



June 13, 2014

Test Results of  
Second Quarter  
Chronic 7-Day Renewal  
Biomonitoring Testing  
for  
Outfall 001

Control No. 179302-1

Prepared for:

Mr. Ed Carlyle  
City of Nashville  
426 North Main  
Nashville, AR 71852

Prepared by:

AMERICAN INTERPLEX CORPORATION  
8600 Kanis Road  
Little Rock, AR 72204-2322



City of Nashville  
ATTN: Mr. Ed Carlyle  
426 North Main  
Nashville, AR 71852

Re: Chronic 7-Day Renewal utilizing *Pimephales promelas* (Fathead minnow) and *Ceriodaphnia dubia*  
Outfall 001  
NPDES Permit No. NPDES AR0021776 AFIN 31-00036

Dear Mr. Ed Carlyle:

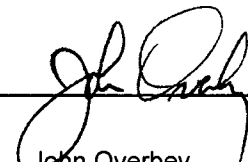
This report is the analytical results and supporting information for the samples submitted to American Interplex Corporation (AIC). The following results are applicable only to the sample identified by the control number referenced above. Accurate assessment of the data requires access to the entire document. Each section of the report has been reviewed and approved by the laboratory director or qualified designee.

Testing procedures and Quality Assurance were in accordance with "Short Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms" EPA-821-R-02-013, Fourth Edition, October 2002. Test results are summarized below:

Method 1000.0 Chronic *Pimephales promelas* (Fathead minnow) Survival and Growth Test: The No Observable Effects Concentration (NOEC) for survival occurred at 97 % effluent, which is above the critical dilution of 73 %. The NOEC for growth occurred at 97 % effluent, which is above the critical dilution of 73 %. **The sample, therefore, PASSED both lethal and sub-lethal effects for the Fathead minnow test.**

Method 1002.0 Chronic *Ceriodaphnia dubia* Survival and Reproduction Test: The No Observable Effects Concentration (NOEC) for survival occurred at 97 % effluent, which is above the critical dilution of 73 %. The NOEC for reproduction occurred at 0 % effluent, which is below the critical dilution of 73 %. **The sample PASSED lethal effects, however, FAILED sub-lethal effects for the *Ceriodaphnia dubia* test.**

AMERICAN INTERPLEX CORPORATION



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John Overbey  
Laboratory Director

PDF cc: City of Nashville  
ATTN: Mr. Ed Carlyle  
mredcarlyle@yahoo.com

I. Control Acceptance Criteria

*Pimephales promelas* (Fathead minnow) Method 1000.0

CRITERIA	RESULTS	PASS/FAIL
Control Survival > or = 80%	100	PASS
Control Growth > or = 0.25 mg per Surviving minnow	0.274	PASS
Control Growth CV < or = 40%	27.6	PASS
Growth Minimum Significant Difference 12 to 30%	24.0	PASS
Critical Dilution CV < or = 40%	8.59	PASS

*Ceriodaphnia dubia* Method 1002.0

CRITERIA	RESULTS	PASS/FAIL
Control Survival > or = 80%	100	PASS
Control Reproduction > or = 15 per Surviving Female	25.7	PASS
Control CV < or = 40% per Surviving Female	8.42	PASS
Reproduction Minimum Significant Difference 13 to 47%	17.7	PASS
Critical Dilution CV < or = 40%	28.1	PASS

II. Outlined Report

A. Introduction

1. Permit Number: NPDES AR0021776 AFIN 31-00036
2. Test Requirements: Test Methods 1000.0 and 1002.0
3. Receiving Stream: Ouachita River Basin

B. Source of Effluent/Dilution Water

1. Effluent Samples:
  - a. Sampling Point: Outfall 001
  - b. Chemical Data:

Analysis	Sample 1	Sample 2	Sample 3
Dissolved oxygen (mg/l)	6.7	7.8	7.5
pH (standard units)	6.8	7.2	7.4
Alkalinity (mg/l as CaCO <sub>3</sub> )	33	35	35
Hardness (mg/l as CaCO <sub>3</sub> )	23	26	26
Conductivity (umhos/cm)	230	240	260
Residual Chlorine (mg/l)	0.080	<0.05	<0.05
Ammonia as N (mg/l)	1.2	1.4	1.1

2. Dilution Water Samples: Synthetic Soft Water #4104
  - a. Dates Prepared: May 29 through June 12, 2014
  - b. Chemical Data:

Analysis	Sample 1	Sample 2	Sample 3
Dissolved oxygen (mg/l)	8.0	7.8	7.5
pH (standard units)	7.1	7.2	7.5
Alkalinity (mg/l as CaCO <sub>3</sub> )	35	35	35
Hardness (mg/l as CaCO <sub>3</sub> )	47	48	48
Conductivity (umhos/cm)	160	160	160
Residual Chlorine (mg/l)	<0.05	<0.05	<0.05

C. Test Methods

1. Test methods used:

Short Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, EPA-821-R-02-013; test Methods 1000.0 and 1002.0, Fathead Minnow Survival and Growth and *Ceriodaphnia dubia* Survival and Reproduction.

2. Endpoint: No Observable Effects Concentration (NOEC)

3. Test Conditions:

*Pimephales promelas* (Fathead minnow) Survival and Growth Method 1000.0

Date & Time Test Initiated: June 3, 2014 at 1400  
Date & Time Test Terminated: June 10, 2014 at 1355  
Type & Volume of Test Chamber: 500 ml disposable beaker  
Volume of Sample: 250 ml  
Number of Organisms per replicate: 8  
Number of Replicates per dilution: 5

*Ceriodaphnia dubia* Survival and Growth Method 1002.0

Date & Time Test Initiated: June 3, 2014 at 1400  
Date & Time Test Terminated: June 10, 2014 at 1600  
Type & Volume of Test Chamber: 30 ml disposable beaker  
Volume of Sample: 15 ml  
Number of Organisms per replicate: 1  
Number of Replicates per dilution: 10

4. Acclimation of test organisms: Obtained from in-house cultures

5. Test Temperature: 25 +/- 1 degree Celsius

D. Test Organisms

1. Scientific Name

- a. Test 1000.0 *Pimephales promelas*
- b. Test 1002.0 *Ceriodaphnia dubia*

III. Data Analysis

The data was analyzed using American Interplex Corporation's Laboratory Information Management Software based on Toxstat.

*Pimephales promelas* (Fathead minnow) survival data was transformed using the Arc Sine transformation. Normality and homogeneity of variance were checked using Shapiro-Wilk's. The survival data was then analyzed using Steel's Many-One Rank Test to determine the No Observable Effects Concentration (NOEC).

Fathead minnow growth data was analyzed for normality and homogeneity of variance using Shapiro-Wilk's and Bartlett's test. Dunnett's Test was used to determine the No Observable Effects Concentration (NOEC) for growth.

*Ceriodaphnia dubia* survival data was analyzed with Fisher's Exact Test. Reproduction data was analyzed using Kolmogorov's Test for Normality and Bartlett's test and analyzed with Dunnett's Test to determine the No Observable Effects Concentration (NOEC) for Reproduction.

IV. Standard Reference Toxicants

American Interplex Corporation has an ongoing test organism culturing program. The sensitivity of the offspring is determined by performing a standard reference toxicant test with each effluent test. Sodium chloride in synthetic moderately hard water is used as prescribed in EPA-821-R-02-013.

*Pimephales promelas* (Fathead minnow)

Chronic reference tests are performed monthly.

A chronic reference test was performed on May 20, 2014 at 1800 to May 27, 2014 at 1600

The results were as follows: (Control No. 178808-1.)

Survival LC-50: 1772 mg/l

Growth IC-25: 2543 mg/l

Growth PMSD: 13.1

*Ceriodaphnia dubia*

Chronic reference tests are performed monthly.

A chronic reference test was performed on May 20, 2014 at 1630 to May 27, 2014 at 1510

The results were as follows: (Control No. 178808-2.)

Survival LC-50: 2050 mg/l

Growth IC-25: 460.6 mg/l

Growth PMSD: 11.4

V. Chemical Analysis/Quality Control

Parameter	Method	% Recovery	Relative % Difference
Alkalinity	SM 2320 B	NA	0.00
Hardness	EPA 200.7	103	0.151
pH	SM 4500-H+ B	100	0.677
Conductivity	EPA 120.1	102	5.48

VI. Organism History

*Pimephales promelas* (Fathead minnow)

Date: June 3, 2014

Age: <24 hours

Source: In-house culture

Water Chemistry Record:

Alkalinity: 57-64 mg/l

Hardness: 80-100 mg/l

Temperature: 25 deg.C

*Ceriodaphnia dubia*

Date: June 3, 2014

Age: <24 hours

Source: In-house culture

Water Chemistry Record:

Alkalinity: 57-64 mg/l

Hardness: 80-100 mg/l

Temperature: 25 deg.C

VII. Results Summary *Pimephales promelas*, Fathead minnow Larval Survival and Growth Test -- Method 1000.0

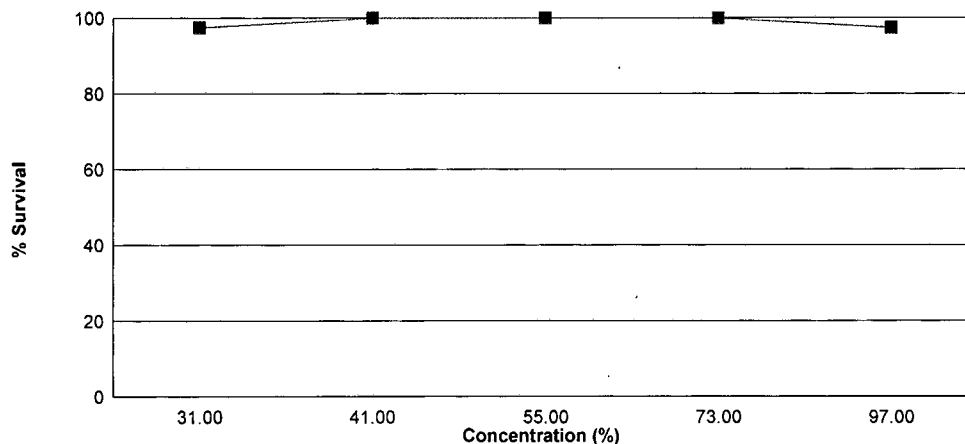
Larvae are exposed in a static renewal system for seven days to different concentrations of effluent with dilution water. Test results are based on the survival and growth (increase in weight) of the larvae.

Effluent dilutions for this test were 31 %, 41 %, 55 %, 73 %, 97 % in accordance with the NPDES permit.

The low flow or 'critical' dilution is specified in the NPDES permit as 73 % effluent.

The test was initiated on June 3, 2014 at 1400 and continued through June 10, 2014 at 1355. Statistical analyses were performed on the observed data and the no observable effects concentrations (NOECs) were as follows:

- a.) NOEC survival = 97 % effluent
- b.) NOEC growth = 97 % effluent



Summary of the 7-day Fathead Minnow Survival and Growth		
Concentration	Percent Survival	Mean Growth (mg)
Control	100	0.274
31 %	97.5	0.273
41 %	100	0.269
55 %	100	0.271
73 %	100	0.279
97 %	97.5	0.272

VII. Results Summary *Ceriodaphnia dubia*, Cladoceran Survival and Reproduction Test -- Method 1002.0

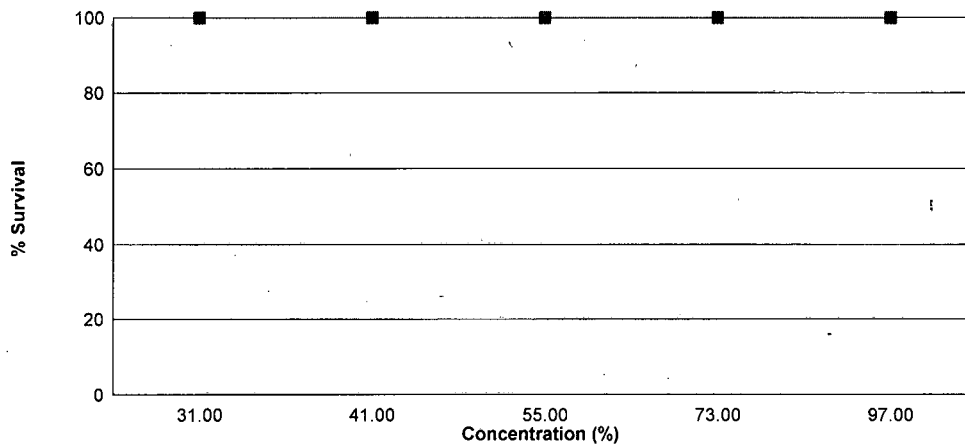
Neonates are exposed in a static renewal system to different concentrations of effluent with dilution water until 60% of surviving control organisms have three broods of offspring with an average of at least 15 young per female.

Effluent dilutions for this test were 31 %, 41 %, 55 %, 73 %, 97 % in accordance with the NPDES permit.

The low flow or 'critical' dilution is specified in the NPDES permit as 73 % effluent.

The test was initiated on June 3, 2014 at 1400 and continued through June 10, 2014 at 1600. Statistical analyses were performed on the observed data and the no observable effects concentrations (NOECs) were as follows:

- a.) NOEC survival = 97 % effluent
- b.) NOEC reproduction = 0 % effluent



Concentration	Percent Survival	Mean Reproduction
Control	100	25.7
31 %	100	19.6 *
41 %	100	21.2
55 %	100	20.0 *
73 %	100	20.2 *
97 %	100	17.1 *

\*Significant difference when compared to the control (p=0.05)



Appendix B: Test 1000.0  
 SUMMARY REPORTING FORMS  
 CHRONIC BIOMONITORING  
*Pimephales promelas* (Fathead Minnow)  
 SURVIVAL AND GROWTH

Permittee: City of Nashville

NPDES No.: NPDES AR0021776 AFIN 31-00036

Date and Time Test Initiated: June 3, 2014 at 1400  
 Date and Time Test Terminated: June 10, 2014 at 1355  
 Dilution water used: Synthetic Soft Water #4104

DATA TABLE FOR SURVIVAL

Effluent Conc. %	Percent Survival in replicate chambers					Mean percent survival			CV%
	A	B	C	D	E	24 hr	48 hr	7 days	
Control	100	100	100	100	100	100	100	100	0.00
31 %	100	87.5	100	100	100	100	97.5	97.5	5.73
41 %	100	100	100	100	100	100	100	100	0.00
55 %	100	100	100	100	100	100	100	100	0.00
73 %	100	100	100	100	100	100	100	100	0.00
97 %	87.5	100	100	100	100	100	100	97.5	5.73

DATA TABLE FOR GROWTH

Effluent Conc. %	Average dry weight, mg replicate chambers					Mean dry weight, mg	CV%
	A	B	C	D	E		
Control	0.219	0.168	0.320	0.335	0.326	0.274	27.6
31 %	0.216	0.260	0.285	0.311	0.291	0.273	13.4
41 %	0.252	0.274	0.291	0.269	0.261	0.269	5.45
55 %	0.242	0.246	0.310	0.272	0.286	0.271	10.5
73 %	0.265	0.314	0.290	0.274	0.252	0.279	8.59
97 %	0.201	0.256	0.254	0.304	0.345	0.272	20.1

CV = Coefficient of variation = standard deviation \* 100 / mean



Appendix B: Test 1000.0  
SUMMARY REPORTING FORMS  
CHRONIC BIOMONITORING  
*Pimephales promelas* (Fathead Minnow)  
SURVIVAL AND GROWTH

1. Steel's Many-One Rank Test:

Is the mean survival significantly different ( $p=0.05$ ) than the control survival for the % effluent corresponding to (lethality):

a.) LOW FLOW OR CRITICAL DILUTION	(73 %)	_____ YES	_____ X NO
b.) 1/2 LOW FLOW DILUTION	(NA)	_____ YES	_____ NO

2. Dunnett's Test:

Is the mean dry weight (growth) significantly different ( $p=0.05$ ) than the control's dry weight (growth) for the % effluent corresponding to (significant non-lethal effects):

a.) LOW FLOW OR CRITICAL DILUTION	(73 %)	_____ YES	_____ X NO
b.) 1/2 LOW FLOW DILUTION	(NA)	_____ YES	_____ NO

3. If you answered NO to 1.a) enter [0] otherwise enter [1]:   0   (TLP6C)
4. If you answered NO to 2.a) enter [0] otherwise enter [1]:   0   (TGP6C)
5. NOEC *Pimephales* Lethality:   97 %   (TOP6C)
6. LOEC *Pimephales* Lethality:   97 %   (TXP6C)
7. NOEC *Pimephales* Sublethality:   97 %   (TPP6C)
8. LOEC *Pimephales* Sublethality:   97 %   (TYP6C)
9. Coefficient of variation for *Pimephales* growth:   27.6   (TQP6C)

## Appendix B: Test 1000.0

**CHRONIC TOXICITY SUMMARY FORM**  
*Pimephales promelas* (Fathead minnow)  
**CHEMICAL PARAMETERS CHART**

PERMITTEE: <u>City of Nashville</u>	SAMPLE No. 1 COLLECTED ending: <u>DATE: June 3, 2014</u>	TIME: <u>0800</u>
NPDES NO.: <u>NPDES AR0021776 AFIN 31-000</u>	SAMPLE No. 2 COLLECTED ending: <u>DATE: June 5, 2014</u>	TIME: <u>0800</u>
CONTACT: <u>Mr. Ed Carlyle</u>	SAMPLE No. 3 COLLECTED ending: <u>DATE: June 8, 2014</u>	TIME: <u>    </u>
ANALYST: <u>280, 304, 307, 310</u>	Test Initiated: <u>DATE: June 3, 2014</u>	TIME: <u>1400</u>
	Test Terminated: <u>DATE: June 10, 2014</u>	TIME: <u>1355</u>

DILUTION Control	DAY						
	1	2	3	4	5	6	7
D.O. Initial	8.0	7.6	7.8	7.7	7.5	7.8	7.9
Final	8.1	7.1	6.9	7.1	7.7	7.6	6.7
pH Initial	7.1	7.2	7.2	7.2	7.5	7.2	7.4
Final	7.6	7.0	7.1	7.2	7.5	7.3	7.0
Alkalinity	35	NA	35	NA	35	NA	NA
Hardness	47	NA	48	NA	48	NA	NA
Conductivity	160	150	160	160	160	160	150
Chlorine	<0.05	NA	<0.05	NA	<0.05	NA	NA

DILUTION 31 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	7.8	7.6	7.8	7.7	7.8	7.6	8.0
Final	7.8	6.7	6.8	7.3	7.9	7.5	6.7
pH Initial	7.0	7.0	7.2	7.3	7.4	7.2	7.4
Final	7.4	6.9	7.0	7.2	7.6	7.3	6.9
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	180	180	180	190	190	190	180
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION 41 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	7.7	7.6	7.9	7.8	7.6	7.7	8.0
Final	8.0	6.4	6.9	6.9	7.8	7.8	6.8
pH Initial	7.0	6.9	7.2	7.2	7.4	7.2	7.3
Final	7.5	6.9	7.0	7.2	7.6	7.3	6.9
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	190	190	190	200	200	200	190
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION 55 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	7.5	7.4	7.8	7.6	7.4	7.6	8.0
Final	7.8	6.2	6.8	7.3	7.7	7.7	6.8
pH Initial	7.0	6.9	7.2	7.2	7.4	7.2	7.3
Final	7.4	6.8	7.0	7.2	7.5	7.4	7.0
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	200	200	200	210	210	210	200
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION 73 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	7.7	7.3	7.7	7.7	8.0	7.7	7.9
Final	7.7	6.4	6.7	7.3	7.7	7.5	6.8
pH Initial	6.9	6.9	7.2	7.2	7.4	7.2	7.3
Final	7.4	6.9	7.0	7.2	7.5	7.3	7.0
Alkalinity	33	NA	35	NA	35	NA	NA
Hardness	29	NA	33	NA	33	NA	NA
Conductivity	210	210	220	220	220	220	220
Chlorine	<0.05	NA	<0.05	NA	<0.05	NA	NA

DILUTION 97 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	7.1	7.2	7.8	7.7	7.7	7.5	7.8
Final	7.8	6.4	6.9	7.5	8.0	8.1	6.8
pH Initial	6.8	6.8	7.2	7.2	7.4	7.1	7.2
Final	7.4	6.8	7.0	7.3	7.6	7.4	7.0
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	230	230	240	240	240	240	240
Chlorine	NA	NA	NA	NA	NA	NA	NA

Appendix B: Test 1002.0  
SUMMARY REPORTING FORMS  
CHRONIC BIOMONITORING  
*Ceriodaphnia dubia*  
SURVIVAL AND REPRODUCTION

Permittee: City of Nashville

NPDES No.: NPDES AR0021776 AFIN 31-00036

Date and Time Test Initiated: June 3, 2014 at 1400  
Date and Time Test Terminated: June 10, 2014 at 1600  
Dilution water used: Synthetic Soft Water #4104

PERCENT SURVIVAL

Time of Reading	Control	Percent Effluent				
		31 %	41 %	55 %	73 %	97 %
24 hour	100	100	100	100	100	100
48 hour	100	100	100	100	100	100
7 day	100	100	100	100	100	100

NUMBER OF YOUNG PRODUCED PER FEMALE @ 7 DAYS

Replicates	Control	Percent Effluent				
		31 %	41 %	55 %	73 %	97 %
A	25	17	22	21	11	20
B	26	20	20	22	27	23
C	24	14	24	16	29	19
D	23	15	19	17	15	13
E	26	23	23	29	19	18
F	24	21	22	14	17	13
G	24	27	28	20	19	21
H	27	25	14	18	23	12
I	30	24	21	26	17	17
J	28	10	19	17	25	15
Mean per Adult	25.7	19.6	21.2	20.0	20.2	17.1
Mean per Surviving Adult	25.7	19.6	21.2	20.0	20.2	17.1
CV %	8.42	27.9	17.3	23.3	28.1	22.0

CV = Coefficient of variation = standard deviation \* 100 / mean  
(calculated based on young produced by surviving females)



Appendix B: Test 1002.0  
 SUMMARY REPORTING FORMS  
 CHRONIC BIOMONITORING  
*Ceriodaphnia dubia*  
 SURVIVAL AND REPRODUCTION

1. Fisher's Exact Test:

Is the mean survival significantly different ( $p=0.05$ ) than the control survival for the % effluent corresponding to (lethality):

a.) LOW FLOW OR CRITICAL DILUTION	(73 %)	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO
b.) 1/2 LOW FLOW DILUTION	(NA)	<input type="checkbox"/> YES	<input type="checkbox"/> NO

2. Dunnett's Test:

Is the mean number of young produced per female significantly different ( $p=0.05$ ) than the control's number of young per female for the % effluent corresponding to (significant non-lethal effects):

a.) LOW FLOW OR CRITICAL DILUTION	(73 %)	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO
b.) 1/2 LOW FLOW DILUTION	(NA)	<input type="checkbox"/> YES	<input type="checkbox"/> NO

- 3. If you answered NO to 1.a) enter [0] otherwise enter [1]: 0 (TLP3B)
- 4. If you answered NO to 2.a) enter [0] otherwise enter [1]: 1 (TGP3B)
- 5. NOEC Ceriodaphnia Lethality: 97 % (TOP3B)
- 6. LOEC Ceriodaphnia Lethality: 97 % (TXP3B)
- 7. NOEC Ceriodaphnia Sublethality: 0 % (TPP3B)
- 8. LOEC Ceriodaphnia Sublethality: 0 % (TYP3B)
- 9. Coefficient of variation for Ceriodaphnia Reproduction: 28.1 (TQP3B)

## Appendix B: Test 1002.0

**CHRONIC TOXICITY SUMMARY FORM**  
*Ceriodaphnia dubia*  
**CHEMICAL PARAMETERS CHART**

PERMITTEE: <u>City of Nashville</u>	SAMPLE No. 1 COLLECTED ending: _____	DATE: <u>June 3, 2014</u>	TIME: <u>0800</u>
NPDES NO.: <u>NPDES AR0021776 AFIN 31-000</u>	SAMPLE No. 2 COLLECTED ending: _____	DATE: <u>June 5, 2014</u>	TIME: <u>0800</u>
CONTACT: <u>Mr. Ed Carlyle</u>	SAMPLE No. 3 COLLECTED ending: _____	DATE: <u>June 8, 2014</u>	TIME: _____
ANALYST: <u>280, 304, 307, 310</u>	Test Initiated: _____	DATE: <u>June 3, 2014</u>	TIME: <u>1400</u>
	Test Terminated: _____	DATE: <u>June 10, 2014</u>	TIME: <u>1600</u>

DILUTION	DAY						
	1	2	3	4	5	6	7
Control							
D.O. Initial	8.0	7.6	7.8	7.7	7.5	7.8	7.9
Final	7.7	7.8	7.7	7.9	8.1	8.5	8.2
pH Initial	7.1	7.2	7.2	7.2	7.5	7.2	7.4
Final	7.2	7.4	7.4	7.6	7.4	7.4	7.3
Alkalinity	35	NA	35	NA	35	NA	NA
Hardness	47	NA	48	NA	48	NA	NA
Conductivity	160	150	160	160	160	160	150
Chlorine	<0.05	NA	<0.05	NA	<0.05	NA	NA

DILUTION	DAY						
	1	2	3	4	5	6	7
31 %							
D.O. Initial	7.8	7.6	7.8	7.7	7.8	7.6	8.0
Final	7.6	7.5	7.8	7.8	8.0	8.6	8.0
pH Initial	7.0	7.0	7.2	7.3	7.4	7.2	7.4
Final	7.2	7.2	7.4	7.7	7.4	7.5	7.2
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	180	180	180	190	190	190	180
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION	DAY						
	1	2	3	4	5	6	7
41 %							
D.O. Initial	7.7	7.6	7.9	7.8	7.6	7.7	8.0
Final	7.6	7.6	7.7	7.8	8.0	8.5	8.0
pH Initial	7.0	6.9	7.2	7.2	7.4	7.2	7.3
Final	7.2	7.3	7.4	7.5	7.4	7.5	7.2
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	190	190	190	200	200	200	190
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION	DAY						
	1	2	3	4	5	6	7
55 %							
D.O. Initial	7.5	7.4	7.8	7.6	7.4	7.6	8.0
Final	7.6	7.8	7.8	7.7	7.9	8.5	8.0
pH Initial	7.0	6.9	7.2	7.2	7.4	7.2	7.3
Final	7.2	7.3	7.4	7.5	7.4	7.5	7.1
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	200	200	200	210	210	210	200
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION	DAY						
	1	2	3	4	5	6	7
73 %							
D.O. Initial	7.7	7.3	7.7	7.7	8.0	7.7	7.9
Final	7.6	7.7	7.8	7.8	8.2	8.5	7.8
pH Initial	6.9	6.9	7.2	7.2	7.4	7.2	7.3
Final	7.2	7.3	7.5	7.5	7.4	7.5	7.1
Alkalinity	33	NA	35	NA	35	NA	NA
Hardness	29	NA	33	NA	33	NA	NA
Conductivity	210	210	220	220	220	220	220
Chlorine	<0.05	NA	<0.05	NA	<0.05	NA	NA

DILUTION	DAY						
	1	2	3	4	5	6	7
97 %							
D.O. Initial	7.1	7.2	7.8	7.7	7.7	7.5	7.8
Final	7.5	7.5	7.7	7.9	8.1	8.5	7.7
pH Initial	6.8	6.8	7.2	7.2	7.4	7.1	7.2
Final	7.2	7.2	7.5	7.5	7.4	7.5	7.0
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	230	230	240	240	240	240	240
Chlorine	NA	NA	NA	NA	NA	NA	NA

426 NORTH MAIN STREET  
NASHVILLE, AR 71852  
870-845-4015

WASTE TREATMENT PLANT  
LABORATORY ANALYSIS  
FOR BIOMONITORING REPORTS

COLLECTION DATE: 6-2/3-14

COLLECTION TIME: 0800 - 0800

COLLECTION PLACE: OUTFALL 001

CBOD	<u>.34</u>	mg/L	#5210B
TSS	<u>6</u>	mg/L	#2540D
AMMN	<u>1.14</u>	mg/L	#4500-NH3 A-B
FECAL COL.	<u>8</u>	mg/L	#9222D
CHLORINE	<u>.04</u>	mg/L	#4500-CI D
pH	<u>7.40</u>	mg/L	#4500 - H
DO	<u>8.21</u>	mg/L	#4500 - OG

ANALYST: EC COLLECTED BY: EC

Analysis include 10% replication  
Test performed as required in Standards Methods  
Samples are iced at time of collection

426 NORTH MAIN STREET  
NASHVILLE, AR 71852  
870-845-4015

WASTE TREATMENT PLANT  
LABORATORY ANALYSIS  
FOR BIOMONITORING REPORTS

COLLECTION DATE: 6/4-5/14

COLLECTION TIME: 0800 - 0800

COLLECTION PLACE: OUTFALL 001

CBOD	<u>.53</u>	mg/L	#5210B
TSS	<u>4</u>	mg/L	#2540D
AMMN	<u>1.21</u>	mg/L	#4500-NH3 A-B
FECAL COL.	<u>6</u>	mg/L	#9222D
CHLORINE	<u>.02</u>	mg/L	#4500-Cl D
pH	<u>7.35</u>	mg/L	#4500 - H
DO	<u>7.91</u>	mg/L	#4500 - OG

ANALYST: EC COLLECTED BY: EC

Analysis include 10% replication  
Test performed as required in Standards Methods  
Samples are iced at time of collection

426 NORTH MAIN STREET  
NASHVILLE, AR 71852  
870-845-4015

WASTE TREATMENT PLANT  
LABORATORY ANALYSIS  
FOR BIOMONITORING REPORTS

COLLECTION DATE: 6/6-7/14  
COLLECTION TIME: 0800 - 0800  
COLLECTION PLACE: OUTFALL 001

CBOD	<u>.47</u>	mg/L	#5210B
TSS	<u>3</u>	mg/L	#2540D
AMMN	<u>1.20</u>	mg/L	#4500-NH3 A-B
FECAL COL.	<u>11</u>	mg/L	#9222D
CHLORINE	<u>.03</u>	mg/L	#4500-CI D
pH	<u>7.21</u>	mg/L	#4500 - H
DO	<u>7.83</u>	mg/L	#4500 - OG

ANALYST: EC COLLECTED BY: EC

Analysis include 10% replication  
Test performed as required in Standards Methods  
Samples are iced at time of collection





CHAIN OF CUSTODY / ANALYSIS REQUEST FORM

PAGE OF

Client: <b>CITY OF NASHVILLE</b>			PO No.		NO OF BOTTLES	ANALYSES REQUESTED <sup>1</sup>										AIC CONTROL NO: 179302								
Project Reference: <b>BIOMONITORING 2ND Q</b>			SAMPLE MATRIX			FATHEAD	MINNOW	CERIODAPINE	DUBIA											AIC PROPOSAL NO:				
Project Manager: <b>ED CARLYLE JR</b>			WATER	SOIL						WASTE											Carrier/Tracking No.			
Sampled By: <b>Ed Carlyle Jr</b>																					Received Temperature C			
AIC No.	Sample Identification	Date/Time Collected	GRAB	COMP																			Remarks	
1	NASHV BIO	6/2-3/14		X			X	3		X														
	2Q14	0800-0800																						
				2				1																
				4				G																
				H				A																
				R				L																
Container Type								P																Field pH calibration
Preservative								NO																on @
																								Buffer:

G = Glass P = Plastic V = VOA vials H = HCl to pH2 T = Sodium Thiosulfate  
 NO = none S = Sulfuric acid pH2 N = Nitric acid pH2 B = NaOH to pH12 Z = Zinc acetate

**NORMAL TURNAROUND**  
**CONTACT: ED CARLYLE, JR.**  
**870-557-3143 FAX: 870-845-7409**  
**REPORT TO: ED CARLYLE, JR.**  
**426 NORTH MAIN**  
**NASHVILLE, AR 71852**

Relinquished By: <i>Ed Carlyle Jr</i>	Date/Time: <b>6-3-14 11:20</b>	Received By:	Date/Time:
Relinquished By:	Date/Time:	Received in Lab By: <i>[Signature]</i>	Date/Time: <b>6-3-14 11:20</b>

Comments: **hand delivered ON ICE TO LABORATORY**



CHAIN OF CUSTODY / ANALYSIS REQUEST FORM

Client: CITY OF NASHVILLE		PO No.		NO OF BOTTLES	ANALYSES REQUESTED <sup>1</sup>										AIC CONTROL NO: 179302	
Project Reference: BIOMONITORING 2ND Q		SAMPLE MATRIX			WATER	SOIL	WASTE	FATHEAD	MINNOW	CERIODAPHNIA	DUBIA	AIC PROPOSAL NO:				
Project Manager: ED CARLYLE JR.		G R A B C O M P										Carrier/Tracking No.				
Sampled By: Ed Carlyle Jr.		Date/Time Collected		Received Temperature C		Remarks										
AIC No.	Sample Identification															
(2)	NASHUBIO	6/4-5/14				X	X									
	2NDQ14(2)	0800-0800														
				2												
				4												
				H												
				R												
Container Type																
Preservative																

G = Glass P = Plastic V = VOA vials H = HCl to pH2 T = Sodium Thiosulfate  
 NO = none S = Sulfuric acid pH2 N = Nitric acid pH2 B = NaOH to pH12 Z = Zinc acetate

**NORMAL TURNAROUND**  
**CONTACT: ED CARLYLE, JR.**  
**870-557-3143 FAX: 870-845-7409**  
**REPORT TO: ED CARLYLE, JR.**  
**426 NORTH MAIN**  
**NASHVILLE, AR 71852**

Relinquished By: Ed Carlyle Jr.	Date/Time: 6/5/14 8:15	Received By: Ed Carlyle Jr.	Date/Time: 6/5/14 8:15
Relinquished By: Ed Carlyle Jr.	Date/Time: 6/5/14 10:45	Received in Lab By: [Signature]	Date/Time: 6-5-14 10:45

Comments: hand delivered on ice to laboratory second set of samples



CHAIN OF CUSTODY / ANALYSIS REQUEST FORM

PAGE OF

Client: <b>CITY OF NASHVILLE</b>			PO No.		NO OF BOTTLES	ANALYSES REQUESTED <sup>1</sup>										AIC CONTROL NO: <b>179302</b>					
Project Reference: <b>BIOMONITORING 2ND Q</b>			SAMPLE MATRIX			3	FATHEAD	MINNOW	CERIODAPHNIA	DUBIA											AIC PROPOSAL NO:
Project Manager: <b>ED CARLYLE JR</b>			WATER	SOIL	3						X		X								
Sampled By: <b>Ed Carlyle Jr.</b>						G R A B	C O M P	3	X						X						
AIC No.	Sample Identification	Date/Time Collected																			
3	NASHUBIO				3	X		X													
	2NDQ14(3)				1																
					G																
					A																
					L																
					P															Field pH calibration	
					NO															on _____ @ _____	
																				Buffer:	

G = Glass    P = Plastic    V = VOA vials    H = HCl to pH2    T = Sodium Thiosulfate  
 NO = none    S = Sulfuric acid pH2    N = Nitric acid pH2    B = NaOH to pH12    Z = Zinc acetate

**T**  
**E**  
**V**  
**P**  
**R**  
**REPORT TO: ED CARLYLE, JR.**  
**426 NORTH MAIN**  
**NASHVILLE, AR 71852**

Relinquished By: <b>Ed Carlyle Jr.</b>	Date/Time <b>8:15 6-7-14</b>	Received By: <b>[Signature]</b>	Date/Time <b>8:15 6-7-14</b>
Relinquished By: <b>[Signature]</b>	Date/Time <b>10:30 6-7-14</b>	Received in Lab By: <b>SA310</b>	Date/Time <b>7 June 14 10:30</b>

Comments:

Nashville Public Works

426 North Main, Nashville, AR 71852  
PH (870) 845-4015, FAX (870) 845-7409

July 2, 2014

STATE OF ARKANSAS  
Arkansas Department of Environmental Quality  
5301 Northshore Drive  
North Little Rock, AR 72118-5317

Attn: Mr. Allen Anderson  
Administrative Assistant, NPDES Enforcement

Re: NPDES Permit #AR0021776, AFIN # 31-00036  
Bio-monitoring Results Second Quarter - 2014

Dear Mr. Anderson:

Please find enclosed our results for the second quarter of 2014. Results have indicated that we passed both tests for fathead minnow. We have passed the lethal effects for Ceriodaphnia Dubia , however , failed sub -lethal and will be retesting the week of July 7, 2014 and will turnover those results as soon as possible,

If you have any questions of concern, please contact me at 870-845-4015.

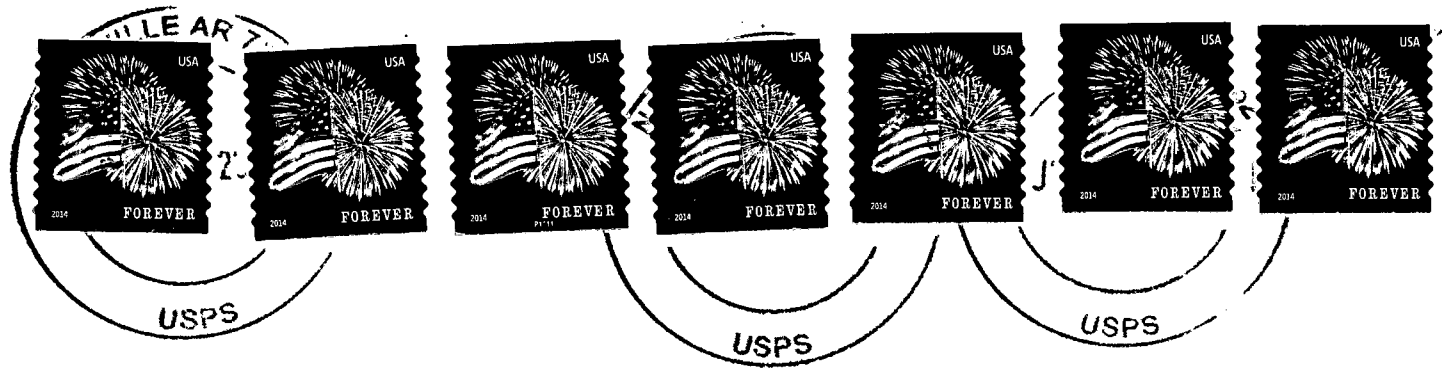
Sincerely,



Larry Dunaway  
Public Works Director

cc: Pretreatment File 2014

**CITY OF NASHVILLE  
LARRY DUNAWAY  
PUBLIC WORKS  
DIRECTOR  
426 NORTH MAIN STREET  
NASHVILLE, AR 71852**



**Arkansas Department of  
Environmental Quality  
Attn: Mr. Allen Anderson  
Enforcement Assistant, NPDES  
5301 Northshore Drive  
Little Rock, AR 72118-5317**

