

REVIEW OF TOXICITY BIOMONITORING REPORT

Environmental Toxicology, NPDES Permitting Program/OWQ

Biomonitoring Review Report: <u>IDEM/100/29/334/137/2024</u>	Document Date: <u>04/22/2024</u>
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Discharger: Frankfort WWTP NPDES No. IN0022934
 City: Frankfort County: Clinton State: IN Zip: 46041

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

A. Test Material:

Effluent/W. Water: Whole Effluent Outfall No(s): 001
 Grab/Composite: 24-hr Composite Date(s) Effluent Collected: 04/08/2024 04/10/2024 04/12/2024
 Concentrations Used: Control, 6.25%, 12.5%, 25%, 50%, 100% Dilution Factor: 0.5
 Dilution Water: Receiving Water Reconstituted Perrier
 Name of Receiving Water Body: Prairie Creek 04/09/2024- 04/15/2024
Test Date(s): 04/09/2024- 04/16/2024

B. Testing Laboratory: BIOMONITOR INC. 8802 West Washington Street

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 / reticulata</i>	<input checked="" type="checkbox"/> 1. <i>Ceriodaphnia dubia / 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	
1. Control:								
D.O. Initial	✓	✓	✓	✓	✓	✓	✓	_____
Final	✓	✓	✓	✓	✓	✓	✓	_____
pH Initial	✓	✓	✓	✓	✓	✓	✓	_____
Final	✓	✓	✓	✓	✓	✓	✓	_____
Alkalinity:	✓	—	✓	—	✓	✓	✓	_____
Hardness:	✓	—	✓	—	✓	✓	✓	_____
Conductivity:	✓	—	✓	—	✓	—	—	_____
2. Test Sample:								
D.O. Initial	✓	✓	✓	✓	✓	✓	✓	_____
Final	✓	✓	✓	✓	✓	✓	✓	_____
pH Initial	✓	✓	✓	✓	✓	✓	✓	_____
Final	✓	✓	✓	✓	✓	✓	✓	_____
Alkalinity:	✓	—	✓	—	✓	—	—	_____
Hardness:	✓	—	✓	—	✓	—	—	_____
Conductivity:	✓	—	✓	—	✓	—	—	_____
Chlorine:	✓	—	✓	—	✓	—	—	<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 Reprod.</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>Steel Many-One rank Test</u>	
	<u>Fisher's Exact 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:

LC₅₀ (48-hr): ≥ 100% Effluent (<1 TUa)

2. Chronic:

NOEL:	Survival	<u>100% (1.0 TUc)</u>	Reproduction	<u>100% (1.0 TUc)</u>	Growth	_____
LOEL:	Survival	_____	Reproduction	_____	Growth	_____
Chronic Value:	Survival	_____	Reproduction	_____	Growth	_____

C. Permit Limits Requirement:

1. Acute:

LC₅₀ (48-hr): 100% Effluent (1 TUc)

2. Chronic:

NOEL:	Survival	<u>100% (1.0 TUc)</u>	Reproduction	<u>100% (1.0 TUc)</u>	Growth	_____
LOEL:	Survival	_____	Reproduction	_____	Growth	_____

D. Reference Toxicant Data:

- Reference Toxicant: Copper chloride, Reagent Grade, from Carolina Biological
- Test Date: March 19 – 27, 2024
- Results: 48-hr LC₅₀ = 80 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 (LC ₅₀)	<u>(1 TUa)</u>	<input type="checkbox"/>	Fail (LC ₅₀)	_____
<input checked="" type="checkbox"/>	Pass (NOEL/Survival)	<u>(1 TUc)</u>	<input type="checkbox"/>	Fail (NOEL/Survival)	_____
<input checked="" type="checkbox"/>	Pass (NOEL/Reprod.)	<u>(1 TUc)</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	Dunnett's Test	<u>Passed. No Significant Difference for Growth.</u>
2. Non-Parametric:	<u>Steels Many-One Rank Test</u>	<u>PASSE 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:

LC₅₀ (96-hr): >100% Effluent (<1 TUc)

2. Chronic:

NOEL:	Survival	<u>100% (1.0 TUc)</u>	Reproduction	_____	Growth	<u>100% (1.0 TUc)</u>
LOEL:	Survival	_____	Reproduction	_____	Growth	_____
Chronic Value:	Survival	_____	Reproduction	_____	Growth	_____

C. Permit Limits Requirement:

1. Acute:

LC₅₀ (96-hr): >100% Effluent (<1 TUc)

2. Chronic:

NOEL:	Survival	<u>100% (1.0 TUc)</u>	Reproduction	_____	Growth	<u>100% (1.0 TUc)</u>
LOEL:	Survival	_____	Reproduction	_____	Growth	_____

D. Reference Toxicant Data:

- Reference Toxicant:** Potassium chloride (KCl) Reagent Grade, from Sigma-Aldrich
- Test Date:** March 19 – 26, 2024
- Results:** 96-hr LC₅₀ = 1189 mg/L, NOEL (Growth.) = 500 mg/L, L5EL (Growth) = 1000 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)	(1 TUa)	<input type="checkbox"/>	Fail (LC50)	_____
<input checked="" type="checkbox"/>	Pass (NOEL/Survival)	(1 TUc)	<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)	(1 TUc)	<input type="checkbox"/>	Fail (NOEL/Growth)	_____

Is the Test Acceptable? Yes No _____ Reason _____

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 April 2023 in the Semi-annual testing whole effluent from Frankfort 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 LC₅₀ to both the test species was >100% effluent (<1 TUa), respectively and acceptable. Likewise, the NOEC for *Ceriodaphnia dubia* Survival and Reproduction and for Fathead minnow, *Pimephales promelas* Survival and Growth was 100% effluent (1 TUC) and acceptable as compared to 100% effluent (1 TUC) WET compliance limit in the facility NPDES permit.

Reviewed by:

Signature:  Date: 06/19/2024
 Syed GhiasUddin Title: Environmental Toxicologist
 NPDES Permits Branch, OWQ

Electronic copy:

Jerry Dittmer, BC, NPDES Permitting Branch, OWQ
 Leigh Voss, SC, NPDES Permitting Branch, OWQ