

Chronic Toxicity Testing Results for Wyckoff Eagle Harbor Groundwater Treatment Plant

Monitoring Period: February 2020

Prepared for:

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Prepared by:

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Date Submitted: March 18, 2020

Data Quality Assurance:

- Enthalpy Analytical is accredited in accordance with NELAP by the State of Oregon Environmental Laboratory Accreditation Program (ORELAP ID 4053). It is also certified by the State of California Water Resources Control Board Environmental Laboratory Accreditation Program (Certificate No. 1802) and the State of Washington Department of Ecology (Lab ID C552). Specific fields of testing applicable to each accreditation are available upon request.
- All data have been reviewed and verified.
- All test results have met minimum test acceptability criteria under their respective US EPA protocols, unless otherwise noted in this report.
- All tests have met internal Quality Assurance Program requirements.

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Results verified by:

Eric Green, Project Manager

Introduction

A toxicity test was performed using a groundwater composite sample collected on February 4, 2020 from the Wyckoff Eagle Harbor Groundwater Treatment Plant on Bainbridge Island in Washington. This test was performed to satisfy quarterly monitoring requirements according to the project Quality Assurance Project Plan (QAPP 2013). The chronic bioassay was conducted using the bivalve *Mytilus galloprovincialis* (Mediterranean mussel). Testing was performed at Enthalpy Analytical located in San Diego, California.

Materials and Methods

The groundwater sample was collected into a low-density polyethylene cubitainer by Jacobs personnel, packed in a cooler containing ice, and shipped overnight to Enthalpy. Appropriate chain-of-custody (COC) procedures were employed during collection and transport. Upon arrival at the laboratory, the cooler was opened, the sample inspected, and the contents verified against information on the COC form. Standard water quality parameters were measured and recorded on a sample check-in form and are summarized in Table 1. The sample was stored at 4°C in the dark until used for testing.

| Sample ID | 020420 |
|--------------------------------------|-----------------|
| Enthalpy Log-in Number | 20-0143 |
| Collection Date; Time | 2/4/2020; 0926h |
| Receipt Date; Time | 2/5/2020; 0950h |
| Receipt Temperature (°C) | 2.8 |
| Dissolved Oxygen (mg/L) | 9.4 |
| рН | 7.42 |
| Conductivity (µS/cm) | 10,710 |
| Salinity (ppt) | 6.6 |
| Alkalinity (mg/L CaCO ₃) | 409 |
| Total Chlorine (mg/L) | 0.02 |
| Total Ammonia (mg/L as N) | 1.3 |

Table 1. Sample Information

NM = not measured

Test Methods

Chronic toxicity testing was conducted according to the method set forth in USEPA (1995). This method is summarized in Table 2.

| Table 2. Summary of Methous for u | |
|--|---|
| Test Period | 2/5/2020, 1310h to 2/7/2020, 1230h |
| Test Organism | Mytilus galloprovincialis |
| Test Organism Source | Taylor Shellfish (Shelton, WA) |
| Test Organism Age | 4 hours post fertilization |
| Test Duration | 48 ± 2 hours |
| Test Type | Static |
| Test Chamber, Test Solution Volume | 30 mL glass vial, 10 mL |
| Test Temperature | 15 ± 1°C |
| Dilution Water | Laboratory Seawater (Source: Scripps Institution of Oceanography [SIO] intake) diluted with de-ionized water |
| Additional Control | Brine Control (de-ionized water and hypersaline brine) |
| Test Salinity | 30 ± 2 ppt |
| Source of Salinity | Hypersaline brine made by freezing seawater to a salinity of 94.1 ppt |
| Test Concentrations (% sample) | 73.3 ^a , 35, 18, 9, 4, and 2%, lab and brine controls |
| Number of Replicates | 5 |
| Photoperiod | 16 hours light/8 hours dark |
| Test Protocol | EPA/600/R-95/136 |
| Test Acceptability Criteria for Controls | \geq 50% mean survival, \geq 90% mean development rate |
| Reference Toxicant | Copper chloride ^b |
| Statistical Software | CETIS™ 1.8.7.20 |

Table 2. Summary of Methods for the Bivalve Larval Development Test

^a Highest concentration tested due to the addition of hypersaline brine

^b A deviation to the QAPP was approved by USEPA and Washington Department of Ecology to conduct reference toxicant testing with copper chloride. See QA section.

Results

There were no statistically significant effects observed in any effluent concentration tested for the survival or development endpoint of the bivalve test. This results in a no observed effect concentration (NOEC) of 73.3 (the highest concentration tested) and a chronic toxic unit (TU_c) of less than 1.36 for both endpoints.

Results for the chronic toxicity test are summarized in Tables 3 and 4. Individual statistical summaries for the test and copies of the laboratory bench sheets are provided in Appendix A. The sample check-in sheet and COC form are provided in Appendices B and C, respectively.

| Table 3. Summary | of Statistical Results for the Chronic Toxicity | ' Tests |
|------------------|---|---------|
|------------------|---|---------|

| Species | Endpoint | NOEC (% effluent) | LOEC (% effluent) | Toxic Unit (TU _c) | EC ₂₅ (% effluent) |
|------------------|--------------------|----------------------|----------------------|----------------------------------|----------------------------------|
| Biyalya | Normal Development | 73.3 | > 73.5 | < 1.36 | > 73.3 |
| Bivalve Survival | | 73.3 | > 73.5 | < 1.36 | > 73.3 |

NOEC = No Observed Effect Concentration

LOEC = Lowest Observed Effect Concentration

Chronic Toxic Unit (TU_c) = 100//NOEC. NOTE: Since 100% sample was not tested, the TU_c value can only be calculated up to the highest concentration tested. If no toxicity is observed at this concentration, the TU_c is reported as less than the calculated value. Effect Concentration 25 (IC_{25}) = Concentration expected to cause an effect to 25% of the organisms

| Concentration (% Effluent) | Mean Survival (%) | Mean Normal Development (%) |
|-------------------------------|----------------------|--------------------------------|
| 0 (Brine Control) | 92.4 | 99.0 |
| 0 (Lab Control) | 93.5 | 98.4 |
| 2 | 94.3 | 98.6 |
| 4 | 99.7 | 98.8 |
| 9 | 96.9 | 98.7 |
| 18 | 96.1 | 98.0 |
| 35 | 93.7 | 99.0 |
| 73.3 ^a | 97.7 | 98.6 |

Table 4. Detailed Results for the Bivalve Development Chronic Toxicity Test

^a Highest concentration tested due to the addition of hypersaline brine

Quality Assurance

The sample was received within the required 36-hour holding time, in good condition, and within the appropriate temperature range of 0-6°C. All control acceptability criteria were met and water quality parameters remained within the appropriate ranges throughout the test. Statistical analyses followed standard USEPA flowchart selections. Dose-response relationships were reviewed to ensure the reliability of the results. Based on the dose response observed, the calculated effects concentrations were deemed reliable. Minor QA/QC issues that were unlikely to have any bearing on the final test results, such as slight temperature deviations, are noted on the data sheets and a list of qualifier codes used on bench data sheets is presented in Appendix D.

Reference Toxicant

Results for the reference toxicant tests used to monitor laboratory performance and test organism sensitivity are summarized in Table 5. A deviation to the QAPP was approved by USEPA and Washington Department of Ecology to conduct reference toxicant testing with copper chloride rather than copper sulfate. The results for the concurrent reference toxicant test were within the acceptable range of the mean historical test results plus or minus two standard deviations. The reference toxicant statistical summaries and laboratory bench sheets are provided in Appendix E.

| Species | Endpoint | EC₅₀ (μg/L copper) | Historical mean ± 2 SD (µg/L copper) | CV (%) |
|---------|--------------------|-----------------------|---|-----------|
| Bivalve | Normal Development | 7.13 | 8.96 ± 6.03 | 33.7 |
| Divalve | Survival Rate | 29.8 | 29.8 ± 4.88 | 8.19 |

Effect Concentration 50 (EC_{50}) = Concentration expected to cause an effect to 50% of the organisms

CV = Coefficient of Variation.

References

- CH2MHill. 2013. Quality Assurance Project Plan Groundwater Treatment Plant Operations, Maintenance, Bainbridge, Washington. Prepared for USEPA Region 10 June 5, 2013.
- Standard Guide for Conducting Static Acute Toxicity Tests with Embryos of Four Species of Saltwater Bivalve Molluscs. 1989. ASTM Standard E 724-89.
- Tidepool Scientific Software. 2000-2013. CETIS Comprehensive Environmental Toxicity Information System Software, Version 1.8.7.20.
- USEPA. 1995. Short-Term Method for Estimating the Chronic Toxicity of Effluents and Receiving Waters to the West Coast Marine and Estuarine Organisms. EPA/600/R-95/136. pp. 209-258 and 389-465.
- Washington State Department of Ecology. 2016. Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria. Publication No. WQ-R-95-80. Revised June 2016

Appendix A Statistical Summaries and Raw Bench Sheets

CETIS Summary Report

26 Feb-20 15:22 (p 1 of 2) 2002-S016 | 11-4010-6265

| Bivalve Larva | Survival and D | evelopm | ent Test | | | | | | Nautilus | Environn | nental (CA) |
|---|--|------------|--|--|-------------------------|----------------|-----------------------------|-----------------------------------|----------------------------|-------------|-------------|
| Batch ID: Start Date: Ending Date: Duration: | 11-1242-0616 05 Feb-20 13:1 07 Feb-20 12:3 47h | 0 P 0 S | est Type: rotocol: pecies: ource: | Development-S EPA/600/R-95/ Mytilus gallopro Taylor Shellfish | 136 (1995) wincialis | | Anal Dilu Brin Age | ent: Dilut e: Froz | ed Natural S en Seawate | | |
| • | 15-3935-9903 04 Feb-20 09:2 05 Feb-20 09:5 28h (2.8 °C) | 6 N 0 S | ode: laterial: ource: tation: | 20-0143 Effluent Sample Jacobs Wyckoff G7 W | | Hvent | Clie Proj | | obs | | |
| Comparison S | Summary | | | | | | | | | | |
| Analysis ID | Endpoint | | NOEL | LOEL | TOEL | PMSD | TU | Method | | | |
| 07-1815-1513 04-4290-4136 | Development R Survival Rate | late | 73.3 73.3 | >73.3 >73.3 | NA NA | 1.72% 12.8% | <1.364 <1.364 | | ultiple Com | | |
| Test Acceptat | oility | | | | | | | | ÷ | | |
| Analysis ID | Endpoint | | Attrib | ute | Test Stat | TAC Lin | nits | Overlap | Decision | | |
| 07-1815-1513 | Development R | late | Contr | ol Resp | 0.9895 | 0.9 - NL | | Yes Passes Acceptability Criteria | | | Criteria |
| 04-4290-4136 | Survival Rate | | Contr | ol Resp | 0.9236 | 0.5 - NL | | Yes | | ceptability | |
| Development | Rate Summary | | | | | | | | | | |
| C-% | Control Type | Count | Mean | 95% LCL | 95% UCL | Min | Max | Std Err | Std Dev | CV% | %Effect |
| 0 | Brine Control | 5 | 0.989 | 5 0.9807 | 0.9983 | 0.982 | 1 | 0.003161 | 0.007069 | 0.71% | 0.0% |
| 0 | Lab Control | 5 | 0.983 | 8 0.9667 | 1 | 0.9608 | 0.9926 | 0.006158 | 0.01377 | 1.4% | 0.58% |
| 2 | | 5 | 0.986 | 2 0.979 | 0.9934 | 0.9792 | 0.9926 | 0.002595 | 0.005804 | 0.59% | 0.34% |
| 4 | | 5 | 0.988 | 2 0.9742 | 1 | 0.9752 | 1 | 0.00505 | 0.01129 | 1.14% | 0.13% |
| 9 | | 5 | 0.987 | 2 0.9818 | 0.9926 | 0.9828 | 0.9924 | 0.001934 | 0.004323 | 0.44% | 0.23% |
| 18 | | 5 | 0.979 | 7 0.9577 | 1 | 0.9576 | 1 | 0.007949 | 0.01777 | 1.81% | 0.99% |
| 35 | | 5 | 0.989 | 9 0.979 | 1 | 0.9758 | 1 | 0.003927 | 0.008781 | 0.89% | -0.04% |
| 73.3 | | 5 | 0.985 | 8 0.9732 | 0.9984 | 0.9741 | 1 | 0.004546 | 0.01016 | 1.03% | 0.37% |
| Survival Rate | Summary | | | | | | | | | | |
| C-% | Control Type | Count | Mean | 95% LCL | 95% UCL | Min | Max | Std Err | Std Dev | CV% | %Effect |
| 0 | Brine Control | 5 | 0.923 | 6 0.8306 | 1 | 0.8049 | 1 | 0.03348 | 0.07487 | 8.11% | 0.0% |
| 0 | Lab Control | 5 | 0.935 | 0.8284 | 1 | 0.8293 | 1 | 0.03839 | 0.08585 | 9.18% | -1.23% |
| 2 | | 5 | 0.943 | 1 0.8275 | 1 | 0.7805 | 1 | 0.04161 | 0.09305 | 9.87% | -2.11% |
| 4 | | 5 | 0.996 | | 1 | 0.9837 | 1 | 0.003252 | 0.007272 | 0.73% | -7.92% |
| 9 | | 5 | 0.969 | | 1 | 0.9024 | 1 | 0.01998 | 0.04468 | 4.61% | -4.93% |
| 18 | | 5 | 0.961 | | 1 | 0.9106 | 1 | 0.0177 | 0.03958 | 4.12% | -4.05% |
| | | | | | | | | | | | |
| 35 | | 5 | 0.936 | 6 0.844 | 1 | 0.8211 | 1 | 0.03336 | 0.0746 | 7.97% | -1.41% |

Analyst: EG JCL QA: EG 2/27/20

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| Bivalve | Larval | Survival | and | Development | Test |
|---------|--------|----------|-----|-------------|------|
| | | | | | |

| 26 Feb-20 1 | 5:22 (p 2 of | 2) |
|-------------|--------------|-----|
| 2002 2016 | 44 4040 00 | 005 |

Report Date:

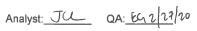
Test Code:

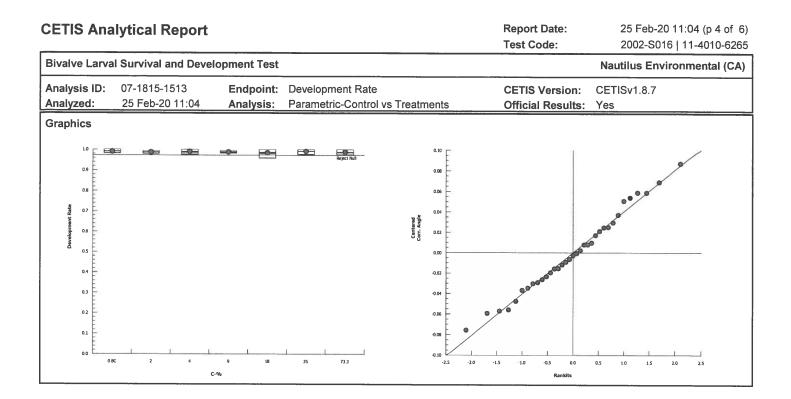
2002-S016 | 11-4010-6265

| Nautilus Environmental (CA) |
|-----------------------------|
|-----------------------------|

| | t Rate Detail | | | | | |
|---|-------------------------------|---|---|--|---|--|
| C-% | Control Type | Rep 1 | Rep 2 | Rep 3 | Rep 4 | Rep 5 |
| 0 | Brine Control | 0.982 | 0.9841 | 0.9899 | 0.9915 | 1 |
| 0 | Lab Control | 0.9926 | 0.9608 | 0.9918 | 0.981 | 0.9926 |
| 2 | | 0.9792 | 0.9926 | 0.9917 | 0.9829 | 0.9845 |
| 4 | | 0.9752 | 0.9846 | 1 | 1 | 0.9811 |
| 9 | | 0.9828 | 0.9924 | 0.9837 | 0.986 | 0.991 |
| 18 | | 0.9576 | 0.9911 | 0.9847 | 1 | 0.9652 |
| 35 | | 0.9911 | 1 | 0.9924 | 0.9901 | 0.9758 |
| 73.3 | | 0.9793 | 1 | 0.9914 | 0.9843 | 0.9741 |
| Survival Rate | e Detail | | | | | |
| C-% | Control Type | Rep 1 | Rep 2 | Rep 3 | Rep 4 | Rep 5 |
| 0 | Brine Control | 0.9024 | 1 | 0.8049 | 0.9593 | 0.9512 |
| 0 | Lab Control | 1 | 0.8293 | 0.9919 | 0.8537 | 1 |
| 2 | | 0.7805 | 1 | 0.9837 | 0.9512 | 1 |
| 4 | | 0.9837 | 1 | 1 | 1 | 1 |
| 9 | | 0.9431 | 1 | 1 | 1 | 0.9024 |
| 18 | | 0.9593 | 0.9106 | 1 | 1 | 0.935 |
| 35 | | 0.9106 | 0.9512 | 1 | 0.8211 | 1 |
| 73.3 | | 1 | 1 | 0.9431 | 1 | 0.9431 |
| Development | t Rate Binomials | | | | | in a second s |
| C-% | Control Type | Rep 1 | Rep 2 | Rep 3 | Rep 4 | Rep 5 |
| 0 | Brine Control | 109/111 | 124/126 | 98/99 | 117/118 | 117/117 |
| 0 | Lab Control | 135/136 | 98/102 | 121/122 | 103/105 | 135/136 |
| 2 | | 94/96 | 134/135 | 120/121 | 115/117 | 127/129 |
| 4 | | | 10 11 100 | | | 12//120 |
| | | 118/121 | 128/130 | 140/140 | 140/140 | 156/159 |
| 9 | | | | | 140/140 141/143 | |
| 9 18 | | 118/121 | 128/130 | 140/140 | | 156/159 |
| 1 | | 118/121 114/116 | 128/130 131/132 | 140/140 121/123 | 141/143 | 156/159 110/111 |
| 18 | | 118/121 114/116 113/118 | 128/130 131/132 111/112 | 140/140 121/123 129/131 | 141/143 125/125 | 156/159 110/111 111/115 |
| 18 35 | e Binomials | 118/121 114/116 113/118 111/112 | 128/130 131/132 111/112 117/117 | 140/140 121/123 129/131 131/132 | 141/143 125/125 100/101 | 156/159 110/111 111/115 121/124 |
| 18 35 73.3 | e Binomials Control Type | 118/121 114/116 113/118 111/112 | 128/130 131/132 111/112 117/117 | 140/140 121/123 129/131 131/132 | 141/143 125/125 100/101 | 156/159 110/111 111/115 121/124 |
| 18 35 73.3 Survival Rate | | 118/121 114/116 113/118 111/112 142/145 | 128/130 131/132 111/112 117/117 123/123 | 140/140 121/123 129/131 131/132 115/116 | 141/143 125/125 100/101 125/127 | 156/159 110/111 111/115 121/124 113/116 |
| 18 35 73.3 Survival Rate C-% | Control Type | 118/121 114/116 113/118 111/112 142/145 Rep 1 | 128/130 131/132 111/112 117/117 123/123 Rep 2 | 140/140 121/123 129/131 131/132 115/116 Rep 3 | 141/143 125/125 100/101 125/127 Rep 4 | 156/159 110/111 111/115 121/124 113/116 Rep 5 |
| 18 35 73.3 Survival Rate C-% 0 | Control Type Brine Control | 118/121 114/116 113/118 111/112 142/145 Rep 1 111/123 | 128/130 131/132 111/112 117/117 123/123 Rep 2 123/123 | 140/140 121/123 129/131 131/132 115/116 Rep 3 99/123 | 141/143 125/125 100/101 125/127 Rep 4 118/123 | 156/159 110/111 111/115 121/124 113/116 Rep 5 117/123 |
| 18 35 73.3 Survival Rate C-% 0 0 | Control Type Brine Control | 118/121 114/116 113/118 111/112 142/145 Rep 1 111/123 123/123 | 128/130 131/132 111/112 117/117 123/123 Rep 2 123/123 102/123 | 140/140 121/123 129/131 131/132 115/116 Rep 3 99/123 122/123 | 141/143 125/125 100/101 125/127 Rep 4 118/123 105/123 | 156/159 110/111 111/115 121/124 113/116 Rep 5 117/123 123/123 |
| 18 35 73.3 Survival Rate C-% 0 0 2 | Control Type Brine Control | 118/121 114/116 113/118 111/112 142/145 Rep 1 111/123 123/123 96/123 | 128/130 131/132 111/112 117/117 123/123 Rep 2 123/123 102/123 123/123 | 140/140 121/123 129/131 131/132 115/116 Rep 3 99/123 122/123 121/123 | 141/143 125/125 100/101 125/127 Rep 4 118/123 105/123 117/123 | 156/159 110/111 111/115 121/124 113/116 Rep 5 117/123 123/123 123/123 |
| 18 35 73.3 Survival Rate C-% 0 0 2 4 | Control Type Brine Control | 118/121 114/116 113/118 111/112 142/145 Rep 1 111/123 123/123 96/123 121/123 | 128/130 131/132 111/112 117/117 123/123 Rep 2 123/123 102/123 123/123 123/123 | 140/140 121/123 129/131 131/132 115/116 Rep 3 99/123 122/123 121/123 123/123 | 141/143 125/125 100/101 125/127 Rep 4 118/123 105/123 117/123 123/123 | 156/159 110/111 111/115 121/124 113/116 Rep 5 117/123 123/123 123/123 123/123 |
| 18 35 73.3 Survival Rate C-% 0 0 2 4 9 | Control Type Brine Control | 118/121 114/116 113/118 111/112 142/145 Rep 1 111/123 123/123 96/123 121/123 116/123 | 128/130 131/132 111/112 117/117 123/123 Rep 2 123/123 123/123 123/123 123/123 | 140/140 121/123 129/131 131/132 115/116 Rep 3 99/123 122/123 121/123 123/123 | 141/143 125/125 100/101 125/127 Rep 4 118/123 105/123 117/123 123/123 123/123 | 156/159 110/111 111/115 121/124 113/116 Rep 5 117/123 123/123 123/123 123/123 123/123 111/123 |

| | ETIS Analytical Report | | | | | | | | 2002 | 25 Feb-20 11:04 (p 3 of 6) 2002-S016 11-4010-6265 | | |
|--|--|--|--|--|---|---|---|--|--|---|--|--|
| Bivalve Larva | al Survival and | Developn | nent Test | | | | | | Nautilus | Environr | nental (CA) | |
| Analysis ID: Analyzed: | 07-1815-1513 25 Feb-20 11: | | | velopment R ametric-Con | | iments | | S Version: ial Results: | CETISv1. Yes | 8.7 | | |
| Data Transfor | rm | Zeta | Alt Hyp | Trials | Seed | | PMSD | NOEL | LOEL | TOEL | TU | |
| Angular (Corre | ected) | NA | C > T | NA | NA | | 1.72% | 73.3 | >73.3 | NA | 1.364 | |
| Dunnett Mult | iple Compariso | n Test | | | | | | | | | | |
| Control | vs C-% | | Test Stat | Critical | MSD DF | P-Value | P-Type | Decision(| x:5%) | | | |
| Brine Control 2 | | | 0.5629 | 2.407 | 0.067 8 | 0.6531 | CDF | | icant Effect | | -, | |
| | 4 | | 0.03426 | 2.407 | 0.067 8 | 0.8477 | CDF | Non-Significant Effect Non-Significant Effect | | | | |
| | 9 | | 0.435 | 2.407 | 0.067 8 | 0.7075 | CDF | | | | | |
| | 18 | | 1.142 | 2.407 | 0.067 8 | 0.3883 | CDF | - | icant Effect | | | |
| | 35 | | -0.117 | 2.407 | 0.067 8 | 0.8864 | CDF | - | icant Effect | | | |
| | 73.3 | | 0.5034 | 2.407 | 0.067 8 | 0.6789 | CDF | - | icant Effect | | | |
| ANOVA Table |) | | | | | | | | | | | |
| Source | Sum Sqi | uares | Mean Squ | iare | DF | F Stat | P-Value | Decision(α:5%) | | | | |
| Between | 0.004377 | 651 | 0.0007296 | 085 | 6 | 0.3806 | 0.8851 | Non-Signif | icant Effect | | | |
| Error | 0.05367923 | | 0.0019171 | 15 | 28 | | | | | | | |
| Total | 0.058056 | 88 | | | 34 | _ | | | | | | |
| Distributiona | l Tests | | | | | | | | | | | |
| Attribute | Test | | | Test Stat | Critical | P-Value | Decision(| α:1%) | | | | |
| Variances | Bartlett | Equality of | Variance | 6.978 | 16.81 | 0.3229 | Equal Var | iances | | | | |
| Distribution | Shapiro | Wilk W N | ormality | 0.984 | 0.9146 | 0.8798 | Normal Di | nal Distribution | | | | |
| Development | Doto Summon | | | | | | | | | | | |
| | . Rate Summary | 1 | | | | | | | | | | |
| C-% | Control Type | Count | Mean | 95% LCL | 95% UCL | Median | Min | Max | Std Err | CV% | %Effect | |
| C-% | - | | Mean 0.9895 | 95% LCL | 95% UCL | Median 0.9899 | Min 0.982 | Max 1 | Std Err 0.003162 | CV% 0.71% | %Effect 0.0% | |
| | Control Type | Count | | | | | | | | | | |
| 0 | Control Type | Count 5 | 0.9895 | 0.9807 | 0.9983 | 0.9899 | 0.982 | 1 | 0.003162 | 0.71% | 0.0% | |
| 0 2 | Control Type | Count 5 5 | 0.9895 0.9862 | 0.9807 0.979 | 0.9983 0.9934 | 0.9899 0.9845 | 0.982 0.9792 | 1 0.9926 | 0.003162 0.002596 | 0.71% 0.59% | 0.0% 0.34% | |
| 0 2 4 | Control Type | Count 5 5 5 | 0.9895 0.9862 0.9882 | 0.9807 0.979 0.9742 | 0.9983 0.9934 1 | 0.9899 0.9845 0.9846 | 0.982 0.9792 0.9752 | 1 0.9926 1 | 0.003162 0.002596 0.00505 | 0.71% 0.59% 1.14% | 0.0% 0.34% 0.13% | |
| 0 2 4 9 | Control Type | Count 5 5 5 5 5 | 0.9895 0.9862 0.9882 0.9872 | 0.9807 0.979 0.9742 0.9818 | 0.9983 0.9934 1 0.9926 | 0.9899 0.9845 0.9846 0.986 | 0.982 0.9792 0.9752 0.9828 | 1 0.9926 1 0.9924 | 0.003162 0.002596 0.00505 0.001934 | 0.71% 0.59% 1.14% 0.44% | 0.0% 0.34% 0.13% 0.23% | |
| 0 2 4 9 18 | Control Type | Count 5 5 5 5 5 5 | 0.9895 0.9862 0.9882 0.9872 0.9797 | 0.9807 0.979 0.9742 0.9818 0.9577 | 0.9983 0.9934 1 0.9926 1 | 0.9899 0.9845 0.9846 0.986 0.9847 | 0.982 0.9792 0.9752 0.9828 0.9576 | 1 0.9926 1 0.9924 1 | 0.003162 0.002596 0.00505 0.001934 0.007949 0.003927 | 0.71% 0.59% 1.14% 0.44% 1.81% | 0.0% 0.34% 0.13% 0.23% 0.99% | |
| 0 2 4 9 18 35 73.3 | Control Type | Count 5 5 5 5 5 5 5 5 5 5 5 | 0.9895 0.9862 0.9882 0.9872 0.9797 0.9899 0.9858 | 0.9807 0.979 0.9742 0.9818 0.9577 0.979 | 0.9983 0.9934 1 0.9926 1 1 | 0.9899 0.9845 0.9846 0.986 0.9847 0.9911 | 0.982 0.9792 0.9752 0.9828 0.9576 0.9758 | 1 0.9926 1 0.9924 1 1 | 0.003162 0.002596 0.00505 0.001934 0.007949 0.003927 | 0.71% 0.59% 1.14% 0.44% 1.81% 0.89% | 0.0% 0.34% 0.13% 0.23% 0.99% -0.04% | |
| 0 2 4 9 18 35 73.3 | Control Type Brine Control | Count 5 5 5 5 5 5 5 5 5 5 5 | 0.9895 0.9862 0.9882 0.9872 0.9797 0.9899 0.9858 | 0.9807 0.979 0.9742 0.9818 0.9577 0.979 | 0.9983 0.9934 1 0.9926 1 1 0.9984 | 0.9899 0.9845 0.9846 0.986 0.9847 0.9911 | 0.982 0.9792 0.9752 0.9828 0.9576 0.9758 | 1 0.9926 1 0.9924 1 1 | 0.003162 0.002596 0.00505 0.001934 0.007949 0.003927 | 0.71% 0.59% 1.14% 0.44% 1.81% 0.89% | 0.0% 0.34% 0.13% 0.23% 0.99% -0.04% | |
| 0 2 4 9 18 35 73.3 Angular (Corr | Control Type Brine Control rected) Transfo | Count 5 5 5 5 5 5 5 7 7 med Sun | 0.9895 0.9862 0.9882 0.9872 0.9797 0.9899 0.9858 | 0.9807 0.979 0.9742 0.9818 0.9577 0.979 0.9732 | 0.9983 0.9934 1 0.9926 1 1 0.9984 95% UCL | 0.9899 0.9845 0.9846 0.986 0.9847 0.9911 0.9843 Median | 0.982 0.9792 0.9752 0.9828 0.9576 0.9758 0.9741 Min | 1 0.9926 1 0.9924 1 1 1 Max | 0.003162 0.002596 0.00505 0.001934 0.007949 0.003927 0.004546 Std Err | 0.71% 0.59% 1.14% 0.44% 1.81% 0.89% 1.03% | 0.0% 0.34% 0.13% 0.23% 0.99% -0.04% 0.37% | |
| 0 2 4 9 18 35 73.3 Angular (Corr C-% | Control Type Brine Control rected) Transfo Control Type | Count 5 5 5 5 5 5 7 7 med Sun Count | 0.9895 0.9862 0.9882 0.9872 0.9797 0.9899 0.9858 mmary Mean | 0.9807 0.979 0.9742 0.9818 0.9577 0.979 0.9732 95% LCL | 0.9983 0.9934 1 0.9926 1 1 0.9984 | 0.9899 0.9845 0.9846 0.986 0.9847 0.9911 0.9843 | 0.982 0.9792 0.9752 0.9828 0.9576 0.9758 0.9741 Min 1.436 | 1 0.9926 1 0.9924 1 1 1 1 Max 1.525 | 0.003162 0.002596 0.00505 0.001934 0.007949 0.003927 0.004546 Std Err 0.01556 | 0.71% 0.59% 1.14% 0.44% 1.81% 0.89% 1.03% CV% 2.37% | 0.0% 0.34% 0.13% 0.23% 0.99% -0.04% 0.37% %Effect 0.0% | |
| 0 2 4 9 18 35 73.3 Angular (Corr C-% 0 2 | Control Type Brine Control rected) Transfo Control Type | Count 5 5 5 5 5 5 5 7 rmed Sun Count 5 | 0.9895 0.9862 0.9882 0.9872 0.9797 0.9899 0.9858 mmary Mean 1.471 | 0.9807 0.979 0.9742 0.9818 0.9577 0.979 0.9732 95% LCL 1.428 | 0.9983 0.9934 1 0.9926 1 1 0.9984 95% UCL 1.514 | 0.9899 0.9845 0.9846 0.986 0.9847 0.9911 0.9843 Median 1.47 | 0.982 0.9792 0.9752 0.9828 0.9576 0.9758 0.9741 Min 1.436 1.426 | 1 0.9926 1 0.9924 1 1 1 1 Max 1.525 1.485 | 0.003162 0.002596 0.00505 0.001934 0.007949 0.003927 0.004546 Std Err | 0.71% 0.59% 1.14% 0.44% 1.81% 0.89% 1.03% CV% 2.37% 1.77% | 0.0% 0.34% 0.13% 0.23% 0.99% -0.04% 0.37% %Effect 0.0% 1.06% | |
| 0 2 4 9 18 35 73.3 Angular (Corr C-% 0 2 | Control Type Brine Control rected) Transfo Control Type | Count 5 5 5 5 5 5 5 5 rmed Sun Count 5 5 | 0.9895 0.9862 0.9882 0.9872 0.9797 0.9899 0.9858 mmary Mean 1.471 1.455 | 0.9807 0.979 0.9742 0.9818 0.9577 0.979 0.9732 95% LCL 1.428 1.423 | 0.9983 0.9934 1 0.9926 1 1 0.9984 95% UCL 1.514 1.487 | 0.9899 0.9845 0.9846 0.986 0.9847 0.9911 0.9843 Median 1.47 1.446 | 0.982 0.9792 0.9752 0.9828 0.9576 0.9758 0.9741 Min 1.436 | 1 0.9926 1 0.9924 1 1 1 1 Max 1.525 | 0.003162 0.002596 0.00505 0.001934 0.007949 0.003927 0.004546 Std Err 0.01556 0.01151 0.02456 | 0.71% 0.59% 1.14% 0.44% 1.81% 0.89% 1.03% CV% 2.37% 1.77% 3.74% | 0.0% 0.34% 0.13% 0.23% 0.99% -0.04% 0.37% %Effect 0.0% 1.06% 0.06% | |
| 0 2 4 9 18 35 73.3 Angular (Corr C-% 0 2 4 9 | Control Type Brine Control rected) Transfo Control Type | Count 5 5 5 5 5 5 5 5 rmed Sun 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 | 0.9895 0.9862 0.9882 0.9872 0.9797 0.9899 0.9858 mmary Mean 1.471 1.455 1.47 | 0.9807 0.979 0.9742 0.9818 0.9577 0.979 0.9732 95% LCL 1.428 1.423 1.402 1.434 | 0.9983 0.9934 1 0.9926 1 1 0.9984 95% UCL 1.514 1.487 1.538 1.483 | 0.9899 0.9845 0.9846 0.986 0.9847 0.9911 0.9843 Median 1.47 1.446 1.446 1.452 | 0.982 0.9792 0.9752 0.9828 0.9576 0.9758 0.9741 Min 1.436 1.426 1.413 1.439 | 1 0.9926 1 0.9924 1 1 1 1 Max 1.525 1.485 1.529 1.484 | 0.003162 0.002596 0.00505 0.001934 0.007949 0.003927 0.004546 Std Err 0.01556 0.01151 | 0.71% 0.59% 1.14% 0.44% 1.81% 0.89% 1.03% CV% 2.37% 1.77% 3.74% 1.37% | 0.0% 0.34% 0.13% 0.23% 0.99% -0.04% 0.37% %Effect 0.0% 1.06% 0.06% 0.82% | |
| 0 2 4 9 18 35 73.3 Angular (Corr C-% 0 2 4 | Control Type Brine Control rected) Transfo Control Type | Count 5 5 5 5 5 5 5 7 med Sun 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 | 0.9895 0.9862 0.9882 0.9872 0.9797 0.9899 0.9858 mmary Mean 1.471 1.455 1.47 1.459 | 0.9807 0.979 0.9742 0.9818 0.9577 0.979 0.9732 95% LCL 1.428 1.423 1.402 | 0.9983 0.9934 1 0.9926 1 1 0.9984 95% UCL 1.514 1.487 1.538 | 0.9899 0.9845 0.9846 0.986 0.9847 0.9911 0.9843 Median 1.47 1.446 1.446 | 0.982 0.9792 0.9752 0.9828 0.9576 0.9758 0.9741 Min 1.436 1.426 1.413 | 1 0.9926 1 0.9924 1 1 1 1 Max 1.525 1.485 1.529 | 0.003162 0.002596 0.00505 0.001934 0.007949 0.003927 0.004546 Std Err 0.01556 0.01151 0.02456 0.008907 | 0.71% 0.59% 1.14% 0.44% 1.81% 0.89% 1.03% CV% 2.37% 1.77% 3.74% | 0.0% 0.34% 0.13% 0.23% 0.99% -0.04% 0.37% %Effect 0.0% 1.06% 0.06% | |

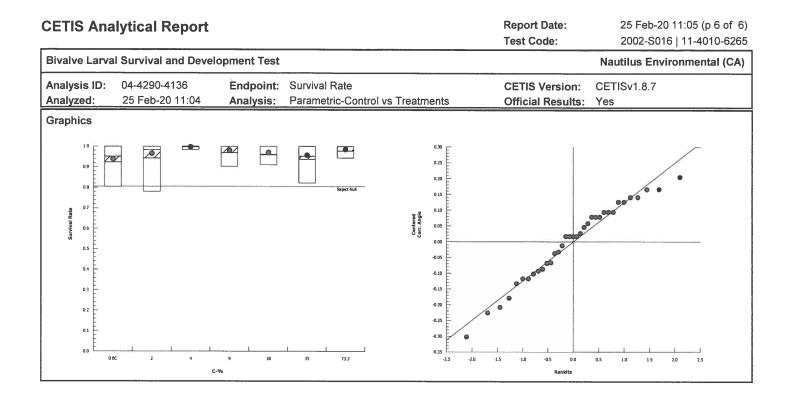




| CETIS Ana | ETIS Analytical Report | | | | | | | | 25 Feb-20 11:04 (p 5 of 6) 2002-S016 11-4010-6265 | | |
|---|---|--|--|--|--|---|--|---|--|------------------------------------|-------------------------------------|
| Bivalve Larv | al Survival and [| Develop | oment Test | | | | | | Nautilus | Environn | nental (CA) |
| Analysis ID: Analyzed: | D: 04-4290-4136 Endpoint: Survival Rate 25 Feb-20 11:04 Analysis: Parametric-Control vs Treatme | | tments | CETIS Version: CETISv1.8.7 Official Results: Yes | | | | | | | |
| Data Transfo | orm | Zeta | Alt Hyp | Trials | Seed | | PMSD | NOEL | LOEL | TOEL | TU |
| Angular (Corrected) NA C > T | | NA | NA | | 12.8% | 73.3 | >73.3 | NA | 1.364 | | |
| Dunnett Mult | tiple Compariso | n Test | | | | | | | | | |
| Control | vs C-% | | Test Sta | at Critical | MSD DF | P-Value | Р-Туре | Decision(| a:5%) | | |
| Brine Control | 2 | | -0.7365 | 2.407 | 0.208 8 | 0.9740 | CDF | | icant Effect | | |
| | 4 | | -2.174 | 2.407 | 0.208 8 | 0.9998 | CDF | - | icant Effect | | |
| | 9 | | -1.28 | 2.407 | 0.208 8 | 0.9948 | CDF | - | icant Effect | | |
| | 18 | | -0.9071 | 2.407 | 0.208 8 | 0.9838 | CDF | - | icant Effect | | |
| | 35 | | -0.4469 | 2.407 | 0.208 8 | 0.9454 | CDF | - | icant Effect | | |
| | 73.3 | | -1.458 | 2.407 | 0.208 8 | 0.9971 | CDF | - | icant Effect | | |
| ANOVA Table | e | | | | | | | · · · · · | | | - |
| Source | Sum Squ | ares | Mean S | quare | DF | F Stat | P-Value | Decision(| a:5%) | | |
| Between | 0.113521 | | 0.01892 | 017 | 6 | 1.017 | 0.4344 | Non-Significant Effect | | | |
| Error | 0.5207969 0.01859 | | 989 | 28 | | | | | | | |
| Total | 0.634317 | 9 | | | 34 | | | | | | |
| Distributiona | al Tests | | | | | | | | | | |
| Attribute | Test | | | Test Stat | Critical | P-Value | Decision | α:1%) | | | |
| Variances | Bartlett E | Equality | of Variance | 7.921 | 16.81 | 0.2439 | Equal Var | iances | | | |
| Distribution | Shapiro- | Wilk W | Normality | 0.9664 | 0.9146 | 0.3519 | Normal Di | Distribution | | | |
| Survival Rate | e Summary | | | | | | | | | | |
| C-% | Control Type | Cour | nt Mean | 95% LCL | 95% UCL | Median | Min | Max | Std Err | CV% | %Effect |
| 0 | Brine Control | 5 | 0.9236 | 0.8306 | 1 | 0.9512 | 0.8049 | 1 | 0.03348 | 8.11% | 0.0% |
| 2 | | 5 | 0.9431 | 0.8275 | 1 | 0.9837 | 0.7805 | 1 | 0.04161 | 9.87% | -2.11% |
| 4 | | 5 | 0.9967 | 0.9877 | 1 | 1 | 0.9837 | 1 | 0.003252 | 0.73% | -7.92% |
| 9 | | 5 | 0.9691 | 0.9136 | 1 | 1 | 0.9024 | 1 | 0.01998 | 4.61% | -4.93% |
| 18 | | 5 | 0.961 | 0.9118 | 1 | 0.9593 | 0.9106 | 1 | 0.0177 | 4.12% | -4.05% |
| 35 | | 5 | 0.9366 | 0.844 | 1 | 0.9512 | 0.8211 | 1 | 0.03336 | 7.97% | -1.41% |
| | | | | | 1 | 1 | 0.9431 | 1 | 0.01394 | 3.19% | -5.81% |
| 73.3 | | 5 | 0.9772 | 0.9385 | | | | | | | |
| 73.3 Angular (Cor | rected) Transfor | med S | ummary | | . <u></u> | | | | | | |
| 73.3 Angular (Cor C-% | Control Type | med Si Cour | ummary nt Mean | 95% LCL | 95% UCL | | Min | Max | Std Err | CV% | %Effect |
| 73.3 Angular (Cor C-% 0 | | med Si Cour | ummary nt Mean 1.322 | 95% LCL 1.133 | 95% UCL 1.51 | 1.348 | Min 1.113 | 1.526 | Std Err 0.06804 | CV% 11.51% | %Effect 0.0% |
| 73.3 Angular (Cor C-% 0 2 | Control Type | rmed So Cour 5 5 | ummary nt Mean 1.322 1.385 | 95% LCL 1.133 1.157 | 95% UCL 1.51 1.614 | 1.348 1.443 | Min 1.113 1.083 | 1.526 1.526 | | | |
| 73.3 Angular (Cor C-% 0 2 4 | Control Type | rmed Si Cour 5 5 5 5 | ummary nt Mean 1.322 1.385 1.509 | 95% LCL 1.133 1.157 1.463 | 95% UCL 1.51 1.614 1.555 | 1.348 1.443 1.526 | Min 1.113 | 1.526 1.526 1.526 | 0.06804 | 11.51% | 0.0% |
| 73.3 Angular (Cor C-% 0 2 4 9 | Control Type | Cour 5 5 5 5 5 | ummary nt Mean 1.322 1.385 1.509 1.432 | 95% LCL 1.133 1.157 1.463 1.269 | 95% UCL 1.51 1.614 1.555 1.595 | 1.348 1.443 1.526 1.526 | Min 1.113 1.083 1.443 1.253 | 1.526 1.526 1.526 1.526 | 0.06804 0.08228 | 11.51% 13.28% | 0.0% -4.81% |
| 73.3 Angular (Cor C-% 0 2 4 9 18 | Control Type | med S Cour 5 5 5 5 5 5 5 | ummary nt Mean 1.322 1.385 1.509 1.432 1.4 | 95% LCL 1.133 1.157 1.463 1.269 1.25 | 95% UCL 1.51 1.614 1.555 1.595 1.549 | 1.348 1.443 1.526 1.526 1.368 | Min 1.113 1.083 1.443 1.253 1.267 | 1.526 1.526 1.526 1.526 1.526 | 0.06804 0.08228 0.01655 | 11.51% 13.28% 2.45% | 0.0% -4.81% -14.19% |
| 73.3 Angular (Cor C-% 0 2 4 9 | Control Type | Cour 5 5 5 5 5 | ummary nt Mean 1.322 1.385 1.509 1.432 | 95% LCL 1.133 1.157 1.463 1.269 | 95% UCL 1.51 1.614 1.555 1.595 | 1.348 1.443 1.526 1.526 | Min 1.113 1.083 1.443 1.253 | 1.526 1.526 1.526 1.526 | 0.06804 0.08228 0.01655 0.05863 | 11.51% 13.28% 2.45% 9.16% | 0.0% -4.81% -14.19% -8.36% |

- 20

Analyst: JU QA: EU 2/27/20



Analyst: JU QA: EL 2/22/26

CETIS Test Data Worksheet

 Report Date:
 02 Feb-20 12:41 (p 1 of 1)

 Test Code:
 2002 - 50% 11-4010-6265/43F4A419

Nautilus Environmental (CA)

Bivalve Larval Survival and Development Test

| | | 95 Feb-20 97 Feb-20 94 Feb-20 | | 7 Feb-20 4 Feb-20 | | Species: Protocol: Material: | Mytilus galloprovincialis EPA/600/R-95/136 (1995) Effluent Sample | | | Sample Code: 20- 0143 Sample Source: Jacobs Sample Station: Wyckoff G WTP Effluent |
|-----|------|-------------------------------------|-----|----------------------|---------------|------------------------------------|---|----------------------------------|--|--|
| C-% | Code | Rep | Pos | Initial Density | Final Density | # Counted | # Normal | Notes | | |
| | | | 256 | | | 123 | 121 | RT 2/19/20 | | |
| | | | 257 | | | 121 | 118 | 1 | | |
| | | | 258 | | | 127 | 125 | | | |
| | | | 259 | | | 112 | 111 | | | |
| | | | 260 | | | 143 | 141 | | | |
| | | | 261 | | | 145 | 142 | | | |
| | | | 262 | | | 111 | 109 | | | |
| | | | 263 | | | 132 | 131 | | | |
| | | | 264 | | | 123 | 123 | | | |
| | | | 265 | | | 116 | 113 | | | |
| | | | 266 | | | 101 | 100 | | | |
| | | | 267 | | | 129 | 127 | | | |
| | | | 268 | | | 135 | 134 98 | | | |
| | | | 269 | | | 99 | 98 | | | |
| | | | 270 | | | 116 | 115 | | | |
| | | | 271 | | | 117 | 117 | | | |
| | | | 272 | | | 102 | 98 | | | |
| | | | 273 | | | 112 | 111 | | | |
| | | | 274 | | | 105 | 103 | | | |
| | | | 275 | | | [2] | 120 | | | |
| | | | 276 | | | 117 | 117 | | | |
| | | | 277 | | | 125 | 125 | | | |
| | | | 278 | | | 124 | 121 | | | |
| | | | 279 | | | 130 | 128 | | | |
| | | | 280 | | | 136 | 135 | | | |
| | | | 281 | | | 116 | 114 | | | |
| | | | 282 | | | 115 | 111 | | | |
| | | | 283 | | | 96 | 94 | | | |
| | | | 284 | | | 118 | 113 | | | |
| | | | 285 | | | 126 | 124 | \checkmark | | |
| | | | 286 | | | 131 | 129 | RT 2/21/20 | | |
| | | | 287 | | | hi | 110 | | | |
| | | | 288 | | | 140 | 140 | RT Z/21/20 J A(S 2/24/2020 | | |
| | | | 289 | | | 159 | 156 | Λ | | |
| | | | 290 | | | 132 | 131 | | | |
| | | | 291 | | | 136 | 135 | | | |
| | | | 292 | | | 117 | 115 | | | |
| | | | 293 | | | 1(8 | 117 | 1 | | |
| | | | 294 | | | 140 | 140 | | | |
| | | | 295 | | | 122 | 121 | | | |

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CETIS Test Data Worksheet

Report Date: 02 Feb-20 12:40 (p 1 of 1) Test Code: 2002 - SOL6 11-4010-6265/43F4A419

| Bivalve Larv | valve Larval Survival and Development Test | | | | | | | Nautilus Environmental (CA) | | | |
|---|--|-----|-----|-----------------|---|-----------|----------|-----------------------------|--|--|--|
| Start Date: End Date: Sample Date | -1 3 | | | | Sample Code: 20-0143 Sample Source: Jacobs Sample Station: Wyckoff GWTP FIFWent | | | | | | |
| C-% | Code | Rep | Pos | Initial Density | Final Density | # Counted | # Normal | Notes | | | |
| 0 | BC | 1 | 262 | | | | | | | | |
| 0 | BC | 2 | 285 | | | | | | | | |
| 0 | BC | 3 | 269 | | | 106 | 106 | NM 217/20 | | | |
| 0 | BC | 4 | 293 | | | | | · · · · · · | | | |
| 0 | BC | 5 | 271 | | | | | | | | |
| 0 | LC | 1 | 291 | | | | | | | | |
| 0 | LC | 2 | 272 | | | | | | | | |
| 0 | LC | 3 | 295 | | | 123 | 122 | NM | | | |
| 0 | LC | 4 | 274 | | | | | | | | |
| 0 | LC | 5 | 280 | | | | | | | | |
| 2 | | 1 | 283 | | | | | | | | |
| 2 | | 2 | 268 | | | | | | | | |
| 2 | | 3 | 275 | | | 117 | 117 | NM | | | |
| 2 | | 4 | 292 | | | | | | | | |
| 2 | | 5 | 267 | | | | | | | | |
| 4 | | 1 | 257 | | | | | | | | |
| 4 | | 2 | 279 | | | | | | | | |
| 4 | | 3 | 294 | | | 140 | 139 | NM | | | |
| 4 | | 4 | 288 | | | | | | | | |
| 4 | | 5 | 289 | | | | | | | | |
| 9 | | 1 | 281 | | | | | | | | |
| 9 | | 2 | 263 | | | | | | | | |
| 9 | | 3 | 256 | | | 118 | 116 | NM | | | |
| 9 | | 4 | 260 | | | | | | | | |
| 9 | | 5 | 287 | | | | | | | | |
| 18 | | 1 | 284 | | | | | | | | |
| 18 | | 2 | 273 | | | | | | | | |
| 18 | | 3 | 286 | | | 130 | 128 | NM | | | |
| 18 | | 4 | 277 | | | | | | | | |
| 18 | | 5 | 282 | | | | | | | | |
| 35 | | 1 | 259 | | | | | | | | |
| 35 | | 2 | 276 | | | | | | | | |
| 35 | | 3 | 290 | | | 137 | 135 | NM | | | |
| 35 | | 4 | 266 | - | | | | | | | |
| 35 | | 5 | 278 | | | | | | | | |
| 74.1 | | 1 | 261 | | | | | | | | |
| 74.1 -73 74.1 | .3 | 2 | 264 | | | | | | | | |
| | | 3 | 270 | | - | 117 | 117 | NM | | | |
| 4.1 | | 4 | 258 | | | | | | | | |
| ₱ | | 5 | 265 | | | | | | | | |

Ats QC= \$4

Analyst: AC] QA: EG 2/27/20

Marine Chronic Bioassay DM-014

Water Quality Measurements

Client: Jacobs

Sample ID: Wyckoff GUTP EFFluent Sample Log No.: 20-0143

Test No.: 2002-Sol 0

 Test Species:
 M. galloprovincialis

 Start Date/Time:
 2/5/2020
 1310

 End Date/Time:
 2/7/2020
 1330

| Concentration (% sample) | Salinity (ppt) | | | Т | emperatu (°C) | ire | Dissolved Oxygen (mg/L) | | | pH (pH units) | | |
|-----------------------------|-------------------|-------|------|------|------------------|------|----------------------------|-----|-----|------------------|------|------|
| | 0 | 24 | 48 | 0 | 24 | 48 | 0 | 24 | 48 | 0 | 24 | 48 |
| Lab Control | 30,3 | 30,0 | 29.9 | 14.3 | 14.5 | 14.7 | 8.7 | 8.5 | 8.4 | 8.08 | 8.04 | 7.97 |
| Brine Control | 30.5 | 30.2 | 30.4 | 14.9 | 14,2 | 14.5 | 83 | 8.6 | 8.4 | 8.24 | 8.09 | 8.01 |
| 2 | 30.3 | 30.0 | 30.2 | 14.8 | 14.7 | 14.8 | 8.4 | 8.5 | 8.3 | 8,07 | 8.06 | 8.00 |
| 4 | 30.3 | 30.0 | 30.1 | 14.5 | 14.5 | 14.6 | 8.5 | 3.6 | 8.4 | 8.04 | 8.06 | 8.03 |
| 9 | 30.3 | 3.0.1 | 30.1 | 14.3 | 14,4 | 14.5 | 8.4 | 3.6 | 8.4 | 7.94 | 8.06 | 8.07 |
| 18 | 30,3 | 30.1 | 30.2 | 14,4 | 14.7 | 14.9 | 8,4 | 8.5 | 8.3 | 7.84 | 8.06 | 8.12 |
| 35 | 30,3 | 30.0 | 30.2 | 14.1 | 14.6 | 14.8 | 8.3 | 8.5 | 8.3 | 7.69 | 8.07 | 8-19 |
| 73.3 | 30,5 | 30,3 | 30.4 | 14.0 | 14.6 | 14.7 | 8.4 | 3.5 | 8.4 | 7,60 | 8.09 | 8.Z7 |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |

| Technician Initials: | WQ Readings: Dilutions made by: | 0 EG EG | 24 DM - | 48 P++ 080 ///- | Environmental Chamber: | D |
|----------------------|------------------------------------|---------------|---------------|---------------------|------------------------|-----------------------------------|
| Comments: | 0 hrs: 24 hrs: 48 hrs: | | | | | |
| QC Check: | EG 2/27/20 | | | | Final Revie | w: <u>PH 313/20 // AZ 3/ 6/20</u> |

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

Marine Chronic Bioassay

Brine Dilution Worksheet

| Project: | JACOBS | | | Analyst: | EG | | |
|-----------------------------|----------------------------|----------|---------------|----------------|--------------------|-----------------|--|
| Sample ID: | Wyckoff GWTY | effluent | | Test Date: | 2/5/2020 | | |
| Test No: | o: <u>2002-S016</u> | | | Test Type: | Mussel Development | | |
| Salinity of Ef | fluent | 6.6 | | | | | |
| Salinity of Br | ine | 94.1 | Date | of Brine used: | 12/20/2019 | _ | |
| Target Salini | ty | 30 | Alkalinity of | Brine Control: | 83 | _ mg/L as CaCO3 | |
| Test Dilution | Volume | 250 | | | , | | |
| | | Effluent | Brine Control | | | | |
| (TS - SE)/(SB TS = targe | • | 0.37 | 0.47 | | | | |

SB = salinity of brine

| Concentration % | Effluent Volume (ml) | Salinity Adjustment Factor | Brine Volume (ml) | Dilute to: (ml) |
|--------------------|----------------------------|----------------------------------|-------------------------|-----------------------|
| Control | NA | NA | NA | 250 |
| 2 | 5.0 | 0.37 | 1.8 | 250 |
| 4 | 10.0 | 0.37 | 3.7 | 250 |
| 9 | 22.5 | 0.37 | 8.2 | 250 |
| 18 | 45.0 | 0.37 | 16.4 | 250 |
| 35 | 87.5 | 0.37 | 31.9 | 250 |
| 73.3 | 183.1 | 0.37 | 66.9 | 250 |

| | DI Volume | | | |
|---------------|-----------|------|------|-----|
| Brine Control | 142.9 | 0.47 | 66.9 | 250 |

Total Brine Volume Required (ml): 195.8

QC Check: Eq 2/27/20

Final Review: <u>p# 3/3/2071 AC, 3</u>/6/20

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

Marine Chronic Bioassay DM-013

| Client/Sample: | Jacobs/Wyckoff GUTP EAGluent |
|------------------|------------------------------|
| Test No.: | 2002-5016 |
| Test Species: | Mytilus galloprovincialis |
| Animal Source/Ba | ich Tank: Taylor / 19B |
| Date Received: | 11/20/19 |
| Test Chambers: | 30 mL glass shell vials |
| Sample Volume: | 10 mL |

0935

Larval Development Worksheet

| Start Date/Time: | 2/5/2020 | 1310 | |
|----------------------|----------|------|--|
| End Date/Time: | 2/7/2020 | 1230 | |
| Technician Initials: | EG | | |

Spawn Information

| Sex | Beaker Number(s) | Condition (sperm motility, egg density, color, shape, etc.) |
|----------|---------------------|--|
| Male | 1,2,3 | good denotby + motility |
| Female 1 | 1 | Ok shape, good density pink color |
| Female 2 | 2 | great shake, OK density, pale color |
| Female 3 | | |

| Sex | Number Spawning |
|--------|-----------------|
| Male | 3+ |
| Female | 2 |

| Embryo | Stock | Selection | |
|--------|-------|-----------|--|
| | | | |

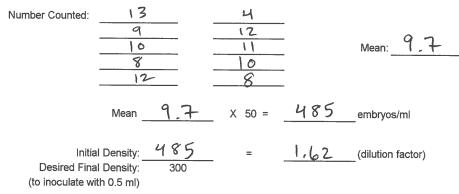
| Stock Number | % of embryos at 2-cell division stage |
|--------------|---------------------------------------|
| Female 1 | |
| Female 2 | 100 |
| Female 3 | |

Egg Fertilization Time: 1025

Stock(s) chosen for testing:

Embryo Inoculum Preparation

Target count on Sedgwick-Rafter slide for desired density is 6 embryos



Prepare the embryo inoculum according to the calculated dilution factor. For example, if the dilution factor is 2.25, use 100 ml of existing stock (1 part) and 125 ml of dilution water (1.25 parts).

Gamete Selection

Time Zero Control Counts

| TØ Vial No. | No. Dividing | Dividing Total % Dividing | | Mean % Dividing |
|----------------|--------------|---------------------------|-----|--------------------|
| TØ A | 119 | 119 119 100 | | |
| TØ B | 144 | 144 | 100 | |
| тøс | 119 | 119 | 100 | 100 |
| TØ D | 127 | 127 | 100 | (00 |
| TØ E | 121 | 121 | 100 | |
| TØ F | 107 | 107 | 100 | |
| <u>x</u> = | 123 | | | |

48-h QC: 116/118 = 98.3%

Comments:

QC Check:

EG 2/27/20



Final Review: <u>R41 3/3/20 AC 3/6</u>/2.

Appendix B Sample Check-In Information

| 340 Vandever Avenue | Sample ID: | LLINC D | off Gulin | Peffluent | (120470) | | formation DC-005 |
|--|---|--|--|---|--|---------------------|---------------------|
| an Diego, CA 92120 | Test ID No(s).: | | -5016 | | Sample Description: | | |
| an Diego, CA 32120 | Test ID NO(S) | 2002 | 3016 | | A: no colar, clear, no | dec | - a debas |
| | | | | | n. n= cons, clear, no | 000 , 1 | 1000000 |
| Sample (A | A, B, C): | | | | | | |
| Log-in No. (20 | | | | | | | |
| Sample Collection Date a | & Time: 2/4/20 0926 | | | | COC Complete (Y/N)? | | |
| Sample Receipt Date a | & Time: 2/5/20 0450 | | | | ABC | | |
| Number of Containers & Containe | er Type: L cubi | | | | | | |
| Approx. Total Volume Receiv | | | | | Filtration? Y (N) | | |
| Check-in Temperatur | re (°C) 2.8 | | | | Initials: A) B) (|) | |
| Temperature | | YN | Y N | Y N | Pore Size: | | |
| DO (I | (mg/L) 9.4 | | | | Organisms or | Debris | |
| pH (| units) 7.42 | | | | Salinity Adjustment? | | |
| Conductivity (µ | IS/cm) 10,710 | | | | Test: Mussel Source: F | Targe | et ppt: 30 |
| Salini | ity (ppt) 6,6 | | | | Test: Source: | | et ppt: |
| Alkalinity (| | | | | Test: Source: | Targe | et ppt: |
| Hardness (m | ng/L) ^{2, 3} | | | | pH Adjustment? Y (N) | | |
| Total Chlorine (| mg/L) 0.02 | | | | A | В | С |
| Technician In | nitials RT/ER/HS | | | | Initial pH: | | |
| 0 0 | 4 | | | | Amount of HCI added: | | |
| | | | | | | | |
| Test Performed: MUSSel Develop | Men Control/Dilution War | ter: 8:2 / <u>Lat</u> | SW_/ Lab ART | Other: | Final pH: | | |
| Test Performed: MUSSEL Develop | Other Control/Dilution Wat Alkalinity: 97 | ter: 8:2 / Lab Hardness or | Salinity: 3 Salinity: | Other: | Final pH: Cl ₂ Adjustment? Y (N) | | |
| Test Performed: MV35l DWClop Additional Control? (Y | <u>Diver</u> Control/Dilution War Alkalinity: <u>97</u> DN = <u>Blive Control</u> A | ter: 8:2 / Lat Hardness or Ikalinity:3 | Salinity: <u>3</u> Sa | Other: | | В | c |
| Test Performed: MV35ll DW10f Additional Control? (Y | $\frac{\text{Other A} \text{Control/Dilution Wat}}{\text{Alkalinity:} 97}}{\text{ON} = \text{Blive Curtual A}}$ | ter: 8:2 / Lat Hardness or Ikalinity:{3 | SW_/ Lab ART Salinity: Hardness or S | Other: | Cl ₂ Adjustment? Y | В | с |
| Test Performed: MV35ll DW106 Additional Control? (Y | <u>N</u> = <u>Blive Control</u> A | Ikalinity: <u>02</u> ter: 8:2 / Lab | SW / Lab ART | alinity: <u>50pp (</u> Other: | Cl ₂ Adjustment? Y N | B | с |
| Additional Control? (Y | <u>N</u> = <u>Blive Cuntrol</u> A <u>Control/Dilution Wat</u> Alkalinity: | Ikalinity: <u>02</u> ter: 8:2 / Lab Hardness or | Hardness or S SW / Lab ART Salinity: | alinity: <u>50pp (</u> Other: | Cl ₂ Adjustment? Y N A Initial Free Cl ₂ : | B | с |
| Additional Control? (Y | <u>N</u> = <u>Blive Control</u> A | Ikalinity: <u>02</u> ter: 8:2 / Lab Hardness or | Hardness or S SW / Lab ART Salinity: | alinity: <u>50pp (</u> Other: | Cl ₂ Adjustment? Y N A Initial Free Cl ₂ : | В | с |
| Additional Control? (Y | <u>Control/Dilution Wat</u> <u>Control/Dilution Wat</u> <u>Alkalinity:</u> <u>N</u> =A | Ikalinity: <u>02</u> ter: 8:2 / Lab Hardness or Ikalinity: | Hardness or S SW / Lab ART Salinity: Hardness or S | alinity: <u>50 pp (</u> Other: alinity: | Cl ₂ Adjustment? Y N A Initial Free Cl ₂ : STS added: Final Free Cl ₂ : Sample Aeration? Y N | | |
| Additional Control? (Y | <u>N</u> = <u>Blive Cuntual</u> A Control/Dilution Wat Alkalinity: N N Control/Dilution Wat Control/Dilution Wat | Ikalinity: <u>02</u> ter: 8:2 / Lab Hardness or Ikalinity: ter: 8:2 / Lab | SW / Lab ART (Salinity: | alinity: <u>50 pp (</u> Other: alinity: | Cl ₂ Adjustment? Y N A Initial Free Cl ₂ : STS added: Final Free Cl ₂ : Sample Aeration? Y N A | B | C C |
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| Additional Control? (Y <u>Test Performed:</u> Additional Control? Y <u>Test Performed:</u> Additional Control? Y | Control/Dilution Wat Control/Dilution Wat Alkalinity: N = Control/Dilution Wat Control/Dilution Wat Alkalinity: Alkalinity: Alkalinity: Alkalinity: Alkalinity: Alkalinity: Alkalinity: Alkalinity: Alkalinity: Alkalinity: Alkalinity: Alkalinity: | Ikalinity: <u>02</u> ter: 8:2 / Lab Hardness or Ikalinity: ter: 8:2 / Lab Hardness or Ikalinity: | Hardness or S SW / Lab ART Salinity: Hardness or S SW / Lab ART Salinity: Hardness or S | alinity: <u>50 pp (</u> | Cl ₂ Adjustment? Y N A Initial Free Cl ₂ : STS added: Final Free Cl ₂ : Sample Aeration? Y N A Initial D.O. | | |
| Additional Control?Y Test Performed: Additional Control?Y Test Performed: Additional Control?Y Notes:Temperature of sample | Control/Dilution Wat Control/Dilution Wat Alkalinity: N = Control/Dilution Wat Control/Dilution Wat Alkalinity: Alkalinity: Alkalinity: Alkalinity: Alkalinity: Alkalinity: Alkalinity: Alkalinity: Alkalinity: Alkalinity: Alkalinity: Alkalinity: | Ikalinity: <u>02</u> ter: 8:2 / Lab Hardness or Ikalinity: ter: 8:2 / Lab Hardness or Ikalinity: more than 24 hou | Hardness or S SW / Lab ART Salinity: Hardness or S SW / Lab ART Salinity: Hardness or S Sinity: Hardness or S Salinity: | alinity: <u>50 pp (</u> | Cl ₂ Adjustment? Y N A Initial Free Cl ₂ : STS added: Final Free Cl ₂ : Sample Aeration? Y N A Initial D.O. Duration & Rate | B | C |
| Additional Control?Y Test Performed: Additional Control?Y Test Performed: Additional Control?Y Notes:Temperature of sample | <u>Control/Dilution Wat</u> Control/Dilution Wat Alkalinity: N = Control/Dilution Wat Alkalinity: Alkalinity: Alkalinity: Alkalinity: N = Alkalinity: Alkalinity: Alkalinity: Alkalinity: N | Ikalinity: <u>02</u> ter: 8:2 / Lab Hardness or Ikalinity: ter: 8:2 / Lab Hardness or Ikalinity: more than 24 hou | Hardness or S SW / Lab ART Salinity: Hardness or S SW / Lab ART Salinity: Hardness or S Sinity: Hardness or S Salinity: | alinity: <u>50 pp (</u> | Cl ₂ Adjustment? Y N A Initial Free Cl ₂ : STS added: Final Free Cl ₂ : Sample Aeration? Y N A Initial D.O. Duration & Rate Final D.O. | B nistry Require | C |

519401171

Overlying Water

Total Ammonia Analysis Freshwater

DC-001

| DI BI Test Start D | Analyst: DM Analysis Date: 2/13/20 | | | | |
|---------------------------------------|---------------------------------------|------------|----------|--------|---------------------|
| | Nautilus | Sub-Sample | Test | NH3-N | N x 1.22 Ammonia |
| Sample ID | ID | Date | Day | (mg/L) | (mg/L) |
| ank Spike (10 mg/L NH3) | | NA | NA | 7.4 | 9.0 |
| yckoff | 20-0143 | 2/5/2020 | Check In | 1,3 | 1.6 |
| | | | | | |
| | | | | | |
| | | | | | 1 |
| | | | | | |
| | | | | 2.0 | |
| bike Check (10 mg/L NH ₃) | | NA | NA | 7.4 | 9,0 |
| | | | | | |
| ······· | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| Imple Duplicate ^a | | NA | NA | 1,2 | 1.5 |
| mple Duplicate + Spike ^a | | NA | NA | 8,7 | 10.6 |
| ike Check (10 mg/L NH ₃) | | NA | NA | 7.4 | 9.0 |

Acceptable Range: 80-120%^b

Percent Recovery = [spiked sample] (mg/L) - [sample] (mg/L) x 100 nominal [spike] (mg/L)

Measured Nominal [NH₃] [Sample Dup] [Spike] [Spike] % Recovery QC Sample ID RPD 0.0 9.0 90 Blank 10 NA NA 10.6 Wychoff 1.6 1.5 90 10 6.5

Comments:

Notes: ^aUnless otherwise noted, the last sample listed on the datasheet is used for duplicate and duplicate + spike QC check.

^b Acceptable range for % recovery applies only to the blank spike. Spike recoveries in samples may vary based on samp e matrix and are for information only.

^c Calculation not performed due to one or both values below the method detection limit.

Method Detection Limit = 0.5 mg/L

QC Check: BO Z/28/20

EG 2 28 20 Final Review:

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

Appendix C Chain-of-Custody Form Page 1 of 1

Enthalpy Analyyical (REGION COPY)

DateShipped: 2/4/2020 CarrierName: FedEx AirbillNo: 7776 8157 0320

CHAIN OF CUSTODY RECORD Wyckoff Eagle Harbor GWTP 2019/WA Project Code: WEH-029K Cooler #: 1 of 1

No: 10-020420-095301-0439

2020T10P000DD210W2LA00 Contact Name: Keith Allers Contact Phone: 206-780-1711

| Sample Identifier | CLP Sample No. | Matrix/Sampler | Coll. Method | Analysis/Turnaround (Days) | Tag/Preservative/Bottles | Location | Collection Date/Time | Sample Type |
|-------------------|-------------------|---------------------------|-----------------|-------------------------------|--------------------------|----------|-------------------------|--------------|
| 020420 | | Ground Water/ K.Allers | Composite | CHRTOX(8 Weeks) | (< 6 C) (1) | SP-11 | 02/04/2020 09:26 | Field Sample |
| | | | | | | | | |
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| | Shipment for Case Complete? N |
|---------------------------------------|---|
| Special Instructions: | Samples Transferred From Chain of Custody # |
| Analysis Key: CHRTOX=Chronic Toxicity | |

| Items/Reason | Relinquished by (Signature and Organization) | | | ure and Organization) | Date/Time | Sample Cond | lition Upon Receipt | in#: |
|--------------|--|------------------|----------------|-----------------------|----------------|-------------|---------------------|--------|
| | Kuth aller JAGOBS | 2-4-2020 1000 | Elizabet Dugse | Enthalpy | 2/5/20 0950 | GOOD | 2.8°C | 20-014 |
| | <i>P</i> * | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

Appendix D List of Qualifier Codes



Glossary of Qualifier Codes:

- Q1 Temperatures out of recommended range; corrective action taken and recorded in Test Temperature Correction Log
- Q2 Temperatures out of recommended range; no action taken, test terminated same day
- Q3 Sample aerated prior to initiation or renewal due to dissolved oxygen (D.O.) levels below 6.0 mg/L
- Q4 Test aerated; D.O. levels dropped below 4.0 mg/L
- Q5 Test initiated with aeration due to an anticipated drop in D.O.
- Q6 Airline obstructed or fell out of replicate and replaced; drop in D.O. occurred
- Q7 Salinity out of recommended range
- Q8 Spilled test chamber/ Unable to recover test organism(s)
- Q9 Inadequate sample volume remaining, 50% renewal performed
- Q10 Inadequate sample volume remaining, no renewal performed
- Q11 Sample out of holding time; refer to QA section of report
- Q12 Replicate(s) not initiated; excluded from data analysis
- Q13 Survival counts not recorded due to poor visibility or heavy debris
- Q14 D.O. percent saturation was checked and was $\leq 110\%$
- Q15 Did not meet minimum test acceptability criteria. Refer to QA section of report.
- Q16 Percent minimum significant difference (PMSD) was <u>below</u> the lower bound limit for acceptability. This indicates that statistics may be over-sensitive in detecting a difference from the control due to low variability in the data set.
- Q17 Percent minimum significant difference (PMSD) was <u>above</u> the upper bound limit for acceptability. This indicates that statistics may be under-sensitive in detecting a difference from the control due to high variability in the data set.
- Q18 Incorrect Entry
- Q19 Illegible Entry
- Q20 Miscalculation
- Q21 Other (provide reason in comments section)
- Q22 Greater than 10% mortality observed upon receipt and/or in holding prior to test initiation. Organisms acclimated to test conditions at Nautilus and ultimately deemed fit to use for testing.
- Q23 Test organisms received at a <u>temperature</u> greater than 3°C outside the recommended test temperature range. However, due to age-specific protocol requirements and/or sample holding time constraints, the organisms were used to initiate tests upon the day of arrival. Organisms were acclimated to the appropriate test conditions upon receipt and prior to test initiation.
- Q24 Test organisms received at <u>salinity</u> greater than 3 ppt outside of the recommended test salinity range. However, due to age-specific protocol requirements and/or sample holding time constraints, the organisms were used to initiate tests upon the day of arrival. Organisms were acclimated to the appropriate test conditions upon receipt and prior to test initiation.

Appendix E Reference Toxicant Test Results

CETIS Summary Report

Report Date: Test Code: 11 Mar-20 15:07 (p 1 of 3) 200205msdv | 06-6849-2235

| Bivalve Larva | l Survival and Develop | ment Test | | | | | | Nautilus Environmental (CA |
|---|---|--|---|---|--|----|--|--|
| Batch ID: Start Date: Ending Date: Duration: | 05 Feb-20 13:10 07 Feb-20 12:30 | Test Type: Protocol: Species: Source: | Development- EPA/600/R-95 Mytilus gallopr Taylor Shellfis | /136 (1995) ovincialis | | | Analyst: Diluent: Brine: Age: | Diluted Natural Seawater Not Applicable |
| Sample ID: Sample Date: Receive Date: Sample Age: | 05 Feb-20 05 Feb-20 9 | Code: Material: Source: Station: | 200205msdv Copper chlorid Reference Tox Copper Chlorid | ticant | | | Client: Project: | Internal |
| Comparison S | | | | | | | | |
| Analysis ID | Endpoint | NOEL | LOEL | TOEL | PMSD | τu | Meth | od |
| 18-0959-6796 | Combined Developmer | nt Ra 2.5 | 5 | 3.536 | 11.2% | | Dunn | ett Multiple Comparison Test |
| 06-6130-0163 | Development Rate | 2.5 | 5 | 3.536 | 2.67% | | | ett Multiple Comparison Test |
| 12-4039-9276 | Survival Rate | 20 | 40 | 28.28 | 18.1% | | | ett Multiple Comparison Test |
| | | | | | | | | |
| Point Estimate | e Summary | | | | | | | |
| | e Summary Endpoint | Level | μg/L | 95% LCL | 95% UCL | ти | Meth | od |
| Analysis ID | • | | μ <mark>g/L</mark> 5.654 7.103 | 95% LCL 4.978 6.652 | 95% UCL 6.09 7.393 | TU | | od Ir Interpolation (ICPIN) |
| Point Estimate Analysis ID 04-8167-3886 20-3119-3253 | Endpoint | nt Ra EC25 EC50 EC25 | 5.654 7.103 5.698 | 4.978 6.652 5.291 | 6.09 7.393 6.115 | TU | Linea | |
| Analysis ID 04-8167-3886 | Endpoint Combined Developmen Development Rate | nt Ra EC25 EC50 | 5.654 7.103 | 4.978 6.652 | 6.09 7.393 | TU | Linea | r Interpolation (ICPIN) |
| Analysis ID 04-8167-3886 20-3119-3253 | Endpoint Combined Developmen Development Rate Survival Rate | nt Ra EC25 EC50 EC25 EC50 EC50 | 5.654 7.103 5.698 7.132 24.74 | 4.978 6.652 5.291 6.86 22.76 | 6.09 7.393 6.115 7.41 25.13 | TU | Linea | ar Interpolation (ICPIN) ar Interpolation (ICPIN) |
| Analysis ID 04-8167-3886 20-3119-3253 07-0404-6516 Test Acceptat | Endpoint Combined Developmen Development Rate Survival Rate | nt Ra EC25 EC50 EC25 EC50 EC50 | 5.654 7.103 5.698 7.132 24.74 29.83 | 4.978 6.652 5.291 6.86 22.76 | 6.09 7.393 6.115 7.41 25.13 30.09 | | Linea | ar Interpolation (ICPIN) ar Interpolation (ICPIN) ar Interpolation (ICPIN) |
| Analysis ID 04-8167-3886 20-3119-3253 07-0404-6516 Test Acceptak Analysis ID | Endpoint Combined Developmen Development Rate Survival Rate | nt Ra EC25 EC50 EC25 EC50 EC25 EC50 Attrib | 5.654 7.103 5.698 7.132 24.74 29.83 | 4.978 6.652 5.291 6.86 22.76 28.51 | 6.09 7.393 6.115 7.41 25.13 30.09 | | Linea Linea Linea | ar Interpolation (ICPIN) ar Interpolation (ICPIN) ar Interpolation (ICPIN) |
| Analysis ID 04-8167-3886 20-3119-3253 07-0404-6516 Test Acceptak Analysis ID 06-6130-0163 | Endpoint Combined Developmen Development Rate Survival Rate ility Endpoint | nt Ra EC25 EC50 EC25 EC50 EC25 EC50 Attrib Contro | 5.654 7.103 5.698 7.132 24.74 29.83 ute | 4.978 6.652 5.291 6.86 22.76 28.51 Test Stat | 6.09 7.393 6.115 7.41 25.13 30.09 TAC Limi | | Linea Linea Linea Over | ar Interpolation (ICPIN) ar Interpolation (ICPIN) ar Interpolation (ICPIN) |
| Analysis ID 04-8167-3886 20-3119-3253 07-0404-6516 Test Acceptat Analysis ID 06-6130-0163 20-3119-3253 | Endpoint Combined Developmen Development Rate Survival Rate ility Endpoint Development Rate | nt Ra EC25 EC50 EC25 EC50 EC25 EC50 Attrib Contro Contro | 5.654 7.103 5.698 7.132 24.74 29.83 ute | 4.978 6.652 5.291 6.86 22.76 28.51 Test Stat 0.9893 | 6.09 7.393 6.115 7.41 25.13 30.09 TAC Limi 0.9 - NL | | Linea Linea Linea Over Yes | ar Interpolation (ICPIN) ar Interpolation (ICPIN) ar Interpolation (ICPIN) Iap Decision Passes Acceptability Criteria |
| Analysis ID 04-8167-3886 20-3119-3253 07-0404-6516 | Endpoint Combined Developmen Development Rate Survival Rate ility Endpoint Development Rate Development Rate | nt Ra EC25 EC50 EC25 EC50 EC25 EC50 Attrib Contro Contro Contro | 5.654 7.103 5.698 7.132 24.74 29.83 ute DI Resp DI Resp | 4.978 6.652 5.291 6.86 22.76 28.51 Test Stat 0.9893 0.9893 | 6.09 7.393 6.115 7.41 25.13 30.09 TAC Limi 0.9 - NL 0.9 - NL | | Linea Linea Linea Over Yes Yes | ar Interpolation (ICPIN) ar Interpolation (ICPIN) ar Interpolation (ICPIN) ar Interpolation (ICPIN) Iap Decision Passes Acceptability Criteria Passes Acceptability Criteria |

000-089-187-4

CETIS Summary Report

C-µg/L

0

2.5

Bivalve Larval Survival and Development Test

Count

5

5

Mean

0.8927

0.8944

95% LCL 95% UCL

0.9656

0.9873

0.8197

0.8014

Min

0.7886

0.8049

Max

0.9268

0.9922

Combined Development Rate Summary

Lab Control

Control Type

000-089-187-4

| 5 | | 5 | 0.7715 | 0.6788 | 0.8641 | 0.6423 | 0.8293 | 0.03338 | 0.07464 | 9.68% | 13.58% |
|-------------|------------------|----------|--------|---------|---------|--------|--------|----------|----------|--------|---------|
| 10 | | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 100.0% |
| 20 | | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 100.0% |
| 40 | | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 100.0% |
| Developme | ent Rate Summary | | | | | | | | | | |
| C-µg/L | Control Type | Count | Mean | 95% LCL | 95% UCL | Min | Max | Std Err | Std Dev | CV% | %Effect |
| 0 | Lab Control | 5 | 0.9893 | 0.9804 | 0.9982 | 0.9828 | 1 | 0.003192 | 0.007137 | 0.72% | 0.0% |
| 2.5 | | 5 | 0.9858 | 0.9683 | 1 | 0.963 | 1 | 0.006318 | 0.01413 | 1.43% | 0.35% |
| 5 | | 5 | 0.8669 | 0.7847 | 0.9491 | 0.776 | 0.9519 | 0.02962 | 0.06623 | 7.64% | 12.37% |
| 10 | | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 100.0% |
| 20 | | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 100.0% |
| 40 | | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 100.0% |
| Survival Ra | ate Summary | | | | | | | ****** | | | |
| C-µg/L | Control Type | Count | Mean | 95% LCL | 95% UCL | Min | Max | Std Err | Std Dev | CV% | %Effect |
| 0 | Lab Control | 5 | 0.9024 | 0.8269 | 0.978 | 0.7967 | 0.9431 | 0.02721 | 0.06084 | 6.74% | 0.0% |
| 2.5 | | 5 | 0.9073 | 0.8135 | 1 | 0.8049 | 1 | 0.03378 | 0.07553 | 8.32% | -0.54% |
| 5 | | 5 | 0.8943 | 0.7559 | 1 | 0.7236 | 1 | 0.04985 | 0.1115 | 12.46% | 0.9% |
| 10 | | 5 | 0.8829 | 0.7738 | 0.992 | 0.7642 | 0.9919 | 0.03929 | 0.08787 | 9.95% | 2.16% |
| 20 | | 5 | 0.8959 | 0.8087 | 0.9832 | 0.8293 | 1 | 0.03142 | 0.07027 | 7.84% | 0.72% |
| 40 | | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 100.0% |
| Combined | Development Rate | e Detail | | | | | | | | | |
| C-µg/L | Control Type | Rep 1 | Rep 2 | Rep 3 | Rep 4 | Rep 5 | | | | | |
| 0 | Lab Control | 0.9106 | 0.9268 | 0.9106 | 0.9268 | 0.7886 | | | | | |
| 2.5 | | 0.9431 | 0.8455 | 0.8862 | 0.8049 | 0.9922 | | | | | |
| 5 | | 0.8049 | 0.8049 | 0.8293 | 0.776 | 0.6423 | | | | | |
| 10 | | 0 | 0 | 0 | 0 | 0 | | | | | |
| 20 | | 0 | 0 | 0 | 0 | 0 | | | | | |
| 40 | | 0 | 0 | 0 | 0 | 0 | | | | | |
| Developme | ent Rate Detail | | | | | | | | | | |
| C-µg/L | Control Type | Rep 1 | Rep 2 | Rep 3 | Rep 4 | Rep 5 | | | | | |
| | | 0.00/0 | | | | | | | | | |

| C-µg/L | Control Type | Rep 1 | Rep 2 | Rep 3 | Rep 4 | Rep 5 |
|-------------|--------------|--------|--------|--------|--------|--|
| 0 | Lab Control | 0.9912 | 0.9828 | 1 | 0.9828 | 0.9898 |
| 2.5 | | 0.9831 | 0.963 | 0.9909 | 1 | 0.9922 |
| 5 | | 0.8319 | 0.9519 | 0.887 | 0.776 | 0.8876 |
| 10 | | 0 | 0 | 0 | 0 | 0 |
| 20 | | 0 | 0 | 0 | 0 | 0 |
| 40 | | 0 | 0 | 0 | 0 | 0 |
| Survival Ra | te Detail | | | | | an a |
| C-µg/L | Control Type | Rep 1 | Rep 2 | Rep 3 | Rep 4 | Rep 5 |
| 0 | Lab Control | 0.9187 | 0.9431 | 0.9106 | 0.9431 | 0.7967 |
| 2.5 | | 0.9593 | 0.878 | 0.8943 | 0.8049 | 1 |
| 5 | | 0.9675 | 0.8455 | 0.935 | 1 | 0.7236 |
| 10 | | 0.9919 | 0.7642 | 0.9187 | 0.9106 | 0.8293 |
| 20 | | 0.935 | 1 | 0.8618 | 0.8537 | 0.8293 |
| 40 | | 0 | 0 | 0 | 0 | 0 |

Report Date: Test Code:

Std Err

0.02627

0.03348

Std Dev

0.05874

0.07486

11 Mar-20 15:07 (p 2 of 3) 200205msdv | 06-6849-2235

Nautilus Environmental (CA)

CV%

6.58%

8.37%

%Effect

0.0%

-0.19%



0/122

0/115

Rep 1

113/123

118/123

119/123

122/123

115/123

0/123

0/1

0/94

0/129

Rep 2

116/123

108/123

104/123

94/123

123/123

0/123

0/1

0/113

0/106

Rep 3

112/123

110/123

115/123

113/123

106/123

0/123

0/1

10

20

40

0

2.5

5

10

20

40

C-µg/L

Survival Rate Binomials

Control Type

Lab Control

| Report Date: | 11 |
|--------------|-----|
| Test Code: | 200 |

11 Mar-20 15:07 (p 3 of 3) 200205msdv | 06-6849-2235

| | | | | | | | Test Code. | 20020011507 00-0649-2200 |
|------------|----------------------|-------------|---------|---------|---------|---------|--|---|
| Bivalve La | arval Survival and I | Developme | nt Test | | | | | Nautilus Environmental (CA) |
| Combined | d Development Rat | e Binomials | 5 | | | | | |
| C-µg/L | Control Type | Rep 1 | Rep 2 | Rep 3 | Rep 4 | Rep 5 | | |
| 0 | Lab Control | 112/123 | 114/123 | 112/123 | 114/123 | 97/123 | | |
| 2.5 | | 116/123 | 104/123 | 109/123 | 99/123 | 128/129 | | |
| 5 | | 99/123 | 99/123 | 102/123 | 97/125 | 79/123 | | |
| 10 | | 0/123 | 0/123 | 0/123 | 0/123 | 0/123 | | |
| 20 | | 0/123 | 0/129 | 0/123 | 0/123 | 0/123 | | |
| 40 | | 0/123 | 0/123 | 0/123 | 0/123 | 0/123 | | |
| Developm | ent Rate Binomials | 6 | | | | | | |
| C-µg/L | Control Type | Rep 1 | Rep 2 | Rep 3 | Rep 4 | Rep 5 | | |
| 0 | Lab Control | 112/113 | 114/116 | 112/112 | 114/116 | 97/98 | 1999-1899-1997-1997-1997-1997-1997-1997- | na y synandar analys ar yn yn yn gymra dy ffyddiad yn faf far fa'r far yn |
| 2.5 | | 116/118 | 104/108 | 109/110 | 99/99 | 128/129 | | |
| 5 | | 99/119 | 99/104 | 102/115 | 97/125 | 79/89 | | |
| | | | | | | | | |

0/112

0/105

Rep 4

116/123

99/123

123/123

112/123

105/123

0/123

0/1

0/102

0/102

Rep 5

98/123

89/123

123/123

102/123

102/123

0/123

0/1

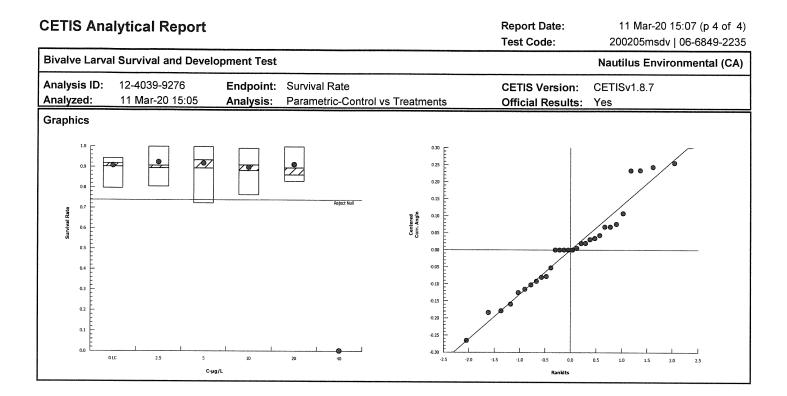
Analyst: Jac QA: 13/12/20

| CETIS An | alytical Rep | ort | | | | | | ort Date: Code: | | | 06 (p 1 of 4) 6-6849-2235 |
|---|--------------------------------|-------------------------------|------------------|-----------------------------|--|---|-------------------|---|----------------|---------------|------------------------------|
| Bivalve Larv | al Survival and I | Developm | ent Test | | an a | ana ana ina ina ina ina ina ina ina ina | | N MARANA MANYA MANA MANYA KATA KATA KATA KATA KATA KATA KATA KA | Nautilus | Environr | nental (CA) |
| Analysis ID: Analyzed: | 18-0959-6796 11 Mar-20 15:0 | | | mbined Deve rametric-Cor | | | | IS Version: al Results: | CETISv1 Yes | 8.7 | |
| Data Transfo | orm | Zeta | Alt Hyp | Trials | Seed | | PMSD | NOEL | LOEL | TOEL | TU |
| Angular (Cor | rected) | NA | C > T | NA | NĂ | | 11.2% | 2.5 | 5 | 3.536 | **** |
| Dunnett Mul | tiple Compariso | n Test | | | | | | | | | |
| Control | vs C-µg/L | | Test Stat | Critical | MSD DF | P-Value | P-Type | Decision(| a:5%) | | |
| Lab Control | 2.5 | | -0.2838 | 2.108 | 0.146 8 | 0.7688 | CDF | Non-Signif | icant Effect | | |
| | 5* | | 2.431 | 2.108 | 0.146 8 | 0.0284 | CDF | Significant | Effect | | |
| ANOVA Tabl | le | | | | | | | | | | |
| Source | Sum Squ | ares | Mean Sq | uare | DF | F Stat | P-Value | Decision(| a:5%) | | |
| Between | 0.106906 | | 0.053452 | | 2 4.452 | | | Significant | Effect | | |
| Error | 0.144065 | | 0.012005 | 46 | 12 | | | | | | |
| Total | 0.250971 | 0 | | | 14 | | | | | | |
| Distribution | al Tests | | | | | | | | | | |
| Attribute | Test | | | Test Stat | Critical | P-Value | Decision | α:1%) | | | |
| Variances | | Variance | 1.501 | 9.21 | 0.4722 | Equal Var | riances | | | | |
| Distribution | Shapiro- | 0.8999 | 0.8328 | 0.0948 | Normal D | stribution | | | | | |
| Combined D | evelopment Rate | e Summar | У | | | | | | | | |
| C-µg/L | Control Type | Count | Mean | 95% LCL | | | Min | Max | Std Err | CV% | %Effect |
| 0 | Lab Control | 5 | 0.8927 | 0.8197 | 0.9656 | 0.9106 | 0.7886 | 0.9268 | 0.02627 | 6.58% | 0.0% |
| 2.5 5 | | 5 5 | 0.8944 0.7715 | 0.8014 0.6788 | 0.9873 0.8641 | 0.8862 0.8049 | 0.8049 | 0.9922 | 0.03348 | 8.37% | -0.19% |
| 10 | | 5 | 0.7715 | 0.0788 | 0.0041 | 0.8049 0 | 0.6423 0 | 0.8293 0 | 0.03338 0 | 9.68% | 13.58% 100.0% |
| 20 | | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 100.0% |
| 40 | | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 100.0% |
| Angular (Co | rrected) Transfor | med Sum | mary | | | | | | | | |
| C-µg/L | Control Type | Count | Mean | 95% LCL | 95% UCL | Median | Min | Max | Std Err | CV% | %Effect |
| 0 | Lab Control | 5 | 1.244 | 1.138 | 1.351 | 1.267 | 1.093 | 1.297 | 0.03837 | 6.9% | 0.0% |
| 2.5 | | 5 | 1.264 | 1.082 | 1.446 | 1.227 | 1.113 | 1.483 | 0.06546 | 11.58% | -1.58% |
| 5 10 | | 5 5 | 1.076 0.0451 | 0.9702 0.04509 | 1.181 0.04511 | 1.113 0.0451 | 0.9297 | 1.145 | 0.03803 | 7.91% | 13.54% |
| 20 | | 5 | 0.04489 | 0.04309 | 0.04511 | 0.0451 | 0.0451 0.04404 | 0.0451 0.0451 | 0 0.000212 | 0.0% 1.06% | 96.38% 96.39% |
| 40 | | 5 | 0.0451 | 0.04509 | 0.04511 | 0.0451 | 0.0451 | 0.0451 | 0 | 0.0% | 96.38% |
| Graphics | | 98.940.922421.041.1722.441.44 | | | | | | | | | |
| 1.0 | | | | | | | | | | | |
| | | | | | | 0.25 E | | | | ٠ | |
| 0.9 | | | | | | 0.20 | | | | | |
| | | Z | | Reject Null | - | 0.15 | | | | | / |
| 0.7 L | | | | | g | 0.10 | | | | | |
| Combined Development Rate | | | | | Centered | L 0.05 | | | | 9 8 | |
| alitica e e e e e e e e e e e e e e e e e e e | | | | | | 0.00 | | | <u> </u> | | |
| 0.4 | | | | | | -0.05 | • | | | | |
| 0.3 | | | | | | -0.10 | | | | | |
| 0.2 | | | | | | | | | | | |
| | | | | | | -0.15 | | | | | |
| 0.1 | | | | | | -0.20 | | | | | |
| 0.0 E | 0 LC 2.5 | 5 | 10 20 | 40 | 1 | -0.25 -2.5 -2 | 2.0 -1.5 -1.0 | -0.5 0.0 | 0.5 1.0 | 1.5 2.0 | J 2.5 |
| | | C-µg/L | | | | | | Rankits | | | |

CETIS™ v1.8.7.20

| | alytical Repo | ort | | | | | | ort Date: Code: | | | 07 (p 2 of 4 6-6849-223 |
|-----------------------------------|--------------------------------|---------------|-----------|-----------------------------|---|-------------------|-------------------|--------------------|---------------|---------------|----------------------------|
| Bivalve Larv | al Survival and I | Developme | nt Test | | nin di Anna anna anna anna anna anna anna ann | | | | Nautilus | Environ | mental (CA |
| Analysis ID: Analyzed: | 06-6130-0163 11 Mar-20 15:0 | | - | velopment R rametric-Con | | tments | | S Version: | | 8.7 | |
| Data Transfo | orm | Zeta | Alt Hyp | Trials | Seed | | PMSD | NOEL | LOEL | TOEL | TU |
| Angular (Corr | rected) | NA | C > T | NA | NA | | 2.67% | 2.5 | 5 | 3.536 | - |
| Dunnett Mul | tiple Comparisor | n Test | | | | | | | | | |
| Control | vs C-µg/L | | Test Stat | Critical | MSD DF | P-Value | P-Type | Decision | (α:5%) | | |
| Lab Control | 2.5 | | 0.2372 | 2.108 | 0.093 8 | 0.5698 | CDF | | ficant Effect | | |
| | 5* | | 5.987 | 2.108 | 0.093 8 | <0.0001 | CDF | Significan | t Effect | | |
| ANOVA Tabl | e | | | | | | | | | | |
| Source | Sum Squ | iares | Mean Squ | Jare | DF | F Stat | P-Value | Decision | (α:5%) | | |
| Between | 0.221848 | 2 | 0.1109241 | | 2 | 22.99 | <0.0001 | Significan | t Effect | | |
| Error | 0.0579058 | | 0.0048254 | 187 | 12 | | | | | | |
| Total | 0.279754 | | | | 14 | * | | | | | |
| Distributiona | al Tests | | | | | | | | | | |
| Attribute | Test | | | Test Stat | Critical | P-Value | Decision(| α:1%) | | | |
| Variances | Bartlett E | Equality of V | ariance | 4.061 | 9.21 | 0.1312 | Equal Var | | | | |
| Distribution | Shapiro- | | 0.9697 | 0.8328 | 0.8539 | Normal Di | | | _ | | |
| Developmen | nt Rate Summary | | | | | | | | | | |
| C-µg/L | Control Type | Count | Mean | 95% LCL | 95% UCL | Median | Min | Max | Std Err | CV% | %Effect |
| 0 | Lab Control | 5 | 0.9893 | 0.9804 | 0.9982 | 0.9898 | 0.9828 | 1 | 0.003192 | 0.72% | 0.0% |
| 2.5 | | 5 | 0.9858 | 0.9683 | 1 | 0.9909 | 0.963 | 1 | 0.006318 | 1.43% | 0.35% |
| 5 | | 5 | 0.8669 | 0.7847 | 0.9491 | 0.887 | 0.776 | 0.9519 | 0.02962 | 7.64% | 12.37% |
| 10 | | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 100.0% |
| 20 | | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 100.0% |
| 40 | | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 100.0% |
| Angular (Cor | rrected) Transfor | rmed Sumn | nary | | | | | | | 11 - I | |
| C-µg/L | Control Type | Count | Mean | 95% LCL | 95% UCL | Median | Min | Max | Std Err | CV% | %Effect |
| 0 | Lab Control | 5 | 1.47 | 1.427 | 1.513 | 1.47 | 1.439 | 1.524 | 0.01552 | 2.36% | 0.0% |
| 2.5 | | 5 | 1.459 | 1.392 | 1.526 | 1.475 | 1.377 | 1.521 | 0.02415 | 3.7% | 0.71% |
| 5 | | 5 | 1.207 | 1.08 | 1.333 | 1.228 | 1.078 | 1.35 | 0.04551 | 8.44% | 17.9% |
| 10 | | 5 | 0.04814 | 0.04511 | 0.05118 | 0.04726 | 0.04528 | 0.05159 | 0.001095 | 5.08% | 96.72% |
| | | | | | | | | | | | |
| 20 | | 5 | 0.04752 | 0.04476 | 0.05028 | 0.04858 | 0.04404 | 0.04953 | 0.000994 | 4.68% | 96.77% |
| 20 40 | | | | | | | 0.04404 0.5236 | 0.04953 0.5236 | 0.000994 0 | 4.68% 0.0% | 96.77% 64.37% |
| 10 20 40 Graphics | | 5 | 0.04752 | 0.04476 | 0.05028 | 0.04858 | | | | | |
| 20 40 Graphics | | 5 | 0.04752 | 0.04476 | 0.05028 | 0.04858 | | | | | |
| 20 40 Graphics | | 5 | 0.04752 | 0.04476 0.5234 | 0.05028 | 0.04858 0.5236 | | | | | |
| 20 40 Graphics | | 5 | 0.04752 | 0.04476 0.5234 | 0.05028 | 0.04858 0.5236 | | | | | |
| 20 40 Graphics | | 5 | 0.04752 | 0.04476 0.5234 | 0.05028 0.5238 | 0.04858 0.5236 | | | | | |
| 20 40 Graphics | | 5 | 0.04752 | 0.04476 0.5234 | 0.05028 0.5238 | 0.04858 0.5236 | | | 0 | | |
| 20 40 Graphics | | 5 | 0.04752 | 0.04476 0.5234 | 0.05028 | 0.04858 0.5236 | | 0.5236 | 0 | | |
| 20 40 Graphics | | 5 | 0.04752 | 0.04476 0.5234 | 0.05028 0.5238 | 0.04858 0.5236 | 0.5236 | 0.5236 | 0 | | |
| 20 40 Graphics | | 5 | 0.04752 | 0.04476 0.5234 | 0.05028 0.5238 | 0.04858 0.5236 | | 0.5236 | 0 | | |
| 20 40 Graphics | | 5 | 0.04752 | 0.04476 0.5234 | 0.05028 0.5238 | 0.04858 0.5236 | 0.5236 | 0.5236 | 0 | | |
| 20 40 Graphics | | 5 | 0.04752 | 0.04476 0.5234 | 0.05028 0.5238 | 0.04858 0.5236 | 0.5236 | 0.5236 | 0 | | |
| 20 40 Graphics | | 5 | 0.04752 | 0.04476 0.5234 | 0.05028 0.5238 | 0.04858 0.5236 | 0.5236 | 0.5236 | 0 | | |
| 20 40 Graphics | | 5 | 0.04752 | 0.04476 0.5234 | 0.05028 0.5238 | 0.04858 0.5236 | 0.5236 | 0.5236 | 0 | | |
| 20 40 Graphics | οιc 2.5 | 5 | 0.04752 | 0.04476 0.5234 | 0.05028 0.5238 | 0.04858 0.5236 | 0.5236 | 0.5236 | 0 | | |

| CETIS An | alytical Rep | ort | | | Report Date: 11 Mar-20 15:07 (p Test Code: 200205msdv 06-684 | | | | | | |
|---|-----------------------------------|---|--|--|--|---|--|--|--|---|--|
| Bivalve Larv | al Survival and I | Developm | ent Test | den den en en de de la referir de la referir y de la arte | | | **** | 16 (16 y - 16) / 201 / 201 / 201 / 201 / 201 / 201 / 201 / 201 / 201 / 201 / 201 / 201 / 201 / 201 / 201 / 201 | Nautilus | Environn | nental (CA) |
| Analysis ID: Analyzed: | 12-4039-9276 11 Mar-20 15:(| | n dpoint : Su n alysis: Pa | vival Rate ametric-Cor | itrol vs Trea | tments | | S Version: | CETISv1. Yes | 8.7 | ÷ |
| Data Transfo | orm | Zeta | Alt Hyp | Trials | Seed | | PMSD | NOEL | LOEL | TOEL | TU |
| Angular (Cor | rected) | NA | C > T | NA | NA | | 18.1% | 20 | 40 | 28.28 | |
| Dunnett Mul | Itiple Compariso | n Test | | | | | | | | | |
| Control | vs C-µg/L | | Test Stat | Critical | MSD DF | P-Value | P-Type | Decision(| α:5%) | | |
| Lab Control | 2.5 | | -0.3009 | 2.305 | 0.228 8 | 0.8829 | CDF | | ficant Effect | | |
| | 5 | | -0.2032 | 2.305 | 0.228 8 | 0.8593 | CDF | | ficant Effect | | |
| | 10 | | 0.1492 | 2.305 | 0.228 8 | 0.7481 | CDF | - | ficant Effect | | |
| | 20 | | -0.08069 | 2.305 | 0.228 8 | 0.8252 | CDF | - | ficant Effect | | |
| ANOVA Tabl | le | | | | | | | | | | |
| Source | Sum Squ | ares | Mean Squ | lare | DF | F Stat | P-Value | Decision(| α:5%) | | |
| Between | 0.006000 | 22 | 0.0015000 |)55 | 4 | 0.06134 | 0.9925 | | ficant Effect | | |
| Error | 0.489131 | | 0.024456 | 55 | 20 | | | | | | |
| Total | 0.495131 | 2 | | | 24 | | | | | | |
| Distribution | al Tests | | | | | | | | | | |
| Attribute | Test | | | Test Stat | Critical | P-Value | Decision | α:1%) | | | |
| Variances | Bartlett E | Equality of | Variance | 1.868 | 13.28 | 0.7600 | Equal Var | iances | | | |
| Distribution | Shapiro- | Wilk W No | ormality | 0.9544 | 0.8877 | 0.3148 | Normal Di | stribution | | | |
| Survival Rat | e Summary | | | | | | | | | | |
| C-µg/L | Control Type | Count | Mean | 95% LCL | 95% UCL | Median | 8.8. | | | | |
| 0 | | | | | | Meulan | Min | Max | Std Err | CV% | %Effect |
| | Lab Control | 5 | 0.9024 | 0.8269 | 0.978 | 0.9187 | 0.7967 | 0.9431 | 0.02721 | CV% | %Effect 0.0% |
| 2.5 | Lab Control | 5 5 | | 0.8269 0.8135 | | | | | | | |
| 2.5 5 | Lab Control | | 0.9024 | | 0.978 | 0.9187 | 0.7967 | 0.9431 | 0.02721 | 6.74% | 0.0% |
| | Lab Control | 5 | 0.9024 0.9073 | 0.8135 | 0.978 1 | 0.9187 0.8943 | 0.7967 0.8049 | 0.9431 1 | 0.02721 0.03378 | 6.74% 8.32% | 0.0% -0.54% |
| 5 | Lab Control | 5 5 | 0.9024 0.9073 0.8943 | 0.8135 0.7559 | 0.978 1 1 | 0.9187 0.8943 0.935 | 0.7967 0.8049 0.7236 | 0.9431 1 1 | 0.02721 0.03378 0.04985 | 6.74% 8.32% 12.46% | 0.0% -0.54% 0.9% |
| 5 10 | Lab Control | 5 5 5 | 0.9024 0.9073 0.8943 0.8829 | 0.8135 0.7559 0.7738 | 0.978 1 1 0.992 | 0.9187 0.8943 0.935 0.9106 | 0.7967 0.8049 0.7236 0.7642 | 0.9431 1 1 0.9919 | 0.02721 0.03378 0.04985 0.03929 | 6.74% 8.32% 12.46% 9.95% | 0.0% -0.54% 0.9% 2.16% |
| 5 10 20 40 | Lab Control | 5 5 5 5 5 | 0.9024 0.9073 0.8943 0.8829 0.8959 0 | 0.8135 0.7559 0.7738 0.8087 | 0.978 1 1 0.992 0.9832 | 0.9187 0.8943 0.935 0.9106 0.8618 | 0.7967 0.8049 0.7236 0.7642 0.8293 | 0.9431 1 1 0.9919 1 | 0.02721 0.03378 0.04985 0.03929 0.03142 | 6.74% 8.32% 12.46% 9.95% | 0.0% -0.54% 0.9% 2.16% 0.72% |
| 5 10 20 40 | | 5 5 5 5 5 | 0.9024 0.9073 0.8943 0.8829 0.8959 0 | 0.8135 0.7559 0.7738 0.8087 | 0.978 1 1 0.992 0.9832 | 0.9187 0.8943 0.935 0.9106 0.8618 | 0.7967 0.8049 0.7236 0.7642 0.8293 | 0.9431 1 1 0.9919 1 | 0.02721 0.03378 0.04985 0.03929 0.03142 | 6.74% 8.32% 12.46% 9.95% | 0.0% -0.54% 0.9% 2.16% 0.72% |
| 5 10 20 40 Angular (Co | rrected) Transfor | 5 5 5 5 5 med Sum | 0.9024 0.9073 0.8943 0.8829 0.8959 0 | 0.8135 0.7559 0.7738 0.8087 0 | 0.978 1 1 0.992 0.9832 0 | 0.9187 0.8943 0.935 0.9106 0.8618 0 | 0.7967 0.8049 0.7236 0.7642 0.8293 0 | 0.9431 1 0.9919 1 0 | 0.02721 0.03378 0.04985 0.03929 0.03142 0 | 6.74% 8.32% 12.46% 9.95% 7.84% | 0.0% -0.54% 0.9% 2.16% 0.72% 100.0% |
| 5 10 20 40 Аngular (Со С-µg/L | rrected) Transfor Control Type | 5 5 5 5 med Sum Count | 0.9024 0.9073 0.8943 0.8829 0.8959 0 mary Mean | 0.8135 0.7559 0.7738 0.8087 0 95% LCL | 0.978 1 1 0.992 0.9832 0 95% UCL | 0.9187 0.8943 0.935 0.9106 0.8618 0 Median | 0.7967 0.8049 0.7236 0.7642 0.8293 0 Min | 0.9431 1 0.9919 1 0 Max | 0.02721 0.03378 0.04985 0.03929 0.03142 0 Std Err | 6.74% 8.32% 12.46% 9.95% 7.84% | 0.0% -0.54% 0.9% 2.16% 0.72% 100.0% |
| 5 10 20 40 Аngular (Сол С-µg/L 0 | rrected) Transfor Control Type | 5 5 5 5 med Sum 5 | 0.9024 0.9073 0.8943 0.8829 0.8959 0 mary Mean 1.262 | 0.8135 0.7559 0.7738 0.8087 0 95% LCL 1.146 | 0.978 1 1 0.992 0.9832 0 95% UCL 1.378 | 0.9187 0.8943 0.935 0.9106 0.8618 0 Median 1.282 | 0.7967 0.8049 0.7236 0.7642 0.8293 0 Min 1.103 | 0.9431 1 0.9919 1 0 Max 1.33 | 0.02721 0.03378 0.04985 0.03929 0.03142 0 Std Err 0.04177 | 6.74% 8.32% 12.46% 9.95% 7.84% CV% 7.4% 12.3% | 0.0% -0.54% 0.9% 2.16% 0.72% 100.0% %Effect 0.0% -2.36% |
| 5 10 20 40 Аngular (Сол С-µg/L 0 2.5 | rrected) Transfor Control Type | 5 5 5 5 med Sum 5 5 5 | 0.9024 0.9073 0.8943 0.8829 0.8959 0 mary Mean 1.262 1.292 | 0.8135 0.7559 0.7738 0.8087 0 95% LCL 1.146 1.095 | 0.978 1 1 0.992 0.9832 0 95% UCL 1.378 1.49 | 0.9187 0.8943 0.935 0.9106 0.8618 0 Median 1.282 1.24 | 0.7967 0.8049 0.7236 0.7642 0.8293 0 Min 1.103 1.113 | 0.9431 1 0.9919 1 0 Max 1.33 1.526 | 0.02721 0.03378 0.04985 0.03929 0.03142 0 Std Err 0.04177 0.0711 | 6.74% 8.32% 12.46% 9.95% 7.84% CV% 7.4% | 0.0% -0.54% 0.9% 2.16% 0.72% 100.0% %Effect 0.0% |
| 5 10 20 40 Angular (Co C-μg/L 0 2.5 5 | rrected) Transfor Control Type | 5 5 5 5 med Sum 5 5 5 5 5 | 0.9024 0.9073 0.8943 0.8829 0.8959 0 mary Mean 1.262 1.292 1.282 | 0.8135 0.7559 0.7738 0.8087 0 95% LCL 1.146 1.095 1.038 | 0.978 1 1 0.992 0.9832 0 95% UCL 1.378 1.49 1.527 | 0.9187 0.8943 0.935 0.9106 0.8618 0 Median 1.282 1.24 1.313 | 0.7967 0.8049 0.7236 0.7642 0.8293 0 Min 1.103 1.113 1.017 | 0.9431 1 0.9919 1 0 Max 1.33 1.526 1.526 | 0.02721 0.03378 0.04985 0.03929 0.03142 0 Std Err 0.04177 0.0711 0.08811 | 6.74% 8.32% 12.46% 9.95% 7.84% CV% 7.4% 12.3% 15.36% | 0.0% -0.54% 0.9% 2.16% 0.72% 100.0% %Effect 0.0% -2.36% -1.59% |



| CETIS | S Anal | ytical Repo | ort | | | | | | port Date: st Code: | | | :07 (p 1 of 3 06-6849-223 |
|---|----------|----------------|---------------|---------|--|---------------|-----------|---|------------------------|---|-----------|--|
| Bivalve | e Larval | Survival and D | evelopme | nt Test | | | | | | Nautilu | s Enviror | mental (CA) |
| Analys | is ID: | 04-8167-3886 | End | dpoint: | Combined Dev | velopment R | late | CE | TIS Version: | CETISv1 | .8.7 | |
| Analyz | ed: | 11 Mar-20 15:0 | 5 An a | alysis: | Linear Interpo | lation (ICPIN | I) | Of | ficial Results | : Yes | | |
| Linear | Interpol | ation Options | | | an an an Air an Air Maer Is ann a tùmhaidh an ta | | | INTERPRETATION CANCELON AND A CANDING STATE | | Talanda kapa-akan tiké di Kabutatan Apira pan | **** | 99999999999999999999999999999999999999 |
| X Tran | sform | Y Transform | n See | ed | Resamples | Exp 95% | GCL M | lethod | | | | |
| Linear | | Linear | 361 | 23 | 1000 | Yes | T١ | wo-Point Inte | rpolation | | | |
| Point E | Estimate | s | | | | | | | | | | |
| Level | µg/L | 95% LCL | 95% UCL | | | | | | | | | |
| EC25 | 5.654 | 4.978 | 6.09 | | | | | | ····· | a Manufa Andrea a Roy, Nora Ana an Ana an | | |
| EC50 | 7.103 | 6.652 | 7.393 | | | | | | | | | |
| Combi | ned Dev | elopment Rate | Summary | | | Calc | ulated Va | riate(A/B) | | unzer (za juga za politika) | | |
| C-µg/L | Co | ontrol Type | Count | Mean | Min | Max | Std Er | r Std Dev | / CV% | %Effect | А | в |
| 0 | La | b Control | 5 | 0.8927 | 7 0.7886 | 0.9268 | 0.0262 | 7 0.05874 | 6.58% | 0.0% | 549 | 615 |
| 2.5 | | | 5 | 0.8944 | 0.8049 | 0.9922 | 0.0334 | 8 0.07486 | 8.37% | -0.19% | 556 | 621 |
| 5 | | | 5 | 0.7715 | 5 0.6423 | 0.8293 | 0.0333 | 8 0.07464 | 9.68% | 13.58% | 476 | 617 |
| 10 | | | 5 | 0 | 0 | 0 | 0 | 0 | | 100.0% | 0 | 615 |
| 20 | | | 5 | 0 | 0 | 0 | 0 | 0 | | 100.0% | 0 | 621 |
| 40 | | | 5 | 0 | 0 | 0 | 0 | 0 | | 100.0% | 0 | 615 |
| Graphi are completed beneformer Fate | | | | | | | | | | | | |

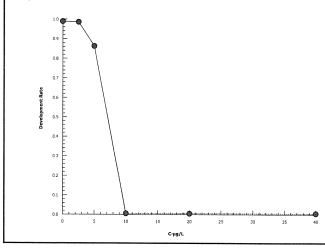
0.2

C-µg/L

25 30 35 40

| CETIS | Ana | lytical Rep | ort | | | • | ort Date: Code: | 11 Mar-20 15:07 (p 2 of 200205msdv 06-6849-22 | | | | |
|----------|---------|----------------|-----------|----------|-----------|--|--------------------|---|---------|----------------|-----------|---|
| Bivalve | Larval | Survival and [| Developme | ent Test | | | | | | Nautilu | s Enviror | mental (CA |
| - | • | | | | | Development Rate Linear Interpolation (ICPIN) | | | | CETISv1 Yes | .8.7 | ga 2012 d 4 14 d 4 1 4 19 19 19 19 19 19 19 19 19 19 19 19 19 |
| Linear I | nterpo | lation Options | | | | | | | | | | |
| X Trans | form | Y Transform | n Se | ed | Resamples | Exp 95% | % CL Met | hod | | | | |
| Linear | | Linear | 37 | 2019 | 1000 | Yes | Two | -Point Interp | olation | | | |
| Point E | stimate | s | | | | | | | | | | |
| Level | µg/L | 95% LCL | 95% UC | L | | | | | | | | |
| EC25 | 5.698 | 5.291 | 6.115 | | | | | · · · · · · · · · · · · · · · · · · · | | | | |
| EC50 | 7.132 | 6.86 | 7.41 | | | | | | | | | |
| Develop | oment l | Rate Summary | | | | Calc | ulated Varia | ate(A/B) | | | | |
| C-µg/L | C | ontrol Type | Count | Mean | Min | Max | Std Err | Std Dev | CV% | %Effect | Α | в |
| 0 | La | ab Control | 5 | 0.989 | 3 0.9828 | 1 | 0.003192 | 0.007136 | 0.72% | 0.0% | 549 | 555 |
| 2.5 | | | 5 | 0.985 | 8 0.963 | 1 | 0.006318 | 0.01413 | 1.43% | 0.35% | 556 | 564 |
| 5 | | | 5 | 0.866 | 9 0.776 | 0.9519 | 0.02962 | 0.06623 | 7.64% | 12.37% | 476 | 552 |
| 10 | | | 5 | 0 | 0 | 0 | 0 | 0 | | 100.0% | 0 | 543 |
| 20 | | | 5 | 0 | 0 | 0 | 0 | 0 | | 100.0% | 0 | 557 |
| 40 | | | 5 | 0 | 0 | 0 | 0 | 0 | | 100.0% | 0 | 5 |

Graphics



| CETIS | S Analytical Repo | ort | | | | | - | ort Date: Code: | | | :07 (p 3 of 3) 06-6849-2235 |
|--------------------|-------------------------|------------|--------|-----------------------------------|--------------|-----------------------|---------------|------------------------------|----------------|--|--------------------------------|
| Bivalve | e Larval Survival and D | evelopment | Test | | | | | | Nautilus | s Environ | mental (CA) |
| Analysi Analyzo | | | | Survival Rate Linear Interpola | tion (ICPIN) | | | IS Version: cial Results: | CETISv1 Yes | .8.7 | |
| Linear | Interpolation Options | | | | | ter Antonio (CATOMAG) | | | | **** | |
| X Trans | sform Y Transform | n Seed | | Resamples | Exp 95% CL | Met | hod | | | | |
| Linear | Linear | 66426 | 53 | 1000 | Yes | Two | -Point Interp | olation | | | |
| Point E | Estimates | | | | | | | | | | |
| Level | µg/L 95% LCL | 95% UCL | | | | | | | | | |
| EC25 | 24.74 22.76 | 25.13 | | | | | | | | 2910 CMANA (1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 | |
| EC50 | 29.83 28.51 | 30.09 | | | | | | | | | |
| Surviva | al Rate Summary | | | | Calculate | d Varia | ate(A/B) | | | | |
| C-µg/L | Control Type | Count | Mean | Min | Max S | td Err | Std Dev | CV% | %Effect | А | в |
| 0 | Lab Control | 5 | 0.9024 | 0.7967 | 0.9431 0 | 02721 | 0.06084 | 6.74% | 0.0% | 555 | 615 |
| 2.5 | | 5 | 0.9073 | 0.8049 | 1 0 | 03378 | 0.07553 | 8.32% | -0.54% | 558 | 615 |
| 5 | | | 0.8943 | | 1 0 | 04985 | 0.1115 | 12.46% | 0.9% | 550 | 615 |
| 10 | | | 0.8829 | | 0.9919 0 | 03929 | 0.08787 | 9.95% | 2.16% | 543 | 615 |
| 20 | | | 0.8959 | | | 03142 | 0.07027 | 7.84% | 0.72% | 551 | 615 |
| 40 | | 5 | 0 | 0 | 0 0 | | 0 | | 100.0% | 0 | 615 |
| Graphic | | 5 20 2 | | | | | | | | 7 | |

Analyst: Ja QA: 45 3/120

| Test Type: Protocol: | Development-Surviv EPA/600/R-95/136 (| | Organism: Endpoint: | | alloprovincia d Developm | | | aterial: ource: | | chloride ice Toxicant | -REF |
|---------------------------|--|--------------------------|--|-----------------|-----------------------------|--------------------------|------------------------|--------------------|--------------------------|--------------------------|--------------|
| | | | Biva | ilve Larval Sur | vival and Develo | pment Test | | | | | |
| | 25 | | | | | | | | | | |
| | 20- | | | | | | | | | | +3s |
| | 15- | | | | | | | | | | +2s |
| er chloride | 10- | | × | 9 | | | | | • | | \backslash |
| EC50-µg/L Copper chloride | | | | | | | | | | | Mean |
| ECSO | 5- | | | | | | | • | | | -25 |
| | | | | | | | | | | | -3s |
| | -5 | 19 | | | | 2 0 | | -6] | 0 g | | |
| | 17 11/10 12 | 07 Aug-19- 14 Aug-19- | 1/ Aug-19- 20 Aug-19- 24 Aug-19- | 28 Aug-19- | 11 John 19 | 18 Sep-19- 17 Oct-19- | 30 Oct-19 27 Nov-19 | 05 Dec-19 | 11 Dec-19- 08 Jan-20- | 22 Jan-20- 04 Feb-20- | 05 Feb-20 |

| (| CE | TIS | QC | Plot | |
|---|----|-----|----|------|--|
| | | | | | |

Bivalve Larval Survival and Development Test

Nautilus Environmental (CA)

| Mean: | 8.915 | Count: | 20 | -2s Warning Limit: | 2.837 | -3s Action Limit: | -0.2019 |
|--------|-------|--------|--------|--------------------|-------|-------------------|---------|
| Sigma: | 3.039 | CV: | 34.10% | +2s Warning Limit: | 14.99 | +3s Action Limit: | 18.03 |

Quality Control Data

| Point ` | Year | Month | Day | Time | QC Data | Delta | Sigma | Warning | Action | Test ID | Analysis ID |
|---------|------|-------|-----|-------|---------|---------|---------|---------|--------|--------------|--------------|
| 1 2 | 2019 | Jul | 17 | 14:50 | 8.497 | -0.4178 | -0.1375 | | | 04-5072-3133 | 00-7236-3161 |
| 2 | | | 23 | 14:30 | 13.76 | 4.846 | 1.595 | | | 07-6771-8781 | 18-1893-5656 |
| 3 | | | 30 | 15:30 | 7.313 | -1.602 | -0.5272 | | | 15-3542-8276 | 10-4430-8659 |
| 4 | | Aug | 7 | 15:30 | 7.395 | -1.52 | -0.5003 | | | 01-2834-9487 | 15-5629-3220 |
| 5 | | | 14 | 14:15 | 7.255 | -1.66 | -0.5462 | | | 18-5609-6564 | 17-5885-5207 |
| 6 | | | 17 | 14:00 | 7.582 | -1.333 | -0.4386 | | | 15-9584-4385 | 11-8998-1524 |
| 7 | | | 20 | 14:15 | 10.86 | 1.947 | 0.6405 | | | 14-8361-1578 | 03-1832-9380 |
| 8 | | | 24 | 16:00 | 7.414 | -1.501 | -0.4938 | | | 19-4374-5817 | 01-6546-9581 |
| 9 | | | 28 | 14:30 | 7.348 | -1.567 | -0.5156 | | | 01-0546-0046 | 21-3090-7111 |
| 10 | | Sep | 11 | 14:30 | 11.93 | 3.02 | 0.9936 | | | 09-2717-2159 | 04-2480-9094 |
| 11 | | | 12 | 14:25 | 8.444 | -0.4706 | -0.1548 | | | 19-6218-6352 | 07-5188-6358 |
| 12 | | | 18 | 13:20 | 7.4 | -1.515 | -0.4985 | | | 10-9359-1611 | 21-3838-7021 |
| 13 | | Oct | 17 | 12:30 | 4.368 | -4.547 | -1.496 | | | 01-8239-7270 | 07-0806-0577 |
| 14 | | | 30 | 12:30 | 7.518 | -1.397 | -0.4597 | | | 07-8198-2858 | 11-8079-0492 |
| 15 | | Nov | 27 | 20:00 | 7.249 | -1.666 | -0.5484 | | | 12-9914-0499 | 16-0529-7707 |
| 16 | | Dec | 5 | 13:15 | 4.982 | -3.933 | -1.294 | | | 04-7411-4445 | 13-6587-0425 |
| 17 | | | 11 | 13:35 | 7.245 | -1.67 | -0.5495 | | | 10-8800-1613 | 10-7929-5811 |
| 18 2 | 2020 | Jan | 8 | 13:40 | 12.34 | 3.425 | 1.127 | | | 07-8444-5322 | 01-1422-4896 |
| 19 | | | 22 | 13:25 | 14.72 | 5.805 | 1.91 | | | 02-1152-2212 | 07-1224-7163 |
| 20 | | Feb | 4 | 16:30 | 14.68 | 5.761 | 1.896 | | | 19-9078-6483 | 21-0369-4045 |
| 21 | | | 5 | 13:10 | 7.103 | -1.812 | -0.5963 | | | 06-6849-2235 | 04-8167-3886 |

CETIS QC Plot

| Bivalve La | rval Survival and Developmer | nt Test | | | Nautilus Environmental (CA |
|---------------------------|--|-------------------------|--|-----------|--|
| Test Type: | Development-Survival | Organism: | Mytilus galloprovincialis (Bay Mussel | Material: | Copper chloride |
| Protocol: | EPA/600/R-95/136 (1995) | Endpoint: | Development Rate | Source: | Reference Toxicant-REF |
| | | Biva | lve Larval Survival and Development Test | | |
| | 20- | | | | |
| | | | | | +35 |
| | 15 | | | | +2s |
| | | | | | |
| ide | 10- | | \frown | | |
| EC50-µg/L Copper chloride | | | | -0 | Mean |
| J/L Copp | 5- | | | | • |
| EC50-µ | | | | | -25 |
| | | | | | |
| | - | | | | -35 |
| | | | | | |
| | - 17-but 71 - 23-but 72 - 23-but - 23-but - 23-but - 24-but - 24-b | 17 Aug-19 | 28 Aug-19 11 Sep-19 12 Sep-19 13 Sep-19 17 Oct-19 30 Oct-19 | 04-19 | |
| | 17. 23. 23. 23. 23. 23. 17. 14. 14. 14. 14. 14. 14. 14. 14. 14. 14 | 17 Ai 20 Ai 24 Ai | 28 A 11 Sc 12 Sc 18 Sc 17 O 30 O | 27 Nov-19 | 11 Dec-19- 08 Jan-20- 22 Jan-20- 04 Feb-20- 05 Feb-20- |

| Mean: | 8.961 | Count: | 20 | -2s Warning Limit: | 2.929 | -3s Action Limit: | -0.0867 |
|--------|-------|--------|--------|--------------------|-------|-------------------|---------|
| Sigma: | 3.016 | CV: | 33.70% | +2s Warning Limit: | 14.99 | +3s Action Limit: | 18.01 |

| Quality | Control | Data |
|---------|---------|------|
|---------|---------|------|

| Point | Year | Month | Day | Time | QC Data | Delta | Sigma | Warning | Action | Test ID | Analysis ID |
|-------|------|-------|-----|-------|---------|---------|---------|---------|--------|--------------|--------------|
| 1 | 2019 | Jul | 17 | 14:50 | 8.504 | -0.4571 | -0.1516 | | | 04-5072-3133 | 09-0911-7730 |
| 2 | | | 23 | 14:30 | 13.38 | 4.42 | 1.466 | | | 07-6771-8781 | 07-7153-3575 |
| 3 | | | 30 | 15:30 | 7.388 | -1.573 | -0.5215 | | | 15-3542-8276 | 07-3589-9194 |
| 4 | | Aug | 7 | 15:30 | 7.473 | -1.488 | -0.4934 | | | 01-2834-9487 | 19-8086-2685 |
| 5 | | | 14 | 14:15 | 7.466 | -1.495 | -0.4957 | | | 18-5609-6564 | 14-6389-5644 |
| 6 | | | 17 | 14:00 | 7.563 | -1.398 | -0.4634 | | | 15-9584-4385 | 19-0402-2449 |
| 7 | | | 20 | 14:15 | 10.76 | 1.803 | 0.5976 | | | 14-8361-1578 | 12-0750-5104 |
| В | | | 24 | 16:00 | 7.521 | -1.44 | -0.4775 | | | 19-4374-5817 | 04-6745-5945 |
| 9 | | | 28 | 14:30 | 7.351 | -1.61 | -0.5339 | | | 01-0546-0046 | 10-3410-8075 |
| 10 | | Sep | 11 | 14:30 | 11.98 | 3.022 | 1.002 | | | 09-2717-2159 | 17-4622-9429 |
| 11 | | | 12 | 14:25 | 8.608 | -0.3534 | -0.1172 | | | 19-6218-6352 | 06-5225-4823 |
| 12 | | | 18 | 13:20 | 7.546 | -1.415 | -0.4693 | | | 10-9359-1611 | 16-7089-5314 |
| 13 | | Oct | 17 | 12:30 | 4.375 | -4.586 | -1.521 | | | 01-8239-7270 | 19-1864-9270 |
| 14 | | | 30 | 12:30 | 7.481 | -1.48 | -0.4906 | | | 07-8198-2858 | 15-7183-3565 |
| 15 | | Νον | 27 | 20:00 | 7.297 | -1.664 | -0.5517 | | | 12-9914-0499 | 01-7534-7240 |
| 16 | | Dec | 5 | 13:15 | 5.087 | -3.874 | -1.284 | | | 04-7411-4445 | 10-0471-4567 |
| 17 | | | 11 | 13:35 | 7.32 | -1.641 | -0.544 | | | 10-8800-1613 | 20-9346-8800 |
| 18 | 2020 | Jan | 8 | 13:40 | 12.43 | 3.468 | 1.15 | | | 07-8444-5322 | 06-2499-4329 |
| 19 | | | 22 | 13:25 | 14.68 | 5.72 | 1.897 | | | 02-1152-2212 | 04-4145-0874 |
| 20 | | Feb | 4 | 16:30 | 15.01 | 6.047 | 2.005 | (+) | | 19-9078-6483 | 06-3219-7963 |
| 21 | | | 5 | 13:10 | 7.132 | -1.829 | -0.6064 | | | 06-6849-2235 | 20-3119-3253 |



| Bivalve Lar | val Survival and Developmer | nt Test | Nautilus Er | vironmental (CA |
|---------------------------|---|--|--|-----------------|
| | Development-Survival EPA/600/R-95/136 (1995) | Organism: Mytilus galloprovincialis (Bay Mussel Endpoint: Survival Rate | Material:Copper chlorideSource:Reference Toxical | nt-REF |
| | | Bivalve Larval Survival and Development Test | | |
| | 38- | | | |
| | | | | +3s |
| | | | | +2s |
| | 34 - - | | | |
| ide | 32 | | | |
| ECSO-µg/L Copper chloride | 30- | | | ®Mann |
| ig/L Copi | 28- | | | - near |
| EC50-µ | | | - | |
| | 26 | | | |
| | 24- | | | -25 |
| | 22 | | | -3s |
| | 16 Jul-19 17 Jul-19- 23 Jul-19- 30 Jul-19- 07 Aug-19- | 14 Aug-19- 17 Aug-19- 24 Aug-19- 28 Aug-19- 11 Sep-19- 12 Sep-19- 13 Sep-19- 13 Cot+19- 17 Oct+19- | 30 Oct-19 27 Nov-19 05 Dec-19 11 Dec-19 08 Jan-20 22 Jan-20 | 05 Feb-20 |
| | | 11 12 11 12 11 12 11 12 11 12 11 12 11 | 37 37 37 37 37 37 37 37 37 37 37 37 37 3 | 8 |

| Mean: | 29.78 | Count: | 20 | -2s Warning Limit: | 24.9 | -3s Action Limit: | 22.47 |
|--------|-------|--------|-------|--------------------|-------|-------------------|-------|
| Sigma: | 2.438 | CV: | 8.19% | +2s Warning Limit: | 34.66 | +3s Action Limit: | 37.09 |

Quality Control Data

| Point | Year | Month | Day | Time | QC Data | Delta | Sigma | Warning | Action | Test ID | Analysis ID |
|-------|------|-------|-----|-------|---------|----------|----------|---------|--------|--------------|--------------|
| 1 | 2019 | Jul | 16 | 14:35 | 29.46 | -0.3165 | -0.1298 | | | 04-6285-8375 | 17-5419-9497 |
| 2 | | | 17 | 14:50 | 30.25 | 0.4679 | 0.1919 | | | 04-5072-3133 | 00-3161-9686 |
| 3 | | | 23 | 14:30 | 29.36 | -0.4224 | -0.1733 | | | 07-6771-8781 | 15-4437-4125 |
| 4 | | | 30 | 15:30 | 29.67 | -0.107 | -0.04388 | | | 15-3542-8276 | 20-8453-4017 |
| 5 | | Aug | 7 | 15:30 | 29.85 | 0.07493 | 0.03073 | | | 01-2834-9487 | 07-4855-2818 |
| 6 | | | 14 | 14:15 | 28.85 | -0.9345 | -0.3833 | | | 18-5609-6564 | 13-1367-1354 |
| 7 | | | 17 | 14:00 | 29.6 | -0.1763 | -0.07233 | | | 15-9584-4385 | 20-0172-5237 |
| 8 | | | 20 | 14:15 | 37.92 | 8.139 | 3.338 | (+) | (+) | 14-8361-1578 | 02-5800-6574 |
| 9 | | | 24 | 16:00 | 30.04 | 0.2574 | 0.1056 | | | 19-4374-5817 | 17-7461-0750 |
| 10 | | | 28 | 14:30 | 28.66 | -1.115 | -0.4575 | | | 01-0546-0046 | 13-4512-6481 |
| 11 | | Sep | 11 | 14:30 | 33.71 | 3.935 | 1.614 | | | 09-2717-2159 | 01-1883-2964 |
| 12 | | | 12 | 14:25 | 29.16 | -0.6159 | -0.2526 | | | 19-6218-6352 | 02-6393-7831 |
| 13 | | | 18 | 13:20 | 29.04 | -0.741 | -0.304 | | | 10-9359-1611 | 04-3365-2341 |
| 14 | | Oct | 17 | 12:30 | 24.88 | -4.898 | -2.009 | (-) | | 01-8239-7270 | 13-2801-3685 |
| 15 | | | 30 | 12:30 | 29.32 | -0.4571 | -0.1875 | | | 07-8198-2858 | 20-5233-5110 |
| 16 | | Nov | 27 | 20:00 | 29.07 | -0.7133 | -0.2926 | | | 12-9914-0499 | 00-1104-7300 |
| 17 | | Dec | 5 | 13:15 | 28.21 | -1.566 | -0.6422 | | | 04-7411-4445 | 20-5035-4724 |
| 18 | | | 11 | 13:35 | 29.18 | -0.6007 | -0.2464 | | | 10-8800-1613 | 02-9848-3585 |
| 19 | 2020 | Jan | 8 | 13:40 | 29.6 | -0.1789 | -0.0734 | | | 07-8444-5322 | 01-5655-1706 |
| 20 | | | 22 | 13:25 | 29.76 | -0.02439 | -0.01 | | | 02-1152-2212 | 19-4150-8988 |
| 21 | | Feb | 5 | 13:10 | 29.83 | 0.04632 | 0.019 | | | 06-6849-2235 | 07-0404-6516 |

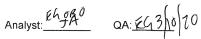
CETIS Test Data Worksheet

Report Date: Test Code:

02 Feb-20 12:41 (p 1 of 1) 06-6849-2235/200205msdv

| Start Date: End Date: Sample Date | 07 F | ⁼ eb-20 ⁼ eb-20 ⁼ eb-20 |) | | Mytilus galloprovi EPA/600/R-95/13 Copper chloride | | | Sample Code: 200205msdv Sample Source: Reference Toxicant Sample Station: Copper Chloride |
|---|------|--|-----|-----------------|--|-----------|----------|---|
| C-µg/L | Code | Rep | Pos | Initial Density | Final Density | # Counted | # Normal | Notes |
| | | | 226 | | | 115 | 0 | JA 2/21/20 |
| | | | 227 | | | 0 | 0 | 1 |
| | | | 228 | | | 113 | 112 | |
| | | | 229 | | | 105 | 0 | |
| | | | 230 | | | 118 | 116 | |
| | | | 231 | | | 125 | 97 | JA 2/28/20 |
| | | | 232 | | | 102 | 0 | |
| | | | 233 | | | 106 | 0 | |
| | | | 234 | | | 110 | 109 | |
| | | | 235 | | | 116 | 114 | |
| | | | 236 | | | 112 | 112 | |
| | | | 237 | | | 122 | 0 | |
| | | | 238 | | | 108 | 104 | |
| | | | 239 | | | 0 | 0 | |
| | | | 240 | | | ALZE 1 | 10-90 | 9 JA 3/6/20 EG QC:23/10/20 VS QC:23/11/20 0/102. EG QC:23/10/20 0/102. |
| | | | 241 | | | 902 | 0 | *5 QCid 3/11/20 0/129 |
| | | | 242 | | | A. @ 102 | 0 | EL QC'd 3/10/20 0/102. |
| | | | 243 | | | 0 | \circ | |
| | | | 244 | | | 94 | 0 | |
| | | | 245 | | | 104 | 99 | |
| | | | 246 | | | 0 | 0 | |
| | | | 247 | | | 112 | D | |
| | | | 248 | | | 113 | 0 | |
| | | | 249 | | | 116 | 114 | |
| | | | 250 | | | 98 | 97 | |
| | | | 251 | | | 115 | 102 | |
| | | | 252 | | | 129 | 128 | |
| | | | 253 | | | 89 | 79 | |
| | | | 254 | | | 0 | 0 | |
| | | | 255 | | | 99 | 99 | |

(B) KS Q18 3/10/20 (B) KS Q18 3/11/20



000-089-187-4

CETIS Test Data Worksheet

 Report Date:
 02 Feb-20 1

 Test Code:
 06-6849-223

02 Feb-20 12:41 (p 1 of 1) 06-6849-2235/200205msdv

| | | | | velopment Test | | | | Nautilus Environmental (CA |
|--|---------------------------------------|-----|-----|---------------------------------------|---|-----------|----------|--|
| Start Date: End Date: Sample Date: | 05 Feb-20 07 Feb-20 : 05 Feb-20 | | | Protocol: | Mytilus galloprovincialis EPA/600/R-95/136 (1995) Copper chloride | | | Sample Code:200205msdvSample Source:Reference ToxicantSample Station:Copper Chloride |
| C-µg/L | Code | Rep | Pos | Initial Density | Final Density | # Counted | # Normal | Notes |
| 0 | LC | 1 | 228 | | | | | |
| 0 | LC | 2 | 249 | | | | | |
| 0 | LC | 3 | 236 | | | 110 | 109 | NM 2/7/20 |
| 0 | LC | 4 | 235 | | | | 1 - 1 | 101 C 21112- |
| 0 | LC | 5 | 250 | | | | | |
| 2.5 | | 1 | 230 | | | | | |
| 2.5 | | 2 | 238 | | | | | |
| 2.5 | | 3 | 234 | · · · · · · · · · · · · · · · · · · · | | 114 | 114 | NM |
| 2.5 | | 4 | 255 | | | | | |
| 2.5 | | 5 | 252 | | | | | |
| 5 | | 1 | 240 | | | | | |
| 5 | | 2 | 245 | | | | | |
| 5 | | 3 | 251 | | | 116 | 103 | NM |
| 5 | | 4 | 231 | | | 110 | 100 | |
| 5 | | 5 | 253 | | - | | | |
| 10 | | 1 | 237 | ···· | | | | |
| 10 | | 2 | 244 | | | | | |
| 10 | | 3 | 248 | | | 112 | 0 | NM |
| 10 | | 4 | 247 | | | 11 ~~ | Ű | |
| 10 | | 5 | 232 | | - | | | |
| 20 | | 1 | 226 | | | - | | |
| 20 | | 2 | 241 | | | | | |
| 20 | | 3 | 233 | | | 105 | 0 | NM |
| 20 | | 4 | 229 | | | | | |
| 20 | | 5 | 242 | | | | | |
| 40 | | 1 | 254 | | | | | |
| 40 | | 2 | 227 | | | | | |
| 40 | | 3 | 243 | | | 0 | 0 | Cells lysed NM |
| 40 | | 4 | 246 | | | | | |
| 40 | | 5 | 239 | | + | | | |

QC= Eh

Analyst: #() QA: EG 3/10/20

Marine Chronic Bioassay

DM-014

Client: Internal

Sample ID: CuCl₂

Test No.: 200205msdv

Water Quality Measurements

| Test Species: | M. gallopro | vincialis |
|------------------|-------------|-----------|
| Start Date/Time: | 2/5/2020 | 1310 |
| End Date/Time: | 2/7/2020 | 1230 |

| Concentration (µg/L) | | Salinity (ppt) | | Т | emperatu (°C) | ire | Dis | solved Ox (mg/L) | xygen | | pH (pH units | 3) |
|---|-----------|-------------------|----------|----------|------------------|------|---|---------------------|-------------------------|--------------------------------|-----------------|------|
| (+-37 | 0 | 24 | 48 | 0 | 24 | 48 | 0 | 24 | 48 | 0 | 24 | 48 |
| Lab Control | 31.7 | 31.5 | 31.6 | 14.6 | 15,2 | 14.9 | 89 | 3.8 | 8.5 | 8.04 | 8.00 | 7.97 |
| 2.5 | 31.9 | 31.6 | 31.7 | 14.6 | 14.7 | 14.7 | 8.9 | 8.8 | 8.5 | 8.01 | 8.01 | 7.98 |
| 5 | 31.9 | 31.6 | 31.7 | 14.6 | 14.7 | 14.6 | 8.6 | 8.7 | 8.5 | 7.99 | 2.01 | 7.98 |
| 10 | 31.9 | 31.8 | 31.9 | 14.7 | 15.1 | 15.2 | 8.5 | 8.6 | 8.3 | 7.98 | 8.01 | 7.98 |
| 20 | 32.0 | 31.6 | 31.7 | 14.8 | 15.0 | 15.0 | 8.5 | 8.6 | 8.4 | 8,02 | 8.02 | 7.99 |
| 40 | 31,9 | 31.6 | 31.6 | 14.7 | 15.0 | 14.9 | 8.5 | 8.6 | 8.4 | 8.04 | 8.03 | 07.9 |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | - | | | |
| | | | | | | | | | | | | |
| | | | | | | | | 1 | | | | 1 |
| and an analysis and a substantial machine and an advantage of a machine solar distance and an and a substance a | | | 0 | 0.4 | 40 | | | | d | L | 4.0 | - |
| echnician Initials: | WO F | Readings: | 0 €4 | 24 Dm | 48 HOV |] | | conc. mai | de (µg/L): ded (mL): | | 40 | - |
| | Dilutions | - | | | 00000 | | | | ime (mL): | | | 1 |
| | | · | L | | 1 | Cι | | | on (µg/L): | | | 1 |
| nvironmental Chaml | oer: | D | | | | | | | | , | | |
| omments: | 0 hrs: | | | | | | | | | | | |
| | 24 hrs: | | | | | | 1979 in | | | 51001157, 21-170-911-101-101-1 | | |
| | 48 hrs: | MAR | KL217/20 | | | | | | | *-** | | |

QC Check:

RH03/10/20

Final Review: <u>EG 3/10/20</u>

Marine Chronic Bioassay DM-013

| Client/Sample: | Internal / Cullz | | |
|--|---------------------------|--|--|
| Test No.: | 200205 msdv | | |
| Test Species: | Mytilus galloprovincialis | | |
| Animal Source/Batch Tank: Taylor / 19B | | | |
| Date Received: | 11/20/19 | | |
| Test Chambers: | 30 mL glass shell vials | | |
| Sample Volume: | 10 mL | | |

0935

Larval Development Worksheet

| Start Date/Time: | 2/5/2020 | 1310 | |
|----------------------|----------|------|--|
| End Date/Time: | 2/7/2020 | 1233 | |
| Technician Initials: | EG | | |

Spawn Information

| First Gamete | Release | Time: |
|--------------|---------|-------|
|--------------|---------|-------|

Gamete Selection

| Sex | Number Spawning | |
|--------|-----------------|--|
| Male | 3+ | |
| Female | 2 | |

| Sex | Beaker Number(s) | Condition (sperm motility, egg density, color, shape, etc.) | | |
|----------|---------------------|--|--|--|
| Male | 1,2,3 | good density + motility | | |
| Female 1 | 1 | Ok shape, good density, pink color | | |
| Female 2 | 2 | great shake, OK density, pale color | | |
| Female 3 | | | | |

Egg Fertilization Time: 1025

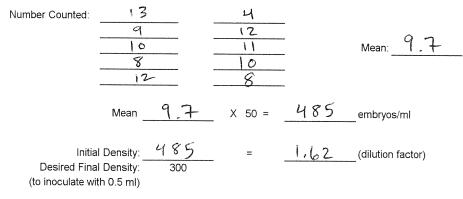
Stock(s) chosen for testing:

Embryo Stock Selection

| Stock Number | % of embryos at 2-cell division stage | |
|--------------|---------------------------------------|--|
| Female 1 | | |
| Female 2 | 100 | |
| Female 3 | | |

Embryo Inoculum Preparation

Target count on Sedgwick-Rafter slide for desired density is 6 embryos



Prepare the embryo inoculum according to the calculated dilution factor. For example, if the dilution factor is 2.25, use 100 ml of existing stock (1 part) and 125 ml of dilution water (1.25 parts).

| Time Ze | ro Control Cou | unts | | |
|----------------|----------------|-------|------------|--------------------|
| TØ Vial No. | No. Dividing | Total | % Dividing | Mean % Dividing |
| TØ A | 119 | 119 | 100 | |
| TØ B | 144 | 144 | 100 | |
| TØC | 119 | 119 | 100 | 100 |
| TØ D | 127 | 127 | 100 | |
| TØ E | 121 | 121 | 100 | |
| TØ F | 107 | 107 | 100 | |
| <u>X</u> = | 123 | | | |

48-h QC: 116/118 = 98.3%

Comments:

QC Check:

Rt03/10/20

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

Final Review: EG 3/10/20