Wyckoff Groundwater Treatment Plant: Second Quarter 2023 Bioassay Monitoring

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1. Introduction

This technical memorandum summarizes information obtained from the second quarter 2023 sampling event performed at the U.S. Environmental Protection Agency (EPA) Wyckoff/Eagle Harbor Superfund Site (the Site) groundwater treatment plant (GWTP) located at 5350 Creosote Place NE, Bainbridge Island, Washington. CH2M HILL Engineers, Inc. (CH2M)¹ conducted this sampling event to support the current biomonitoring requirements of the Site's National Pollutant Discharge Elimination System (NPDES).

Sampling was generally conducted in accordance with the final *Quality Assurance Project Plan, Groundwater Treatment Plant Operations and Maintenance* (QAPP; CH2M, 2022). While there were deviations from the QAPP as noted in the Laboratory Quality Data Review section, the data is deemed usable, and the sampling is considered to have met the monitoring requirements of the NPDES permit.

The current NPDES permit does not include effluent limits for chronic toxicity. Chronic toxicity testing was conducted on the effluent samples per the requirements outlined in the NPDES permit. The current NPDES permit does not include specific dilution series for chronic toxicity tests. For the mussel larvae chronic toxicity testing conducted during the second quarter 2023 sampling event, 100 percent effluent is the highest concentration tested due to the addition of artificial sea salts to achieve a salinity of 30 parts per trillion (ppt) per the *Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms* (EPA/600/R-95/136, 1995).

No statistically significant effects on the survival endpoint were observed for all test concentrations and species, indicating no evidence of the presence of chronic toxicity for the survival endpoint. A statistically significant effect was detected at the highest test concentration (100 percent effluent concentration) for the development endpoint of the chronic toxicity test.

As stated above, the current NPDES permit does not include effluent limit for chronic toxicity. The chronic toxicity test requirement section of the permit (Section II.8) specifies the following:

"EPA and Ecology will evaluate the results to determine whether they indicate the occurrence of chronic toxicity outside the mixing zone. If it appears that this may be occurring, a toxicity evaluation and reduction plan will be prepared within 90 days. The evaluation portion of the plan may include additional toxicity testing if needed to follow up on initial results or gather information for a possible toxicity limit in the future."

The observed results for the chronic developmental endpoint would therefore trigger this requirement.

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 $^{^{1}}$ CH2M HILL Engineers, Inc. is now a wholly owned subsidiary of Jacobs Engineering Group Inc.

2. Sampling and Analysis Results

Biomonitoring samples were collected per the monitoring frequency included in the NPDES permit. Samples were collected from a 24-hr. autosampler collection point at the effluent tank of the treatment system. Water samples were collected on April 11, 2023. Chemical testing was conducted on a split of each sample collected for bioassay testing per the NPDES permit requirement. The bioassays were performed by EcoAnalysts, Inc. (EcoAnalysts), Port Gamble, Washington, a Washington State Department of Ecology accredited lab. Table 1 lists the sample Laboratory ID and sampling analysis methods. EcoAnalysts sampling analysis report for chronic toxicity testing is provided in Attachment 1.

Table 1. Biological Testing Summary

Laboratory	Laboratory ID	Method	Test Type/Descriptor/Species
EcoAnalysts	P230411.01	EPA/600/R-95-136 Method 1005.0;	Chronic/48-hr Survival and
		ASTM E724-89	Development/Mytilus galloprovincialis
		TOX042.12	(Mussel)

No statistically significant effects were detected in any effluent concentration tested for the survival endpoint of the bivalve test. This result indicates a No Observed Effect Concentration of 100 percent of the effluent concentration and a chronic toxic unit of 1. A statistically significant effect was detected in the 100 percent effluent concentration for the development endpoint, which results in a No Observed Effect Concentration (NOEC) of 50 and a chronic toxic unit of 2. Overall, the Effect Concentration 50 is expected to affect 50 percent of the organisms and determined to be greater than 100 percent of the effluent concentration.

3. Laboratory Quality Data Review

A CH2M chemist validated the bioassay results Stage 2A in accordance with the QAPP. Additional examination of the data beyond the data validation scope was performed because a statistically significant biological response by the test organism was observed. The QAPP (CH2M 2022) was cited by EcoAnalysts and the appropriate species of mussel specified in the QAPP was used for the analytical testing.

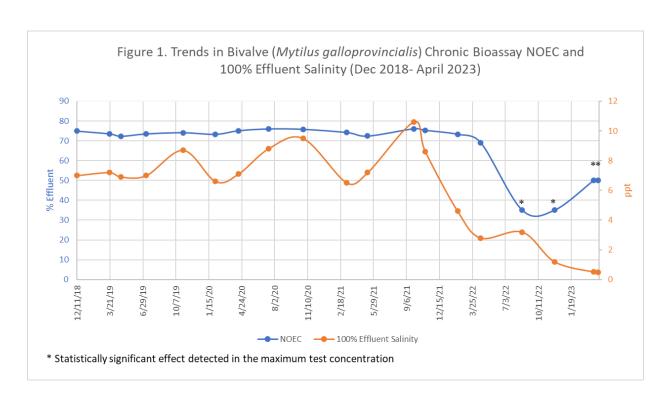
The data were 100 percent complete, and method and QAPP quality control requirements were met, with the following exceptions noted:

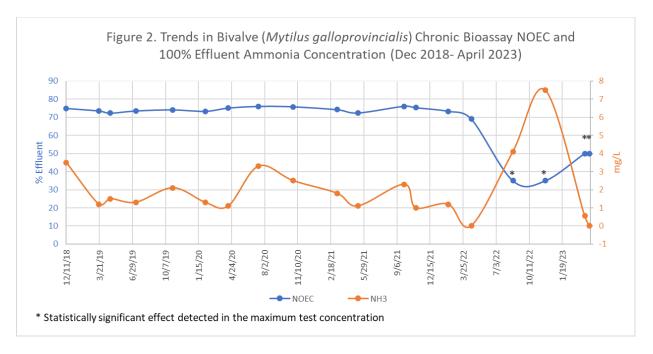
- The QAPP reference toxicant copper sulfate was not used. The reference toxicant utilized was ammonia. A review of the total and unionized ammonia quality control data indicates the ammonia reference toxicant test results were within two standard deviations of the laboratory mean at the time of testing. There is no impact to the data and an addendum to the QAPP to utilize ammonia as reference toxicant has been requested in May 2023 after these samples were collected and analyzed.
- 2. The EPA method indicates that hypersaline brine (HSB) is to be used to adjust salinity. EcoAnalysts utilized artificial sea salts to adjust salinity. The method indicates that the use artificial sea salts is only necessary when high effluent concentrations preclude the use of HSB alone. The use of HSB was discussed with EcoAnalysts in May 2023 after these samples were collected and analyzed. EcoAnalysts has indicated they will follow method specification going forward.

4. Trends

A review of bioassay data collected from 2007 through the second quarter of 2023 indicated there were no statistically significant effect detected for the survival endpoint for any test concentrations and species. No statistically significant effect was detected for the sublethal endpoints with the exception for the sampling events since the third quarter of 2022. For these four sampling events, statistically significant effects were detected in the maximum test concentrations for the developmental endpoint of the chronic bioassay test.

Figure 1 shows the bivalve chronic bioassay NOEC and salinity for the 100 percent effluent samples from December 2018 through April 2023. NOEC for bivalve chronic bioassay tests conducted prior to December 2018 were 70 percent. HSB with a fixed concentration was used for the salinity adjustment for chronic toxicity testing conducted prior to December 2018, therefore the maximum test concentrations remained the same for that test period. The laboratories that conducted the testing from December 2018 to November 2022 used HSB created at their laboratory (i.e. concentration varies slightly from batch to batch), therefore the resulting maximum test concentrations varies slightly for the different monitoring events. The maximum test concentration for the current quarter (i.e. first and second quarter of 2023) is higher than previous monitoring events (i.e. 100 percent versus ~70 percent) due to the use of artificial sea salts as opposed to HSB. This resulted in a higher NOEC than those reported for the third and fourth quarter of 2022 despite a statistically significant effect was only observed in the maximum test concentration in the samples in all three sampling events. A review of the water quality parameters measured for the bioassay samples indicated the lowest detected salinity levels were detected in the samples collected from the most recent four sampling events (see Figure 1). While the elevated ammonia concentrations detected in the third and fourth quarter 2022 may have contributed to the observed toxicity during those sampling events, ammonia does not appear to be contributing to the toxicity observed in the monitoring events for the first and second quarter of 2023 (see Figure 2).





5. Overall Assessment

While the current NPDES permit does not include specific whole effluent toxicity (WET) limits, the Washington Administrative Code (WAC) 173-205-020 specifies the following:

"Whole effluent toxicity performance standard" means a level of effluent toxicity that is consistently so much lower than is necessary to meet state water quality standards (chapter 173-201A WAC) that no reasonable potential exists to violate the water quality standards. For acute toxicity, the performance standard is the median survival in one hundred percent effluent being equal to or greater than eighty percent and no individual test result showing less than sixty-five percent survival in one hundred percent effluent. For chronic toxicity, the performance standard is no chronic toxicity test demonstrating a statistically significant difference in response between the control and a test concentration equal to the acute critical effluent concentration. For permittees that are ineligible for an approved mixing zone, the performance standard will equal or be close to equal (in the case of acute toxicity) the water quality-based effluent toxicity limit.

Based on sampling results, the survival endpoint of the chronic toxicity test met the WET performance standard because survival rates were within acceptable limits. While the development endpoint of the chronic toxicity test showed a statistically significant response relative to the lab control, uncertainty exists as the observed toxicity may be related to salinity adjustment using artificial sea salts. As there are no established chronic toxicity criteria included in the permit, CH2M recommends an accelerated schedule of WET testing to establish whether a pattern of chronic toxicity exists. Consistent with WAC 173-205-090(1)(b), it is recommended that the accelerated testing to be conducted monthly for three months using the same toxicity test as in the routine effluent WET testing where a statistically significant effect is detected. Due to uncertainties with the toxicity results relating to the deviations identified in Section 3, CH2M recommends triggering of the accelerated testing: 1) after EcoAnalysts switch to the use of HSB for salinity adjustment, 2) if the testing meets EPA test acceptability criteria, and 3) a statistically significant effect is detected when compared to the lab control.

CH2M will provide recommendations for next steps after review of bioassay data collected after EcoAnalysts makes the necessary adjustments to the testing procedures listed in Section 3.

6. References

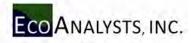
CH2M HILL Engineers, Inc. (CH2M, now a wholly owned subsidiary of Jacobs Engineering Group Inc.). 2022. *Quality Assurance Project Plan, Groundwater Treatment Plant Operations and Maintenance*. Final. Prepared for Wyckoff/Eagle Harbor Superfund Site, Bainbridge Island, Washington, U.S. Environmental Protection Agency, Region 10, Seattle, Washington. January.

EPA. 1995. Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms, 1st ed. EPA/600/R-95/136. U.S. Environmental Protection Agency, National Exposure Research Laboratory, Cincinnati, OH.

Washington Administrative Code (WAC) 173-205-020, "Definitions." Available at: https://app.leg.wa.gov/WAC/default.aspx?cite=173-205-020

WAC 173-205-090, "Response to noncompliance with whole effluent toxicity limits." Available at: https://app.leg.wa.gov/WAC/default.aspx?cite=173-205-090

Attachment 1
EcoAnalysts Toxicity Testing Results
Wyckoff/Eagle Harbor Superfund Groundwater
Treatment Plant



TOXICITY TESTING RESULTS

WYCKOFF/EAGLE HARBOR SUPERFUND SITE GROUNDWATER TREATMENT PLANT BAINBRIDGE ISLAND, WA

NPDES TOXICITY TESTING: 2ND QUARTER 2023

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Contract: 68HE0318D0004 Task Order No: 68HE0722F0011

EcoAnalysts Report ID: PG1799Q2.01

Submittal Date: May 11, 2023



Toxicity Testing Results
Wyckoff/Eagle Harbor Superfund Site Groundwater
Treatment Plant

All testing reported herein was performed consistent with our laboratory's quality assurance program. All results are intended to be considered in their entirety, and EcoAnalysts is not responsible for use of less than the complete report. The test results summarized in this report apply only to the sample(s) evaluated. This document is uncontrolled when printed or accessed from electronic distribution.

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APPENDICES

Appendix A: Statistical Comparison and Laboratory Documents

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ACRONYMS AND ABBREVIATIONS

EC₅₀: Effect Concentration to 50% of test population

EPA: Environmental Protection Agency

LC₅₀: Lethal Concentration to 50% of test population

LOEL: Lowest Observed Effect Level

NOEL: No Observed Effect Level

NPDES: National Pollutant Discharge Elimination System

PMSD: Percent Minimum Significant Difference

QAPP: Quality Assurance Project Plan

QM: Quality Manual

SOP: Standard Operating Procedures

WET: Whole Effluent Toxicity

1. EXECUTIVE SUMMARY

EcoAnalysts conducted Whole Effluent Toxicity (WET) testing as part of the biological compliance monitoring for Wyckoff/Eagle Harbor Superfund Site, in Bainbridge Island, Washington. The objective of this program was to assess the potential toxicity of discharge water to selected aquatic organisms following procedures defined under the facility's Quality Assurance Project Plan (QAPP) (CH2M HILL 2022). The results of the toxicity testing are contained in this report.

A statistically significant biological response of the test organisms was detected at the 100% effluent sample concentration for the proportional normal endpoint (Table 1-1).

Table 1-1. Toxicity Test Results Summary.

	Test	NOEL (%)	LOEL (%)	LC50/EC50 (%)
Channin	<i>Mytilus galloprovincialis</i> 48-Hour Proportion Survived	100	>100	>100
Chronic	<i>Mytilus galloprovincialis</i> 48-Hour Proportion Normal	50	100	>100

NOEL = No Observed Effect Level LOEL = Lowest Observed Effect Level

 LC_{50}/EC_{50} = Lethal/Effect Concentration to 50% of test population

2. METHODS

The sample was analyzed for toxicity using criteria outlined in ASTM E724-89 and the Environmental Protection Agency's (EPA) most recently promulgated effluent guidance documents outlined in Section 4.

To evaluate the relative sensitivity of the organisms, reference toxicity tests were performed using standard reference toxicants (Lee 1980).

2.1 Sample Collection and Storage

Jacobs personnel collected a sample on April 11, 2023. The sample was transported by courier and received at the laboratory on the same day as collection. The sample temperature upon receipt was 0.5°C, below the 6°C threshold.

Additional sample conditions are summarized in Table 2-1. The samples were held in a walk-in cold room at 4 ± 2 °C in the dark until utilized for testing.

Table 2-1. Sample Conditions upon Receipt

Sample	041123
Laboratory ID	P230411.01
Date/Time sampled	4/11/23; 0127
Date/Time received	4/11/23; 1305
Dissolved Oxygen (mg/L) Recommended: >4.0 mg/L	9.0
Temperature (°C) Recommended: 0 – 6°C	0.5
pH (units) Recommended: 6 – 9	7.6
Conductivity (μS/cm)	843
Salinity (ppt)	0.5
Total Chlorine (mg/L)	0.01
Total Ammonia (mg/L)	0.00

2.2 Bioassay Testing

Bioassay testing for this project consisted of one chronic bioassay. The test conducted in support of this project is summarized in Table 2-2.

Table 2-2. Biological Testing Performed

Test Type	Test Descriptor	Species	Method
Chronic	48-Hour Survival and Development	Mytilus galloprovincialis (Mussel)	EPA/600/R-95-136 Method 1005.0; ASTM E724-89; TOX042.12

2.3 Organisms for Testing

Adult mussels (*Mytilus galloprovincialis*) were obtained from Taylor Shellfish in Shelton, Washington on April 10, 2023. They were shipped dry and maintained under ambient seawater flow-through conditions

at 12 ± 3 °C until utilized for testing. The overall health of the organisms was visually confirmed by a laboratory technician.

2.4 Water for Bioassay Testing

Seawater diluent used in this study came from the northern Hood Canal at Port Gamble, Washington. This water source has been used successfully on similar bioassay testing programs. Extensive testing on a variety of test species has shown that there is no significant potential for toxicity or bioaccumulation from this water supply. Chemical analysis of each water source is conducted and reviewed on an annual basis.

2.5 Sample Adjustment

Salinity adjustment was necessary to bring the sample within the recommended test salinity for the marine test species. The salinity of the effluent sample was adjusted with Crystal Sea® Marinemix bioassay-grade artificial salt to the desired test salinity for the marine acute and chronic tests.

Table 2-3 summarizes the salinity adjustment performed on the project sample in relation to marine test species.

An artificial salt control sample was created to evaluate any potential negative impacts to the test organisms from the salinity adjustment alone. Filtered seawater was diluted with laboratory deionized water to meet the salinity of the received effluent sample. Next, Crystal Sea® Marinemix was added to adjust the salinity to the test requirement. This sample was designated "Salt Control" and the results are discussed in the sections below.

Table 2-3. Salinity Adjustment of Project Samples

Sample ID: 041123	Sample Salinity Adjustment (ppt)
Sample 1: Collected 4/11/23	30 ± 2

2.6 Data Management and Analysis

Endpoint data was calculated for each replicate, and the mean value and standard deviation were determined for each sample concentration. All hand-entered data was reviewed for data entry errors, which were corrected prior to summary calculations. A minimum of 10% of all calculations and data sorting was reviewed for errors. Review counts were conducted on any apparent outliers.

Statistical comparisons were made according to the EPA guidance. Statistical comparisons were performed using CETIS™ software.

2.7 Quality Assurance/Quality Control

The quality assurance objectives for toxicity testing conducted by the testing laboratory are detailed in the method specific guidance documents and the laboratory's quality manual (QM). These objectives for accuracy and precision involve all aspects of the testing process, including the following:

- Source and Condition of Test Organisms
- Condition of Equipment
- Test Conditions
- Instrument Calibration
- Use of Reference Toxicants
- Record Keeping

• Data Evaluation

The batch of test organisms obtained was evaluated in a reference toxicant test that was run concurrently with the test period to establish the sensitivity of the test organisms. The reference toxicant LC_{50} or EC_{50} should fall within two standard deviations of the historical laboratory mean. Water quality measurements were monitored to ensure that they fell within prescribed limits.

The methods employed in every phase of the toxicity testing program are detailed in the EcoAnalysts Standard Operating Procedures (SOP). All EcoAnalysts staff members receive regular, documented training in all SOPs and test methods. Finally, all data collected and produced because of these analyses were recorded on approved data sheets. If an aspect of a test deviated from protocol, the test was evaluated to determine whether it was valid according to the regulatory agencies responsible for approval of the proposed permitting action.

3. RESULTS

The results of the effluent testing are presented in this section. Statistical comparisons and laboratory documents are provided in Appendix A. Chain-of-custody and sample receipt logs are provided in Appendix B.

3.1 Mytilus galloprovincialis Test Results

The chronic toxicity test with *M. galloprovincialis* was conducted on April 11, 2023. The test met EPA test acceptability criteria of ≥50% survival, ≥90% normal shell development and <25% Percent Minimum Significant Difference (PMSD) with 100% proportion survived, 95.1% proportion normal, and 2.7% PMSD for proportion normal in the laboratory control. Mean survival and proportion normal are summarized in Table 3-1. The test conditions are summarized in Table 3-2.

Concentrations of 6.25, 12.5, 25, 50, and 100% effluent were prepared utilizing laboratory water. Sample P230411.01 (received 4/11/23) was used for test initiation. Water quality parameters were within the acceptable limits throughout the duration of the 48-hour static test.

No significant difference was observed between the laboratory (dilution water) control and the salt control, indicating that the addition of artificial salts did not contribute to any negative biological effects. The statistics were run against both the dilution water and the salt control, and there was no difference in the statistical results. The 100% test concentration had significantly lower normality compared to both the dilution water and salt controls. It should be noted that the PMSD was low (2.7%), though acceptable (there is no minimum PMSD standard). As the difference in normality between the 100% and the controls was also low (8.2%), there is a chance that the statistical significance was a false positive.

The EC $_{50}$ for the ammonia reference toxicant test was 7.8 mg/L total ammonia and was within two standard deviations of the laboratory mean (Table 3-2) at the time of testing. This indicates that the organisms are of a similar sensitivity to those previously tested at the EcoAnalysts laboratory.

Table 3-1. Results Summary for Mytilus galloprovincialis Embryo Development Test

Conc. (%)	Mean Proportion Survived (%)	Standard Deviation	NOEL (%)	LOEL (%)	EC ₅₀ Value (%)
0	100	0.0			
Salt Control	99.4	0.7			
6.25	96.7	3.4			
12.5	99.7	0.4	100 ^{c,d}	>100 ^{c,d}	>100
25	97.8	2.6			
50	100	0.0			
100	98.5	3.0			
Conc. (%)	Mean Proportion Normal (%)	Standard Deviation	NOEL (%)	LOEL (%)	EC ₅₀ Value (%)
0	95.1	1.6			
Salt Control	95.3	1.0			
6.25	95.7	1.0			
12.5	96.1	1.1	50 ^{c,d}	100 ^{c,d}	>100
25	96.5	1.6			
50	95.0	1.7			

BOLD = Significantly different than control; a = significant compared to dilution water control; b = significant compared to salt control; c = compared to dilution water control; d = compared to salt control

NOEL = No Observed Effect Level; LOEL = Lowest Observed Effect Level; LC_{50}/EC_{50} = Lethal/Effect Concentration to 50% of test population; proportion survived = total counted / stocking density; proportion normal = number normal/total counted;

Table 3-2. Test Condition Summary for *Mytilus galloprovincialis* Embryo Development Test.

Test Duration / Type	48-Hour; Static				
Species	Mytilus gall	oprovincialis			
Supplier	Taylor :	Shellfish			
Date acquired	4/1	0/23			
Test Dates	4/11/23	- 4/13/23			
Age at test initiation Recommended: <4-hour embryos	<4 h	nours			
Sample(s) used:	041123; P	230411.01			
Holding Time at Initiation: Recommended: < 36 hours	15 h	nours			
Test Procedures	EPA/600/R-95-136, Metho	od 1005.0; SOP: TOX042.12			
Test location	EcoAnalysts, Po	ort Gamble, WA			
Control water / Diluent	0.45 μm-filtered, Nort	h Hood Canal seawater			
Test Lighting	16 hour light	/8 hour dark			
Test Chamber	30-mL Chamber				
Exposure volume	10 mL				
Organisms/replicate	Recommended: 150 –300	Actual: 254			
Replicates/treatment		4			
Concentration/treatment	6.25, 12.5, 25	, 50 and 100%			
Feeding	No	one			
Test solution renewal	No	one			
Test Water Quality					
Test Dissolved Oxygen	Recommended: > 4.0 mg/L	Actual: 7.3 – 8.6 mg/L			
Test Temperature	Recommended: 16 ± 1°C	Actual: 14.9 – 17.3 °C			
Test pH	Recommended: 7 – 9	Actual: 7.7 – 8.3			
Test Salinity	Recommended: 30 ± 2 ppt	Actual: 29 – 32 ppt			
Control performance standard (Survival, Normal shell development, PMSD)	Recommended: ≥50% survival, ≥90% normal development, <25% PMSD	Actual: 100% survival, 95.1% normal development, 2.7% PMSD; Pass			
Reference Toxicant Date	4/11/23				
Reference Toxicant EC ₅₀	7.8 mg/L total ammonia				
Laboratory Mean EC ₅₀	6.7 mg/L total ammonia				
Acceptable Range EC ₅₀ (± 2 SD)	3.5 – 12.9 mg/L total ammonia (within range)				
Deviations from Test Protocol	None				

4. REFERENCES

- ASTM. 1989. Standard Guide for Conducting Static Acute Toxicity Tests Starting with Embryos of Saltwater Bivalve Molluscs, E724-89. ASTM International, West Conshohocken, PA.
- CETIS. 2022. CETIS™ Comprehensive Environmental Toxicity Information System User's Guide. Tidepool Scientific Software. McKinleyville, CA.
- CH2M HILL. 2022. Quality Assurance Project Plan, Groundwater Treatment Plant Operations and Maintenance, Final. Wyckoff/Eagle Harbor Superfund Site. Bainbridge Island, Washington.
- USEPA. 1995. Short Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine Organisms and Estuarine Organisms, First Edition. EPA-600-R-95-136.

Toxicity Testing Results Wyckoff/Eagle Harbor Superfund Site Groundwater Treatment Plant

APPENDIX A

Statistical Comparisons and Laboratory Documents

Report ID PG1799Q2.01 EcoAnalysts, Inc.

Toxicity Testing Results Wyckoff/Eagle Harbor Superfund Site Groundwater Treatment Plant

APPENDIX A.1

Mytilus galloprovincialis 48-Hour Survival and Development Test

Statistical Comparison and Laboratory Data Sheets

Report ID PG1799Q2.01 EcoAnalysts, Inc.

CETIS Summary Report

Report Date: Test Code/ID: 25 Apr-23 15:03 (p 1 of 2) P230411.01 / 20-6592-2484

Bivalve Larva	l Survival and	Developm	nent Test							Ec	oAnaly	/sts
Batch ID: Start Date: Ending Date: Test Length:	The state of the s	39 P 43 S	est Type: Protocol: Species: axon:	Development-S EPA/600/R-95/ Mytilus gallopro Bivalvia	136 (1995)		Dii Br	ine: Cry	Laboratory Seawater Crystal Sea Marine Mix Taylor Shellfish		Age:	<4h
	08-1100-2764 11 Apr-23 01:: 11 Apr-23 13:: 15h (0.5 °C)	27 N	Code: Material: CAS (PC): Client:	P230411.01 Treated Ground Jacobs Wyckof			So	ource: Jac	rckoff Eagle cobs Wyckof 1123		P 2023	3/W
Multiple Com	parison Sumn	nary		2 2 10 20 30 10 10 10 10 10 10 10 10 10 10 10 10 10		1	fsansz	diluma	Contra	-	*********	*****
Analysis ID	Endpoint		Comp	parison Method			NOEL	LOEL	TOEL	PMSD	TU	S
13-4273-5465	Proportion No	rmal	Dunn	ett Multiple Com	parison Test		50	100	70.71	2.73%	2	
15-7875-5056	Proportion Su	rvived		Many-One Rank	7), 1864), 97(Aug.) 171		100	>100		2.56%	1	
Point Estimat	e Summary											
Analysis ID	Endpoint		Point	Estimate Meth	od	V	Level	%	95% LCL	95% UCL	TU	9
10-6814-5445	Proportion No	rmal	Linea	r Interpolation (IC	CPIN)	- 4	/ EC15	>100			<1	
						-	/ EC20	>100			<1	
							/ EC25	>100		-	<1	
						×	/ EC40	>100			<1	
	4					N	/ EC50	>100	-		<1	
13-7435-1578	Proportion Su	rvived	Linea	r Interpolation (I	CPIN)	4	/ EC15	>100			<1	
							/ EC20	>100			<1	
						Ň	/ EC25	>100		-	<1	
							/ EC40	>100		(MANA)	<1	
						•	/ EC50	>100	-		<1	
Test Acceptal	oility					TAC	imits					
Analysis ID	Endpoint		Attrib	ute	Test Stat	Lower	Upper	Overlap	Decision			
	Proportion No		Contr	ol Resp	0.9507	0.9	<<	Yes	Passes C	riteria		
	Proportion No		Contr	ol Resp	0.9507	0.9	<<	Yes	Passes C	riteria		
	Proportion Su		Control Resp		1	0.5	<<	Yes	Passes C			
15-7875-5056	Proportion Su	rvived	Control Resp		1	0.5	<<	Yes	Passes C	riteria		
Proportion No	ormal Summa	ry										
Conc-%	Code	Count					Max	Std Err	Std Dev	CV%	%Eff	
0	D	4	0.950		0.9764	0.9345	0.9672	0.0081	0.0162	1.70%	0.009	
0	SC	4	0.952		0.9692	0.9377	0.9602	0.0051	0.0102	1.07%	-0.23	
6.25		4	0.956		0.9721	0.9426	0.9640	0.0048	0.0096	1.01%	-0.64	
12.5		4	0.960		0.9772	0.9476	0.9723	0.0052	0.0105	1.09%	-1.04	
25		4	0.964		0.9898	0.9419	0.9767	0.0078	0.0156	1.62%	-1.50	
50		4	0.950		0.9771	0.9370	0.9745		0.0169	1.77%	0.049	
100	134 100 200	4	0.872	9 0.8493	0.8966	0.8582	0.8870	0.0074	0.0148	1.70%	8.189	/0
	urvived Summ		Mac	050/ 1 01	059/ 1101	Min	Men	Ctd E-	Ctd Day	CV9/	0/ E#	oct.
Conc-%	Code	Count	5 7 7 7	STATE OF STA			Max	Std Err	Std Dev	CV% 0.00%	%Eff	
0	D	4	1.000		1.0000	1.0000	1.0000	0.0000	0.0000			
0	SC	4	0.994		1.0050	0.9882	1.0000	0.0034	0.0068	0.69%	0.59	
6.25		4	0.966		1.0210	0.9213	1.0000		0.0343	3.54%	3.35	
12.5		4	0.997		1.0030	0.9921	1.0000	0.0019	0.0038	0.38%	0.30	
25		4	0.978		1.0190	0.9488	1.0000		0.0258 0.0000	2.64% 0.00%	0.00	
50 100		4	1.000 0.985		1.0000 1.0320	1.0000 0.9409	1.0000		0.0000	3.00%	1.48	
100		4	0.985	2 0.9383	1.0320	0.5409	1.0000	0.0140	0.0295	3.0070	1.40	/0

CETIS Summary Report

Report Date: Test Code/ID:

25 Apr-23 15:03 (p 2 of 2) P230411.01 / 20-6592-2484

EcoAnaly	Bivalve Larval Survival and Development Test						
MD5: AC97CE4F7B4BDBCA87BCD976613F					rmal Detail	Proportion No	
	Rep 4	Rep 3	Rep 2	Rep 1	Code	Conc-%	
	0.9393	0.9345	0.9617	0.9672	D	0	
	0.9602	0.9377	0.9574	0.9562	sc	0	
	0.9615	0.9588	0.9640	0.9426		6.25	
	0.9579	0.9476	0.9723	0.9643		12.5	
	0.9696	0.9714	0.9419	0.9767		25	
	0.9370	0.9407	0.9745	0.9490		50	
	0.8582	0.8870	0.8843	0.8622		100	
MD5: 34274F2C473BCA45C41E89F9A34590					vived Detail	Proportion Su	
The second secon	Rep 4	Rep 3	Rep 2	Rep 1	Code	Conc-%	
	1.0000	1.0000	1.0000	1.0000	D	0	
	0.9882	1.0000	1.0000	0.9882	sc	0	
	0.9213	1.0000	0.9843	0.9606		6.25	
	1.0000	1.0000	0.9961	0.9921		12.5	
	1.0000	0.9646	0.9488	1.0000		25	
	1.0000	1.0000	1.0000	1.0000		50	
	1.0000	0.9409	1.0000	1.0000		100	
				s	rmal Binomial	Proportion No	
	Rep 4	Rep 3	Rep 2	Rep 1	Code	Conc-%	
	263/280	257/275	251/261	265/274	D	0	
	241/251	256/273	270/282	240/251	SC	0	
	225/234	256/267	241/250	230/244		6.25	
	250/261	253/267	246/253	243/252		12.5	
	255/263	238/245	227/241	252/258		25	
	253/270	254/270	267/274	242/255		50	
	230/268	212/239	237/268	244/283		100	
				als	vived Binomi	Proportion Su	
	Rep 4	Rep 3	Rep 2	Rep 1	Code	Conc-%	
	254/254	254/254	254/254	254/254	D	0	
	251/254	254/254	254/254	251/254	SC	0	
	234/254	254/254	250/254	244/254		6.25	
	254/254	254/254	253/254	252/254		12.5	
	254/254	245/254	241/254	254/254		25	
	254/254	254/254	254/254	254/254		50	
	254/254	239/254	254/254	254/254		100	

Report Date: Test Code/ID: 09 May-23 12:07 (p 1 of 3) P230411.01 / 20-6592-2484

Bivalve Larva	l Su	vival and D	evelopme	nt Test									E	coAnalysts	
Analysis ID:		273-5465		dpoint:	Pro	portion Norr	nal			CETIS V	ersion:	CETISv2	.1.4		
Analyzed:	Analyzed: 25 Apr-23 14:56 Analysis: Parametric-Control vs Tre				itrol vs Trea	atments		Status Lo	evel:	1					
Edit Date:	25 A	pr-23 14:16	ME	5 Hash:	E18	ODCA46C1	1FB7FBA8	A52D5BDAE	3DA	Editor ID	:	006-677-	240-1		
Batch ID:	06-2	153-7552	Te	st Type:	Dev	elopment-S	urvival			Analyst:					
Start Date:	11 A	pr-23 16:39	Pro	otocol:	EP/	4/600/R-95/	136 (1995)			Diluent:	Lab	oratory Sea	water		
Ending Date:	13 A	pr-23 14:43	Sp	ecies:	Myt	ilus gallopro	vincialis			Brine:	Crys	stal Sea Mai	rine Mix		
Test Length:	46h		Ta	kon:	Biva	alvia				Source:	Tay	lor Shellfish		Age: <4	
Sample ID:	08-1	100-2764	Co	de:	P23	0411.01				Project:	Wyo	ckoff Eagle I	Harbor GW	TP 2023/M	
Sample Date:	11 A	pr-23 01:27	Ma	terial:	Trea	ated Ground	lwater			Source:	Jac	obs Wyckoff			
Receipt Date:	11 A	pr-23 13:05	CA	S (PC):					-	Station:	041	123			
Sample Age:	15h	(0.5 °C)	Cli	ent:	Jac	obs Wyckof	f	A wans +	Di	lusar	Was	er cons	1.		
Data Transfor	m		Alt Hyp					NOEL	LOE		EL	Tox Units	7177	PMSD	
Angular (Corre	cted		C > T					50	100	70	.71	2	0.02597	2.73%	
Dunnett Multi	ple C	omparison	Test												
Control	vs	Conc-%	d	f Test S	Stat	Critical	MSD	P-Type	P-Va	lue De	cision	(a:5%)			
Dilution Water	1	6.25	6	-0.560)3	2.407	0.05625	CDF	0.947			ficant Effect	, -		
		12.5	6	-0.983	32	2.407	0.05625	CDF	0.981			ficant Effect			
		25	6	-1.554		2.407	0.05625	CDF	0.996			ficant Effect			
		50	6	0.009	355	2.407	0.05625	CDF	0.830		0.000	ficant Effect			
		100*	6	6.091		2.407	0.05625	CDF	4.8E-	05 Sig	gnifican	t Effect			
Test Acceptal	oility	Criteria	TAC	Limits											
Attribute		Test Stat		Uppe	r	Overlap	Decision								
Control Resp	T	0.9507	0.9	<<		Yes	Passes C	200 - 75 -							
ANOVA Table	+			_			- 00	-						======	
Source		Sum Squa	ares	Mean	Sau	are	DF	F Stat	P-Va	lue De	cision	(a·5%)			
Between	+	0.085811	1103	0.017	-		5	15.72	<1.0E			t Effect			
Error		0.0196564		0.001			18	10.72	1.01	-00 010	Jimoan	LIIGO			
Total	Ť	0.105467		-			23	_							
ANOVA Assur	nptio	ons Tests													
Attribute		Test					Test Stat	Critical	P-Va	lue De	cision	(a:1%)			
Variance	Ť	Bartlett Eq	uality of V	ariance T	est		2.113	15.09	0.833		Decision(α:1%) Equal Variances				
		Levene Ed					0.776	4.248	0.579		ual Var				
		Mod Lever				Test	0.3638	4.248	0.866	4.4	ual Var				
Distribution		Anderson-					0.3582	3.878	0.457	*		istribution			
		D'Agostino	Kurtosis	Test			0.5387	2.576	0.590		rmal D	istribution			
		D'Agostino					0.01523	2.576	0.987		Normal Distribution				
		D'Agostino			bus '	Test	0.2905	9.21	0.864			istribution			
		Kolmogoro					0.1161	0.2056	0.556		rmal D	istribution			
		Shapiro-W			st		0.9749	0.884	0.787		rmal D	istribution			
Proportion No	orma	I Summary													
Conc-%		Code	Count	Mean		95% LCL	95% UCL	Median	Min	Ma	x	Std Err	CV%	%Effect	
0	7	D	4	0.950	7	0.9250	0.9764	0.9505	0.934		9672	0.0081	1.70%	0.00%	
U			4	0.956	7	0.9414	0.9721	0.9602	0.942		9640	0.0048	1.01%	-0.64%	
			4	0.960		0.9439	0.9772	0.9611	0.947		9723	0.0052	1.09%	-1.04%	
6.25											9767				
6.25 12.5			4	0.964	9	0.9400	0.9898	0.9705	0.94	9 11		UUUUU	1.02%	-1 30770	
6.25 12.5 25			4	0.964		0.9400	0.9898	0.9705	0.941			0.0078	1.62%	-1.50% 0.04%	
6.25 12.5 25 50 100			4 4 4	0.964 0.950 0.872	3	0.9400 0.9235 0.8493	0.9898 0.9771 0.8966	0.9705 0.9449 0.8733	0.937 0.858	0.9	9745 8870	0.0078 0.0084 0.0074	1.62% 1.77% 1.70%	0.04% 8.18%	

Report Date: Test Code/ID:

09 May-23 12:07 (p 2 of 3) P230411.01 / 20-6592-2484

Bivalve Larval Survival and Development Test

EcoAnalysts

Analysis ID: 13-4273-5465 Endpoint: Proportion Normal

CETIS Version:

Analyzed: 25 Apr-23 14:56 **Edit Date:** 25 Apr-23 14:16 Analysis: Parametric-Control vs Treatments MD5 Hash: E180DCA46C11FB7FBA8A52D5BDAE3DA Editor ID:

Status Level:

006-677-240-1

CETISv2.1.4

Angular	(Corrected)	Transformed	Summary
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Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	4	1.3490	1.2890	1.4090	1.3480	1.3120	1.3890	0.0189	2.80%	0.00%
6.25		4	1.3620	1.3260	1.3980	1.3700	1.3290	1.3800	0.0114	1.68%	-0.97%
12.5		4	1.3720	1.3290	1.4150	1.3720	1.3400	1.4040	0.0135	1.97%	-1.70%
25		4	1.3850	1.3220	1.4490	1.3980	1.3270	1.4180	0.0199	2.87%	-2.69%
50		4	1.3490	1.2810	1.4160	1.3340	1.3170	1.4100	0.0212	3.14%	0.02%
100		4	1.2070	1.1710	1.2420	1.2070	1.1850	1.2280	0.0112	1.85%	10.55%

Proportion Normal Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	
0	D	0.9672	0.9617	0.9345	0.9393	
6.25		0.9426	0.9640	0.9588	0.9615	
12.5		0.9643	0.9723	0.9476	0.9579	
25		0.9767	0.9419	0.9714	0.9696	
50		0.9490	0.9745	0.9407	0.9370	
100		0.8622	0.8843	0.8870	0.8582	

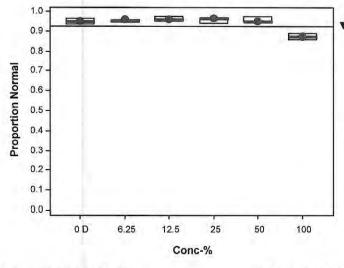
Angular (Corrected) Transformed Detail

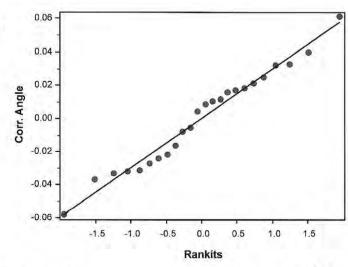
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	
0	D	1.3890	1.3740	1.3120	1.3220	
6.25		1.3290	1.3800	1.3660	1.3730	
12.5		1.3810	1.4040	1.3400	1.3640	
25		1.4180	1.3270	1.4010	1.3950	
50		1.3430	1.4100	1.3250	1.3170	
100		1.1900	1.2240	1.2280	1.1850	

Proportion Normal Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	
0	D	265/274	251/261	257/275	263/280	
6.25		230/244	241/250	256/267	225/234	
12.5		243/252	246/253	253/267	250/261	
25		252/258	227/241	238/245	255/263	
50		242/255	267/274	254/270	253/270	
100		244/283	237/268	212/239	230/268	

Graphics





Convergent Rounding (4 sf)

CETIS™ v2.1.4.6 x64 (006-677-240-1)

QA: More

Report Date: Test Code/ID: 09 May-23 12:07 (p 3 of 3) P230411.01 / 20-6592-2484

	, ou	vivai and D	evelopmer)	it lest							E	coAnalyst
Analysis ID:	15-7	7875-5056	End	point:	Proportion Sun	vived		CET	IS Versi	on: CETIS	Sv2.1.4	
Analyzed:	25 A	Apr-23 14:56		lysis:	Nonparametric		reatments		us Level			
Edit Date:	200	Apr-23 14:16		•	C97390078BC				or ID:		77-240-1	
Batch ID:	06-2	2153-7552	Tes	t Type:	Development-S	Survival		Ana	lyst:			
Start Date:	11 /	Apr-23 16:39		tocol:	EPA/600/R-95/					_aboratory S	eawater	
Ending Date:	13 A	Apr-23 14:43	Spe	cies:	Mytilus gallopro			Brin		Crystal Sea I		
Test Length:			Tax		Bivalvia					Taylor Shellf		Age: <
Sample ID:	08-1	100-2764	Cod	le:	P230411.01			Proj	ect: \	Nyckoff Eag	le Harbor GW	TP 2023/
Sample Date:	11 A	Apr-23 01:27	Mat	erial:	Treated Ground	dwater		Sou	rce: .	Jacobs Wycl	coff	
Receipt Date:	11 /	Apr-23 13:05	CAS	(PC):				Stat	ion: (041123		
Sample Age:	15h	(0.5 °C)	Clie	nt:	Jacobs Wycko	ff						
Data Transfor	m		Alt Hyp				NOEL	LOEL	TOEL	Tox Ur	nits MSDu	PMSD
Angular (Corre	cted)	C>T				100	>100	74	1	0.02556	2.56%
Steel Many-O	ne R	ank Sum Te	est									
Control	vs	Conc-%	df	Test S	Stat Critical	Ties	P-Type	P-Value	Decisi	ion(α:5%)		
Dilution Water		6.25	6	12	10	1	CDF	0.1424	Non-S	ignificant Eff	ect	
		12.5	6	14	10	1	CDF	0.3451		ignificant Eff		
		25	6	14	10	1	CDF	0.3451		ignificant Eff		
		50	6	18	10	1	CDF	0.8333	Non-S	ignificant Eff	ect	
	100 6 16				10	1	CDF	0.6105		ignificant Eff		
Test Acceptat	ility	Criteria	TAC L	imits								
Attribute		Test Stat		Upper	Overlap	Decision						
Control Resp		4	0.5		Yes	D 0	dia da					
Control (103p		1	0.5	<<	165	Passes C	nteria					
A STATE OF THE STA		1	0.5	<<	res	Passes C	nteria		-			
ANOVA Table		Sum Squa			Square	DF	F Stat	P-Value	Decisi	ion(α:5%)		
ANOVA Table			ares		Square			P-Value 0.1487		ion(α:5%) ignificant Eff	ect .	
ANOVA Table Source Between		Sum Squa	ares	Mean	Square 3083	DF	F Stat				ect	
ANOVA Table Source Between Error		Sum Squa 0.0540415	ares	Mean 0.0108	Square 3083	DF 5	F Stat				ect	
ANOVA Table Source Between Error Total	1	Sum Squa 0.0540415 0.103693 0.157734	ares	Mean 0.0108	Square 3083	DF 5 18	F Stat				ect	
ANOVA Table Source Between Error Total ANOVA Assur	1	Sum Squa 0.0540415 0.103693 0.157734	ares	Mean 0.0108	Square 3083	DF 5 18	F Stat 1.876		Non-S		ect	
ANOVA Table Source Between Error Total ANOVA Assur	1	Sum Squa 0.0540415 0.103693 0.157734 ons Tests Test	ares	Mean 0.0108 0.0057	Square 8083 7607	DF 5 18 23	F Stat 1.876	0.1487	Non-S Decisi	ignificant Eff	ect	
ANOVA Table Source Between Error Total ANOVA Assur	1	Sum Squa 0.0540415 0.103693 0.157734 ons Tests Test Bartlett Eq	ares	Mean 0.0108 0.0057	Square 3083 7607	DF 5 18 23 Test Stat 7.367	F Stat 1.876	0.1487	Non-S Decisi	ignificant Eff ion(α:1%)		
ANOVA Table Source Between Error Total ANOVA Assur	1	Sum Squa 0.0540415 0.103693 0.157734 ons Tests Test Bartlett Eq Levene Ed	ares	Mean 0.0108 0.0057 riance T	Square 8083 7607 Test	DF 5 18 23 Test Stat 7.367 2.55	F Stat 1.876 — Critical	0.1487 P-Value	Decisi Indete Unequ	ignificant Eff ion(α:1%) rminate		
ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance	1	Sum Squa 0.0540415 0.103693 0.157734 ons Tests Test Bartlett Eq Levene Ed Mod Level	ares juality of Va	Mean 0.0108 0.005	Square 8083 7607 Test	DF 5 18 23 Test Stat 7.367	F Stat 1.876 Critical 4.248	0.1487 P-Value	Decisi Indete Unequ Equal	ignificant Eff ion(α:1%) rminate ial Variances		
ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance	1	Sum Squa 0.0540415 0.103693 0.157734 ons Tests Test Bartlett Eq Levene Ed Mod Leven Anderson-	ares quality of Va quality of Va quality of Va	Mean 0.0108 0.0057 riance T riance T of Varian	Square 8083 7607 Test	DF 5 18 23 Test Stat 7.367 2.55	F Stat 1.876 Critical 4.248 4.248	0.1487 P-Value 0.0006 0.0651	Decisi Indete Unequ Equal Norma	ignificant Eff ion(α:1%) rminate ial Variances Variances	3	
ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance	1	Sum Squa 0.0540415 0.103693 0.157734 ons Tests Test Bartlett Eq Levene Ed Mod Leven Anderson- D'Agostino D'Agostino	quality of Va quality of Va quality of Va ne Equality Darling A2 o Kurtosis T o Skewness	Mean 0.0108 0.005	Square 3083 7607 Test Test Test	DF 5 18 23 Test Stat 7.367 2.55 0.829 0.9441 1.261	F Stat 1.876 Critical 4.248 4.248 4.248 3.878 2.576 2.576	0.1487 P-Value 0.0006 0.0651 0.0322 0.3451 0.2074	Decisi Indete Unequ Equal Norma	ignificant Eff ion(α:1%) rminate ial Variances Variances al Distributior		
ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance	1	Sum Squa 0.0540415 0.103693 0.157734 ons Tests Test Bartlett Eq Levene Ed Mod Leven Anderson- D'Agostino D'Agostino D'Agostino	quality of Va quality of Va quality of Va ne Equality Darling A2 o Kurtosis T o Skewness o-Pearson k	Mean 0.0108 0.0057 riance T riance T of Varian Test est Test 2 Omnii	Square 3083 7607 Test Test Test	DF 5 18 23 Test Stat 7.367 2.55 0.829 0.9441 1.261 2.481	F Stat 1.876 Critical 4.248 4.248 4.248 3.878 2.576	0.1487 P-Value 0.0006 0.0651 0.0322 0.3451 0.2074 0.2893	Decisi Indete Unequ Equal Norma Norma	ignificant Eff ion(α:1%) rminate ial Variances Variances al Distribution al Distribution		
ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance	1	Sum Squa 0.0540415 0.103693 0.157734 ons Tests Test Bartlett Eq Levene Ed Mod Leven Anderson- D'Agostino D'Agostino D'Agostino Kolmogoro	quality of Va quality of Va ne Equality -Darling A2 o Kurtosis T o Skewness o-Pearson k ov-Smirnov	Mean 0.0108 0.005; riance T riance T of Varian Test est Test (2 Omnii D Test	Square 3083 7607 Fest Fest Ince Test	DF 5 18 23 Test Stat 7.367 2.55 0.829 0.9441 1.261 2.481 0.2083	F Stat 1.876 ————————————————————————————————————	0.1487 P-Value 0.0006 0.0651 0.0322 0.3451 0.2074 0.2893 0.0084	Decisi Indete Uneque Equal Norma Norma Norma Norma	ion(α:1%) rminate nal Variances la Distribution la Distribution la Distribution la Distribution la Distribution la Distribution	s n n n n oution	
ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance	1	Sum Squa 0.0540415 0.103693 0.157734 ons Tests Test Bartlett Eq Levene Ed Mod Leven Anderson- D'Agostino D'Agostino D'Agostino Kolmogoro	quality of Va quality of Va quality of Va ne Equality Darling A2 o Kurtosis T o Skewness o-Pearson k	Mean 0.0108 0.005; riance T riance T of Varian Test est Test (2 Omnii D Test	Square 3083 7607 Fest Fest Ince Test	DF 5 18 23 Test Stat 7.367 2.55 0.829 0.9441 1.261 2.481	F Stat 1.876 Critical 4.248 4.248 4.248 3.878 2.576 2.576 9.21	0.1487 P-Value 0.0006 0.0651 0.0322 0.3451 0.2074 0.2893	Decisi Indete Uneque Equal Norma Norma Norma Norma	ion(α:1%) rminate nal Variances al Distributior al Distributior al Distributior	s n n n n oution	
ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution	mptid	Sum Squa 0.0540415 0.103693 0.157734 ons Tests Test Bartlett Eq Levene Ed Mod Leven Anderson- D'Agostino D'Agostino D'Agostino Composido Shapiro-W	quality of Va quality of Va ne Equality Darling A2 o Kurtosis T o Skewness o-Pearson k ov-Smirnov Vilk W Norm	Mean 0.0108 0.005; riance T riance T of Varian Test est Test (2 Omnii D Test	Square 3083 7607 Fest Fest Ince Test	DF 5 18 23 Test Stat 7.367 2.55 0.829 0.9441 1.261 2.481 0.2083 0.9403	F Stat 1.876 Critical 4.248 4.248 3.878 2.576 2.576 9.21 0.2056 0.884	0.1487 P-Value 0.0006 0.0651 0.0322 0.3451 0.2074 0.2893 0.0084	Decisi Indete Uneque Equal Norma Norma Norma Norma Norma	ion(α:1%) rminate val Variances al Distribution	s n n n n oution	
ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution	mptid	Sum Squa 0.0540415 0.103693 0.157734 ons Tests Test Bartlett Eq Levene Ec Mod Leven Anderson- D'Agostino D'Agostino D'Agostino Kolmogoro Shapiro-W	quality of Va quality of Va quality of Va ne Equality Darling A2 o Kurtosis T o Skewness o-Pearson k ov-Smirnov Vilk W Norm	Mean 0.0108 0.0057 riance T riance T of Varian Test est Test (2 Omnii D Test ality Tes Mean	Square 3083 7607 Test Test Test The st Test Test Test Test Test Test Test Te	DF 5 18 23 Test Stat 7.367 2.55 0.829 0.9441 1.261 2.481 0.2083 0.9403	F Stat 1.876 Critical 4.248 4.248 3.878 2.576 2.576 9.21 0.2056 0.884 Median	0.1487 P-Value 0.0006 0.0651 0.0322 0.3451 0.2074 0.2893 0.0084 0.1653	Decisi Indete Uneque Equal Norma Norma Norma Non-Norma	ion(α:1%) rminate lal Variances lal Distribution lal Distribution lal Distribution lal Distribution lal Distribution lal Distribution lateral Distribution lateral Distribution lateral Distribution	on on the control of	
ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution	mptid	Sum Squa 0.0540415 0.103693 0.157734 ons Tests Test Bartlett Eq Levene Ed Mod Leven Anderson- D'Agostino D'Agostino D'Agostino Kolmogoro Shapiro-W	quality of Va quality of Va quality of Va ne Equality -Darling A2 o Kurtosis T o Skewness o-Pearson k ov-Smirnov /ilk W Norm	Mean 0.0108 0.0053 riance T riance T of Varian Test est Test 22 Omnii D Test ality Tes	Square 3083 7607 Test Test Test The st Test Test Test Test Test Test Test Te	DF 5 18 23 Test Stat 7.367 2.55 0.829 0.9441 1.261 2.481 0.2083 0.9403	F Stat 1.876 Critical 4.248 4.248 3.878 2.576 2.576 9.21 0.2056 0.884	0.1487 P-Value 0.0006 0.0651 0.0322 0.3451 0.2074 0.2893 0.0084 0.1653	Decisi Indete Uneque Equal Norma Norma Norma Norma Norma	ion(α:1%) rminate lal Variances lal Distribution lal Distribution lal Distribution lal Distribution lal Distribution lal Distribution lateral Distribution lateral Distribution lateral Distribution	on on the control of	%Effec 0.00%
ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution Proportion Su Conc-% 0	mptid	Sum Squa 0.0540415 0.103693 0.157734 ons Tests Test Bartlett Eq Levene Ec Mod Leven Anderson- D'Agostino D'Agostino D'Agostino Kolmogoro Shapiro-W	quality of Va quality of Va quality of Va ne Equality Darling A2 o Kurtosis T o Skewness o-Pearson k ov-Smirnov Vilk W Norm	riance T riance T riance T riance T of Varian Test est Test 2 Omnii D Test ality Tes Mean 1.0000 0.9668	Square 3083 7607 Test Test Test Dus Test 95% LCL 0 1.0000 5 0.9120	DF 5 18 23 Test Stat 7.367 2.55 0.829 0.9441 1.261 2.481 0.2083 0.9403	F Stat 1.876 Critical 4.248 4.248 3.878 2.576 2.576 9.21 0.2056 0.884 Median	0.1487 P-Value 0.0006 0.0651 0.0322 0.3451 0.2074 0.2893 0.0084 0.1653	Decisi Indete Uneque Equal Norma Norma Norma Non-Norma	ion(α:1%) rminate lal Variances lal Distribution lal Distribution lal Distribution lal Distribution lat Distribution	r CV%	
ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution Proportion Su Conc-% 0 6.25	mptid	Sum Squa 0.0540415 0.103693 0.157734 ons Tests Test Bartlett Eq Levene Ec Mod Leven Anderson- D'Agostino D'Agostino D'Agostino Kolmogoro Shapiro-W	quality of Va quality of Va quality of Va ne Equality Darling A2 o Kurtosis T o Skewness o-Pearson k ov-Smirnov /ilk W Norm	riance T riance T riance T rof Varian Test est Test (2 Omnii D Test ality Tes Mean 1.000	Square 3083 7607 Test Test Test Dus Test 95% LCL 0 1.0000 5 0.9120	DF 5 18 23 Test Stat 7.367 2.55 0.829 0.9441 1.261 2.481 0.2083 0.9403 95% UCL 1.0000	F Stat 1.876 Critical 4.248 4.248 3.878 2.576 2.576 9.21 0.2056 0.884 Median 1.0000	0.1487 P-Value 0.0006 0.0651 0.0322 0.3451 0.2074 0.2893 0.0084 0.1653 Min 1.0000	Decisi Indete Uneque Equal Norma Norma Norma Non-N Norma	ion(α:1%) rminate lal Variances lal Distribution lal Distribution lal Distribution lormal Distribution std Distribution lormal Distribution Std Er	c CV% 0.00% 3.54%	0.00%
ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution Proportion St. Conc-% 0 6.25 12.5	mptid	Sum Squa 0.0540415 0.103693 0.157734 ons Tests Test Bartlett Eq Levene Ec Mod Leven Anderson- D'Agostino D'Agostino D'Agostino Kolmogoro Shapiro-W	quality of Va quality of Va quality of Va ne Equality Darling A2 o Kurtosis T o Skewness o-Pearson k ov-Smirnov Vilk W Norm	riance T riance T riance T riance T of Varian Test est Test 2 Omnii D Test ality Tes Mean 1.0000 0.9668	Square 3083 7607 Test Test Test Dus Test 95% LCL 0 1.0000 5 0.9120 0 0.9911	DF 5 18 23 Test Stat 7.367 2.55 0.829 0.9441 1.261 2.481 0.2083 0.9403 95% UCL 1.0000 1.0000	F Stat 1.876 Critical 4.248 4.248 3.878 2.576 2.576 9.21 0.2056 0.884 Median 1.0000 0.9724	0.1487 P-Value 0.0006 0.0651 0.0322 0.3451 0.2074 0.2893 0.0084 0.1653 Min 1.0000 0.9213	Decisi Indete Uneque Equal Norma Norma Norma Norma Norma Norma 1.0000	ion(α:1%) rminate ral Variances Variances I Distribution I Distribution I Distribution I Distribution Std Er 0 0.0000 0 0.0171 0 0.0019	CV% 0.00% 3.54% 0.38%	0.00% 3.35%
ANOVA Table Source Between Error Total ANOVA Assur	mptid	Sum Squa 0.0540415 0.103693 0.157734 ons Tests Test Bartlett Eq Levene Ec Mod Leven Anderson- D'Agostino D'Agostino D'Agostino Kolmogoro Shapiro-W	quality of Va quality of Va ne Equality -Darling A2 o Kurtosis T o Skewness o-Pearson k ov-Smirnov /ilk W Norm	riance T riance T riance T riance T of Varian Test est Test (2 Omnii D Test ality Tes Mean 1.0000 0.9666 0.9970	Square 3083 7607 Test Test bus Test 95% LCL 0 1.0000 5 0.9120 0 0.9911 3 0.9373	DF 5 18 23 Test Stat 7.367 2.55 0.829 0.9441 1.261 2.481 0.2083 0.9403 95% UCL 1.0000 1.0000	F Stat 1.876 Critical 4.248 4.248 4.248 3.878 2.576 2.576 9.21 0.2056 0.884 Median 1.0000 0.9724 0.9987	0.1487 P-Value 0.0006 0.0651 0.0322 0.3451 0.2074 0.2893 0.0084 0.1653 Min 1.0000 0.9213 0.9921	Decisi Indete Uneque Equal Norma Norma Norma Norma Norma Norma 1.0000 1.0000	ion(α:1%) rminate lal Variances lal Distribution lal Distribution lal Distribution lal Distribution lal Distribution lat Distribution Std Er 0 0.0000 0 0.0171 0 0.0019 0 0.0129	CV% 0.00% 3.54% 0.38% 2.64%	3.35% 0.30%

Report Date: Test Code/ID:

09 May-23 12:07 (p 4 of 3) P230411.01 / 20-6592-2484

Bivalve Larval Survival and Development Test

EcoAnalysts

Analysis ID: 15-7875-5056 Analyzed: 25 Apr-23 14:56

Edit Date:

Endpoint: Proportion Survived

Analysis: Nonparametric-Control vs Treatments

CETIS Version:

Status Level:

MD5 Hash: C97390078BCFAFC85E5C06B7C9BD7CA Editor ID:

006-677-240-1

CETISv2.1.4

Angular	(Corrected)	Transformed	Summary
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25 Apr-23 14:16

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	4	1.5390	1.5390	1.5400	1.5390	1.5390	1.5390	0.0000	0.00%	0.00%
6.25		4	1.4100	1.2390	1.5820	1.4080	1.2860	1.5390	0.0538	7.63%	8.38%
12.5		4	1.5170	1.4730	1.5610	1.5290	1.4820	1.5390	0.0139	1.83%	1.44%
25		4	1.4510	1.2860	1.6160	1.4870	1.3430	1.5390	0.0518	7.14%	5.76%
50		4	1.5390	1.5390	1.5400	1.5390	1.5390	1.5390	0.0000	0.00%	0.00%
100		4	1.4860	1.3160	1.6560	1.5390	1.3250	1.5390	0.0535	7.20%	3.48%

Proportion Survived Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	
0	D	1.0000	1.0000	1.0000	1.0000	
6.25		0.9606	0.9843	1.0000	0.9213	
12.5		0.9921	0.9961	1.0000	1.0000	
25		1.0000	0.9488	0.9646	1.0000	
50		1.0000	1.0000	1.0000	1.0000	
100		1.0000	1.0000	0.9409	1.0000	

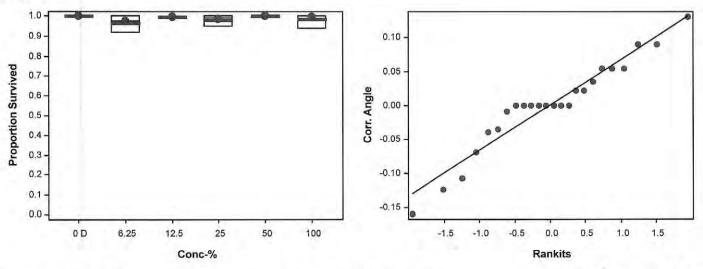
Angular (Corrected) Transformed Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	
0	D	1.5390	1.5390	1.5390	1.5390	
6.25		1.3710	1.4450	1.5390	1.2860	
12.5		1.4820	1.5080	1.5390	1.5390	
25		1.5390	1.3430	1.3810	1.5390	
50		1.5390	1.5390	1.5390	1.5390	
100		1.5390	1.5390	1.3250	1.5390	

Proportion Survived Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	254/254	254/254	254/254	254/254
6.25		244/254	250/254	254/254	234/254
12.5		252/254	253/254	254/254	254/254
25		254/254	241/254	245/254	254/254
50		254/254	254/254	254/254	254/254
100		254/254	254/254	239/254	254/254

Graphics



Convergent Rounding (4 sf)

CETIS™ v2.1.4.6 x64 (006-677-240-1)

Analyst:

CETIS Test Data Worksheet

Bivalve Larval Survival and Development Test

Report Date: Test Code/ID: 25 Apr-23 15:04 (p 1 of 1) P230411.01 / 20-6592-2484

EcoAnalysts

 Start Date:
 11 Apr-23 16:39
 Species:
 Mytilus galloprovincialis

 End Date:
 13 Apr-23 14:43
 Protocol:
 EPA/600/R-95/136 (199)

Sample Code: P230411.01 Sample Source: Jacobs Wyckoff

Sample Station: 041123

nple Date	: 11 A	pr-23	01:27	Material:	Treated Groundw	ater	Sample Stat	ion: 041123
Conc-%	Code	Rep	Pos	Initial Density	Final Density	# Counted	# Normal	Notes
0	D	1	1	254	274	274	265	
0	D	2	26	254	261	261	251	
0	D	3	23	254	275	275	257	
0	D	4	2	254	280	280	263	
0	SC	1	20	254	251	251	240	
0	SC	2	11	254	282	282	270	
0	SC	3	17	254	273	273	256	
0	SC	4	15	254	251	251	241	
6.25		1	7	254	244	244	230	
6.25		2	14	254	250	250	241	
6.25		3	24	254	267	267	256	
6.25		4	12	254	234	234	225	
12.5		1	10	254	252	252	243	
12.5		2	28	254	253	253	246	
12.5	1	3	21	254	267	267	253	
12.5		4	16	254	261	261	250	
25		1	27	254	258	258	252	
25		2	19	254	241	241	227	
25		3	4	254	245	245	238	
25		4	25	254	263	263	255	
50		1	13	254	255	255	242	
50		2	6	254	274	274	267	
50		3	9	254	270	270	254	
50		4	18	254	270	270	253	
100		1	5	254	283	283	244	
100		2	3	254	268	268	237	
100		3	22	254	239	239	212	
100		4	8	254	268	268	. 230	

CETIS Summary Report

Report Date: Test Code/ID: 26 Apr-23 10:36 (p 1 of 2) P230411.01 / 20-6592-2484

Bivalve Larva	l Survival and	Develop	ment Test								Ec	oAnaly	ysts
Batch ID: Start Date: Ending Date: Test Length:	06-2153-7552 11 Apr-23 16: 13 Apr-23 14:4 46h	39	Test Type: Protocol: Species: Taxon:	Development-S EPA/600/R-95/ Mytilus gallopro Bivalvia	136 (1995)			Dilu Brir	ne: C	_aboratory Sea Crystal Sea Ma Faylor Shellfish		Age:	<4h
	08-1100-2764 11 Apr-23 01:2 11 Apr-23 13:0 15h (0.5 °C)	27 05	Code: Material: CAS (PC): Client:	P230411.01 Treated Ground Jacobs Wyckof				Sou	urce: J	Nyckoff Eagle I Jacobs Wyckoff 041123		P 2023	3/W
Multiple Com	parison Summ	nary					1	gainst	Salt 1	mol			
Analysis ID	Endpoint		Comp	parison Method			1	NOEL	LOEL	TOEL	PMSD	TU	S
04-8050-7479	Proportion No	rmal	Dunne	ett Multiple Com	parison Test	t	1	50	100	70.71	2.53%	2	1
05-2590-3784	Proportion Sur	rvived	Steel	Many-One Rank	Sum Test		1	100	>100	=	3.5%	1	9
Point Estimat	e Summary												
Analysis ID	Endpoint		Point	Estimate Meth	od		1	Level	%	95% LCL	95% UCL	TU	S
14-3639-5141	Proportion No	rmal	Linea	r Interpolation (IC	CPIN)		_	EC15	>100			<1	1
							1	EC20	>100			<1	
							1	EC25	>100			<1	
							1	EC40	>100			<1	
			****				1	EC50	>100	1		<1	
5-8751-8497 Proportion Survived Linear Interpolation (ICPIN)					CPIN)		1	EC15	>100	222	(-4-7	<1	*
							1	EC20	>100	222		<1	
								2225	>100			<1	
								EC40	>100	-	-	<1	
2: v.v.v.v.a.a.							√	EC50	>100			<1	
Test Acceptat	1 1		23.00				Li	mits	200				
Analysis ID	Endpoint		Attrib	The second secon	Test Stat	2000		Upper	Overla	p Decision			
	Proportion No			ol Resp	0.9529	0.9		<<	Yes	Passes C			
	Proportion No			ol Resp	0.9529	0.9		<<	Yes	Passes C			
	Proportion Sur			ol Resp	0.9941	0.5		<<	Yes	Passes C			
15-8751-8497	Proportion Sur	rvived	Contr	ol Resp	0.9941	0.5		<<	Yes	Passes C	riteria		
Proportion No	ormal Summar	y											
Conc-%	Code	Coun	t Mean	95% LCL	95% UCL	Min		Max	Std Er	r Std Dev	CV%	%Eff	fect
0	D	4	0.950		0.9764	0.9345		0.9672	0.0081	0.0162	1.70%	0.009	%
0	SC	4	0.952		0.9692	0.9377		0.9602	0.0051		1.07%	-0.23	
6.25		4	0.956		0.9721	0.9426		0.9640	0.0048		1.01%	-0.64	
12.5		4	0.960		0.9772	0.9476		0.9723	0.0052		1.09%	-1.04	
25		4	0.964		0.9898	0.9419		0.9767	0.0078		1.62%	-1.50	
50		4	0.950		0.9771	0.9370		0.9745	0.0084		1.77%	0.049	
100		4	0.872	9 0.8493	0.8966	0.8582		0.8870	0.0074	0.0148	1.70%	8.189	%
	ırvived Summ												
Conc-%	Code	Coun	7 7	Y	95% UCL	THE PERSON NAMED IN		Max	Std Er		CV%	%Eff	
0	D	4	1.000		1.0000	1.0000		1.0000	0.0000		0.00%	0.009	
0	SC	4	0.994		1.0050	0.9882		1.0000	0.0034		0.69%	0.599	
6.25		4	0.966		1.0210	0.9213		1.0000	0.0171		3.54%	3.359	
12.5		4	0.997		1.0030	0.9921		1.0000	0.0019		0.38%	0.309	
25		4	0.978		1.0190	0.9488		1.0000	0.0129		2.64%	2.179	
DI.		4	1.000	0 1.0000	1.0000	1.0000		1.0000	0.0000	0.0000	0.00%	0.009	70
50 100		4	0.985	2 0.9383	1.0320	0.9409		1.0000	0.0148	0.0295	3.00%	1.489	2/

CETIS Summary Report

Report Date: Test Code/ID: 26 Apr-23 10:36 (p 2 of 2) P230411.01 / 20-6592-2484

Rivalve Length	Cundival and	Dovolone	of Toof			Test Code/ID: P230411.01 / 20-6592-2484
Bivalve Larval		Developme	it rest			EcoAnalysts
Proportion No						MD5: AC97CE4F7B4BDBCA87BCD976613F43Al
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	
0	D	0.9672	0.9617	0.9345	0.9393	
0	SC	0.9562	0.9574	0.9377	0.9602	
6.25		0.9426	0.9640	0.9588	0.9615	
12.5		0.9643	0.9723	0.9476	0.9579	
25		0.9767	0.9419	0.9714	0.9696	
50		0.9490	0.9745	0.9407	0.9370	
100		0.8622	0.8843	0.8870	0.8582	
Proportion Su	rvived Detail					MD5: 34274F2C473BCA45C41E89F9A34590F6
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	
0	D	1.0000	1.0000	1.0000	1.0000	
0	sc	0.9882	1.0000	1.0000	0.9882	
6.25		0.9606	0.9843	1.0000	0.9213	
12.5		0.9921	0.9961	1.0000	1.0000	
25		1.0000	0.9488	0.9646	1.0000	
50		1.0000	1.0000	1.0000	1.0000	
100		1.0000	1.0000	0.9409	1.0000	
Proportion No	rmal Binomia	ıls				
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	
0	D	265/274	251/261	257/275	263/280	
0	sc	240/251	270/282	256/273	241/251	
6.25		230/244	241/250	256/267	225/234	
12.5		243/252	246/253	253/267	250/261	
25		252/258	227/241	238/245	255/263	
50		242/255	267/274	254/270	253/270	
100		244/283	237/268	212/239	230/268	
Proportion Su	rvived Binom	ials				
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	
0	D	254/254	254/254	254/254	254/254	
0	SC	251/254	254/254	254/254	251/254	
6.25		244/254	250/254	254/254	234/254	
12.5		252/254	253/254	254/254	254/254	
25		254/254	241/254	245/254	254/254	
50		254/254	254/254	254/254	254/254	
100		254/254	254/254	239/254	254/254	

Report Date: Test Code/ID: 09 May-23 12:08 (p 1 of 3) P230411.01 / 20-6592-2484

34.31.13.531.11	July	vival and D	evelopme	nt lest							E	coAnalyst
Analysis ID:	04-80	050-7479	En	dpoint:	Proportion Nor	mal		CET	S Version	: CETISv2	.1.4	
Analyzed:	26 Ar	or-23 10:35	An	alysis:	Parametric-Co	ntrol vs Trea	tments	Statu	us Level;	1		
Edit Date:	25 Ap	or-23 14:16	MD	5 Hash:	74B728472AA	D8891B08E	F07D2AD6	7213 Edite	or ID:	006-677-	240-1	
Batch ID:	06-21	153-7552	Tes	t Type:	Development-S	Survival		Anal	yst:			
Start Date:	11 Ap	or-23 16:39	Pro	tocol:	EPA/600/R-95/	/136 (1995)		Dilue	ent: La	boratory Sea	water	
Ending Date:	13 Ar	or-23 14:43	Sp	ecies:	Mytilus gallopri	ovincialis		Brine		ystal Sea Ma		
Test Length:	46h		Tax	con:	Bivalvia			Sour	ce: Ta	ylor Shellfish		Age: <4
Sample ID:	08-11	100-2764	Co	de:	P230411.01			Proje	ect: W	yckoff Eagle	Harbor GW	TP 2023/\
Sample Date:	11 Ar	or-23 01:27	Ma	terial:	Treated Groun	dwater		Sour	ce: Ja	cobs Wyckof	f	
Receipt Date:	11 Ap	or-23 13:05	CA	S (PC):				Stati	on: 04	1123		
Sample Age:	15h (0.5 °C)	Cli	ent:	Jacobs Wycko	ff						
Data Transfor	m		Alt Hyp				NOEL	LOEL	TOEL	Tox Units	MSDu	PMSD
Angular (Corre	cted)		C > T				50	100	70.71	2	0.02415	2.53%
Dunnett Multi	ple C	omparison	Test									
Control	vs	Conc-%	d	Test S	tat Critical	MSD	P-Type	P-Value	Decisio	n(α:5%)		
Salt Control		6.25	6	-0.428	8 2.407	0.0523	CDF	0.9291	Non-Sig	nificant Effec		
		12.5	6	-0.883	7 2.407	0.0523	CDF	0.9765	- 100 C C C C C C C C C C C C C C C C C C	nificant Effec		
		25	6	-1.498	2,407	0.0523	CDF	0.9958	Non-Sig	nificant Effec		
		50	6	0.1838	2.407	0.0523	CDF	0.7735	Non-Sig	nificant Effec	Ė	
		100*	6	6.725	2.407	0.0523	CDF	3.3E-05	Significa	int Effect		
Test Acceptal	oility (Criteria	TAC	imits								
Attribute		Test Stat	Lower	Upper	Overlap	Decision						
Control Resp		0.9529	0.9	<<	Yes	Passes C	riteria					
ANOVA Table												
Source		Sum Squa	ares	Mean	Square	DF	F Stat	P-Value	Decisio	n(a:5%)		
Between		0.0862117		0.0172		5	18.27	<1.0E-05		int Effect		
Error		0.0169921		0.0009	440	18						
Total		0.103204				23	_					
	40.00											
ANOVA Assui	nptio	ns Tests										
ANOVA Assui Attribute	mptio.	ns Tests Test				Test Stat	Critical	P-Value	Decisio	n(α:1%)		
Attribute	mptio	Test Bartlett Eq	uality of V			2.379	15.09	0.7946	Equal V	ariances		
Attribute	mptio	Test Bartlett Eq	uality of Vi						Equal V			
Attribute	mptio	Test Bartlett Eq	uality of V	ariance T	est	2.379	15.09	0.7946	Equal V	ariances		
Attribute Variance	mptio	Test Bartlett Eq Levene Ed	quality of V ne Equality	ariance T of Variar	est	2.379 0.607	15.09 4.248	0.7946 0.6956	Equal V Equal V Equal V	ariances ariances		
Attribute Variance	mptio	Test Bartlett Eq Levene Ec Mod Lever	quality of Vone Equality Darling A2	ariance T of Variar Test	est	2.379 0.607 0.2372	15.09 4.248 4.248	0.7946 0.6956 0.9409	Equal V Equal V Equal V Normal	ariances ariances ariances		
Attribute Variance	mptio	Test Bartlett Eq Levene Ec Mod Lever Anderson-	quality of Vone Equality Darling A2 Discourage of Kurtosis	ariance T of Variar Test Fest	est	2.379 0.607 0.2372 0.525	15.09 4.248 4.248 3.878	0.7946 0.6956 0.9409 0.1847	Equal Volume Equal Volume Equal Volume Normal Normal	ariances ariances ariances Distribution		
Attribute Variance	mptio	Bartlett Eq Levene Ed Mod Lever Anderson- D'Agostino	quality of Vone Equality Darling A2 Discourse of Kurtosis Discourse of Skewnes	ariance T of Variar Test Test s Test	est nce Test	2.379 0.607 0.2372 0.525 0.277	15.09 4.248 4.248 3.878 2.576	0.7946 0.6956 0.9409 0.1847 0.7818	Equal Variable Equal Variable Equal Variable Normal Normal	ariances ariances ariances Distribution Distribution		
Attribute Variance	mptio	Bartlett Eq Levene Ed Mod Lever Anderson- D'Agostino D'Agostino Colmogoro	quality of V- ne Equality Darling A2 o Kurtosis o o Skewnes o-Pearson ov-Smirnov	ariance T of Variar Test Fest s Test K2 Omnik D Test	est nce Test ous Test	2.379 0.607 0.2372 0.525 0.277 0.1924	15.09 4.248 4.248 3.878 2.576 2.576 9.21 0.2056	0.7946 0.6956 0.9409 0.1847 0.7818 0.8475 0.9447 0.2079	Equal Vi Equal Vi Equal Vi Normal Normal Normal	ariances ariances ariances Distribution Distribution Distribution		
	mptio	Bartlett Eq Levene Ed Mod Leven Anderson- D'Agostino D'Agostino D'Agostino	quality of V- ne Equality Darling A2 o Kurtosis o o Skewnes o-Pearson ov-Smirnov	ariance T of Variar Test Fest s Test K2 Omnik D Test	est nce Test ous Test	2.379 0.607 0.2372 0.525 0.277 0.1924 0.1137	15.09 4.248 4.248 3.878 2.576 2.576 9.21	0.7946 0.6956 0.9409 0.1847 0.7818 0.8475 0.9447	Equal Von Equal Von Equal Von Normal Normal Normal Normal Normal Normal Normal Normal	ariances ariances ariances Distribution Distribution Distribution Distribution		
Attribute Variance Distribution		Bartlett Eq Levene Ec Mod Lever Anderson- D'Agostino D'Agostino D'Agostino Kolmogoro Shapiro-W	quality of V- ne Equality Darling A2 o Kurtosis o o Skewnes o-Pearson ov-Smirnov	ariance T of Variar Test Fest s Test K2 Omnik D Test	est nce Test ous Test	2.379 0.607 0.2372 0.525 0.277 0.1924 0.1137 0.1454	15.09 4.248 4.248 3.878 2.576 2.576 9.21 0.2056	0.7946 0.6956 0.9409 0.1847 0.7818 0.8475 0.9447 0.2079	Equal Von Equal Von Equal Von Normal Normal Normal Normal Normal Normal Normal Normal	ariances ariances ariances Distribution Distribution Distribution Distribution Distribution		
Attribute Variance Distribution Proportion No		Test Bartlett Eq Levene Ec Mod Lever Anderson- D'Agostino D'Agostino Kolmogoro Shapiro-W Summary Code	quality of Vone Equality Darling A2 O Kurtosis O Skewness O-Pearson OV-Smirnov //ilk W Norm	ariance T of Variar Test Test s Test <2 Omnit D Test nality Tes Mean	est nce Test ous Test st 95% LCL	2.379 0.607 0.2372 0.525 0.277 0.1924 0.1137 0.1454 0.9642	15.09 4.248 4.248 3.878 2.576 2.576 9.21 0.2056 0.884	0.7946 0.6956 0.9409 0.1847 0.7818 0.8475 0.9447 0.2079 0.5282	Equal Vocation of the control of the	ariances ariances ariances Distribution Distribution Distribution Distribution Distribution Distribution	CV%	%Effect
Attribute Variance Distribution Proportion Notice Conc-%		Test Bartlett Eq Levene Ec Mod Lever Anderson- D'Agostino D'Agostino Kolmogoro Shapiro-W Summary	quality of Vone Equality Darling A2 O Kurtosis O Skewness O-Pearson OV-Smirnov Vilk W Norm	ariance T of Variar Test Test s Test <2 Omnit D Test nality Tes Mean 0.9529	est nce Test bus Test 95% LCL 0 0.9366	2.379 0.607 0.2372 0.525 0.277 0.1924 0.1137 0.1454 0.9642 95% UCL 0.9692	15.09 4.248 4.248 3.878 2.576 2.576 9.21 0.2056 0.884 Median 0.9568	0.7946 0.6956 0.9409 0.1847 0.7818 0.8475 0.9447 0.2079 0.5282 Min	Equal Voluments	ariances ariances ariances Distribution	1.07%	0.00%
Attribute Variance Distribution Proportion Not Conc-% 0 6.25		Test Bartlett Eq Levene Ec Mod Lever Anderson- D'Agostino D'Agostino Kolmogoro Shapiro-W Summary Code	quality of Vone Equality Darling A2 O Kurtosis O Skewness O-Pearson OV-Smirnov //ilk W Norm	ariance T of Variar Test Test s Test <2 Omnit D Test nality Tes Mean	est nce Test ous Test st 95% LCL 0 0.9366	2.379 0.607 0.2372 0.525 0.277 0.1924 0.1137 0.1454 0.9642	15.09 4.248 4.248 3.878 2.576 2.576 9.21 0.2056 0.884	0.7946 0.6956 0.9409 0.1847 0.7818 0.8475 0.9447 0.2079 0.5282	Equal Vocation of the control of the	ariances ariances ariances Distribution Distribution Distribution Distribution Distribution Distribution		
Attribute Variance Distribution Proportion Not Conc-% 0 6.25		Test Bartlett Eq Levene Ec Mod Lever Anderson- D'Agostino D'Agostino Kolmogoro Shapiro-W Summary Code	quality of Vone Equality Darling A2 O Kurtosis O Skewness O-Pearson OV-Smirnov Vilk W Norm	ariance T of Variar Test Test s Test <2 Omnit D Test nality Tes Mean 0.9529	est	2.379 0.607 0.2372 0.525 0.277 0.1924 0.1137 0.1454 0.9642 95% UCL 0.9692	15.09 4.248 4.248 3.878 2.576 2.576 9.21 0.2056 0.884 Median 0.9568	0.7946 0.6956 0.9409 0.1847 0.7818 0.8475 0.9447 0.2079 0.5282 Min	Equal Voluments	ariances ariances ariances Distribution	1.07%	0.00%
Attribute Variance		Test Bartlett Eq Levene Ec Mod Lever Anderson- D'Agostino D'Agostino Kolmogoro Shapiro-W Summary Code	quality of Vone Equality Darling A2 O Kurtosis O Skewnes O Pearson OV-Smirnov filk W Norm	ariance T of Variar Test Fest S Test C Omnit D Test hality Tes Mean 0.9529 0.9567	est face Test fa	2.379 0.607 0.2372 0.525 0.277 0.1924 0.1137 0.1454 0.9642 95% UCL 0.9692 0.9721	15.09 4.248 4.248 3.878 2.576 2.576 9.21 0.2056 0.884 Median 0.9568 0.9602	0.7946 0.6956 0.9409 0.1847 0.7818 0.8475 0.9447 0.2079 0.5282 Min 0.9377 0.9426	Equal Voluments	ariances ariances ariances Distribution	1.07% 1.01%	0.00% -0.41%
Attribute Variance Distribution Proportion No. Conc-% 0 6.25 12.5		Test Bartlett Eq Levene Ec Mod Lever Anderson- D'Agostino D'Agostino Kolmogoro Shapiro-W Summary Code	quality of Vone Equality Darling A2 Control Stewness Control Stewness Control Count 4 4 4	riance T of Variar Test Fest S Test C Omnit D Test hality Tes Mean 0.9529 0.9567 0.9605	95% LCL 9 0.9366 7 0.9414 6 0.9439 9 0.9400	2.379 0.607 0.2372 0.525 0.277 0.1924 0.1137 0.1454 0.9642 95% UCL 0.9692 0.9721 0.9772	15.09 4.248 4.248 3.878 2.576 2.576 9.21 0.2056 0.884 Median 0.9568 0.9602 0.9611	0.7946 0.6956 0.9409 0.1847 0.7818 0.8475 0.9447 0.2079 0.5282 Min 0.9377 0.9426 0.9476	Equal Vi Equal Vi Equal Vi Normal Normal Normal Normal Normal Normal Normal 0.9602 0.9640 0.9723	ariances ariances ariances Distribution	1.07% 1.01% 1.09%	0.00% -0.41% -0.80%

Report Date: Test Code/ID:

09 May-23 12:08 (p 2 of 3) P230411.01 / 20-6592-2484

Bivalve Larval Survival and Development Test

EcoAnalysts

Analysis ID: 04-8050-7479 Analyzed: 26 Apr-23 10:35

Endpoint: Proportion Normal Analysis:

Parametric-Control vs Treatments MD5 Hash: 74B728472AAD8891B08EF07D2AD67213

CETIS Version:

Status Level: Editor ID:

006-677-240-1

CETISv2.1.4

Edit Date:	25 Apr-23 14:16	MD5 Ha
Angular (Co	rrected) Transforme	d Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	SC	4	1.3530	1.3160	1.3900	1.3610	1.3190	1.3700	0.0116	1.72%	0.00%
6.25		4	1.3620	1.3260	1.3980	1.3700	1.3290	1.3800	0.0114	1.68%	-0.69%
12.5		4	1.3720	1.3290	1.4150	1.3720	1.3400	1.4040	0.0135	1.97%	-1.42%
25		4	1.3850	1.3220	1.4490	1.3980	1.3270	1.4180	0.0199	2.87%	-2.41%
50		4	1.3490	1.2810	1.4160	1.3340	1.3170	1.4100	0.0212	3.14%	0.30%
100		4	1.2070	1.1710	1.2420	1.2070	1.1850	1.2280	0.0112	1.85%	10.80%

Proportion Normal Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	
0	sc	0.9562	0.9574	0.9377	0.9602	
6.25		0.9426	0.9640	0.9588	0.9615	
12.5		0.9643	0.9723	0.9476	0.9579	
25		0.9767	0.9419	0.9714	0.9696	
50		0.9490	0.9745	0.9407	0.9370	
100		0.8622	0.8843	0.8870	0.8582	

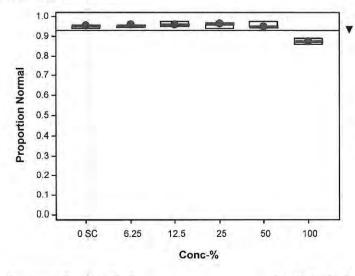
Angular (Corrected) Transformed Detail

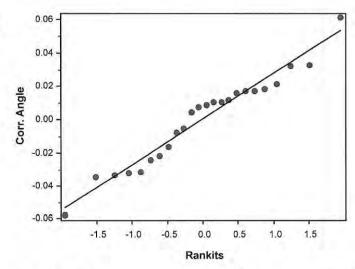
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	
0	SC	1.3600	1.3630	1.3190	1.3700	
6.25		1.3290	1.3800	1.3660	1.3730	
12.5		1.3810	1.4040	1.3400	1.3640	
25		1.4180	1.3270	1.4010	1.3950	
50		1.3430	1.4100	1.3250	1.3170	
100		1.1900	1.2240	1.2280	1.1850	

Proportion Normal Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	
0	SC	240/251	270/282	256/273	241/251	
6.25		230/244	241/250	256/267	225/234	
12.5		243/252	246/253	253/267	250/261	
25		252/258	227/241	238/245	255/263	
50		242/255	267/274	254/270	253/270	
100		244/283	237/268	212/239	230/268	

Graphics





CETIS™ v2.1.4.6 x64 (003-841-189-5)

Analyst:

Report Date: Test Code/ID: 09 May-23 12:08 (p 3 of 3) P230411.01 / 20-6592-2484

								T	est C	ode/ID:		P230	411.01/2	0-6592-24
Bivalve Larva	l Survival and	Developm	nent T	lest .									Е	coAnalyst
Analysis ID:	05-2590-3784	E	ndpo	int: Pro	portion Sun	vived			CET	IS Versi	on:	CETISv2.	1.4	
Analyzed:	26 Apr-23 10:3		nalys		nparametric		Treatments			us Leve		1		
Edit Date:	25 Apr-23 14:1				4B120B481F					or ID:		006-677-2	240-1	
Batch ID:	06-2153-7552	-	oot T	mai Da	volonment C	Numai and	I TOTAL THE STATE OF		A 1			221111111111111111111111111111111111111		
Start Date:	11 Apr-23 16:3		rotoc		velopment-S A/600/R-95/				Anal		عجمام ا			
									Dilu			atory Seaw		
	13 Apr-23 14:4		pecie		tilus gallopro	ovincialis			Brin	711		al Sea Mari	ine Mix	
Test Length:	46h	4	axon	: Biv	alvia				Sou	rce:	Taylor	Shellfish		Age: <
Sample ID:	08-1100-2764	C	ode:	P2:	30411.01				Proj	ect:	Wyck	off Eagle H	larbor GW	TP 2023/
Sample Date:	11 Apr-23 01:2	27 N	lateri	al: Tre	ated Ground	dwater			Sou	rce:	Jacob	s Wyckoff		
Receipt Date:	11 Apr-23 13:0)5 C	AS (F	PC):					Stati	on:	04112	23		
Sample Age:	15h (0.5 °C)	C	lient:	Jac	cobs Wyckot	ff								
Data Transfor	m	Alt Hy	р				NOEL	LO	EL	TOEL		Tox Units	MSDu	PMSD
Angular (Corre	cted)	C > T					100	>10	0			1	0.03475	3.50%
Steel Many-O	ne Rank Sum	Test												
Control	vs Conc-%		df T	est Stat	Critical	Ties	P-Type	P-V	alue	Decis	ion(α:	:5%)		
Salt Control	6.25		_	3	10	2	CDF	0.23	7 4 7 7			ant Effect		
	12.5		6 2	20	10	2	CDF	0.98	516			ant Effect		
	25		6 1	6	10	2	CDF	0.6				ant Effect		
	50		6 2	22	10	2	CDF	0.99				ant Effect		
	100		6 1	9	10	2	CDF	0.90				ant Effect		
Test Acceptat	oility Criteria	TAC	Lim	ito										
Attribute	Test Sta			Jpper	Overlap	Decision								
Control Resp	0.9941	0.5	_	<<	Yes	Passes C	riteria							
ANOVA Table														
Source	Sum Sq	uares		Mean Squ	uare	DF	F Stat	P-V	alue	Decis	ionla	-5%)		
Between	0.043886			0.008777		5	1.44	0.25				ant Effect		
Error	0.10970	7		0.006094		18		0.2	., .		giiiii	ant Enout		
Total	0.153587					23	-							
ANOVA Assur	nntions Tests													
Attribute	Test					Test Stat	Critical	D.V	alue	Decis	ionla	-10/.)		
C - 2		quality of	Vario	non Tost		rest otat	Citical	14	aiue					
Variance		Equality of				5.52	4.248	0.00	130	Indete		te riances		
		ene Equal				1.92	4.248	0.14		Equal				
Distribution		n-Darling A	131		1001	0.4022	3.878	0.36		3-06-10-6		ribution		
Distribution		no Kurtosi				0.4522	2.576	0.57				ribution		
		no Skewne				1.164	2.576	0.24				ribution		
		no-Pearso			Toet	1.663	9.21	0.43				ribution		
		rov-Smirn			1030	0.125	0.2056	0.42				ribution		
		Wilk W No				0.967	0.884	0.59				ribution		
Proportion Su	rvived Summa	arv								7127612				
Conc-%	Code	Count	N	Mean	95% LCL	95% UCL	Median	Min	0	Max		Std Err	CV%	%Effect
0	sc	4		0.9941	0.9832	1.0000	0.9941	0.98	75-	1.0000		0.0034	0.69%	0.00%
6.25		4		.9665	0.9120	1.0000	0.9724	0.92		1.0000		0.0171	3.54%	2.77%
12.5		4		0.9970	0.9911	1.0000	0.9987	0.99		1.0000		0.0019	0.38%	-0.30%
25		4		0.9783	0.9373	1.0000	0.9882	0.94		1.0000		0.0019	2.64%	
														1.58%
50		4		.0000	1.0000	1.0000	1.0000	1.00		1.0000		0.0000	0.00%	-0.59%
100		4	0	0.9852	0.9383	1.0000	1.0000	0.94	109	1.0000	J	0.0148	3.00%	0.89%

Report Date: Test Code/ID:

09 May-23 12:08 (p 4 of 3) P230411.01 / 20-6592-2484

Bivalve Larval Survival and Development Test

EcoAnalysts

Analysis ID: 05-2590-3784 Analyzed:

Edit Date:

Endpoint: Proportion Survived 26 Apr-23 10:36

Analysis: Nonparametric-Control vs Treatments **CETIS Version:**

Status Level:

006-677-240-1

CETISv2.1.4

Angular	(Corrected)	Transformed Summary
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25 Apr-23 14:16

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	SC	4	1.5010	1.4290	1.5720	1.5010	1.4620	1.5390	0.0224	2.98%	0.00%
6.25		4	1.4100	1.2390	1.5820	1.4080	1.2860	1.5390	0.0538	7.63%	6.01%
12.5		4	1.5170	1.4730	1.5610	1.5290	1.4820	1.5390	0.0139	1.83%	-1.10%
25		4	1.4510	1.2860	1.6160	1.4870	1.3430	1.5390	0.0518	7.14%	3.33%
50		4	1.5390	1.5390	1.5400	1.5390	1.5390	1.5390	0.0000	0.00%	-2.58%
100		4	1.4860	1.3160	1.6560	1.5390	1.3250	1.5390	0.0535	7.20%	0.98%

MD5 Hash: 2B4B120B481FCDD0A8B754AA78F5B06F Editor ID:

Proportion Survived Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	SC	0.9882	1.0000	1.0000	0.9882
6.25		0.9606	0.9843	1.0000	0.9213
12.5		0.9921	0.9961	1.0000	1.0000
25		1.0000	0.9488	0.9646	1.0000
50		1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	0.9409	1.0000

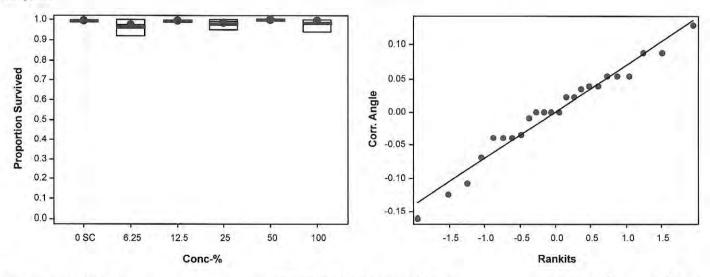
Angular (Corrected) Transformed Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	
0	SC	1.4620	1.5390	1.5390	1.4620	
6.25		1.3710	1.4450	1.5390	1.2860	
12,5		1.4820	1.5080	1.5390	1.5390	
25		1.5390	1.3430	1.3810	1.5390	
50		1.5390	1.5390	1.5390	1.5390	
100		1.5390	1.5390	1.3250	1.5390	

Proportion Survived Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	
0	SC	251/254	254/254	254/254	251/254	
6.25		244/254	250/254	254/254	234/254	
12.5		252/254	253/254	254/254	254/254	
25		254/254	241/254	245/254	254/254	
50		254/254	254/254	254/254	254/254	
100		254/254	254/254	239/254	254/254	

Graphics



Convergent Rounding (4 sf)

CETIS™ v2.1.4.6 x64 (003-841-189-5)

Analyst: N

Report Date: Test Code/ID: 25 Apr-23 15:03 (p 1 of 4) P230411.01 / 20-6592-2484

Bivalve Larva	I Sur	vival and D	evelopn	nent Test								E	coAnalysts
Analysis ID:	19-90	74-0866	E	ndpoint:	Pro	portion Norn	nal	CETIS Versi			CETISv2	.1.4	
Analyzed:	25 A	or-23 15:00	A	Analysis: Parametric-Two			Sample			tus Level:	1		
Edit Date:	25 Ap	or-23 14:16	N	ID5 Hash	1: 11E	1A41E623E	BF4457AB01BA4E103A2E5			tor ID:	006-677-	240-1	
Batch ID:	06-21	153-7552	1	est Type	: Dev	elopment-S	urvival		Ana	ılyst:			
Start Date:	11 A	or-23 16:39	F	rotocol:	EP	A/600/R-95/	136 (1995)		Dile	ent: Labo	oratory Sea	water	
Ending Date:	13 A	or-23 14:43	S	pecies:	Myt	ilus gallopro	vincialis		Bri	ne: Crys	stal Sea Ma	rine Mix	
Test Length:	46h	6h Taxon:		Biva	alvia			Sou	ırce: Tayl	or Shellfish		Age: <4	
Sample ID:	08-11	100-2764	C	ode:	P23	30411.01			Pro	ject: Wyo	koff Eagle I	Harbor GV	VTP 2023/W
Sample Date:	11 A	11 Apr-23 01:27 Mat		/laterial:	Tre	ated Ground	lwater		Soi	urce: Jaco	obs Wyckof	f	
Receipt Date:	: 11 Apr-23 13:05 CA		AS (PC)					Sta	tion: 041	123			
Sample Age:	15h (0.5 °C)	C	Client:	Jac	obs Wyckof	f						
Data Transfor	rm		Alt Hy	р				Comparis	son Result				PMSD
Angular (Corre	angular (Corrected) C > T						Salt Conti	rol passed	proportion no	rmal endpo	int	2.02%	
Equal Variance	ce t Tv	vo-Sample	Test										
Control I	vs	Control II		df Test	Stat	Critical	MSD	P-Type	P-Value	Decision((a:5%)		
Dilution Water		Salt Contro	ol	6 -0.17		1.943	0.04307	CDF	0.5648		ficant Effect	t -	
Test Acceptal	bility (Criteria	TA	C Limits									
Attribute		Test Stat			er	Overlap	Decision						
Control Resp	-	0.9529	0.9	<<		Yes	Passes Cr	riteria					
Control Resp		0.9507	0.9	<<		Yes	Passes Ci	riteria					
ANOVA Table													
Source		Sum Squa	ares	Mea	n Squ	ıare	DF	F Stat	P-Value	Decision	(a:5%)		
Between		2.851E-05		78, 567	1E-05		1	0.02902	0.8703		ficant Effec	t	
Error		0.0058957			09826		6						
Total		0.0059242					7						
ANOVA Assui	mptio	ns Tests											
Attribute		Test					Test Stat	Critical	P-Value	Decision	(a:1%)		
Variance	77	Levene Ed	quality of	Variance	Test		4.495	13.75 0.0783 Equal Variances					
		Mod Lever	ne Equal	lity of Var	iance	Test	3.077	13.75	0.1299	Equal Var			
		Variance F					2.649	47.47	0.4448	Equal Var			
Distribution		Anderson-	-				0.4461 0.221	3.878	0.2864		Normal Distribution		
		Kolmogoro Shapiro-W					0.3313 0.6451	0.3372	Normal Distribution Normal Distribution				
			TIIN VV INC	officiality i	CSI		0.9001	0.0431	0.2090	Nomial	istribution -		
Proportion No	ormal			12.0		050/ 1 01	050/ 1101	Madies	Mile	Marr	Ctd C-	CV9/	0/ E#act
Conc-%	-	Code	Count		_	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0		D	4	0.95		0.9250	0.9764	0.9505	0.9345	0.9672	0.0081	1.70%	0.00%
0		sc	4	0.95	29	0.9366	0.9692	0.9568	0.9377	0.9602	0.0051	1.07%	-0.23%
Angular (Corr	rected					7.0x 3.7c	1.01.005	Acres and	450	0.2	274	EV 50 5	21.000
Conc-%	1	Code	Count		-	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
		D	4	1.34		1.2890	1.4090	1.3480	1,3120	1.3890	0.0189	2.80%	0.00%
					20	1.3160	1.3900	1.3610	1.3190	1.3700	0.0116	1.72%	-0.28%
0		SC	4	1.35	30	1.0100	10,000,000		3400.7				
0 0 Proportion Ne	ormal	E	4	1.35	30	1,0100							
0	ormal	E	4 Rep 1	Rep		Rep 3	Rep 4						
0 Proportion No	ormal	Detail		Rep	2								

Report Date: Test Code/ID:

Editor ID:

25 Apr-23 15:03 (p 2 of 4) P230411.01 / 20-6592-2484

Bivalve Larval Survival and Development Test

EcoAnalysts

19-9074-0866 Analysis ID:

Endpoint: Proportion Normal

CETISv2.1.4 **CETIS Version:**

Analyzed: 25 Apr-23 15:00 **Edit Date:** 25 Apr-23 14:16 Analysis: Parametric-Two Sample MD5 Hash: 11D1A41E623BF4457AB01BA4E103A2E5

Status Level:

006-677-240-1

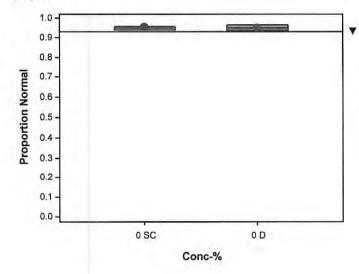
Angular (Corrected) Transformed Detail

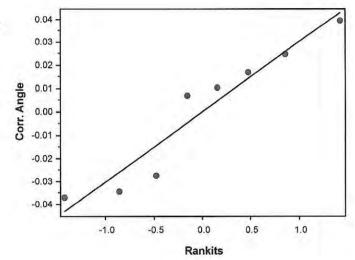
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	
0	D	1.3890	1.3740	1.3120	1.3220	
0	sc	1.3600	1.3630	1.3190	1.3700	

Proportion Normal Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	
0	D	265/274	251/261	257/275	263/280	
0	SC	240/251	270/282	256/273	241/251	

Graphics





Report Date: Test Code/ID: 25 Apr-23 15:03 (p 3 of 4) P230411.01 / 20-6592-2484

Bivalve Larva	I Surv	ival and D	evelop	omen	t Test									EcoAnalyst
Analyzed:	25 Ap	667-2197 or-23 15:00 or-23 14:16		Endpoint: Proportion Survived Analysis: Parametric-Two Sample MD5 Hash: 317C009E761D3EBD1AF3				141C0A0E9	CETIS Version: CETISv2.1.4 Status Level: 1 C0A0E95AE Editor ID: 006-677-240-1					
	06-2153-7552 11 Apr-23 16:39 13 Apr-23 14:43 46h				ocol: E cies: N	Development-S EPA/600/R-95/ Mytilus gallopn Bivalvia			Brine: Crys		ystal Sea Ma	ooratory Seawater stal Sea Marine Mix vlor Shellfish		
Sample ID: Sample Date: Receipt Date: Sample Age:	11 Ap	or-23 13:05		Code Mate CAS Clier	erial: T (PC):	230411.01 reated Groun				Proje Sour Stati	rce: Ja	yckoff Eagle cobs Wycko 1123		VTP 2023/W
Data Transfor	m		Alt H	Нур				Comparis	on R	esult				PMSD
ngular (Corrected) C > T							Salt Contr	ol pas	sed p	roportion s	urvived end	ooint	0.70%	
Unequal Varia	nce t	Two-Sami	ole Te	st										
Control I	vs	Control II		df	Test St	at Critical	MSD	P-Type	P.V	alue	Decision	n(a:5%)		
Dilution Water	-	Salt Contro	ol	3	1.732	2.353	0.05266	CDF	0.09	71000	- Joseph Line	nificant Effec	t	
						2.000	0.00200		-	100	1,011 019			
Test Acceptat	oility (AC Li		2	2-7-7-							
Attribute	4	Test Stat	4-1-07	er	Upper	Overlap	Decision							
Control Resp Control Resp		0.9941	0.5		<<	Yes Yes	Passes C							
Control Resp			0.5		,,	165	rasses C	ntena						
ANOVA Table														
Source		Sum Squa			Mean S		DF	F Stat		alue	Decision			
Between		0.0030043			0.00300	37.54	1	3	0.13	340	Non-Sig	nificant Effec	t	
Error Total	-	0.0060087	_	-	0.00100)15	7	_						
. 7070	9	NEW TOWN OF THE PARTY OF THE PA								_				
ANOVA Assur	nptio	ns Tests					-1							
Attribute		Test					Test Stat	Critical	P-V	alue	Decisio	n(a:1%)		
Variance Distribution		Variance Ratio F Test Anderson-Darling A2 Test Kolmogorov-Smirnov D Test Shapiro-Wilk W Normality Test					0.6699 0.25 0.8489	3.878 0.3313 0.6451	0.08 0.18 0.09	599	Normal I	ninate Distribution Distribution Distribution		
Proportion Su	ırvive	d Summar	у											
Conc-%		Code	Cour	nt	Mean	95% LCL	95% UCL	Median	Min		Max	Std Err	CV%	%Effect
0		D	4		1.0000	1.0000	1.0000	1.0000	1.00		1.0000	0.0000	0.00%	0.00%
0		sc	4		0.9941	0.9832	1.0000	0.9941	0.98	382	1.0000	0.0034	0.69%	0.59%
Angular (Corr	ected) Transfori	ned S	umm	arv									
Conc-%		Code	Cour		Mean	95% LCL	95% UCL	Median	Min		Max	Std Err	CV%	%Effect
0		D	4		1.5390	1.5390	1.5400	1.5390	1.53		1.5390	0.0000	0.00%	0.00%
0		SC	4		1.5010	1.4290	1.5720	1.5010	1.46		1.5390	0.0224	2.98%	2.52%
Proportion Su	urvive	7.20.00			2.719.22									
Conc-%		Code	Rep	1	Rep 2	Rep 3	Rep 4							
0		D	1.000	_	1.0000	1.0000	1.0000							
0		sc	0.98	82	1.0000	1.0000	0.9882							
Angular (Corr	ected) Transfor	med D	etail										
Conc-%		Code	Rep	1	Rep 2	Rep 3	Rep 4							
0		D	1.539	-	1.5390	1.5390	1.5390							
U		-		00	1.0000	1.0000								

Report Date: Test Code/ID:

25 Apr-23 15:03 (p 4 of 4) P230411.01 / 20-6592-2484

Bivalve Larval Survival and Development Test

EcoAnalysts

Analysis ID: 08-8567-2197

25 Apr-23 15:00 25 Apr-23 14:16 Endpoint: Proportion Survived

Analysis: Parametric-Two Sample **CETIS Version:**

Status Level:

MD5 Hash: 317C009E761D3EBD1AF3141C0A0E95AE Editor ID:

006-677-240-1

CETISv2.1.4

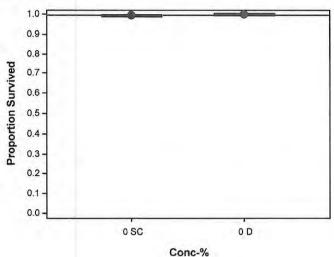
Proportion Survived Binomials

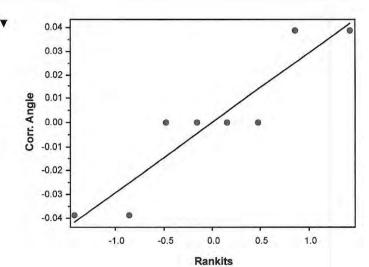
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	
0	D	254/254	254/254	254/254	254/254	
0	SC	251/254	254/254	254/254	251/254	

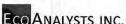


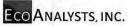
Analyzed:

Edit Date:









Version V.2

GENERAL

2	GENERAL	
Client	Jacobs- Wyckoff	
Project	Wyckoff Eagle Harbor GWTP 2023/WA	1
Project Number	PG1799	
Project Manager	J. Levengood	Note: input lowest and highest decimal for temp
Date Sample Received	4/11/2023	
Test type	48-Hour Chronic Toxicity Using Bivalve Larvae	
Matrix	Liquid	1
Test Acceptability	≥90% normal shell development, ≥50% survival (mussels) or ≥70% survival (oysters), MSD <25%	TEST ST
Test Start Date	04/11/23	TEST
Test Species	Mytilus spp.	
Organism Batch	TS041023.01	C
Organism Acquired	4/10/2023	4
Organism Acclimation	(1)	
Organism Age	<4 hr old embryos	
Test Protocol	TOX 042	
Test Location	Incubator 1	
Light Intensity	50-100 foot candles	
Light Cycle	16L:8D	Salinity Adjustment CSMM Batch #
Water Description	0.45 um filtered seawater	C4661304
Organisms per Replicate	150 - 300	
Test Chamber Size	30 mL	Formalin Lot #
Exposure Volume	10 mL	220304-50
Test Dissolved Oxygen	> 4.0	
Test Temperature	16 ± 1	Rose Bangel Batch #
Test Salinity	30 ± 2	5135
Test pH	8±1	

T	est Parameters	
	Min	Max
DO	4.0	
Temp	15	17
Salinity	28	32
pH	7	9

1639 EST START TIME/INIT: TEST END TIME/INIT:

CLIENT SAMPLE ID	LAB ID	
41123	P230411.01	

Concentrations Control Salt Control 6.25% 12.5% 25% 50% 100%



CLIENT	Jacobs- Wyckofi	DATE RECEIVED	3/28/23	PROTOCOL	TOX 042
PROJECT	Wyckoff Eagle Harbor GWTP 2023/WA	TEST START DATE	4/11/23	PROJECT MANAGER	J. Levengood
CLIENT SAMPLI	EID 41123	TEST END DATE	4/13/23	SPECIES	Mytilus spp.
LAB SAMPLE ID	P230411.01	MATRIX	Liquid	NO. OF ORGANISMS	150 - 300

48-Hour (Chronic	Toxicity	Using	Bivalve	Larvae
-----------	---------	----------	-------	---------	--------

Day of Test	Concentration	Vol. Effluent Sample Added (mL)	Vol. Diluent Added (mL)	Total Volume (mL)	Diluent Type	FSW
	0%	0	250.0	250		
	Salt Control	#VALUE!	#VALUE!	250		
	6.25%	15.6	234.4	250		
0	12.5%	31.25	218.75	250		
	25%	62.5	187.5	250		
	50%	125	125.0	250		
	100%	250	0.0	250		

Test Dilution Prep

Date	Balance ID	Sample ID (P#)	Water Batch ID	Initials
4/1123	5	P230411.01	FSW041123.01	Ug

V.2	CLIENT	Jacobs- Wyckoff	DATE RECEIVED	4/11/23	PROTOCOL	TOX 042
	PROJECT	Wyckoff Eagle Harbor GWTP 2023/WA	TEST START DATE	4/11/23	PROJECT MANAGER	J. Levengood
	CLIENT SAMPLE ID	41123	TEST END DATE	4/13/23	SPECIES	Mytilus spp.
	LAR SAMPLE ID	D220411 01	MATRIX	Liquid	NO OF OPGANISMS	150 - 300

48-Hour Chronic Toxicity Using Bivalve Larvae

SPAWNING METHOD Heat Shock		NITIAL SPAWNING TIME 1341	FINAL SPAWNING TIME 1430	
MALES 2	FEMALES 4	SPERM VIABILITY Good	EGG CONDITION Good	
BEGIN FERTILIZATION 1430		END FERTILIZATION 1637	CONDITION OF EMBRYOS Good	

TIME OF INITIATION	INITIALS
1639	DM/MS

EMBRYO DENSITY CALCULATIONS

# of embryos in 1 mL of 100X diluted embryo stock		o stock	# embryos in original stock = # of embryos in diluted stock x 100	
Count 1	int 1 Count 2 Mean			
	152	135	143.5	14350
larcantaga of	f ambrus stack a	oodod = 3E00	ombruge per 1 ml /# ombr	aver in existinal stack
	The second secon	eeded = 2500	embryos per 1 mL/# embr	ryos in original stock
	f embryo stock n 0.17	eeded = 2500	embryos per 1 mL/# embr	ryos in original stock
	0.17			
mL of egg stoo	0.17	to achieve to	tal volume = percentage o	ryos in original stock f embro stock needed * 40 mL (or desired volume of embryo stock) desired volume of embryo stock) with FSW = final embryo stock



V.2	CLIENT	Jacobs- Wyckoff	DATE RECEIVED	3/28/23	PROTOCOL	TOX 042
	PROJECT	off Eagle Harbor GWTP 2023/WA	TEST START DATE	4/11/23	PROJECT MANAGER	J. Levengood
	CLIENT SAMPLE ID	41123	TEST END DATE	4/13/23	SPECIES	Mytilus spp.
И	LAB SAMPLE ID	P230411.01	MATRIX	Liquid	NO. OF ORGANISMS	150 - 300

	4	8-Hour Chronic	Toxicity Using Bival	ve Larvae	
		DO (mg/L)	TEMP (°C)	SALINITY (ppt)	рН
	Concentration (%)	> 4.0	15 - 17	28 - 32	7-9
Day 0	Control	7.9	17.3	29	7.9
Stock	Salt Control	8.3	6.51	29	8.1
Date 4/11/23	6.25%	8.3	16.9	30	7.9
Time 1448	12.5%	8.4	16.9	30	7.9
Tech Ub	25%	8.4	16.9	30	8.5
Meter# 8	50%	8.5	16.6	30	7.7
	100%	8,6	16.0	30	7.7
Day 1	Control		15.90		
Surrogate	Salt Control		15.90		
Date 4 (12/23)	6.25%		15.9		
Time 0959	12.5%	300	15.9 0		
Tech 52	25%		15.90		
Meter# TI6	50%		15.90		
	100%		15.9		
Day 2	Control	7.3	14.90	29	7.8
Surrogate	Salt Control	7.8	149 0	30	8.1
Date 4/13/27	6.25%	7.9	14.9 0	30 31	0.1
Time 1029	12.5%	7.8	14.1 0	32	8.1
Tech (V)	25%	7.8	14.7 0	31	8.2
Meter # 9	50%	7.4	14.9 0	30	8.2
	100%	7.4	14.1	30	8.3

Otemp taken from temp blank-sz 4/12/23



² CLIENT		Jacobs- Wyckoff	DATE RECEIVED	3/28/23	PROTOCOL	TOX 042
PROJECT	Wyckoff Eagle H	arbor GWTP 2023/WA	TEST START DATE	4/11/23	PROJECT MANAGER	J. Levengood
CLIENT SA	MPLE ID	41123	TEST END DATE	4/13/23	SPECIES	Mytilus spp.
LAB SAMI	PLE ID	P230411.01	MATRIX	Liquid	NO. OF ORGANISMS	150 - 300

48-Hour Chronic Toxicity Using Bivalve Larvae

Concentration (%)	REP	Normal	Abnormal	Date	Tech	Comments/QA Counts
	1	264		4/21/23	NL	
	2	265		4/21/23	NL	
Stadden Densite	3	262		4/21/23	NL	
Stocking Density	4	240		4/21/23	NL	
	5	234		4/21/23	NL	
	6	261		4/2/23	NU	
	1	265	9	4/21/23	MS	
Control	2	251	10	4/21/23	52	
Control	3	257	18	414123	82	
	4	243	17	4/21/23	52	
	1	240	11	4/21/23	52	
Salt Control	2	270	12	4/21/23	SZ	
Sait Control	3	254	17	4/21/23	52	
	4	241	10	4/21/23	SZ	
	1	230	14	4/21/23	52	
6.25%	2	241	9	4/21/23	S2	N. 17 4:87 P-1
0.2376	3	25le		4/21/23	SZ	134705 417. uji
	4	225	9	4/21/23	SZ	
	1	243	9	4/21/23	SZ	
12.5%	2	246	7	4/21/23	52	
12.5%	3	253	14	4/21/23	52	
	4	250	ll l	4/21/23	52	
	1	252	6	4/21/23	52	
25%	2	227	14	4121/23	52	
25/0	3	738	7	4/2/23	52	
	4	255	8	4/2/23	52	N. 255 A. 8 255/23 97 D. 0/ N
	1	242	13	4/21/23	52	N: 244 A13 A= 0/. N N: 244 A13 A= 0/.
50%	2	267	7	4/21/23	52	
3070	3	254	16	4/22/23	M	
	4	253	П	4/22/23	NL	
	1	244	39	4/22/23	M	
100%	2	237	31	4/22/23	NL	
100/0	3	212	27	4/2423	M	
	4	230	38	4/22/23	N	

Report Date:

25 Apr-23 15:19 (1 of 1)

Bivalve Larval Survival and Development Test

All Matching Labs

Test Type: Development-Survival

Organism: Mytilus galloprovincialis

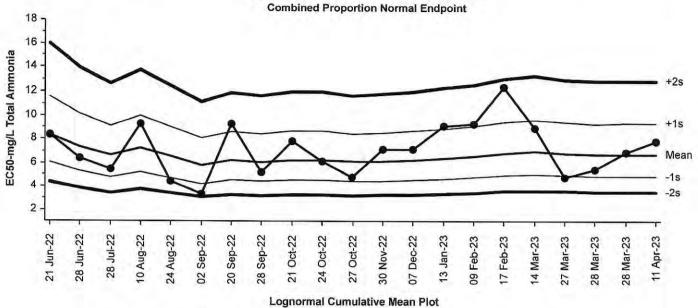
Material: Total Ammonia

Protocol: EPA/600/R-95/136 (1995)

Endpoint: Combined Proportion Normal

Source: Reference Toxicant-REF

Bivalve Larval Survival and Development Test



Mean: Sigma:

6.746 NA

Count: 20 CV: 33.40%

-1s Warning Limit: 4.87 +1s Warning Limit: 9.34

-2s Action Limit: 3.52 +2s Action Limit: 12.9

Quality Control Data

Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID	Laboratory
1	2022	Jun	21	17:46	8.368	1.621	0.6627			03-7983-1979	17-5961-0612	EcoAnalysts
2			28	16:05	6.362	-0.3843	-0.1805			08-5637-7603	04-5931-5430	EcoAnalysts
3		Jul	28	15:55	5.431	-1.315	-0.6671			19-6544-8440	11-0281-7196	EcoAnalysts
4		Aug	10	16:57	9.323	2.576	0.9952			20-5736-9281	08-2934-0504	EcoAnalysts
5			24	16:43	4.439	-2.307	-1.288	(-)		10-4871-9595	11-0042-4049	EcoAnalysts
6		Sep	2	14:54	3.311	-3.435	-2.19	(-)	(-)	16-0701-8534	00-0124-1152	EcoAnalysts
7			20	16:02	9.267	2.521	0.9769			11-7896-9547	00-7476-6700	EcoAnalysts
8			28	16:31	5.182	-1.565	-0.8119			10-3818-0354	11-9896-8834	EcoAnalysts
9		Oct	21	14:16	7.804	1.058	0.4483			05-2022-4267	03-4308-3965	EcoAnalysts
10			24	15:17	6.15	-0.5965	-0.2849			01-4864-2336	19-5269-5566	EcoAnalysts
11			27	17:02	4.776	-1.97	-1.063	(-)		12-4527-0974	13-7457-7890	EcoAnalysts
12		Nov	30	14:32	7.166	0.4193	0.1856			11-2220-4195	10-4569-3704	EcoAnalysts
13		Dec	7	17:43	7.159	0.4125	0.1826			19-4874-8030	20-9525-0017	EcoAnalysts
14	2023	Jan	13	15:30	9.078	2.331	0.9132			14-2219-3979	18-3945-1944	EcoAnalysts
15		Feb	9	15:28	9.246	2.5	0.9699			00-8572-7368	10-5325-0783	EcoAnalysts
16			17	14:30	12.4	5.651	1.872	(+)		20-3891-7103	06-7296-3936	EcoAnalysts
17		Mar	14	15:15	8.955	2.209	0.8715			00-9622-9067	21-3408-3763	EcoAnalysts
18			27	16:54	4.818	-1.928	-1.036	(-)		13-8989-7877	05-5295-3514	EcoAnalysts
19			28	15:46	5.455	-1.291	-0.6538			02-2233-3890	16-3797-4494	EcoAnalysts
20			28	15:47	6.941	0.1943	0.08735			01-6969-0938	06-4639-7696	EcoAnalysts
21		Apr	11	16:37	7.809	1.063	0.4502			14-1713-1401	15-2064-5147	EcoAnalysts

0.25

0.20 0.15

0.10

0.05 0.00

13 Apr-22

11 May-22

Bivalve Larval Survival and Development Test

03 Jun-22

28 Jun-22

10 Aug-22

24 Aug-22

02 Sep-22

20 Sep-22

28 Sep-22

17 May-22

All Matching Labs

+2s

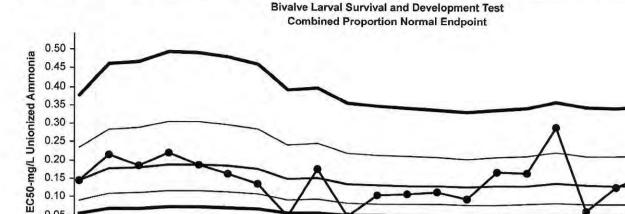
+1s

Mean

-1s

11 Apr-23

Test Type: Development-Survival Organism: Mytilus galloprovincialis Material: Unionized Ammonia Protocol: EPA/600/R-95/136 (1995) Endpoint: Combined Proportion Normal Source: Reference Toxicant-REF



Lognormal Cumulative Mean Plot

21 Oct-22

24 Oct-22

27 Oct-22

07 Dec-22

13 Jan-23

09 Feb-23

17 Feb-23

27 Mar-23

28 Mar-23

28 Mar-23

Mean: 0.1336 Count: 20 -1s Warning Limit: 0.0827 -2s Action Limit: 0.0512 Sigma: NA CV: 50.80% +1s Warning Limit: 0.216 +2s Action Limit: 0.349

Qualit	y Con	trol Data	a									
Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID	Laboratory
1	2022	Apr	13	15:38	0.1448	0.01121	0.168			18-9475-6703	13-3543-8688	EcoAnalysts
2		May	11	15:54	0.2152	0.08161	0.9944			19-4844-7090	04-7446-5371	EcoAnalysts
3			17	16:11	0.185	0.05143	0.6792			21-0960-1917	00-4551-7197	EcoAnalysts
4		Jun	3	16:12	0.2219	0.08835	1.059	(+)		21-4199-4121	20-5427-8206	EcoAnalysts
5			28	16:05	0.188	0.05444	0.7129			19-3785-6817	00-8378-9623	EcoAnalysts
5		Aug	10	16:57	0.1651	0.03156	0.4422			09-3839-8015	12-5640-2017	EcoAnalysts
7			24	16:43	0.1359	0.00228	0.0353			00-7678-9875	07-1760-4646	EcoAnalysts
8		Sep	2	14:54	0.04851	-0.08508	-2.113	(-)	(-)	13-9573-6141	09-4475-1376	EcoAnalysts
9			20	16:02	0.1767	0.04315	0.5838			13-8303-2046	02-4939-5521	EcoAnalysts
10			28	16:31	0.04973	-0.08386	-2.061	(-)	(-)	14-4835-8902	06-7637-8760	EcoAnalysts
11		Oct	21	14:16	0.1071	-0.0265	-0.4611			20-9426-4253	15-1656-6246	EcoAnalysts
12			24	15:17	0.1096	-0.024	-0.4129			18-7734-9147	06-4748-9707	EcoAnalysts
13			27	17:02	0.1156	-0.018	-0.3018			01-3898-0369	19-9850-5740	EcoAnalysts
14		Dec	7	17:43	0.09634	-0.03725	-0.6818			15-6747-3203	15-5237-0673	EcoAnalysts
15	2023	Jan	13	15:30	0.1703	0.03673	0.5066			14-6111-3358	19-5184-9524	EcoAnalysts
16		Feb	9	15:28	0.1664	0.03277	0.4575			11-1705-9064	00-9866-2896	EcoAnalysts
17			17	14:30	0.2912	0.1576	1.625	(+)		05-8051-1741	00-4535-0428	EcoAnalysts
18		Mar	27	16:54	0.06349	-0.0701	-1.551	(-)		01-2022-2925	11-3364-1842	EcoAnalysts
19			28	15:46	0.1275	-0.00612	-0.09772			08-8126-4059	10-2993-2407	EcoAnalysts
20			28	15:47	0.1637	0.03008	0.4236			03-3638-8838	12-4289-2851	EcoAnalysts
21		Арг	11	16:37	0.1673	0.03376	0.4698				18-0348-0749	

CETIS Summary Report

Report Date:

25 Apr-23 15:19 (p 1 of 1)

The state of the s								Test C	ode/ID:	8	P220	0819.45 / 14	-1713-140
Bivalve Larva	l Survival and D	evelopment Te	st									Ec	oAnalysts
Batch ID:	12-6778-5180	Test Typ	e: De	evelopment-S	urvival			Ana	lyst:	Julia	a Levengood	1	
Start Date:	11 Apr-23 16:37		: EF	PA/600/R-95/	136 (1995)			Dilu	ent:	Lab	oratory Seav	water	
Ending Date:	13 Apr-23 14:42	Species:	Му	tilus gallopro	vincialis			Brin	e:	Not	Applicable		
Test Length:	46h	Taxon:	Biv	valvia				Sou	rce:	Tay	lor Shellfish		Age: <4h
Sample ID:	09-5090-7122	Code:	P2	20819.45				Proj	ect:	Refe	erence Toxic	ant	
Sample Date:	19 Aug-22	Material	То	tal Ammonia				Sou	rce:	Refe	erence Toxic	cant	
Receipt Date:	19 Aug-22	CAS (PC):					Stat	ion:	P22	0819.45		
Sample Age:	235d 17h	Client:	Int	ernal Lab									
Multiple Com	parison Summa	ry									7, , , , , , , ,		
Analysis ID	Endpoint	Co	mpari	son Method			1	NOEL	LOE	L	TOEL	PMSD	3
12-5775-8348	Combined Propo	ortion Norma Du	nnett N	Multiple Com	oarison Test			5.55	11.2		7.884	8.77%	
Point Estimat	e Summary												
Analysis ID	Endpoint	Po	int Est	timate Metho	od	1.3	1	Level	mg/L		95% LCL	95% UCL	
15-2064-5147	Combined Propo	ortion Norma Trir	nmed	Spearman-K	ärber			EC50	7.809		7.754	7.865	
Test Acceptal	bility					TAC	1 1	mite					
Analysis ID	Endpoint	Att	ribute		Test Stat			Upper	Over	lap	Decision		
12-5775-8348	Combined Propo	ortion Norma PM	SD		0.08766	<<		0.25	No		Passes Cr	riteria	
Combined Pr	oportion Normal	I Summary					-						
Conc-mg/L	Code	Count Me	an	95% LCL	95% UCL	Min		Max	Std I	Err	Std Dev	CV%	%Effect
0	D	4 0.9	695	0.8929	1.0460	0.8976	Ĩ	1.0000	0.024	41	0.0482	4.97%	0.00%
1.34		4 0.9	026	0.7529	1.0520	0.7756		1.0000	0.04	70	0.0941	10.42%	6.90%
2.64			203	0.8346	1.0060	0.8504		0.9646	0.026		0.0538	5.85%	5.08%
5.55			193	0.8487	0.9899	0.8780		0.9803	0.022		0.0444	4.83%	5.18%
11.2			315	-0.0085	0.0715	0.0079		0.0551	0.012		0.0251	79.71%	96.75%
18		4 0.0	000	0.0000	0.0000	0.0000		0.0000	0.000	00	0.0000	(100.00%
Combined Pro	oportion Normal	l Detail						MD	5: CC9	34FI	DD4CCEA65	E5CF84D0	504BE0F8
Conc-mg/L	Code	Rep 1 Re	p 2	Rep 3	Rep 4			- 4			1 1 1 1 1 1 1		
0	D	0.8976 0.9	882	0.9921	1.0000								
1.34		0.9331 1.0	000	0.7756	0.9016								
2.64		0.9646 0.9	055	0.9606	0.8504								
5.55		0.9213 0.9	803	0.8976	0.8780								
11.2		0.0551 0.0	079	0.0118	0.0512								
18		0.0000 0.0	000	0.0000	0.0000								
Combined Pro	oportion Normal	I Binomials											
Conc-mg/L	Code	Rep 1 Re	p 2	Rep 3	Rep 4								
0	D	228/254 251	/254	252/254	272/272								
1.34		237/254 269	/269	197/254	229/254								
2.64		245/254 230)/254	244/254	216/254								
5.55			9/254	228/254	223/254								
11.2		14/254 2/2		3/254	13/254								
30		0.0004 0.00		0.00 = 4	0/054								

0/254

0/254

0/254

0/254

Report Date:

25 Apr-23 15:19 (p 1 of 1)

Test Code/ID:

P220819.45 / 14-1713-1401

Bivalve Larva			1000	oropinone ro	·			EcoAnalyst				
Start Date: End Date: Sample Date:	13 A	pr-23	16:37 14:42	Protocol:	Mytilus galloprovi EPA/600/R-95/13 Total Ammonia		Sample Code: P220819.45 Sample Source: Reference Toxicant Sample Station: P220819.45					
Conc-mg/L	Code	Rep	Pos	Initial Density	Final Density	# Counted	#Normal	Notes				
0	D	1	14	254	242	242	228					
0	D	2	24	254	262	262	251					
0	D	3	3	254	270	270	252					
0	D	4	23	254	286	286	272					
1.34		1	15	254	247	247	237					
1.34		2	2	254	281	281	269					
1.34		3	11	254	209	209	197					
1.34		4	6	254	239	239	229					
2.64	1,5	1	21	254	252	252	245					
2.64		2	9	254	237	237	230					
2.64		3	8	254	254	254	244					
2.64		4	17	254	226	226	216					
5.55		1	7	254	261	261	234					
5.55		2	16	254	274	274	249					
5.55		3	4	254	249	249	228					
5.55		4	10	254	248	248	223					
11.2		1	19	254	263	263	14					
11.2		2	5	254	235	235	2					
11.2		3	13	254	238	238	3					
11.2		4	20	254	289	289	13					
18		1	22	254	267	267	0					
18		2	18	254	230	230	0					
18		3	12	254	229	229	0					
18		4	1	254	268	268	0					

CETIS Summary Report

Report Date:

25 Apr-23 15:31 (p 1 of 1)

	3 1.05 B. S.							Test C	ode/ID:		P220819	.45UIA / 13	-1124-3474
Bivalve Larva	al Survival and D	evelopme	nt Test									Ec	oAnalysts
Batch ID:	06-0385-8455	Tes	t Type:	Development-S	Survival			Ana	yst:	Julia	Levengood		
Start Date:	11 Apr-23 16:37	Pro	tocol:	EPA/600/R-95/	136 (1995)			Dilu	ent:	Labo	oratory Seav	vater	
	13 Apr-23 14:42	Spe	ecies:	Mytilus gallopro	ovincialis			Brin	e:	Not.	Applicable		
Test Length:	46h	Тах	on:	Bivalvia				Sou	rce:	Tayl	or Shellfish		Age: <4h
Sample ID:	02-6788-7277	Cod	de:	P220819.45UIA	Α.			Proj	ect:	Refe	erence Toxic	ant	
Sample Date:	19 Aug-22	Mat	terial:	Unionized Amn	nonia			Sou	rce:	Refe	erence Toxic	ant	
Receipt Date:	19 Aug-22	CA	S (PC):					Stat	on:	P22	0819.45UIA		
Sample Age:	235d 17h	Clie	ent:	Internal Lab									
Multiple Com	parison Summa	ry											
Analysis ID	Endpoint		Comp	arison Method			1	NOEL	LOE	_	TOEL	PMSD	
01-0944-0679	Combined Propo	rtion Norm	a Dunne	ett Multiple Com	parison Test	91		0.118	0.242	2	0.169	8.77%	
Point Estimat	te Summary												
Analysis ID	Endpoint		Point	Estimate Meth	od		1	Level	mg/L		95% LCL	95% UCL	
18-0348-0749	Combined Propo	rtion Norm	a Trimm	ed Spearman-K	(ärber			EC50	0.167		0.1661	0.1686	
Test Acceptal	bility					TAC	Li	mits					
Analysis ID	Endpoint		Attrib	ute	Test Stat	1,515		Upper	Over	lap	Decision		
01-0944-0679	Combined Propo	rtion Norm	a PMSD		0.08766	<<	1	0.25	No		Passes Cr	iteria	
Combined Pr	oportion Normal	Summary											
Conc-mg/L	Code	Count	Mean	95% LCL	95% UCL	Min		Max	Std E	irr	Std Dev	CV%	%Effect
0	D	4	0.9695	0.8929	1.0460	0.8976		1.0000	0.024	1	0.0482	4.97%	0.00%
0.029		4	0.9026	0.7529	1.0520	0.7756		1.0000	0.047	0	0.0941	10.42%	6.90%
0.057		4	0.9203	0.8346	1.0060	0.8504		0.9646	0.026	9	0.0538	5.85%	5.08%
0.118		4	0.9193		0.9899	0.8780		0.9803	0.022		0.0444	4.83%	5.18%
0.242		4	0.0315		0.0715	0.0079		0.0551	0.012		0.0251	79.71%	96.75%
0.308		4	0.0000	0.0000	0.0000	0.0000		0.0000	0.000	00	0.0000	1	100.00%
Combined Pro	oportion Normal	Detail						MD	5: B76	DD8E	36FCFF974	50768BA06	D24ED403
Conc-mg/L	Code	D 4		-									
0		Rep 1	Rep 2		Rep 4								
	D	0.8976	0.9882		Rep 4 1.0000								
0.029				0.9921									
0.029 0.057		0.8976	0.9882	0.9921 0.7756	1.0000								
		0.8976 0.9331	0.9882	0.9921 0.7756 0.9606	1.0000 0.9016								
0.057		0.8976 0.9331 0.9646	0.9882 1.0000 0.9055	0.9921 0.7756 0.9606 0.8976	1.0000 0.9016 0.8504								
0.057 0.118		0.8976 0.9331 0.9646 0.9213	0.9882 1.0000 0.9055 0.9803	0.9921 0.7756 5 0.9606 3 0.8976 0.0118	1.0000 0.9016 0.8504 0.8780								
0.057 0.118 0.242 0.308		0.8976 0.9331 0.9646 0.9213 0.0551 0.0000	0.9882 1.0000 0.9055 0.9803 0.0075 0.0000	0.9921 0.7756 5 0.9606 3 0.8976 0.0118	1.0000 0.9016 0.8504 0.8780 0.0512								
0.057 0.118 0.242 0.308	D	0.8976 0.9331 0.9646 0.9213 0.0551 0.0000	0.9882 1.0000 0.9055 0.9803 0.0075 0.0000	0.9921 0.7756 5 0.9606 3 0.8976 0.0118 0 0.0000	1.0000 0.9016 0.8504 0.8780 0.0512								
0.057 0.118 0.242 0.308 Combined Pro Conc-mg/L	D oportion Normal	0.8976 0.9331 0.9646 0.9213 0.0551 0.0000	0.9882 1.0000 0.9055 0.9803 0.0075 0.0000	2 0.9921 0 0.7756 5 0.9606 3 0.8976 0 0.0118 0 0.0000	1.0000 0.9016 0.8504 0.8780 0.0512 0.0000								
0.057 0.118 0.242 0.308 Combined Pro Conc-mg/L	D oportion Normal Code	0.8976 0.9331 0.9646 0.9213 0.0551 0.0000 Binomials	0.9882 1.0000 0.9055 0.9803 0.0075 0.0000	2 0.9921 0 0.7756 5 0.9606 3 0.8976 9 0.0118 0 0.0000 Rep 3	1.0000 0.9016 0.8504 0.8780 0.0512 0.0000								
0.057 0.118 0.242 0.308 Combined Press	D oportion Normal Code	0.8976 0.9331 0.9646 0.9213 0.0551 0.0000 Binomials Rep 1 228/254	0.9882 1.0000 0.9055 0.9803 0.0075 0.0000 s Rep 2	2 0.9921 0 0.7756 5 0.9606 3 0.8976 9 0.0118 0 0.0000 Rep 3 54 252/254 59 197/254	1.0000 0.9016 0.8504 0.8780 0.0512 0.0000 Rep 4								
0.057 0.118 0.242 0.308 Combined Pro Conc-mg/L 0 0.029	D oportion Normal Code	0.8976 0.9331 0.9646 0.9213 0.0551 0.0000 Binomials Rep 1 228/254 237/254	0.9882 1.0000 0.9055 0.9803 0.0000 s Rep 2 251/25 269/26	2 0.9921 0 0.7756 5 0.9606 3 0.8976 9 0.0118 0 0.0000 Rep 3 54 252/254 59 197/254 54 244/254	1.0000 0.9016 0.8504 0.8780 0.0512 0.0000 Rep 4 272/272 229/254								

0/254

0/254

0/254

0/254

0.308

CETIS Test Data Worksheet

Report Date:

25 Apr-23 15:31 (p 1 of 1)

Test Code/ID:

P220819.45UIA / 13-1124-3474

Bivalve Larva	al Surv	ival a	nd Dev	elopment Test					EcoAnalyst
Start Date: End Date: Sample Date	13 A	pr-23 pr-23 ug-22	14:42	Protocol: E	/lytilus galloprovi EPA/600/R-95/13 Jnionized Ammo	86 (1995)	Sample	e Code: P22081 e Source: Reference Station: P22081	
Conc-mg/L	Code	Rep	Pos	Initial Density	Final Density	# Counted	# Normal		Notes
0	D	1	17	254	242	242	228		
0	D	2	2	254	262	262	251		
0	D	3	12	254	270	270	252		
0	D	4	4	254	286	286	272		
0.029		1	8	254	247	247	237		
0.029		2	13	254	281	281	269		
0.029		3	9	254	209	209	197		
0.029		4	16	254	239	239	229		
0.057		1	14	254	252	252	245		
0.057		2	15	254	237	237	230		
0.057		3	21	254	254	254	244		
0.057		4	11	254	226	226	216		
0.118	1	1	19	254	261	261	234		
0.118		2	23	254	274	274	249		
0.118		3	1	254	249	249	228		
0.118		4	10	254	248	248	223		
0.242		1	20	254	263	263	14		
0.242		2	18	254	235	235	2		
0.242		3	3	254	238	238	3		
0.242		4	5	254	289	289	13		
0.308		1	22	254	267	267	0		
0.308		2	6	254	230	230	0		

229

268

0

0.308

0.308

3 7

4

24

254

254

229

Un-ionized Ammonia Calculator

CLIENT:	Jacobs	Date of Test:	April 11, 2023
PROJECT:	Wyckoff	Test Type:	Mytilus galloprovincialis
COMMENTS:	P220819.45		

To convert Total Ammonia (mg/L) to Free (un-ionized) Ammonia (mg/L) enter the corresponding total ammonia, salinity, temperature, and pH.

	Sample	Mod	NH3T (mg/L)	salinity (ppt)	pН	temp (C)	temp (K)	pKa ^s	NH ₃ U (mg/L
	Target / Sample Name		Actual	Actual	Actual	Actual	Calculated	Calculated	Calculated
lonic strength:pKa ^s	Example 3.5		2.000	10.0	7.5	5.0	278.15	9.2520	0.008
1 9.26 1		Œ							
2 9.27 2				1					
3 9.28 3	1.5		1.34	30	7.9	15.8	288.95	9.2559	0.029
4 9.29 4	3		2.64	30	7.9	15.7	288.85	9.2559	0.057
5 9.30 5	6		5.55	30	7.9	15.4	288.55	9.2559	0.118
6 9.32 6	12		11.2	30	7.9	15.6	288.75	9.2559	0.242
7 9.33 7	18		18	30	7.8	15.5	288.65	9.2559	0.308
8 9.34 8									
9									
93510					*				
935 934 933									
9.32									
930									
928 927 14									
926							1		
1 2 3 4 5 6 7 8 40		771	10						
y = 0.0003x2 F									
+ 0.0091x + 17 9.2502 18									
9.2502		1		7					
20									
20		5						7	
22									
23								1	
24						1	-		
25		-							
26									
27									
28									
29									
30						-			-
31		-							
32									
33		_		1		-			
34									1
35									
36							-		
37	*								-
38						1			
39		- 3				1			
40						-			
40		-				1			
271									
42						1		1	
43									

OAV Maris

48 Hour Bivalve Development Reference Toxicant Test

Test ID:		Replica	ates: 4		tudy Director			Location:			
P220819 Dilution Water	-	Organi	cm Databa		. Levengood	4/-1		Incubat			
FSW041123.01		TS041	sm Batch: 123.01		Associated Tes Various	c(s):		Organis Mytilus			
Chamber Size/		Exposu	re Volume:								
30 ml she		- I t - t -	10 ml								
Toxicant: Amn	ionium Cr	nioride		ı	Date Prepared	: 4	/11/23	Initials:	MS		
Target Conc	entratio	ns:		(Quantity of			Quantity of Diluent:			
	See snik	ing works	hoot	1	arget:			Target:			
					See spikir			A -A) mL	
	see spik	ing works	neet	F	ctual: See spi	King	worksneet	Actual:	250	mL	
				SPAW	NING DAT	Ά					
Initial Spawning	g Time:	Final S	pawning	Fertilizati	on Time:	No	o. of Females:	4 1	lo. of M	ales: ν	
Embryo Density (count/	mL):	1. 15	2	2. 13	5	3.		- N	lean:	13.5	
Stocking Volun		ition: $V_{\mathcal{L}}$	0041435	x = 0.17x	40ml = 6	.97	ML 49 Hock	- 401	W-10	99 = 33.03M	
0 Hours	Date:	4/11/23	WQ Time:			10000	art Time: ()	37		Is: M/MS	
				S	тоск		1 4	V I		01 4100	
			Control	1.5	3		6	12	2	18	
D.O. (%) (>4.0 mg/L)			8.0	8.4	8.5		8.5	8.1	و	8.6	
Temperature (1	.6 ± 1°C)		6.4	15.8	15.7		15.4	15.	6	15.5	
Salinity (30 ± 2 ppt)			29	30	30		30	30		30	
pH (6-9)		_	1.9	7.9	7.9		7.9	7.9		7.8	
Meter#	0.00		8	8	8		8	8		8	
Day 1	Tempe (16 ± 1°0		15.9	(Meter #		TIG		Initial	s: \$2	
Day 2	Date:	4/13/23	WQ Time:	1038	ms	En	d Time: 44	12	Initial	s: S Z	
			Formalin L	ot#: 220	304-50	Ro	se Bengal Lot #	:	5	135	
					TOCK		5135			0 0	
		1	Control	1.5	3		6	12	2	18	
D.O. (%) (>4.0 mg/L)			1.7	7.8	8.1	3	8.1	9.1		8.1	
	emperature (16 ± 1°C)			14.9 0 14.9 0		0	14.90	14,	90	14.90	
Salinity (30 ± 2 ppt)				29 29			30	30		30	
pH (6-9)			8.0	G.8	6.8	8.0		8.0		6.0	
Meter#			9	9	9		9	a		9	

O Temp. blank used -MJ 4/13

48 Hour Bivalve Development Reference Toxicant Test

Conc.	Rep	Number Normal	Number Abnormal	Date	Initials	
	1	228	14	4/20/23	32	
Control	2	251	11	4/20/23	52	
Control	3	252	18	4/20/23	52	
	4	272	14	4/20/23	52	
	1	237	10	4/20/23	52	
1.5	2	269	12	4/20/23	52	
1.5	3	197	12	4/20/23	SZ	
	4	229	10	4/20/23	52	
	1	245	7	4/20/23	SZ	
	2	230	7	4/20/23	52	
3	3	244	10	4/20123	52	
	4	216	10	4/20/23	52	
	1	234	27	4/20/23	52	
	2	249	25	4/20/23	52	
6	3	228	21	4/20/23	52	
	4	223	25	4/20/23	52	
	1	14	249	4/21/23	SZ	
42	2	2	233	4/21/23	52	
12	3	3	235	4/21/23	52	
	4	13	276	4/21/23	52	
	1	0	267	4/21/23	52	
10	2	0	230	4/21/23	52	
18	3	0	229	4/21/23	52	
	4	0	268	4/21/23	52	
		Stocking	Density			
Rep		Cou	nt	Init		
1		@ Ho8	3 264	NL		
2		0 20		NL		
3		0 22	8 262	NL		
4		0 2	15 240	NL		
5		0 2	30 234 Po 261	NL		
6		0 21	To 261	N		
Ι Δ.	Mean:	~	124	2 2	UN BA	
233N (2A	(.5	195N 195/208	:1291		29:96.37	
233/295=95°1% 128/292=94.2%	OZ.	19: 197/209:		010. 211	41-46.51	
	2			1/1	/201 : 95.6 0.7/, Page 2 of 2	
0=0.9% DW	114123	1.0=110	1. m. 1/2/23	1. 1.	0.7%	

DIE-52 4/21/23

Ammonia Reference Toxicant Spiking Worksheet

	2 2	
Reference	Tovicant	ID.
reletetice	IUXILAIIL	ID.

P220819 45

Date Prepared:

4/11/23

Technician Initials:

MS

Biv / Echino NH₃ RT

Assumptions in Model

Stock ammonia concentration is 9,000 mg/L = 9 mg/mL

Date:

4/7/2023

Measurement:

Te	st Solutions						
Measured Concentration	Desired Concentration	Volume	Volume of stock to reach desired concentration				
mg/L	mg/L	mL	mL stock to increase				
			SALT WATER				
1.34	1.5	250	0.074				
2.64	3	250	0.148				
5.55	6	250	0.296				
11.2	12	250	0.591				
18.0	18	250	0.887				
		1000					

ORGANISM RECEIPT LOG

	10/23	Tir	me: 135	26	В	TSOH	1023.01					
Organism	: M:	5p.										
Source / S		or 8h	UFTS	h								
No. Order	11		. Receive									
	of Organis	sms:		(Days from	mate Si	ze or Age: ife stage, size						
	weier			B of L (7	racking	l No.)						
	of Contain	er:		Receive	d By: ₩\			:				
Container	D.O. (mg/L)	Temp. (°C)	Cond. Sal. (Include Units)	le (1	pH Jnits)	# Dead	% Dead*	Tech. (Initials)				
1	0	10.1	0				>	DM				
i>10% contac	t lab manager											
lotes: 1			m-Ali	0/23				હ્યું				



TAYLOR SHELLFISH FARMS SE 130 LYNCH RD, SHELTON, WA 98584 PH: (360) 426-6178 FAX: (360) 426-3643 WASHINGTON CERTIFICATION #. WA 46SP

10 lbs **Unprocessed Mussels**

Original Harvesters Cert#: WA 0046 SP Original Harvest Date: 4/10/2023 Final Harvest Date: 4/10/2023 Harvested In: Washington State Harvest Area: Totten Inlet - I2 Wet Stored: SHIP TO:

BEST BY	BB DATE
PO#	PO#
ITEM #	Lot# 3100003

Perishable Keup Refrigerated Farm Raised Shellfish -

Airbill #

Toxicity Testing Results Wyckoff/Eagle Harbor Superfund Site Groundwater Treatment Plant

APPENDIX B

Chain-of-Custody and Sample Receipt Forms

Report ID PG1799Q2.01 EcoAnalysts, Inc.

Page 1 c

EcoAnalysts, Inc (REGION COPY)

DateShipped: 4/11/2023

CarrierName: EcoAaylists (hand delivery)

AirbillNo:

Jacobs, Wyckoff-

Wyckoff Eagle Harbor GWTP 2023/WA

Project Code: WEH-031W

Cooler #: 1 of 1

No: 10-041123-102811-0683

IFD10W2LA0010PXTSDDD2

Contact Name: Daniel Baca Contact Phone: 661-313-3807

Sample Identifier	CLP Sample No.	Matrix/Sampler	Coll. Method	Analysis/Turnaround (Days)	Tag/Preservative/Bottles	Location	Collection	Sample Type
041123 (1)		Ground Water/	Composite				Date/Time	
U		D. Baca	Composite	CHRTOX(8 Weeks)	N (1)	SP-11	04/11/2023 01:27	Field Sample
			-					
		1						
							1	
				Į.				
					- 1			

Special Instructions: 2023 Week 13-2nd Quarter Bioassay-Chronic Toxicity Bivalve Test. SP-11 is our Effluent Sampling Point.

Analysis Key: CHRTOX=Chronic Toxicity

Shipment for Case Complete? N

Samples Transferred From Chain of Custody #

Items/Reason

Relinquished by (Signature and Organization)

Date/Time

Received by (Signature and Organization)

Date/Time

Sample Condition Upon Receipt

012

@ JACOBS

4-11-23

WIND MULLYPHY FOO Analysis

11/23 1365

Gost

SAMPLE RECEIPT

Cilent	Chefft 1D;							Lab	ID	:	Renewals:						
Jacobs. Wu	401	F	041123						11	10.							
Project Wyckoff Eng	10	124								,01							
hoebor GWTF	w	MX															
Date/Time Received:						4	7/1	11/23	1	305							
Airbill #:							(1)	Weil	P								
Shipper Tracking Information Kept for Records: (Y/N/NA)								N	A								
Collection Date/Time:						4	lu	23 0	017	17							
Sample Holding Time (must be ≤36 hours at test initiation)								1	V								
Condition of								9,060							_		
Type and Ca	pacit	y of San	nple	Containe	er:			7	L culpi F L								
Total Sample	e Vol	ume (L)	:					41	/								
Condition of								GNO	d								
Sample Cont			riat	e: (Y/N)				Y	4								
(Intact/Brok	en/I	Not Pres						Int	at								
Frozen Wet (Shipment/Ti	or Blo ansp	ue Ice P port: (Y/	rese N)	nt During	9		F	zozen	+	Plue 10	£			4111-167			
Sampler's Name Present on COC Form: (Print Name/Not Present)						-		Bou									
Color:							-	Plane	_	4							
	TA	KE TH	IE I	FOLLO	W)				-		S UPO	N ARI	RIVAL				
	#	. *	#	p . c	7		1		T	E C	s o	> -		_ m	T		
LAB ID	Meter #	Temp. (°C) (0-6°C)	Meter #	Dissolved Oxygen (mg/L)	Motor #	Hd	Meter #	Cond. (µS/cm)	Mater #	Sal. (ppt)	Hardness (mg CaCO ₃ /L)	Alkalinity (mg CaCO ₃ /L)	Total Chlorine (mg/L)	Total NH3 (mg/L)	Tech		
236411.01	121	0.5	9	9.0	9	7.6	9	843	a	05	_		0.01	0.00	DWYM		
						- 4			-1	V. J			V.01	0.00	7/4		
Notify proje me. Client r	ct m	nanager	or	study di	ire	ctor of	te	mper	atı	ıres ab	ove 6°C	or ≥3	6 hours	holding			
ATO CHEME!	nast					rosoln		ما الماسد			1						
leason for i	ınac			re samp	JIE.	receip	ינן	eldore	ms	, comp	piete the	e follow	ring:				
lame of Cli	ent (Contact						Cor	nta	cted by	y:	+					
lient Response and/or Action to be Taken:								Date Action Taken:									