

**Toxicity Tests  
For  
Western Virginia Water Authority  
Report # 3177**

Submitted To: S. Scott Shirley  
Chief Operating Officer- Water Quality  
Western Virginia Water Authority

Submitted By: Biological Monitoring, Inc.  
1800 Kraft Drive, Suite 104  
Blacksburg, VA 24060

Phone: 540-953-2821  
Fax: 540-951-1481

Report Date: May 23, 2023



Biological Monitoring, Inc. is accredited by The NELAC Institute (TNI 2016, ID:460015). The test results reported herein meet all requirements of TNI. The procedures are deemed compliant with the methods and acceptable for reporting.



Quality Manager

A handwritten signature in black ink, appearing to read "Wendy R. Boese", is written over a horizontal line.



# BIOLOGICAL MONITORING, INC

1800 KRAFT DRIVE SUITE 104 BLACKSBURG VIRGINIA 24060

PH:540-953-2821 EMAIL:BMI@BIOMON.COM WWW.BIOMON.COM



TNI ACCREDITED LAB# 460015

## Toxicity Testing Data Summary

**Client** Western Virginia Water Authority **Permit #** 4AROA202.20 **Sample** 13th Street Bridge

**Test ID** WVA050223-3 **Result** NOEC = 100, IC25 > 100 **Pass/Fail** NA **Next Step** NA

**Test ID** WVA050223-4 **Result** NOEC = 100, IC25 > 100 **Pass/Fail** NA **Next Step** NA



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## Certificate of Analysis

Client Western Virginia Water Authority

Report # 3177

BMI Project # 4268

Report Date May 23, 2023

Permit # 4AROA202.20

Sample ID #s WVA050223-2

Sample 13th Street Bridge

Test ID # WVA050223-3

Test Type Short Term Chronic

Organism Pimephales promelas

Test Start Date May 2, 2023

Test Start Time 1230

EPA Method # 1000

Test End Date May 9, 2023

Test End Time 1200

Photoperiod 16h L/8h D

Endpoint Survival Method Steel's Many-One Rank Test Result NOEC = 100

Endpoint Survival Method Graphical Result 48h LC50 > 100

Endpoint Growth Method Dunnett's Test Result NOEC = 100

Endpoint Growth Method Linear Interpolation Result IC25 > 100

Endpoint Growth Method PMSD Result 19.68%

Final Result NOEC = 100, IC25 > 100, TUC = 1

Pass/Fail NA



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TNI ACCREDITED LAB# 460015

## Certificate of Analysis

**Client** Western Virginia Water Authority

**Report #** 3177

**BMI Project #** 4268

**Report Date** May 23, 2023

**Permit #** 4AROA202.20

**Sample ID #s** WVA050223-2

**Sample** 13th Street Bridge

**Test ID #** WVA050223-4

**Test Type** Short Term Chronic

**Organism** Ceriodaphnia dubia

**Test Start Date** May 2, 2023

**Test Start Time** 1330

**EPA Method #** 1002

**Test End Date** May 8, 2023

**Test End Time** 1300

**Photoperiod** 16h L/8h D

**Endpoint** Survival

**Method** Fisher's Exact Test

**Result** NOEC = 100

**Endpoint** Survival

**Method** Graphical

**Result** 48h LC50 > 100

**Endpoint** Reproduction

**Method** Dunnett's Test

**Result** NOEC = 100

**Endpoint** Reproduction

**Method** Linear Interpolation

**Result** IC25 > 100

**Endpoint** Reproduction

**Method** PMSD

**Result** 40.02%

**Final Result** NOEC = 100, IC25 > 100, TUC = 1

**Pass/Fail** NA



Chronic Toxicity Test  
(Pimephales promelas)

Page 1 of 4

Experiment I.D.# WVVA050223-3  
 Biologist(s): JR PR VF MH WB RG  
 Permit # LA 1201202, 20  
 Client: WVVA  
 Effluent toxicant: 13<sup>th</sup> Street  
 Sample Type: Grab Composite  
 Sample Chlorine: 0.02  
 Dilution Water Used MHRW  
 Feeding Schedule: 0.15 ml Artemia 2x Daily  
 Aeration: WVA  
 Template #: 4x6 even

Start of Test Date: 05/02/23 Time: 1230  
 End of Test Date: 5/9/23 Time: 1200  
 Test Duration: 7 days  
 Test Temperature: 25 +/- 1 deg C  
 Test Volume: 350 ml  
 Test Containers Used: 500 ml PE  
 Renewal Frequency: Daily  
 Test Organism Age: ~24h  
 Organism Batch #: ABS050223-1  
 Organisms per concentration: 40  
 Waterbath/Shelf #: 7

| SAMPLE COLLECTION |          |         |     |              |         |          |                  |
|-------------------|----------|---------|-----|--------------|---------|----------|------------------|
| Date(s)           |          | Time(s) |     | TEST RENEWAL |         |          |                  |
| From:             | To:      | From:   | To: | Date(s)      | Time(s) | Test Day | Diluent Batch #: |
| 05/01/23          | 05/01/23 | 0800    | —   | 05/02/23     | 1230    | 0        | 8457             |
| 05/02/23          | 05/02/23 | 1005    | —   | 05/03/23     | 1200    | 1        | 8457             |
|                   |          |         |     | 05/04/23     | 1300    | 2        | 8460             |
|                   |          |         |     | 05/05/23     | 1330    | 3        | 8460             |
| 05/05/23          | 05/05/23 | 1105    | —   | 05/06/23     | 1130    | 4        | 8462             |
|                   |          |         |     | 05/07/23     | 1200    | 5        | 8462             |
|                   |          |         |     | 05/08/23     | 1230    | 6        | 8462             |

**Meters:** Instrument Id#: Temp.: 089 pH: 06.1

DO: 0.1 Conductivity/Salinity: 041

Condition of Organisms at End of Test: Normal

Average weight per control fish: 0.885 mg Control Survival (%): 100

Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Experiment ID: WJAC05223-3

| Conc:<br>Units | Day | Number of Live Organisms |    |    |    | DO (mg/L) |       | pH     |       | Alkalinity<br>mg/L as<br>CaCO <sub>3</sub> | Hardness<br>mg/L as<br>CaCO <sub>3</sub> | Cond./<br>Salinity<br>umho/<br>0/00 | Temp. (C) |       | Feeding<br>1 | Feeding<br>2 | Comments | Initials |
|----------------|-----|--------------------------|----|----|----|-----------|-------|--------|-------|--|--|-------------------------------------|-----------|-------|--------------|--------------|----------|----------|
|                |     | A                        | B  | C  | D  | Before    | After | Before | After |  |  |                                     | Before    | After |              |              |          |          |
| %              | 0   | 10                       | 10 | 10 | 10 |           | 7.51  |        | 8.20  | 60   | 82                                       | 533                                 |           | 25    |              | ✓            |          | Bd       |
|                | 1   | 10                       | 10 | 10 | 10 | 8.47      | 8.65  | 8.18   | 8.20  |  |  | 310                                 | 25        | 25    | ✓            | ✓            |          | Bd       |
|                | 2   | 10                       | 10 | 10 | 10 | 6.30      | 8.30  | 8.24   | 8.13  | 64   | 88                                       | 326                                 | 25        | 25    | ✓            | ✓            |          | Bd       |
|                | 3   | 10                       | 10 | 10 | 10 | 6.66      | 8.34  | 7.92   | 8.17  |  |  | 322                                 | 25        | 25    | ✓            | ✓            |          | Bd       |
|                | 4   | 10                       | 10 | 10 | 10 | 7.73      | 8.24  | 8.31   | 8.24  | 60   | 92                                       | 330                                 | 25        | 25    | ✓            | ✓            |          | MH       |
|                | 5   | 10                       | 10 | 10 | 10 | 7.81      | 8.12  | 8.29   | 8.23  |  |  | 327                                 | 25        | 25    | ✓            | ✓            |          | Bd       |
|                | 6   | 10                       | 10 | 10 | 10 | 7.42      | 8.19  | 8.03   | 8.15  |  |  | 340                                 | 25        | 25    | ✓            | ✓            |          | Bd       |
| 6.25           | 7   | 10                       | 10 | 10 | 10 | 7.15      |       | 8.01   |       |  |  |                                     | 25        |       | No Food      |              |          | Bd       |
|                | 0   | 10                       | 10 | 10 | 10 |           | 7.61  |        | 8.27  |  |  | 315                                 |           | 25    |              | ✓            |          | Bd       |
|                | 1   | 10                       | 10 | 10 | 10 | 8.57      | 8.77  | 8.17   | 8.18  |  |  | 355                                 | 25        | 25    | ✓            | ✓            |          | Bd       |
|                | 2   | 10                       | 10 | 10 | 10 | 6.38      | 8.05  | 8.06   | 8.12  |  |  | 319                                 | 25        | 25    | ✓            | ✓            |          | Bd       |
|                | 3   | 10                       | 10 | 10 | 10 | 6.88      | 7.50  | 8.05   | 8.18  |  |  | 314                                 | 25        | 25    | ✓            | ✓            |          | Bd       |
|                | 4   | 10                       | 10 | 10 | 10 | 7.53      | 8.16  | 8.18   | 8.22  |  |  | 333                                 | 25        | 25    | ✓            | ✓            |          | MH       |
|                | 5   | 10                       | 10 | 10 | 9  | 8.01      | 8.14  | 8.21   | 8.17  |  |  | 331                                 | 25        | 25    | ✓            | ✓            |          | Bd       |
| 12.5           | 6   | 10                       | 10 | 10 | 9  | 7.35      | 8.20  | 8.04   | 8.14  |  |  | 332                                 | 25        | 25    | ✓            | ✓            |          | Bd       |
|                | 7   | 10                       | 10 | 10 | 9  | 7.05      |       | 7.98   |       |  |  |                                     | 25        |       | No Food      |              |          | Bd       |
|                | 0   | 10                       | 10 | 10 | 10 |           | 7.82  |        | 8.20  |  |  | 303                                 |           | 25    |              | ✓            |          | Bd       |
|                | 1   | 10                       | 10 | 10 | 10 | 8.63      | 8.71  | 8.15   | 8.19  |  |  | 302                                 | 25        | 25    | ✓            | ✓            |          | Bd       |
|                | 2   | 10                       | 10 | 10 | 10 | 6.50      | 8.00  | 8.07   | 8.12  |  |  | 316                                 | 25        | 25    | ✓            | ✓            |          | Bd       |
|                | 3   | 10                       | 10 | 10 | 7  | 6.91      | 7.60  | 8.08   | 8.19  |  |  | 310                                 | 25        | 25    | ✓            | ✓            |          | Bd       |
|                | 4   | 10                       | 10 | 10 | 7  | 7.56      | 8.10  | 8.19   | 8.22  |  |  | 312                                 | 25        | 25    | ✓            | ✓            |          | MH       |
|                | 5   | 10                       | 10 | 10 | 7  | 8.03      | 8.10  | 8.16   | 8.18  |  |  | 319                                 | 25        | 25    | ✓            | ✓            |          | Bd       |
|                | 6   | 9                        | 10 | 10 | 7  | 7.31      | 8.29  | 8.05   | 8.10  |  |  | 334                                 | 25        | 25    | ✓            | ✓            |          | Bd       |
|                | 7   | 9                        | 10 | 10 | 7  | 6.92      |       | 7.94   |       |  |  |                                     | 25        |       | No Food      |              |          | Bd       |

WJAC-05/05/23  
 ① MH 05/06/23 (was 6)  
 Effective Date: 01FEB23

Experiment ID: NVA056223-3

| Conc:<br>Units | Day | Number of Live Organisms |    |    |    | DO (mg/L) |       | pH     |       | Alkalinity<br>mg/L as<br>CaCO <sub>3</sub> | Hardness<br>mg/L as<br>CaCO <sub>3</sub> | Cond./<br>Salinity<br>umho/<br>0/00 | Temp. (C) |       | Feeding<br>1 | Feeding<br>2 | Comments | Initials |
|----------------|-----|--------------------------|----|----|----|-----------|-------|--------|-------|--|--|-------------------------------------|-----------|-------|--------------|--------------|----------|----------|
|                |     | A                        | B  | C  | D  | Before    | After | Before | After |  |  |                                     | Before    | After |              |              |          |          |
| %              | 0   | 10                       | 10 | 10 | 10 |           | 8.76  |        | 8.18  |  |  | 301                                 |           | 25    |              |              |          | MH       |
|                | 1   | 10                       | 10 | 10 | 10 | 8.80      | 8.83  | 8.20   | 8.21  |  |  | 274                                 | 25        | 25    | ✓            | ✓            |          | Bd       |
|                | 2   | 10                       | 10 | 10 | 10 | 7.89      | 7.83  | 8.16   | 8.14  |  |  | 305                                 | 25        | 25    | ✓            | ✓            |          | Bd       |
|                | 3   | 10                       | 10 | 10 | 10 | 6.94      | 7.04  | 8.14   | 8.20  |  |  | 302                                 | 25        | 25    | ✓            | ✓            |          | Bd       |
|                | 4   | 10                       | 10 | 10 | 10 | 7.66      | 8.10  | 8.23   | 8.25  |  |  | 328                                 | 25        | 25    | ✓            | ✓            |          | MH       |
|                | 5   | 10                       | 10 | 10 | 10 | 7.48      | 8.05  | 8.19   | 8.23  |  |  | 325                                 | 25        | 25    | ✓            | ✓            |          | Bd       |
|                | 6   | 10                       | 10 | 10 | 10 | 7.18      | 8.30  | 8.08   | 8.19  |  |  | 326                                 | 25        | 25    | ✓            | ✓            |          | Bd       |
| 50             | 7   | 10                       | 10 | 10 | 10 | 6.95      |       | 8.06   |       |  |  |                                     | 25        |       | No Food      |              |          | Bd       |
|                | 0   | 10                       | 10 | 10 | 10 |           | 8.24  |        | 8.23  |  |  | 276                                 |           | 25    |              | ✓            |          | MH       |
|                | 1   | 10                       | 10 | 10 | 10 | 8.78      | 8.87  | 8.21   | 8.24  |  |  | 277                                 | 25        | 25    | ✓            | ✓            |          | Bd       |
|                | 2   | 10                       | 10 | 10 | 10 | 7.25      | 7.97  | 8.21   | 8.19  |  |  | 291                                 | 25        | 25    | ✓            | ✓            |          | Bd       |
|                | 3   | 10                       | 10 | 10 | 10 | 7.04      | 7.80  | 8.18   | 8.22  |  |  | 285                                 | 25        | 25    | ✓            | ✓            |          | Bd       |
|                | 4   | 10                       | 10 | 10 | 9  | 7.71      | 8.20  | 8.30   | 8.30  |  |  | 334                                 | 25        | 25    | ✓            | ✓            |          | MH       |
|                | 5   | 10                       | 10 | 10 | 9  | 7.35      | 8.17  | 8.20   | 8.27  |  |  | 334                                 | 25        | 25    | ✓            | ✓            |          | Bd       |
| 100            | 6   | 10                       | 10 | 10 | 9  | 7.21      | 8.42  | 8.20   | 8.24  |  |  | 323                                 | 25        | 25    | ✓            | ✓            |          | Bd       |
|                | 7   | 10                       | 10 | 10 | 9  | 6.86      |       | 8.11   |       |  |  |                                     | 25        |       | No Food      |              |          | Bd       |
|                | 0   | 10                       | 10 | 10 | 10 |           | 8.28  |        | 8.27  | 92   | 122                                      | 241                                 |           | 25    |              | ✓            |          | MH       |
|                | 1   | 10                       | 10 | 10 | 10 | 8.76      | 8.95  | 8.27   | 8.28  | 108  | 120                                      | 264                                 | 25        | 25    | ✓            | ✓            |          | Bd       |
|                | 2   | 10                       | 10 | 10 | 10 | 7.15      | 8.10  | 8.23   | 8.26  |  |  | 260                                 | 25        | 25    | ✓            | ✓            |          | Bd       |
|                | 3   | 10                       | 8  | 10 | 8  | 6.98      | 8.28  | 8.27   | 8.24  |  |  | 255                                 | 25        | 25    | ✓            | ✓            |          | Bd       |
|                | 4   | 10                       | 8  | 10 | 8  | 7.90      | 8.57  | 8.42   | 8.35  | 138  | 152                                      | 327                                 | 25        | 25    | ✓            | ✓            |          | MH       |
|                | 5   | 10                       | 8  | 10 | 6  | 7.34      | 8.29  | 8.32   | 8.36  |  |  | 319                                 | 25        | 25    | ✓            | ✓            |          | Bd       |
|                | 6   | 10                       | 8  | 10 | 6  | 7.13      | 8.92  | 8.30   | 8.26  |  |  | 307                                 | 25        | 25    | ✓            | ✓            |          | Bd       |
|                | 7   | 10                       | 7  | 10 | 6  | 6.86      |       | 8.28   |       |  |  |                                     | 25        |       | No Food      |              |          | Bd       |

OMH 05/08/23

## Weight Data Sheet

Experiment ID: WVA050223-3

| Treatment ID | Initial Weight (mg) | Final Weight (mg) | # Larvae | Comments | Initials |
|--------------|---------------------|-------------------|----------|----------|----------|
| 0 A          | 17.29               | 25.68             | 10       |          | MH       |
| 0 B          | 16.93               | 25.54             | 10       |          | MH       |
| 0 C          | 16.99               | 26.85             | 10       |          | MH       |
| 0 D          | 17.16               | 25.71             | 10       |          | MH       |
|              |                     |                   |          |          |          |
| 6.25 A       | 16.78               | 24.78             | 10       |          | MH       |
| 6.25 B       | 16.99               | 24.44             | 10       |          | MH       |
| 6.25 C       | 17.08               | 25.60             | 10       |          | MH       |
| 6.25 D       | 16.71               | 25.95             | 10       |          | MH       |
|              |                     |                   |          |          |          |
| 12.5 A       | 16.74               | 26.06             | 10       |          | MH       |
| 12.5 B       | 16.60               | 22.42             | 10       |          | MH       |
| 12.5 C       | 16.53               | 24.58             | 10       |          | MH       |
| 12.5 D       | 16.43               | 24.41             | 10       |          | MH       |
|              |                     |                   |          |          |          |
| 25 A         | 17.30               | 26.45             | 10       |          | MH       |
| 25 B         | 17.36               | 24.86             | 10       |          | MH       |
| 25 C         | 16.68               | 26.12             | 10       |          | MH       |
| 25 D         | 16.78               | 24.72             | 10       |          | MH       |
|              |                     |                   |          |          |          |
| 50 A         | 17.11               | 25.28             | 10       |          | MH       |
| 50 B         | 17.27               | 25.67             | 10       |          | MH       |
| 50 C         | 16.84               | 24.81             | 10       |          | MH       |
| 50 D         | 17.54               | 23.70             | 10       |          | MH       |
|              |                     |                   |          |          |          |
| 100 A        | 17.05               | 25.45             | 10       |          | MH       |
| 100 B        | 17.19               | 24.56             | 10       |          | MH       |
| 100 C        | 17.08               | 24.87             | 10       |          | MH       |
| 100 D        | 16.98               | 22.80             | 10       |          | MH       |
|              |                     |                   |          |          |          |
|              |                     |                   |          |          |          |
|              |                     |                   |          |          |          |
|              |                     |                   |          |          |          |

# CETIS Analytical Report

Report Date: 23 May-23 13:06 (p 1 of 4)  
 Test Code/ID: WVA050223-3 / 07-4759-6996

## Fathead Minnow 7-d Larval Survival and Growth Test

Biological Monitoring, Inc.

|                               |   |  |
|-------------------------------|---|--|
| Analysis ID: 19-1607-8432     | Endpoint: 7d Survival Rate                    | CETIS Version: CETISv1.9.4             |
| Analyzed: 23 May-23 13:05     | Analysis: Nonparametric-Control vs Treatments | Status Level: 1                        |
| Batch ID: 14-4014-2575        | Test Type: Growth-Survival (7d)               | Analyst: Lab Tech                      |
| Start Date: 02 May-23 12:30   | Protocol: EPA/821/R-02-013 (2002)             | Diluent: Mod-Hard Synthetic Water      |
| Ending Date: 09 May-23 12:00  | Species: Pimephales promelas                  | Brine:                                 |
| Test Length: 6d 23h           | Taxon: Actinopterygii                         | Source: Aquatic Biosystems, CO Age: 24 |
| Sample ID: 13-3062-0434       | Code: WVA050223-2                             | Project: Special Studies               |
| Sample Date: 01 May-23 08:00  | Material: Riverine Monitoring Sample          | Source: 4AROA202.20 (4AROA202.2)       |
| Receipt Date: 02 May-23 09:00 | CAS (PC):                                     | Station: 13th Street Bridge            |
| Sample Age: 28h               | Client: Western Va Water Authority            |  |

| Data Transform      | Alt Hyp | NOEL | LOEL | TOEL | TU | PMSD   |
|---------------------|---------|------|------|------|----|--------|
| Angular (Corrected) | C > T   | 100  | >100 | n/a  | 1  | 15.79% |

### Steel Many-One Rank Sum Test

| Control        | vs | Conc-% | Test Stat | Critical | Ties | DF | P-Type | P-Value | Decision(α:5%)         |
|----------------|----|--------|-----------|----------|------|----|--------|---------|------------------------|
| Dilution Water |    | 6.25   | 16        | 10       | 1    | 6  | CDF    | 0.6105  | Non-Significant Effect |
|                |    | 12.5   | 14        | 10       | 1    | 6  | CDF    | 0.3451  | Non-Significant Effect |
|                |    | 25     | 18        | 10       | 1    | 6  | CDF    | 0.8333  | Non-Significant Effect |
|                |    | 50     | 16        | 10       | 1    | 6  | CDF    | 0.6105  | Non-Significant Effect |
|                |    | 100    | 14        | 10       | 1    | 6  | CDF    | 0.3451  | Non-Significant Effect |

### Test Acceptability Criteria

| Attribute    | Test Stat | Lower | Upper | Overlap | Decision        |
|--------------|-----------|-------|-------|---------|-----------------|
| Control Resp | 1         | 0.8   | >>    | Yes     | Passes Criteria |

### ANOVA Table

| Source  | Sum Squares | Mean Square | DF | F Stat | P-Value | Decision(α:5%)         |
|---------|-------------|-------------|----|--------|---------|------------------------|
| Between | 0.178982    | 0.0357964   | 5  | 1.661  | 0.1950  | Non-Significant Effect |
| Error   | 0.387934    | 0.0215519   | 18 |        |         |                        |
| Total   | 0.566917    |             | 23 |        |         |                        |

### Distributional Tests

| Attribute    | Test                                 | Test Stat | Critical | P-Value | Decision(α:1%)      |
|--------------|--------------------------------------|-----------|----------|---------|---------------------|
| Variances    | Levene Equality of Variance Test     | 12.5      | 4.248    | 2.5E-05 | Unequal Variances   |
| Variances    | Mod Levene Equality of Variance Test | 6.575     | 4.248    | 0.0012  | Unequal Variances   |
| Distribution | Shapiro-Wilk W Normality Test        | 0.8966    | 0.884    | 0.0183  | Normal Distribution |

### 7d Survival Rate Summary

| Conc-% | Code | Count | Mean   | 95% LCL | 95% UCL | Median | Min    | Max    | Std Err | CV%    | %Effect |
|--------|------|-------|--------|---------|---------|--------|--------|--------|---------|--------|---------|
| 0      | D    | 4     | 1.0000 | 1.0000  | 1.0000  | 1.0000 | 1.0000 | 1.0000 | 0.0000  | 0.00%  | 0.00%   |
| 6.25   |      | 4     | 0.9750 | 0.8954  | 1.0000  | 1.0000 | 0.9000 | 1.0000 | 0.0250  | 5.13%  | 2.50%   |
| 12.5   |      | 4     | 0.9000 | 0.6750  | 1.0000  | 0.9500 | 0.7000 | 1.0000 | 0.0707  | 15.71% | 10.00%  |
| 25     |      | 4     | 1.0000 | 1.0000  | 1.0000  | 1.0000 | 1.0000 | 1.0000 | 0.0000  | 0.00%  | 0.00%   |
| 50     |      | 4     | 0.9750 | 0.8954  | 1.0000  | 1.0000 | 0.9000 | 1.0000 | 0.0250  | 5.13%  | 2.50%   |
| 100    |      | 4     | 0.8250 | 0.4970  | 1.0000  | 0.8500 | 0.6000 | 1.0000 | 0.1031  | 24.99% | 17.50%  |

### Angular (Corrected) Transformed Summary

| Conc-% | Code | Count | Mean  | 95% LCL | 95% UCL | Median | Min    | Max   | Std Err | CV%    | %Effect |
|--------|------|-------|-------|---------|---------|--------|--------|-------|---------|--------|---------|
| 0      | D    | 4     | 1.412 | 1.412   | 1.412   | 1.412  | 1.412  | 1.412 | 0       | 0.00%  | 0.00%   |
| 6.25   |      | 4     | 1.371 | 1.242   | 1.501   | 1.412  | 1.249  | 1.412 | 0.04074 | 5.94%  | 2.89%   |
| 12.5   |      | 4     | 1.266 | 0.9499  | 1.582   | 1.331  | 0.9912 | 1.412 | 0.09936 | 15.70% | 10.34%  |
| 25     |      | 4     | 1.412 | 1.412   | 1.412   | 1.412  | 1.412  | 1.412 | 0       | 0.00%  | 0.00%   |
| 50     |      | 4     | 1.371 | 1.242   | 1.501   | 1.412  | 1.249  | 1.412 | 0.04074 | 5.94%  | 2.89%   |
| 100    |      | 4     | 1.175 | 0.7351  | 1.616   | 1.202  | 0.8861 | 1.412 | 0.1383  | 23.54% | 16.76%  |

# CETIS Analytical Report

Report Date: 23 May-23 13:06 (p 2 of 4)  
 Test Code/ID: WVA050223-3 / 07-4759-6996

## Fathead Minnow 7-d Larval Survival and Growth Test

Biological Monitoring, Inc.

Analysis ID: 19-1607-8432 Endpoint: 7d Survival Rate CETIS Version: CETISv1.9.4  
 Analyzed: 23 May-23 13:05 Analysis: Nonparametric-Control vs Treatments Status Level: 1

### 7d Survival Rate Detail

| Conc-% | Code | Rep 1  | Rep 2  | Rep 3  | Rep 4  |
|--------|------|--------|--------|--------|--------|
| 0      | D    | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| 6.25   |      | 1.0000 | 1.0000 | 1.0000 | 0.9000 |
| 12.5   |      | 0.9000 | 1.0000 | 1.0000 | 0.7000 |
| 25     |      | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| 50     |      | 1.0000 | 1.0000 | 1.0000 | 0.9000 |
| 100    |      | 1.0000 | 0.7000 | 1.0000 | 0.6000 |

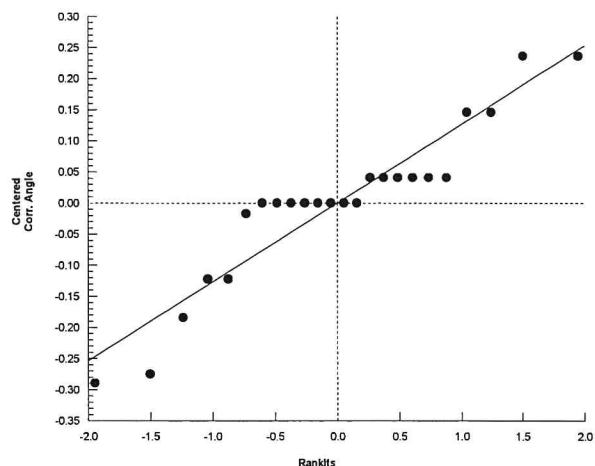
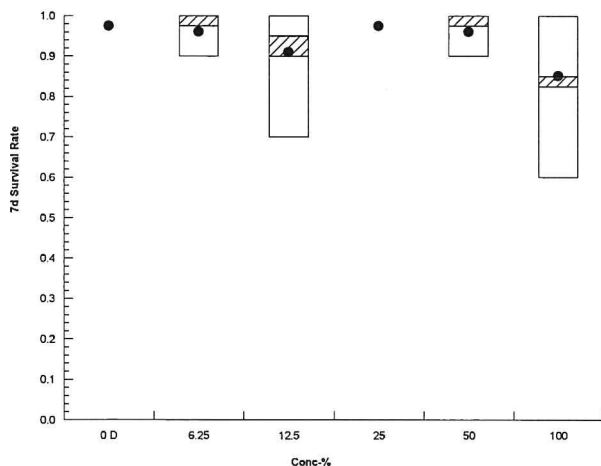
### Angular (Corrected) Transformed Detail

| Conc-% | Code | Rep 1 | Rep 2  | Rep 3 | Rep 4  |
|--------|------|-------|--------|-------|--------|
| 0      | D    | 1.412 | 1.412  | 1.412 | 1.412  |
| 6.25   |      | 1.412 | 1.412  | 1.412 | 1.249  |
| 12.5   |      | 1.249 | 1.412  | 1.412 | 0.9912 |
| 25     |      | 1.412 | 1.412  | 1.412 | 1.412  |
| 50     |      | 1.412 | 1.412  | 1.412 | 1.249  |
| 100    |      | 1.412 | 0.9912 | 1.412 | 0.8861 |

### 7d Survival Rate Binomials

| Conc-% | Code | Rep 1 | Rep 2 | Rep 3 | Rep 4 |
|--------|------|-------|-------|-------|-------|
| 0      | D    | 10/10 | 10/10 | 10/10 | 10/10 |
| 6.25   |      | 10/10 | 10/10 | 10/10 | 9/10  |
| 12.5   |      | 9/10  | 10/10 | 10/10 | 7/10  |
| 25     |      | 10/10 | 10/10 | 10/10 | 10/10 |
| 50     |      | 10/10 | 10/10 | 10/10 | 9/10  |
| 100    |      | 10/10 | 7/10  | 10/10 | 6/10  |

### Graphics



# CETIS Analytical Report

Report Date: 23 May-23 13:06 (p 3 of 4)  
Test Code/ID: WVA050223-3 / 07-4759-6996

## Fathead Minnow 7-d Larval Survival and Growth Test

Biological Monitoring, Inc.

|                               |  |  |
|-------------------------------|--|--|
| Analysis ID: 07-8344-3478     | Endpoint: Mean Dry Biomass-mg              | CETIS Version: CETISv1.9.4             |
| Analyzed: 23 May-23 13:05     | Analysis: Parametric-Control vs Treatments | Status Level: 1                        |
| Batch ID: 14-4014-2575        | Test Type: Growth-Survival (7d)            | Analyst: Lab Tech                      |
| Start Date: 02 May-23 12:30   | Protocol: EPA/821/R-02-013 (2002)          | Diluent: Mod-Hard Synthetic Water      |
| Ending Date: 09 May-23 12:00  | Species: Pimephales promelas               | Brine:                                 |
| Test Length: 6d 23h           | Taxon: Actinopterygii                      | Source: Aquatic Biosystems, CO Age: 24 |
| Sample ID: 13-3062-0434       | Code: WVA050223-2                          | Project: Special Studies               |
| Sample Date: 01 May-23 08:00  | Material: Riverine Monitoring Sample       | Source: 4AROA202.20 (4AROA202.2)       |
| Receipt Date: 02 May-23 09:00 | CAS (PC):                                  | Station: 13th Street Bridge            |
| Sample Age: 28h               | Client: Western Va Water Authority         |  |

| Data Transform | Alt Hyp | NOEL | LOEL | TOEL | TU | PMSD   |
|----------------|---------|------|------|------|----|--------|
| Untransformed  | C > T   | 100  | >100 | n/a  | 1  | 19.68% |

### Dunnett Multiple Comparison Test

| Control        | vs | Conc-% | Test Stat | Critical | MSD   | DF | P-Type | P-Value | Decision(α:5%)         |
|----------------|----|--------|-----------|----------|-------|----|--------|---------|------------------------|
| Dilution Water |    | 6.25   | 0.7599    | 2.407    | 0.174 | 6  | CDF    | 0.5306  | Non-Significant Effect |
|                |    | 12.5   | 1.465     | 2.407    | 0.174 | 6  | CDF    | 0.2395  | Non-Significant Effect |
|                |    | 25     | 0.4767    | 2.407    | 0.174 | 6  | CDF    | 0.6576  | Non-Significant Effect |
|                |    | 50     | 1.627     | 2.407    | 0.174 | 6  | CDF    | 0.1896  | Non-Significant Effect |
|                |    | 100    | 2.083     | 2.407    | 0.174 | 6  | CDF    | 0.0903  | Non-Significant Effect |

### Test Acceptability Criteria

| Attribute    | Test Stat | Lower | Upper | Overlap | Decision        |
|--------------|-----------|-------|-------|---------|-----------------|
| Control Resp | 0.8852    | 0.25  | >>    | Yes     | Passes Criteria |

### ANOVA Table

| Source  | Sum Squares | Mean Square | DF | F Stat | P-Value | Decision(α:5%)         |
|---------|-------------|-------------|----|--------|---------|------------------------|
| Between | 0.0646368   | 0.0129274   | 5  | 1.234  | 0.3341  | Non-Significant Effect |
| Error   | 0.188589    | 0.0104772   | 18 |        |         |                        |
| Total   | 0.253226    |             | 23 |        |         |                        |

### Distributional Tests

| Attribute    | Test                               | Test Stat | Critical | P-Value | Decision(α:1%)      |
|--------------|------------------------------------|-----------|----------|---------|---------------------|
| Variances    | Bartlett Equality of Variance Test | 1.982     | 15.09    | 0.8517  | Equal Variances     |
| Distribution | Shapiro-Wilk W Normality Test      | 0.9635    | 0.884    | 0.5124  | Normal Distribution |

### Mean Dry Biomass-mg Summary

| Conc-% | Code | Count | Mean   | 95% LCL | 95% UCL | Median | Min   | Max   | Std Err | CV%    | %Effect |
|--------|------|-------|--------|---------|---------|--------|-------|-------|---------|--------|---------|
| 0      | D    | 4     | 0.8852 | 0.7774  | 0.9931  | 0.858  | 0.839 | 0.986 | 0.0339  | 7.66%  | 0.00%   |
| 6.25   |      | 4     | 0.8303 | 0.7089  | 0.9516  | 0.826  | 0.745 | 0.924 | 0.03813 | 9.18%  | 6.21%   |
| 12.5   |      | 4     | 0.7792 | 0.5482  | 1.01    | 0.8015 | 0.582 | 0.932 | 0.0726  | 18.63% | 11.97%  |
| 25     |      | 4     | 0.8508 | 0.7021  | 0.9994  | 0.8545 | 0.75  | 0.944 | 0.04672 | 10.98% | 3.90%   |
| 50     |      | 4     | 0.7675 | 0.6044  | 0.9306  | 0.807  | 0.616 | 0.84  | 0.05126 | 13.36% | 13.30%  |
| 100    |      | 4     | 0.7345 | 0.5593  | 0.9097  | 0.758  | 0.582 | 0.84  | 0.05506 | 14.99% | 17.03%  |

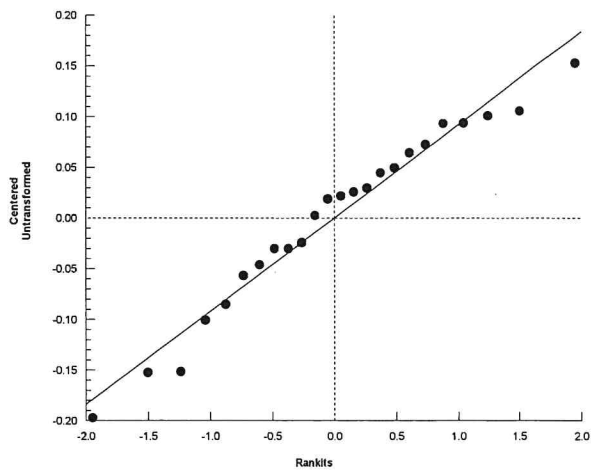
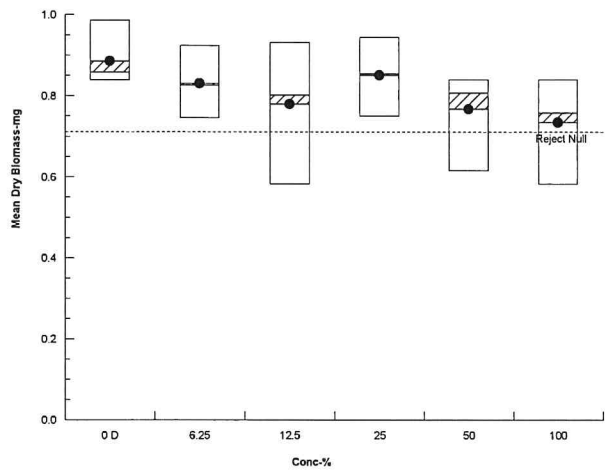
### Mean Dry Biomass-mg Detail

| Conc-% | Code | Rep 1 | Rep 2 | Rep 3 | Rep 4 |
|--------|------|-------|-------|-------|-------|
| 0      | D    | 0.839 | 0.861 | 0.986 | 0.855 |
| 6.25   |      | 0.8   | 0.745 | 0.852 | 0.924 |
| 12.5   |      | 0.932 | 0.582 | 0.805 | 0.798 |
| 25     |      | 0.915 | 0.75  | 0.944 | 0.794 |
| 50     |      | 0.817 | 0.84  | 0.797 | 0.616 |
| 100    |      | 0.84  | 0.737 | 0.779 | 0.582 |

Fathead Minnow 7-d Larval Survival and Growth Test Biological Monitoring, Inc.

|                           |  |                            |
|---------------------------|--|----------------------------|
| Analysis ID: 07-8344-3478 | Endpoint: Mean Dry Biomass-mg              | CETIS Version: CETISv1.9.4 |
| Analyzed: 23 May-23 13:05 | Analysis: Parametric-Control vs Treatments | Status Level: 1            |

Graphics





# CETIS Analytical Report

Report Date: 23 May-23 13:06 (p 1 of 2)

Test Code/ID: WVA050223-3 / 07-4759-6996

## Fathead Minnow 7-d Larval Survival and Growth Test

Biological Monitoring, Inc.

|                               |  |  |
|-------------------------------|--|--|
| Analysis ID: 16-6347-0028     | Endpoint: Mean Dry Biomass-mg          | CETIS Version: CETISv1.9.4             |
| Analyzed: 23 May-23 13:05     | Analysis: Linear Interpolation (ICPIN) | Status Level: 1                        |
| Batch ID: 14-4014-2575        | Test Type: Growth-Survival (7d)        | Analyst: Lab Tech                      |
| Start Date: 02 May-23 12:30   | Protocol: EPA/821/R-02-013 (2002)      | Diluent: Mod-Hard Synthetic Water      |
| Ending Date: 09 May-23 12:00  | Species: Pimephales promelas           | Brine:                                 |
| Test Length: 6d 23h           | Taxon: Actinopterygii                  | Source: Aquatic Biosystems, CO Age: 24 |
| Sample ID: 13-3062-0434       | Code: WVA050223-2                      | Project: Special Studies               |
| Sample Date: 01 May-23 08:00  | Material: Riverine Monitoring Sample   | Source: 4AROA202.20 (4AROA202.2)       |
| Receipt Date: 02 May-23 09:00 | CAS (PC):                              | Station: 13th Street Bridge            |
| Sample Age: 28h               | Client: Western Va Water Authority     |  |

### Linear Interpolation Options

| X Transform | Y Transform | Seed    | Resamples | Exp 95% CL | Method                  |
|-------------|-------------|---------|-----------|------------|-------------------------|
| Linear      | Linear      | 1935850 | 1000      | Yes        | Two-Point Interpolation |

### Test Acceptability Criteria

#### TAC Limits

| Attribute    | Test Stat | Lower | Upper | Overlap | Decision        |
|--------------|-----------|-------|-------|---------|-----------------|
| Control Resp | 0.8852    | 0.25  | >>    | Yes     | Passes Criteria |

### Point Estimates

| Level | %     | 95% LCL | 95% UCL | TU    | 95% LCL | 95% UCL |
|-------|-------|---------|---------|-------|---------|---------|
| IC5   | 5.03  | 0.5602  | 80.92   | 19.88 | 1.236   | 178.5   |
| IC10  | 34.62 | n/a     | n/a     | 2.889 | n/a     | n/a     |
| IC15  | 72.78 | n/a     | n/a     | 1.374 | n/a     | n/a     |
| IC20  | >100  | n/a     | n/a     | <1    | n/a     | n/a     |
| IC25  | >100  | n/a     | n/a     | <1    | n/a     | n/a     |
| IC40  | >100  | n/a     | n/a     | <1    | n/a     | n/a     |
| IC50  | >100  | n/a     | n/a     | <1    | n/a     | n/a     |

### Mean Dry Biomass-mg Summary

#### Calculated Variate

#### Isotonic Variate

| Conc-% | Code | Count | Mean   | Min   | Max   | Std Dev | CV%    | %Effect | Mean   | %Effect |
|--------|------|-------|--------|-------|-------|---------|--------|---------|--------|---------|
| 0      | D    | 4     | 0.8852 | 0.839 | 0.986 | 0.06781 | 7.66%  | 0.0%    | 0.8852 | 0.0%    |
| 6.25   |      | 4     | 0.8303 | 0.745 | 0.924 | 0.07626 | 9.19%  | 6.21%   | 0.8303 | 6.21%   |
| 12.5   |      | 4     | 0.7792 | 0.582 | 0.932 | 0.1452  | 18.63% | 11.97%  | 0.815  | 7.94%   |
| 25     |      | 4     | 0.8508 | 0.75  | 0.944 | 0.09344 | 10.98% | 3.9%    | 0.815  | 7.94%   |
| 50     |      | 4     | 0.7675 | 0.616 | 0.84  | 0.1025  | 13.36% | 13.3%   | 0.7675 | 13.3%   |
| 100    |      | 4     | 0.7345 | 0.582 | 0.84  | 0.1101  | 14.99% | 17.03%  | 0.7345 | 17.03%  |

### Mean Dry Biomass-mg Detail

| Conc-% | Code | Rep 1 | Rep 2 | Rep 3 | Rep 4 |
|--------|------|-------|-------|-------|-------|
| 0      | D    | 0.839 | 0.861 | 0.986 | 0.855 |
| 6.25   |      | 0.8   | 0.745 | 0.852 | 0.924 |
| 12.5   |      | 0.932 | 0.582 | 0.805 | 0.798 |
| 25     |      | 0.915 | 0.75  | 0.944 | 0.794 |
| 50     |      | 0.817 | 0.84  | 0.797 | 0.616 |
| 100    |      | 0.84  | 0.737 | 0.779 | 0.582 |

# CETIS Analytical Report

Report Date: 23 May-23 13:06 (p 2 of 2)  
Test Code/ID: WVA050223-3 / 07-4759-6996

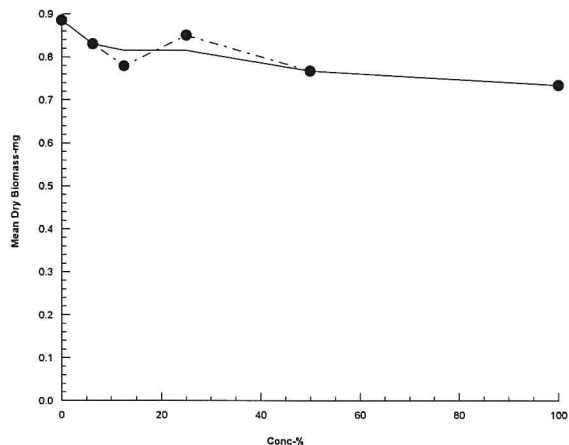
## Fathead Minnow 7-d Larval Survival and Growth Test

Biological Monitoring, Inc.

Analysis ID: 16-6347-0028      Endpoint: Mean Dry Biomass-mg  
Analyzed: 23 May-23 13:05      Analysis: Linear Interpolation (ICPIN)

CETIS Version: CETISv1.9.4  
Status Level: 1

### Graphics



## Page 1 of 5

Start of Test Date: 05/02/23 Time: 1330  
End of Test Date: 5/8/23 Time: 1300  
Test Duration: 3 Broods  
Test Temperature: 25 +/- 1 deg C  
Test Volume: 15 ml  
Test Containers Used: 30 ml PS  
Renewal Frequency: Daily  
Test Organism Age: 15.5-21.5 h  
Organism Batch #: 042523 (1600-2200)  
Organisms per concentration: 10  
Waterbath/Shelf #: 9

Food Batch/Days Used: YCT 032123 0-3 Algae 042323 0-5  
YCT 040423 4-5 Algae                     

Condition of Organisms at End of Test: Normal

Control Survival (%): 90 Average # Young/Female: 20.0

Percent control female with 3 broods (%): 70

Comments: \_\_\_\_\_

Experiment ID: WVA050223-4

| Conc:<br>Units | Day   | A  | B                          | C  | D  | E  | F  | G  | H  | I  | J  | #<br>Young | #<br>Adults | #<br>Males | Init. |
|----------------|-------|----|----------------------------|----|----|----|----|----|----|----|----|------------|-------------|------------|-------|
| 0              | 1     | 0  | 0                          | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0          | 10          |            | VF    |
|                | 2     | 0  | 0                          | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0          | 10          |            | VF    |
|                | 3     | 5  | 6                          | 4  | 5  | 6  | 3  | 0  | 4  | 0  | 0  | 33         | 10          | 0          | VF    |
|                | 4     | 0  | 0                          | 0  | 0  | 0  | 0  | 4  | 0  | 5  | 0  | 9          | 10          | 0          | VF    |
|                | 5     | 8  | 2x                         | 10 | 8  | 10 | 12 | 7  | 8  | 9  | 11 | 85         | 9           | 0          | VF    |
|                | 6     | 9  | <del>2x</del> <sup>1</sup> | 11 | 12 | 13 | 9  | 0  | 4  | 10 | 5  | 73         | 9           | 0          | VF    |
|                | 7     |    |                            |    |    |    |    |    |    |    |    |            |             |            |       |
|                | Total | 22 | 8                          | 25 | 25 | 29 | 24 | 11 | 16 | 24 | 16 | 200        | 9           | 0          | WNO   |
| 6.25           | 1     | 0  | 0                          | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0          | 16          |            | VF    |
|                | 2     | 0  | 0                          | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0          | 10          |            | VF    |
|                | 3     | 0  | 6                          | 0  | 5  | 4  | 0  | 4  | 6  | 2  | 3  | 30         | 10          | 0          | VF    |
|                | 4     | 0  | 0                          | 0  | 0  | 0  | 4  | 0  | 0  | 0  | 0  | 4          | 10          | 0          | VF    |
|                | 5     | 8  | 12                         | 5  | 9  | 10 | 9  | 5  | 8  | 6  | 9  | 81         | 10          | 0          | VF    |
|                | 6     | 6  | 11                         | 0  | 12 | 9  | 20 | 11 | 12 | 0  | 10 | 91         | 10          | 0          | VF    |
|                | 7     |    |                            |    |    |    |    |    |    |    |    |            |             |            |       |
|                | Total | 14 | 29                         | 5  | 26 | 23 | 33 | 20 | 26 | 8  | 22 | 206        | 10          | 0          | WNO   |
| 12.5           | 1     | 0  | 0                          | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0          | 16          |            | VF    |
|                | 2     | 0  | 0                          | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0          | 10          |            | VF    |
|                | 3     | 5  | 6                          | 4  | 5  | 0  | 2  | 4  | 3  | 2  | 7  | 38         | 10          | 0          | VF    |
|                | 4     | 0  | 0                          | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0          | 10          | 0          | VF    |
|                | 5     | 7  | 11                         | 12 | 10 | 8  | 11 | 7  | 5  | 11 | 12 | 94         | 10          | 0          | VF    |
|                | 6     | 11 | 12                         | 9  | 15 | 12 | 16 | 0  | 10 | 10 | 16 | 111        | 10          | 0          | VF    |
|                | 7     |    |                            |    |    |    |    |    |    |    |    |            |             |            |       |
|                | Total | 23 | 29                         | 25 | 30 | 20 | 29 | 11 | 18 | 23 | 35 | 243        | 10          | 0          | WNO   |

WNO 5/23/23

Experiment ID: WVFA050223-4

| Conc:<br>Units | Day   | A  | B  | C  | D  | E  | F   | G  | H  | I  | J  | #<br>Young | #<br>Adults | #<br>Males | Init. |
|----------------|-------|----|----|----|----|----|-----|----|----|----|----|------------|-------------|------------|-------|
| 25             | 1     | 0  | 0  | 0  | 0  | 0  | 0   | 0  | 0  | 0  | 0  | 0          | 10          |            | VF    |
|                | 2     | 0  | 0  | 0  | 0  | 0  | 0   | 0  | 0  | 0  | 0  | 0          | 10          |            | VF    |
|                | 3     | 6  | 5  | 2  | 7  | 0  | 6   | 7  | 3  | 5  | 4  | 45         | 10          | 0          | VF    |
|                | 4     | 0  | 0  | 0  | 0  | 0  | 0   | 0  | 0  | 0  | 0  | 0          | 10          | 0          | VF    |
|                | 5     | 11 | 13 | 15 | 9  | 11 | 8   | 12 | 3  | 12 | 13 | 107        | 10          | 0          | VF    |
|                | 6     | 15 | 16 | 17 | 14 | 9  | 6   | 13 | 0  | 10 | 2  | 102        | 10          | 0          | VF    |
|                | 7     |    |    |    |    |    |     |    |    |    |    |            |             |            |       |
| 50             | Total | 32 | 34 | 34 | 30 | 20 | 20  | 32 | 6  | 27 | 19 | 254        | 10          | 0          | WMO   |
|                | 1     | 0  | 0  | 0  | 0  | 0  | 0   | 0  | 0  | 0  | 0  | 0          | 10          |            | VF    |
|                | 2     | 0  | 0  | 0  | 0  | 0  | 0   | 0  | 0  | 0  | 0  | 0          | 10          |            | VF    |
|                | 3     | 5  | 6  | 7  | 7  | 3  | 5   | 0  | 0  | 0  | 0  | 26         | 10          | 0          | VF    |
|                | 4     | 0  | 0  | 3  | 0  | 0  | 0   | 5  | 6  | 0  | 3  | 17         | 10          | 0          | VF    |
|                | 5     | 9  | 6  | 4  | 11 | 9  | 10x | 12 | 9  | 6  | 6  | 81         | 9           | 0          | VF    |
|                | 6     | 13 | 12 | 0  | 11 | 9  | ↓   | 10 | 0  | 20 | 15 | 90         | 9           | 0          | VF    |
| 100            | 7     |    |    |    |    |    |     |    |    |    |    |            |             |            |       |
|                | Total | 27 | 24 | 7  | 29 | 21 | 15  | 27 | 15 | 26 | 23 | 214        | 9           | 0          | WMO   |
|                | 1     | 0  | 0  | 0  | 0  | 0  | 0   | 0  | 0  | 0  | 0  | 0          | 10          |            | VF    |
|                | 2     | 0  | 0  | 0  | 0  | 0  | 0   | 0  | 0  | 0  | 0  | 0          | 10          |            | VF    |
|                | 3     | 3  | 7  | 5  | 6  | 4  | 5   | 3  | 5  | 3  | 0  | 41         | 10          | 0          | VF    |
|                | 4     | 0  | 0  | 0  | 0  | 0  | 0   | 5  | 0  | 0  | 2  | 7          | 10          | 0          | VF    |
|                | 5     | 13 | 15 | 9  | 11 | 9  | 7   | 9  | 7  | 5  | 0  | 85         | 10          | 0          | VF    |
|                | 6     | 12 | 16 | 17 | 14 | 12 | 13  | 0  | 11 | 10 | 10 | 115        | 10          | 0          | VF    |
|                | 7     |    |    |    |    |    |     |    |    |    |    |            |             |            |       |
|                | Total | 28 | 38 | 31 | 31 | 25 | 25  | 17 | 23 | 18 | 12 | 248        | 10          | 0          | WMO   |

OVF 5/8/23

Experiment ID: WJVA050223-4

| Conc:<br>Units | Day | Temperature (C) |       | Dissolved Oxygen (mg/L) |       | pH     |       | Cond.<br>(umhos) | Alkalinity<br>(mg/L<br>CaCO <sub>3</sub> ) | Hardness<br>(mg/L<br>CaCO <sub>3</sub> ) | Food | Init. |
|----------------|-----|-----------------|-------|-------------------------|-------|--------|-------|------------------|--|--|------|-------|
|                |     | Before          | After | Before                  | After | Before | After |                  |  |  |      |       |
| %              | 0   |                 | 25    |                         | 7.51  |        | 8.20  | 533              | 60   | 82                                       | ✓    | Bd    |
|                | 1   | 25              | 25    | 8.12                    | 8.65  | 8.24   | 8.26  | 310              |  |  | ✓    | Bd    |
|                | 2   | 25              | 25    | 7.75                    | 8.36  | 8.31   | 8.13  | 326              | 64   | 88                                       | ✓    | Bd    |
|                | 3   | 25              | 25    | 7.64                    | 8.34  | 8.33   | 8.17  | 322              |  |  | ✓    | Bd    |
|                | 4   | 25              | 25    | 7.65                    | 8.24  | 8.31   | 8.29  | 330              | 60   | 92                                       | ✓    | VF    |
|                | 5   | 25              | 25    | 7.66                    | 8.12  | 8.32   | 8.23  | 327              |  |  | ✓    | VF    |
|                | 6   | 25              |       | 7.75                    |       | 8.26   |       |                  |  |  |      | Bd    |
| 6.25           | 0   |                 | 25    |                         | 7.61  |        | 8.27  | 315              |  |  | ✓    | Bd    |
|                | 1   | 25              | 25    | 8.28                    | 8.77  | 8.23   | 8.18  | 305              |  |  | ✓    | Bd    |
|                | 2   | 25              | 25    | 7.88                    | 8.05  | 8.30   | 8.12  | 319              |  |  | ✓    | Bd    |
|                | 3   | 25              | 25    | 7.71                    | 7.50  | 8.39   | 8.18  | 314              |  |  | ✓    | Bd    |
|                | 4   | 25              | 25    | 7.90                    | 8.16  | 8.34   | 8.22  | 343              |  |  | ✓    | VF    |
|                | 5   | 25              | 25    | 7.73                    | 8.14  | 8.33   | 8.17  | 331              |  |  | ✓    | VF    |
|                | 6   | 25              |       | 7.78                    |       | 8.28   |       |                  |  |  |      | Bd    |
| 12.5           | 0   |                 | 25    |                         | 7.82  |        | 8.20  | 303              |  |  | ✓    | Bd    |
|                | 1   | 25              | 25    | 8.21                    | 8.71  | 8.19   | 8.19  | 302              |  |  | ✓    | Bd    |
|                | 2   | 25              | 25    | 7.89                    | 8.00  | 8.31   | 8.12  | 316              |  |  | ✓    | Bd    |
|                | 3   | 25              | 25    | 7.77                    | 7.60  | 8.40   | 8.19  | 310              |  |  | ✓    | Bd    |
|                | 4   | 25              | 25    | 8.15                    | 8.10  | 8.37   | 8.22  | 322              |  |  | ✓    | VF    |
|                | 5   | 25              | 25    | 7.75                    | 8.10  | 8.35   | 8.18  | 329              |  |  | ✓    | VF    |
|                | 6   | 25              |       | 7.83                    |       | 8.33   |       |                  |  |  |      | Bd    |

Experiment ID: WJVA050223-4

| Conc:<br>Units | Day | Temperature (C) |       | Dissolved Oxygen (mg/L) |       | pH     |       | Cond.<br>(umhos) | Alkalinity<br>(mg/L<br>CaCO <sub>3</sub> ) | Hardness<br>(mg/L<br>CaCO <sub>3</sub> ) | Food | Init. |
|----------------|-----|-----------------|-------|-------------------------|-------|--------|-------|------------------|--|--|------|-------|
|                |     | Before          | After | Before                  | After | Before | After |                  |  |  |      |       |
| %              | 0   |                 | 25    |                         | 8.20  |        | 8.20  | 301              |  |  | ✓    | BF    |
|                | 1   | 25              | 25    | 8.10                    | 8.83  | 8.24   | 8.21  | 294              |  |  | ✓    | BF    |
|                | 2   | 25              | 25    | 7.91                    | 7.83  | 8.33   | 8.14  | 305              |  |  | ✓    | BF    |
|                | 3   | 25              | 25    | 8.02                    | 7.64  | 8.42   | 8.20  | 302              |  |  | ✓    | BF    |
|                | 4   | 25              | 25    | 8.06                    | 8.10  | 8.37   | 8.25  | 328              |  |  | ✓    | VF    |
|                | 5   | 25              | 25    | 7.82                    | 8.05  | 8.40   | 8.23  | 325              |  |  | ✓    | VF    |
|                | 6   | 25              |       | 7.92                    |       | 8.36   |       |                  |  |  |      | BF    |
| 50             | 0   |                 | 25    |                         | 8.24  |        | 8.23  | 276              |  |  | ✓    | BF    |
|                | 1   | 25              | 25    | 8.07                    | 8.87  | 8.25   | 8.24  | 277              |  |  | ✓    | BF    |
|                | 2   | 25              | 25    | 7.94                    | 7.97  | 8.44   | 8.19  | 291              |  |  | ✓    | BF    |
|                | 3   | 25              | 25    | 8.31                    | 7.80  | 8.45   | 8.22  | 285              |  |  | ✓    | BF    |
|                | 4   | 25              | 25    | 8.05                    | 8.20  | 8.39   | 8.30  | 334              |  |  | ✓    | VF    |
|                | 5   | 25              | 25    | 7.88                    | 8.17  | 8.48   | 8.27  | 334              |  |  | ✓    | VF    |
|                | 6   | 25              |       | 8.00                    |       | 8.44   |       |                  |  |  |      | BF    |
| 100            | 0   |                 | 25    |                         | 8.28  |        | 8.27  | 241              | 92   | 122                                      | ✓    | BF    |
|                | 1   | 25              | 25    | 8.08                    | 8.95  | 8.26   | 8.28  | 294              | 108  | 126                                      | ✓    | BF    |
|                | 2   | 25              | 25    | 8.04                    | 8.10  | 8.51   | 8.26  | 260              |  |  | ✓    | BF    |
|                | 3   | 25              | 25    | 8.24                    | 8.28  | 8.49   | 8.24  | 255              |  |  | ✓    | BF    |
|                | 4   | 25              | 25    | 8.09                    | 8.57  | 8.51   | 8.35  | 327              | 138  | 152                                      | ✓    | VF    |
|                | 5   | 25              | 25    | 7.94                    | 8.59  | 8.48   | 8.30  | 319              |  |  | ✓    | VF    |
|                | 6   | 25              |       | 8.04                    |       | 8.46   |       |                  |  |  |      | BF    |

BF 05/02/23, DO. = 8.20

## CETIS Analytical Report

Report Date: 23 May-23 13:11 (p 1 of 2)

Test Code/ID: WVA050223-4 / 03-3899-3020

## Ceriodaphnia 7-d Survival and Reproduction Test

Biological Monitoring, Inc.

|                               |                                       |                                   |
|-------------------------------|---------------------------------------|-----------------------------------|
| Analysis ID: 18-3122-6501     | Endpoint: 6d Survival Rate            | CETIS Version: CETISv1.9.4        |
| Analyzed: 23 May-23 13:10     | Analysis: STP 2xK Contingency Tables  | Status Level: 1                   |
| Batch ID: 13-2918-9551        | Test Type: Reproduction-Survival (7d) | Analyst: Lab Tech                 |
| Start Date: 02 May-23 13:30   | Protocol: EPA/821/R-02-013 (2002)     | Diluent: Mod-Hard Synthetic Water |
| Ending Date: 08 May-23 13:00  | Species: Ceriodaphnia dubia           | Brine:                            |
| Test Length: 5d 23h           | Taxon: Branchiopoda                   | Source: In-House Culture Age: 24  |
| Sample ID: 17-3888-4285       | Code: WVA050223-2                     | Project: Special Studies          |
| Sample Date: 01 May-23 08:00  | Material: Riverine Monitoring Sample  | Source: 4AROA202.20 (4AROA202.2)  |
| Receipt Date: 02 May-23 09:00 | CAS (PC):                             | Station: 13th Street Bridge       |
| Sample Age: 29h               | Client: Western Va Water Authority    |                                   |

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

## Fisher Exact/Bonferroni-Holm Test

| Control        | vs | Group | Test Stat | P-Type | P-Value | Decision(α:5%)         |
|----------------|----|-------|-----------|--------|---------|------------------------|
| Dilution Water |    | 6.25  | 1.0000    | Exact  | 1.0000  | Non-Significant Effect |
|                |    | 12.5  | 1.0000    | Exact  | 1.0000  | Non-Significant Effect |
|                |    | 25    | 1.0000    | Exact  | 1.0000  | Non-Significant Effect |
|                |    | 50    | 0.7632    | Exact  | 1.0000  | Non-Significant Effect |
|                |    | 100   | 1.0000    | Exact  | 1.0000  | Non-Significant Effect |

## Data Summary

| Conc-% | Code | NR | R | NR + R | Prop NR | Prop R | %Effect |
|--------|------|----|---|--------|---------|--------|---------|
| 0      | D    | 9  | 1 | 10     | 0.9     | 0.1    | 0.0%    |
| 6.25   |      | 10 | 0 | 10     | 1       | 0      | -11.11% |
| 12.5   |      | 10 | 0 | 10     | 1       | 0      | -11.11% |
| 25     |      | 10 | 0 | 10     | 1       | 0      | -11.11% |
| 50     |      | 9  | 1 | 10     | 0.9     | 0.1    | 0.0%    |
| 100    |      | 10 | 0 | 10     | 1       | 0      | -11.11% |

## 6d Survival Rate Detail

| Conc-% | Code | Rep 1  | Rep 2  | Rep 3  | Rep 4  | Rep 5  | Rep 6  | Rep 7  | Rep 8  | Rep 9  | Rep 10 |
|--------|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0      | D    | 1.0000 | 0.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| 6.25   |      | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| 12.5   |      | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| 25     |      | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| 50     |      | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 0.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| 100    |      | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |

## 6d Survival Rate Binomials

| Conc-% | Code | Rep 1 | Rep 2 | Rep 3 | Rep 4 | Rep 5 | Rep 6 | Rep 7 | Rep 8 | Rep 9 | Rep 10 |
|--------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|
| 0      | D    | 1/1   | 0/1   | 1/1   | 1/1   | 1/1   | 1/1   | 1/1   | 1/1   | 1/1   | 1/1    |
| 6.25   |      | 1/1   | 1/1   | 1/1   | 1/1   | 1/1   | 1/1   | 1/1   | 1/1   | 1/1   | 1/1    |
| 12.5   |      | 1/1   | 1/1   | 1/1   | 1/1   | 1/1   | 1/1   | 1/1   | 1/1   | 1/1   | 1/1    |
| 25     |      | 1/1   | 1/1   | 1/1   | 1/1   | 1/1   | 1/1   | 1/1   | 1/1   | 1/1   | 1/1    |
| 50     |      | 1/1   | 1/1   | 1/1   | 1/1   | 1/1   | 0/1   | 1/1   | 1/1   | 1/1   | 1/1    |
| 100    |      | 1/1   | 1/1   | 1/1   | 1/1   | 1/1   | 1/1   | 1/1   | 1/1   | 1/1   | 1/1    |



# CETIS Analytical Report

Report Date: 23 May-23 13:11 (p 2 of 2)  
Test Code/ID: WVA050223-4 / 03-3899-3020

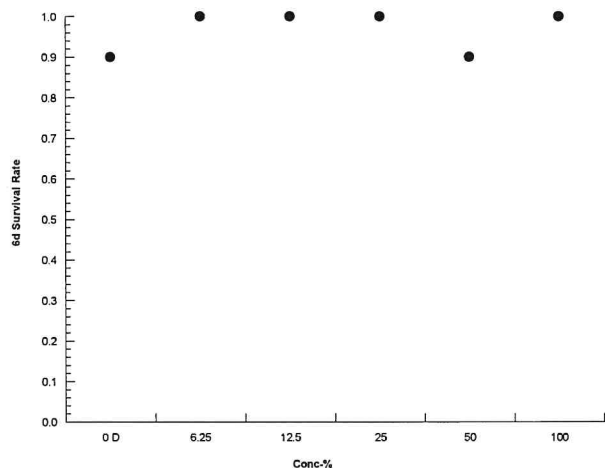
## Ceriodaphnia 7-d Survival and Reproduction Test

Biological Monitoring, Inc.

Analysis ID: 18-3122-6501      Endpoint: 6d Survival Rate  
Analyzed: 23 May-23 13:10      Analysis: STP 2xK Contingency Tables

CETIS Version: CETISv1.9.4  
Status Level: 1

### Graphics



## CETIS Analytical Report

Report Date: 23 May-23 13:11 (p 1 of 2)

Test Code/ID: WVA050223-4 / 03-3899-3020

## Ceriodaphnia 7-d Survival and Reproduction Test

Biological Monitoring, Inc.

|                               |  |                                   |
|-------------------------------|--|-----------------------------------|
| Analysis ID: 00-8003-7123     | Endpoint: Reproduction                     | CETIS Version: CETISv1.9.4        |
| Analyzed: 23 May-23 13:11     | Analysis: Parametric-Control vs Treatments | Status Level: 1                   |
| Batch ID: 13-2918-9551        | Test Type: Reproduction-Survival (7d)      | Analyst: Lab Tech                 |
| Start Date: 02 May-23 13:30   | Protocol: EPA/821/R-02-013 (2002)          | Diluent: Mod-Hard Synthetic Water |
| Ending Date: 08 May-23 13:00  | Species: Ceriodaphnia dubia                | Brine:                            |
| Test Length: 5d 23h           | Taxon: Branchiopoda                        | Source: In-House Culture Age: 24  |
| Sample ID: 17-3888-4285       | Code: WVA050223-2                          | Project: Special Studies          |
| Sample Date: 01 May-23 08:00  | Material: Riverine Monitoring Sample       | Source: 4AROA202.20 (4AROA202.2)  |
| Receipt Date: 02 May-23 09:00 | CAS (PC):                                  | Station: 13th Street Bridge       |
| Sample Age: 29h               | Client: Western Va Water Authority         |                                   |

| Data Transform | Alt Hyp | NOEL | LOEL | TOEL | TU | PMSD   |
|----------------|---------|------|------|------|----|--------|
| Untransformed  | C > T   | 100  | >100 | n/a  | 1  | 40.02% |

## Dunnett Multiple Comparison Test

| Control        | vs | Conc-% | Test Stat | Critical | MSD   | DF | P-Type | P-Value | Decision(α:5%)         |
|----------------|----|--------|-----------|----------|-------|----|--------|---------|------------------------|
| Dilution Water |    | 6.25   | -0.1716   | 2.289    | 8.004 | 18 | CDF    | 0.8793  | Non-Significant Effect |
|                |    | 12.5   | -1.23     | 2.289    | 8.004 | 18 | CDF    | 0.9922  | Non-Significant Effect |
|                |    | 25     | -1.544    | 2.289    | 8.004 | 18 | CDF    | 0.9973  | Non-Significant Effect |
|                |    | 50     | -0.4004   | 2.289    | 8.004 | 18 | CDF    | 0.9256  | Non-Significant Effect |
|                |    | 100    | -1.373    | 2.289    | 8.004 | 18 | CDF    | 0.9951  | Non-Significant Effect |

## Test Acceptability Criteria

## TAC Limits

| Attribute    | Test Stat | Lower | Upper | Overlap | Decision        |
|--------------|-----------|-------|-------|---------|-----------------|
| Control Resp | 20        | 15    | >>    | Yes     | Passes Criteria |

## ANOVA Table

| Source  | Sum Squares | Mean Square | DF | F Stat | P-Value | Decision(α:5%)         |
|---------|-------------|-------------|----|--------|---------|------------------------|
| Between | 276.35      | 55.27       | 5  | 0.9042 | 0.4852  | Non-Significant Effect |
| Error   | 3300.9      | 61.1278     | 54 |        |         |                        |
| Total   | 3577.25     |             | 59 |        |         |                        |

## Distributional Tests

| Attribute    | Test                               | Test Stat | Critical | P-Value | Decision(α:1%)      |
|--------------|------------------------------------|-----------|----------|---------|---------------------|
| Variances    | Bartlett Equality of Variance Test | 1.514     | 15.09    | 0.9114  | Equal Variances     |
| Distribution | Shapiro-Wilk W Normality Test      | 0.955     | 0.9459   | 0.0268  | Normal Distribution |

## Reproduction Summary

| Conc-% | Code | Count | Mean | 95% LCL | 95% UCL | Median | Min | Max | Std Err | CV%    | %Effect |
|--------|------|-------|------|---------|---------|--------|-----|-----|---------|--------|---------|
| 0      | D    | 10    | 20   | 15.09   | 24.91   | 23     | 8   | 29  | 2.171   | 34.32% | 0.00%   |
| 6.25   |      | 10    | 20.6 | 14.13   | 27.07   | 22.5   | 5   | 33  | 2.86    | 43.91% | -3.00%  |
| 12.5   |      | 10    | 24.3 | 19.35   | 29.25   | 24     | 11  | 35  | 2.186   | 28.45% | -21.50% |
| 25     |      | 10    | 25.4 | 18.94   | 31.86   | 28.5   | 6   | 34  | 2.857   | 35.56% | -27.00% |
| 50     |      | 10    | 21.4 | 16.4    | 26.4    | 23.5   | 7   | 29  | 2.212   | 32.69% | -7.00%  |
| 100    |      | 10    | 24.8 | 19.28   | 30.32   | 25     | 12  | 38  | 2.439   | 31.11% | -24.00% |

## Reproduction Detail

| Conc-% | Code | Rep 1 | Rep 2 | Rep 3 | Rep 4 | Rep 5 | Rep 6 | Rep 7 | Rep 8 | Rep 9 | Rep 10 |
|--------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|
| 0      | D    | 22    | 8     | 25    | 25    | 29    | 24    | 11    | 16    | 24    | 16     |
| 6.25   |      | 14    | 29    | 5     | 26    | 23    | 33    | 20    | 26    | 8     | 22     |
| 12.5   |      | 23    | 29    | 25    | 30    | 20    | 29    | 11    | 18    | 23    | 35     |
| 25     |      | 32    | 34    | 34    | 30    | 20    | 20    | 32    | 6     | 27    | 19     |
| 50     |      | 27    | 24    | 7     | 29    | 21    | 15    | 27    | 15    | 26    | 23     |
| 100    |      | 28    | 38    | 31    | 31    | 25    | 25    | 17    | 23    | 18    | 12     |

# CETIS Analytical Report

Report Date: 23 May-23 13:11 (p 2 of 2)  
Test Code/ID: WVA050223-4 / 03-3899-3020

## Ceriodaphnia 7-d Survival and Reproduction Test

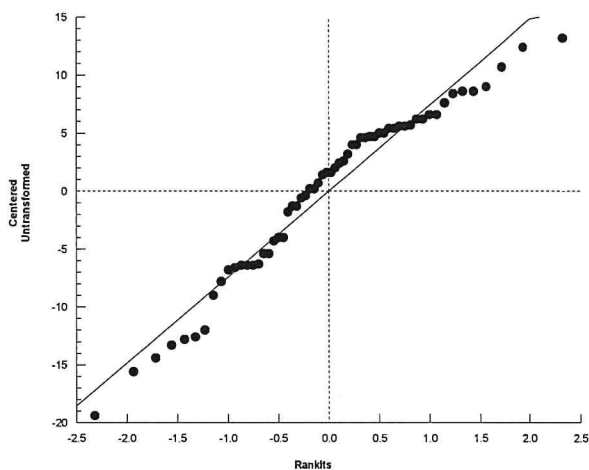
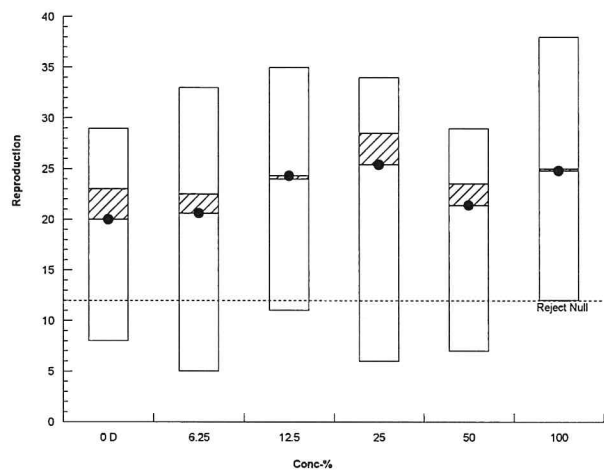
Biological Monitoring, Inc.

Analysis ID: 00-8003-7123  
Analyzed: 23 May-23 13:11

Endpoint: Reproduction  
Analysis: Parametric-Control vs Treatments

CETIS Version: CETISv1.9.4  
Status Level: 1

### Graphics



# CETIS Analytical Report

Report Date: 23 May-23 13:11 (p 1 of 2)  
Test Code/ID: WVA050223-4 / 03-3899-3020

## Ceriodaphnia 7-d Survival and Reproduction Test

Biological Monitoring, Inc.

|                               |  |                                   |
|-------------------------------|--|-----------------------------------|
| Analysis ID: 18-5971-3737     | Endpoint: Reproduction                 | CETIS Version: CETISv1.9.4        |
| Analyzed: 23 May-23 13:11     | Analysis: Linear Interpolation (ICPIN) | Status Level: 1                   |
| Batch ID: 13-2918-9551        | Test Type: Reproduction-Survival (7d)  | Analyst: Lab Tech                 |
| Start Date: 02 May-23 13:30   | Protocol: EPA/821/R-02-013 (2002)      | Diluent: Mod-Hard Synthetic Water |
| Ending Date: 08 May-23 13:00  | Species: Ceriodaphnia dubia            | Brine:                            |
| Test Length: 5d 23h           | Taxon: Branchiopoda                    | Source: In-House Culture Age: 24  |
| Sample ID: 17-3888-4285       | Code: WVA050223-2                      | Project: Special Studies          |
| Sample Date: 01 May-23 08:00  | Material: Riverine Monitoring Sample   | Source: 4AROA202.20 (4AROA202.2)  |
| Receipt Date: 02 May-23 09:00 | CAS (PC):                              | Station: 13th Street Bridge       |
| Sample Age: 29h               | Client: Western Va Water Authority     |                                   |

### Linear Interpolation Options

| X Transform | Y Transform | Seed    | Resamples | Exp 95% CL | Method                  |
|-------------|-------------|---------|-----------|------------|-------------------------|
| Linear      | Linear      | 2089305 | 1000      | Yes        | Two-Point Interpolation |

### Test Acceptability Criteria

#### TAC Limits

| Attribute    | Test Stat | Lower | Upper | Overlap | Decision        |
|--------------|-----------|-------|-------|---------|-----------------|
| Control Resp | 20        | 15    | >>    | Yes     | Passes Criteria |

### Point Estimates

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

### Reproduction Summary

#### Calculated Variate

#### Isotonic Variate

| Conc-% | Code | Count | Mean | Min | Max | Std Dev | CV%    | %Effect | Mean  | %Effect |
|--------|------|-------|------|-----|-----|---------|--------|---------|-------|---------|
| 0      | D    | 10    | 20   | 8   | 29  | 6.864   | 34.32% | 0.0%    | 22.75 | 0.0%    |
| 6.25   |      | 10    | 20.6 | 5   | 33  | 9.046   | 43.91% | -3.0%   | 22.75 | 0.0%    |
| 12.5   |      | 10    | 24.3 | 11  | 35  | 6.913   | 28.45% | -21.5%  | 22.75 | 0.0%    |
| 25     |      | 10    | 25.4 | 6   | 34  | 9.033   | 35.56% | -27.0%  | 22.75 | 0.0%    |
| 50     |      | 10    | 21.4 | 7   | 29  | 6.995   | 32.69% | -7.0%   | 22.75 | 0.0%    |
| 100    |      | 10    | 24.8 | 12  | 38  | 7.714   | 31.11% | -24.0%  | 22.75 | 0.0%    |

### Reproduction Detail

| Conc-% | Code | Rep 1 | Rep 2 | Rep 3 | Rep 4 | Rep 5 | Rep 6 | Rep 7 | Rep 8 | Rep 9 | Rep 10 |
|--------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|
| 0      | D    | 22    | 8     | 25    | 25    | 29    | 24    | 11    | 16    | 24    | 16     |
| 6.25   |      | 14    | 29    | 5     | 26    | 23    | 33    | 20    | 26    | 8     | 22     |
| 12.5   |      | 23    | 29    | 25    | 30    | 20    | 29    | 11    | 18    | 23    | 35     |
| 25     |      | 32    | 34    | 34    | 30    | 20    | 20    | 32    | 6     | 27    | 19     |
| 50     |      | 27    | 24    | 7     | 29    | 21    | 15    | 27    | 15    | 26    | 23     |
| 100    |      | 28    | 38    | 31    | 31    | 25    | 25    | 17    | 23    | 18    | 12     |

# CETIS Analytical Report

Report Date: 23 May-23 13:11 (p 2 of 2)  
Test Code/ID: WVA050223-4 / 03-3899-3020

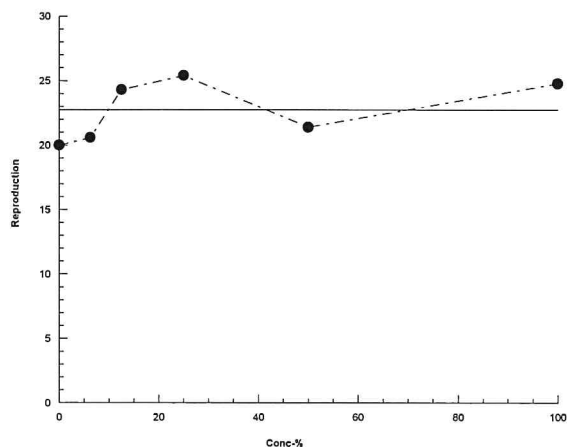
## Ceriodaphnia 7-d Survival and Reproduction Test

Biological Monitoring, Inc.

Analysis ID: 18-5971-3737      Endpoint: Reproduction  
Analyzed: 23 May-23 13:11      Analysis: Linear Interpolation (ICPIN)

CETIS Version: CETISv1.9.4  
Status Level: 1

### Graphics





NELAC ACCREDITED LAB # 460015

Bridge  
202

## Sample Collection – Chain of Custody Form

Lab Sample ID  
(Lab Use Only)

W V A 0 5 0 2 2 3 - 2

### General Information

Client WVWA Contact Name/Phone # (540) 266-2835

NPDES Permit # 4AR0A202.20 Outfall Name/# 13<sup>th</sup> Street

Sample Chlorinated? \_\_\_\_\_ Dechlorinated? \_\_\_\_\_

Should BMI Dechlorinate Sample? \_\_\_\_\_

### Sampling Information

☒ Grab Sample <sup>EP</sup> Date 5/1/23 Time 0800 Volume 3gal

☐ Composite Sample Type \_\_\_\_\_ Time \_\_\_\_\_ Flow \_\_\_\_\_

Composite Start Date \_\_\_\_\_ Composite Start Time \_\_\_\_\_

Composite End Date \_\_\_\_\_ Composite End Time \_\_\_\_\_

# Sub-samples \_\_\_\_\_ Frequency \_\_\_\_\_ Volume \_\_\_\_\_

### Field Measurements

| Temp at Collection Point | Temp In Collection Device | pH | Chlorine | Date/Time | Initials |
|--------------------------|---------------------------|----|----------|-----------|----------|
|                          |                           |    |          |           |          |

### Custody Information

| Relinquished By | Date          | Time        | Received By       | Date            | Time        |
|-----------------|---------------|-------------|-------------------|-----------------|-------------|
| <u>Daniel B</u> | <u>5-1-23</u> | <u>1100</u> | <u>Matt Baker</u> | <u>05/01/23</u> | <u>1100</u> |
|                 |               |             |                   |                 |             |

Daniel Beckman / WVWA

Printed Name/Affiliation

Daniel B

Signature

5-1-23

Date

### Sample Check In (Lab Use Only)

Temperature 2.4 pH 8.13 Chlorine 0.02 DO 8.68 Conductivity/Salinity 245

On Ice? ☒ Custody Seal? N/A Alkalinity 92 Hardness 122

Visual Description clear Odor none

Ammonia (NH3-N) 0.00 Initials VF Date/Time 05-02-23/0900

# BIOLOGICAL MONITORING, INC.

1800 KRAFT DRIVE SUITE 104 BLACKSBURG VIRGINIA 24060  
PH: 540-953-2821 FAX: 540-951-1481 WWW.BIOMON.COM



NELAC ACCREDITED LAB # 460015

## Sample Collection – Chain of Custody Form

Lab Sample ID  
(Lab Use Only)

W V A 0 5 0 923 2 3 - 2

### General Information

Client WVWA Contact Name/Phone # (540) 266-2835

NPDES Permit # 4AR0A202.20 Outfall Name/# 13th Street

Sample Chlorinated? \_\_\_\_\_ Dechlorinated? \_\_\_\_\_  
Should BMI Dechlorinate Sample? \_\_\_\_\_

### Sampling Information



Grab Sample \_\_\_\_\_ Date 5-2-23 Time 1005 Volume 3gal



Composite Sample Type \_\_\_\_\_ Time \_\_\_\_\_ Flow \_\_\_\_\_

Composite Start Date \_\_\_\_\_ Composite Start Time \_\_\_\_\_

Composite End Date \_\_\_\_\_ Composite End Time \_\_\_\_\_

# Sub-samples \_\_\_\_\_ Frequency \_\_\_\_\_ Volume \_\_\_\_\_

### Field Measurements

| Temp at Collection Point | Temp In Collection Device | pH | Chlorine | Date/Time | Initials |
|--------------------------|---------------------------|----|----------|-----------|----------|
|                          |                           |    |          |           |          |

### Custody Information

| Relinquished By    | Date          | Time        | Received By           | Date          | Time        |
|--------------------|---------------|-------------|-----------------------|---------------|-------------|
| <u>Eric Powers</u> | <u>5/2/23</u> | <u>1100</u> | <u>Wendy R. Boyer</u> | <u>5/2/23</u> | <u>1100</u> |
|                    |               |             |                       |               |             |

Eric Powers

Printed Name/Affiliation

Eric Powers

Signature

5/2/23

Date

### Sample Check In (Lab Use Only)

Temperature 3.1 pH 8.24 Chlorine LO.02 DO 9.15 Conductivity/Salinity 253

On Ice? ✓ Custody Seal? N/A Alkalinity 108 Hardness 126

Visual Description Slight yellow tint Odor None

Ammonia (NH3-N) 0.00 Initials Ed Date/Time 05/03/23 0900

OWH 05/03/23



# BIOLOGICAL MONITORING, INC.

1800 KRAFT DRIVE SUITE 104 BLACKSBURG VIRGINIA 24060

PH: 540-953-2821 FAX: 540-951-1481 WWW.BIOMON.COM



NELAC ACCREDITED LAB # 460015

## Sample Collection – Chain of Custody Form

Lab Sample ID  
(Lab Use Only)

|   |   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|---|
| W | V | A | O | S | O | 6 | 2 | 3 | - | 2 |
|---|---|---|---|---|---|---|---|---|---|---|

### General Information

Client WVNA Contact Name/Phone # (540) 266-2835

NPDES Permit # 4A00A202.20 Outfall Name/# 13th Street

Sample Chlorinated? \_\_\_\_\_ Dechlorinated? \_\_\_\_\_  
Should BMI Dechlorinate Sample? \_\_\_\_\_

### Sampling Information



Grab Sample \_\_\_\_\_ Date 5/5/23 Time 1105 Volume 5gal



Composite Sample Type \_\_\_\_\_ Time \_\_\_\_\_ Flow \_\_\_\_\_

Composite Start Date \_\_\_\_\_ Composite Start Time \_\_\_\_\_

Composite End Date \_\_\_\_\_ Composite End Time \_\_\_\_\_

# Sub-samples \_\_\_\_\_ Frequency \_\_\_\_\_ Volume \_\_\_\_\_

### Field Measurements

| Temp at Collection Point | Temp In Collection Device | pH | Chlorine | Date/Time | Initials |
|--------------------------|---------------------------|----|----------|-----------|----------|
|                          |                           |    |          |           |          |

### Custody Information

| Relinquished By    | Date          | Time | Received By        | Date          | Time        |
|--------------------|---------------|------|--------------------|---------------|-------------|
| <u>Eric Powers</u> | <u>5/5/23</u> |      | <u>[Signature]</u> | <u>5/5/23</u> | <u>1205</u> |
|                    |               |      |                    |               |             |

Eric Powers

Printed Name/Affiliation

[Signature]

Signature

5/5/23

Date

### Sample Check In (Lab Use Only)

Temperature 2.5 pH 8.22 Chlorine 40.02 DO 9.22 Conductivity/Salinity 305

On Ice? ✓ Custody Seal? N/A Alkalinity 138 Hardness 152

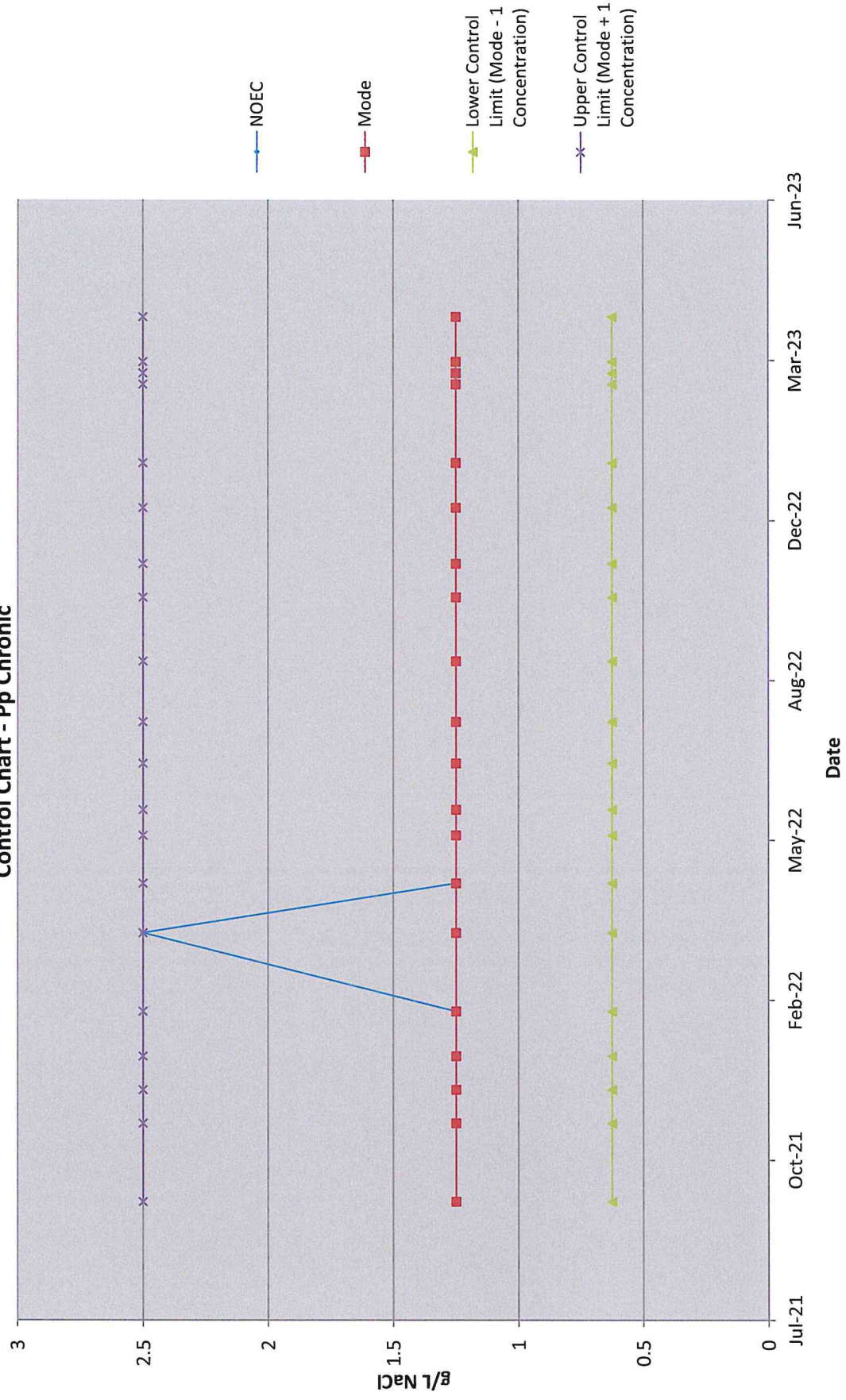
Visual Description clear Odor None

Ammonia (NH<sub>3</sub>-N) 0.06 Initials VF Date/Time 5-6-23/0930



Biological Monitoring, Inc.

Control Chart - Pp Chronic



Biological Monitoring, Inc.

Control Chart - Cd Chronic

