

Nashville Public Works

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

November 18, 2013

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 Forth Quarter - 2013

Dear Mr. Anderson:

Please find enclosed our results for the forth quarter of 2013. Results have indicated that we passed both tests for fathead minnow and both tests for the ceriodaphnia-dubia.

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

Sincerely,



Larry Dunaway
Public Works Director

cc: Jeremy Stone, City Engineer
Pretreatment File, 2013

November 6, 2013

Test Results of
Fourth Quarter
Chronic 7-Day Renewal
Biomonitoring Testing
for
Outfall 001
Nashville, AR

Control No. 171778-1

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 - Nashville, AR
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 %. Any statistical difference with sublethal effects cannot be considered toxic due to the minimum significant difference (PMSD) calculated result being below the lower PMSD bounds. **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 97 % effluent, which is above the critical dilution of 73 %. **The sample, therefore, PASSED both lethal and sub-lethal effects for the *Ceriodaphnia dubia* test.**

AMERICAN INTERPLEX CORPORATION

A handwritten signature in black ink, appearing to read 'John Overbey', is written over a horizontal line.

John Overbey
Laboratory Director

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

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Pimephales promelas (Fathead minnow) Survival and Growth

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Ceriodaphnia dubia Survival and Reproduction

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I. Control Acceptance Criteria

Pimephales promelas (Fathead minnow) Method 1000.0

CRITERIA	RESULTS	PASS/FAIL
Control Survival > or = 80%	97.5	PASS
Control Growth > or = 0.25 mg per Surviving minnow	0.318	PASS
Control Growth CV < or = 40%	7.97	PASS
Growth Minimum Significant Difference 12 to 30%	11.7	BELOW
Critical Dilution CV < or = 40%	7.24	PASS

Ceriodaphnia dubia Method 1002.0

CRITERIA	RESULTS	PASS/FAIL
Control Survival > or = 80%	100	PASS
Control Reproduction > or = 15 per Surviving Female	21.8	PASS
Control CV < or = 40% per Surviving Female	10.5	PASS
Reproduction Minimum Significant Difference 13 to 47%	22.0	PASS
Critical Dilution CV < or = 40%	13.5	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)	8.0	8.2	8.6
pH (standard units)	7.6	7.6	7.7
Alkalinity (mg/l as CaCO ₃)	85	81	81
Hardness (mg/l as CaCO ₃)	37	38	38
Conductivity (umhos/cm)	480	480	490
Residual Chlorine (mg/l)	0.070	0.11	<0.05
Ammonia as N (mg/l)	2.6	3.3	4.1

2. Dilution Water Samples: Synthetic Soft Water #4029

- a. Dates Prepared: October 9 through October 23, 2013
- b. Chemical Data:

Analysis	Sample 1	Sample 2	Sample 3
Dissolved oxygen (mg/l)	7.8	8.2	8.9
pH (standard units)	7.5	7.7	7.7
Alkalinity (mg/l as CaCO ₃)	31	32	32
Hardness (mg/l as CaCO ₃)	48	46	46
Conductivity (umhos/cm)	170	180	170
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: October 22, 2013 at 1630
Date & Time Test Terminated: October 29, 2013 at 1430
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: October 22, 2013 at 1455
Date & Time Test Terminated: October 30, 2013 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 analyzed with Steel's Many-One Rank Test to determine the No Observable Effects Concentration (NOEC) for Reproduction. Dunnett's Test was used to calculate the PMSD.

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 October 22, 2013 at 1720 to October 29, 2013 at 1637

The results were as follows: (Control No. 171796-1.)

Survival LC-50: 3370 mg/l

Growth IC-25: 2260 mg/l

Growth PMSD: 7.84

Ceriodaphnia dubia

Chronic reference tests are performed monthly.

A chronic reference test was performed on October 22, 2013 at 1630 to October 29, 2013 at 1620

The results were as follows: (Control No. 171796-2.)

Survival LC-50: 1853 mg/l

Growth IC-25: 1136 mg/l

Growth PMSD: 15.1

V. Chemical Analysis/Quality Control

Parameter	Method	% Recovery	Relative % Difference
Alkalinity	SM 2320 B	NA	0.00
Hardness	EPA 200.7	97.1	3.00
pH	SM 4500-H+ B	101	0.538
Conductivity	EPA 120.1	105	0.647

VI. Organism History

Pimephales promelas (Fathead minnow)

Date: October 22, 2013

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: October 22, 2013

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

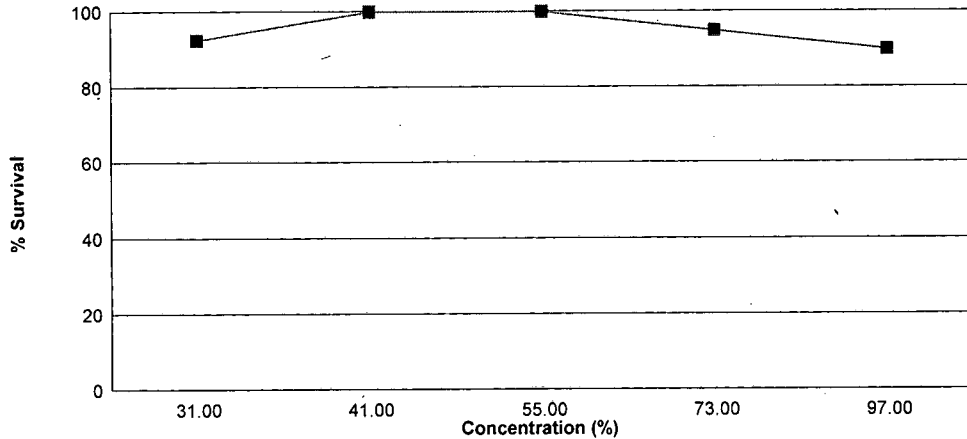
Larvae are exposed in a static renewal system for seven days to different concentrations of effluent with dilution water. Test results are based on the survival and growth (increase in weight) of the larvae.

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 October 22, 2013 at 1630 and continued through October 29, 2013 at 1430. 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	97.5	0.310
31 %	92.5	0.282
41 %	100	0.297
55 %	100	0.276
73 %	95.0	0.330
97 %	90.0	0.281

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

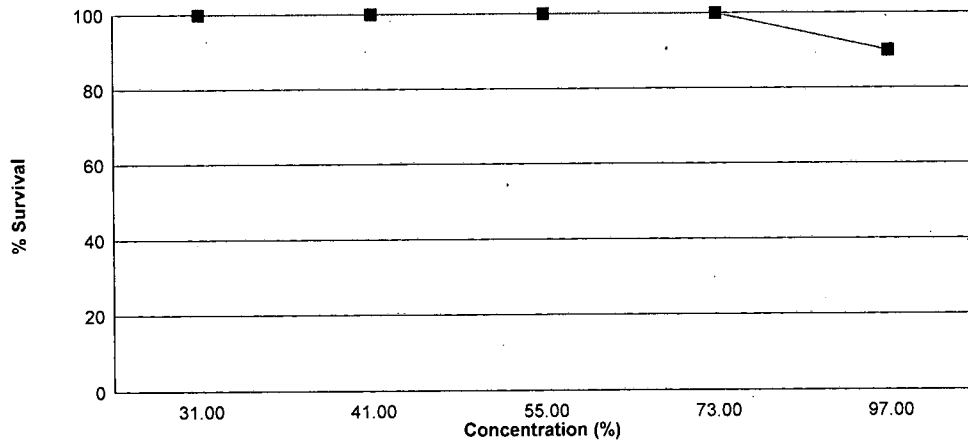
Neonates are exposed in a static renewal system to different concentrations of effluent with dilution water until 60% of surviving control organisms have three broods of offspring with an average of at least 15 young per female.

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 October 22, 2013 at 1455 and continued through October 30, 2013 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 = 97 % effluent



Concentration	Percent Survival	Mean Reproduction
Control	100	21.8
31 %	100	25.0
41 %	100	22.0
55 %	100	21.8
73 %	100	20.7
97 %	90.0	19.1

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: October 22, 2013 at 1630

Date and Time Test Terminated: October 29, 2013 at 1430

Dilution water used: Synthetic Soft Water #4029

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	87.5	100	100	100	100	100	97.5	5.73
31 %	100	87.5	100	100	75.0	100	100	92.5	12.1
41 %	100	100	100	100	100	100	100	100	0.00
55 %	100	100	100	100	100	100	100	100	0.00
73 %	75.0	100	100	100	100	100	97.5	95.0	11.8
97 %	100	87.5	100	87.5	75.0	100	100	90.0	11.6

DATA TABLE FOR GROWTH

Effluent Conc. %	Average dry weight, mg replicate chambers					Mean dry weight, mg	CV%
	A	B	C	D	E		
Control	0.301	0.280	0.302	0.346	0.320	0.31	7.97
31 %	0.262	0.264	0.275	0.314	0.296	0.282	7.91
41 %	0.315	0.324	0.298	0.284	0.265	0.297	7.97
55 %	0.252	0.249	0.285	0.309	0.284	0.276	9.13
73 %	0.291	0.341	0.341	0.324	0.352	0.33	7.24
97 %	0.282	0.268	0.305	0.304	0.244	0.281	9.16

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 %)	<u> </u> YES	<u> X </u> NO
b.) 1/2 LOW FLOW DILUTION	(NA)	<u> </u> YES	<u> </u> 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 %)	<u> </u> YES	<u> X </u> NO
b.) 1/2 LOW FLOW DILUTION	(NA)	<u> </u> YES	<u> </u> 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: 7.97 (TQP6C)

Appendix B: Test 1000.0

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

PERMITTEE: City of Nashville SAMPLE No. 1 COLLECTED ending: DATE: October 22, 2013 TIME: 0800
 NPDES NO.: NPDES AR0021776 AFIN 31-000 SAMPLE No. 2 COLLECTED ending: DATE: October 24, 2013 TIME: 0800
 CONTACT: Mr. Ed Carlyle 1600
 ANALYST: 280, 298, 304, 307

Test Initiated: DATE: October 22, 2013 TIME: 1630
 Test Terminated: DATE: October 29, 2013 TIME: 1430

DILUTION	DAY						
	1	2	3	4	5	6	7
Control							
D.O. Initial	7.8	7.8	8.2	8.3	8.9	9.0	8.1
Final	7.8	7.7	7.8	8.1	8.8	7.7	7.3
pH Initial	7.5	7.4	7.7	7.6	7.7	7.8	7.7
Final	7.5	7.5	7.5	7.5	7.5	7.5	7.4
Alkalinity	31	NA	32	NA	32	NA	NA
Hardness	48	NA	46	NA	46	NA	NA
Conductivity	170	180	180	170	170	180	170
Chlorine	<0.05	NA	<0.05	NA	<0.05	NA	NA

DILUTION	DAY						
	1	2	3	4	5	6	7
31 %							
D.O. Initial	7.9	7.7	8.2	8.1	9.0	8.4	7.9
Final	8.0	7.8	7.9	7.7	8.8	7.7	7.3
pH Initial	7.6	7.6	7.7	7.5	7.7	7.6	7.6
Final	7.6	7.6	7.5	7.5	7.6	7.7	7.6
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	270	270	270	270	280	280	270
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION	DAY						
	1	2	3	4	5	6	7
41 %							
D.O. Initial	7.6	7.6	8.0	8.3	8.4	8.3	7.9
Final	7.9	8.0	7.9	8.2	8.8	7.5	7.1
pH Initial	7.6	7.6	7.7	7.5	7.8	7.6	7.6
Final	7.7	7.7	7.6	7.6	7.7	7.7	7.6
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	300	300	300	300	320	300	300
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION	DAY						
	1	2	3	4	5	6	7
55 %							
D.O. Initial	7.8	7.8	8.0	8.2	8.9	8.6	8.0
Final	7.7	7.6	8.1	8.2	8.9	7.8	7.5
pH Initial	7.6	7.6	7.7	7.6	7.7	7.6	7.6
Final	7.7	7.7	7.7	7.7	7.7	7.8	7.6
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	340	340	340	340	350	340	340
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION	DAY						
	1	2	3	4	5	6	7
73 %							
D.O. Initial	7.8	7.7	8.2	7.9	8.7	9.3	8.0
Final	7.8	7.6	7.9	8.6	8.9	7.6	7.1
pH Initial	7.6	7.7	7.8	7.5	7.6	7.6	7.5
Final	7.8	7.7	7.7	7.8	7.6	7.8	7.7
Alkalinity	66	NA	57	NA	51	NA	NA
Hardness	40	NA	43	NA	43	NA	NA
Conductivity	400	400	390	390	400	410	400
Chlorine	<0.05	NA	0.060	NA	<0.05	NA	NA

DILUTION	DAY						
	1	2	3	4	5	6	7
97 %							
D.O. Initial	8.0	7.5	7.9	8.0	8.7	9.0	7.8
Final	7.7	7.6	8.0	8.0	8.9	7.6	7.1
pH Initial	7.6	7.8	7.7	7.4	7.6	7.6	7.5
Final	7.7	7.8	7.8	7.8	7.8	8.0	7.8
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	470	470	470	470	470	480	470
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: October 22, 2013 at 1455

Date and Time Test Terminated: October 30, 2013 at 1600

Dilution water used: Synthetic Soft Water #4029

PERCENT SURVIVAL

Time of Reading	Percent Effluent					
	Control	31 %	41 %	55 %	73 %	97 %
24 hour	100	100	100	100	100	100
48 hour	100	100	100	100	100	90.0
8 day	100	100	100	100	100	90.0

NUMBER OF YOUNG PRODUCED PER FEMALE @ 8 DAYS

Replicates	Percent Effluent					
	Control	31 %	41 %	55 %	73 %	97 %
A	24	33	11	22	21	28
B	25	23	21	21	20	26
C	22	34	23	22	25	20
D	24	33	30	27	19	26
E	23	17	22	24	21	0
F	21	20	25	20	15	18
G	19	31	17	25	24	20
H	18	15	25	23	22	17
I	22	23	23	13	19	19
J	20	21	23	21	21	17
Mean per Adult	21.8	25.0	22.0	21.8	20.7	19.1
Mean per Surviving Adult	21.8	25.0	22.0	21.8	20.7	21.2
CV %	10.5	28.5	23.1	17.1	13.5	20.1

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. Steel's Many-One Rank 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 type="checkbox"/> YES	<input checked="" 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]: 0 (TGP3B)
5. NOEC Ceriodaphnia Lethality: 97 % (TOP3B)
6. LOEC Ceriodaphnia Lethality: 97 % (TXP3B)
7. NOEC Ceriodaphnia Sublethality: 97 % (TPP3B)
8. LOEC Ceriodaphnia Sublethality: 97 % (TYP3B)
9. Coefficient of variation for Ceriodaphnia Reproduction: 13.5 (TQP3B)

Appendix B: Test 1002.0
CHRONIC TOXICITY SUMMARY FORM
Ceriodaphnia dubia
CHEMICAL PARAMETERS CHART

PERMITTEE: City of Nashville SAMPLE No. 1 COLLECTED ending: DATE: October 22, 2013 TIME: 0800
 NPDES NO.: NPDES AR0021776 AFIN 31-000 SAMPLE No. 2 COLLECTED ending: DATE: October 24, 2013 TIME: 0800
 CONTACT: Mr. Ed Carlyle 1600
 ANALYST: 280, 298, 304, 307 Test Initiated: DATE: October 22, 2013 TIME: 1455
 Test Terminated: DATE: October 30, 2013 TIME: 1600

DILUTION Control	DAY						
	1	2	3	4	5	6	7
D.O. Initial	7.8	7.8	8.2	8.3	8.9	9.0	8.1
Final	8.0	8.4	8.8	8.7	8.1	8.1	8.0
pH Initial	7.5	7.4	7.7	7.6	7.7	7.8	7.7
Final	7.7	8.0	8.0	8.1	8.2	8.0	8.0
Alkalinity	31	NA	32	NA	32	NA	NA
Hardness	48	NA	46	NA	46	NA	NA
Conductivity	170	180	180	170	170	180	170
Chlorine	<0.05	NA	<0.05	NA	<0.05	NA	NA

DILUTION 31 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	7.9	7.7	8.2	8.1	9.0	8.4	7.9
Final	8.3	8.2	8.8	8.8	8.4	8.7	8.3
pH Initial	7.6	7.6	7.7	7.5	7.7	7.6	7.6
Final	8.1	8.2	8.1	8.3	8.2	8.4	8.3
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	270	270	270	270	280	280	270
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION 41 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	7.6	7.6	8.0	8.3	8.4	8.3	7.9
Final	8.2	8.5	9.0	8.6	8.2	8.8	8.3
pH Initial	7.6	7.6	7.7	7.5	7.8	7.6	7.6
Final	8.0	8.3	8.1	8.3	8.2	8.5	8.4
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	300	300	300	300	320	300	300
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION 55 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	7.8	7.8	8.0	8.2	8.9	8.6	8.0
Final	8.3	8.4	8.4	8.8	8.2	8.6	8.3
pH Initial	7.6	7.6	7.7	7.6	7.7	7.6	7.6
Final	8.1	8.2	8.1	8.3	8.1	8.4	8.3
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	340	340	340	340	350	340	340
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION 73 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	7.8	7.7	8.2	7.9	8.7	9.3	8.0
Final	8.3	8.7	9.0	8.8	8.4	8.5	8.1
pH Initial	7.6	7.7	7.8	7.5	7.6	7.6	7.5
Final	8.2	8.3	8.2	8.3	8.3	8.5	8.4
Alkalinity	66	NA	57	NA	51	NA	NA
Hardness	40	NA	43	NA	43	NA	NA
Conductivity	400	400	390	390	400	410	400
Chlorine	<0.05	NA	0.060	NA	<0.05	NA	NA

DILUTION 97 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	8.0	7.5	7.9	8.0	8.7	9.0	7.8
Final	8.2	8.6	8.3	8.8	7.4	8.7	8.5
pH Initial	7.6	7.8	7.7	7.4	7.6	7.6	7.5
Final	8.2	8.3	7.8	8.6	7.6	8.6	8.5
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	470	470	470	470	470	480	470
Chlorine	NA	NA	NA	NA	NA	NA	NA

CHAIN OF CUSTODY / ANALYSIS REQUEST FORM

Client: CITY OF NASHVILLE			PO No.	NO OF BOTTLES	ANALYSES REQUESTED								AIC CONTROL NO: 171778
Project Reference: BIOMONITORING 4th Q.			SAMPLE MATRIX		FATHEAD	MINNOW	CERIODAPHA	DUBIA					AIC PROPOSAL NO:
Project Manager: ED CARLYLE JR.			W	S	3	X		X					Carrier:
Sampled By: Ed Carlyle Sr.	GRA	COMP	ATER	SOIL									Received Temperature C
AIC No.	Sample Identification	Date/Time Collected											09°C
①	NASHUB109Q	10/21-22/13	24	X									Remarks
	13(1)	0800-0800	HR										
		Container Type											Field pH calibration
		Preservative											on _____ @ _____
G = Glass NO = none			P = Plastic S = Sulfuric acid pH2		V = VOA vials N = Nitric acid pH2			H = HCl to pH2 B = NaOH to pH12			T = Sodium Thiosulfate Z = Zinc acetate		
T: NORMAL TURNAROUND			Relinquished By: Ed Carlyle Sr.		Date/Time: 10/22/13 11:31			Received By:			Date/Time:		
V: CONTACT: ED CARLYLE, JR.			Relinquished By:		Date/Time:			Received in Lab By: Jimmy Day			Date/Time: 10/22/13 1131		
W: 870-557-3143 FAX: 870-845-7409			Comments: hand delivered to laboratory - one set										
R: REPORT TO: ED CARLYLE, JR.			426 NORTH MAIN			NASHVILLE, AR 71852							



CHAIN OF CUSTODY / ANALYSIS REQUEST FORM

Client: CITY OF NASHVILLE			PO No.		NO OF BOTTLES	ANALYSES REQUESTED								AIC CONTROL NO: 171778																														
Project Reference: BIOMONITORING 4Q 13			SAMPLE MATRIX			<table border="1"> <tr> <td>FATHEAD</td> <td>MINNOW</td> <td>CERIODAPHNIA</td> <td>DUBIA</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>X</td> <td></td> <td>X</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>								FATHEAD	MINNOW	CERIODAPHNIA	DUBIA												X		X													AIC PROPOSAL NO:
FATHEAD	MINNOW	CERIODAPHNIA	DUBIA																																									
X		X																																										
Project Manager: ED CARLYLE JR			G R A B	C O M P	W A T E R	S O I L	W A S T E	NO OF BOTTLES									Carrier:																											
Sampled By: Ed Carlyle Jr.																	Received Temperature C 0.4°C																											
AIC No.	Sample Identification	Date/Time Collected															Remarks																											
2	NASHUBIO	10/23-24/13	Z4			X	3		X			X																																
	4Q13(2)	0800-0800	HR					1																																				
								G																																				
								A																																				
								L																																				
								P																																				
								DA																																				
Container Type Preservative																	Field pH calibration on _____ @ _____ Buffer:																											
G = Glass NO = none			P = Plastic S = Sulfuric acid pH2		V = VOA vials N = Nitric acid pH2		H = HCl to pH2 B = NaOH to pH12		T = Sodium Thiosulfate 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: 10/24/13 9:52	Received By:	Date/Time:
Relinquished By:	Date/Time:	Received in Lab By:	Date/Time: 10-24-13 5:52
Comments: hand delivered on ice to lab (second of three samples)			

CHAIN OF CUSTODY / ANALYSIS REQUEST FORM

Client: CITY OF NASHVILLE			PO No.		NO OF BOTTLES	ANALYSES REQUESTED								AIC CONTROL NO: 171778
Project Reference: BIOMONITORING 4Q13 (2)			SAMPLE MATRIX			FATHEAD	MINNOW	CERIODAPHNIA	DUBIA					AIC PROPOSAL NO:
Project Manager: ED CARLYLE JR.			WATER	SOIL	SLUDGE									Carrier:
Sampled By: <i>Ed Carlyle Jr.</i>						GRA	COMP					Received Temperature C 2.0		
AIC No.	Sample Identification	Date/Time Collected												Remarks
3	NASHVBIO	10-26-13		8										
	4Q13(3)	0800-1600		HR										
					1									
					G									
					A.									
					L									
					P									
		Container Type			NO							Field pH calibration: on _____ @ _____ Buffer:		
		Preservative												
G = Glass NO = none			P = Plastic S = Sulfuric acid pH2		V = VOA vials N = Nitric acid pH2		H = HCl to pH2 B = NaOH to pH12		T = Sodium Thiosulfate 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: 10-26-13 5:30	Received By:	Date/Time:						
					Relinquished By:	Date/Time:	Received in Lab By: <i>5/13/10</i>	Date/Time: 10-26-13 0810						
					Comments: <i>hand delivered to laboratory on ice.</i>									

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

WASTE TREATMENT PLANT
LABORATORY ANALYSIS
FOR BIOMONITORING REPORTS

COLLECTION DATE: 10/21-22/2013

COLLECTION TIME: 0800 - 0800

COLLECTION PLACE: OUTFALL 001

CBOD	<u>2.60</u>	mg/L	#5210B
TSS	<u>16</u>	mg/L	#2540D
AMMN	<u>2.69</u>	mg/L	#4500-NH3 A-B
FECAL COL.	<u>77</u>	mg/L	#9222D
CHLORINE	<u>.03</u>	mg/L	#4500-CI D
pH	<u>7.17</u>	mg/L	#4500 - H
DO	<u>9.45</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: 10/23-24/2013
COLLECTION TIME: 0800-0800
COLLECTION PLACE: OUTFALL 001

CBOD	<u>2.48</u>	mg/L	#5210B
TSS	<u>4</u>	mg/L	#2540D
AMMN	<u>2.74</u>	mg/L	#4500-NH3 A-B
FECAL COL.	<u>18</u>	mg/L	#9222D
CHLORINE	<u>.04</u>	mg/L	#4500-CI D
pH	<u>7.05</u>	mg/L	#4500 - H
DO	<u>9.44</u>	mg/L	#4500 - OG

ANALYST: EC COLLECTED BY: CC

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: 10/25/2013
COLLECTION TIME: 0800 - 1600
COLLECTION PLACE: OUTFALL 001

CBOD	<u>2.42</u>	mg/L	#5210B
TSS	<u>7</u>	mg/L	#2540D
AMMN	<u>2.98</u>	mg/L	#4500-NH3 A-B
FECAL COL.	<u>1</u>	mg/L	#9222D
CHLORINE	<u>.06</u>	mg/L	#4500-CI D
pH	<u>7.25</u>	mg/L	#4500 - H
DO	<u>9.43</u>	mg/L	#4500 - OG

ANALYST: EC COLLECTED BY: CC

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

City of Nashville
426 North Main Street
Nashville, AR 71852

March 1, 2013

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

Attn: Mr. Allen Anderson
Enforcement Assistant, NPDES

Re: Cyanide/Selenium Fourth Quarter Report, 2013

Dear Mr. Anderson:

Enclosed you shall find our fourth quarter sampling results for cyanide and selenium, the year 2013. There are no excursions at this time.

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

Sincerely,



Larry Dunaway
Public Works Director

cc: 2013 File Binder

**CITY OF NASHVILLE
426 NORTH MAIN
NASHVILLE, AR 71852
870-845-4015 FAX: 870-845-7409**

November 18, 2013

**State of Arkansas
Department of Environmental Quality
NPDES Enforcement Division
5301 Northshore
North Little Rock, AR 72118**

Attn: Mr. Allen Anderson

**Re: Permit AR0021776, AFIN 31-00036
DMR Report for October, 2013**

Dear Mr. Anderson:

Find enclosed you will find a copy of the DMR for October. We have no violations to report at this time.

If you have any questions please call.

Sincerely,


**Larry Duhaway
Public Works Director**

cc: DMR for the month of October 2013 File.


Sanitary Sewer Overflow (SSO) Monthly Report

Facility Name: NASHVILLE NPDES Permit No. AR0021776 Monitoring Period (Month/Year) 10/2013

No Sanitary Sewer Overflows This Monitoring Period

Cause(s) of SSO		Summary Report Code Descriptions		
		SSO Impact	Action(s) Taken	Ultimate Discharge Location
CO-Construction	D-Debris	NEAE-No Evidence Adverse Health/ Environmental Impact		CR-Creek/Stream/River (specify)
E-Equipment Failure	G-Grease	OEHC-Observed or Evidence of Human Contact	EC-Environmental Cleanup	DI-Ditch
HC-Hydro Clean	LF-Line Failure	EFK-Evidence of Fish Kill	HC-Hydro Cleaned	DR-Drop Inlet
R-Rainfall	RG-Roots / Grease		HR-Hand Rodded	GR-Ground Surface
RO-Roots	V-Vandalism		EN-Referred to Engineering	PA-Paved Area
			PN-Public Notification	CB-Contained in Building

Location	Manhole #	Start Date of SSO	End Date of SSO	Estimated Volume (in gallons)	Cause of SSO	Environmental Impact	Action (s) Taken to Address SSO	Discharge Location
					<i>SEE FOLLOWING ATTACHMENT</i>			


11-18-13

 Signature of Cognizant or Ranking Official Date

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

CONFIRMATION NUMBER

7488A3BB-2BE7-4EC1-96E3-D5BE608F7133

(NOTE: You will need this number should you ever need to contact ADEQ concerning this report)

The following information has been sent.

[Close this window](#) [Print this page](#)

24-Hour Sanitary Sewer Overflow Report

SSO ID#: 7488A3BB-2BE7-4EC1-96E3-D5BE608F7133

Date Sent: 10/30/2013

SSO Bypass Upset

Facility Permit Number:	0021776	Facility name:	Nashville Public Works
Date Overflow Began:	10/29/2013	Time:	2:00 pm
Date Overflow Ended:	10/29/2013	Time:	3:00 pm

Location: **1761 S 4th St, Behind property. Overflow went into the ditch.**

(Give address, manhole number-if numbered. Include where the overflow went-yard, ditch, stream, storm sewer, building, other).

Type of Overflow

- Manhole Overflow
- Lift Station Overflow
- Main Line Overflow
- Service Line Overflow
- Other Overflow Type:

(Enter overflow type if not listed)

Cause of Overflow

- I & I - Rainfall
- Roots
- Grease
- Debris
- Equipment Failure
- Construction
- Vandalism
- Power Failure
- Line Failure/Break
- Other Cause:

Volume: unknown

(Give an estimate in gallons)

Impact of SSO Event: SSO Reached Public Land Only (ground)

Action Taken - Check all that apply

(Short term and long-term action, including clean-up and any plans to remediate I & I).

- | | |
|--|---|
| <input checked="" type="checkbox"/> Machine rodded | <input type="checkbox"/> Disinfected and Deodorized |
| <input type="checkbox"/> Jet-Vac | <input type="checkbox"/> Hydro Cleaned |
| <input type="checkbox"/> Hand rodded | <input type="checkbox"/> Spread Lime on Affected Area |
| <input type="checkbox"/> Used Generator To Power Pumps/Equipment | <input type="checkbox"/> Public Notification |
| <input type="checkbox"/> Other: Describe | |

Environmental Damage

- | | |
|--|---|
| <input type="checkbox"/> OEHC - Observed or Evidence of Human Contact | <input checked="" type="checkbox"/> NEAH - No Evidence of Adverse Health/Environmental Impact |
| <input type="checkbox"/> OEEI - Observed or Evidence of Environmental Impact | <input type="checkbox"/> EFK - Evidence of Fish Kill |

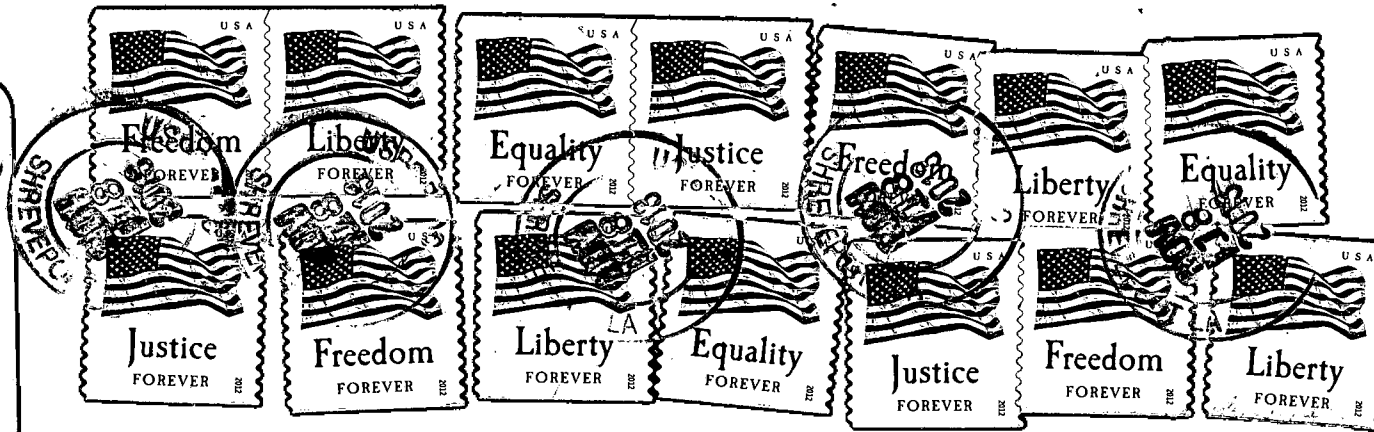
Reported By Jason Morris

Title Distribution Superintendent

Telephone Number (870) 845-1440

Additional Comments if Needed:

**MR. LARRY DUNAWAY
PUBLIC WORKS DIRECTOR
426 NORTH MAIN
NASHVILLE, AR 71852**



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