

# REVIEW OF TOXICITY BIOMONITORING REPORT

## Environmental Toxicology, NPDES Permitting Program/OWQ

Biomonitoring Review Report: <u>IDEM/100/29/334/133/2024</u>	Document Date:	03/27/2024
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Discharger: Belmont Advanced WWTP NPDES No. IN0023183  
 City: Indianapolis County: Marion State: IN Zip: 46221

### I. Background Information: (To be Completed by the Testing Lab.)

#### A. Test Material:

Effluent/W. Water: Whole Effluent Outfall No(s): 006  
 Grab/Composite: 24-hr Composite Date(s) Effluent Collected: 03/11/2024 03/13/2024 03/15/2024  
 Concentrations Used: Control, 11.3%, 22.7%, 45, 90.9, 100% Dilution Factor: 0.5  
 Dilution Water: Receiving Water  Reconstituted  Perrier   
 Name of Receiving Water Body: West Fork of White River Test Date(s): 03/12/2024 - 03/19/2024  
03/12/2024 - 03/19/2024

B. Testing Laboratory: BIOMONITOR INC. 8802 W. Washington St.  
 City: Indianapolis State IN Zip 46231

#### Responsible Person(s):

Study Director/Manager: Michael Britton  
 Technical Staff: Initials  
 Phone No. 317-297-7713

#### C. Toxicity Test Conducted:

Acute Test:	Short-Term Chronic Test:
<input checked="" type="checkbox"/> 1. <i>Ceriodaphnia dubia</i> / <i>reticulata</i>	<input checked="" type="checkbox"/> 1. <i>Ceriodaphnia dubia</i> / <i>reticulata</i> Survival & Reproduction test
<input type="checkbox"/> 2. <i>Daphnia magna</i> or <i>D. pulex</i>	<input checked="" type="checkbox"/> 2. <i>Pimephales promelas</i> (FH. minnow) Larval Survival & Growth test
<input checked="" type="checkbox"/> 3. <i>Pimephales promelas</i> (FH. minnow)	<input type="checkbox"/> 3. <i>Selenastrum capricornutum</i> Growth
<input type="checkbox"/> 4. Other: _____	<input type="checkbox"/> 4. Other: _____

#### D. Chemical Analyses Checklist:

Parameter	Day							Comment
	1	2	3	4	5	6	7	
<b>1. Control:</b>								
D.O. Initial	✓	✓	✓	✓	✓	✓	✓	_____
Final	✓	✓	✓	✓	✓	✓	✓	_____
pH Initial	✓	✓	✓	✓	✓	✓	✓	_____
Final	✓	✓	✓	✓	✓	✓	✓	_____
Alkalinity:	✓	—	✓	—	✓	—	—	_____
Hardness:	✓	—	✓	—	✓	—	—	_____
Conductivity:	✓	—	✓	—	✓	—	—	_____
Chlorine:	—	—	—	—	—	—	—	_____
<b>2. Test Sample:</b>								
D.O. Initial	✓	✓	✓	✓	✓	✓	✓	_____
Final	✓	✓	✓	✓	✓	✓	✓	_____
pH Initial	✓	✓	✓	✓	✓	✓	✓	_____
Final	✓	✓	✓	✓	✓	✓	✓	_____
Alkalinity:	✓	—	✓	—	✓	—	—	_____
Hardness:	✓	—	✓	—	✓	—	—	_____
Conductivity:	✓	—	✓	—	✓	—	—	_____
Chlorine:	<u>ND</u>	—	<u>ND</u>	—	<u>ND</u>	—	—	<u>100% Only</u>

**II. *Daphnia* or *Ceriodaphnia* Toxicity Test Information**  
(To be Completed by the Testing Lab.)

**A. Data Analyses:**

Statistical Test	Method Used	Comment
Normality test:	<u>Chi-Square Test</u>	<u>Passed. Indicates Normal Distribution for Reproduction.</u>
Homogeneity test:	<u>Hartley Test</u>	<u>Passed. Indicates Equal Variances for Reprod.</u>
Significance test:		
1. Parametric	<u>Dunnett's Test</u>	<u>Passed. No Significant Difference for Reprod.</u>
2. Non-Parametric:	<u>Steels Many-One Rank Test</u>	
	<u>Fishers Exact Test</u>	<u>Passed. No Significant Difference for Survival.</u>
3. Are the Critical Values of Significance Provided?		<u>Yes</u>
4. Other:	<u>100% survival for all effluent concentrations</u>	

**B. Toxicity Test Results:**

1. **Acute:**  
LC<sub>50</sub> (48-hr): >100% Effluent (<1 TUa)

2. **Chronic:**

NOEL:	Survival	<u>100% (1 TUc)</u>	Reproduction	<u>100% (1 TUc)</u>	Growth	_____
LOEL:	Survival	_____	Reproduction	_____	Growth	_____
Chronic Value:	Survival	_____	Reproduction	_____	Growth	_____

**C. Permit Limits Requirement:**

1. **Acute:**  
LC<sub>50</sub> (48-hr): 100% Effluent (1 TUa)

2. **Chronic:**

NOEL:	Survival	<u>90.9% (1.1 TUc)</u>	Reproduction	<u>90.9% (1.1 TUc)</u>	Growth	_____
LOEL:	Survival	_____	Reproduction	_____	Growth	_____

**D. Reference Toxicant Data:**

- Reference Toxicant:** Copper chloride, Reagent Grade, from Carolina Biological
- Test Date:** February 20 - 27, 2024
- Results:** 48-hr LC<sub>50</sub> = 86 µg/L, NOEL (Reprod.) = 40 µg/L, LOEL (Reprod.) = 80 µg/L as Cu.
- Acceptable Range:** Within Laboratory Control Limits

**E. Permit Limits Compliance:** (To be Completed by IDEM Staff Only)

<input checked="" type="checkbox"/>	Pass (LC50)	<u>(1 TUa)</u>	<input type="checkbox"/>	Fail (LC50)	_____
<input checked="" type="checkbox"/>	Pass (NOEL/Survival)	<u>(1 TUa)</u>	<input type="checkbox"/>	Fail (NOEL/Survival)	_____
<input checked="" type="checkbox"/>	Pass (NOEL/Reprod.)	<u>(1 TUa)</u>	<input type="checkbox"/>	Fail (NOEL/Reprod.)	_____
<input type="checkbox"/>	Pass (NOEL/Growth)	_____	<input type="checkbox"/>	Fail (NOEL/Growth)	_____

Is the Test Acceptable? Yes  No  Reason \_\_\_\_\_

**III. Fathead Minnow (*Pimephales*) Toxicity Test Information**  
*(To be Completed by the Testing Lab.)*

**A. Data Analyses:**

Statistical Test	Method Used	Comment
Normality test:	<u>Chi-Square Test</u>	<u>Passed. Indicates Normal Distribution for Growth.</u>
Homogeneity test:	<u>Hartley Test</u>	<u>Passed. Indicates Equal Variances for Growth.</u>
Significance test:		
1. Parametric	<u>Dunnett's Test</u>	<u>Passed. No Significant Difference for Growth.</u>
2. Non-Parametric:	<u>Steel's Many-One Rank Test</u>	<u>Passed. No Significant Difference for Survival.</u>
3. Are the Critical Values of Significance Provided?		<u>Yes</u>
4. Other:		

**B. Toxicity Test Results:**

1. **Acute:**

LC<sub>50</sub> (96-hr): >100% Effluent (<1 TUa)

2. **Chronic:**

NOEL:	Survival	<u>100% (1 TUc)</u>	Reproduction	_____	Growth	<u>100% (1 TUc)</u>
LOEL:	Survival	_____	Reproduction	_____	Growth	_____
Chronic Value:	Survival	_____	Reproduction	_____	Growth	_____

**C. Permit Limits Requirement:**

1. **Acute:**

LC<sub>50</sub> (96-hr): 100% Effluent (1 TUa)

2. **Chronic:**

NOEL:	Survival	<u>90.9% (1.1 TUc)</u>	Reproduction	_____	Growth	<u>90.9% (1.1 TUc)</u>
LOEL:	Survival	_____	Reproduction	_____	Growth	_____

**D. Reference Toxicant Data:**

- Reference Toxicant: Potassium chloride (KCl) Reagent Grade, from Sigma-Aldrich
- Test Date: February 20 - 27, 2024
- Results: 96-hr LC<sub>5</sub> = 952 mg/L, NOEL (Growth.) = 1000 mg/L, LOEL (Growth.) = 2000 mg/L as KCl
- Acceptable Range: Within Laboratory Control Limits

**E. Permit Limits Compliance:** (To be Completed by IDEM Staff Only)

<input checked="" type="checkbox"/>	Pass (LC50)	<u>(1 TUa)</u>	<input type="checkbox"/>	Fail (LC50)	_____
<input checked="" type="checkbox"/>	Pass (NOEL/Survival)	<u>(1 TUc)</u>	<input type="checkbox"/>	Fail (NOEL/Survival)	_____
<input type="checkbox"/>	Pass (NOEL/Reprod.)	_____	<input type="checkbox"/>	Fail (NOEL/Reprod.)	_____
<input checked="" type="checkbox"/>	Pass (NOEL/Growth)	<u>(1 TUc)</u>	<input type="checkbox"/>	Fail (NOEL/Growth)	_____

Is the Test Acceptable? Yes  No  Reason Passed for Survival/Growth

**IV. GLP and QA/QC Compliance:**  
*(To be completed by IDEM Staff Only)*

**A. Does the Biomonitoring Report provide?**

- |   |       |                                     |    |                          |
|---|-------|-------------------------------------|----|--------------------------|
| 1. GLP Compliance Statement:                        | Yes   | <input checked="" type="checkbox"/> | No | <input type="checkbox"/> |
| 2. QA/QC Compliance Statement:                      | Yes   | <input checked="" type="checkbox"/> | No | <input type="checkbox"/> |
| 3. Were the required GLPs followed?                 | Yes   | <input checked="" type="checkbox"/> | No | <input type="checkbox"/> |
| 4. If not, the Report lacks what major information: | _____ |                                     |    |                          |

**B. Laboratory Raw Data Sheets:**

- |  |       |                                     |    |                          |
|--|-------|-------------------------------------|----|--------------------------|
| 1. Does the Report enclose raw data sheets?                | Yes   | <input checked="" type="checkbox"/> | No | <input type="checkbox"/> |
| 2. Does the raw data sheets provide essential information? | Yes   | <input checked="" type="checkbox"/> | No | <input type="checkbox"/> |
| 3. If not, the Report lacks what major information:        | _____ |                                     |    |                          |

**V. Comments and Recommendations:**  
*(To be Completed by IDEM Staff Only)*

- In March 2024 in the Semi-annual testing whole effluent from **Belmont WWTP** did not demonstrate any acute or chronic toxicity to *Ceriodaphnia dubia* or to Fathead minnow, *Pimephales promelas*. The 48-hr and the 96-hr LC<sub>50</sub> to both the test species was **>100% effluent (<1 TUa)**, respectively and acceptable. Likewise, the NOEL for *Ceriodaphnia dubia* Survival and Reproduction and for *Pimephales promelas* Survival and Growth was **100% effluent (1 TUc)** and acceptable as compared to **99.9% effluent (1.1 TUc)** WET compliance limit in the facility NPDES permit.
- A chemical analysis of the three composite effluent samples collected on March 13, 13 and 15, 2024 was included with the report. **ASTBURY Water Technology, Inc.** Indianapolis, IN performed the testing. Parameters tested were: CBOD<sub>5</sub>, total suspended solids, total dissolved solids, chloride, fluoride, sulfate, total cyanide, amenable cyanide, ammonia and mercury. Results were less than the quantitation and/or the permitted daily maximum limits for each parameter.

**Reviewed by:**

Signature: \_\_\_\_\_

Syed GhiasUddin  
 NPDES Permits Branch, OWQ

Date: \_\_\_\_\_

Title: Environmental Toxicologist

**Electronic copy:**

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