NASHVILLE PUBLIC WORKS

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

October 17, 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 Third Quarter - 2013

Dear Mr. Anderson:

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

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

Sincerely,

Larry Dunaway

Larry Dunaway
Public Works Director

cc: Jeremy Stone, City Engineer
Pretreatment File, 2013

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*
Effluent - 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 %. 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 %. 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 *Ceriodaphnia dubia* test.**

AMERICAN INTERPLEX CORPORATION

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	0.390	PASS
Control Growth CV < or = 40%	7.92	PASS
Growth Minimum Significant Difference 12 to 30%	14.4	PASS
Critical Dilution CV < or = 40%	8.27	PASS

Ceriodaphnia dubia Method 1002.0

CRITERIA	RESULTS	PASS/FAIL
Control Survival > or = 80%	100	PASS
Control Reproduction > or = 15 per Surviving Female	23.5	PASS
Control CV < or = 40% per Surviving Female	7.57	PASS
Reproduction Minimum Significant Difference 13 to 47%	12.7	BELOW
Critical Dilution CV < or = 40%	8.17	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: Effluent
   b. Chemical Data:

Analysis	Sample 1	Sample 2	Sample 3
Dissolved oxygen (mg/l)	7.4	8.1	7.5
pH (standard units)	7.3	8.4	7.4
Alkalinity (mg/l as CaCO3)	70	55	59
Hardness (mg/l as CaCO3)	39	39	35
Conductivity (umhos/cm)	500	470	450
Residual Chlorine (mg/l)	0.070	<0.05	0.10
Ammonia as N (mg/l)	0.72	0.54	0.69

2. Dilution Water Samples: Synthetic Soft Water #4021
   a. Dates Prepared: September 10 through September 24, 2013
   b. Chemical Data:

Analysis	Sample 1	Sample 2	Sample 3
Dissolved oxygen (mg/l)	8.0	7.3	7.9
pH (standard units)	7.7	8.3	7.8
Alkalinity (mg/l as CaCO3)	31	32	35
Hardness (mg/l as CaCO3)	44	47	47
Conductivity (umhos/cm)	170	170	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:	September 17, 2013 at 1730
Date & Time Test Terminated:	September 24, 2013 at 1830
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:	September 17, 2013 at 1720
Date & Time Test Terminated:	September 24, 2013 at 1700
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 September 10, 2013 at 1435 to September 17, 2013 at 1316
The results were as follows: (Control No. 170403-1.)
Survival LC-50: 6398.6 mg/l
Growth IC-25: 2808 mg/l
Growth PMSD: 12.9

Ceriodaphnia dubia

Chronic reference tests are performed monthly.
A chronic reference test was performed on August 20, 2013 at 1505 to August 28, 2013 at 1450
The results were as follows: (Control No. 169867-2.)
Survival LC-50: 2125 mg/l
Growth IC-25: 1610 mg/l
Growth PMSD: 18.3

V. Chemical Analysis/Quality Control

Parameter	Method	% Recovery	Relative % Difference
Alkalinity	SM 2320 B	NA	8.09
Hardness	EPA 200.7	100	0.750
pH	SM 4500-H+ B	100	0.939
Conductivity	EPA 120.1	101	6.99

VI. Organism History

Pimephales promelas (Fathead minnow)

Date: September 17, 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: September 17, 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

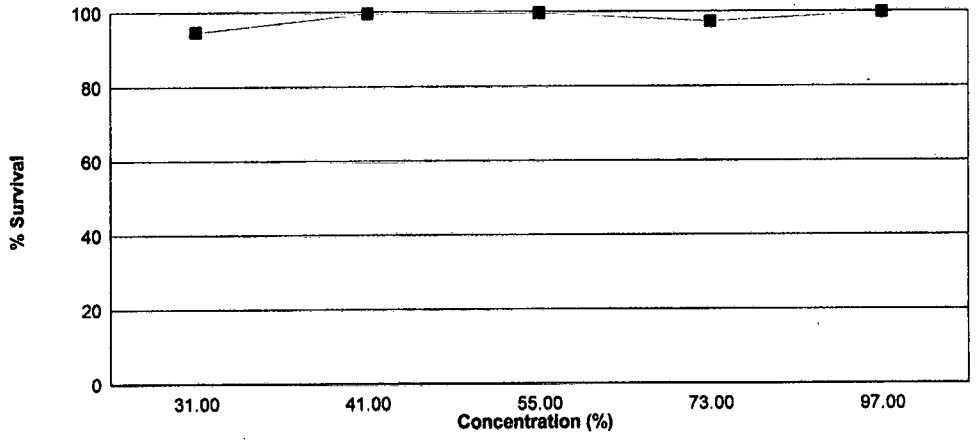
Larvae are exposed in a static renewal system for seven days to different concentrations of effluent with dilution water. Test results are based on the survival and growth (increase in weight) of the larvae.

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 September 17, 2013 at 1730 and continued through September 24, 2013 at 1830. 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	0.390
31 %	95.0	0.397
41 %	100	0.412
55 %	100	0.420
73 %	97.5	0.393
97 %	100	0.384

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

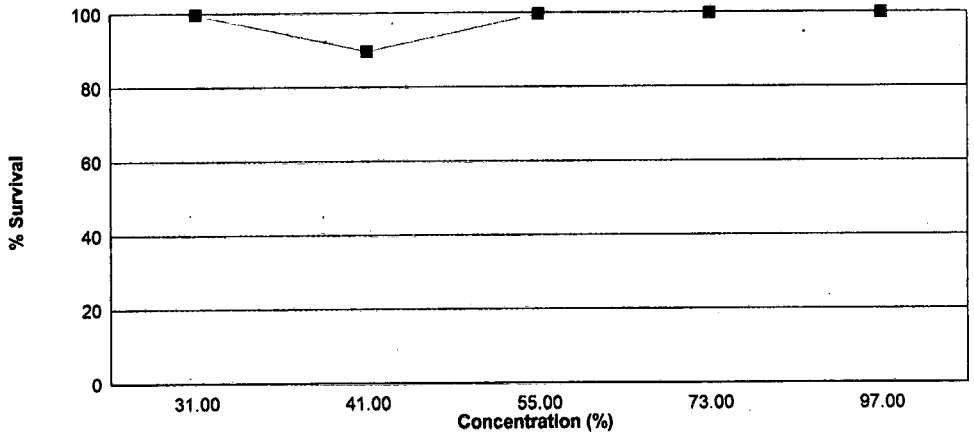
Neonates are exposed in a static renewal system to different concentrations of effluent with dilution water until 60% of surviving control organisms have three broods of offspring with an average of at least 15 young per female.

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 September 17, 2013 at 1720 and continued through September 24, 2013 at 1700. 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



Summary of the 7-day *Ceriodaphnia dubia* Survival and Reproduction Data		
Concentration	Percent Survival	Mean Reproduction
Control	100	23.5
31 %	100	29.9
41 %	90.0	26.0
55 %	100	28.1
73 %	100	27.7
97 %	100	27.3

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: September 17, 2013 at 1730
Date and Time Test Terminated: September 24, 2013 at 1830
Dilution water used: Synthetic Soft Water #4021

DATA TABLE FOR SURVIVAL

Effluent Conc. %	Percent Survival in replicate chambers A	B	C	D	E	Mean percent survival 24 hr	48 hr	7 days	CV%
Control	100	100	100	100	100	100	100	100	0.00
31 %	100	87.5	100	100	87.5	100	100	95.0	7.21
41 %	100	100	100	100	100	100	100	100	0.00
55 %	100	100	100	100	100	100	100	100	0.00
73 %	87.5	100	100	100	100	100	100	97.5	5.73
97 %	100	100	100	100	100	100	100	100	0.00

DATA TABLE FOR GROWTH

Effluent Conc. %	Average dry weight, mg replicate chambers A	B	C	D	E	Mean dry weight, mg	CV%
Control	0.379	0.366	0.379	0.381	0.444	0.39	7.92
31 %	0.331	0.372	0.451	0.428	0.404	0.397	11.9
41 %	0.416	0.405	0.381	0.399	0.458	0.412	6.99
55 %	0.402	0.381	0.401	0.422	0.496	0.42	10.6
73 %	0.349	0.378	0.419	0.430	0.389	0.393	8.27
97 %	0.359	0.336	0.388	0.430	0.405	0.384	9.67

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: 8.27 (TQP6C)

Appendix B: Test 1000.0

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

PERMITTEE: City of Nashville
NPDES NO.: NPDES AR0021776 AFIN 31-000
CONTACT: Mr. Ed Carlyle
ANALYST: 280, 298, 304, 307

SAMPLE No. 1 COLLECTED ending: DATE: September 17, 2013 TIME: 0800
SAMPLE No. 2 COLLECTED ending: DATE: September 19, 2013 TIME: 0800
SAMPLE No. 3 COLLECTED ending: DATE: September 21, 2013 TIME: 0800
Test Initiated: DATE: September 17, 2013 TIME: 1730
Test Terminated: DATE: September 24, 2013 TIME: 1830

DILUTION Control	DAY 1	2	3	4	5	6	7
D.O. Initial	8.0	8.2	7.3	8.0	7.9	7.8	8.0
Final	7.4	7.2	7.1	7.4	7.0	5.9	7.6
pH Initial	7.7	7.4	8.3	8.1	7.8	7.6	7.8
Final	7.8	7.8	7.2	7.7	7.3	7.4	7.3
Alkalinity	31	NA	32	NA	35	NA	NA
Hardness	44	NA	47	NA	47	NA	NA
Conductivity	170	180	170	150	160	160	160
Chlorine	<0.05	NA	<0.05	NA	<0.05	NA	NA

DILUTION 31 %	DAY 1	2	3	4	5	6	7
D.O. Initial	7.7	8.2	7.1	7.8	7.8	7.6	7.7
Final	7.1	6.9	7.1	7.2	7.1	5.8	7.2
pH Initial	7.5	7.6	8.2	8.0	7.7	7.6	7.6
Final	7.9	7.9	7.4	7.7	7.4	7.4	7.3
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	270	280	260	250	250	250	240
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION 41 %	DAY 1	2	3	4	5	6	7
D.O. Initial	7.5	8.2	7.0	7.8	7.6	7.6	7.6
Final	7.1	6.8	6.8	7.3	6.9	5.9	7.1
pH Initial	7.5	7.6	8.3	8.0	7.7	7.6	7.6
Final	8.0	7.8	7.4	7.7	7.5	7.5	7.3
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	310	310	290	280	280	280	270
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION 55 %	DAY 1	2	3	4	5	6	7
D.O. Initial	8.1	8.2	6.8	7.6	7.5	7.5	7.6
Final	7.1	6.6	6.7	7.0	6.7	5.8	7.6
pH Initial	7.4	7.6	8.3	7.9	7.7	7.5	7.6
Final	8.1	7.9	7.3	7.7	7.5	7.6	7.5
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	350	360	330	320	320	320	310
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION 73 %	DAY 1	2	3	4	5	6	7
D.O. Initial	7.8	8.1	6.9	7.7	7.9	7.5	7.6
Final	7.2	6.4	6.5	7.0	6.8	5.9	7.3
pH Initial	7.4	7.7	8.4	7.9	7.8	7.5	7.6
Final	8.1	7.9	7.3	7.8	7.6	7.6	7.4
Alkalinity	52	NA	66	NA	42	NA	NA
Hardness	40	NA	40	NA	37	NA	NA
Conductivity	410	410	380	370	380	370	360
Chlorine	0.050	NA	<0.05	NA	0.090	NA	NA

DILUTION 97 %	DAY 1	2	3	4	5	6	7
D.O. Initial	7.7	8.1	8.1	7.4	7.7	7.6	7.3
Final	7.1	7.3	6.7	7.2	6.8	5.7	7.5
pH Initial	7.3	7.8	8.4	7.9	7.7	7.5	7.5
Final	8.1	8.0	7.4	7.9	7.7	7.6	7.5
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	480	490	460	450	460	460	440
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: September 17, 2013 at 1720
Date and Time Test Terminated: September 24, 2013 at 1700
Dilution water used: Synthetic Soft Water #4021

PERCENT SURVIVAL

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

NUMBER OF YOUNG PRODUCED PER FEMALE @ 7 DAYS

		Percent Effluent				
Replicates	Control	31 %	41 %	55 %	73 %	97 %
A	22	30	33	22	24	27
B	23	28	28	32	26	29
C	25	29	28	31	29	28
D	27	34	33	28	32	29
E	25	26	27	18	26	27
F	23	30	32	27	29	26
G	24	32	27	31	26	29
H	21	30	28	32	28	25
I	22	29	24	31	28	24
J	23	31	0	29	29	29
Mean per Adult	23.5	29.9	26.0	28.1	27.7	27.3
Mean per Surviving Adult	23.5	29.9	28.9	28.1	27.7	27.3
CV %	7.57	7.30	10.7	16.6	8.17	6.70

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 %) _____YES ___X___NO
   b.) 1/2 LOW FLOW DILUTION (NA) _____YES _____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 %) _____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 (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: 8.17 (TQP3B)

Appendix B: Test 1002.0

CHRONIC TOXICITY SUMMARY FORM
Ceriodaphnia dubia
CHEMICAL PARAMETERS CHART

PERMITTEE: City of Nashville
NPDES NO.: NPDES AR0021776 AFIN 31-000
CONTACT: Mr. Ed Carlyle
ANALYST: 280, 298, 304, 307

SAMPLE No. 1 COLLECTED ending: DATE: September 17, 2013 TIME: 0800
SAMPLE No. 2 COLLECTED ending: DATE: September 19, 2013 TIME: 0800
SAMPLE No. 3 COLLECTED ending: DATE: September 21, 2013 TIME: 0800
Test Initiated: DATE: September 17, 2013 TIME: 1720
Test Terminated: DATE: September 24, 2013 TIME: 1700

DILUTION Control	DAY 1	2	3	4	5	6	7
D.O. Initial	8.0	8.2	7.3	8.0	7.9	7.8	8.0
Final	8.1	7.5	7.8	7.8	7.9	6.4	7.1
pH Initial	7.7	7.4	8.3	8.1	7.8	7.6	7.8
Final	7.8	7.9	7.8	7.6	8.0	7.9	8.2
Alkalinity	31	NA	32	NA	35	NA	NA
Hardness	44	NA	47	NA	47	NA	NA
Conductivity	170	180	170	150	160	160	160
Chlorine	<0.05	NA	<0.05	NA	<0.05	NA	NA

DILUTION 31 %	DAY 1	2	3	4	5	6	7
D.O. Initial	7.7	8.2	7.1	7.8	7.8	7.6	7.7
Final	8.1	7.7	7.9	7.4	8.0	6.6	6.9
pH Initial	7.5	7.6	8.2	8.0	7.7	7.6	7.6
Final	8.1	8.1	8.0	7.7	8.2	8.1	8.2
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	270	280	260	250	250	250	240
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION 41 %	DAY 1	2	3	4	5	6	7
D.O. Initial	7.5	8.2	7.0	7.8	7.6	7.6	7.6
Final	8.1	7.6	7.9	7.4	7.9	6.5	7.0
pH Initial	7.5	7.6	8.3	8.0	7.7	7.6	7.6
Final	8.0	8.1	8.0	7.7	8.2	8.2	8.2
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	310	310	290	280	280	280	270
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION 55 %	DAY 1	2	3	4	5	6	7
D.O. Initial	8.1	8.2	6.8	7.6	7.5	7.5	7.6
Final	8.2	7.6	7.9	7.2	7.8	6.5	7.2
pH Initial	7.4	7.6	8.3	7.9	7.7	7.5	7.6
Final	8.1	8.2	8.0	7.8	8.2	8.1	8.2
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	350	360	330	320	320	320	310
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION 73 %	DAY 1	2	3	4	5	6	7
D.O. Initial	7.8	8.1	6.9	7.7	7.9	7.5	7.6
Final	8.2	7.4	7.8	7.5	7.7	6.4	6.9
pH Initial	7.4	7.7	8.4	7.9	7.8	7.5	7.6
Final	8.1	8.2	8.1	7.9	8.2	8.3	8.4
Alkalinity	52	NA	66	NA	42	NA	NA
Hardness	40	NA	40	NA	37	NA	NA
Conductivity	410	410	380	370	380	370	360
Chlorine	0.050	NA	<0.05	NA	0.090	NA	NA

DILUTION 97 %	DAY 1	2	3	4	5	6	7
D.O. Initial	7.7	8.1	8.1	7.4	7.7	7.6	7.3
Final	8.2	7.6	8.0	7.6	7.8	6.5	7.3
pH Initial	7.3	7.8	8.4	7.9	7.7	7.5	7.5
Final	8.1	8.3	8.1	8.0	8.4	8.3	8.4
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	480	490	460	450	460	460	440
Chlorine	NA	NA	NA	NA	NA	NA	NA

AMERICAN INTERPLEX CORPORATION
LABORATORIES

CHAIN OF CUSTODY / ANALYSIS REQUEST FORM

PAGE OF

Client: CITY OF NASHVILLE
Project Reference: BIOMONITORING 3RD QUARTER
Project Manager: ED CARLYLE JR
Sampled By: Ed Carlyle Sr.

PO No.

SAMPLE MATRIX: WATER, SOIL, WASTE

AIC No.	Sample Identification	Date/Time Collected	GRAB	COMP	WATER	SOIL	WASTE	NO OF BOTTLES	CERIODAPHNIA	DUBIA	FATHEAD	MINNOW
(1)	NASHVB103Q	9/16-17/13		24			X	3	X		X	
	13EFF(1)	0800-0800		HR								
								1				
	EFFLUENT SAMPLE							G				
								A				
								L				
		Container Type						P				
		Preservative						NO				

AIC CONTROL NO: 70615
AIC PROPOSAL NO:
Carrier/Tracking No. ED
Received Temperature C: 2°c
Remarks
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

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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:	Date/Time	Received By:	Date/Time
Ed Carlyle Sr.	9/17/13 10:00		
Relinquished By:	Date/Time	Received in Lab By:	Date/Time
		Steve Pendleton	9-17-13 10:00AM

Comments: hand delivered on ice to Little Rock laboratory

FORM 0060

AMERICAN INTERPLEX CORPORATION LABORATORIES

CHAIN OF CUSTODY / ANALYSIS REQUEST FORM

PAGE OF

Client: CITY OF NASHVILLE
Project Reference: BIOMONITORING 3RD QUAR.
Project Manager: ED CARLYLE, JR
Sampled By: Ed Carlyle Sr.

PO No.

SAMPLE MATRIX: WATER, SOIL, WASTE

NO OF BOTTLES

ANALYSES REQUESTED[1]: CERIODAPHNIA, DUBIA, FATHEAD, MINNOW

AIC CONTROL NO: 170615
AIC PROPOSAL NO:
Carrier/Tracking No.
Received Temperature C: 2°C

AIC No.	Sample Identification	Date/Time Collected	GRAB	COMP	WATER	SOIL	WASTE	NO OF BOTTLES	CERIODAPHNIA	DUBIA	FATHEAD	MINNOW	Remarks
(2)	NASHVBIO	9/18-19/13		24			X	3	X		X		
	3Q13EFF2	0800-0800		HR									
								1					
								G					
								A					
								L					
		Container Type						P					Field pH calibration
		Preservative						NO					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

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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:	Date/Time	Received By:	Date/Time
Ed Carlyle Sr.	9/19/13 1038		
Relinquished By:	Date/Time	Received in Lab By:	Date/Time
			9/19/13 1038

Comments: hand delivered on ice to laboratory

FORM 0060

AMERICAN INTERPLEX CORPORATION
LABORATORIES

CHAIN OF CUSTODY / ANALYSIS REQUEST FORM

PAGE OF

Client: CITY OF NASHVILLE
Project Reference: BIOMONITORING 3RD QUARTER
Project Manager: ED CARLYLE, JR.
Sampled By: Ed Carlyle Sr.

PO No.

SAMPLE MATRIX: WATER, SOIL, WASTE

AIC No.	Sample Identification	Date/Time Collected	GRAB	COMP	WATER	SOIL	WASTE	NO OF BOTTLES	CERIODAPHNIA	DUBIA	FATHEAD	MINNOW	AIC CONTROL NO: 17061S
(3)	NASHVBIO	9/20-21/13		24			X	3	X		X		AIC PROPOSAL NO:
	3RD 13 EFF 3			HR									Carrier/Tracking No. NPW
								1					Received Temperature C 2.0°
								G					Remarks
								A					
								L					
		Container Type						P					Field pH calibration
		Preservative						NO					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

T

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:	Date/Time	Received By:	Date/Time
Ed Carlyle Sr.	9/21/13 11:20		
Relinquished By:	Date/Time	Received in Lab By:	Date/Time
		Shawn Horn	9-21-13 (1120)

Comments: hand delivered on ice to laboratory

FORM 0060

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

WASTE TREATMENT PLANT
LABORATORY ANALYSIS
FOR BIOMONITORING REPORTS

COLLECTION DATE: 9-16-13 / 9-17-13

COLLECTION TIME: 0800-0800

COLLECTION PLACE: OUTFALL 001

CBOD	2.65	**mg/L**	**#5210B**
TSS	4	**mg/L**	**#2540D**
AMMN	.437	**mg/L**	**#4500-NH3 A-B**
FECAL COL.	10	**mg/L**	**#9222D**
CHLORINE	.05	**mg/L**	**#4500-CI D**
pH	7.77	**mg/L**	**#4500 – H**
DO	6.66	**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

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

WASTE TREATMENT PLANT LABORATORY ANALYSIS FOR BIOMONITORING REPORTS

COLLECTION DATE: 9-18-13 / 9-19-13

COLLECTION TIME: 0800-0800

COLLECTION PLACE: OUTFALL 001

CBOD	2.38	**mg/L**	**#5210B**
TSS	12	**mg/L**	**#2540D**
AMMN	.416	**mg/L**	**#4500-NH3 A-B**
FECAL COL.	82	**mg/L**	**#9222D**
CHLORINE	.06	**mg/L**	**#4500-CI D**
pH	6.64	**mg/L**	**#4500 – H**
DO	7.70	**mg/L**	**#4500 – OG**

ANALYST: BH **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: 9-20-13 / 9-21-13

COLLECTION TIME: 0800-0800

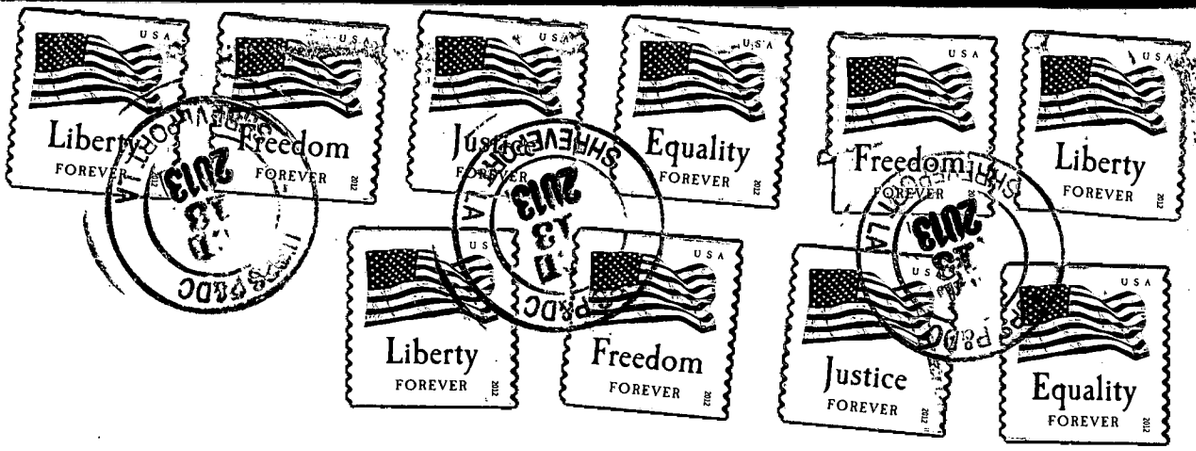
COLLECTION PLACE: OUTFALL 001

CBOD	1.83	**mg/L**	**#5210B**
TSS	10	**mg/L**	**#2540D**
AMMN	.165	**mg/L**	**#4500-NH3 A-B**
FECAL COL.	61	**mg/L**	**#9222D**
CHLORINE	.04	**mg/L**	**#4500-CI D**
pH	6.63	**mg/L**	**#4500 – H**
DO	7.72	**mg/L**	**#4500 – OG**

ANALYST: BH **COLLECTED BY:** BC

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

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