
IC10	>100	n/a	n/a	<1	n/a	n/a
IC15	>100	n/a	n/a	<1	n/a	n/a
IC20	>100	n/a	n/a	<1	n/a	n/a
IC25	>100	n/a	n/a	<1	n/a	n/a
IC40	>100	n/a	n/a	<1	n/a	n/a
IC50	>100	n/a	n/a	<1	n/a	n/a

Reproduction Summary			Calculated Variate						
Conc-%	Code	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	10	24.3	17	30	1.14	3.59	14.80%	0.0%
6.25		10	28.6	23	36	1.25	3.95	13.80%	-17.7%
12.5		8	31.6	28	34	0.8	2.26	7.16%	-30.1%
25		10	28.1	16	34	1.84	5.82	20.70%	-15.6%
50		10	24.3	3	34	3.42	10.8	44.50%	0.0%
100		9	30.9	25	36	1.05	3.14	10.20%	-27.1%



CETIS Analytical Report

Report Date: 08 Dec-18 16:31 (p 1 of 1)
 Test Code: 80713 | 09-4943-1982

Ceriodaphnia Survival and Reproduction Test Pacific EcoRisk

Analysis ID: 18-4465-5826 Endpoint: Survival CETIS Version: CETISv1.9.2
 Analyzed: 08 Dec-18 16:18 Analysis: STP 2xK Contingency Tables Official Results: Yes

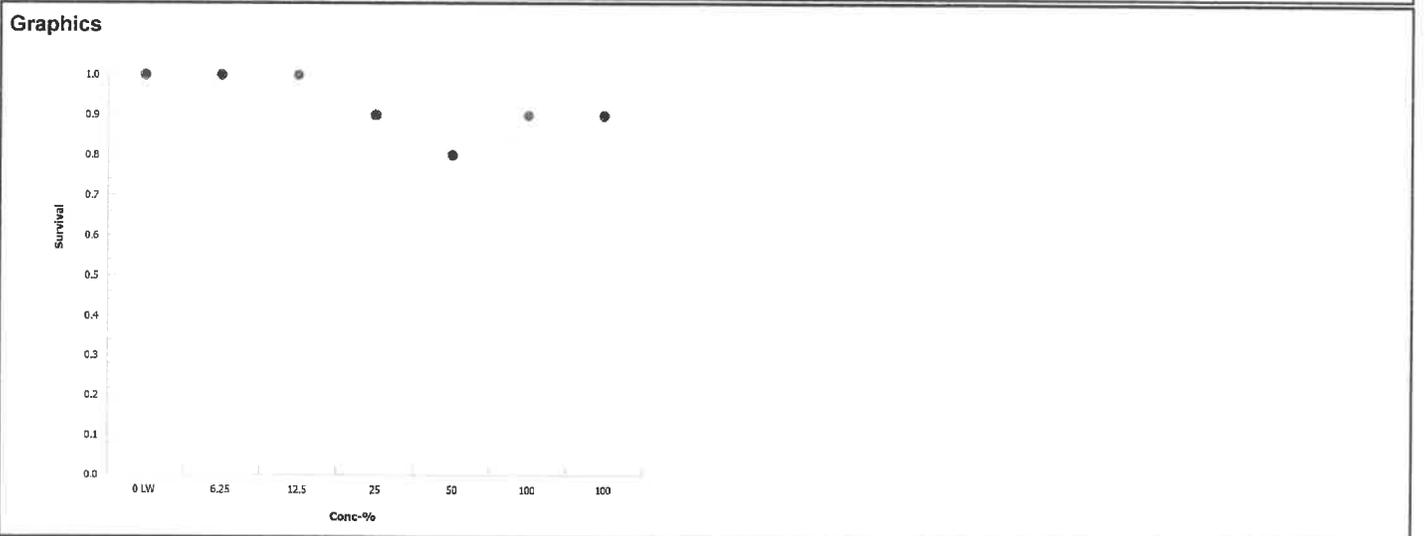
Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU
Untransformed	C > T	100	> 100	n/a	1

Fisher Exact/Bonferroni-Holm Test

Control	vs	Group	Test Stat	P-Type	P-Value	Decision(α:5%)
Lab Water Contr		6.25	1.000	Exact	1.0000	Non-Significant Effect
		12.5	1.000	Exact	1.0000	Non-Significant Effect
		25	0.500	Exact	1.0000	Non-Significant Effect
		50	0.237	Exact	1.0000	Non-Significant Effect
		100	0.500	Exact	1.0000	Non-Significant Effect

Data Summary

Conc-%	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
0	LW	10	0	10	1	0	0.0%
6.25		10	0	10	1	0	0.0%
12.5		9	0	9	1	0	0.0%
25		9	1	10	0.9	0.1	10.0%
50		8	2	10	0.8	0.2	20.0%
100		9	1	10	0.9	0.1	10.0%



Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: LWA - Calleguas Creek Material: 70-UNIV Test Date: 11/30/18
 Project #: 29633 Test ID: 80713 Randomization: 10.7.1 Control Water: Mod EPAMH

Day	pH		D.O.		Cond. (µS/cm)	Temp (°C)	Survival / Reproduction										SIGN-OFF						
	New	Old	New	Old			A	B	C	D	E	F	G	H	I	J	Date:	New WQ:	Test Init.:				
0	8.32		7.3		356	25.0	0	0	0	0	0	0	0	0	0	0	0	0	0	Date: 11/30/18	New WQ: SVV	Test Init.: TA	Time: 1303
1	7.86	7.61	8.5	5.0	355	24.8	0	0	0	0	0	0	0	0	0	0	0	0	0	Date: 12/1/18	New WQ: mbl	Counts: LB	Time: 743
2	7.80	7.68	7.6	7.4	351	25.5	0	0	0	0	0	0	0	0	0	0	0	0	0	Date: 12/2/18	New WQ: SAT	Counts: BV	Time: 235
3	7.92	7.86	8.9	8.2	357	25.4	5	5	5	3	5	4	4	4	4	5				Date: 12/3/18	New WQ: mbl	Counts: KB	Time: 1057
4	7.90	7.93	8.8	7.8	362	25.6	0	10	10	0	9	0	0	0	9	8				Date: 12/4/18	New WQ: BK	Counts: BK	Time: 1333
5	7.90	7.73	8.7	7.3	360	24.3	8	0	0	5	0	9	9	8	0	1				Date: 12/5/18	New WQ: TA	Counts: LB	Time: 1300
6	-	8.20	-	8.0	375	24.2	9	6	15	9	13	12	13	13	11	12				Date: 1/6/19	New WQ: -	Counts: LB	Time: 1300
7																				Date:	New WQ:	Counts:	
8																				Date:	Old WQ:	Counts:	
Total=							22	21	30	17	27	25	26	25	24	26	Mean Neonates/Female = 74.3						
Day	pH		D.O.		Cond. (µS/cm)	Temp (°C)	Survival / Reproduction										Sample ID						
	New	Old	New	Old			A	B	C	D	E	F	G	H	I	J							
0	8.32		7.3		385	25.2	0	0	0	0	0	0	0	0	0	0	0	0	0	51470			
1	7.85	7.72	8.5	5.4	384	25.1	0	0	0	0	0	0	0	0	0	0	0	0	0	51470			
2	7.79	7.67	7.6	7.1	376	25.5	0	0	0	0	0	0	0	0	0	0	0	0	0	51470			
3	7.94	7.95	8.8	8.3	389	25.5	5	5	5	4	4	6	3	4	5	5				51470			
4	7.91	7.89	8.8	8.0	389	25.4	7	6	10	0	0	0	0	14	9	0				51470			
5	7.87	7.71	8.6	7.2	389	24.4	2	0	0	11	11	5	9	0	1	13				51470			
6	-	7.89	-	7.8	403	24.1	13	12	13	15	18	13	17	12	11	18				-			
7																							
8																							
Total=							27	23	28	30	33	24	29	30	26	36	Mean Neonates/Female = 28.6						

Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: LWA - Calleguas Creek Material: 70-UNIV Test Date: 11/30/18
 Project #: 29633 Test ID: 80713 Control Water: Mod EPAMH

Day	pH		D.O.		Cond. (µS/cm)	Temp (°C)	Survival / Reproduction										SIGN-OFF	
	New	Old	New	Old			A	B	C	D	E	F	G	H	I	J		
12.5%	0	8.33		7.3		412	24.8	0	0	0	0	0	0	0	0	0	0	
	1	7.84	7.75	8.5	5.7	411	25.7	0	0	0	0	0	0	0	0	0	0	
	2	7.81	7.67	7.6	7.6	413	25.1	0	0	0	0	0	0	0	0	0	0	
	3	7.90	8.01	8.8	8.3	417	25.4	6	4	5	5	0	5	3	7	5	4	
	4	7.90	7.88	8.7	8.0	415	25.8	13	12	13	0	10	0	0	-	10	12	
	5	7.80	7.69	8.6	6.7	415	24.9	0	0	0	11	0	12	0	-	1	0	
	6	-	7.79	-	7.9	433	24.0	15	14	16	15	16	17	16	-	12	14	
	7														-			
	8														-			
Total=							34	30	34	31	32	34	19	70	27	30	Mean Neonates/Female = 30.2	
25%	0	8.33		7.4		465	24.4	0	0	0	0	0	0	0	0	0	0	
	1	7.82	7.72	8.6	6.2	460	25.8	0	0	0	0	0	0	0	0	0	0	
	2	7.78	7.71	7.6	8.2	469	25.8	0	0	0	0	0	0	0	0	0	0	
	3	7.88	8.05	8.8	8.5	471	25.5	4	5	4	5	5	4	5	4	5	4	
	4	7.88	7.91	8.6	8.2	465	25.8	9	11	10	0	10	0	0	0	11	0	
	5	7.83	7.75	8.6	7.2	468	25.0	0	0	0	8	0	11	9	7	7	0	
	6	-	7.76	-	8.0	487	24.1	12	18	19	18	17	18	15	15	-	18	
	7														-			
	8														-			
Total=							25	34	33	31	32	33	29	28	16	22	Mean Neonates/Female = 28.3	

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420
12/2/18

Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: LWA - Calleguas Creek Material: 70-UNIV Test Date: 11/30/18
 Project #: 29633 Test ID: 80713 Control Water: Mod EPAMH

Day	pH		D.O.		Cond. (µS/cm)	Temp (°C)	Survival / Reproduction										SIGN-OFF	
	New	Old	New	Old			A	B	C	D	E	F	G	H	I	J		
0	8.31		7.6		575	24.3	0	0	0	0	0	0	0	0	0	0	0	
1	7.76	7.74	8.6	7.0	563	25.9	0	0	0	0	0	0	0	0	0	0	0	
2	7.74	7.68	7.7	7.3	570	25.8	0	0	0	0	0	0	0	0	0	0	0	
3	7.83	8.08	8.9	8.5	578	25.3	5	5	5	5	5	4	3	4	4	5		
4	7.84	7.89	8.6	8.1	564	25.7	11	11	1/9	0	0	0	0	0	5	0		
5	7.79	7.77	8.6	7.3	568	25.1	0	0	-	7	12	1/2	1/2	10	0	10		
6	-	7.76	-	7.9	593	24.5	16	12	-	0	16	15	-	20	16	18		
7									-									
8									-									
Total=							32	28	1/4	12	33	1/2	1/2	34	25	33	Mean Neonates/Female = 24.3	
Day	pH		D.O.		Cond. (µS/cm)	Temp (°C)	Survival / Reproduction										SIGN-OFF	
	New	Old	New	Old			A	B	C	D	E	F	G	H	I	J		
0	8.25		7.8		792	24.5	0	0	0	0	0	0	0	0	0	0	0	
1	7.68	7.84	8.6	7.0	765	25.9	0	0	0	0	0	0	0	0	0	0	0	
2	7.66	7.72	7.6	7.7	790	25.7	0	0	0	0	0	0	0	0	0	0	0	
3	7.73	8.13	8.9	8.4	794	25.8	5	5	4	1/3	4	3	4	3	4	5		
4	7.96	7.91	8.3	8.1	762	25.4	12	9	9	-	0	0	0	0	8	0		
5	7.72	7.71	8.4	7.4	767	24.8	0	0	0	-	11	10	10	8	1	11		
6	-	7.86	-	8.0	798	24.0	16	15	16	-	18	18	16	14	19	20		
7									-									
8									-									
Total=							33	29	2/3	1/3	33	31	30	27	32	36	Mean Neonates/Female = 28.1	

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CETIS Summary Report

Report Date: 10 Dec-18 13:54 (p 1 of 2)
Test Code: 80714 | 13-4953-7412

Ceriodaphnia Survival and Reproduction Test **Pacific EcoRisk**

Batch ID: 00-4779-8765	Test Type: Reproduction-Survival (7d)	Analyst: Wesley Cram
Start Date: 30 Nov-18 13:37	Protocol: EPA-821-R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 06 Dec-18 16:18	Species: Ceriodaphnia dubia	Brine: Not Applicable
Duration: 6d 3h	Source: In-House Culture	Age: 1

Sample ID: 04-7189-8807	Code: 70-ADOLF-045	Client: Larry Walker Associates
Sample Date: 29 Nov-18 11:40	Material: Ambient Water	Project: 29633
Receipt Date: 30 Nov-18 09:03	Source: Calleguas Creek	
Sample Age: 26h (0.6 °C)	Station: ADOLF	

Comments:
 Stats excluding reproductive outlier: 12.5-D

Multiple Comparison Summary							
Analysis ID	Endpoint	Comparison Method	NOEL	LOEL	TOEL	TU	PMSD ✓
18-7367-5191	Reproduction	Wilcoxon/Bonferroni Adj Test	100	> 100	n/a	1	20.7%
14-5175-5447	Survival	Fisher Exact/Bonferroni-Holm Test	100	> 100	n/a	1	n/a

Point Estimate Summary							
Analysis ID	Endpoint	Point Estimate Method	Level	%	95% LCL	95% UCL	TU ✓
10-3141-3121	Reproduction	Linear Interpolation (ICPIN)	IC5	53.8	21.2	n/a	1.86
			IC10	75.2	52.9	n/a	1.329
			IC15	96.7	62.9	n/a	1.034
			IC20	>100	n/a	n/a	<1
			IC25	>100	n/a	n/a	<1
			IC40	>100	n/a	n/a	<1
			IC50	>100	n/a	n/a	<1

Reproduction Summary											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	10	30.5	28	33	25	35	1.11	3.5	11.49%	0.00%
6.25		10	35.1	33.7	36.5	32	38	0.605	1.91	5.45%	-15.08%
12.5		9	34.2	31.2	37.2	27	41	1.3	3.9	11.39%	-12.20%
25		10	34.1	30	38.2	22	43	1.82	5.74	16.84%	-11.80%
50		10	32.1	30.1	34.1	27	36	0.9	2.85	8.87%	-5.25%
100		10	28.2	19.9	36.5	0	39	3.65	11.5	40.94%	7.54%

Survival Summary											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
6.25		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
12.5		10	0.900	0.674	1.000	0.000	1.000	0.100	0.316	35.14%	10.00%
25		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
50		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
100		10	0.900	0.674	1.000	0.000	1.000	0.100	0.316	35.14%	10.00%

CETIS Summary Report

Report Date: 10 Dec-18 13:54 (p 2 of 2)
 Test Code: 80714 | 13-4953-7412

Ceriodaphnia Survival and Reproduction Test											Pacific EcoRisk
Reproduction Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	33	29	35	30	34	26	31	34	25	28
6.25		37	32	34	35	38	37	35	33	34	36
12.5		37	27	31		33	35	34	41	34	36
25		33	34	30	35	38	36	39	43	31	22
50		32	29	31	33	36	31	32	27	34	36
100		17	29	35	39	29	31	32	35	35	0
Survival Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
6.25		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
12.5		1.000	1.000	1.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000
25		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
50		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
100		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.000
Survival Binomials											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
6.25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
12.5		1/1	1/1	1/1	0/1	1/1	1/1	1/1	1/1	1/1	1/1
25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
50		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
100		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	0/1

CETIS Analytical Report

Report Date: 10 Dec-18 13:54 (p 1 of 1)
 Test Code: 80714 | 13-4953-7412

Ceriodaphnia Survival and Reproduction Test **Pacific EcoRisk**

Analysis ID: 18-7367-5191 Endpoint: Reproduction CETIS Version: CETISv1.9.2
 Analyzed: 10 Dec-18 13:53 Analysis: Nonparametric-Multiple Comparison Official Results: Yes

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	C > T	100	> 100	n/a	1	20.69%

Wilcoxon/Bonferroni Adj Test

Control	vs	Conc-%	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Lab Water Contr		6.25	142	n/a	3	18	Exact	1.0000	Non-Significant Effect
		12.5	114	n/a	4	17	Exact	1.0000	Non-Significant Effect
		25	129	n/a	5	18	Exact	1.0000	Non-Significant Effect
		50	118	n/a	4	18	Exact	1.0000	Non-Significant Effect
		100	112	n/a	3	18	Exact	1.0000	Non-Significant Effect

ANOVA Table

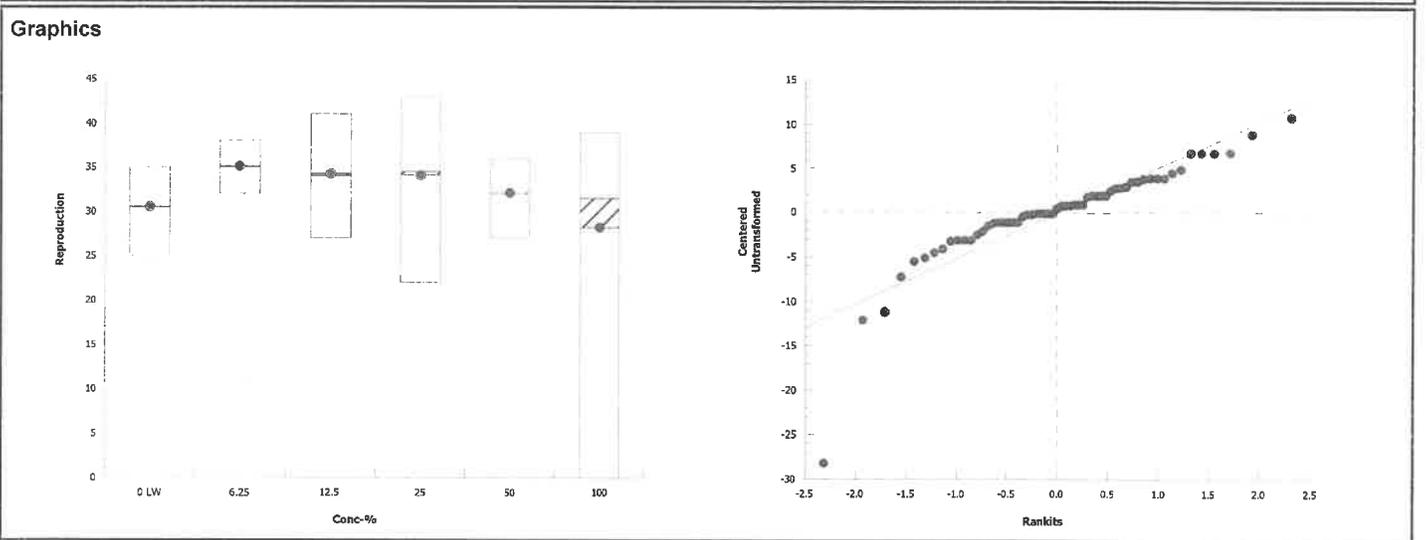
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	344.865	68.973	5	1.99	0.0947	Non-Significant Effect
Error	1834.36	34.6105	53			
Total	2179.22		58			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	35.9	15.1	1.0E-06	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.826	0.945	7.5E-07	Non-Normal Distribution

Reproduction Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	LW	10	30.5	28	33	30.5	25	35	1.11	11.49%	0.00%
6.25		10	35.1	33.7	36.5	35	32	38	0.605	5.45%	-15.08%
12.5		9	34.2	31.2	37.2	34	27	41	1.3	11.39%	-12.20%
25		10	34.1	30	38.2	34.5	22	43	1.82	16.84%	-11.80%
50		10	32.1	30.1	34.1	32	27	36	0.9	8.87%	-5.25%
100		10	28.2	19.9	36.5	31.5	0	39	3.65	40.94%	7.54%



CETIS Analytical Report

Report Date: 10 Dec-18 13:54 (p 1 of 1)
 Test Code: 80714 | 13-4953-7412

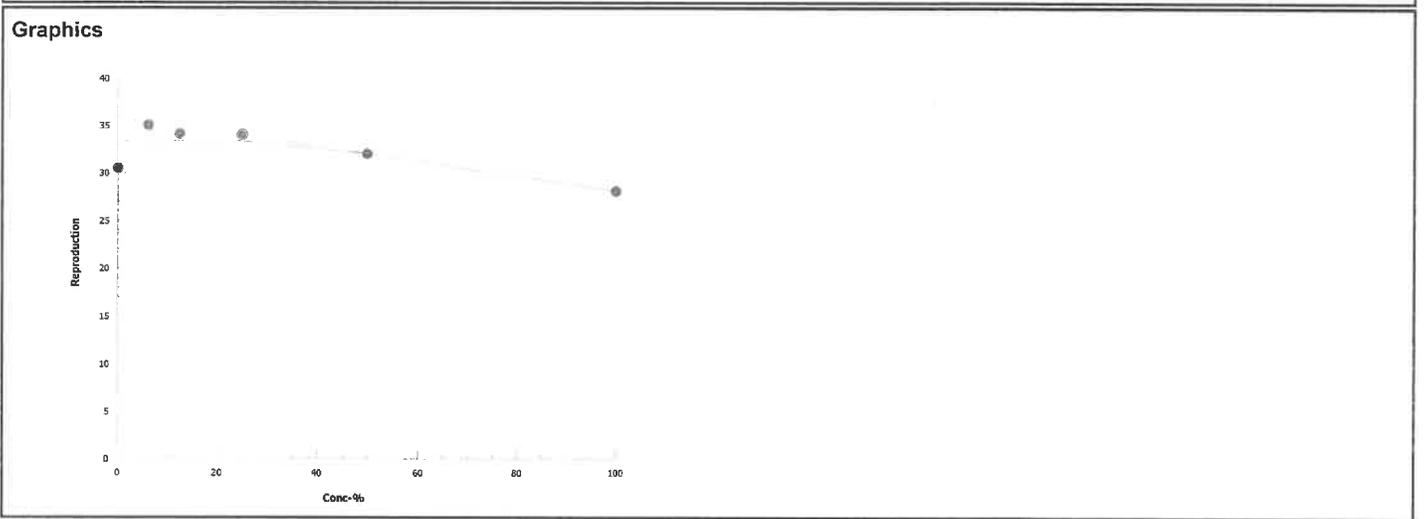
Ceriodaphnia Survival and Reproduction Test **Pacific EcoRisk**

Analysis ID: 10-3141-3121 Endpoint: Reproduction CETIS Version: CETISv1.9.2
 Analyzed: 10 Dec-18 13:54 Analysis: Linear Interpolation (ICPIN) Official Results: Yes

Linear Interpolation Options					
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	1576623	200	Yes	Two-Point Interpolation

Point Estimates						
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	53.8	21.2	n/a	1.86	n/a	4.723
IC10	75.2	52.9	n/a	1.329	n/a	1.889
IC15	96.7	62.9	n/a	1.034	n/a	1.591
IC20	>100	n/a	n/a	<1	n/a	n/a
IC25	>100	n/a	n/a	<1	n/a	n/a
IC40	>100	n/a	n/a	<1	n/a	n/a
IC50	>100	n/a	n/a	<1	n/a	n/a

Reproduction Summary			Calculated Variate						
Conc-%	Code	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	10	30.5	25	35	1.11	3.5	11.50%	0.0%
6.25		10	35.1	32	38	0.605	1.91	5.45%	-15.1%
12.5		9	34.2	27	41	1.3	3.9	11.40%	-12.2%
25		10	34.1	22	43	1.82	5.74	16.80%	-11.8%
50		10	32.1	27	36	0.9	2.85	8.87%	-5.25%
100		10	28.2	0	39	3.65	11.5	40.90%	7.54%



CETIS Analytical Report

Report Date: 10 Dec-18 13:54 (p 1 of 1)

Test Code: 80714 | 13-4953-7412

Ceriodaphnia Survival and Reproduction Test **Pacific EcoRisk**

Analysis ID: 14-5175-5447 Endpoint: Survival CETIS Version: CETISv1.9.2
 Analyzed: 10 Dec-18 13:53 Analysis: STP 2xK Contingency Tables Official Results: Yes

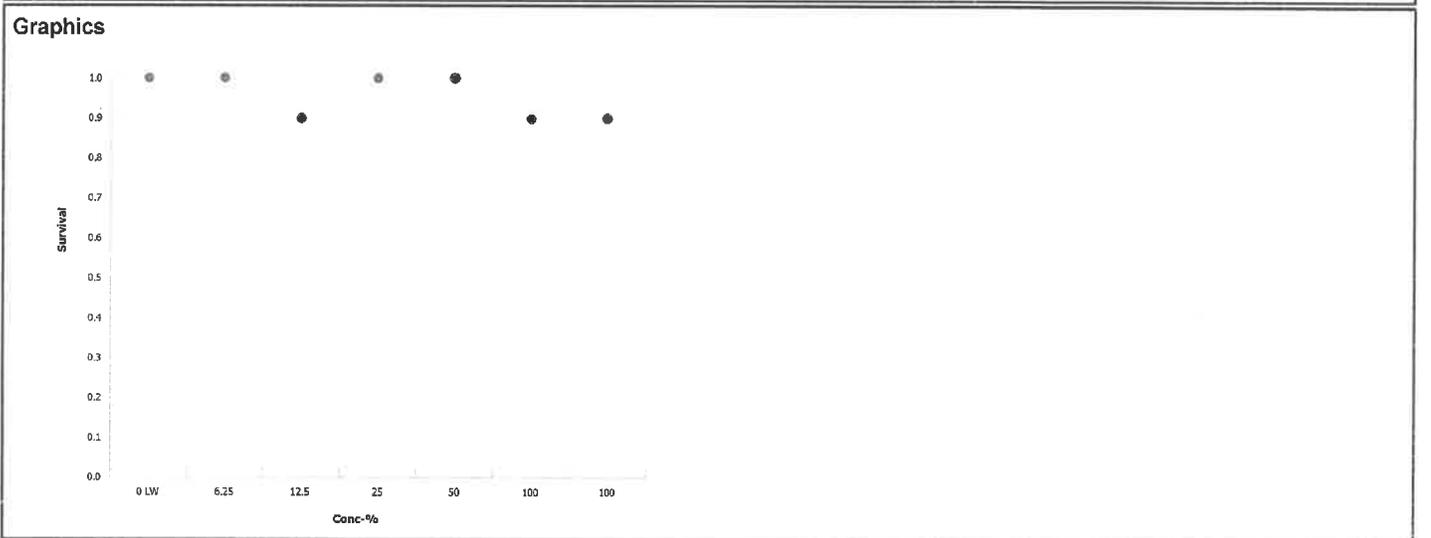
Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU
Untransformed	C > T	100	> 100	n/a	1

Fisher Exact/Bonferroni-Holm Test

Control	vs	Group	Test Stat	P-Type	P-Value	Decision(α:5%)
Lab Water Contr		6.25	1.000	Exact	1.0000	Non-Significant Effect
		12.5	0.500	Exact	1.0000	Non-Significant Effect
		25	1.000	Exact	1.0000	Non-Significant Effect
		50	1.000	Exact	1.0000	Non-Significant Effect
		100	0.500	Exact	1.0000	Non-Significant Effect

Data Summary

Conc-%	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
0	LW	10	0	10	1	0	0.0%
6.25		10	0	10	1	0	0.0%
12.5		9	1	10	0.9	0.1	10.0%
25		10	0	10	1	0	0.0%
50		10	0	10	1	0	0.0%
100		9	1	10	0.9	0.1	10.0%



Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: LWA - Calleguas Creek Material: 70-ADOLF Test Date: 11/30/18
 Project #: 29633 Test ID: 80714 Randomization: 10-7-1 Control Water: Mod EPAMH

	Day	pH		D.O.		Cond. (µS/cm)	Temp (°C)	Survival / Reproduction										SIGN-OFF		
		New	Old	New	Old			A	B	C	D	E	F	G	H	I	J			
Lab Water Control	0	7.84		7.7		352	24.0	0	0	0	0	0	0	0	0	0	0	0	0	Date: 11/30/18 New WQ: SAT Test Init.: AAF Sol'n Prep: SVV Time: 3:37
	1	7.71	7.72	8.3	4.7	344	24.0	0	0	0	0	0	0	0	0	0	0	0	0	Date: 12/1/18 New WQ: SR Counts: AEF Sol'n Prep: SV Old WQ: MB Time: 1:50
	2	7.79	8.05	8.1	8.2	354	24.5	0	0	0	0	0	0	0	0	0	0	0	0	Date: 12/1/18 New WQ: TA Counts: SV Sol'n Prep: AAF Old WQ: DM Time: 1:30
	3	7.87	7.85	8.7	7.5	354	24.2	7	4	6	5	5	4	5	6	4	6			Date: 12/3/18 New WQ: UB Counts: SV Sol'n Prep: SV Old WQ: KO Time: 1:23
	4	7.87	7.77	8.9	7.6	363	25.0	0	0	0	0	6	0	0	0	0	10			Date: 12/4/18 New WQ: YR Counts: LB Sol'n Prep: ER Old WQ: TA Time: 1:38
	5	7.92	7.73	6.5	7.9	357	24.0	10	10	13	10	12	0	11	12	12	0			Date: 12/5/18 New WQ: ER Counts: AEF Sol'n Prep: ER Old WQ: SV Time: 1:30
	6	—	7.73	—	7.8	379	24.0	16	15	16	15	17	16	15	16	9	12			Date: 12/6/18 New WQ: Counts: AEF Sol'n Prep: — Old WQ: SR Time: 10:10
	7																			Date: New WQ: Counts: Sol'n Prep: Old WQ: Time:
8																			Date: Old WQ: Counts: Time:	
Total=								33	29	36	30	34	26	31	34	25	28	Mean Neonates/Female = 30.5		
	Day	pH		D.O.		Cond. (µS/cm)		Survival / Reproduction										Sample ID		
		New	Old	New	Old			A	B	C	D	E	F	G	H	I	J			
6.25%	0	7.83		7.5		396	24.2	0	0	0	0	0	0	0	0	0	0	0	0	51471
	1	7.77	7.70	8.4	5.8	395	24.0	0	0	0	0	0	0	0	0	0	0	0	0	51471
	2	7.79	7.96	8.2	8.0	405	24.5	0	0	0	0	0	0	0	0	0	0	0	0	51471
	3	7.92	7.89	8.7	8.0	409	24.2	6	5	6	5	6	6	5	5	5	4			51471
	4	7.88	7.79	8.7	7.7	410	24.6	0	0	10	9	0	12	0	10	0	0			51471
	5	7.95	7.68	7.0	7.5	411	24.0	11	12	0	0	12	0	10	0	11	12			51471
	6	—	7.74	—	7.7	429	24.0	20	15	18	21	20	19	20	18	18	20			
	7																			
8																				
Total=								37	32	34	35	38	37	35	33	34	36	Mean Neonates/Female = 35.1		

Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: LWA - Calleguas Creek Material: 70-ADOLF Test Date: 11/30/18
 Project #: 29633 Test ID: 80714 Control Water: Mod EPAMH

Day	pH		D.O.		Cond. (µS/cm)	Temp (°C)	Survival / Reproduction										SIGN-OFF	
	New	Old	New	Old			A	B	C	D	E	F	G	H	I	J		
12.5%	0	7.83		7.7	452	24.4	0	0	0	0	0	0	0	0	0	0	0	
	1	7.83	7.69	8.4	5.7	444	24.0	0	0	0	0	0	0	0	0	0	0	
	2	7.83	7.88	8.1	7.8	457	24.5	0	0	0	0	0	0	0	0	0	0	
	3	7.91	7.92	8.6	8.4	460	24.2	6	4	6	6	5	5	5	6	0	4	
	4	7.86	7.83	8.6	7.9	463	25.3	0	0	8	11	9	10	9	13	5	10	
	5	7.93	7.74	7.1	7.3	458	24.1	10	9	0	10	0	0	0	13	0		
	6	—	7.76	—	7.4	484	24.0	21	14	17	—	19	20	20	22	16	22	
	7										-							
	8										-							
Total=							37	27	31	11	33	35	34	41	34	36	Mean Neonates/Female = 32.7	
25%	0	7.83		7.9	516	25.7	0	0	0	0	0	0	0	0	0	0	0	
	1	7.83	7.85	8.4	5.8	521	24.0	0	0	0	0	0	0	0	0	0	0	
	2	7.84	7.83	8.2	7.2	535	24.6	0	0	0	0	0	0	0	0	0	0	
	3	7.88	7.99	8.6	8.5	550	24.1	5	5	6	5	6	5	6	5	5		
	4	7.84	7.87	8.5	7.7	556	25.0	0	0	6	12	10	9	0	0	0		
	5	7.89	7.69	7.1	8.4	555	24.0	13	13	0	0	0	0	12	15	10	12	
	6	—	7.84	—	7.8	582	24.0	15	16	18	18	22	22	21	22	16	5	
	7																	
	8																	
Total=							33	34	30	35	38	36	39	43	31	22	Mean Neonates/Female = 34.1	

Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: LWA - Calleguas Creek Material: 70-ADOLF Test Date: 11/30/18

Project #: 29633 Test ID: 80714 Control Water: Mod EPAMH

Day	pH		D.O.		Cond. (µS/cm)	Temp (°C)	Survival / Reproduction										SIGN-OFF	
	New	Old	New	Old			A	B	C	D	E	F	G	H	I	J		
50%	0	7.83		8.1		721	25.8	0	0	0	0	0	0	0	0	0	0	
	1	7.81	7.83	8.3	4.9	690	24.0	0	0	0	0	0	0	0	0	0	0	
	2	7.78	7.90	8.2	8.6	726	24.3	0	0	0	0	0	0	0	0	0	0	
	3	7.86	8.06	8.7	8.8	739	24.0	6	0	4	3	4	4	4	4	0	5	
	4	7.80	7.89	8.3	7.5	742	24.9	0	1	10	0	0	10	0	7	5	0	
	5	7.85	7.93	7.2	7.1	733	24.0	10	10	0	11	12	0	10	0	12	15	
	6	—	7.91	—	7.7	782	24.0	16	18	17	19	20	17	18	16	17	16	
	7																	
	8																	
Total=							32	29	31	33	36	31	32	27	34	36	Mean Neonates/Female = 32.1	
100%	0	7.84		8.9		1064	25.9	0	0	0	0	0	0	0	0	0	0	
	1	7.81	7.99	8.4	4.7	1055	24.0	0	0	0	0	0	0	0	0	0	0	
	2	7.74	8.05	8.3	8.2	1089	24.4	0	0	0	0	0	0	0	0	0	0	
	3	7.83	8.29	8.4	8.9	1103	24.0	5	4	6	6	5	6	6	6	6	—	
	4	7.72	8.15	7.9	7.6	1099	24.8	0	0	11	10	0	0	11	0	—		
	5	7.75	8.12	6.8	7.2	1088	24.0	12	10	0	0	9	12	10	0	14	—	
	6	—	8.00	—	7.8	1150	24.0	0	15	18	23	15	13	16	18	15	—	
	7																—	
	8																	
Total=							17	29	35	39	29	31	32	35	35	10	Mean Neonates/Female = 28.2	

CETIS Summary Report

Report Date: 10 Dec-18 14:43 (p 1 of 2)
 Test Code: 80719 | 03-4960-5947

Ceriodaphnia Survival and Reproduction Test				Pacific EcoRisk
Batch ID: 20-3918-7412	Test Type: Reproduction-Survival (7d)	Analyst: Wesley Cram		
Start Date: 30 Nov-18 13:49	Protocol: EPA-821-R-02-013 (2002)	Diluent: Laboratory Water		
Ending Date: 06 Dec-18 15:53	Species: Ceriodaphnia dubia	Brine: Not Applicable		
Duration: 6d 2h	Source: In-House Culture	Age: 1		
Sample ID: 06-7471-6060	Code: 70-WOOD-097	Client: Larry Walker Associates		
Sample Date: 29 Nov-18 07:00	Material: Ambient Water	Project: 29633		
Receipt Date: 30 Nov-18 09:03	Source: Calleguas Creek			
Sample Age: 31h (1.2 °C)	Station: WOOD			

Comments:
 Stats exclude reproductive outlier: 50-G

Multiple Comparison Summary							
Analysis ID	Endpoint	Comparison Method	NOEL	LOEL	TOEL	TU	PMSD ✓
09-2076-1834	Reproduction	Bonferroni Adj t Test	50	> 50	n/a	2	15.7%
05-8236-6215	Survival	Fisher Exact/Bonferroni-Holm Test	50	> 50	n/a	2	n/a

Point Estimate Summary							
Analysis ID	Endpoint	Point Estimate Method	Level	%	95% LCL	95% UCL	TU ✓
03-6251-7375	Reproduction	Linear Interpolation (ICPIN)	IC5	52.5	24.5	52.5	1.905
			IC10	55	52.5	55	1.818
			IC15	57.5	55.2	57.5	1.739
			IC20	60	57.8	60	1.667
			IC25	62.5	60.4	62.5	1.6
			IC40	70	68.3	70	1.429
			IC50	75	73.6	75	1.333

Reproduction Summary											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	10	28.9	25.2	32.6	19	36	1.62	5.11	17.68%	0.00%
6.25		10	31.8	29.3	34.3	25	36	1.1	3.49	10.97%	-10.03%
12.5		10	34.3	32.2	36.4	29	38	0.932	2.95	8.59%	-18.69%
25		10	31	26.6	35.4	20	38	1.96	6.2	20.00%	-7.27%
50		9	32.7	31.1	34.2	30	35	0.667	2	6.12%	-13.03%
100		10	0	0	0	0	0	0	0		100.00%

Survival Summary											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
6.25		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
12.5		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
25		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
50		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
100		10	0.000	0.000	0.000	0.000	0.000	0.000	0.000		100.00%

CETIS Summary Report

Report Date: 10 Dec-18 14:43 (p 2 of 2)
 Test Code: 80719 | 03-4960-5947

Ceriodaphnia Survival and Reproduction Test											Pacific EcoRisk
Reproduction Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	26	31	36	19	27	33	32	31	23	31
6.25		31	35	36	30	29	35	32	25	30	35
12.5		34	35	38	33	33	37	29	31	35	38
25		36	36	30	22	38	28	30	20	34	36
50		32	35	32	30	32	33		30	35	35
100		0	0	0	0	0	0	0	0	0	0
Survival Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
6.25		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
12.5		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
25		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
50		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
100		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Survival Binomials											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
6.25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
12.5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
50		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
100		0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1

CETIS Analytical Report

Report Date: 10 Dec-18 14:43 (p 1 of 1)
 Test Code: 80719 | 03-4960-5947

Ceriodaphnia Survival and Reproduction Test Pacific EcoRisk

Analysis ID: 09-2076-1834 Endpoint: Reproduction CETIS Version: CETISv1.9.2
 Analyzed: 10 Dec-18 14:42 Analysis: Parametric-Multiple Comparison Official Results: Yes

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	C > T	50	> 50	n/a	2	15.74%

Bonferroni Adj t Test

Control	vs	Conc-%	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Water Contr		6.25	-1.52	2.32	4.43	18	CDF	1.0000	Non-Significant Effect
		12.5	-2.83	2.32	4.43	18	CDF	1.0000	Non-Significant Effect
		25	-1.1	2.32	4.43	18	CDF	1.0000	Non-Significant Effect
		50	-1.92	2.32	4.55	17	CDF	1.0000	Non-Significant Effect

ANOVA Table

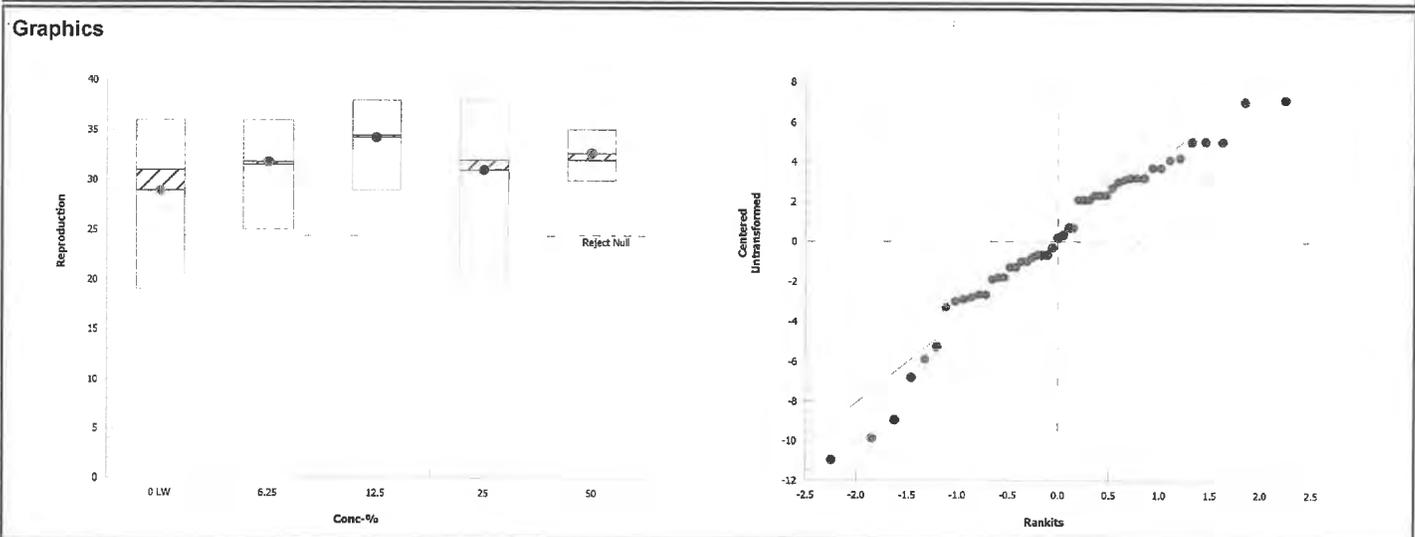
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	159.4	39.85	4	2.19	0.0857	Non-Significant Effect
Error	800.6	18.1955	44			
Total	960		48			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	11.9	13.3	0.0183	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.952	0.936	0.0450	Normal Distribution

Reproduction Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	LW	10	28.9	25.2	32.6	31	19	36	1.62	17.68%	0.00%
6.25		10	31.8	29.3	34.3	31.5	25	36	1.1	10.97%	-10.03%
12.5		10	34.3	32.2	36.4	34.5	29	38	0.932	8.59%	-18.69%
25		10	31	26.6	35.4	32	20	38	1.96	20.00%	-7.27%
50		9	32.7	31.1	34.2	32	30	35	0.667	6.12%	-13.03%



CETIS Analytical Report

Report Date: 10 Dec-18 14:43 (p 1 of 1)
 Test Code: 80719 | 03-4960-5947

Ceriodaphnia Survival and Reproduction Test Pacific EcoRisk

Analysis ID: 03-6251-7375 Endpoint: Reproduction CETIS Version: CETISv1.9.2
 Analyzed: 10 Dec-18 14:43 Analysis: Linear Interpolation (ICPIN) Official Results: Yes

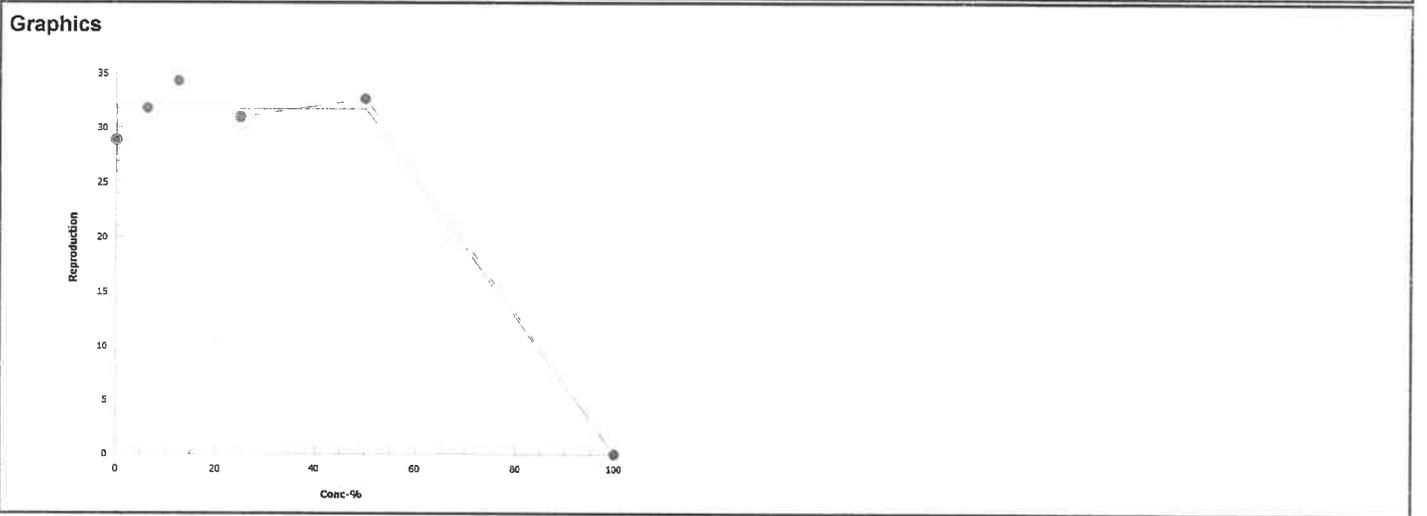
Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	1465203	200	Yes	Two-Point Interpolation

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	52.5	24.5	52.5	1.905	1.905	4.081
IC10	55	52.5	55	1.818	1.818	1.904
IC15	57.5	55.2	57.5	1.739	1.739	1.813
IC20	60	57.8	60	1.667	1.667	1.73
IC25	62.5	60.4	62.5	1.6	1.6	1.655
IC40	70	68.3	70	1.429	1.429	1.463
IC50	75	73.6	75	1.333	1.333	1.358

Reproduction Summary			Calculated Variate						
Conc-%	Code	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	10	28.9	19	36	1.62	5.11	17.70%	0.0%
6.25		10	31.8	25	36	1.1	3.49	11.00%	-10.0%
12.5		10	34.3	29	38	0.932	2.95	8.59%	-18.7%
25		10	31	20	38	1.96	6.2	20.00%	-7.27%
50		9	32.7	30	35	0.667	2	6.12%	-13.0%
100		10	0	0	0	0	0		100.0%



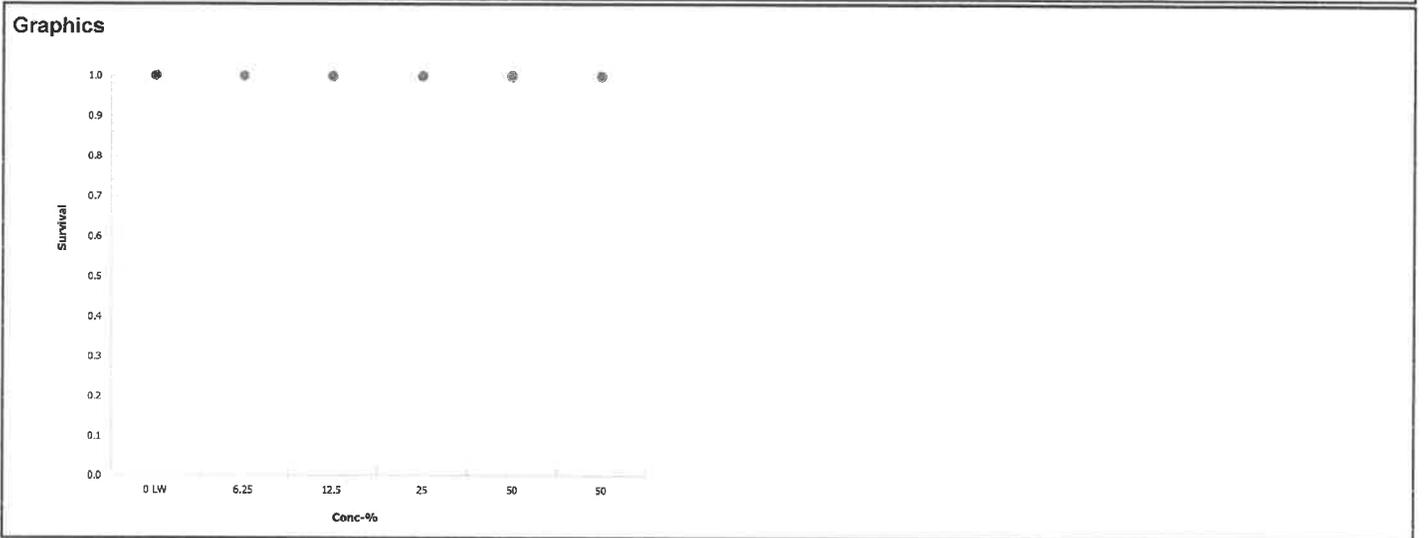
CETIS Analytical Report

Report Date: 10 Dec-18 14:43 (p 1 of 1)
 Test Code: 80719 | 03-4960-5947

Ceriodaphnia Survival and Reproduction Test				Pacific EcoRisk			
Analysis ID: 05-8236-6215		Endpoint: Survival		CETIS Version: CETISv1.9.2			
Analyzed: 10 Dec-18 14:42		Analysis: STP 2xK Contingency Tables		Official Results: Yes			
Data Transform		Alt Hyp		NOEL	LOEL	TOEL	TU
Untransformed		C > T		50	> 50	n/a	2

Fisher Exact/Bonferroni-Holm Test						
Control	vs	Group	Test Stat	P-Type	P-Value	Decision(α:5%)
Lab Water Contr		6.25	1.000	Exact	1.0000	Non-Significant Effect
		12.5	1.000	Exact	1.0000	Non-Significant Effect
		25	1.000	Exact	1.0000	Non-Significant Effect
		50	1.000	Exact	1.0000	Non-Significant Effect

Data Summary							
Conc-%	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
0	LW	10	0	10	1	0	0.0%
6.25		10	0	10	1	0	0.0%
12.5		10	0	10	1	0	0.0%
25		10	0	10	1	0	0.0%
50		10	0	10	1	0	0.0%



Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: LWA - Calleguas Creek Material: 70-WOOD Test Date: 11/30/18
 Project #: 29633 Test ID: 80719 Randomization: 10.7.1 Control Water: Mod EPAMH

Day	pH		D.O.		Cond. (µS/cm)	Temp (°C)	Survival / Reproduction										SIGN-OFF		
	New	Old	New	Old			A	B	C	D	E	F	G	H	I	J			
0	8.16		7.3		353	24.2	0	0	0	0	0	0	0	0	0	0	0	0	Date: 11/30/18 New WQ: <u>SAT</u> Test Init.: <u>TF</u> Sol'n Prep: <u>SNV</u> Old WQ: <u>SAT</u> Counts: <u>1349</u> Time: <u>1349</u>
1	7.95	7.94	8.16	7.9	336	24.6	0	0	0	0	0	0	0	0	0	0	0	0	Date: 12/1/18 New WQ: <u>SAT</u> Counts: <u>1326</u> Sol'n Prep: <u>SNV</u> Old WQ: <u>SAT</u> Time: <u>1330</u>
2	7.78	7.62	7.5	6.1	350	24.3	0	0	0	0	0	0	0	0	0	0	0	0	Date: 12/2/18 New WQ: <u>SAT</u> Counts: <u>136</u> Sol'n Prep: <u>SNV</u> Old WQ: <u>MDL</u> Time: <u>1340</u>
3	7.81	7.75	8.9	7.7	360	24.8	6	5	5	4	5	4	5	5	5	4	4	4	Date: 12/3/18 New WQ: <u>MDL</u> Counts: <u>72</u> Sol'n Prep: <u>SNV</u> Old WQ: <u>MDL</u> Time: <u>1300</u>
4	7.89	7.92	8.6	7.9	356	25.7	10	10	12	0	12	11	10	9	8	0	0	0	Date: 12/4/18 New WQ: <u>TA</u> Counts: <u>21</u> Sol'n Prep: <u>ER</u> Old WQ: <u>TA</u> Time: <u>132</u>
5	7.97	7.73	6.8	8.4	372	24.7	10	1	0	6	10	0	0	0	10	11	11	11	Date: 12/5/18 New WQ: <u>ER</u> Counts: <u>113</u> Sol'n Prep: <u>ER</u> Old WQ: <u>TA</u> Time: <u>1549</u>
6	-	7.91	-	7.6	378	25.6	0	15	19	9	0	16	17	17	0	16	16	16	Date: 12/11/18 New WQ: <u>ER</u> Counts: <u>16</u> Sol'n Prep: <u>ER</u> Old WQ: <u>JR</u> Time: <u>1553</u>
7																			Date: New WQ: Counts: Sol'n Prep: Old WQ: Time:
8																			Date: Old WQ: Counts: Time:
Total=							26	31	30	19	27	25 ³³	32	31	23	31	Mean Neonates/Female = <u>27.5</u> <u>28.4</u>		
Day	pH		D.O.		Cond. (µS/cm)	Temp (°C)	Survival / Reproduction										Sample ID		
	New	Old	New	Old			A	B	C	D	E	F	G	H	I	J			
0	8.17		7.3		514	24.5	0	0	0	0	0	0	0	0	0	0	0	0	51472
1	7.75	7.86	8.4	7.8	501	24.7	0	0	0	0	0	0	0	0	0	0	0	0	51472
2	7.78	7.70	7.6	6.8	514	24.7	0	0	0	0	0	0	0	0	0	0	0	0	51472
3	7.82	7.79	8.8	7.6	526	24.9	6	6	7	5	4	5	5	5	5	6	6	6	51472
4	7.86	7.91	8.5	8.0	519	25.9	10	10	14	0	9	12	10	8	11	0	0	0	51472
5	7.91	7.75	7.0	7.6	521	25.1	15	0	0	10	14	0	0	12	0	11	11	11	51472
6	-	7.90	-	7.5	546	25.2	0	19	15	15	0	13	17	0	14	13	13	13	-
7																			
8																			
Total=							31	35	30	30	29	35	32	25	30	35	Mean Neonates/Female = <u>31.9</u>		

Att 12/1/18

Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: LWA - Calleguas Creek Material: 70-WOOD Test Date: 11/30/18
 Project #: 29633 Test ID: 80719 Control Water: Mod EPAMH

Day	pH		D.O.		Cond. (µS/cm)	Temp (°C)	Survival / Reproduction										SIGN-OFF	
	New	Old	New	Old			A	B	C	D	E	F	G	H	I	J		
12.5%	0	8.16		7.3		683	24.3	0	0	0	0	0	0	0	0	0		
	1	7.76	7.83	8.3	7.9	651	24.7	0	0	0	0	0	0	0	0	0		
	2	7.77	7.74	7.5	6.9	673	24.6	0	0	0	0	0	0	0	0	0		
	3	7.80	7.79	8.7	7.8	685	24.7	6	5	5	6	5	6	5	4	6	6	
	4	7.83	7.90	8.4	8.1	675	25.9	10	12	12	0	11	12	10	11	12	12	
	5	7.88	7.75	7.1	7.4	669	25.1	18	0	1	10	17	0	0	0	0	0	
	6	-	7.86	-	7.5	707	25.1	0	18	20	17	0	19	14	16	17	20	
	7																	
	8																	
Total=							34	35	38	33	33	37	29	31	35	38	Mean Neonates/Female = 34.3	
25%	0	8.12		7.2		914	24.1	0	0	0	0	0	0	0	0	0		
	1	7.71	7.82	8.2	7.9	897	24.7	0	0	0	0	0	0	0	0	0		
	2	7.75	7.75	7.3	7.3	951	24.8	0	0	0	0	0	0	0	0	0		
	3	7.74	7.88	8.5	8.4	959	24.8	6	6	6	4	6	6	6	5	5	5	
	4	7.77	7.92	8.1	8.1	965	26.0	10	9	11	0	12	10	10	1	11	0	
	5	7.81	7.72	6.6	7.3	952	25.4	20	3	0	9	20	0	14	14	18	12	
	6	-	7.85	-	7.5	1005	25.3	0	18	13	9	0	12	0	0	0	19	
	7																	
	8																	
Total=							30	30	30	22	38	28	28	20	34	30	Mean Neonates/Female = 31.0	

Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: LWA - Calleguas Creek Material: 70-WOOD Test Date: 11/30/18
 Project #: 29633 Test ID: 80719 Control Water: Mod EPAMH

	Day	pH		D.O.		Cond. (µS/cm)	Temp (°C)	Survival / Reproduction										SIGN-OFF
		New	Old	New	Old			A	B	C	D	E	F	G	H	I	J	
50%	0	8.06		7.0		1510	24.5	0	0	0	0	0	0	0	0	0	0	
	1	7.63	7.90	8.0	7.9	1441	24.6	0	0	0	0	0	0	0	0	0	0	
	2	7.71	7.80	7.2	7.2	1492	25.3	0	0	0	0	0	0	0	0	0	0	
	3	7.68	7.98	8.2	8.4	1538	25.0	6	6	6	5	6	7	5	5	5	7	
	4	7.67	7.97	7.6	8.1	1501	25.7	10	10	9	8	8	5	9	12	0		
	5	7.72	7.82	6.5	7.2	1497	25.2	16	0	0	18	1	0	16	0	10		
	6	—	7.85	—	7.5	1576	24.7	0	19	17	15	0	17	14	0	18	18	
	7																	
	8																	
Total=								32	35	32	30	32	33	24	30	35	35	Mean Neonates/Female = 31.2
100%	0	7.92		6.3		2538	24.6	0	0	0	0	0	0	0	0	0	0	
	1	7.55	7.97	7.1	7.8	2399	24.7	0	0	0	%	0	%	0	0	0	0	
	2	7.62	7.95	6.5	7.5	2539	25.4	%	%	%	—	%	—	%	%	%	%	
	3	7.57	—	7.2	—	2545	—	—	—	—	—	—	—	—	—	—	—	
	4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
	5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
	6	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
	7	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
	8																	
	Total=								%	%	%	%	%	%	%	%	%	Mean Neonates/Female = %

CETIS Summary Report

Report Date: 10 Dec-18 12:01 (p 1 of 2)
 Test Code: 80718 | 07-0531-0198

Ceriodaphnia Survival and Reproduction Test **Pacific EcoRisk**

Batch ID: 01-8699-7664	Test Type: Reproduction-Survival (7d)	Analyst: Wesley Cram
Start Date: 30 Nov-18 14:17	Protocol: EPA-821-R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 06 Dec-18 15:52	Species: Ceriodaphnia dubia	Brine: Not Applicable
Duration: 6d 2h	Source: In-House Culture	Age: 1

Sample ID: 02-0723-3626	Code: 70-UPLAND-144	Client: Larry Walker Associates
Sample Date: 29 Nov-18 11:25	Material: Ambient Water	Project: 29633
Receipt Date: 30 Nov-18 09:03	Source: Calleguas Creek	
Sample Age: 27h (1 °C)	Station: UPLAND	

Comments:
 Stats excluding reproductive outliers: 6.25-I, 100-D

Multiple Comparison Summary							
Analysis ID	Endpoint	Comparison Method	NOEL	LOEL	TOEL	TU	PMSD ✓
04-5689-8914	Reproduction	Bonferroni Adj t Test	100	> 100	n/a	1	14.9%
17-1851-2199	Survival	Fisher Exact/Bonferroni-Holm Test	100	> 100	n/a	1	n/a

Point Estimate Summary							
Analysis ID	Endpoint	Point Estimate Method	Level	%	95% LCL	95% UCL	TU ✓
12-1521-0266	Reproduction	Linear Interpolation (ICPIN)	IC5	>100	n/a	n/a	<1
			IC10	>100	n/a	n/a	<1
			IC15	>100	n/a	n/a	<1
			IC20	>100	n/a	n/a	<1
			IC25	>100	n/a	n/a	<1
			IC40	>100	n/a	n/a	<1
			IC50	>100	n/a	n/a	<1

Reproduction Summary											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	10	31.8	29.1	34.5	27	38	1.19	3.77	11.84%	0.00%
6.25		9	34.7	32.2	37.2	30	40	1.08	3.24	9.35%	-9.01%
12.5		10	32.1	28.1	36.1	21	41	1.79	5.65	17.59%	-0.94%
25		10	32	29.1	34.9	23	38	1.3	4.11	12.84%	-0.63%
50		10	30.4	27	33.8	22	36	1.5	4.74	15.60%	4.40%
100		9	34.2	31.5	37	28	40	1.19	3.56	10.41%	-7.62%

Survival Summary											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
6.25		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
12.5		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
25		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
50		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
100		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%

CETIS Summary Report

Report Date: 10 Dec-18 12:01 (p 2 of 2)
 Test Code: 80718 | 07-0531-0198

Ceriodaphnia Survival and Reproduction Test											Pacific EcoRisk
Reproduction Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	38	27	30	30	33	28	30	30	35	37
6.25		34	33	38	33	33	30	33	38		40
12.5		34	32	34	21	38	32	26	41	33	30
25		34	30	34	23	38	36	30	31	31	33
50		22	24	33	31	36	30	32	33	27	36
100		37	28	40		30	34	34	36	34	35
Survival Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
6.25		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
12.5		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
25		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
50		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
100		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Survival Binomials											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
6.25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
12.5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
50		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
100		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1

CETIS Analytical Report

Report Date: 10 Dec-18 12:01 (p 1 of 1)
 Test Code: 80718 | 07-0531-0198

Ceriodaphnia Survival and Reproduction Test **Pacific EcoRisk**

Analysis ID: 04-5689-8914 Endpoint: Reproduction CETIS Version: CETISv1.9.2
 Analyzed: 10 Dec-18 11:58 Analysis: Parametric-Multiple Comparison Official Results: Yes

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	C > T	100	> 100	n/a	1	14.86%

Bonferroni Adj t Test

Control	vs	Conc-%	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Water Contr		6.25	-1.46	2.4	4.72	17	CDF	1.0000	Non-Significant Effect
		12.5	-0.157	2.4	4.6	18	CDF	1.0000	Non-Significant Effect
		25	-0.104	2.4	4.6	18	CDF	1.0000	Non-Significant Effect
		50	0.731	2.4	4.6	18	CDF	1.0000	Non-Significant Effect
		100	-1.23	2.4	4.72	17	CDF	1.0000	Non-Significant Effect

ANOVA Table

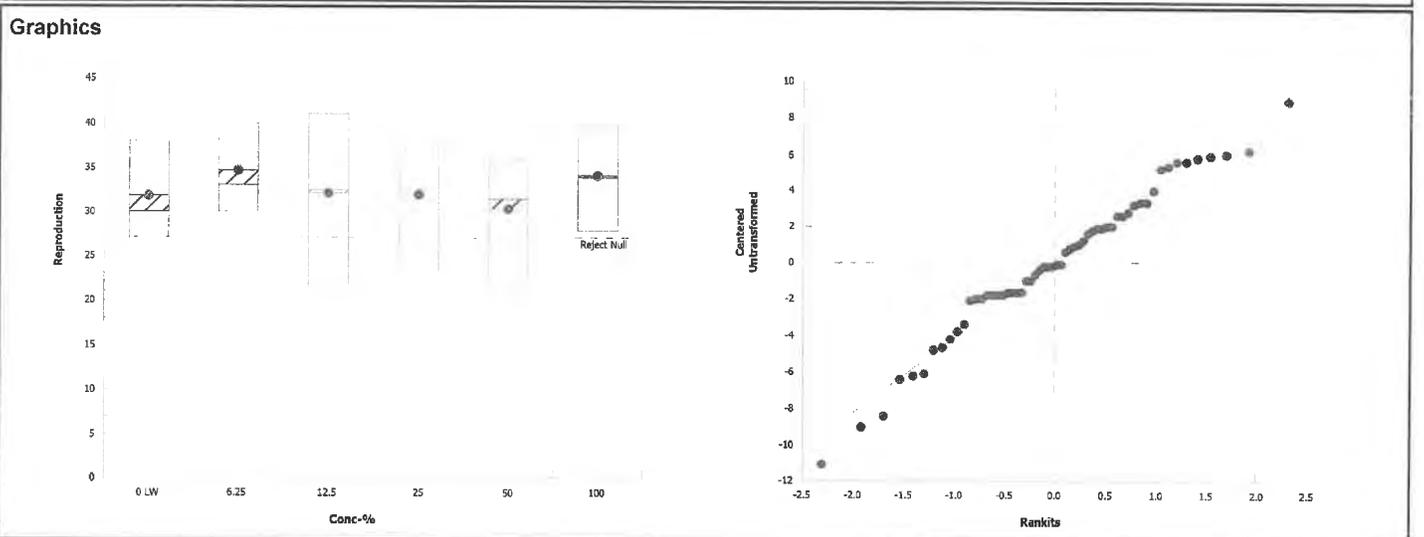
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	121.975	24.3951	5	1.33	0.2666	Non-Significant Effect
Error	954.456	18.3549	52			
Total	1076.43		57			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	3.54	15.1	0.6180	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.979	0.944	0.4242	Normal Distribution

Reproduction Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	LW	10	31.8	29.1	34.5	30	27	38	1.19	11.84%	0.00%
6.25		9	34.7	32.2	37.2	33	30	40	1.08	9.35%	-9.01%
12.5		10	32.1	28.1	36.1	32.5	21	41	1.79	17.59%	-0.94%
25		10	32	29.1	34.9	32	23	38	1.3	12.84%	-0.63%
50		10	30.4	27	33.8	31.5	22	36	1.5	15.60%	4.40%
100		9	34.2	31.5	37	34	28	40	1.19	10.41%	-7.62%



CETIS Analytical Report

Report Date: 10 Dec-18 12:01 (p 1 of 1)
 Test Code: 80718 | 07-0531-0198

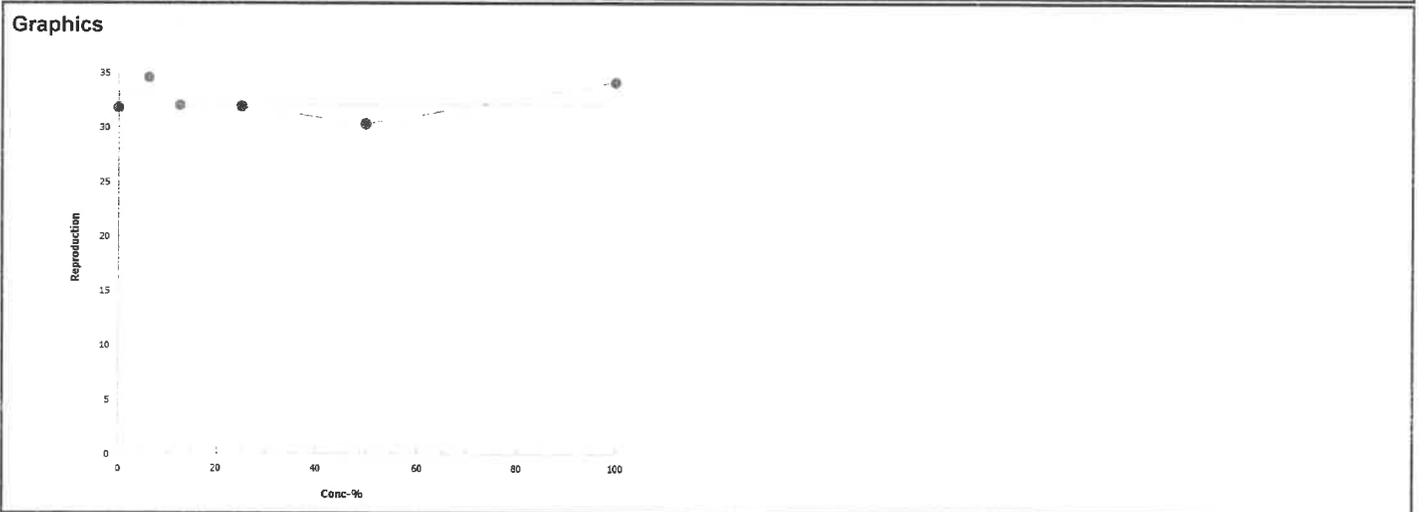
Ceriodaphnia Survival and Reproduction Test Pacific EcoRisk

Analysis ID: 12-1521-0266	Endpoint: Reproduction	CETIS Version: CETISv1.9.2
Analyzed: 10 Dec-18 11:58	Analysis: Linear Interpolation (ICPIN)	Official Results: Yes

Linear Interpolation Options					
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	530408	200	Yes	Two-Point Interpolation

Point Estimates						
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	>100	n/a	n/a	<1	n/a	n/a
IC10	>100	n/a	n/a	<1	n/a	n/a
IC15	>100	n/a	n/a	<1	n/a	n/a
IC20	>100	n/a	n/a	<1	n/a	n/a
IC25	>100	n/a	n/a	<1	n/a	n/a
IC40	>100	n/a	n/a	<1	n/a	n/a
IC50	>100	n/a	n/a	<1	n/a	n/a

Reproduction Summary			Calculated Variate						
Conc-%	Code	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	10	31.8	27	38	1.19	3.77	11.80%	0.0%
6.25		9	34.7	30	40	1.08	3.24	9.35%	-9.01%
12.5		10	32.1	21	41	1.79	5.65	17.60%	-0.94%
25		10	32	23	38	1.3	4.11	12.80%	-0.63%
50		10	30.4	22	36	1.5	4.74	15.60%	4.4%
100		9	34.2	28	40	1.19	3.56	10.40%	-7.62%



CETIS Analytical Report

Report Date: 10 Dec-18 12:01 (p 1 of 1)
 Test Code: 80718 | 07-0531-0198

Ceriodaphnia Survival and Reproduction Test Pacific EcoRisk

Analysis ID: 17-1851-2199 Endpoint: Survival CETIS Version: CETISv1.9.2
 Analyzed: 10 Dec-18 12:00 Analysis: STP 2xK Contingency Tables Official Results: Yes

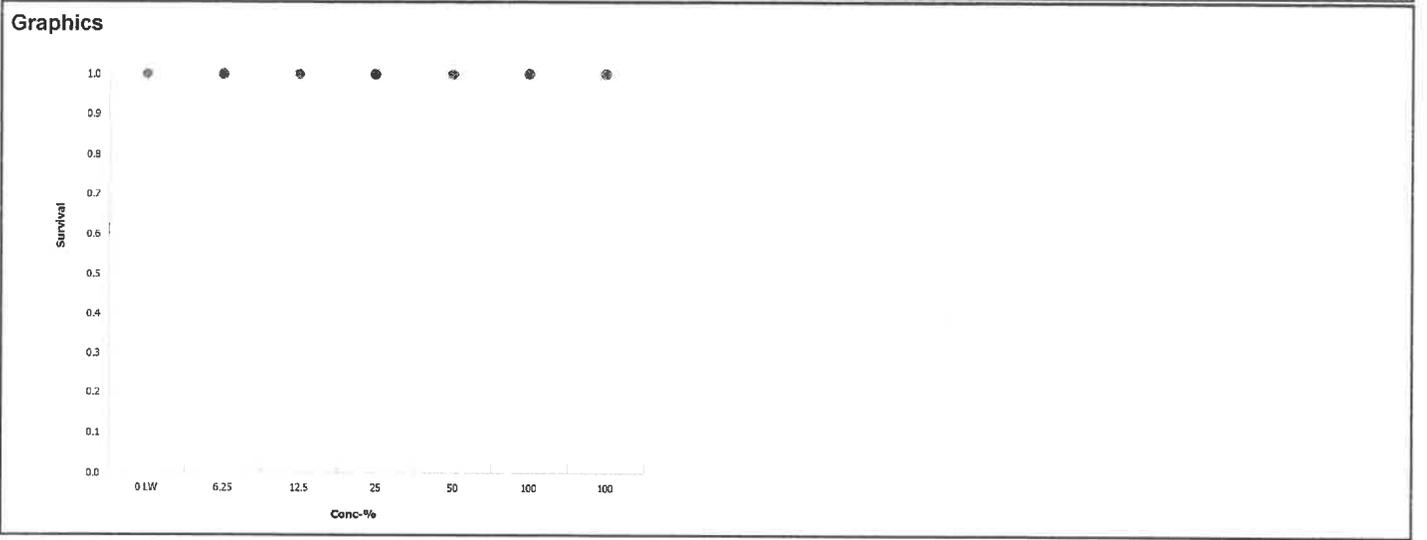
Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU
Untransformed	C > T	100	> 100	n/a	1

Fisher Exact/Bonferroni-Holm Test

Control	vs	Group	Test Stat	P-Type	P-Value	Decision(α:5%)
Lab Water Contr		6.25	1.000	Exact	1.0000	Non-Significant Effect
		12.5	1.000	Exact	1.0000	Non-Significant Effect
		25	1.000	Exact	1.0000	Non-Significant Effect
		50	1.000	Exact	1.0000	Non-Significant Effect
		100	1.000	Exact	1.0000	Non-Significant Effect

Data Summary

Conc-%	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
0	LW	10	0	10	1	0	0.0%
6.25		10	0	10	1	0	0.0%
12.5		10	0	10	1	0	0.0%
25		10	0	10	1	0	0.0%
50		10	0	10	1	0	0.0%
100		10	0	10	1	0	0.0%



Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: LWA - Calleguas Creek Material: 70-UPLAND Test Date: 11/30/18
 Project #: 29633 Test ID: 80718 Randomization: 10.7.2 Control Water: Mod EPAMH

Day	pH		D.O.		Cond. (µS/cm)	Temp (°C)	Survival / Reproduction										SIGN-OFF	
	New	Old	New	Old			A	B	C	D	E	F	G	H	I	J	Date	Time
0	7.78		7.7		350	25.4	0	0	0	0	0	0	0	0	0	0	0	Date: 11/30/18 New WQ: SPT Test Init.: AHF Sol'n Prep: SVV Time: 1417
1	8.03	7.87	8.6	5.6	353	24.3	0	0	0	0	0	0	0	0	0	0	0	Date: 12/1/18 New WQ: 9 PT Counts: NL Sol'n Prep: SV Old WQ: K Time: 1658
2	7.71	7.91	7.9	8.2	354	24.5	0	0	0	0	0	0	0	0	0	0	0	Date: 12/2/18 New WQ: TA Counts: SV Sol'n Prep: AHF Old WQ: TA Time: 1420
3	7.82	7.77	8.7	8.0	355	24.5	6	5	5	5	0	4	5	5	6	7	0	Date: 12/3/18 New WQ: ND Counts: SV Sol'n Prep: SV Old WQ: SV Time: 1352
4	7.85	7.88	8.7	8.1	356	24.5	0	0	9	9	4	9	10	10	0	0	0	Date: 12/4/18 New WQ: TA Counts: CD Sol'n Prep: ER Old WQ: TA Time: 1340
5	7.75	7.64	7.4	7.9	355	24.7	13	7	0	0	12	0	0	0	12	11	0	Date: 12/9/18 New WQ: RB Counts: RB Sol'n Prep: ER Old WQ: SV Time: 1257
6	-	7.57	-	7.4	384	24.1	19	15	16	16	17	15	15	15	17	19	0	Date: 12/13/18 New WQ: - Counts: WC Sol'n Prep: - Old WQ: ID Time: 1552
7																		Date: New WQ: Counts: Sol'n Prep: Old WQ: Time:
8																		Date: Old WQ: Counts: Time:
Total=							38	27	30	30	33	28	30	30	35	37	Mean Neonates/Female = 31.8	
Day	pH		D.O.		Cond. (µS/cm)	Survival / Reproduction	Sample ID											
	New	Old	New	Old			A	B	C	D	E	F	G	H	I	J		
0	7.78		7.4		376	0	0	0	0	0	0	0	0	0	0	0	51473	
1	7.95	7.88	8.2	5.6	358	0	0	0	0	0	0	0	0	0	0	0	51473	
2	7.75	7.89	8.0	7.8	378	0	0	0	0	0	0	0	0	0	0	0	51473	
3	7.84	7.77	8.8	8.0	385	5	5	6	5	5	5	5	5	0	6	0	51473	
4	7.86	7.86	8.8	8.2	383	10	0	0	9	0	8	0	0	0	0	0	51473	
5	7.76	NA	7.9	NA	377	0	10	12	0	12	0	12	13	13	11	0	51473	
6	-	7.61	-	7.7	403	19	18	20	19	16	17	16	20	0	23	0	-	
7																		
8																		
Total=							34	33	38	33	33	30	33	38	14	40	Mean Neonates/Female = 32.6	

Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: LWA - Calleguas Creek Material: 70-UPLAND Test Date: 11/30/18
 Project #: 29633 Test ID: 80718 Control Water: Mod EPAMH

	Day	pH		D.O.		Cond. (µS/cm)	Temp (°C)	Survival / Reproduction										SIGN-OFF		
		New	Old	New	Old			A	B	C	D	E	F	G	H	I	J			
12.5%	0	7.85		8.1		461		0	0	0	0	0	0	0	0	0	0	0	0	
	1	7.87	7.85	8.4	8.7	394		0	0	0	0	0	0	0	0	0	0	0	0	
	2	7.76	7.89	8.1	7.7	404		0	0	0	0	0	0	0	0	0	0	0	0	
	3	7.85	7.77	8.8	8.1	406		4	4	5	4	5	3	4	6	0	4			
	4	7.87	7.85	8.7	8.1	408		0	0	0	0	12	0	7	0	6	6			
	5	7.79	7.65	7.8	7.9	410		11	10	9	0	0	9	0	12	9	0			
	6	-	7.64	-	7.4	447		19	18	20	17	21	20	15	23	18	20			
	7																			
	8																			
Total=							34	32	34	21	38	32	26	41	33	30	Mean Neonates/Female = 32.1			
25%	0	7.83		9.0		446		0	0	0	0	0	0	0	0	0	0	0		
	1	7.84	7.81	8.5	8.1	434		0	0	0	0	0	0	0	0	0	0	0		
	2	7.76	7.90	8.1	8.0	447		0	0	0	0	0	0	0	0	0	0	0		
	3	7.82	7.78	8.4	8.2	460		5	0	3	4	4	3	2	4	4	3			
	4	7.83	7.84	8.7	8.1	452		0	4	12	0	0	0	0	6	0	0			
	5	7.77	7.69	8.0	7.8	458		12	11	0	0	14	12	11	0	10	11			
	6	-	7.67	-	7.6	475		17	15	19	19	20	21	17	21	17	19			
	7																			
	8																			
Total=							34	30	34	23	38	36	30	31	31	33	Mean Neonates/Female = 32.0			

Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: LWA - Calleguas Creek Material: 70-UPLAND Test Date: 11/30/18
 Project #: 29633 Test ID: 80718 Control Water: Mod EPAMH

	Day	pH		D.O.		Cond. (µS/cm)	Temp (°C)	Survival / Reproduction										SIGN-OFF	
		New	Old	New	Old			A	B	C	D	E	F	G	H	I	J		
50%	0	7.77		8.0		535		0	0	0	0	0	0	0	0	0	0	0	
	1	7.77	7.79	8.5	6.2	518		0	0	0	0	0	0	0	0	0	0	0	
	2	7.72	7.91	8.1	8.0	533		0	0	0	0	0	0	0	0	0	0	0	
	3	7.74	7.78	8.4	8.3	540		6	4	3	4	5	5	4	4	0	3		
	4	7.77	7.81	8.7	7.9	542		0	1	0	10	12	8	0	0	2	0		
	5	7.74	7.54	7.9	7.1	543		11	0	11	0	0	0	9	10	9	12		
	6	-	7.73	-	7.8	560		5	19	19	17	19	17	19	19	16	21		
	7																		
	8																		
Total=							22	24	33	31	36	30	32	33	27	36	Mean Neonates/Female = 30.4		
100%	0	7.68		8.2		709		0	0	0	0	0	0	0	0	0	0		
	1	7.66	7.76	8.6	6.2	688		0	0	0	0	0	0	0	0	0	0		
	2	7.66	7.91	8.1	8.0	708		0	0	0	0	0	0	0	0	0	0		
	3	7.64	7.78	8.4	8.4	717		4	4	6	4	3	5	4	5	5	4		
	4	7.66	7.74	8.5	7.7	714		0	0	13	6	8	0	0	0	0	0		
	5	7.66	7.65	7.8	7.3	709		13	11	0	0	12	11	12	11	12	11		
	6	-	7.76	-	7.8	785		20	13	21	8	15	18	18	20	17	20		
	7																		
	8																		
Total=							37	28	40	18	30	34	34	36	34	35	Mean Neonates/Female = 32.6		

CETIS Summary Report

Report Date: 12 Dec-18 16:08 (p 1 of 2)
 Test Code: 80715 | 21-0030-3040

Ceriodaphnia Survival and Reproduction Test **Pacific EcoRisk**

Batch ID: 04-9221-4438	Test Type: Reproduction-Survival (7d)	Analyst: Wesley Cram
Start Date: 30 Nov-18 13:13	Protocol: EPA-821-R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 06 Dec-18 15:36	Species: Ceriodaphnia dubia	Brine: Not Applicable
Duration: 6d 2h	Source: In-House Culture	Age: 1

Sample ID: 11-3555-8654	Code: 70-HITCH-150	Client: Larry Walker Associates
Sample Date: 29 Nov-18 10:10	Material: Ambient Water	Project: 29633
Receipt Date: 30 Nov-18 09:03	Source: Calleguas Creek	
Sample Age: 27h (0.3 °C)	Station: HITCH	

Comments:
 Stats exclude outlier 12.5D

Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	NOEL	LOEL	TOEL	TU	PMSD ✓
03-4817-5831	Reproduction	Bonferroni Adj t Test	100	> 100	n/a	1	9.8%
13-7136-1480	Survival	Fisher Exact/Bonferroni-Holm Test	100	> 100	n/a	1	n/a

Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	Level	%	95% LCL	95% UCL	TU	✓
06-4670-7508	Reproduction	Linear Interpolation (ICPIN)	IC5	>100	n/a	n/a	<1	
			IC10	>100	n/a	n/a	<1	
			IC15	>100	n/a	n/a	<1	
			IC20	>100	n/a	n/a	<1	
			IC25	>100	n/a	n/a	<1	
			IC40	>100	n/a	n/a	<1	
			IC50	>100	n/a	n/a	<1	

Reproduction Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	9	30.2	28.4	32.1	28	35	0.795	2.39	7.90%	0.00%
6.25		9	33.3	31.2	35.4	29	38	0.913	2.74	8.22%	-10.29%
12.5		8	33.2	31.2	35.3	29	37	0.881	2.49	7.50%	-10.02%
25		10	33.7	31.6	35.8	29	38	0.943	2.98	8.85%	-11.51%
50		10	34	31.9	36.1	30	39	0.907	2.87	8.43%	-12.50%
100		10	34.1	32.3	35.9	29	37	0.795	2.51	7.37%	-12.83%

Survival Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	9	0.889	0.633	1.000	0.000	1.000	0.111	0.333	37.50%	0.00%
6.25		9	0.889	0.633	1.000	0.000	1.000	0.111	0.333	37.50%	0.00%
12.5		9	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	-12.50%
25		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	-12.50%
50		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	-12.50%
100		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	-12.50%

CETIS Summary Report

Report Date: 12 Dec-18 16:08 (p 2 of 2)
 Test Code: 80715 | 21-0030-3040

Ceriodaphnia Survival and Reproduction Test											Pacific EcoRisk
Reproduction Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	29	29	31	29	30	35	33	28	28	
6.25		32	35	32	31	34	36	29	33	38	
12.5		32	29	34		34	37	31	34	35	
25		34	36	29	33	34	38	37	33	34	29
50		33	39	32	34	32	36	34	30	38	32
100		34	35	37	36	36	31	34	36	29	33
Survival Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.000	1.000	
6.25		1.000	1.000	1.000	1.000	1.000	1.000	0.000	1.000	1.000	
12.5		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
25		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
50		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
100		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Survival Binomials											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	1/1	1/1	1/1	1/1	1/1	1/1	1/1	0/1	1/1	
6.25		1/1	1/1	1/1	1/1	1/1	1/1	0/1	1/1	1/1	
12.5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	
25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
50		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
100		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1

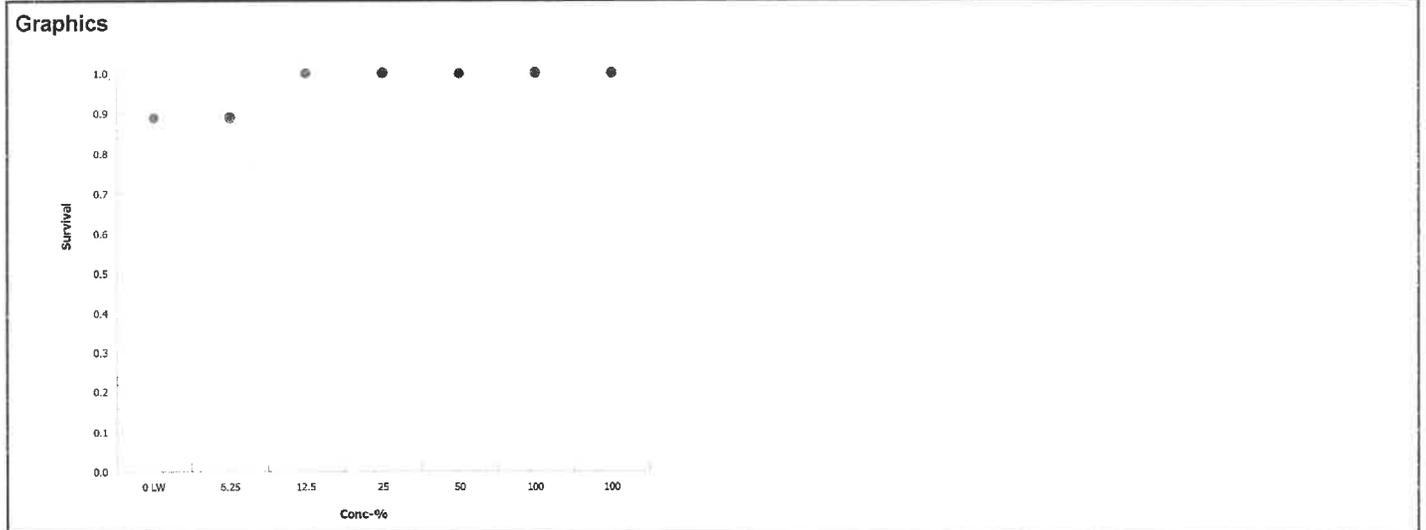
CETIS Analytical Report

Report Date: 12 Dec-18 16:08 (p 1 of 1)
 Test Code: 80715 | 21-0030-3040

Ceriodaphnia Survival and Reproduction Test				Pacific EcoRisk	
Analysis ID: 13-7136-1480	Endpoint: Survival	CETIS Version: CETISv1.9.2			
Analyzed: 12 Dec-18 16:07	Analysis: STP 2xK Contingency Tables	Official Results: Yes			
Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU
Untransformed	C > T	100	> 100	n/a	1

Fisher Exact/Bonferroni-Holm Test						
Control	vs	Group	Test Stat	P-Type	P-Value	Decision(α:5%)
Lab Water Contr		6.25	0.765	Exact	1.0000	Non-Significant Effect
		12.5	1.000	Exact	1.0000	Non-Significant Effect
		25	1.000	Exact	1.0000	Non-Significant Effect
		50	1.000	Exact	1.0000	Non-Significant Effect
		100	1.000	Exact	1.0000	Non-Significant Effect

Data Summary							
Conc-%	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
0	LW	8	1	9	0.889	0.111	0.0%
6.25		8	1	9	0.889	0.111	0.0%
12.5		9	0	9	1	0	-12.5%
25		10	0	10	1	0	-12.5%
50		10	0	10	1	0	-12.5%
100		10	0	10	1	0	-12.5%



CETIS Analytical Report

Report Date: 12 Dec-18 16:08 (p 1 of 1)
 Test Code: 80715 | 21-0030-3040

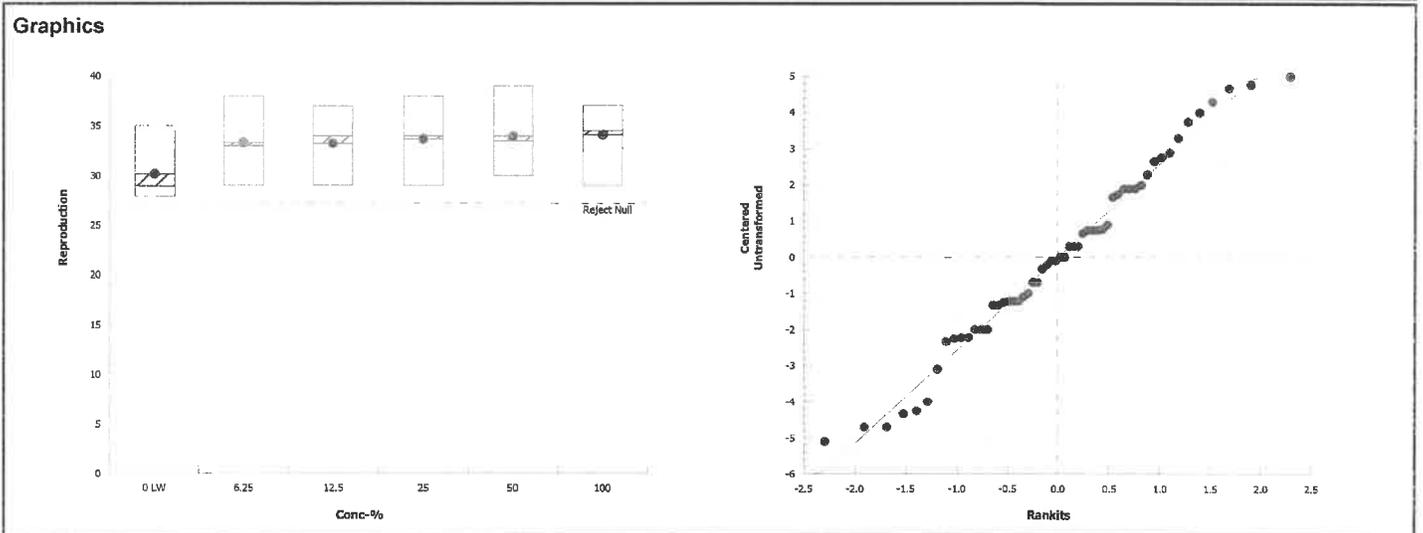
Ceriodaphnia Survival and Reproduction Test						Pacific EcoRisk	
Analysis ID: 03-4817-5831		Endpoint: Reproduction		CETIS Version: CETISv1.9.2			
Analyzed: 12 Dec-18 16:07		Analysis: Parametric-Multiple Comparison		Official Results: Yes			
Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	PMSD	
Untransformed	C > T	100	> 100	n/a	1	9.80%	

Bonferroni Adj t Test									
Control	vs	Conc-%	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Water Contr		6.25	-2.46	2.4	3.04	16	CDF	1.0000	Non-Significant Effect
		12.5	-2.32	2.4	3.13	15	CDF	1.0000	Non-Significant Effect
		25	-2.82	2.4	2.96	17	CDF	1.0000	Non-Significant Effect
		50	-3.06	2.4	2.96	17	CDF	1.0000	Non-Significant Effect
		100	-3.15	2.4	2.96	17	CDF	1.0000	Non-Significant Effect

ANOVA Table						
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	96.8016	19.3603	5	2.69	0.0315	Significant Effect
Error	360.056	7.20111	50			
Total	456.857		55			

Distributional Tests						
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)	
Variances	Bartlett Equality of Variance Test	0.627	15.1	0.9868	Equal Variances	
Distribution	Shapiro-Wilk W Normality Test	0.979	0.943	0.4422	Normal Distribution	

Reproduction Summary											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	LW	9	30.2	28.4	32.1	29	28	35	0.795	7.90%	0.00%
6.25		9	33.3	31.2	35.4	33	29	38	0.913	8.22%	-10.29%
12.5		8	33.2	31.2	35.3	34	29	37	0.881	7.50%	-10.02%
25		10	33.7	31.6	35.8	34	29	38	0.943	8.85%	-11.51%
50		10	34	31.9	36.1	33.5	30	39	0.907	8.43%	-12.50%
100		10	34.1	32.3	35.9	34.5	29	37	0.795	7.37%	-12.83%



CETIS Analytical Report

Report Date: 12 Dec-18 16:08 (p 1 of 1)
 Test Code: 80715 | 21-0030-3040

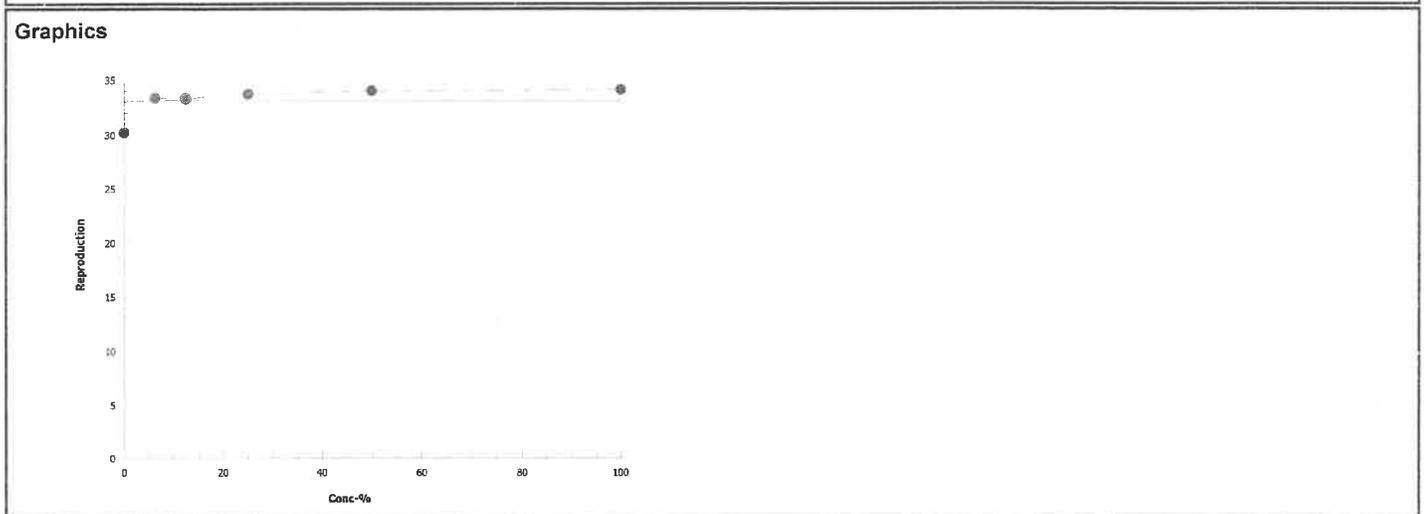
Ceriodaphnia Survival and Reproduction Test Pacific EcoRisk

Analysis ID: 06-4670-7508	Endpoint: Reproduction	CETIS Version: CETISv1.9.2
Analyzed: 12 Dec-18 16:07	Analysis: Linear Interpolation (ICPIN)	Official Results: Yes

Linear Interpolation Options					
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	1088883	200	Yes	Two-Point Interpolation

Point Estimates						
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	>100	n/a	n/a	<1	n/a	n/a
IC10	>100	n/a	n/a	<1	n/a	n/a
IC15	>100	n/a	n/a	<1	n/a	n/a
IC20	>100	n/a	n/a	<1	n/a	n/a
IC25	>100	n/a	n/a	<1	n/a	n/a
IC40	>100	n/a	n/a	<1	n/a	n/a
IC50	>100	n/a	n/a	<1	n/a	n/a

Reproduction Summary			Calculated Variate						
Conc-%	Code	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	9	30.2	28	35	0.795	2.39	7.90%	0.0%
6.25		9	33.3	29	38	0.913	2.74	8.22%	-10.3%
12.5		8	33.2	29	37	0.881	2.49	7.50%	-10.0%
25		10	33.7	29	38	0.943	2.98	8.85%	-11.5%
50		10	34	30	39	0.907	2.87	8.43%	-12.5%
100		10	34.1	29	37	0.795	2.51	7.37%	-12.8%



Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: LWA - Calleguas Creek Material: 70-HITCH Test Date: 11/30/18
 Project #: 29633 Test ID: 80715 Randomization: 10.7.6 Control Water: Mod EPAMH

Day	pH		D.O.		Cond. (µS/cm)	Temp (°C)	Survival / Reproduction										SIGN-OFF		
	New	Old	New	Old			A	B	C	D	E	F	G	H	I	J	Date:	Test Init.:	
0	7.74		7.6		350	24.7	0	0	0	0	0	0	0	0	0	0	0	0	Date: 11/30/18 New WQ: Sol'n Prep: 81V TA Time: 1213
1	7.87	7.70	8.5	7.1	355	25.5	0	0	0	0	0	0	0	0	0	0	0	0	Date: 11/1/18 New WQ: JR Counts: TF Sol'n Prep: BJ Old WQ: JR Time: 1005
2	7.76	7.62	8.0	7.9	355	26.0	0	0	0	0	0	0	0	0	0	0	0	0	Date: 12/21/18 New WQ: TA Counts: BV Sol'n Prep: JRF Old WQ: TP Time: 1330
3	7.91	8.12	8.8	8.0	355	24.4	5	5	6	6	5	6	4	5	5	4	4	4	Date: 12/31/18 New WQ: msa Counts: RL Sol'n Prep: SF Old WQ: AR Time: 1600
4	7.89	7.79	8.8	8.0	360	24.0	10	11	0	0	10	11	12	0	0	0	0	0	Date: 12/4/18 New WQ: JR Counts: KL Sol'n Prep: CF Old WQ: JAT Time: 1440
5	7.69	7.71	8.4	7.6	360	24.2	0	0	9	8	0	0	0	9	8	10	10	10	Date: 12/5/18 New WQ: TA Counts: LZ Sol'n Prep: CF Old WQ: JR Time: 1408
6	-	7.83	-	8.1	390	25.0	14	13	16	15	15	18	17	7/0	15	14	14	14	Date: 12/6/18 New WQ: - Counts: R6 Sol'n Prep: - Old WQ: SF Time: 1536
7																			Date: New WQ: Counts: Sol'n Prep: Old WQ: Time:
8																			Date: Old WQ: Counts: Sol'n Prep: Time:
Total=							29	29	31	28	32	35	33	7/14	28	28	Mean Neonates/Female = 30.2		

Day	pH		D.O.		Cond. (µS/cm)	Survival / Reproduction										Sample ID			
	New	Old	New	Old		A	B	C	D	E	F	G	H	I	J				
0	7.80		7.7		380	24.2	0	0	0	0	0	0	0	0	0	0	0	0	51474
1	7.89	7.67	8.7	7.4	381	25.0	0	0	0	0	0	0	0	0	0	0	0	0	51474
2	7.78	7.73	8.1	8.1	380	25.9	0	0	0	0	0	0	7/0	0	0	0	0	0	51474
3	7.89	7.99	8.9	8.3	385	24.4	5	6	5	0	6	6	-	5	6	6	6	6	51474
4	7.89	7.77	8.7	8.1	387	24.0	12	12	0	4	12	11	-	0	11	0	0	0	51474
5	7.74	7.74	8.5	7.7	387	24.1	0	0	11	8	0	19	-	9	0	12	12	12	51474
6	-	7.80	-	7.7	407	25.5	15	17	16	19	16	0	-	15	16	20	20	20	-
7																			
8																			
Total=							32	35	32	31	34	36	7/0	29	33	38	Mean Neonates/Female = 30.0		

Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: LWA - Calleguas Creek Material: 70-HITCH Test Date: 11/30/18
 Project #: 29633 Test ID: 80715 Control Water: Mod EPAMH

Day	pH		D.O.		Cond. (µS/cm)	Temp (°C)	Survival / Reproduction										SIGN-OFF	
	New	Old	New	Old			A	B	C	D	E	F	G	H	I	J		
12.5%	0	7.80		7.9		403	25.2	0	0	0	0	0	0	0	0	0	0	
	1	7.87	7.72	8.8	7.5	404	25.5	0	0	0	0	0	0	0	0	0	0	
	2	7.81	7.81	8.2	8.4	406	25.9	0	0	0	0	0	0	0	0	0	0	
	3	7.88	7.98	9.0	8.3	409	24.3	5	5	5	6	5	6	4	5	5	6	
	4	7.89	7.79	8.7	8.0	410	24.1	10	12	0	0	12	10	11	0	0	0	
	5	7.77	7.72	8.6	7.6	412	23.8	0	0	10	0	0	0	1	10	11	3	
	6	-	7.81	-	7.8	432	24.2	17	12	19	15	17	21	15	19	19	14	
	7																	
	8																	
Total=							32	29	34	21	34	37	31	34	35	23	Mean Neonates/Female = 31.0	
25%	0	7.80		8.2		450	25.2	0	0	0	0	0	0	0	0	0	0	
	1	7.82	7.69	9.1	7.6	451	25.4	0	0	0	0	0	0	0	0	0	0	
	2	7.79	7.83	8.3	8.5	450	25.9	0	0	0	0	0	0	0	0	0	0	
	3	7.84	7.96	9.1	8.3	452	24.3	6	5	5	6	4	6	7	5	5	5	
	4	7.80	7.78	9.3	7.8	447	24.0	11	13	0	0	13	12	14	1	0	0	
	5	7.74	7.68	8.6	7.3	457	23.7	0	0	9	11	0	0	0	8	11	11	
	6	-	7.79	-	7.6	494	25.3	17	18	15	16	17	20	16	19	18	13	
	7																	
	8																	
Total=							34	36	29	33	34	38	37	33	34	29	Mean Neonates/Female = 33.7	

Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: LWA - Calleguas Creek Material: 70-HITCH Test Date: 11/30/18
 Project #: 29633 Test ID: 80715 Control Water: Mod EPAMH

	Day	pH		D.O.		Cond. (µS/cm)	Temp (°C)	Survival / Reproduction										SIGN-OFF	
		New	Old	New	Old			A	B	C	D	E	F	G	H	I	J		
50%	0	7.75		9.0		539	25.3	0	0	0	0	0	0	0	0	0	0	0	
	1	7.77	7.76	9.6	7.6	546	25.6	0	0	0	0	0	0	0	0	0	0	0	
	2	7.75	7.84	8.7	8.5	540	25.8	0	0	0	0	0	0	0	0	0	0	0	
	3	7.77 7.85	7.97	9.4	8.3	542	24.2	6	7	5	6	5	6	7	6	6	6	6	
	4	7.77	7.75	9.3	7.8	537	24.2	11	12	0	0	10	11	11	0	0	0	0	
	5	7.70	7.68	8.9	7.0	550	23.8	0	0	13	10	0	0	0	9	12	11		
	6	-	7.83	-	8.0	572	25.4	16	20	14	18	17	19	16	15	20	15		
	7																		
	8																		
Total=							33	39	32	34	32	36	34	30	38	32	Mean Neonates/Female = 34.0		
100%	0	7.67		10.8		717	24.9	0	0	0	0	0	0	0	0	0	0		
	1	7.64	7.70	11.0	7.6	719	25.6	0	0	0	0	0	0	0	0	0	0		
	2	7.69	7.81	9.5	8.4	719	25.9	0	0	0	0	0	0	0	0	0	0		
	3	7.64	7.94	10.3	8.4	726	24.4	5	6	5	5	6	6	6	5	5	4		
	4	7.69	7.76	9.5	7.6	713	24.1	10	12	0	0	10	11	10	0	0	0		
	5	7.62	7.79	9.4	7.1	725	23.8	0	0	13	10	0	0	0	11	10	10		
	6	-	7.84	-	8.2	759	25.2	19	17	19	21	20	14	18	20	14	19		
	7																		
	8																		
Total=							34	35	37	36	36	31	34	36	29	33	Mean Neonates/Female = 34.1		

CETIS Summary Report

Report Date: 08 Dec-18 15:23 (p 1 of 2)
 Test Code: 80716 | 06-9020-8991

Ceriodaphnia Survival and Reproduction Test							Pacific EcoRisk					
Batch ID:	15-1675-4982	Test Type:	Reproduction-Survival (7d)				Analyst:	Kristin Robertson				
Start Date:	30 Nov-18 14:00	Protocol:	EPA-821-R-02-013 (2002)				Diluent:	Laboratory Water				
Ending Date:	06 Dec-18 14:33	Species:	Ceriodaphnia dubia				Brine:	Not Applicable				
Duration:	6d 1h	Source:	In-House Culture				Age:	1				
Sample ID:	05-1221-5871	Code:	70-GATE-202				Client:	Larry Walker Associates				
Sample Date:	29 Nov-18 10:15	Material:	Ambient Water				Project:	29633				
Receipt Date:	30 Nov-18 09:03	Source:	Calleguas Creek									
Sample Age:	28h (0.5 °C)	Station:	GATE									
Multiple Comparison Summary												
Analysis ID	Endpoint	Comparison Method			NOEL	LOEL	TOEL	TU	PMSD ✓			
01-9044-5201	Reproduction	Steel Many-One Rank Sum Test			100	> 100	n/a	1	19.8%			
03-4793-7003	Survival	Fisher Exact/Bonferroni-Holm Test			100	> 100	n/a	1	n/a			
Point Estimate Summary												
Analysis ID	Endpoint	Point Estimate Method			Level	%	95% LCL	95% UCL	TU	✓		
16-1327-5075	Reproduction	Linear Interpolation (ICPIN)			IC5	42.1	9.51	n/a	2.378			
					IC10	>100	n/a	n/a	<1			
					IC15	>100	n/a	n/a	<1			
					IC20	>100	n/a	n/a	<1			
					IC25	>100	n/a	n/a	<1			
					IC40	>100	n/a	n/a	<1			
					IC50	>100	n/a	n/a	<1			
Reproduction Summary												
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect	
0	LW	10	30.6	27.7	33.5	25	36	1.28	4.03	13.18%	0.00%	
6.25		10	33.7	31.4	36	29	39	1.02	3.23	9.59%	-10.13%	
12.5		10	32.1	26.8	37.4	19	40	2.34	7.39	23.01%	-4.90%	
25		10	31.6	25.8	37.4	13	40	2.57	8.14	25.76%	-3.27%	
50		10	29.5	24.7	34.3	19	37	2.12	6.7	22.73%	3.59%	
100		10	30.6	27.5	33.7	24	36	1.37	4.33	14.14%	0.00%	
Survival Summary												
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect	
0	LW	10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%	
6.25		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%	
12.5		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%	
25		10	0.900	0.674	1.000	0.000	1.000	0.100	0.316	35.14%	10.00%	
50		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%	
100		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%	

CETIS Summary Report

Report Date: 08 Dec-18 15:23 (p 2 of 2)
 Test Code: 80716 | 06-9020-8991

Ceriodaphnia Survival and Reproduction Test											Pacific EcoRisk
Reproduction Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	35	25	28	31	33	35	30	27	36	26
6.25		32	31	33	30	39	29	35	35	36	37
12.5		31	19	40	39	39	29	34	21	37	32
25		38	29	38	30	40	34	24	34	36	13
50		30	23	20	32	37	35	33	37	19	29
100		28	35	29	35	35	26	36	30	28	24
Survival Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
6.25		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
12.5		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
25		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.000
50		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
100		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Survival Binomials											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
6.25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
12.5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	0/1
50		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
100		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1

Ceriodaphnia Survival and Reproduction Test Pacific EcoRisk

Analysis ID: 01-9044-5201 Endpoint: Reproduction CETIS Version: CETISv1.9.2
 Analyzed: 08 Dec-18 15:21 Analysis: Nonparametric-Control vs Treatments Official Results: Yes

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	C > T	100	> 100	n/a	1	19.85%

Steel Many-One Rank Sum Test

Control	vs	Conc-%	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Lab Water Contr		6.25	127	75	5	18	Asymp	0.9986	Non-Significant Effect
		12.5	118	75	1	18	Asymp	0.9824	Non-Significant Effect
		25	117	75	2	18	Asymp	0.9803	Non-Significant Effect
		50	104	75	3	18	Asymp	0.8098	Non-Significant Effect
		100	106	75	5	18	Asymp	0.8444	Non-Significant Effect

ANOVA Table

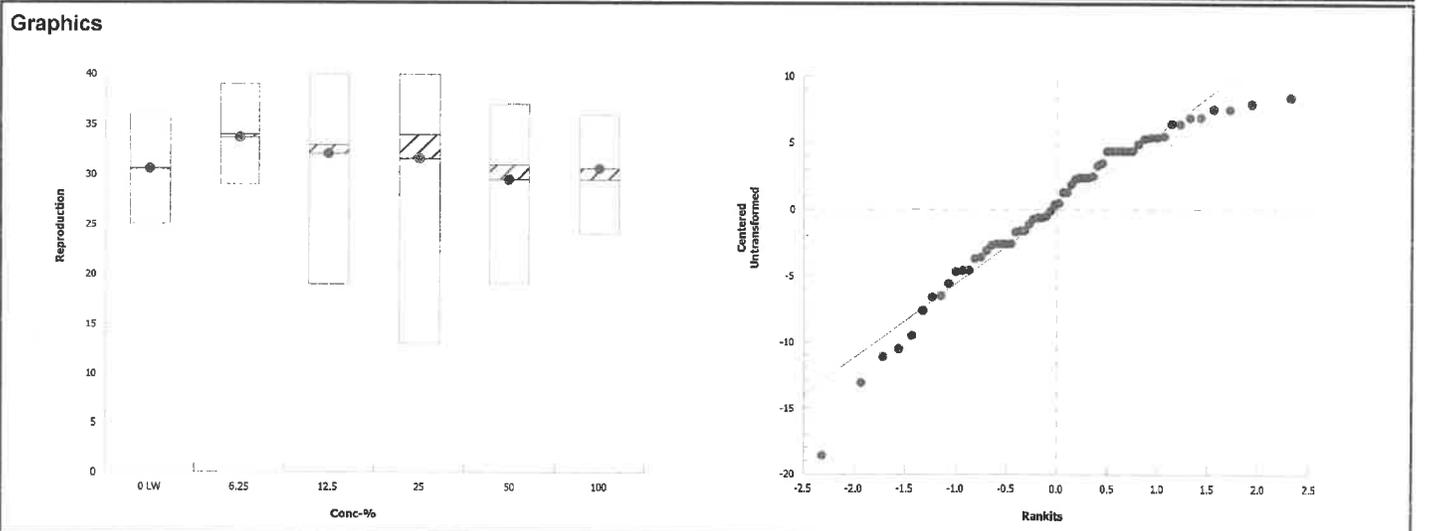
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	106.95	21.39	5	0.608	0.6943	Non-Significant Effect
Error	1900.7	35.1981	54			
Total	2007.65		59			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	11.2	15.1	0.0469	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.945	0.946	0.0095	Non-Normal Distribution

Reproduction Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	LW	10	30.6	27.7	33.5	30.5	25	36	1.28	13.18%	0.00%
6.25		10	33.7	31.4	36	34	29	39	1.02	9.59%	-10.13%
12.5		10	32.1	26.8	37.4	33	19	40	2.34	23.01%	-4.90%
25		10	31.6	25.8	37.4	34	13	40	2.57	25.76%	-3.27%
50		10	29.5	24.7	34.3	31	19	37	2.12	22.73%	3.59%
100		10	30.6	27.5	33.7	29.5	24	36	1.37	14.14%	0.00%



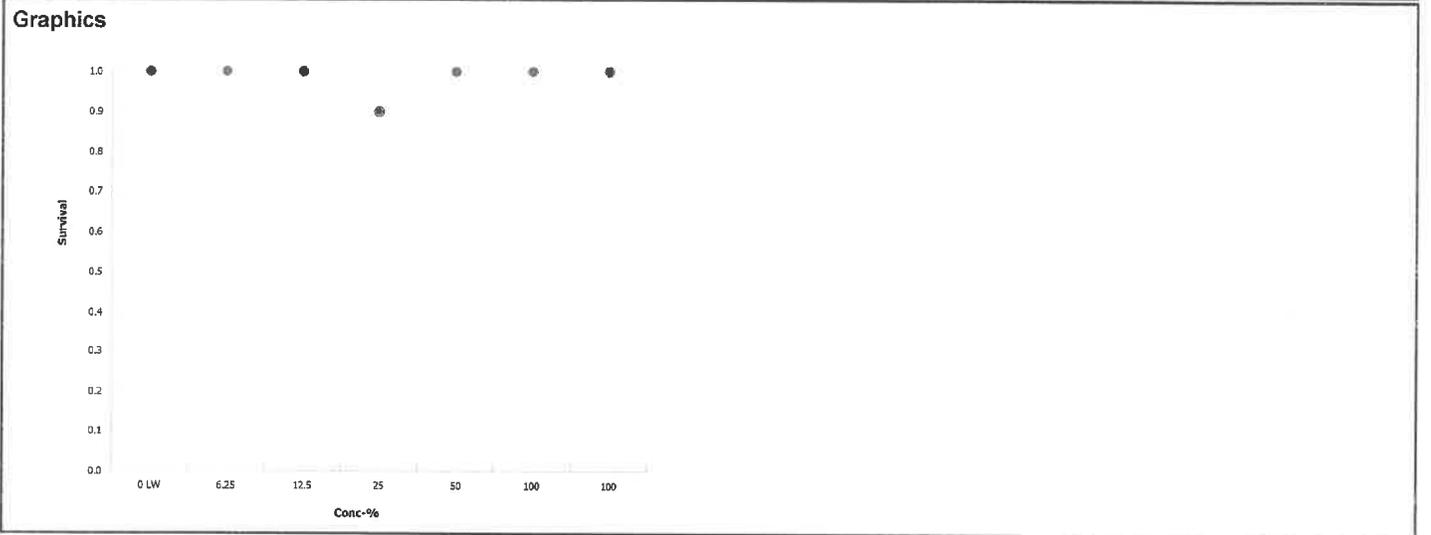
CETIS Analytical Report

Report Date: 08 Dec-18 15:24 (p 1 of 1)
 Test Code: 80716 | 06-9020-8991

Ceriodaphnia Survival and Reproduction Test				Pacific EcoRisk			
Analysis ID: 03-4793-7003		Endpoint: Survival		CETIS Version: CETISv1.9.2			
Analyzed: 08 Dec-18 14:57		Analysis: STP 2xK Contingency Tables		Official Results: Yes			
Data Transform		Alt Hyp		NOEL	LOEL	TOEL	TU
Untransformed		C > T		100	> 100	n/a	1

Fisher Exact/Bonferroni-Holm Test						
Control	vs	Group	Test Stat	P-Type	P-Value	Decision(α:5%)
Lab Water Contr		6.25	1.000	Exact	1.0000	Non-Significant Effect
		12.5	1.000	Exact	1.0000	Non-Significant Effect
		25	0.500	Exact	1.0000	Non-Significant Effect
		50	1.000	Exact	1.0000	Non-Significant Effect
		100	1.000	Exact	1.0000	Non-Significant Effect

Data Summary							
Conc-%	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
0	LW	10	0	10	1	0	0.0%
6.25		10	0	10	1	0	0.0%
12.5		10	0	10	1	0	0.0%
25		9	1	10	0.9	0.1	10.0%
50		10	0	10	1	0	0.0%
100		10	0	10	1	0	0.0%



Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: LWA - Calleguas Creek Material: 70-GATE Test Date: 11/30/18
 Project #: 29633 Test ID: 80716 Randomization: 10.7.3 Control Water: Mod EPAMH

Day	pH		D.O.		Cond. (µS/cm)	Temp (°C)	Survival / Reproduction										SIGN-OFF	
	New	Old	New	Old			A	B	C	D	E	F	G	H	I	J		
0	8.18		7.4		300 298	24.5	0	0	0	0	0	0	0	0	0	0	0	Date: 11/30/18 New WQ: SAT Test Init.: M Sol'n Prep: SNV Old WQ: SAT Time: 1400
1	7.88	7.76	8.6	6.4	355	24.3	0	0	0	0	0	0	0	0	0	0	0	Date: 12/1/18 New WQ: mxc Counts: 151 Sol'n Prep: SV Old WQ: STB Time: 253
2	7.75	7.88	7.9	8.5	357	24.8	0	0	0	0	0	0	0	0	0	0	0	Date: 12/2/18 New WQ: TA Counts: 25 Sol'n Prep: KAT Old WQ: TP Time: 2455
3	7.73	7.73	8.8	6.1	358	25.0	5	4	6	5	6	5	6	6	6	4		Date: 12/31/18 New WQ: STB Counts: 46 Sol'n Prep: SF Old WQ: CR Time: 1557
4	7.87	7.64	8.5	7.9	358	24.6	0	0	0	10	0	10	0	0	0	0		Date: 12/4/18 New WQ: TA Counts: 0 Sol'n Prep: CR Old WQ: CR Time: 250
5	7.81	7.67	8.4	7.0	361	24.0	12	9	10	10	0	10	0	9	12	8		Date: 12/5/18 New WQ: TA Counts: 46 Sol'n Prep: CR Old WQ: TA Time: 1331
6	-	7.75	-	7.9	391	24.4	12	12	12	16	18	19	15	12	13	14		Date: 12/10/18 New WQ: - Counts: 46 Sol'n Prep: - Old WQ: UB Time: 1433
7																		Date: New WQ: Counts: Sol'n Prep: Old WQ: Time:
8																		Date: Old WQ: Counts: Time:
Total=							35	25	28	31	33	35	30	27	31	26		Mean Neonates/Female = 30.1
Day	pH		D.O.		Cond. (µS/cm)	Temp (°C)	Survival / Reproduction										Sample ID	
	New	Old	New	Old			A	B	C	D	E	F	G	H	I	J		
0	8.17		7.4		359	24.8	0	0	0	0	0	0	0	0	0	0	0	11/30/18 SV 51475 51475
1	7.87	7.83	8.6	6.4	365	24.6	0	0	0	0	0	0	0	0	0	0	0	51475
2	7.78	7.82	8.1	8.2	364	25.2	0	0	0	0	0	0	0	0	0	0	0	51475
3	7.76	7.76	8.6	8.0	373	25.0	4	4	5	5	6	4	6	6	5	5		51475
4	7.88	7.76	8.8	8.3	368	24.0	0	0	0	11	0	0	0	0	0	0		51475
5	7.83	7.69	8.4	7.2	370	24.5	12	11	13	0	13	10	11	13	11	11		51475
6	-	7.68	-	7.8	413	24.9	16	16	15	14	20	15	18	16	20	21		
7																		
8																		
Total=							32	31	33	30	39	29	35	35	30	37		Mean Neonates/Female = 33.7

Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: LWA - Calleguas Creek Material: 70-GATE Test Date: 11/30/18
 Project #: 29633 Test ID: 80716 Control Water: Mod EPAMH

Day	pH		D.O.		Cond. (µS/cm)	Temp (°C)	Survival / Reproduction										SIGN-OFF		
	New	Old	New	Old			A	B	C	D	E	F	G	H	I	J			
12.5%	0	8.18		7.5		369	24.6	0	0	0	0	0	0	0	0	0	0	0	
	1	7.84	7.81	8.6	6.3	370	25.2	0	0	0	0	0	0	0	0	0	0	0	
	2	7.79	7.79	8.1	7.9	370	24.7	0	0	0	0	0	0	0	0	0	0	0	
	3	7.79	7.80	8.7	8.1	372	24.9	4	5	0	5	6	4	6	6	6	6	5	
	4	7.87	7.75	8.8	8.2	372	24.5	0	0	7	0	0	0	12	0	0	0		
	5	7.82	7.71	8.5	7.2	375	24.9	10	1	13	14	13	11	0	0	14	13		
	6	-	7.66	-	7.7	419	24.7	17	13	20	20	20	14	16	15	17	14		
	7																		
	8																		
Total=							31	19	40	39	39	27	34	21	37	32	Mean Neonates/Female = 32.1		
25%	0	8.18		7.7		382	24.9	0	0	0	0	0	0	0	0	0	0	0	
	1	7.82	7.78	8.8	6.5	382	25.0	0	0	0	0	0	0	0	0	0	0	0	
	2	7.78	7.75	8.1	7.6	380	24.8	0	0	0	0	0	0	0	0	0	0	0	
	3	7.77	7.83	8.8	6.2	383	24.4	6	5	6	0	6	0	5	5	6	4		
	4	7.82	7.73	8.9	7.9	384	24.4	0	0	0	5	11	6	0	0	0	0		
	5	7.79	7.70	8.6	7.2	388	24.9	12	10	13	9	0	9	0	11	14	1/9		
	6	-	7.65	-	7.7	425	25.1	20	14	19	16	23	19	19	18	16	-		
	7																		
	8																		
Total=							38	29	38	36	40	34	24	34	30	1/13	Mean Neonates/Female = 31.6		

Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: LWA - Calleguas Creek Material: 70-GATE Test Date: 11/30/18
 Project #: 29633 Test ID: 80716 Control Water: Mod EPAMH

	Day	pH		D.O.		Cond. (µS/cm)	Temp (°C)	Survival / Reproduction										SIGN-OFF
		New	Old	New	Old			A	B	C	D	E	F	G	H	I	J	
50%	0	8.10		8.0		406	24.9	0	0	0	0	0	0	0	0	0	0	
	1	7.76	7.40	9.2	6.5	407	25.0	0	0	0	0	0	0	0	0	0	0	
	2	7.74	7.71	8.3	8.2	403	25.2	0	0	0	0	0	0	0	0	0	0	
	3	7.74	7.84	8.9	8.2	409	24.7	6	5	5	4	6	5	5	5	6	5	
	4	7.72	7.75	9.1	8.1	406	24.0	0	0	0	0	11	0	0	0	0	0	
	5	7.73	7.67	8.6	7.1	409	25.0	10	3	0	13	0	13	12	13	0	10	
	6	-	7.66	-	7.7	435	24.0	14	15	15	15	20	17	16	19	13	14	
	7																	
	8																	
Total=							30	23	20	27	49	37	35	33	37	19	29	Mean Neonates/Female = 30.2
100%	0	7.97		8.9		454	25.0	0	0	0	0	0	0	0	0	0	0	
	1	7.67	7.76	10.1	7.2	453	24.9	0	0	0	0	0	0	0	0	0	0	
	2	7.70	7.77	8.6	8.0	454	25.0	0	0	0	0	0	0	0	0	0	0	
	3	7.67	7.83	9.0	8.3	458	24.2	5	6	6	6	6	5	6	5	4	5	
	4	7.60	7.71	9.6	8.0	452	24.0	0	0	0	0	11	0	15	0	0	0	
	5	7.58	7.64	8.8	6.7	455	24.4	9	13	10	13	0	10	0	11	9	9	
	6	-	7.70	-	7.8	496	24.5	14	16	13	16	13	11	15	14	15	10	
	7																	
	8																	
Total=							29	35	29	35	35	20	36	30	23	24	Mean Neonates/Female = 30.6	

CETIS Summary Report

Report Date: 10 Dec-18 15:10 (p 1 of 2)
 Test Code: 80717 | 19-0843-0078

Ceriodaphnia Survival and Reproduction Test Pacific EcoRisk

Batch ID: 06-1789-8083	Test Type: Reproduction-Survival (7d)	Analyst: Wesley Cram
Start Date: 30 Nov-18 14:02	Protocol: EPA-821-R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 06 Dec-18 14:08	Species: Ceriodaphnia dubia	Brine: Not Applicable
Duration: 6d 0h	Source: In-House Culture	Age: 1

Sample ID: 15-8235-7761	Code: 70-BELT-208	Client: Larry Walker Associates
Sample Date: 29 Nov-18 09:15	Material: Ambient Water	Project: 29633
Receipt Date: 30 Nov-18 09:03	Source: Calleguas Creek	
Sample Age: 29h (0.8 °C)	Station: BELT	

Comments:
 Stats exclude reproductive outlier: 12.5-H

Multiple Comparison Summary							
Analysis ID	Endpoint	Comparison Method	NOEL	LOEL	TOEL	TU	PMSD ✓
01-0906-1633	Reproduction	Bonferroni Adj t Test	100	> 100	n/a	1	14.0%
07-9285-6628	Survival	Fisher Exact/Bonferroni-Holm Test	100	> 100	n/a	1	n/a

Point Estimate Summary							
Analysis ID	Endpoint	Point Estimate Method	Level	%	95% LCL	95% UCL	TU ✓
11-6333-2203	Reproduction	Linear Interpolation (ICPIN)	IC5	>100	n/a	n/a	<1
			IC10	>100	n/a	n/a	<1
			IC15	>100	n/a	n/a	<1
			IC20	>100	n/a	n/a	<1
			IC25	>100	n/a	n/a	<1
			IC40	>100	n/a	n/a	<1
			IC50	>100	n/a	n/a	<1

Reproduction Summary											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	10	30.8	27.8	33.8	22	36	1.31	4.13	13.41%	0.00%
6.25		10	35	33.2	36.8	31	38	0.789	2.49	7.13%	-13.64%
12.5		9	36.4	34.3	38.6	32	40	0.915	2.74	7.53%	-18.33%
25		10	35.1	31.2	39	23	42	1.71	5.4	15.40%	-13.96%
50		10	37.3	35.6	39	33	41	0.761	2.41	6.45%	-21.10%
100		10	37.8	33.9	41.7	29	45	1.74	5.49	14.53%	-22.73%

Survival Summary											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
6.25		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
12.5		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
25		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
50		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
100		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%

CETIS Summary Report

Report Date: 10 Dec-18 15:10 (p 2 of 2)
 Test Code: 80717 | 19-0843-0078

Ceriodaphnia Survival and Reproduction Test											Pacific EcoRisk
Reproduction Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	22	26	33	30	31	36	33	34	30	33
6.25		37	38	37	33	38	34	33	33	36	31
12.5		37	40	39	33	35	37	36		39	32
25		33	37	36	33	39	23	31	38	39	42
50		38	39	39	33	38	37	38	34	41	36
100		31	45	40	36	29	45	37	37	43	35
Survival Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
6.25		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
12.5		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
25		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
50		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
100		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Survival Binomials											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
6.25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
12.5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
50		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
100		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1

CETIS Analytical Report

Report Date: 10 Dec-18 15:10 (p 1 of 1)
 Test Code: 80717 | 19-0843-0078

Ceriodaphnia Survival and Reproduction Test Pacific EcoRisk

Analysis ID: 01-0906-1633 Endpoint: Reproduction CETIS Version: CETISv1.9.2
 Analyzed: 10 Dec-18 15:10 Analysis: Parametric-Multiple Comparison Official Results: Yes

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	C > T	100	> 100	n/a	1	14.00%

Bonferroni Adj t Test

Control	vs	Conc-%	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Water Contr		6.25	-2.34	2.4	4.31	18	CDF	1.0000	Non-Significant Effect
		12.5	-3.06	2.4	4.43	17	CDF	1.0000	Non-Significant Effect
		25	-2.39	2.4	4.31	18	CDF	1.0000	Non-Significant Effect
		50	-3.62	2.4	4.31	18	CDF	1.0000	Non-Significant Effect
		100	-3.89	2.4	4.31	18	CDF	1.0000	Non-Significant Effect

ANOVA Table

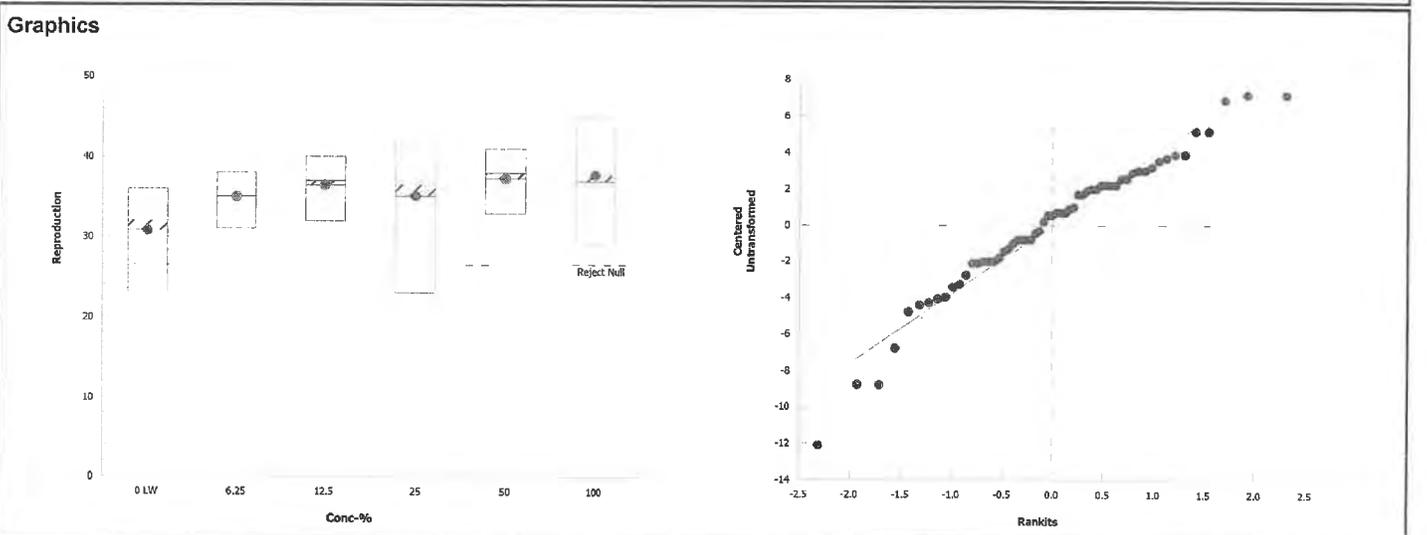
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	317.612	63.5223	5	3.93	0.0042	Significant Effect
Error	856.422	16.1589	53			
Total	1174.03		58			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	12	15.1	0.0352	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.963	0.945	0.0734	Normal Distribution

Reproduction Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	LW	10	30.8	27.8	33.8	32	22	36	1.31	13.41%	0.00%
6.25		10	35	33.2	36.8	35	31	38	0.789	7.13%	-13.64%
12.5		9	36.4	34.3	38.6	37	32	40	0.915	7.53%	-18.33%
25		10	35.1	31.2	39	36.5	23	42	1.71	15.40%	-13.96%
50		10	37.3	35.6	39	38	33	41	0.761	6.45%	-21.10%
100		10	37.8	33.9	41.7	37	29	45	1.74	14.53%	-22.73%



CETIS Analytical Report

Report Date: 10 Dec-18 15:10 (p 1 of 1)
 Test Code: 80717 | 19-0843-0078

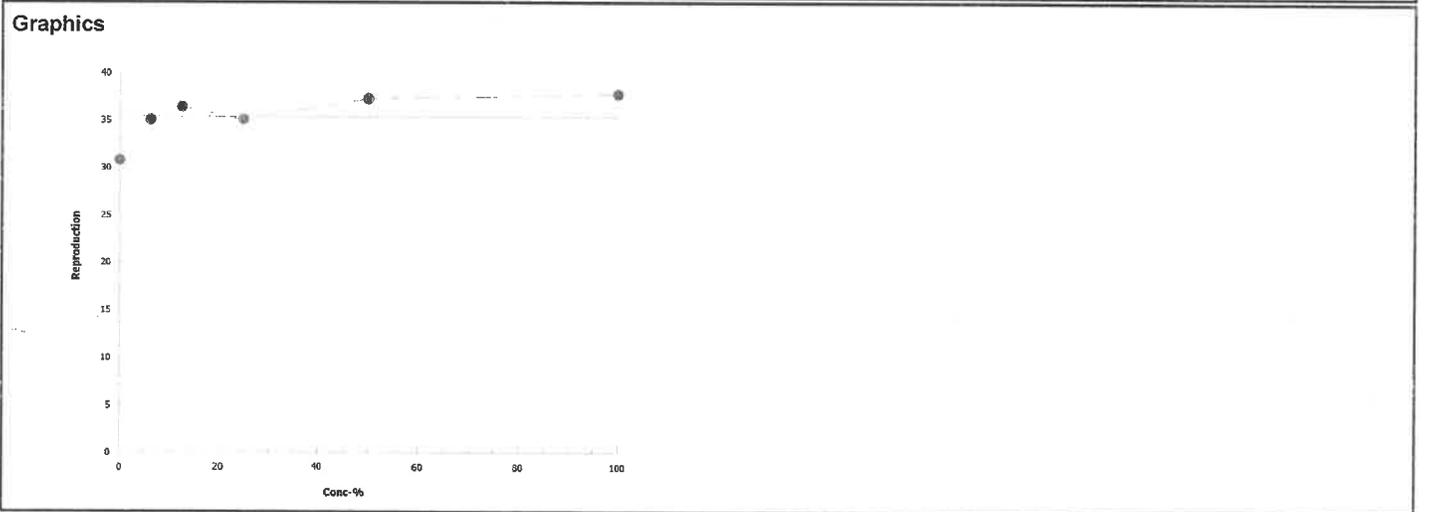
Ceriodaphnia Survival and Reproduction Test **Pacific EcoRisk**

Analysis ID: 11-6333-2203 Endpoint: Reproduction CETIS Version: CETISv1.9.2
 Analyzed: 10 Dec-18 15:10 Analysis: Linear Interpolation (ICPIN) Official Results: Yes

Linear Interpolation Options					
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	195508	200	Yes	Two-Point Interpolation

Point Estimates						
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	>100	n/a	n/a	<1	n/a	n/a
IC10	>100	n/a	n/a	<1	n/a	n/a
IC15	>100	n/a	n/a	<1	n/a	n/a
IC20	>100	n/a	n/a	<1	n/a	n/a
IC25	>100	n/a	n/a	<1	n/a	n/a
IC40	>100	n/a	n/a	<1	n/a	n/a
IC50	>100	n/a	n/a	<1	n/a	n/a

Reproduction Summary			Calculated Variate						
Conc-%	Code	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	10	30.8	22	36	1.31	4.13	13.40%	0.0%
6.25		10	35	31	38	0.789	2.49	7.13%	-13.6%
12.5		9	36.4	32	40	0.915	2.74	7.53%	-18.3%
25		10	35.1	23	42	1.71	5.4	15.40%	-14.0%
50		10	37.3	33	41	0.761	2.41	6.45%	-21.1%
100		10	37.8	29	45	1.74	5.49	14.50%	-22.7%



CETIS Analytical Report

Report Date: 10 Dec-18 15:10 (p 1 of 1)
 Test Code: 80717 | 19-0843-0078

Ceriodaphnia Survival and Reproduction Test				Pacific EcoRisk			
Analysis ID: 07-9285-6628		Endpoint: Survival		CETIS Version: CETISv1.9.2			
Analyzed: 10 Dec-18 15:10		Analysis: STP 2xK Contingency Tables		Official Results: Yes			
Data Transform		Alt Hyp		NOEL	LOEL	TOEL	TU
Untransformed		C > T		100	> 100	n/a	1

Fisher Exact/Bonferroni-Holm Test						
Control	vs	Group	Test Stat	P-Type	P-Value	Decision(α:5%)
Lab Water Contr		6.25	1.000	Exact	1.0000	Non-Significant Effect
		12.5	1.000	Exact	1.0000	Non-Significant Effect
		25	1.000	Exact	1.0000	Non-Significant Effect
		50	1.000	Exact	1.0000	Non-Significant Effect
		100	1.000	Exact	1.0000	Non-Significant Effect

Data Summary							
Conc-%	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
0	LW	10	0	10	1	0	0.0%
6.25		10	0	10	1	0	0.0%
12.5		10	0	10	1	0	0.0%
25		10	0	10	1	0	0.0%
50		10	0	10	1	0	0.0%
100		10	0	10	1	0	0.0%



Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: LWA - Calleguas Creek Material: 70-BELT Test Date: 11/30/18
 Project #: 29633 Test ID: 80717 Randomization: 10.7.15 Control Water: Mod EPAMH

Day	pH		D.O.		Cond. (µS/cm)	Temp (°C)	Survival / Reproduction										SIGN-OFF	
	New	Old	New	Old			A	B	C	D	E	F	G	H	I	J		
0	7.91		7.9		358	24.9	0	0	0	0	0	0	0	0	0	0	0	Date: 11/30/18 New WQ: SAT Test Init.: 1407 Sol'n Prep: 8V Time: 1407
1	7.90	7.88	8.0	8.3	354	24.3	0	0	0	0	0	0	0	0	0	0	0	Date: 12/1/18 New WQ: SB Counts: 75 Sol'n Prep: 8V Old WQ: SAT Time: 1355
2	7.81	7.73	7.5	7.6	346	24.0	0	0	0	0	0	0	0	0	0	0	0	Date: 12/2/18 New WQ: SAT Counts: 38 Sol'n Prep: MAF Old WQ: SAT Time: 1425
3	7.89	7.97	8.5	8.2	355	24.0	6	5	6	5	5	5	4	6	6	5	0	Date: 12/3/18 New WQ: PB Counts: 162 Sol'n Prep: SE Old WQ: KA Time: 1705
4	7.88	7.87	8.6	8.0	357	24.7	0	0	0	0	0	0	0	0	0	0	0	Date: 12/4/18 New WQ: TA Counts: KL Sol'n Prep: CR Old WQ: TA Time: 1330
5	7.80	7.70	8.6	7.5	359	24.2	0	6	12	9	11	13	11	11	11	12	0	Date: 12/5/18 New WQ: TA Counts: KL Sol'n Prep: CR Old WQ: TA Time: 1400
6	-	7.95	-	7.6	382	24.9	16	15	15	16	15	18	18	17	13	16	0	Date: 12/6/18 New WQ: TA Counts: 00 Sol'n Prep: CR Old WQ: TA Time: 1400
7																		Date: New WQ: Counts: Sol'n Prep: Old WQ: Time:
8																		Date: Old WQ: Counts: Time:
Total=							22	26	33	30	31	36	33	34	30	33	Mean Neonates/Female = 30.8	
Day	pH		D.O.		Cond. (µS/cm)	Temp (°C)	Survival / Reproduction										Sample ID	
	New	Old	New	Old			A	B	C	D	E	F	G	H	I	J		
0	7.89		7.9		344	24.7	0	0	0	0	0	0	0	0	0	0	0	51476
1	7.89	7.89	8.1	8.3	357	24.5	0	0	0	0	0	0	0	0	0	0	0	51476
2	7.77	7.76	7.7	7.3	352	24.0	0	0	0	0	0	0	0	0	0	0	0	51476
3	7.89	8.00	8.7	8.2	362	24.0	5	5	5	6	5	5	5	6	6	6	0	51476
4	7.89	7.85	8.8	8.0	358	24.7	0	0	0	0	0	0	0	0	0	0	0	51476
5	7.80	7.73	8.5	7.4	362	24.1	12	11	11	11	13	10	11	14	12	13	0	51476
6	7.84	-	7.1		383	25.1	20	22	21	16	20	19	17	13	18	12	0	-
7																		
8																		
Total=							37	38	37	33	38	34	33	33	36	31	Mean Neonates/Female = 35.0	

Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: LWA - Calleguas Creek Material: 70-BELT Test Date: 11/30/18
 Project #: 29633 Test ID: 80717 Control Water: Mod EPAMH

	Day	pH		D.O.		Cond. (µS/cm)	Temp (°C)	Survival / Reproduction										SIGN-OFF	
		New	Old	New	Old			A	B	C	D	E	F	G	H	I	J		
12.5%	0	7.88		8.0		353	24.9	0	0	0	0	0	0	0	0	0	0	0	
	1	7.90	7.84	7.9	8.0	356	24.4	0	0	0	0	0	0	0	0	0	0	0	
	2	7.82	7.77	7.7	7.5	357	24.0	0	0	0	0	0	0	0	0	0	0	0	
	3	7.89	8.01	8.8	8.2	303	24.3	5	6	6	5	6	4	5	6	6	4		
	4	7.88	7.86	8.8	8.0	358	24.5	0	0	0	0	0	0	0	0	0	0	0	
	5	7.79	7.75	8.5	7.5	361	25.1	11	12	12	12	11	10	10	1	11	11		
	6	-	7.80	-	7.4	408	25.3	21	22	21	16	18	23	21	18	22	17		
	7																		
	8																		
Total=							37	40	39	33	35	37	36	25	39	32	Mean Neonates/Female = 35.3		
25%	0	7.88		8.1		351	24.7	0	0	0	0	0	0	0	0	0	0	0	
	1	7.88	7.82	7.9	7.7	354	24.3	0	0	0	0	0	0	0	0	0	0	0	
	2	7.82	7.76	7.8	7.3	355	24.1	0	0	0	0	0	0	0	0	0	0	0	
	3	7.85	8.03	8.4	8.4	360	24.2	5	5	5	5	6	4	5	6	6	6		
	4	7.83	7.85	8.9	8.0	357	24.7	0	0	0	0	0	0	0	0	0	0	0	
	5	7.75	7.74	8.6	7.5	358	25.1	10	12	12	10	11	0	6	10	13	15		
	6	-	7.80	-	7.5	376	25.2	18	20	19	18	22	19	20	22	20	21		
	7																		
	8																		
Total=							33	37	36	33	39	23	31	38	39	42	Mean Neonates/Female = 35.1		

Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: LWA - Calleguas Creek Material: 70-BELT Test Date: 11/30/18
 Project #: 29633 Test ID: 80717 Control Water: Mod EPAMH

Day	pH		D.O.		Cond. (µS/cm)	Temp (°C)	Survival / Reproduction										SIGN-OFF		
	New	Old	New	Old			A	B	C	D	E	F	G	H	I	J			
50%	0	7.84		8.7		345	24.6	0	0	0	0	0	0	0	0	0	0	0	
	1	7.83	7.79	8.1	7.6	349	24.1	0	0	0	0	0	0	0	0	0	0	0	
	2	7.77	7.76	8.0	7.4	349	24.1	0	0	0	0	0	0	0	0	0	0	0	
	3	7.79	8.05	9.0	8.3	361	24.3	5	6	6	6	5	5	6	5	6	5	6	5
	4	7.77	7.84	9.1	8.1	347	24.5	0	0	0	0	0	0	0	0	0	0	0	0
	5	7.68	7.74	8.6	7.5	357	25.2	12	12	11	10	13	11	10	12	14	13		
	6	-	7.79	-	7.6	369	24.9	21	21	22	17	20	21	22	17	21	18		
	7																		
	8																		
Total=							38	39	39	33	38	37	38	34	41	36	Mean Neonates/Female = 37.3		
100%	0	7.78		10.0		334	24.7	0	0	0	0	0	0	0	0	0	0	0	
	1	7.75	7.75	8.7	7.7	341	24.0	0	0	0	0	0	0	0	0	0	0	0	
	2	7.65	7.74	8.7	7.6	340	24.1	0	0	0	0	0	0	0	0	0	0	0	
	3	7.69	8.00	9.3	8.2	362	24.1	7	6	7	5	6	7	6	6	7	6		
	4	7.61	7.84	9.1	8.1	332	24.4	0	0	0	0	0	0	0	0	0	0	0	
	5	7.53	7.72	8.8	7.4	339	24.4	0	13	11	12	0	14	12	13	13	10		
	6	-	7.77	-	7.8	364	24.5	24	26	22	19	23	24	19	18	23	19		
	7																		
	8																		
Total=							31	45	40	36	29	45	37	37	43	35	Mean Neonates/Female = 37.8		

Appendix C

Test Data and Summary of Statistics for the Evaluation of the Chronic Toxicity of the Calleguas Creek Ambient Waters to *Ceriodaphnia dubia*: Data Analyses Including Statistical Outliers

CETIS Summary Report

Report Date: 08 Dec-18 16:28 (p 1 of 2)
 Test Code: 80713 | 09-4943-1982

Ceriodaphnia Survival and Reproduction Test **Pacific EcoRisk**

Batch ID: 07-4716-3371	Test Type: Reproduction-Survival (7d)	Analyst: Kristin Robertson
Start Date: 30 Nov-18 13:03	Protocol: EPA-821-R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 06 Dec-18 15:00	Species: Ceriodaphnia dubia	Brine: Not Applicable
Duration: 6d 2h	Source: In-House Culture	Age: 1

Sample ID: 07-6720-5968	Code: 70-UNIV-029	Client: Larry Walker Associates
Sample Date: 29 Nov-18 08:45	Material: Ambient Water	Project: 29633
Receipt Date: 30 Nov-18 09:03	Source: Calleguas Creek	
Sample Age: 28h (0.4 °C)	Station: UNIV	

Comments:
 Statistice including reproductive outliers 12.5G and 100D

Multiple Comparison Summary							
Analysis ID	Endpoint	Comparison Method	NOEL	LOEL	TOEL	TU	PMSD ✓
17-8905-8656	Reproduction	Wilcoxon/Bonferroni Adj Test	100	> 100	n/a	1	30.7%
18-4465-5826	Survival	Fisher Exact/Bonferroni-Holm Test	100	> 100	n/a	1	n/a

Point Estimate Summary							
Analysis ID	Endpoint	Point Estimate Method	Level	%	95% LCL	95% UCL	TU ✓
03-7683-5715	Reproduction	Linear Interpolation (ICPIN)	IC5	46.6	19.5	n/a	2.144
			IC10	>100	n/a	n/a	<1
			IC15	>100	n/a	n/a	<1
			IC20	>100	n/a	n/a	<1
			IC25	>100	n/a	n/a	<1
			IC40	>100	n/a	n/a	<1
			IC50	>100	n/a	n/a	<1

Reproduction Summary											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	10	24.3	21.7	26.9	17	30	1.14	3.59	14.78%	0.00%
6.25		10	28.6	25.8	31.4	23	36	1.25	3.95	13.81%	-17.70%
12.5		9	30.2	26.6	33.8	19	34	1.57	4.71	15.59%	-24.37%
25		10	28.1	23.9	32.3	16	34	1.84	5.82	20.71%	-15.64%
50		10	24.3	16.6	32	3	34	3.42	10.8	44.49%	0.00%
100		10	28.1	21.4	34.8	3	36	2.94	9.3	33.11%	-15.64%

Survival Summary											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
6.25		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
12.5		9	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
25		10	0.900	0.674	1.000	0.000	1.000	0.100	0.316	35.14%	10.00%
50		10	0.800	0.498	1.000	0.000	1.000	0.133	0.422	52.70%	20.00%
100		10	0.900	0.674	1.000	0.000	1.000	0.100	0.316	35.14%	10.00%

CETIS Summary Report

Report Date: 08 Dec-18 16:28 (p 2 of 2)
 Test Code: 80713 | 09-4943-1982

Ceriodaphnia Survival and Reproduction Test											Pacific EcoRisk
Reproduction Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	22	21	30	17	27	25	26	25	24	26
6.25		27	23	28	30	33	24	29	30	26	36
12.5		34	30	34	31	32	34	19	28	30	
25		25	34	33	31	32	33	29	26	16	22
50		32	28	14	12	33	29	3	34	25	33
100		33	29	29	3	33	31	30	25	32	36
Survival Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
6.25		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
12.5		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
25		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.000	1.000
50		1.000	1.000	0.000	1.000	1.000	1.000	0.000	1.000	1.000	1.000
100		1.000	1.000	1.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000
Survival Binomials											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
6.25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
12.5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	
25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	0/1	1/1
50		1/1	1/1	0/1	1/1	1/1	1/1	0/1	1/1	1/1	1/1
100		1/1	1/1	1/1	0/1	1/1	1/1	1/1	1/1	1/1	1/1

CETIS Analytical Report

Report Date: 08 Dec-18 16:25 (p 1 of 1)
 Test Code: 80713 | 09-4943-1982

Ceriodaphnia Survival and Reproduction Test **Pacific EcoRisk**

Analysis ID: 17-8905-8656 Endpoint: Reproduction CETIS Version: CETISv1.9.2
 Analyzed: 08 Dec-18 16:24 Analysis: Nonparametric-Multiple Comparison Official Results: Yes

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	C > T	100	> 100	n/a	1	30.74%

Wilcoxon/Bonferroni Adj Test

Control	vs	Conc-%	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Lab Water Contr		6.25	134	n/a	4	18	Exact	1.0000	Non-Significant Effect
		12.5	124	n/a	1	17	Exact	1.0000	Non-Significant Effect
		25	128	n/a	3	18	Exact	1.0000	Non-Significant Effect
		50	118	n/a	1	18	Exact	1.0000	Non-Significant Effect
		100	138	n/a	2	18	Exact	1.0000	Non-Significant Effect

ANOVA Table

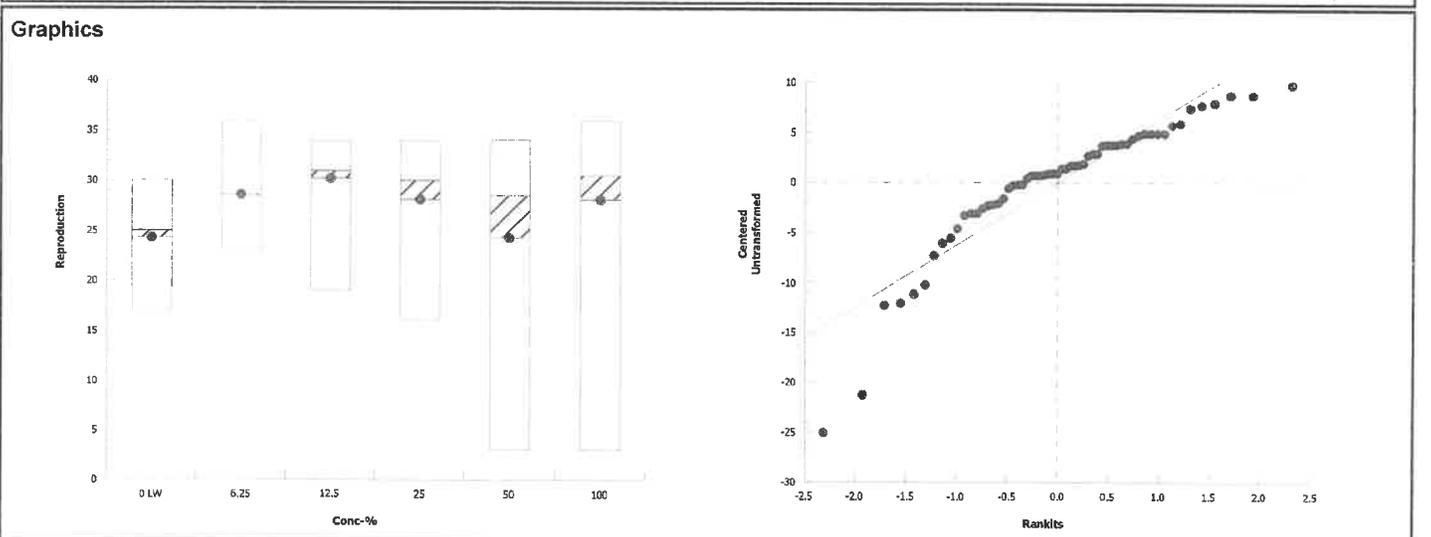
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	286.18	57.236	5	1.18	0.3312	Non-Significant Effect
Error	2569.96	48.4897	53			
Total	2856.14		58			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	17.7	15.1	0.0034	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.866	0.945	1.1E-05	Non-Normal Distribution

Reproduction Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	LW	10	24.3	21.7	26.9	25	17	30	1.14	14.78%	0.00%
6.25		10	28.6	25.8	31.4	28.5	23	36	1.25	13.81%	-17.70%
12.5		9	30.2	26.6	33.8	31	19	34	1.57	15.59%	-24.37%
25		10	28.1	23.9	32.3	30	16	34	1.84	20.71%	-15.64%
50		10	24.3	16.6	32	28.5	3	34	3.42	44.49%	0.00%
100		10	28.1	21.4	34.8	30.5	3	36	2.94	33.11%	-15.64%



CETIS Analytical Report

Report Date: 08 Dec-18 16:25 (p 1 of 1)
 Test Code: 80713 | 09-4943-1982

Ceriodaphnia Survival and Reproduction Test Pacific EcoRisk

Analysis ID: 03-7683-5715 Endpoint: Reproduction CETIS Version: CETISv1.9.2
 Analyzed: 08 Dec-18 16:24 Analysis: Linear Interpolation (ICPIN) Official Results: Yes

Linear Interpolation Options

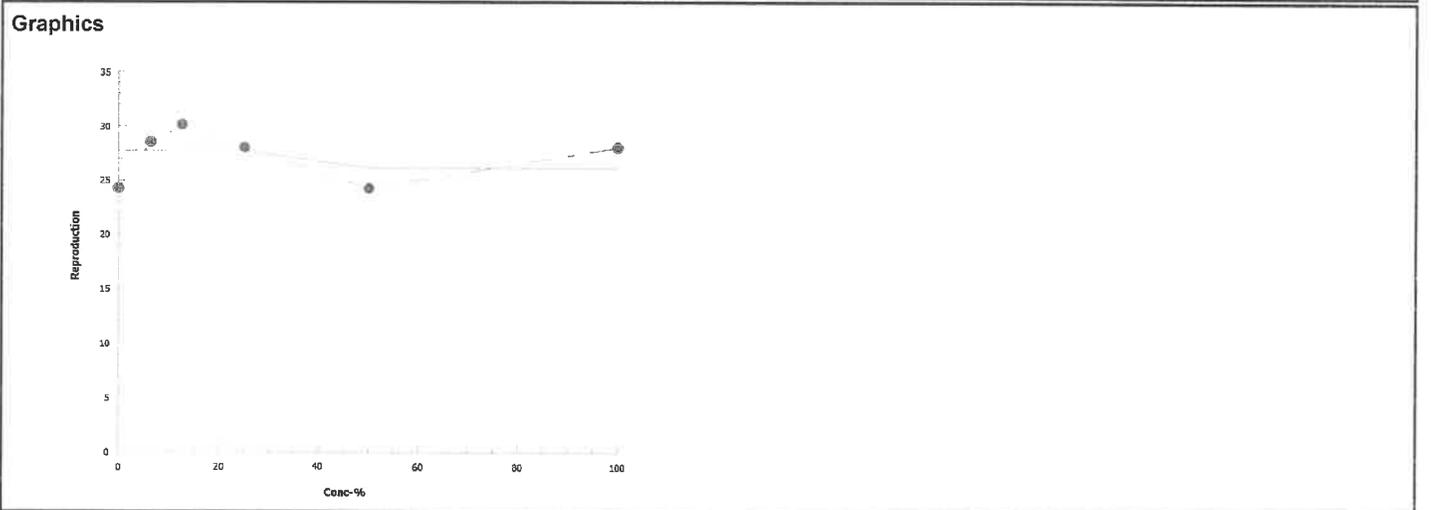
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	1577052	200	Yes	Two-Point Interpolation

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	46.6	19.5	n/a	2.144	n/a	5.138
IC10	>100	n/a	n/a	<1	n/a	n/a
IC15	>100	n/a	n/a	<1	n/a	n/a
IC20	>100	n/a	n/a	<1	n/a	n/a
IC25	>100	n/a	n/a	<1	n/a	n/a
IC40	>100	n/a	n/a	<1	n/a	n/a
IC50	>100	n/a	n/a	<1	n/a	n/a

Reproduction Summary Calculated Variate

Conc-%	Code	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	10	24.3	17	30	1.14	3.59	14.80%	0.0%
6.25		10	28.6	23	36	1.25	3.95	13.80%	-17.7%
12.5		9	30.2	19	34	1.57	4.71	15.60%	-24.4%
25		10	28.1	16	34	1.84	5.82	20.70%	-15.6%
50		10	24.3	3	34	3.42	10.8	44.50%	0.0%
100		10	28.1	3	36	2.94	9.3	33.10%	-15.6%



CETIS Analytical Report

Report Date: 08 Dec-18 16:25 (p 1 of 1)
 Test Code: 80713 | 09-4943-1982

Ceriodaphnia Survival and Reproduction Test **Pacific EcoRisk**

Analysis ID: 18-4465-5826 Endpoint: Survival CETIS Version: CETISv1.9.2
 Analyzed: 08 Dec-18 16:18 Analysis: STP 2xK Contingency Tables Official Results: Yes

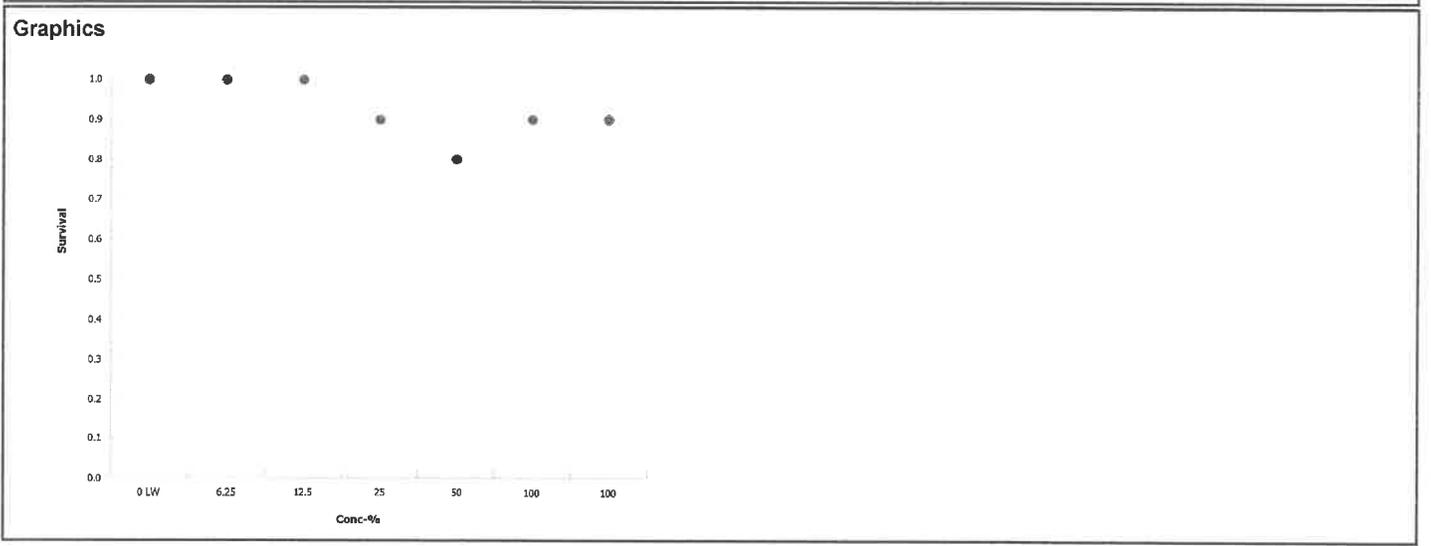
Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU
Untransformed	C > T	100	> 100	n/a	1

Fisher Exact/Bonferroni-Holm Test

Control	vs	Group	Test Stat	P-Type	P-Value	Decision(α:5%)
Lab Water Contr		6.25	1.000	Exact	1.0000	Non-Significant Effect
		12.5	1.000	Exact	1.0000	Non-Significant Effect
		25	0.500	Exact	1.0000	Non-Significant Effect
		50	0.237	Exact	1.0000	Non-Significant Effect
		100	0.500	Exact	1.0000	Non-Significant Effect

Data Summary

Conc-%	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
0	LW	10	0	10	1	0	0.0%
6.25		10	0	10	1	0	0.0%
12.5		9	0	9	1	0	0.0%
25		9	1	10	0.9	0.1	10.0%
50		8	2	10	0.8	0.2	20.0%
100		9	1	10	0.9	0.1	10.0%



CETIS Summary Report

Report Date: 10 Dec-18 13:53 (p 1 of 2)
Test Code: 80714 | 13-4953-7412

Ceriodaphnia Survival and Reproduction Test **Pacific EcoRisk**

Batch ID: 00-4779-8765	Test Type: Reproduction-Survival (7d)	Analyst: Wesley Cram
Start Date: 30 Nov-18 13:37	Protocol: EPA-821-R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 06 Dec-18 16:18	Species: Ceriodaphnia dubia	Brine: Not Applicable
Duration: 6d 3h	Source: In-House Culture	Age: 1

Sample ID: 04-7189-8807	Code: 70-ADOLF-045	Client: Larry Walker Associates
Sample Date: 29 Nov-18 11:40	Material: Ambient Water	Project: 29633
Receipt Date: 30 Nov-18 09:03	Source: Calleguas Creek	
Sample Age: 26h (0.6 °C)	Station: ADOLF	

Comments:
 Stats including reproductive outlier: 12.5-D

Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	NOEL	LOEL	TOEL	TU	PMSD ✓
00-6722-0007	Reproduction	Steel Many-One Rank Sum Test	100	> 100	n/a	1	20.9%
04-7607-6331	Survival	Fisher Exact/Bonferroni-Holm Test	100	> 100	n/a	1	n/a

Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	Level	%	95% LCL	95% UCL	TU	✓
11-3306-1759	Reproduction	Linear Interpolation (ICPIN)	IC5	59	12.4	n/a	1.695	
			IC10	80.2	51.2	n/a	1.247	
			IC15	>100	n/a	n/a	<1	
			IC20	>100	n/a	n/a	<1	
			IC25	>100	n/a	n/a	<1	
			IC40	>100	n/a	n/a	<1	
			IC50	>100	n/a	n/a	<1	

Reproduction Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	10	30.5	28	33	25	35	1.11	3.5	11.49%	0.00%
6.25		10	35.1	33.7	36.5	32	38	0.605	1.91	5.45%	-15.08%
12.5		10	32.5	27.8	37.2	17	41	2.08	6.57	20.22%	-6.56%
25		10	34.1	30	38.2	22	43	1.82	5.74	16.84%	-11.80%
50		10	32.1	30.1	34.1	27	36	0.9	2.85	8.87%	-5.25%
100		10	28.2	19.9	36.5	0	39	3.65	11.5	40.94%	7.54%

Survival Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
6.25		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
12.5		10	0.900	0.674	1.000	0.000	1.000	0.100	0.316	35.14%	10.00%
25		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
50		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
100		10	0.900	0.674	1.000	0.000	1.000	0.100	0.316	35.14%	10.00%

CETIS Summary Report

Report Date: 10 Dec-18 13:53 (p 2 of 2)
 Test Code: 80714 | 13-4953-7412

Ceriodaphnia Survival and Reproduction Test											Pacific EcoRisk
Reproduction Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	33	29	35	30	34	26	31	34	25	28
6.25		37	32	34	35	38	37	35	33	34	36
12.5		37	27	31	17	33	35	34	41	34	36
25		33	34	30	35	38	36	39	43	31	22
50		32	29	31	33	36	31	32	27	34	36
100		17	29	35	39	29	31	32	35	35	0
Survival Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
6.25		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
12.5		1.000	1.000	1.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000
25		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
50		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
100		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.000
Survival Binomials											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
6.25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
12.5		1/1	1/1	1/1	0/1	1/1	1/1	1/1	1/1	1/1	1/1
25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
50		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
100		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	0/1

CETIS Analytical Report

Report Date: 10 Dec-18 13:52 (p 1 of 1)
 Test Code: 80714 | 13-4953-7412

Ceriodaphnia Survival and Reproduction Test Pacific EcoRisk

Analysis ID: 00-6722-0007 Endpoint: Reproduction CETIS Version: CETISv1.9.2
 Analyzed: 10 Dec-18 13:52 Analysis: Nonparametric-Control vs Treatments Official Results: Yes

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	C > T	100	> 100	n/a	1	20.94%

Steel Many-One Rank Sum Test

Control	vs	Conc-%	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Lab Water Contr		6.25	142	75	3	18	Asymp	1.0000	Non-Significant Effect
		12.5	124	75	4	18	Asymp	0.9970	Non-Significant Effect
		25	129	75	5	18	Asymp	0.9992	Non-Significant Effect
		50	118	75	4	18	Asymp	0.9843	Non-Significant Effect
		100	112	75	3	18	Asymp	0.9455	Non-Significant Effect

ANOVA Table

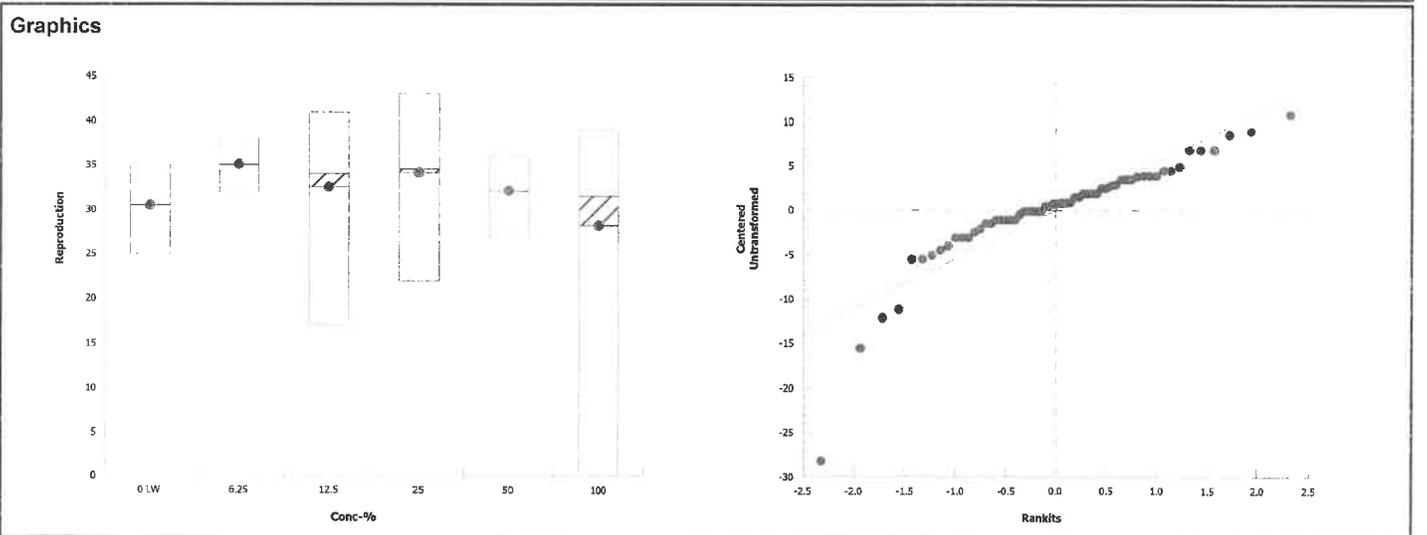
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	309.283	61.8567	5	1.59	0.1787	Non-Significant Effect
Error	2101.3	38.913	54			
Total	2410.58		59			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	33.8	15.1	2.7E-06	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.834	0.946	1.1E-06	Non-Normal Distribution

Reproduction Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	LW	10	30.5	28	33	30.5	25	35	1.11	11.49%	0.00%
6.25		10	35.1	33.7	36.5	35	32	38	0.605	5.45%	-15.08%
12.5		10	32.5	27.8	37.2	34	17	41	2.08	20.22%	-6.56%
25		10	34.1	30	38.2	34.5	22	43	1.82	16.84%	-11.80%
50		10	32.1	30.1	34.1	32	27	36	0.9	8.87%	-5.25%
100		10	28.2	19.9	36.5	31.5	0	39	3.65	40.94%	7.54%



CETIS Analytical Report

Report Date: 10 Dec-18 13:52 (p 1 of 1)
 Test Code: 80714 | 13-4953-7412

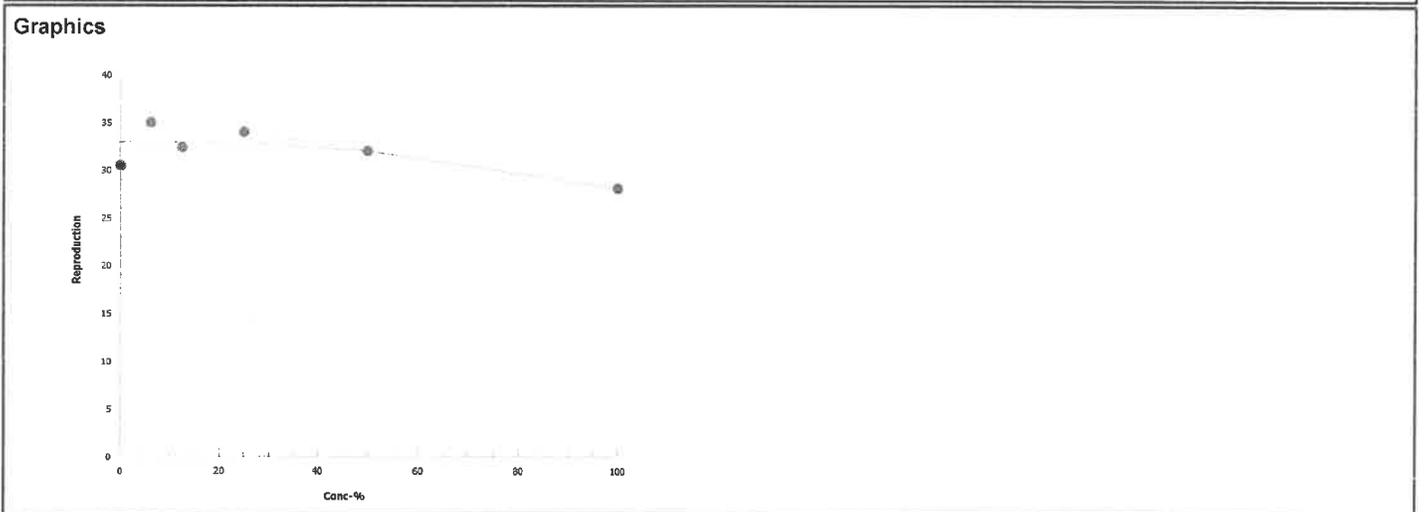
Ceriodaphnia Survival and Reproduction Test **Pacific EcoRisk**

Analysis ID: 11-3306-1759	Endpoint: Reproduction	CETIS Version: CETISv1.9.2
Analyzed: 10 Dec-18 13:52	Analysis: Linear Interpolation (ICPIN)	Official Results: Yes

Linear Interpolation Options					
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	935142	200	Yes	Two-Point Interpolation

Point Estimates						
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	59	12.4	n/a	1.695	n/a	8.059
IC10	80.2	51.2	n/a	1.247	n/a	1.951
IC15	>100	n/a	n/a	<1	n/a	n/a
IC20	>100	n/a	n/a	<1	n/a	n/a
IC25	>100	n/a	n/a	<1	n/a	n/a
IC40	>100	n/a	n/a	<1	n/a	n/a
IC50	>100	n/a	n/a	<1	n/a	n/a

Reproduction Summary			Calculated Variate						
Conc-%	Code	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	10	30.5	25	35	1.11	3.5	11.50%	0.0%
6.25		10	35.1	32	38	0.605	1.91	5.45%	-15.1%
12.5		10	32.5	17	41	2.08	6.57	20.20%	-6.56%
25		10	34.1	22	43	1.82	5.74	16.80%	-11.8%
50		10	32.1	27	36	0.9	2.85	8.87%	-5.25%
100		10	28.2	0	39	3.65	11.5	40.90%	7.54%



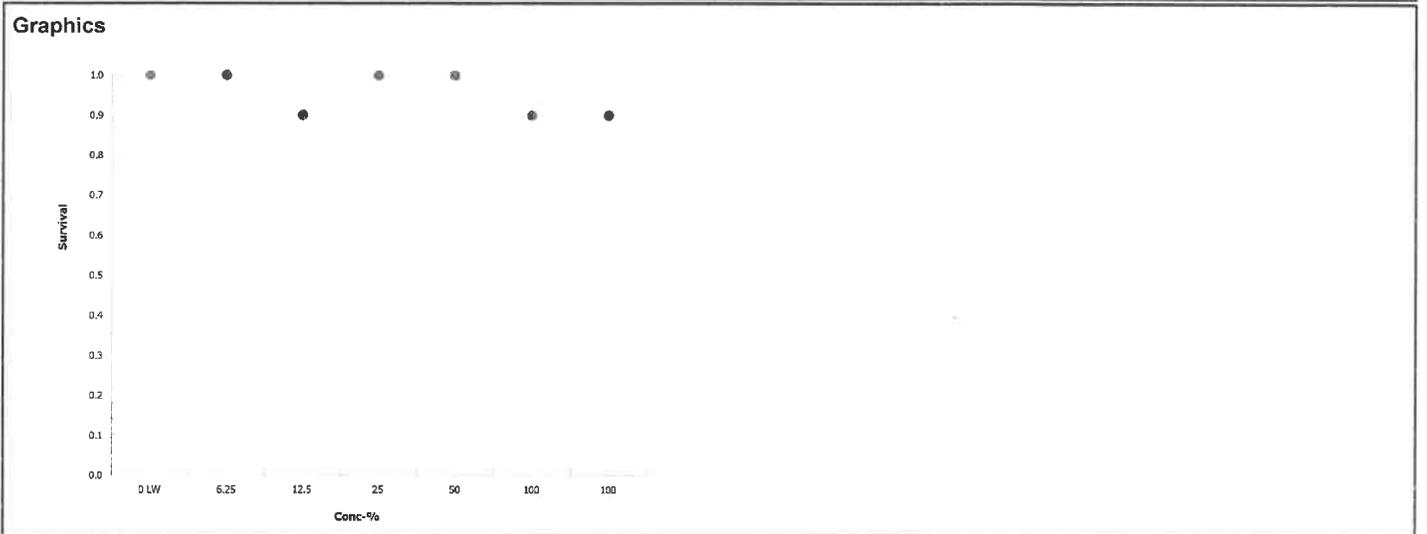
CETIS Analytical Report

Report Date: 10 Dec-18 13:53 (p 1 of 1)
 Test Code: 80714 | 13-4953-7412

Ceriodaphnia Survival and Reproduction Test				Pacific EcoRisk			
Analysis ID: 04-7607-6331		Endpoint: Survival		CETIS Version: CETISv1.9.2			
Analyzed: 10 Dec-18 13:52		Analysis: STP 2xK Contingency Tables		Official Results: Yes			
Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU		
Untransformed	C > T	100	> 100	n/a	1		

Fisher Exact/Bonferroni-Holm Test						
Control	vs	Group	Test Stat	P-Type	P-Value	Decision(α:5%)
Lab Water Contr		6.25	1.000	Exact	1.0000	Non-Significant Effect
		12.5	0.500	Exact	1.0000	Non-Significant Effect
		25	1.000	Exact	1.0000	Non-Significant Effect
		50	1.000	Exact	1.0000	Non-Significant Effect
		100	0.500	Exact	1.0000	Non-Significant Effect

Data Summary							
Conc-%	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
0	LW	10	0	10	1	0	0.0%
6.25		10	0	10	1	0	0.0%
12.5		9	1	10	0.9	0.1	10.0%
25		10	0	10	1	0	0.0%
50		10	0	10	1	0	0.0%
100		9	1	10	0.9	0.1	10.0%



CETIS Summary Report

Report Date: 10 Dec-18 14:40 (p 1 of 2)
Test Code: 80719 | 03-4960-5947

Ceriodaphnia Survival and Reproduction Test **Pacific EcoRisk**

Batch ID: 20-3918-7412	Test Type: Reproduction-Survival (7d)	Analyst: Wesley Cram
Start Date: 30 Nov-18 13:49	Protocol: EPA-821-R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 06 Dec-18 15:53	Species: Ceriodaphnia dubia	Brine: Not Applicable
Duration: 6d 2h	Source: In-House Culture	Age: 1

Sample ID: 06-7471-6060	Code: 70-WOOD-097	Client: Larry Walker Associates
Sample Date: 29 Nov-18 07:00	Material: Ambient Water	Project: 29633
Receipt Date: 30 Nov-18 09:03	Source: Calleguas Creek	
Sample Age: 31h (1.2 °C)	Station: WOOD	

Comments:
 Stats include reproductive outlier: 50-G

Multiple Comparison Summary							
Analysis ID	Endpoint	Comparison Method	NOEL	LOEL	TOEL	TU	PMSD ✓
03-5513-0953	Reproduction	Dunnett Multiple Comparison Test	50	> 50	n/a	2	15.1%
08-8803-5696	Survival	Fisher Exact/Bonferroni-Holm Test	50	> 50	n/a	2	n/a

Point Estimate Summary							
Analysis ID	Endpoint	Point Estimate Method	Level	%	95% LCL	95% UCL	TU ✓
07-8559-2208	Reproduction	Linear Interpolation (ICPIN)	IC5	52.1	21.1	52.5	1.92
			IC10	54.6	51.1	55	1.831
			IC15	57.1	53.8	57.5	1.75
			IC20	59.7	56.5	60	1.676
			IC25	62.2	59.2	62.5	1.608
			IC40	69.7	67.4	70	1.434
			IC50	74.8	72.8	75	1.337

Reproduction Summary											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	10	28.9	25.2	32.6	19	36	1.62	5.11	17.68%	0.00%
6.25		10	31.8	29.3	34.3	25	36	1.1	3.49	10.97%	-10.03%
12.5		10	34.3	32.2	36.4	29	38	0.932	2.95	8.59%	-18.69%
25		10	31	26.6	35.4	20	38	1.96	6.2	20.00%	-7.27%
50		10	31.8	29.4	34.2	24	35	1.05	3.33	10.46%	-10.03%
100		10	0	0	0	0	0	0	0		100.00%

Survival Summary											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
6.25		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
12.5		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
25		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
50		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
100		10	0.000	0.000	0.000	0.000	0.000	0.000	0.000		100.00%

CETIS Summary Report

Report Date: 10 Dec-18 14:40 (p 2 of 2)
Test Code: 80719 | 03-4960-5947

Ceriodaphnia Survival and Reproduction Test											Pacific EcoRisk
Reproduction Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	26	31	36	19	27	33	32	31	23	31
6.25		31	35	36	30	29	35	32	25	30	35
12.5		34	35	38	33	33	37	29	31	35	38
25		36	36	30	22	38	28	30	20	34	36
50		32	35	32	30	32	33	24	30	35	35
100		0	0	0	0	0	0	0	0	0	0
Survival Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
6.25		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
12.5		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
25		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
50		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
100		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Survival Binomials											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
6.25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
12.5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
50		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
100		0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1

CETIS Analytical Report

Report Date: 10 Dec-18 14:40 (p 1 of 1)
 Test Code: 80719 | 03-4960-5947

Ceriodaphnia Survival and Reproduction Test **Pacific EcoRisk**

Analysis ID: 03-5513-0953 Endpoint: Reproduction CETIS Version: CETISv1.9.2
 Analyzed: 10 Dec-18 14:40 Analysis: Parametric-Control vs Treatments Official Results: Yes

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	C > T	50	> 50	n/a	2	15.11%

Dunnett Multiple Comparison Test

Control	vs	Conc-%	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Water Contr		6.25	-1.48	2.22	4.37	18	CDF	0.9945	Non-Significant Effect
		12.5	-2.75	2.22	4.37	18	CDF	0.9999	Non-Significant Effect
		25	-1.07	2.22	4.37	18	CDF	0.9813	Non-Significant Effect
		50	-1.48	2.22	4.37	18	CDF	0.9945	Non-Significant Effect

ANOVA Table

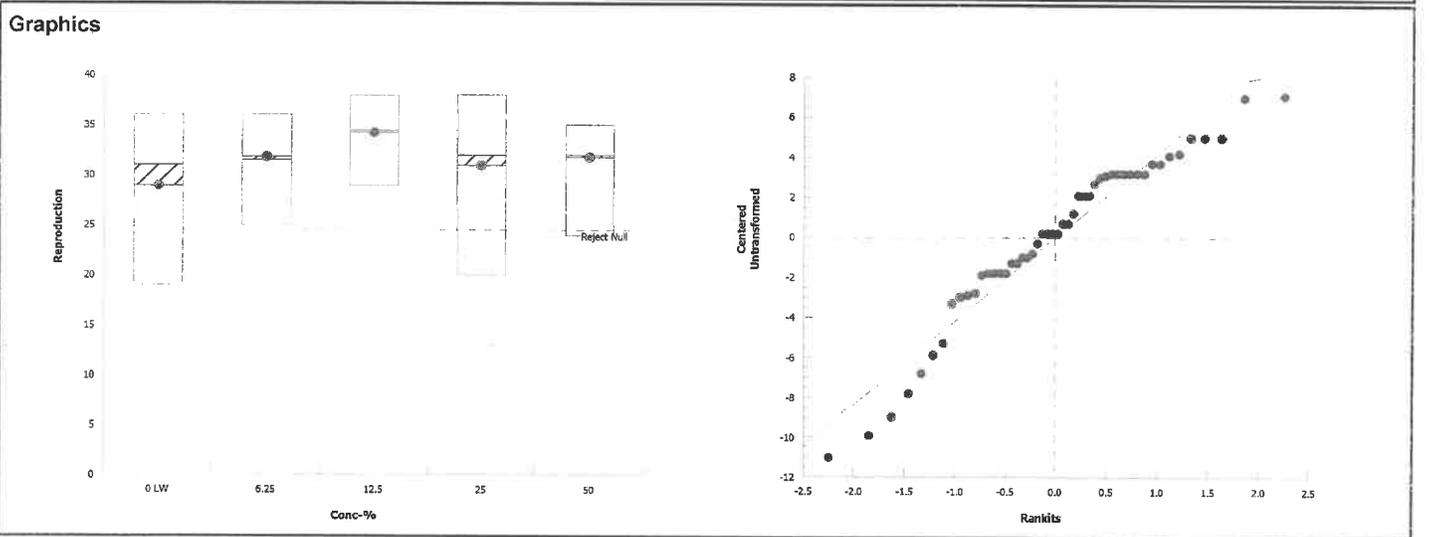
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	150.12	37.53	4	1.95	0.1193	Non-Significant Effect
Error	868.2	19.2933	45			
Total	1018.32		49			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	7.09	13.3	0.1310	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.945	0.937	0.0210	Normal Distribution

Reproduction Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	LW	10	28.9	25.2	32.6	31	19	36	1.62	17.68%	0.00%
6.25		10	31.8	29.3	34.3	31.5	25	36	1.1	10.97%	-10.03%
12.5		10	34.3	32.2	36.4	34.5	29	38	0.932	8.59%	-18.69%
25		10	31	26.6	35.4	32	20	38	1.96	20.00%	-7.27%
50		10	31.8	29.4	34.2	32	24	35	1.05	10.46%	-10.03%



CETIS Analytical Report

Report Date: 10 Dec-18 14:40 (p 1 of 1)
 Test Code: 80719 | 03-4960-5947

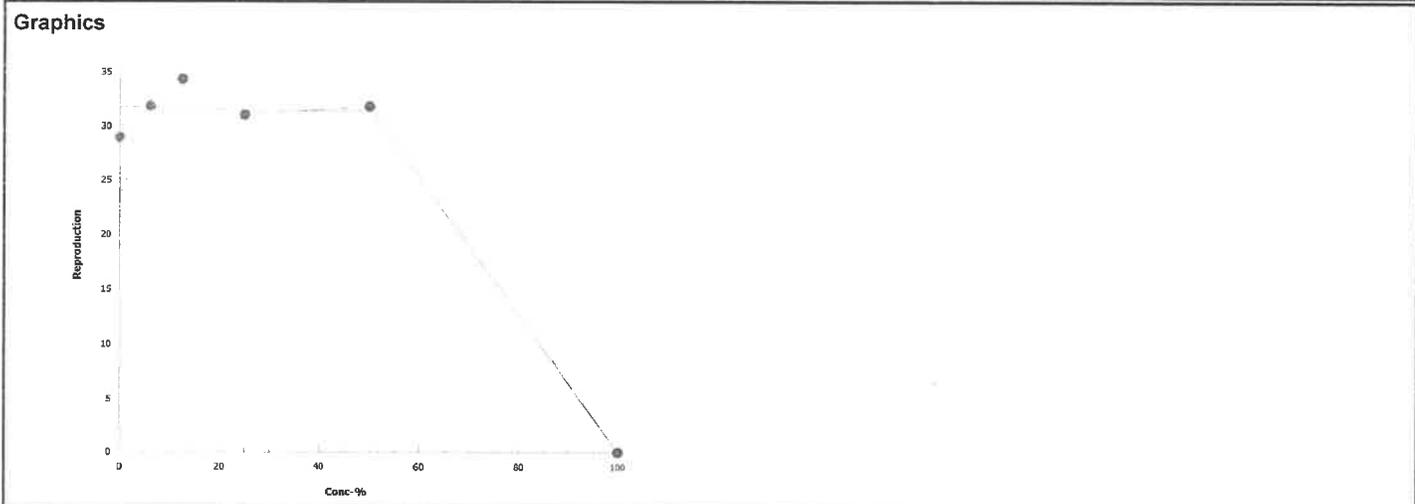
Ceriodaphnia Survival and Reproduction Test **Pacific EcoRisk**

Analysis ID: 07-8559-2208 Endpoint: Reproduction CETIS Version: CETISv1.9.2
 Analyzed: 10 Dec-18 14:40 Analysis: Linear Interpolation (ICPIN) Official Results: Yes

Linear Interpolation Options					
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	129064	200	Yes	Two-Point Interpolation

Point Estimates						
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	52.1	21.1	52.5	1.92	1.905	4.735
IC10	54.6	51.1	55	1.831	1.818	1.958
IC15	57.1	53.8	57.5	1.75	1.739	1.859
IC20	59.7	56.5	60	1.676	1.667	1.77
IC25	62.2	59.2	62.5	1.608	1.6	1.688
IC40	69.7	67.4	70	1.434	1.429	1.484
IC50	74.8	72.8	75	1.337	1.333	1.373

Reproduction Summary			Calculated Variate						
Conc-%	Code	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	10	28.9	19	36	1.62	5.11	17.70%	0.0%
6.25		10	31.8	25	36	1.1	3.49	11.00%	-10.0%
12.5		10	34.3	29	38	0.932	2.95	8.59%	-18.7%
25		10	31	20	38	1.96	6.2	20.00%	-7.27%
50		10	31.8	24	35	1.05	3.33	10.50%	-10.0%
100		10	0	0	0	0	0		100.0%



CETIS Summary Report

Report Date: 10 Dec-18 11:57 (p 1 of 2)
Test Code: 80718 | 07-0531-0198

Ceriodaphnia Survival and Reproduction Test **Pacific EcoRisk**

Batch ID: 01-8699-7664	Test Type: Reproduction-Survival (7d)	Analyst: Wesley Cram
Start Date: 30 Nov-18 14:17	Protocol: EPA-821-R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 06 Dec-18 15:52	Species: Ceriodaphnia dubia	Brine: Not Applicable
Duration: 6d 2h	Source: In-House Culture	Age: 1

Sample ID: 02-0723-3626	Code: 70-UPLAND-144	Client: Larry Walker Associates
Sample Date: 29 Nov-18 11:25	Material: Ambient Water	Project: 29633
Receipt Date: 30 Nov-18 09:03	Source: Calleguas Creek	
Sample Age: 27h (1 °C)	Station: UPLAND	

Comments:
 Stats including reproductive outliers: 6.25-I, 100-D

Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	NOEL	LOEL	TOEL	TU	PMSD ✓
08-2826-5996	Reproduction	Steel Many-One Rank Sum Test	100	> 100	n/a	1	17.4%
05-6568-0017	Survival	Fisher Exact/Bonferroni-Holm Test	100	> 100	n/a	1	n/a

Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	Level	%	95% LCL	95% UCL	TU	✓
20-5690-8123	Reproduction	Linear Interpolation (ICPIN)	IC5	>100	n/a	n/a	<1	
			IC10	>100	n/a	n/a	<1	
			IC15	>100	n/a	n/a	<1	
			IC20	>100	n/a	n/a	<1	
			IC25	>100	n/a	n/a	<1	
			IC40	>100	n/a	n/a	<1	
			IC50	>100	n/a	n/a	<1	

Reproduction Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	10	31.8	29.1	34.5	27	38	1.19	3.77	11.84%	0.00%
6.25		10	32.6	27.4	37.8	14	40	2.28	7.21	22.13%	-2.52%
12.5		10	32.1	28.1	36.1	21	41	1.79	5.65	17.59%	-0.94%
25		10	32	29.1	34.9	23	38	1.3	4.11	12.84%	-0.63%
50		10	30.4	27	33.8	22	36	1.5	4.74	15.60%	4.40%
100		10	32.6	28.2	37	18	40	1.94	6.13	18.81%	-2.52%

Survival Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
6.25		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
12.5		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
25		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
50		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
100		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%

CETIS Summary Report

Report Date: 10 Dec-18 11:57 (p 2 of 2)
 Test Code: 80718 | 07-0531-0198

Ceriodaphnia Survival and Reproduction Test											Pacific EcoRisk
Reproduction Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	38	27	30	30	33	28	30	30	35	37
6.25		34	33	38	33	33	30	33	38	14	40
12.5		34	32	34	21	38	32	26	41	33	30
25		34	30	34	23	38	36	30	31	31	33
50		22	24	33	31	36	30	32	33	27	36
100		37	28	40	18	30	34	34	36	34	35
Survival Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
6.25		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
12.5		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
25		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
50		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
100		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Survival Binomials											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
6.25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
12.5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
50		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
100		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1

CETIS Analytical Report

Report Date: 10 Dec-18 11:57 (p 1 of 1)
 Test Code: 80718 | 07-0531-0198

Ceriodaphnia Survival and Reproduction Test Pacific EcoRisk

Analysis ID: 08-2826-5996 Endpoint: Reproduction CETIS Version: CETISv1.9.2
 Analyzed: 10 Dec-18 11:56 Analysis: Nonparametric-Control vs Treatments Official Results: Yes

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	C > T	100	> 100	n/a	1	17.39%

Steel Many-One Rank Sum Test

Control	vs	Conc-%	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Lab Water Contr		6.25	121	75	3	18	Asymp	0.9924	Non-Significant Effect
		12.5	111	75	3	18	Asymp	0.9347	Non-Significant Effect
		25	113	75	3	18	Asymp	0.9548	Non-Significant Effect
		50	100	75	3	18	Asymp	0.7129	Non-Significant Effect
		100	116	75	4	18	Asymp	0.9727	Non-Significant Effect

ANOVA Table

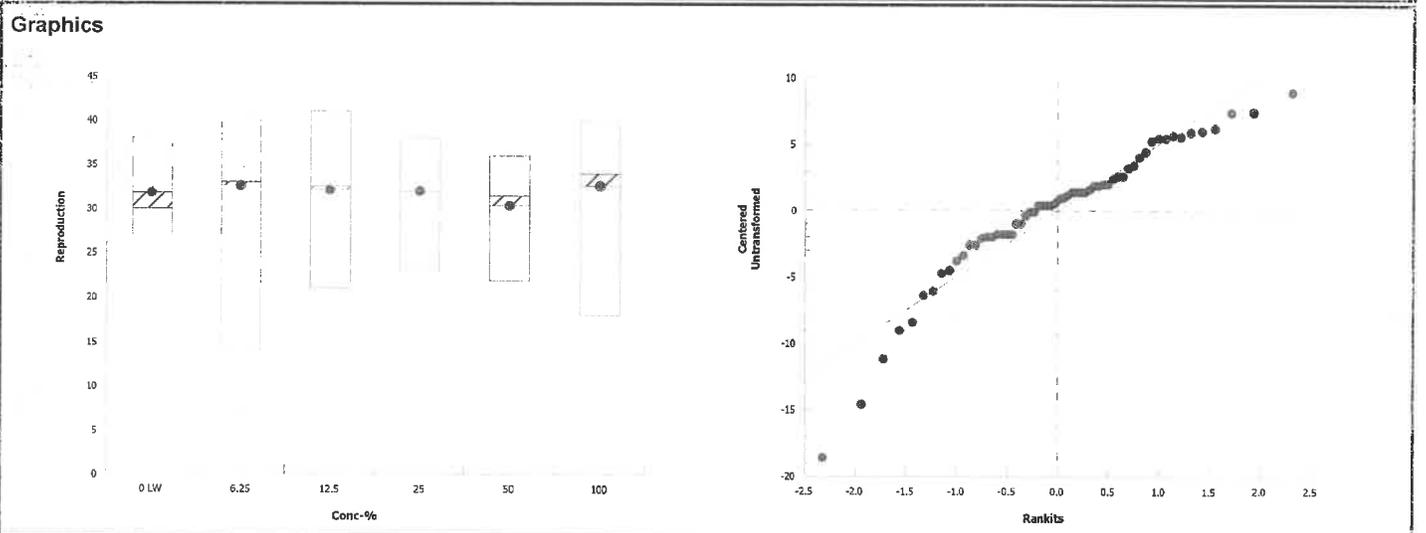
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	32.8833	6.57667	5	0.225	0.9500	Non-Significant Effect
Error	1575.7	29.1796	54			
Total	1608.58		59			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	5.25	15.1	0.3862	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.919	0.946	7.2E-04	Non-Normal Distribution

Reproduction Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	LW	10	31.8	29.1	34.5	30	27	38	1.19	11.84%	0.00%
6.25		10	32.6	27.4	37.8	33	14	40	2.28	22.13%	-2.52%
12.5		10	32.1	28.1	36.1	32.5	21	41	1.79	17.59%	-0.94%
25		10	32	29.1	34.9	32	23	38	1.3	12.84%	-0.63%
50		10	30.4	27	33.8	31.5	22	36	1.5	15.60%	4.40%
100		10	32.6	28.2	37	34	18	40	1.94	18.81%	-2.52%



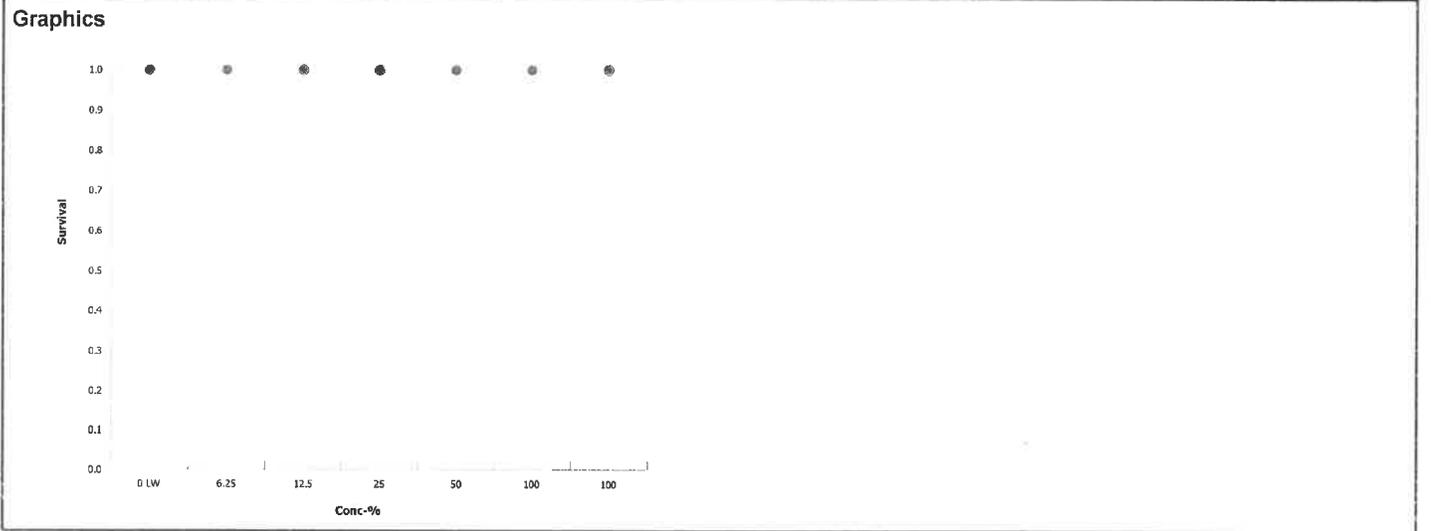
CETIS Analytical Report

Report Date: 10 Dec-18 11:57 (p 1 of 1)
 Test Code: 80718 | 07-0531-0198

Ceriodaphnia Survival and Reproduction Test				Pacific EcoRisk			
Analysis ID: 05-6568-0017		Endpoint: Survival		CETIS Version: CETISv1.9.2			
Analyzed: 10 Dec-18 11:56		Analysis: STP 2xK Contingency Tables		Official Results: Yes			
Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU		
Untransformed	C > T	100	> 100	n/a	1		

Fisher Exact/Bonferroni-Holm Test						
Control	vs	Group	Test Stat	P-Type	P-Value	Decision(α:5%)
Lab Water Contr		6.25	1.000	Exact	1.0000	Non-Significant Effect
		12.5	1.000	Exact	1.0000	Non-Significant Effect
		25	1.000	Exact	1.0000	Non-Significant Effect
		50	1.000	Exact	1.0000	Non-Significant Effect
		100	1.000	Exact	1.0000	Non-Significant Effect

Data Summary							
Conc-%	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
0	LW	10	0	10	1	0	0.0%
6.25		10	0	10	1	0	0.0%
12.5		10	0	10	1	0	0.0%
25		10	0	10	1	0	0.0%
50		10	0	10	1	0	0.0%
100		10	0	10	1	0	0.0%



CETIS Summary Report

Report Date: 12 Dec-18 16:06 (p 1 of 2)
 Test Code: 80715 | 21-0030-3040

Ceriodaphnia Survival and Reproduction Test			Pacific EcoRisk
Batch ID: 04-9221-4438	Test Type: Reproduction-Survival (7d)	Analyst: Wesley Cram	
Start Date: 30 Nov-18 13:13	Protocol: EPA-821-R-02-013 (2002)	Diluent: Laboratory Water	
Ending Date: 06 Dec-18 15:36	Species: Ceriodaphnia dubia	Brine: Not Applicable	
Duration: 6d 2h	Source: In-House Culture	Age: 1	
Sample ID: 11-3555-8654	Code: 70-HITCH-150	Client: Larry Walker Associates	
Sample Date: 29 Nov-18 10:10	Material: Ambient Water	Project: 29633	
Receipt Date: 30 Nov-18 09:03	Source: Calleguas Creek		
Sample Age: 27h (0.3 °C)	Station: HITCH		

Comments:
 Stats include outlier 12.5D

Multiple Comparison Summary							
Analysis ID	Endpoint	Comparison Method	NOEL	LOEL	TOEL	TU	PMSD ✓
10-1881-9883	Reproduction	Bonferroni Adj t Test	100	> 100	n/a	1	11.4%
12-9283-5853	Survival	Fisher Exact/Bonferroni-Holm Test	100	> 100	n/a	1	n/a

Point Estimate Summary							
Analysis ID	Endpoint	Point Estimate Method	Level	%	95% LCL	95% UCL	TU ✓
05-1157-6390	Reproduction	Linear Interpolation (ICPIN)	IC5	>100	n/a	n/a	<1
			IC10	>100	n/a	n/a	<1
			IC15	>100	n/a	n/a	<1
			IC20	>100	n/a	n/a	<1
			IC25	>100	n/a	n/a	<1
			IC40	>100	n/a	n/a	<1
			IC50	>100	n/a	n/a	<1

Reproduction Summary											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	9	30.2	28.4	32.1	28	35	0.795	2.39	7.90%	0.00%
6.25		9	33.3	31.2	35.4	29	38	0.913	2.74	8.22%	-10.29%
12.5		9	31.9	28.3	35.5	21	37	1.57	4.7	14.75%	-5.51%
25		10	33.7	31.6	35.8	29	38	0.943	2.98	8.85%	-11.51%
50		10	34	31.9	36.1	30	39	0.907	2.87	8.43%	-12.50%
100		10	34.1	32.3	35.9	29	37	0.795	2.51	7.37%	-12.83%

Survival Summary											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	9	0.889	0.633	1.000	0.000	1.000	0.111	0.333	37.50%	0.00%
6.25		9	0.889	0.633	1.000	0.000	1.000	0.111	0.333	37.50%	0.00%
12.5		9	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	-12.50%
25		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	-12.50%
50		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	-12.50%
100		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	-12.50%

CETIS Summary Report

Report Date: 12 Dec-18 16:06 (p 2 of 2)
 Test Code: 80715 | 21-0030-3040

Ceriodaphnia Survival and Reproduction Test											Pacific EcoRisk
Reproduction Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	29	29	31	29	30	35	33	28	28	
6.25		32	35	32	31	34	36	29	33	38	
12.5		32	29	34	21	34	37	31	34	35	
25		34	36	29	33	34	38	37	33	34	29
50		33	39	32	34	32	36	34	30	38	32
100		34	35	37	36	36	31	34	36	29	33
Survival Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.000	1.000	
6.25		1.000	1.000	1.000	1.000	1.000	1.000	0.000	1.000	1.000	
12.5		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
25		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
50		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
100		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Survival Binomials											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	1/1	1/1	1/1	1/1	1/1	1/1	1/1	0/1	1/1	
6.25		1/1	1/1	1/1	1/1	1/1	1/1	0/1	1/1	1/1	
12.5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	
25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
50		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
100		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1

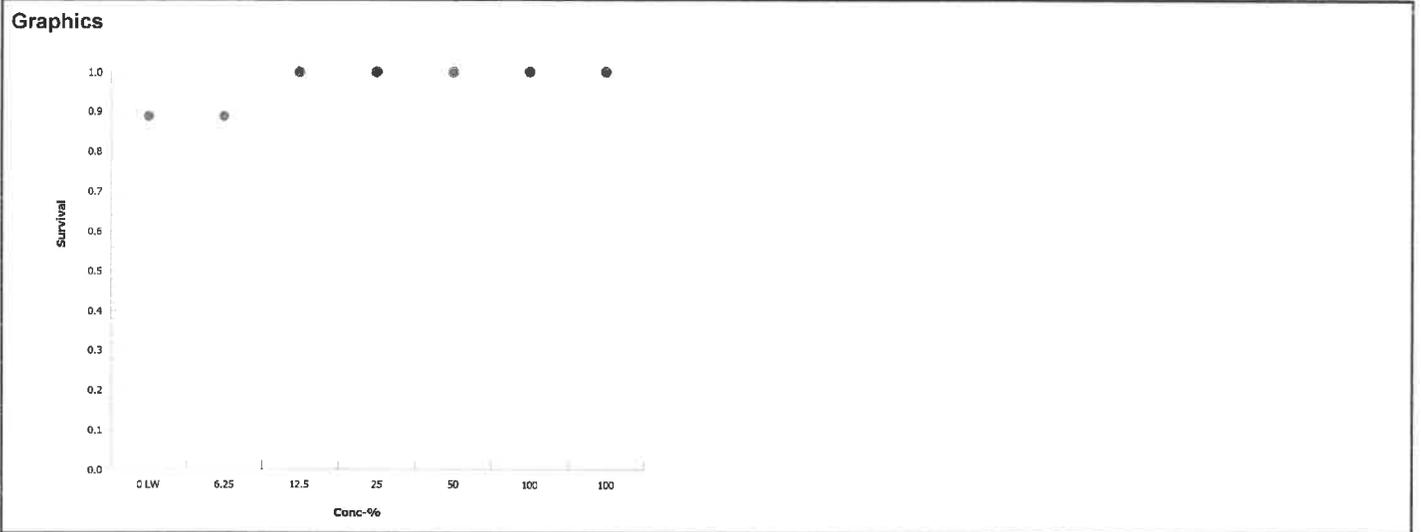
CETIS Analytical Report

Report Date: 12 Dec-18 16:06 (p 1 of 1)
 Test Code: 80715 | 21-0030-3040

Ceriodaphnia Survival and Reproduction Test				Pacific EcoRisk			
Analysis ID:	12-9283-5853	Endpoint:	Survival	CETIS Version:	CETISv1.9.2		
Analyzed:	12 Dec-18 16:01	Analysis:	STP 2xK Contingency Tables	Official Results:	Yes		
Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU		
Untransformed	C > T	100	> 100	n/a	1		

Fisher Exact/Bonferroni-Holm Test						
Control	vs	Group	Test Stat	P-Type	P-Value	Decision(α:5%)
Lab Water Contr		6.25	0.765	Exact	1.0000	Non-Significant Effect
		12.5	1.000	Exact	1.0000	Non-Significant Effect
		25	1.000	Exact	1.0000	Non-Significant Effect
		50	1.000	Exact	1.0000	Non-Significant Effect
		100	1.000	Exact	1.0000	Non-Significant Effect

Data Summary							
Conc-%	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
0	LW	8	1	9	0.889	0.111	0.0%
6.25		8	1	9	0.889	0.111	0.0%
12.5		9	0	9	1	0	-12.5%
25		10	0	10	1	0	-12.5%
50		10	0	10	1	0	-12.5%
100		10	0	10	1	0	-12.5%



Ceriodaphnia Survival and Reproduction Test **Pacific EcoRisk**

Analysis ID: 10-1881-9883 Endpoint: Reproduction CETIS Version: CETISv1.9.2
 Analyzed: 12 Dec-18 16:02 Analysis: Parametric-Multiple Comparison Official Results: Yes

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	C > T	100	> 100	n/a	1	11.36%

Bonferroni Adj t Test

Control	vs	Conc-%	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Water Contr		6.25	-2.12	2.4	3.52	16	CDF	1.0000	Non-Significant Effect
		12.5	-1.14	2.4	3.52	16	CDF	1.0000	Non-Significant Effect
		25	-2.43	2.4	3.43	17	CDF	1.0000	Non-Significant Effect
		50	-2.64	2.4	3.43	17	CDF	1.0000	Non-Significant Effect
		100	-2.71	2.4	3.43	17	CDF	1.0000	Non-Significant Effect

ANOVA Table

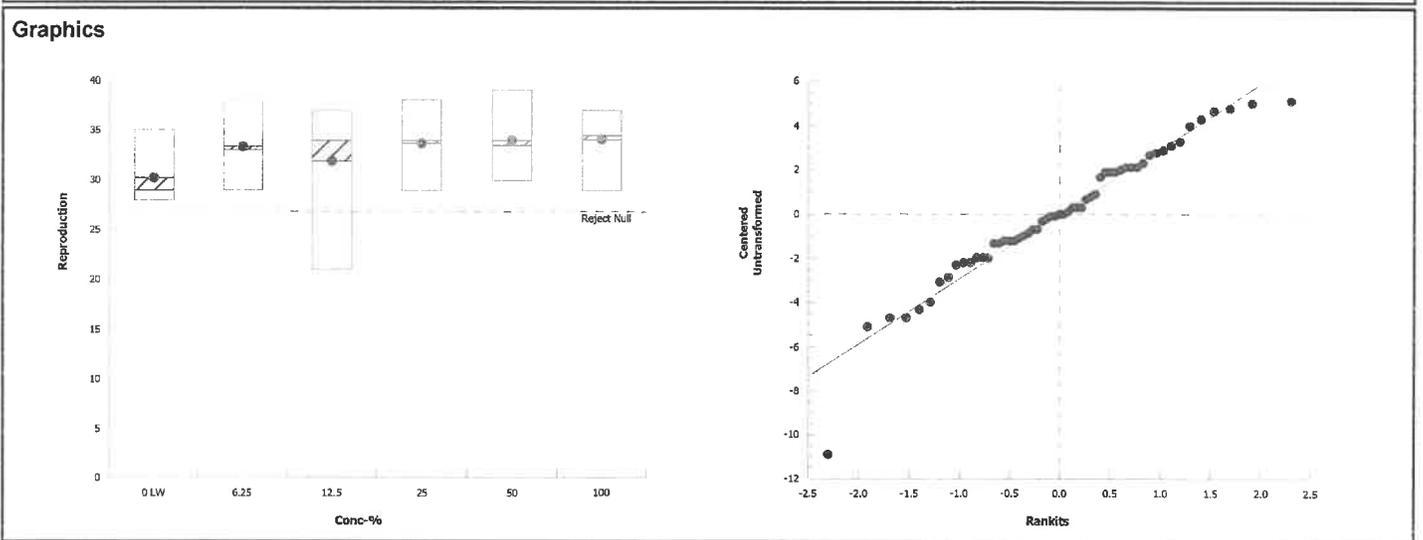
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	108.275	21.655	5	2.24	0.0645	Non-Significant Effect
Error	493.444	9.67538	51			
Total	601.719		56			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	5.46	15.1	0.3622	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.955	0.943	0.0332	Normal Distribution

Reproduction Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	LW	9	30.2	28.4	32.1	29	28	35	0.795	7.90%	0.00%
6.25		9	33.3	31.2	35.4	33	29	38	0.913	8.22%	-10.29%
12.5		9	31.9	28.3	35.5	34	21	37	1.57	14.75%	-5.51%
25		10	33.7	31.6	35.8	34	29	38	0.943	8.85%	-11.51%
50		10	34	31.9	36.1	33.5	30	39	0.907	8.43%	-12.50%
100		10	34.1	32.3	35.9	34.5	29	37	0.795	7.37%	-12.83%



CETIS Analytical Report

Report Date: 12 Dec-18 16:06 (p 1 of 1)
 Test Code: 80715 | 21-0030-3040

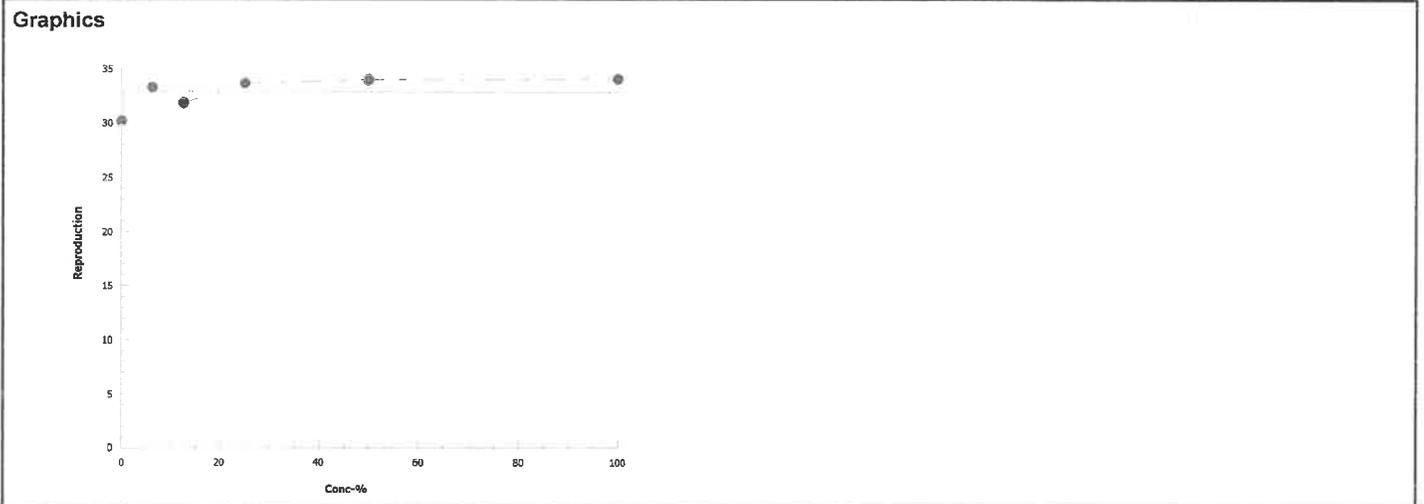
Ceriodaphnia Survival and Reproduction Test **Pacific EcoRisk**

Analysis ID: 05-1157-6390 Endpoint: Reproduction CETIS Version: CETISv1.9.2
 Analyzed: 12 Dec-18 16:02 Analysis: Linear Interpolation (ICPIN) Official Results: Yes

Linear Interpolation Options					
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	222227	200	Yes	Two-Point Interpolation

Point Estimates						
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	>100	n/a	n/a	<1	n/a	n/a
IC10	>100	n/a	n/a	<1	n/a	n/a
IC15	>100	n/a	n/a	<1	n/a	n/a
IC20	>100	n/a	n/a	<1	n/a	n/a
IC25	>100	n/a	n/a	<1	n/a	n/a
IC40	>100	n/a	n/a	<1	n/a	n/a
IC50	>100	n/a	n/a	<1	n/a	n/a

Reproduction Summary			Calculated Variate						
Conc-%	Code	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	9	30.2	28	35	0.795	2.39	7.90%	0.0%
6.25		9	33.3	29	38	0.913	2.74	8.22%	-10.3%
12.5		9	31.9	21	37	1.57	4.7	14.70%	-5.51%
25		10	33.7	29	38	0.943	2.98	8.85%	-11.5%
50		10	34	30	39	0.907	2.87	8.43%	-12.5%
100		10	34.1	29	37	0.795	2.51	7.37%	-12.8%



CETIS Summary Report

Report Date: 10 Dec-18 15:09 (p 1 of 2)
 Test Code: 80717 | 19-0843-0078

Ceriodaphnia Survival and Reproduction Test			Pacific EcoRisk
Batch ID: 06-1789-8083	Test Type: Reproduction-Survival (7d)	Analyst: Wesley Cram	
Start Date: 30 Nov-18 14:02	Protocol: EPA-821-R-02-013 (2002)	Diluent: Laboratory Water	
Ending Date: 06 Dec-18 14:08	Species: Ceriodaphnia dubia	Brine: Not Applicable	
Duration: 6d 0h	Source: In-House Culture	Age: 1	
Sample ID: 15-8235-7761	Code: 70-BELT-208	Client: Larry Walker Associates	
Sample Date: 29 Nov-18 09:15	Material: Ambient Water	Project: 29633	
Receipt Date: 30 Nov-18 09:03	Source: Calleguas Creek		
Sample Age: 29h (0.8 °C)	Station: BELT		

Comments:
 Stats include reproductive outlier: 12.5-H

Multiple Comparison Summary							
Analysis ID	Endpoint	Comparison Method	NOEL	LOEL	TOEL	TU	PMSD ✓
19-9899-9342	Reproduction	Dunnett Multiple Comparison Test	100	> 100	n/a	1	14.1%
13-5580-8251	Survival	Fisher Exact/Bonferroni-Holm Test	100	> 100	n/a	1	n/a

Point Estimate Summary							
Analysis ID	Endpoint	Point Estimate Method	Level	%	95% LCL	95% UCL	TU ✓
13-0370-7173	Reproduction	Linear Interpolation (ICPIN)	IC5	>100	n/a	n/a	<1
			IC10	>100	n/a	n/a	<1
			IC15	>100	n/a	n/a	<1
			IC20	>100	n/a	n/a	<1
			IC25	>100	n/a	n/a	<1
			IC40	>100	n/a	n/a	<1
			IC50	>100	n/a	n/a	<1

Reproduction Summary											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	10	30.8	27.8	33.8	22	36	1.31	4.13	13.41%	0.00%
6.25		10	35	33.2	36.8	31	38	0.789	2.49	7.13%	-13.64%
12.5		10	35.3	32.1	38.5	25	40	1.41	4.45	12.60%	-14.61%
25		10	35.1	31.2	39	23	42	1.71	5.4	15.40%	-13.96%
50		10	37.3	35.6	39	33	41	0.761	2.41	6.45%	-21.10%
100		10	37.8	33.9	41.7	29	45	1.74	5.49	14.53%	-22.73%

Survival Summary											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
6.25		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
12.5		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
25		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
50		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
100		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%

CETIS Summary Report

Report Date: 10 Dec-18 15:09 (p 2 of 2)
 Test Code: 80717 | 19-0843-0078

Ceriodaphnia Survival and Reproduction Test											Pacific EcoRisk
Reproduction Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	22	26	33	30	31	36	33	34	30	33
6.25		37	38	37	33	38	34	33	33	36	31
12.5		37	40	39	33	35	37	36	25	39	32
25		33	37	36	33	39	23	31	38	39	42
50		38	39	39	33	38	37	38	34	41	36
100		31	45	40	36	29	45	37	37	43	35
Survival Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
6.25		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
12.5		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
25		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
50		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
100		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Survival Binomials											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
6.25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
12.5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
50		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
100		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1

CETIS Analytical Report

Report Date: 10 Dec-18 15:09 (p 1 of 1)
 Test Code: 80717 | 19-0843-0078

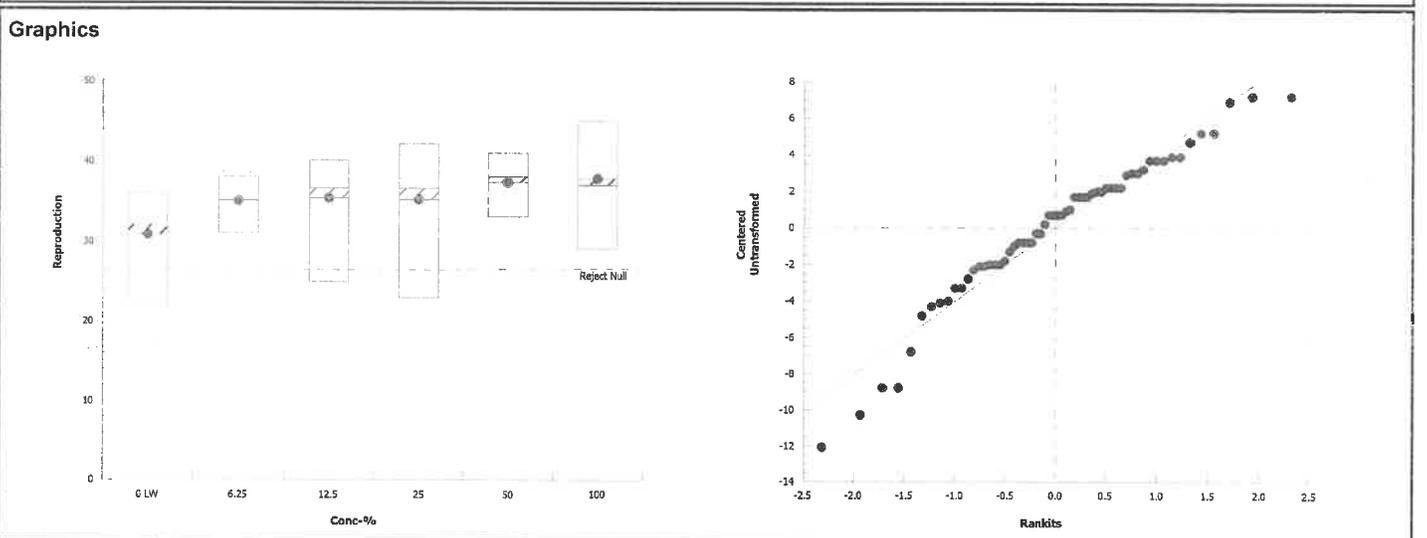
Ceriodaphnia Survival and Reproduction Test						Pacific EcoRisk	
Analysis ID:	19-9899-9342	Endpoint:	Reproduction	CETIS Version:	CETISv1.9.2		
Analyzed:	10 Dec-18 15:09	Analysis:	Parametric-Control vs Treatments	Official Results:	Yes		
Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	PMSD	
Untransformed	C > T	100	> 100	n/a	1	14.12%	

Dunnett Multiple Comparison Test									
Control	vs	Conc-%	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Water Contr		6.25	-2.21	2.29	4.35	18	CDF	0.9998	Non-Significant Effect
		12.5	-2.37	2.29	4.35	18	CDF	0.9999	Non-Significant Effect
		25	-2.26	2.29	4.35	18	CDF	0.9998	Non-Significant Effect
		50	-3.42	2.29	4.35	18	CDF	1.0000	Non-Significant Effect
		100	-3.68	2.29	4.35	18	CDF	1.0000	Non-Significant Effect

ANOVA Table						
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	305.883	61.1767	5	3.39	0.0098	Significant Effect
Error	974.3	18.0426	54			
Total	1280.18		59			

Distributional Tests					
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	10.1	15.1	0.0730	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.953	0.946	0.0208	Normal Distribution

Reproduction Summary											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	LW	10	30.8	27.8	33.8	32	22	36	1.31	13.41%	0.00%
6.25		10	35	33.2	36.8	35	31	38	0.789	7.13%	-13.64%
12.5		10	35.3	32.1	38.5	36.5	25	40	1.41	12.60%	-14.61%
25		10	35.1	31.2	39	36.5	23	42	1.71	15.40%	-13.96%
50		10	37.3	35.6	39	38	33	41	0.761	6.45%	-21.10%
100		10	37.8	33.9	41.7	37	29	45	1.74	14.53%	-22.73%



CETIS Analytical Report

Report Date: 10 Dec-18 15:09 (p 1 of 1)
 Test Code: 80717 | 19-0843-0078

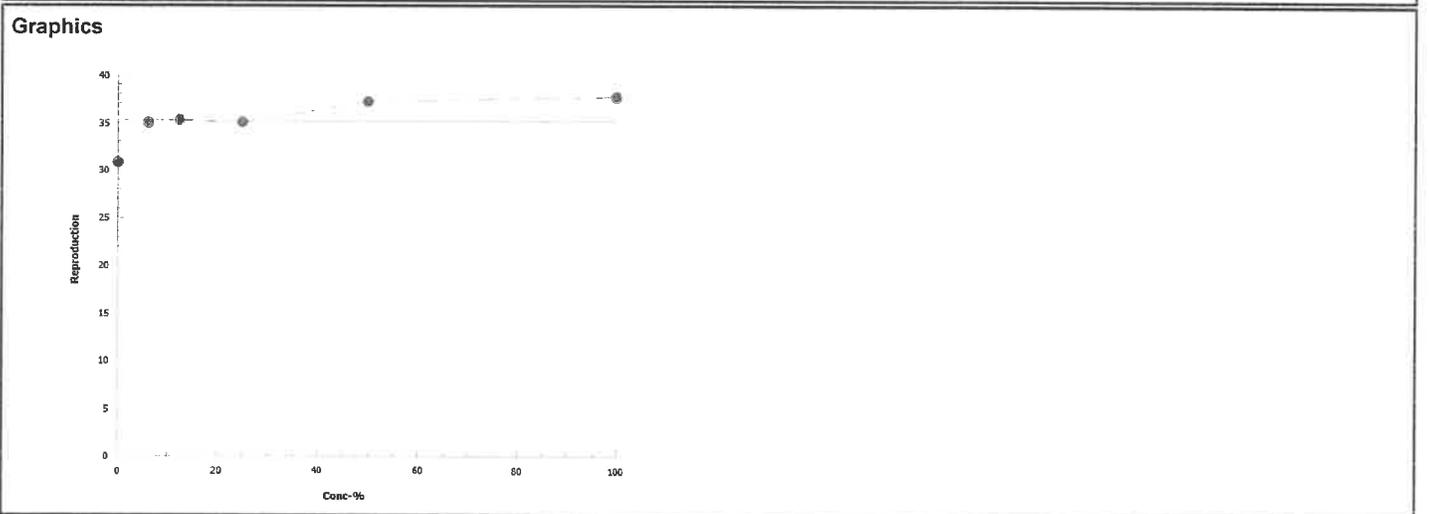
Ceriodaphnia Survival and Reproduction Test Pacific EcoRisk

Analysis ID: 13-0370-7173 Endpoint: Reproduction CETIS Version: CETISv1.9.2
 Analyzed: 10 Dec-18 15:09 Analysis: Linear Interpolation (ICPIN) Official Results: Yes

Linear Interpolation Options					
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	488055	200	Yes	Two-Point Interpolation

Point Estimates						
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	>100	n/a	n/a	<1	n/a	n/a
IC10	>100	n/a	n/a	<1	n/a	n/a
IC15	>100	n/a	n/a	<1	n/a	n/a
IC20	>100	n/a	n/a	<1	n/a	n/a
IC25	>100	n/a	n/a	<1	n/a	n/a
IC40	>100	n/a	n/a	<1	n/a	n/a
IC50	>100	n/a	n/a	<1	n/a	n/a

Reproduction Summary			Calculated Variate						
Conc-%	Code	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	10	30.8	22	36	1.31	4.13	13.40%	0.0%
6.25		10	35	31	38	0.789	2.49	7.13%	-13.6%
12.5		10	35.3	25	40	1.41	4.45	12.60%	-14.6%
25		10	35.1	23	42	1.71	5.4	15.40%	-14.0%
50		10	37.3	33	41	0.761	2.41	6.45%	-21.1%
100		10	37.8	29	45	1.74	5.49	14.50%	-22.7%



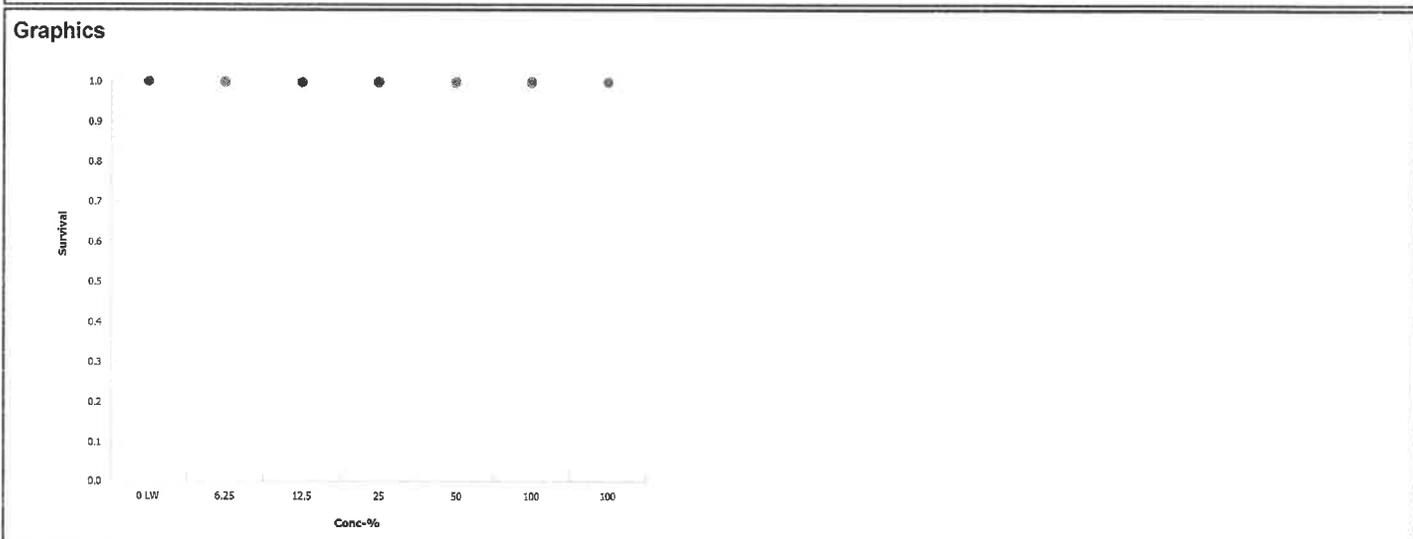
CETIS Analytical Report

Report Date: 10 Dec-18 15:09 (p 1 of 1)
 Test Code: 80717 | 19-0843-0078

Ceriodaphnia Survival and Reproduction Test			Pacific EcoRisk			
Analysis ID: 13-5580-8251	Endpoint: Survival	CETIS Version: CETISv1.9.2		Official Results: Yes		
Analyzed: 10 Dec-18 15:09	Analysis: STP 2xK Contingency Tables					
Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	
Untransformed	C > T	100	> 100	n/a	1	

Fisher Exact/Bonferroni-Holm Test						
Control	vs	Group	Test Stat	P-Type	P-Value	Decision(α:5%)
Lab Water Contr		6.25	1.000	Exact	1.0000	Non-Significant Effect
		12.5	1.000	Exact	1.0000	Non-Significant Effect
		25	1.000	Exact	1.0000	Non-Significant Effect
		50	1.000	Exact	1.0000	Non-Significant Effect
		100	1.000	Exact	1.0000	Non-Significant Effect

Data Summary							
Conc-%	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
0	LW	10	0	10	1	0	0.0%
6.25		10	0	10	1	0	0.0%
12.5		10	0	10	1	0	0.0%
25		10	0	10	1	0	0.0%
50		10	0	10	1	0	0.0%
100		10	0	10	1	0	0.0%



Appendix D

Test Data and Summary of Statistics for the Reference Toxicant Evaluation of the *Ceriodaphnia dubia*

CETIS Summary Report

Report Date: 07 Dec-18 11:46 (p 1 of 2)
 Test Code: 80993 | 06-8813-8043

Ceriodaphnia Survival and Reproduction Test **Pacific EcoRisk**

Batch ID: 04-4012-8022	Test Type: Reproduction-Survival (7d)	Analyst: Ashleigh Findley
Start Date: 30 Nov-18 14:32	Protocol: EPA-821-R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 06 Dec-18 14:45	Species: Ceriodaphnia dubia	Brine: Not Applicable
Duration: 6d 0h	Source: In-House Culture	Age: 1

Sample ID: 19-1961-4729	Code: NaCl	Client: Reference Toxicant
Sample Date: 30 Nov-18 14:32	Material: Sodium chloride	Project: 29671
Receipt Date: 30 Nov-18 14:32	Source: Reference Toxicant	
Sample Age: n/a (24 °C)	Station: In House	

Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	NOEL	LOEL	TOEL	TU	PMSD ✓
17-2119-1845	Reproduction	Steel Many-One Rank Sum Test	500	1000	707.1		17.4%
03-7152-5320	Survival	Fisher Exact/Bonferroni-Holm Test	1500	2000	1732		n/a

Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	Level	mg/L	95% LCL	95% UCL	TU	✓
05-8989-8676	Reproduction	Linear Interpolation (ICPIN)	IC5	142	93	563		
			IC10	283	186	768		
			IC15	425	279	1050		
			IC20	1040	372	1130		
			IC25	1130	465	1230		
			IC40	1410	1300	1520		
14-0037-6886	Survival	Regression: Log-Normal (Probit)	EC5	1500	767	1710		
			EC10	1570	897	1770		
			EC15	1620	996	1810		
			EC20	1660	1080	1850		
			EC25	1700	1160	1880		
			EC40	1800	1370	1980		
EC50	1860	1510	2050					

Reproduction Summary

Conc-mg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	10	32.6	31.2	34	30	36	0.6	1.9	5.82%	0.00%
500		10	26.2	18.6	33.8	6	35	3.37	10.7	40.66%	19.63%
1000		10	27.5	25.5	29.5	21	31	0.898	2.84	10.32%	15.64%
1500		10	17.9	15	20.8	12	24	1.3	4.12	23.03%	45.09%
2000		10	1.4	-0.543	3.34	0	7	0.859	2.72	194.01%	95.71%
2500		10	0	0	0	0	0	0	0		100.00%

Survival Summary

Conc-mg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
500		10	0.900	0.674	1.000	0.000	1.000	0.100	0.316	35.14%	10.00%
1000		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
1500		10	0.900	0.674	1.000	0.000	1.000	0.100	0.316	35.14%	10.00%
2000		10	0.300	0.000	0.646	0.000	1.000	0.153	0.483	161.02%	70.00%
2500		10	0.000	0.000	0.000	0.000	0.000	0.000	0.000		100.00%

CETIS Summary Report

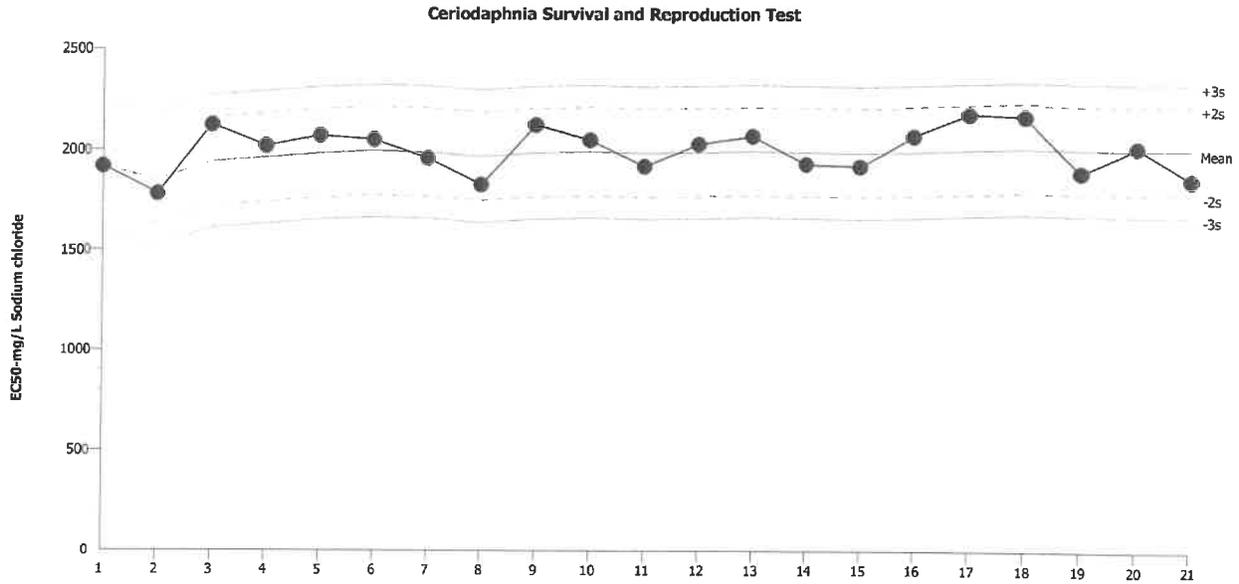
Report Date: 07 Dec-18 11:46 (p 2 of 2)
 Test Code: 80993 | 06-8813-8043

Ceriodaphnia Survival and Reproduction Test											Pacific EcoRisk
Reproduction Detail											
Conc-mg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	30	32	36	33	33	30	34	31	33	34
500		27	7	33	30	33	32	6	31	35	28
1000		21	28	30	26	30	28	27	26	31	28
1500		12	14	12	18	18	20	24	21	22	18
2000		0	1	0	0	7	0	6	0	0	0
2500		0	0	0	0	0	0	0	0	0	0
Survival Detail											
Conc-mg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
500		1.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1000		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1500		1.000	1.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2000		0.000	1.000	0.000	0.000	1.000	0.000	1.000	0.000	0.000	0.000
2500		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Survival Binomials											
Conc-mg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	LW	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
500		1/1	0/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
1000		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
1500		1/1	1/1	0/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
2000		0/1	1/1	0/1	0/1	1/1	0/1	1/1	0/1	0/1	0/1
2500		0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1

Ceriodaphnia Survival and Reproduction Test

Pacific EcoRisk

Test Type: Reproduction-Survival (7d) Organism: Ceriodaphnia dubia (Water Flea) Material: Sodium chloride
 Protocol: EPA-821-R-02-013 (2002) Endpoint: Survival Source: Reference Toxicant-REF



Mean: 2006 Count: 20 -2s Warning Limit: 1785 -3s Action Limit: 1675
 Sigma: 110.3 CV: 5.50% +2s Warning Limit: 2227 +3s Action Limit: 2337

Quality Control Data

Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2018	Aug	28	14:48	1918	-87.64	-0.7945			06-2614-3668	06-1377-5657
2			29	14:50	1780	-225.7	-2.046	(-)		03-9264-7933	02-8153-7063
3		Sep	11	14:40	2125	118.7	1.076			17-7763-6788	12-2919-7286
4			12	14:04	2019	12.9	0.117			17-4569-5270	18-9812-2558
5			18	12:26	2071	65.13	0.5905			20-2968-4066	17-1744-5971
6			19	11:34	2050	43.88	0.3979			16-4284-4765	03-9142-8586
7			25	17:25	1957	-48.58	-0.4404			14-3900-9954	21-1313-3142
8		Oct	3	15:35	1825	-181	-1.641			07-6007-9059	16-4049-1493
9			9	16:46	2125	118.7	1.076			04-5469-0891	20-3055-9291
10			11	14:50	2050	43.88	0.3979			20-2439-9413	10-4540-0750
11			16	13:11	1918	-87.64	-0.7945			03-5850-8111	20-6659-7771
12			18	15:16	2032	25.64	0.2324			05-8033-5759	02-3631-3458
13			19	15:05	2071	65.13	0.5905			02-1441-2791	17-1340-7957
14			23	15:40	1930	-75.54	-0.6848			10-7048-8617	14-7553-0745
15			30	10:35	1918	-87.64	-0.7945			05-8645-6876	01-6608-5367
16			31	14:47	2071	65.13	0.5905			15-6701-8818	10-0650-6684
17		Nov	6	15:55	2180	173.7	1.575			06-4622-5066	07-3608-9199
18			8	16:11	2170	163.8	1.485			07-3988-3316	08-3419-0126
19			13	16:18	1890	-115.9	-1.051			10-7032-1533	04-1396-8369
20			27	13:39	2019	12.9	0.117			01-2067-8558	07-2924-3826
21			30	14:32	1855	-150.9	-1.368			06-8813-8043	14-0037-6886

Ceriodaphnia Survival and Reproduction Test

Pacific EcoRisk

Test Type: Reproduction-Survival (7d)

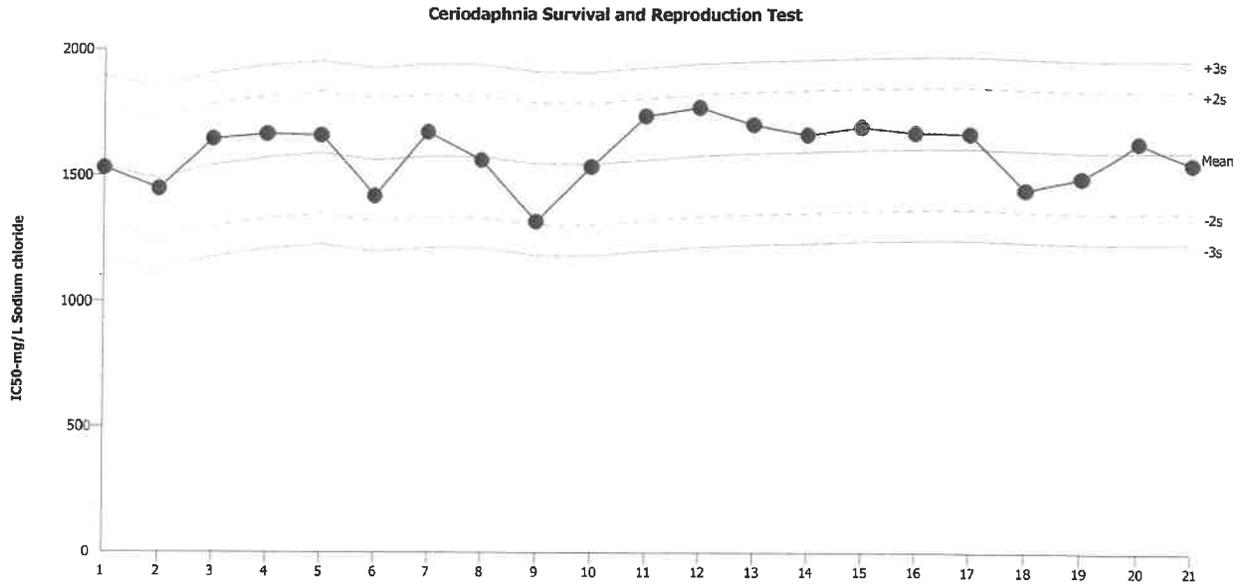
Organism: Ceriodaphnia dubia (Water Flea)

Material: Sodium chloride

Protocol: EPA-821-R-02-013 (2002)

Endpoint: Reproduction

Source: Reference Toxicant-REF



Mean: 1597 Count: 20 -2s Warning Limit: 1354 -3s Action Limit: 1232
 Sigma: 121.6 CV: 7.61% +2s Warning Limit: 1840 +3s Action Limit: 1962

Quality Control Data

Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2018	Aug	28	14:48	1531	-66.18	-0.5442			06-2614-3668	05-2952-0377
2			29	14:50	1447	-150.1	-1.234			03-9264-7933	16-8090-8266
3		Sep	11	14:40	1646	49.43	0.4065			17-7763-6788	12-3840-6964
4			12	14:04	1666	68.78	0.5656			17-4569-5270	09-7553-7941
5			18	12:26	1660	63.12	0.5191			20-2968-4066	11-3715-5377
6			19	11:34	1418	-178.9	-1.471			16-4284-4765	11-9866-6961
7			25	17:25	1673	76.42	0.6284			14-3900-9954	18-5535-4978
8		Oct	3	15:35	1561	-36.21	-0.2978			07-6007-9059	08-5057-3824
9			9	16:46	1317	-280.2	-2.305	(-)		04-5469-0891	07-2283-5254
10			11	14:50	1535	-61.65	-0.507			20-2439-9413	04-4179-5524
11			16	13:11	1738	141.1	1.16			03-5850-8111	05-4684-8364
12			18	15:16	1772	174.7	1.437			05-8033-5759	10-5626-5735
13			19	15:05	1704	106.9	0.8795			02-1441-2791	18-9658-3991
14			23	15:40	1663	66.4	0.546			10-7048-8617	19-2272-0008
15			30	10:35	1694	96.9	0.7969			05-8645-6876	20-8136-4320
16			31	14:47	1670	73.45	0.6041			15-6701-8818	09-4862-8045
17		Nov	6	15:55	1669	71.63	0.5891			06-4622-5066	01-6239-3016
18			8	16:11	1445	-152.4	-1.253			07-3988-3316	04-7517-9392
19			13	16:18	1493	-104.4	-0.8587			10-7032-1533	07-8371-8990
20			27	13:39	1633	35.89	0.2952			01-2067-8558	17-6140-1063
21			30	14:32	1548	-48.52	-0.399			06-8813-8043	05-8989-8676

Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: _____ Reference Toxicant: _____ Material: Sodium Chloride Test Date: 11/30/18
 Project #: 29671 Test ID: 80993 Randomization: 10-7-4 Control Water: Mod EPAMH

Day	pH		D.O.		Cond. (µS/cm)		Temp (°C)	Survival / Reproduction										SIGN-OFF
	New	Old	New	Old	New	Old		A	B	C	D	E	F	G	H	I	J	
0	7.82		8.2		359		24.0	0	0	0	0	0	0	0	0	0	0	Date: 11/30/18 New WQ: _____ Test Init: <u>TF</u> Sol'n Prep: <u>KL</u> <u>Pe</u> Time: <u>1432</u>
1	7.92	7.69	8.6	7.9	364	365	24.8	0	0	0	0	0	0	0	0	0	0	Date: 12/1/18 New WQ: <u>msc</u> Counts: <u>77</u> Sol'n Prep: <u>SW</u> Old WQ: <u>TP</u> Time: <u>1215</u>
2	7.89	7.65	8.6	7.9	³⁶⁵ 364 382	382	24.3	0	0	0	0	0	0	0	0	0	0	Date: 12/1/18 New WQ: <u>TP</u> Counts: <u>86</u> Sol'n Prep: <u>KL</u> Old WQ: <u>TP</u> Time: <u>1337</u>
3	7.96	7.85	8.9	7.9	358	389	25.1	5	5	5	6	6	5	5	5	6	6	Date: 12/3/18 New WQ: <u>msc</u> Counts: <u>122</u> Sol'n Prep: <u>KB</u> Old WQ: <u>LL</u> Time: <u>1440</u>
4	8.20	7.87	8.8	7.8	373	381	26.0	10	0	0	0	0	0	10	0	0	11	Date: 12/4/18 New WQ: <u>JR</u> Counts: <u>21</u> Sol'n Prep: <u>KB</u> Old WQ: <u>TA</u> Time: <u>1417</u>
5	7.89	7.82	7.2	7.7	359	381	24.4	0	12	13	10	10	8	0	11	10	0	Date: 12/5/18 New WQ: <u>JR</u> Counts: <u>52</u> Sol'n Prep: <u>KL</u> Old WQ: <u>JR</u> ^{14/18} Time: <u>1520</u>
6	—	7.70	—	7.4	—	388	24.0	15	15	18	17	17	17	19	15	17	17	Date: 12/6/18 New WQ: <u>—</u> Counts: <u>103</u> Sol'n Prep: <u>—</u> Old WQ: <u>JR</u> Time: <u>1445</u>
7																		Date: _____ New WQ: _____ Counts: _____ Sol'n Prep: _____ Old WQ: _____ Time: _____
8																		Date: _____ New WQ: _____ Counts: _____ Sol'n Prep: _____ Old WQ: _____ Time: _____
Total=								30	32	36	33	33	30	34	31	33	34	Mean Neonates/Female = <u>32.6</u>

Day	pH		D.O.		Cond. (µS/cm)		Temp (°C)	Survival / Reproduction										RT BATCH NUMBER
	New	Old	New	Old	New	Old		A	B	C	D	E	F	G	H	I	J	
0	7.79		8.1		1365		24.3	0	0	0	0	0	0	0	0	0	0	287/288
1	7.83	7.69	8.7	7.8	1343	1387	24.9	0	0	0	0	0	0	0	0	0	0	288
2	7.87	7.68	8.7	7.9	1341	1445	24.7	0	0	0	0	0	0	0	0	0	0	288
3	7.92	7.84	9.0	7.8	1371	1432	25.3	5	6	6	6	5	4	6	5	5	5	288
4	8.11	7.85	8.9	7.9	1369	1478	25.8	9	0	0	8	0	0	0	0	0	9	288
5	7.85	7.82	7.3	7.6	1327	1466	24.6	0	X/1	10	0	12	12	0	11	12	0	288
6	—	7.70	—	7.5	—	1416	24.0	13	—	17	16	16	16	0	15	18	14	—
7																		
8																		
Total=								27	X/7	33	30	33	32	6	32	35	28	Mean Neonates/Female = <u>26.3</u>

Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: _____ Reference Toxicant: _____ Material: Sodium Chloride Test Date: 11/30/19
 Project #: 29671 Test ID: 80993 Randomization: 10-7.4 Control Water: Mod EPAMH

	Day	pH		D.O.		Cond. (µS/cm)		Temp (°C)	Survival / Reproduction										SIGN-OFF
		New	Old	New	Old	New	Old		A	B	C	D	E	F	G	H	I	J	
1000 mg/L	0	7.77		8.2		2335		24.3	0	0	0	0	0	0	0	0	0	0	
	1	7.80	7.67	8.7	7.7	2319	2395	24.7	0	0	0	0	0	0	0	0	0	0	
	2	7.79	7.71	8.9	8.1	2320	2461	24.7	0	0	0	0	0	0	0	0	0	0	
	3	7.86	7.85	9.1	7.7	2327	2483	25.0	4	4	5	4	5	5	6	5	5	5	
	4	8.06	7.83	9.1	7.7	2267	2509	25.8	7	0	0	0	0	0	0	0	0	0	
	5	7.84	7.52	7.5	7.6	2285	2420	24.8	0	9	12	12	10	10	9	11	12	10	
	6	-	7.72	-	7.6	-	2455	24.6	10	15	13	10	15	13	12	10	14	13	
	7																		
	8																		
Total=									21	28	30	24	30	28	27	24	31	28	Mean Neonates/Female = 27.5
1500 mg/L	0	7.68		8.1		3258		24.2	0	0	0	0	0	0	0	0	0	0	
	1	7.84	7.66	8.9	7.8	3257	3381	24.7	0	0	0	0	0	0	0	0	0	0	
	2	7.74	7.71	9.1	8.1	3281	3491	24.4	0	0	0	0	0	0	0	0	0	0	
	3	7.80	7.89	9.2	7.9	3283	3512	25.3	0	0	0	4	0	0	3	0	3	4	
	4	8.01	7.84	9.1	8.0	3235	3539	25.9	0	2	3	0	1	1	1	1	3	0	
	5	7.83	7.57	7.6	7.7	3191	3460	25.0	4	6	9	6	7	8	6	8	6	5	
	6	-	7.73	-	7.5	-	3432	24.5	8	6	8	8	10	11	14	12	10	9	
	7																		
	8																		
Total=									12	14	12	18	18	20	24	21	22	18	Mean Neonates/Female = 17.9

Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: _____ Reference Toxicant: _____ Material: Sodium Chloride Test Date: 11/30/18
 Project #: 29671 Test ID: 80993 Randomization: 10-7-4 Control Water: Mod EPAMH

	Day	pH		D.O.		Cond. (µS/cm)		Temp (°C)	Survival / Reproduction										SIGN-OFF	
		New	Old	New	Old	New	Old		A	B	C	D	E	F	G	H	I	J		
2000 mg/L	0	7.72		8.2		4213		24.1	0	0	0	0	0	0	0	0	0	0		
	1	7.76	7.67	9.0	7.9	4217	4396	24.7	0	0	0	0	0	0	0	0	0	0	0	
	2	7.76	7.71	9.3	8.4	4209	4516	24.7	1/0	0	1/0	1/0	0	1/0	0	1/0	1/0	1/0		
	3	7.78	7.87	9.5	8.0	4208	4422	25.0	-	0	-	-	0	-	0	-	-	-		
	4	7.87	7.83	9.4	8.0	4116	4441	25.7	-	0	-	-	0	-	0	-	-	-		
	5	7.76	7.56	8.0	8.1	4148	4703	24.3	-	1	-	-	2	-	0	-	-	-		
	6	-	7.70	-	7.9	-	4346		24.0	-	0	-	-	5	-	6	-	-	-	
	7									-		-	-			-	-	-		
	8									-		-	-			-	-	-		
Total=									1/0	1	1/0	1/0	7	1/0	6	1/0	1/0	1/0	Mean Neonates/Female = 1.4	
2500 mg/L	0	7.68		8.3		5131		25.1	0	0	0	0	0	0	0	0	0	0		
	1	7.71	7.69	9.2	8.1	5041	5385	24.8	0	0	0	0	0	0	0	0	1/0	0		
	2	7.73	7.71	9.6	8.3	5146	5364	24.0	1/0	1/0	1/0	1/0	1/0	1/0	1/0	1/0	1/0	-	1/0	
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	4									-	-	-	-	-	-	-	-	-		
	5									-	-	-	-	-	-	-	-	-		
	6									-	-	-	-	-	-	-	-	-		
	7									-	-	-	-	-	-	-	-	-		
	8									-	-	-	-	-	-	-	-	-		
Total=									1/0	1/0	1/0	1/0	1/0	1/0	1/0	1/0	1/0	1/0	Mean Neonates/Female = 0	