

May,

We had another flea
sublethal fail. Interplex
is running some test
trying to pinpoint where
we are also doing some
industry sampling.

Mike

July 25, 2012

Test Results of
Third Quarter
Chronic 7-Day Renewal
Biomonitoring Testing
for
Effluent
Mena, AR

Control No. 159423-1

Prepared for:

Mr. Mike Spencer
Mena Water and Sewer
323 County Road 53
Mena, AR 71953

Prepared by:

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



July 25, 2012
Control No. 159423-1
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Mena Water and Sewer
ATTN: Mr. Mike Spencer
323 County Road 53
Mena, AR 71953

Re: Chronic 7-Day Renewal utilizing *Pimephales promelas* (Fathead minnow) and *Ceriodaphnia dubia*
Effluent - Mena, AR
NPDES Permit No. AR0036692 AFIN#5700042

Dear Mr. Mike Spencer:

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 100 % effluent, which is equal to the critical dilution of 100 %. The NOEC for growth occurred at 100 % effluent, which is equal to the critical dilution of 100 %. **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 100 % effluent, which is equal to the critical dilution of 100 %. The NOEC for reproduction occurred at 56 % effluent, which is below the critical dilution of 100 %. **The sample PASSED lethal effects, however, FAILED sub-lethal effects for the *Ceriodaphnia dubia* test.**

AMERICAN INTERPLEX CORPORATION

John Overbey
Laboratory Director

PDF cc: Mena Water and Sewer
ATTN: Mr. Mike Spencer
menawwtp@gmail.com

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I. Control Acceptance Criteria

Pimephales promelas (Fathead minnow) Method 1000.0

CRITERIA	RESULTS	PASS/FAIL
Control Survival > or = 80%	95.0	PASS
Control Growth > or = 0.25 mg per Surviving minnow	0.494	PASS
Control Growth CV < or = 40%	7.82	PASS
Growth Minimum Significant Difference 12 to 30%	18.9	PASS
Critical Dilution CV < or = 40%	18.6	PASS

Ceriodaphnia dubia Method 1002.0

CRITERIA	RESULTS	PASS/FAIL
Control Survival > or = 80%	100	PASS
Control Reproduction > or = 15 per Surviving Female	18.3	PASS
Control CV < or = 40% per Surviving Female	14.6	PASS
Reproduction Minimum Significant Difference 13 to 47%	15.1	PASS
Critical Dilution CV < or = 40%	18.6	PASS

II. Outlined Report

A. Introduction

1. Permit Number: AR0036692 AFIN#5700042
2. Test Requirements: Chronic Biomonitoring, Quarterly
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)	7.9	7.6	8.0
pH (standard units)	7.0	6.9	7.3
Alkalinity (mg/l as CaCO ₃)	15	12	16
Hardness (mg/l as CaCO ₃)	20	20	20
Conductivity (umhos/cm)	130	120	100
Residual Chlorine (mg/l)	0.060	0.050	0.060
Ammonia as N (mg/l)	<0.1	0.16	0.22

2. Dilution Water Samples: Synthetic Soft Water #3892

- a. Dates Prepared: July 11 through July 25, 2012
- b. Chemical Data:

Analysis	Sample 1	Sample 2	Sample 3
Dissolved oxygen (mg/l)	7.6	7.5	8.1
pH (standard units)	7.7	7.7	7.9
Alkalinity (mg/l as CaCO ₃)	30	30	30
Hardness (mg/l as CaCO ₃)	42	42	43
Conductivity (umhos/cm)	100	92	76
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: July 17, 2012 at 1440
Date & Time Test Terminated: July 24, 2012 at 1325
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: July 17, 2012 at 1430
Date & Time Test Terminated: July 24, 2012 at 1625
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. 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 July 10, 2012 at 1515 to July 17, 2012 at 1320

The results were as follows: (Control No. 159240-2.)

Survival LC-50: 5830 mg/l

Growth IC-25: 4405 mg/l

Growth PMSD: 24

Ceriodaphnia dubia

Chronic reference tests are performed monthly.

A chronic reference test was performed on July 10, 2012 at 1350 to July 16, 2012 at 1335

The results were as follows: (Control No. 159240-1.)

Survival LC-50: 2125 mg/l

Growth IC-25: 1433 mg/l

Growth PMSD: 21.8

V. Chemical Analysis/Quality Control

Parameter	Method	% Recovery	Relative % Difference
Alkalinity	SM 2320 B	NA	0.00
Hardness	EPA 200.7	99.9	2.14
pH	SM 4500-H+ B	101	0.267
Conductivity	EPA 120.1	97.8	3.40

VI. Organism History

Pimephales promelas (Fathead minnow)

Date: July 17, 2012

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: July 17, 2012

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

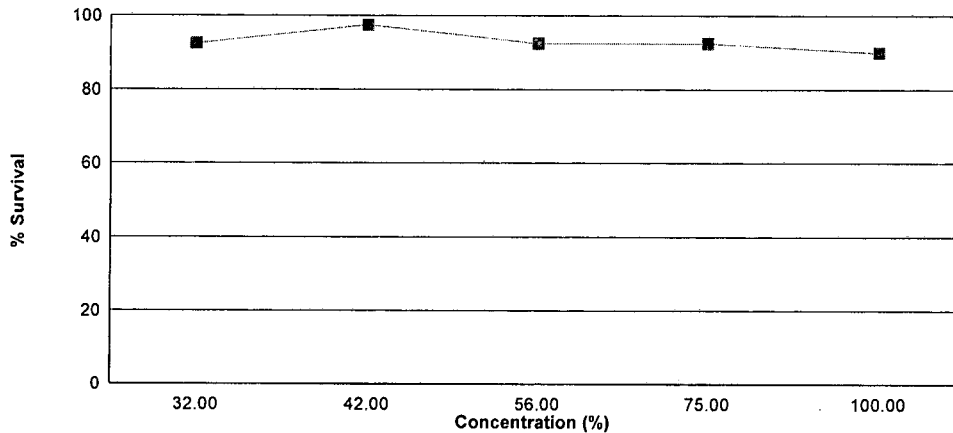
Larvae are exposed in a static renewal system for seven days to different concentrations of effluent with dilution water. Test results are based on the survival and growth (increase in weight) of the larvae.

Effluent dilutions for this test were 32 %, 42 %, 56 %, 75 %, 100 % in accordance with the NPDES permit.

The low flow or 'critical' dilution is specified in the NPDES permit as 100 % effluent.

The test was initiated on July 17, 2012 at 1440 and continued through July 24, 2012 at 1325. Statistical analyses were performed on the observed data and the no observable effects concentrations (NOECs) were as follows:

- a.) NOEC survival = 100 % effluent
- b.) NOEC growth = 100 % effluent



Summary of the 7-day Fathead Minnow Survival and Growth		
Concentration	Percent Survival	Mean Growth (mg)
Control	95.0	0.469
32 %	92.5	0.422
42 %	97.5	0.496
56 %	92.5	0.456
75 %	92.5	0.478
100 %	90.0	0.419

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

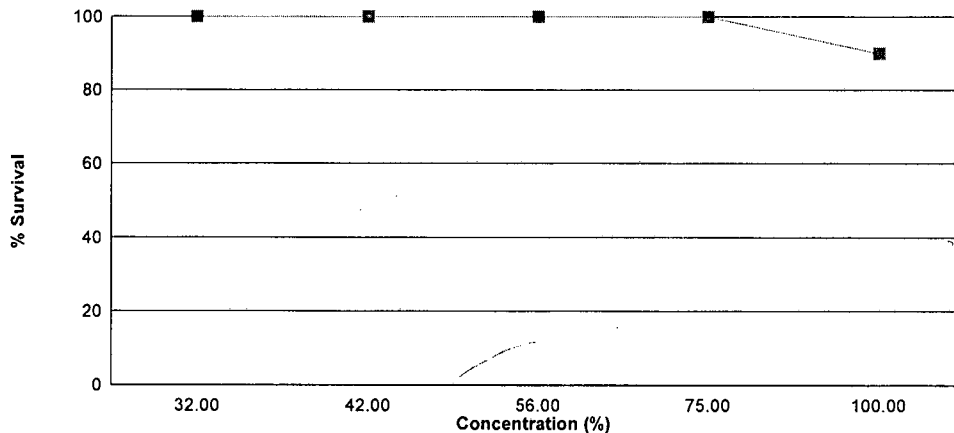
Neonates are exposed in a static renewal system to different concentrations of effluent with dilution water until 60% of surviving control organisms have three broods of offspring with an average of at least 15 young per female.

Effluent dilutions for this test were 32 %, 42 %, 56 %, 75 %, 100 % in accordance with the NPDES permit.

The low flow or 'critical' dilution is specified in the NPDES permit as 100 % effluent.

The test was initiated on July 17, 2012 at 1430 and continued through July 24, 2012 at 1625. Statistical analyses were performed on the observed data and the no observable effects concentrations (NOECs) were as follows:

- a.) NOEC survival = 100 % effluent
- b.) NOEC reproduction = 56 % effluent



Concentration	Percent Survival	Mean Reproduction
Control	100	18.3
32 %	100	18.7
42 %	100	17.6
56 %	100	17.2
75 %	100	14.0 *
100 %	90.0	14.2 *

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

Appendix A1: Test 1000.0

Pimephales promelas (Fathead Minnow) 7-Day Survival

Date and Time Test Initiated: July 17, 2012 at 1440

Date and Time Test Terminated: July 24, 2012 at 1325

Concentration Replicate		Number of Survivors						
		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
Control	A	8	8	8	8	8	8	8
	B	8	8	8	8	8	8	8
	C	8	8	8	8	8	8	8
	D	8	8	8	6	6	6	6
	E	8	8	8	8	8	8	8
32 %	A	8	8	8	8	8	8	8
	B	8	8	7	7	7	7	7
	C	8	8	8	8	7	7	7
	D	8	8	7	7	7	7	7
	E	8	8	8	8	8	8	8
42 %	A	8	8	8	8	8	8	8
	B	8	8	8	8	8	8	8
	C	8	8	8	8	8	8	8
	D	8	8	8	8	7	7	7
	E	8	8	8	8	8	8	8
56 %	A	8	8	8	8	8	8	8
	B	8	8	8	8	7	7	6
	C	8	8	7	7	7	7	7
	D	8	8	8	8	8	8	8
	E	8	8	8	8	8	8	8
75 %	A	8	8	6	6	6	6	6
	B	8	8	8	8	8	8	7
	C	8	8	8	8	8	8	8
	D	8	8	8	8	8	8	8
	E	8	8	8	8	8	8	8
100 %	A	8	8	8	8	8	8	8
	B	8	8	7	7	6	6	6
	C	8	8	8	8	8	8	8
	D	8	8	7	7	7	7	7
	E	8	8	7	7	7	7	7

Appendix A1: Test 1000.0

Pimephales promelas (Fathead Minnow) 7-Day Growth

Test Initiated: July 17, 2012 at 1440
Test Terminated: July 24, 2012 at 1325

Drying Started: July 23, 2012 at 1258
Drying Ended: July 25, 2012 at 1117

Concentration	Replicate	Weight of pan	Weight of pan + fish	Total weight of fish (g)	Original # of fish	Mean dry weight (mg)
Control	A	.93702	.94069	0.00367	8	0.459
	B	.93997	.94373	0.00376	8	0.470
	C	.94360	.94785	0.00425	8	0.531
	D	.94912	.95269	0.00357	8	0.446
	E	.94635	.94986	0.00351	8	0.439
32 %	A	.95030	.95437	0.00407	8	0.509
	B	.95458	.95786	0.00328	8	0.410
	C	.95687	.96015	0.00328	8	0.410
	D	.95821	.96111	0.00290	8	0.362
	E	.95998	.96333	0.00335	8	0.419
42 %	A	.96151	.96580	0.00429	8	0.536
	B	.96530	.96939	0.00409	8	0.511
	C	.96924	.97354	0.00430	8	0.538
	D	.96823	.97152	0.00329	8	0.411
	E	.96869	.97257	0.00388	8	0.485
56 %	A	.96125	.96511	0.00386	8	0.482
	B	.96750	.97070	0.00320	8	0.400
	C	.96449	.96761	0.00312	8	0.390
	D	.94172	.94607	0.00435	8	0.544
	E	.94113	.94485	0.00372	8	0.465
75 %	A	.94284	.94598	0.00314	8	0.392
	B	.94151	.94562	0.00411	8	0.514
	C	.94081	.94442	0.00361	8	0.451
	D	.95282	.95658	0.00376	8	0.470
	E	.94548	.94999	0.00451	8	0.564
100 %	A	.94993	.95299	0.00306	8	0.382
	B	.95015	.95255	0.00240	8	0.300
	C	.95594	.95988	0.00394	8	0.492
	D	.95572	.95946	0.00374	8	0.468
	E	.95727	.96088	0.00361	8	0.451

Appendix A1: Test 1002.0

Ceriodaphnia dubia Survival and Reproduction

Date and Time Test Initiated: July 17, 2012 at 1430

Date and Time Test Terminated: July 24, 2012 at 1625

Concentration: Control														
Day	Replicate										No. of Young	No. of Adults	Young per Adult	
	1	2	3	4	5	6	7	8	9	10				
1	0	0	0	0	0	0	0	0	0	0	0	0	10	0.00
2	0	0	0	0	0	0	0	0	0	0	0	0	10	0.00
3	0	0	0	0	0	0	0	0	0	0	0	0	10	0.00
4	2	2	2	2	4	2	3	3	2	2	24	10	2.40	
5	7	8	4	6	8	6	8	5	7	9	68	10	6.80	
6	0	0	0	0	11	0	0	8	8	9	36	10	3.60	
7	9	10	7	11	0	10	8	0	0	0	55	10	5.50	
8														
TOTAL	18	20	13	19	23	18	19	16	17	20	183	10	18.3	

Concentration: 32 %														
Day	Replicate										No. of Young	No. of Adults	Young per Adult	
	1	2	3	4	5	6	7	8	9	10				
1	0	0	0	0	0	0	0	0	0	0	0	10	0.00	
2	0	0	0	0	0	0	0	0	0	0	0	10	0.00	
3	0	0	0	0	0	0	0	0	0	0	0	10	0.00	
4	2	3	2	2	4	2	3	2	2	2	24	10	2.40	
5	5	0	6	5	8	7	6	7	5	4	53	10	5.30	
6	0	10	0	1	12	0	11	9	1	9	53	10	5.30	
7	8	9	11	8	0	11	0	0	10	0	57	10	5.70	
8														
TOTAL	15	22	19	16	24	20	20	18	18	15	187	10	18.7	

Concentration: 42 %														
Day	Replicate										No. of Young	No. of Adults	Young per Adult	
	1	2	3	4	5	6	7	8	9	10				
1	0	0	0	0	0	0	0	0	0	0	0	10	0.00	
2	0	0	0	0	0	0	0	0	0	0	0	10	0.00	
3	0	0	0	0	0	0	0	0	0	0	0	10	0.00	
4	2	2	3	2	0	0	3	2	2	2	18	10	1.80	
5	4	7	5	7	6	5	6	7	6	6	59	10	5.90	
6	0	0	7	0	9	7	9	6	0	7	45	10	4.50	
7	7	9	6E	8	7	9	1	2	9	2	54	10	5.40	
8														
TOTAL	13	18	15	17	22	21	19	17	17	17	176	10	17.6	

E = Excluded fourth brood neonates

Appendix A1: Test 1002.0

Ceriodaphnia dubia Survival and Reproduction

Date and Time Test Initiated: July 17, 2012 at 1430

Date and Time Test Terminated: July 24, 2012 at 1625

Concentration: 56 %														
Day	Replicate										No. of Young	No. of Adults	Young per Adult	
	1	2	3	4	5	6	7	8	9	10				
1	0	0	0	0	0	0	0	0	0	0	0	0	10	0.00
2	0	0	0	0	0	0	0	0	0	0	0	0	10	0.00
3	0	0	0	0	0	0	0	0	0	0	0	0	10	0.00
4	0	3	2	2	3	2	4	2	2	2	22	10	2.20	
5	6	6	5	4	7	5	7	6	6	4	56	10	5.60	
6	0	0	0	0	0	8	8	12	0	10	38	10	3.80	
7	10	10	8	7	10	0	0	0	11	0	56	10	5.60	
8														
TOTAL	16	19	15	13	20	15	19	20	19	16	172	10	17.2	

Concentration: 75 %														
Day	Replicate										No. of Young	No. of Adults	Young per Adult	
	1	2	3	4	5	6	7	8	9	10				
1	0	0	0	0	0	0	0	0	0	0	0	10	0.00	
2	0	0	0	0	0	0	0	0	0	0	0	10	0.00	
3	0	0	0	0	0	0	0	0	0	0	0	10	0.00	
4	2	0	1	2	3	2	2	2	2	2	18	10	1.80	
5	4	6	4	4	5	6	6	4	4	4	47	10	4.70	
6	0	0	6	0	9	0	8	8	0	7	38	10	3.80	
7	7	7	0	7	0	9	0	0	7	0	37	10	3.70	
8														
TOTAL	13	13	11	13	17	17	16	14	13	13	140	10	14.0	

Concentration: 100 %														
Day	Replicate										No. of Young	No. of Adults	Young per Adult	
	1	2	3	4	5	6	7	8	9	10				
1	0	0	0	0	0	0	0	0	0	0	0	10	0.00	
2	0	0	0	0	0	0	0	0	0	0	0	10	0.00	
3	0	0	0	0	0	0	0	0	0	0	0	10	0.00	
4	2	1	2	2	3	2	3	3	2	0	20	10	2.00	
5	5	4	5	4	4	5	6	5	4	4	46	10	4.60	
6	0	0	9	0	X	7	11	10	7	7	51	9	5.67	
7	9	9	0	7	X	0	0	0	0	0	25	9	2.78	
8														
TOTAL	16	14	16	13	7	14	20	18	13	11	142	10	14.2	

Appendix A2: Statistics

Pimephales promelas (Fathead minnow) Survival

Transformation of Data				Transform: Arc Sin(Square Root(Y))
Group	Identification	Rep	Value	Transformed
1	Control	1	1.00000	1.39310
1	Control	2	1.00000	1.39310
1	Control	3	1.00000	1.39310
1	Control	4	0.75000	1.04720
1	Control	5	1.00000	1.39310
2	32 %	1	1.00000	1.39310
2	32 %	2	0.87500	1.20940
2	32 %	3	0.87500	1.20940
2	32 %	4	0.87500	1.20940
2	32 %	5	1.00000	1.39310
3	42 %	1	1.00000	1.39310
3	42 %	2	1.00000	1.39310
3	42 %	3	1.00000	1.39310
3	42 %	4	0.87500	1.20940
3	42 %	5	1.00000	1.39310
4	56 %	1	1.00000	1.39310
4	56 %	2	0.75000	1.04720
4	56 %	3	0.87500	1.20940
4	56 %	4	1.00000	1.39310
4	56 %	5	1.00000	1.39310
5	75 %	1	0.75000	1.04720
5	75 %	2	0.87500	1.20940
5	75 %	3	1.00000	1.39310
5	75 %	4	1.00000	1.39310
5	75 %	5	1.00000	1.39310
6	100 %	1	1.00000	1.39310
6	100 %	2	0.75000	1.04720
6	100 %	3	1.00000	1.39310
6	100 %	4	0.87500	1.20940
6	100 %	5	0.87500	1.20940

Appendix A2: Statistics

Pimephales promelas (Fathead minnow) Survival

Shapiro - Wilk's Test for Normality		Transform: Arc Sin(Square Root(Y))
<p>D = 0.4432 W = 0.8679 Critical W = 0.9 (alpha = 0.01, N = 30) Critical W = 0.927 (alpha = 0.05, N = 30)</p> <p>Data FAIL normality test (alpha = 0.01).</p>		

Steel's Many-One Rank Test				Transform: Arc Sin(Square Root(Y))	
Ho:Control<Treatment					
Group	Identification	Rank Sum	Critical Value	DF	Sig 0.05
1	Control				
2	32 %	24.00	16.00	5.00	
3	42 %	28.00	16.00	5.00	
4	56 %	25.50	16.00	5.00	
5	75 %	25.50	16.00	5.00	
6	100 %	23.50	16.00	5.00	
Critical values are 1 tailed (k=5)					

Appendix A2: Statistics

Pimephales promelas (Fathead minnow) Growth

Shapiro - Wilk's Test for Normality	No Transformation
<p>D = 0.08493 W = 0.9723 Critical W = 0.9 (alpha = 0.01, N = 30) Critical W = 0.927 (alpha = 0.05, N = 30)</p> <p>Data PASS normality test (alpha = 0.01).</p>	

Bartlett's Test for Homogeneity of Variance	No Transformation
<p>Calculated B1 statistic = 2.186 Critical B = 15.086 (alpha = 0.01, df = 5)</p> <p>Data PASS B1 homogeneity test at 0.01 level.</p>	

Appendix A2: Statistics

Pimephales promelas (Fathead minnow) Growth

ANOVA Table				No Transformation	
SOURCE	DF	SS	MS	F	
Between	5	0.02415	0.00483	1.364	
Within (Error)	24	0.08495	0.00354		
Total	29	0.1091			
Critical F = 3.9 (alpha = 0.01, df = 5,24)					
2.62 (alpha = 0.05, df = 5,24)					
Since F < Critical F FAIL TO REJECT Ho: All equal (alpha = 0.05)					

Dunnett's Test - Table 1 of 2					No Transformation	
Ho:Control<Treatment						
Group	Identification	Transformed Mean	Mean In Original Units	T Stat	Sig 0.05	
1	Control	0.469	0.469			
2	32 %	0.422	0.422	1.249		
3	42 %	0.4962	0.4962	-0.7228		
4	56 %	0.4562	0.4562	0.3402		
5	75 %	0.4782	0.4782	-0.2445		
6	100 %	0.4186	0.4186	1.339		
Dunnett's critical value = 2.36 (1 Tailed, alpha = 0.05, df = 5,24)						

Dunnett's Test - Table 2 of 2					No Transformation	
Ho:Control<Treatment						
Group	Identification	Num of Reps	Min Sig Diff (In Orig. Units)	% of Control	Difference From Control	
1	Control	5				
2	32 %	5	0.08881	18.9	0.047	
3	42 %	5	0.08881	18.9	-0.0272	
4	56 %	5	0.08881	18.9	0.0128	
5	75 %	5	0.08881	18.9	-0.0092	
6	100 %	5	0.08881	18.9	0.0504	

Appendix A2: Statistics

Ceriodaphnia dubia Survival

Fisher's Exact Test			
Identification	Alive	Dead	Total Animals
Control	10	0	10
32 %	10	0	10
Total	20	0	20

Critical Fisher's value (10,10,10) (alpha=0.05) is 6. b value is 10. Since b is greater than 6 there is NO SIGNIFICANT DIFFERENCE between CONTROL and TREATMENT at the 0.05 level.

Fisher's Exact Test			
Identification	Alive	Dead	Total Animals
Control	10	0	10
42 %	10	0	10
Total	20	0	20

Critical Fisher's value (10,10,10) (alpha=0.05) is 6. b value is 10. Since b is greater than 6 there is NO SIGNIFICANT DIFFERENCE between CONTROL and TREATMENT at the 0.05 level.

Fisher's Exact Test			
Identification	Alive	Dead	Total Animals
Control	10	0	10
56 %	10	0	10
Total	20	0	20

Critical Fisher's value (10,10,10) (alpha=0.05) is 6. b value is 10. Since b is greater than 6 there is NO SIGNIFICANT DIFFERENCE between CONTROL and TREATMENT at the 0.05 level.

Fisher's Exact Test			
Identification	Alive	Dead	Total Animals
Control	10	0	10
75 %	10	0	10
Total	20	0	20

Critical Fisher's value (10,10,10) (alpha=0.05) is 6. b value is 10. Since b is greater than 6 there is NO SIGNIFICANT DIFFERENCE between CONTROL and TREATMENT at the 0.05 level.

Appendix A2: Statistics

Ceriodaphnia dubia Survival

Fisher's Exact Test			
Identification	Alive	Dead	Total Animals
Control	10	0	10
100 %	9	1	10
Total	19	1	20

Critical Fisher's value (10,10,10) ($\alpha=0.05$) is 6. b value is 9. Since b is greater than 6 there is NO SIGNIFICANT DIFFERENCE between CONTROL and TREATMENT at the 0.05 level.

Summary of Fisher's Exact Test				
Group	Identification	Exposed	Dead	Sig 0.05
0	Control	10	0	
1	32 %	10	0	
2	42 %	10	0	
3	56 %	10	0	
4	75 %	10	0	
5	100 %	10	1	

Appendix A2: Statistics

Ceriodaphnia dubia Reproduction

Chi-Square Test for Normality	No Transformation
Chi-Square = 3.7302 Critical Chi-Square = 13.28 (alpha = 0.01, df = 4)	
Data PASS normality test (alpha = 0.01).	

Kolmogorov Test for Normality	No Transformation
D = 0.0954 D* = 0.7485 Critical D* = 1.035 (alpha = 0.01, N = 60)	
Data PASS normality test (alpha = 0.01).	

Bartlett's Test for Homogeneity of Variance	No Transformation
Calculated B1 statistic = 3.389 Critical B = 15.086 (alpha = 0.01, df = 5)	
Data PASS B1 homogeneity test at 0.01 level.	

Appendix A2: Statistics

Ceriodaphnia dubia Reproduction

ANOVA Table					No Transformation
SOURCE	DF	SS	MS	F	
Between	5	211.5	42.3	5.494	
Within (Error)	54	415.8	7.7		
Total	59	627.3			
Critical F = 3.38 (alpha = 0.01, df = 5,54)					
2.38 (alpha = 0.05, df = 5,54)					
Since F > Critical F REJECT Ho: All equal (alpha = 0.05)					

Dunnett's Test - Table 1 of 2						No Transformation
Ho:Control<Treatment						
Group	Identification	Transformed Mean	Mean In Original Units	T Stat	Sig 0.05	
1	Control	18.3	18.3			
2	32 %	18.7	18.7	-0.3223		
3	42 %	17.6	17.6	0.5641		
4	56 %	17.2	17.2	0.8864		
5	75 %	14	14	3.465	*	
6	100 %	14.2	14.2	3.304	*	
Dunnett's critical value = 2.31 (1 Tailed, alpha = 0.05, df [used] = 5,40) (Actual df = 5,54)						

Dunnett's Test - Table 2 of 2						No Transformation
Ho:Control<Treatment						
Group	Identification	Num of Reps	Min Sig Diff (In Orig. Units)	% of Control	Difference From Control	
1	Control	10				
2	32 %	10	2.867	15.7	-0.4	
3	42 %	10	2.867	15.7	0.7	
4	56 %	10	2.867	15.7	1.1	
5	75 %	10	2.867	15.7	4.3	
6	100 %	10	2.867	15.7	4.1	

Appendix A2: Statistics

Ceriodaphnia dubia Reproduction

Dunnett's Test for PMSD Calculation (excluding deaths if applicable)

ANOVA Table				No Transformation	
SOURCE	DF	SS	MS	F	
Between	5	174.1	34.82	5.152	
Within (Error)	53	358.2	6.758		
Total	58	532.3			
Critical F = 3.39 (alpha = 0.01, df = 5,53)					
2.39 (alpha = 0.05, df = 5,53)					
Since F > Critical F REJECT Ho: All equal (alpha = 0.05)					

Dunnett's Test - Table 1 of 2					No Transformation	
Ho:Control<Treatment						
Group	Identification	Transformed Mean	Mean In Original Units	T Stat	Sig 0.05	
1	Control	18.3	18.3			
2	32 %	18.7	18.7	-0.3441		
3	42 %	17.6	17.6	0.6021		
4	56 %	17.2	17.2	0.9462		
5	75 %	14	14	3.699	*	
6	100 %	15	15	2.763	*	
Dunnett's critical value = 2.31 (1 Tailed, alpha = 0.05, df [used] = 5,40) (Actual df = 5,53)						
WARNING - Unequal replicate sizes. Critical values assuming equal replicate sizes have been used.						

Dunnett's Test - Table 2 of 2					No Transformation	
Ho:Control<Treatment						
Group	Identification	Num of Reps	Min Sig Diff (In Orig. Units)	% of Control	Difference From Control	
1	Control	10				
2	32 %	10	2.686	14.7	-0.4	
3	42 %	10	2.686	14.7	0.7	
4	56 %	10	2.686	14.7	1.1	
5	75 %	10	2.686	14.7	4.3	
6	100 %	9	2.759	15.1	3.3	

Appendix A3: Water Chemistry
Routine Chemical and Physical Data

Date and Time Test Initiated: July 17, 2012 at 0826
Date and Time Test Terminated: July 24, 2012 at 1625

Effluent Conc.: Control	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	
DO, mg/l	Initial	7.6	7.6	7.5	7.7	8.1	7.9	7.8
	Final *1	7.4	7.3	7.1	7.1	7.0	6.6	6.7
	Final *2	7.6	7.9	7.5	8.2	7.9	8.1	7.8
pH, units	Initial	7.7	7.9	7.7	7.9	7.9	7.8	7.9
	Final *1	7.8	7.5	7.6	7.7	7.6	7.5	7.6
	Final *2	8.2	8.1	8.1	8.2	8.2	8.3	8.0
Alkalinity, mg CaCO ₃ /l	30	NA	30	NA	30	NA	NA	
Hardness, mg CaCO ₃ /l	42	NA	42	NA	43	NA	NA	
Conductivity, umhos/cm	100	92	92	88	76	78	69	
Res. Chlorine, mg/l	<0.05	NA	<0.05	NA	<0.05	NA	NA	

Effluent Conc.: 32 %	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	
DO, mg/l	Initial	7.7	7.6	7.6	7.6	7.5	7.6	7.8
	Final *1	7.5	6.8	6.7	7.4	7.2	6.8	6.4
	Final *2	7.8	8.0	7.8	8.1	7.6	8.1	7.8
pH, units	Initial	7.6	7.7	7.6	7.7	7.6	7.7	7.6
	Final *1	7.6	7.3	7.4	7.6	7.5	7.4	7.4
	Final *2	8.1	8.0	7.9	8.0	7.9	8.4	7.8

Effluent Conc.: 42 %	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	
DO, mg/l	Initial	7.9	7.9	7.8	7.7	7.9	7.7	7.7
	Final *1	7.4	6.7	6.6	7.3	7.1	7.0	6.5
	Final *2	7.8	8.0	7.8	7.9	7.8	8.0	7.9
pH, units	Initial	7.5	7.6	7.5	7.6	7.6	7.6	7.5
	Final *1	7.6	7.3	7.3	7.5	7.4	7.4	7.4
	Final *2	8.0	8.0	7.9	8.0	7.9	8.3	7.8

Appendix A3: Water Chemistry

Routine Chemical and Physical Data

Date and Time Test Initiated: July 17, 2012 at 0826
Date and Time Test Terminated: July 24, 2012 at 1625

Effluent Conc.: 56 %		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
DO, mg/l	Initial	7.7	7.6	7.3	7.9	7.7	7.6	7.7
	Final *1	7.6	7.3	6.8	7.3	7.3	6.0	6.1
	Final *2	7.8	7.9	7.8	8.1	7.8	7.8	7.8
pH, units	Initial	7.4	7.6	7.4	7.5	7.5	7.5	7.4
	Final *1	7.5	7.3	7.3	7.4	7.4	7.3	7.3
	Final *2	8.0	7.9	7.9	8.0	7.8	8.3	7.7

Effluent Conc.: 75 %		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
DO, mg/l	Initial	8.0	7.5	7.7	7.5	8.2	7.7	7.6
	Final *1	7.6	7.2	6.6	7.2	7.3	6.6	6.4
	Final *2	7.7	7.9	7.6	8.2	7.7	8.0	7.9
pH, units	Initial	7.2	7.4	7.3	7.3	7.4	7.4	7.3
	Final *1	7.4	7.2	7.2	7.4	7.4	7.2	7.3
	Final *2	7.8	7.8	7.8	7.8	7.7	8.3	7.6

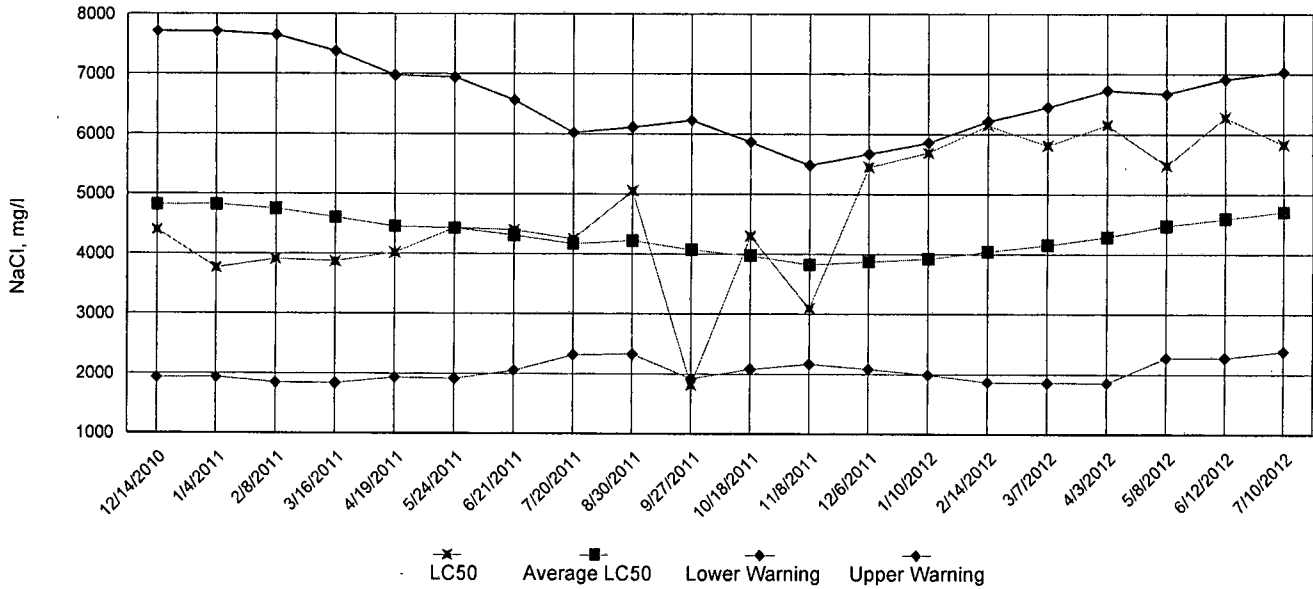
Effluent Conc.: 100 %		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
DO, mg/l	Initial	7.9	7.6	7.6	8.0	8.0	7.7	7.8
	Final *1	7.5	7.3	6.6	7.3	7.4	6.6	6.6
	Final *2	7.7	8.1	7.9	8.2	8.1	7.7	7.7
pH, units	Initial	7.0	7.1	6.9	7.1	7.3	8.1	7.1
	Final *1	7.2	7.1	6.9	7.2	7.2	7.0	7.2
	Final *2	7.6	7.6	7.7	7.6	7.7	8.2	7.6
Alkalinity, mg CaCO ₃ /l	15	NA	12	NA	16	NA	NA	NA
Hardness, mg CaCO ₃ /l	20	NA	20	NA	20	NA	NA	NA
Conductivity, umhos/cm	130	120	120	120	100	160	92	
Res. Chlorine, mg/l	0.060	NA	0.050	NA	0.060	NA	NA	NA

*1 = data from the *Pimephales promelas* (Fathead Minnow) test *2 = data from the *Ceriodaphnia dubia* test

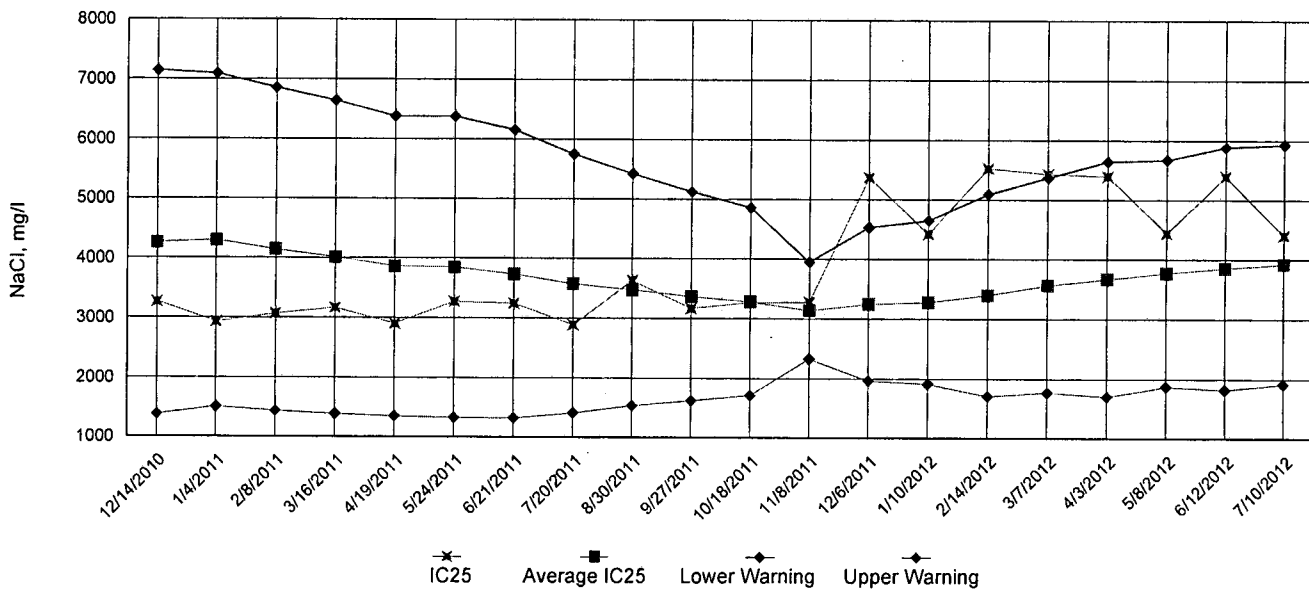
Appendix A4: Test 1000.0

Chronic Reference Toxicant, *Pimephales promelas* (Fathead Minnow)

LC50 Survival Data

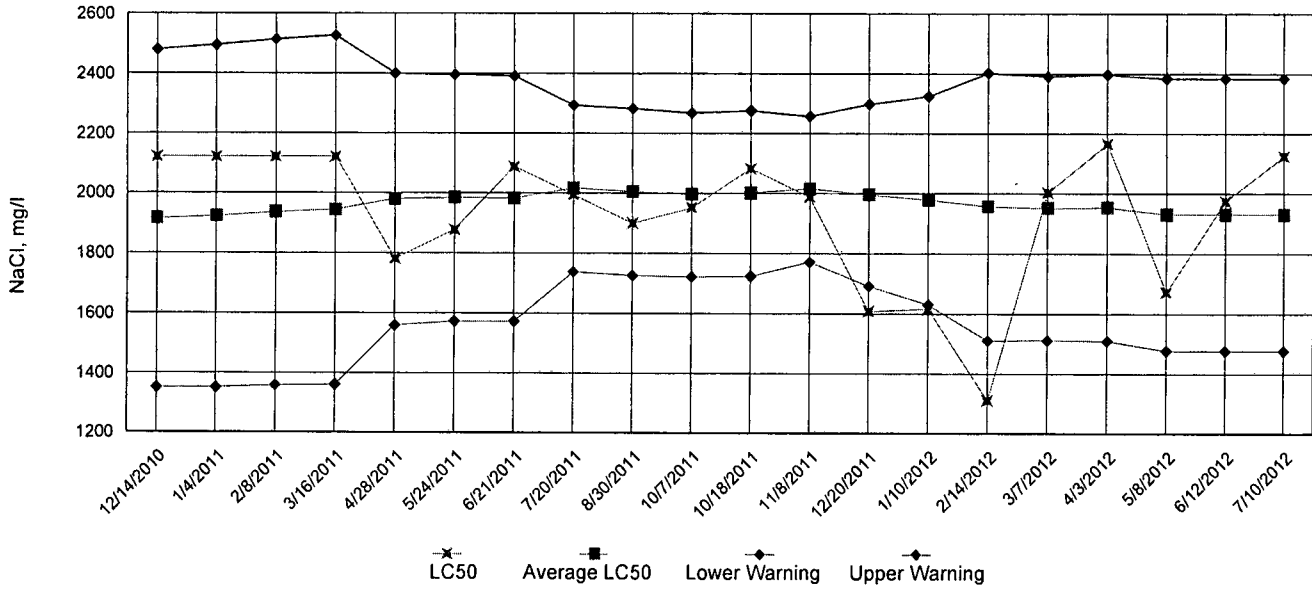


IC25 Growth Data

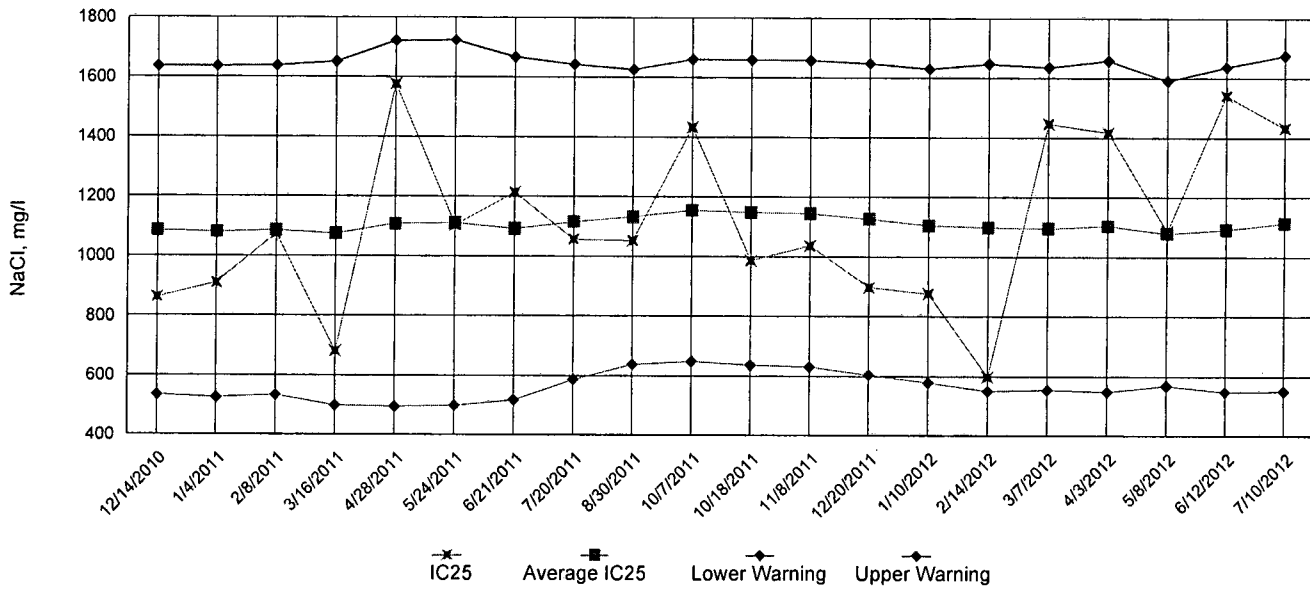


Appendix A4: Test 1002.0
Chronic Reference Toxicant, *Ceriodaphnia dubia*

LC50 Survival Data



IC25 Reproduction Data



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

Permittee: Mena Water and Sewer

NPDES No.: AR0036692 AFIN#5700042

Date and Time Test Initiated: July 17, 2012 at 1440

Date and Time Test Terminated: July 24, 2012 at 1325

Dilution water used: Synthetic Soft Water #3892

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	75.0	100	100	100	95.0	11.8
32 %	100	87.5	87.5	87.5	100	100	100	92.5	7.40
42 %	100	100	100	87.5	100	100	100	97.5	5.73
56 %	100	75.0	87.5	100	100	100	100	92.5	12.1
75 %	75.0	87.5	100	100	100	100	100	92.5	12.1
100 %	100	75.0	100	87.5	87.5	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	0.459	0.470	0.531	0.446	0.439	0.469	7.82
32 %	0.509	0.410	0.410	0.362	0.419	0.422	12.7
42 %	0.536	0.511	0.538	0.411	0.485	0.496	10.5
56 %	0.482	0.400	0.390	0.544	0.465	0.456	13.9
75 %	0.392	0.514	0.451	0.470	0.564	0.478	13.6
100 %	0.382	0.300	0.492	0.468	0.451	0.419	18.6

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	(100 %)	<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	(100 %)	<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: 100 % (TOP6C)
6. LOEC Pimephales Lethality: 100 % (TXP6C)
7. NOEC Pimephales Sublethality: 100 % (TPP6C)
8. LOEC Pimephales Sublethality: 100 % (TYP6C)
9. Coefficient of variation for Pimephales growth: 18.6 (TQP6C)

Appendix B: Test 1000.0

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

PERMITTEE: Mena Water and Sewer
NPDES NO.: AR0036692 AFIN#5700042
CONTACT: Mr. Mike Spencer
ANALYST: 275, 280, 298, 304

Test Initiated: DATE: July 17, 2012 TIME: 1440
Test Terminated: DATE: July 24, 2012 TIME: 1325

DILUTION Control	DAY						
	1	2	3	4	5	6	7
D.O. Initial	7.6	7.6	7.5	7.7	8.1	7.9	7.8
Final	7.4	7.3	7.1	7.1	7.0	6.6	6.7
pH Initial	7.7	7.9	7.7	7.9	7.9	7.8	7.9
Final	7.8	7.5	7.6	7.7	7.6	7.5	7.6
Alkalinity	30	NA	30	NA	30	NA	NA
Hardness	42	NA	42	NA	43	NA	NA
Conductivity	100	92	92	88	76	78	69
Chlorine	<0.05	NA	<0.05	NA	<0.05	NA	NA

DILUTION 32 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	7.7	7.6	7.6	7.6	7.5	7.6	7.8
Final	7.5	6.8	6.7	7.4	7.2	6.8	6.4
pH Initial	7.6	7.7	7.6	7.7	7.6	7.7	7.6
Final	7.6	7.3	7.4	7.6	7.5	7.4	7.4
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	110	100	100	98	84	87	77
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION 42 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	7.9	7.9	7.8	7.7	7.9	7.7	7.7
Final	7.4	6.7	6.6	7.3	7.1	7.0	6.5
pH Initial	7.5	7.6	7.5	7.6	7.6	7.6	7.5
Final	7.6	7.3	7.3	7.5	7.4	7.4	7.4
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	120	100	100	100	86	90	78
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION 56 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	7.7	7.6	7.3	7.9	7.7	7.6	7.7
Final	7.6	7.3	6.8	7.3	7.3	6.0	6.1
pH Initial	7.4	7.6	7.4	7.5	7.5	7.5	7.4
Final	7.5	7.3	7.3	7.4	7.4	7.3	7.3
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	120	110	110	100	89	95	82
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION 75 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	8.0	7.5	7.7	7.5	8.2	7.7	7.6
Final	7.6	7.2	6.6	7.2	7.3	6.6	6.4
pH Initial	7.2	7.4	7.3	7.3	7.4	7.4	7.3
Final	7.4	7.2	7.2	7.4	7.4	7.2	7.3
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	120	110	110	110	94	100	86
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION 100 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	7.9	7.6	7.6	8.0	8.0	7.7	7.8
Final	7.5	7.3	6.6	7.3	7.4	6.6	6.6
pH Initial	7.0	7.1	6.9	7.1	7.3	8.1	7.1
Final	7.2	7.1	6.9	7.2	7.2	7.0	7.2
Alkalinity	15	NA	12	NA	16	NA	NA
Hardness	20	NA	20	NA	20	NA	NA
Conductivity	130	120	120	120	100	160	92
Chlorine	0.060	NA	0.050	NA	0.060	NA	NA

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

Permittee: Mena Water and Sewer

NPDES No.: AR0036692 AFIN#5700042

Date and Time Test Initiated: July 17, 2012 at 1430

Date and Time Test Terminated: July 24, 2012 at 1625

Dilution water used: Synthetic Soft Water #3892

PERCENT SURVIVAL

Time of Reading	Percent Effluent					
	Control	32 %	42 %	56 %	75 %	100 %
24 hour	100	100	100	100	100	100
48 hour	100	100	100	100	100	100
7 day	100	100	100	100	100	90.0

NUMBER OF YOUNG PRODUCED PER FEMALE @ 7 DAYS

Replicates	Percent Effluent					
	Control	32 %	42 %	56 %	75 %	100 %
A	18	15	13	16	13	16
B	20	22	18	19	13	14
C	13	19	15	15	11	16
D	19	16	17	13	13	13
E	23	24	22	20	17	7
F	18	20	21	15	17	14
G	19	20	19	19	16	20
H	16	18	17	20	14	18
I	17	18	17	19	13	13
J	20	15	17	16	13	11
Mean per Adult	18.3	18.7	17.6	17.2	14.0	14.2
Mean per Surviving Adult	18.3	18.7	17.6	17.2	14.0	15.0
CV %	14.6	15.8	15.0	14.5	14.3	18.6

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	(100 %)	<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 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	(100 %)	<u> X </u> YES	<u> </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 (TLP3B)
4. If you answered NO to 2.a) enter [0] otherwise enter [1]: 1 (TGP3B)
5. NOEC *Ceriodaphnia* Lethality: 100 % (TOP3B)
6. LOEC *Ceriodaphnia* Lethality: 100 % (TXP3B)
7. NOEC *Ceriodaphnia* Sublethality: 56 % (TPP3B)
8. LOEC *Ceriodaphnia* Sublethality: 75 % (TYP3B)
9. Coefficient of variation for *Ceriodaphnia* Reproduction: 18.6 (TQP3B)

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

PERMITTEE: Mena Water and Sewer
NPDES NO.: AR0036692 AFIN#5700042
CONTACT: Mr. Mike Spencer
ANALYST: 275, 280, 298, 304

Test Initiated: DATE: July 17, 2012 TIME: 1430
Test Terminated: DATE: July 24, 2012 TIME: 1625

DILUTION Control	DAY						
	1	2	3	4	5	6	7
D.O. Initial	7.6	7.6	7.5	7.7	8.1	7.9	7.8
Final	7.6	7.9	7.5	8.2	7.9	8.1	7.8
pH Initial	7.7	7.9	7.7	7.9	7.9	7.8	7.9
Final	8.2	8.1	8.1	8.2	8.2	8.3	8.0
Alkalinity	30	NA	30	NA	30	NA	NA
Hardness	42	NA	42	NA	43	NA	NA
Conductivity	100	92	92	88	76	78	69
Chlorine	<0.05	NA	<0.05	NA	<0.05	NA	NA

DILUTION 32 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	7.7	7.6	7.6	7.6	7.5	7.6	7.8
Final	7.8	8.0	7.8	8.1	7.6	8.1	7.8
pH Initial	7.6	7.7	7.6	7.7	7.6	7.7	7.6
Final	8.1	8.0	7.9	8.0	7.9	8.4	7.8
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	110	100	100	98	84	87	77
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION 42 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	7.9	7.9	7.8	7.7	7.9	7.7	7.7
Final	7.8	8.0	7.8	7.9	7.8	8.0	7.9
pH Initial	7.5	7.6	7.5	7.6	7.6	7.6	7.5
Final	8.0	8.0	7.9	8.0	7.9	8.3	7.8
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	120	100	100	100	86	90	78
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION 56 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	7.7	7.6	7.3	7.9	7.7	7.6	7.7
Final	7.8	7.9	7.8	8.1	7.8	7.8	7.8
pH Initial	7.4	7.6	7.4	7.5	7.5	7.5	7.4
Final	8.0	7.9	7.9	8.0	7.8	8.3	7.7
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	120	110	110	100	89	95	82
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION 75 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	8.0	7.5	7.7	7.5	8.2	7.7	7.6
Final	7.7	7.9	7.6	8.2	7.7	8.0	7.9
pH Initial	7.2	7.4	7.3	7.3	7.4	7.4	7.3
Final	7.8	7.8	7.8	7.8	7.7	8.3	7.6
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	120	110	110	110	94	100	86
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION 100 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	7.9	7.6	7.6	8.0	8.0	7.7	7.8
Final	7.7	8.1	7.9	8.2	8.1	7.7	7.7
pH Initial	7.0	7.1	6.9	7.1	7.3	8.1	7.1
Final	7.6	7.6	7.7	7.6	7.7	8.2	7.6
Alkalinity	15	NA	12	NA	16	NA	NA
Hardness	20	NA	20	NA	20	NA	NA
Conductivity	130	120	120	120	100	160	92
Chlorine	0.060	NA	0.050	NA	0.060	NA	NA

CHAIN OF CUSTODY / ANALYSIS REQUEST FORM

Client: MENA			PO No.		No of BOTTLES 3	Analyses Requested										AIC Control No: 159423	
Project Reference: MENA WWTP			Sample Matrix													AIC Proposal No:	
Project Manager: MIKE SPENCER			WATER SOIL													Carrier:	
Sampled By: Jeff			G	C												Received Temperature °C 2	
AIC No.	Sample Identification	Date/Time Collected	A	M	R	L											Remarks
1	JEFF	16 JULY 2012 0800		X													
Container Type													Field pH calibration on _____ @ _____				
Preservative													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					
Turnaround Time Requested: (Please circle) NORMAL or EXPEDITED IN _____ DAYS					Relinquished By: <i>[Signature]</i>		Date/Time: 16 JULY 12 1125		Received By: _____				Date/Time: _____				
Expedited results requested by: _____					Relinquished By: _____		Date/Time: _____		Received in Lab By: <i>[Signature]</i>				Date/Time: 7-16-12 1125				
Who should AIC contact with questions: _____					Comments:												
Phone: _____ Fax: _____																	
Report Attention to: _____																	
Report Address to: _____																	



CHAIN OF CUSTODY / ANALYSIS REQUEST FORM

Client: MENA			PO No.		No of B O T T L E S	Analyses Requested										AIC Control No: 159423			
Project Reference: MENA WWTP			Sample Matrix			Flea-Chronic Minnow Chronic											AIC Proposal No:		
Project Manager: MIKE SPENCER			WATER SOIL														Carrier:		
Sampled By: Jeff			G R A B	C O M P	W A T E R	S O I L											Received Temperature °C 2°C		
AIC No.	Sample Identification	Date/Time Collected															Remarks		
2	1 EFF			X			3	X	X										
			Container Type												Field pH calibration				
			Preservative												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								
Turnaround Time Requested: (Please circle) NORMAL or EXPEDITED IN _____ DAYS					Relinquished By: <i>[Signature]</i>					Date/Time: 18 JUL 17 1420					Received By: _____				
Expedited results requested by: _____					Relinquished By: _____					Date/Time: _____					Received in Lab By: <i>[Signature]</i>				
Who should AIC contact with questions: _____															Date/Time: 7-18-17 1420				
Phone: _____ Fax: _____																			
Report Attention to: _____																			
Report Address to: _____																			
															Comments:				

CHAIN OF CUSTODY ANALYSIS REQUEST FORM

Client: <u>MENA</u>			PO No.		No of BOTTLES	Analyses Requested										AIC Control No: <u>159423</u>									
Project Reference: <u>MENA WWT P</u>			Sample Matrix													AIC Proposal No:									
Project Manager: <u>MIKE SPENCER</u>			WATER SOIL													Carrier:									
Sampled By: <u>MIKE</u>			G R A B	C O M P	W A T E R	S O I L	3											Received Temperature °C <u>22</u>							
AIC No.	Sample Identification	Date/Time Collected																Remarks							
<u>3</u>	<u>EFFLUENT</u>	<u>0600 20 July 12</u>		<u>X</u>			<u>3</u>																		
																			Field pH calibration on _____ @ _____						
			Container Type																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				
Turnaround Time Requested: (Please circle) NORMAL or EXPEDITED IN _____ DAYS							Relinquished By: <u>MIKE</u>			Date/Time <u>20 July 12</u> <u>1420</u>			Received By:			Date/Time									
Expedited results requested by: _____							Relinquished By:			Date/Time			Received in Lab By: <u>MIKE</u>			Date/Time <u>7-20-12</u> <u>1420</u>									
Who should AIC contact with questions: _____							Comments:																		
Phone: _____ Fax: _____																									
Report Attention to: _____																									
Report Address to: _____																									

PERMITTEE NAME/ADDRESS (Include Facility Name/Location if Different)

NAME: MENA, CITY OF - WASTEWATER TREATMENT PLANT

ADDRESS: 323 POLK 53
MENA, AR 71953

FACILITY: MENA WASTEWATER TREATMENT PLANT PLANT

LOCATION: 323 POLK 53
MENA, AR 71953

ATTN: MIKE SPENCER, WW SUPERVISOR

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)

DISCHARGE MONITORING REPORT (DMR)

Form Approved
OMB No. 2040-0004

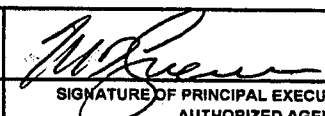

AR0036692	TX1-Q
PERMIT NUMBER	DISCHARGE NUMBER
MONITORING PERIOD	
MM/DD/YYYY	MM/DD/YYYY
7/1/2012	9/30/2012

DMR Mailing ZIP CODE: 71953
MAJOR

001-QTRLY-CHRONIC WET TESTING
External Outfall

No Discharge

PARAMETER		QUANTITY OR LOADING			QUALITY OR CONCENTRATION				NO. EX	FREQUENCY OF ANALYSIS	SAMPLE TYPE
		VALUE	VALUE	UNITS	VALUE	VALUE	VALUE	UNITS			
Whole effluent toxicity	SAMPLE MEASUREMENT	*****	*****	*****	100	*****	*****	%	0	QTR	COMPOS
22414 1 0 Effluent Gross	PERMIT REQUIREMENT	*****	*****	*****	100 DLYAVMIN	*****	*****	%		Quarterly	COMPOS
Whole effluent toxicity	SAMPLE MEASUREMENT	*****	*****	*****	100	*****	*****	%	0	QTR	COMPOS
22414 S 0 See Comments	PERMIT REQUIREMENT	*****	*****	*****	100 7 DA MIN	*****	*****	%		Quarterly	COMPOS
Pass/Fail Static Renewal 7 Day Chronic Ceriodaphnia	SAMPLE MEASUREMENT	*****	*****	*****	1	*****	*****		1	QTR	COMPOS
TGP3B 1 0 Effluent Gross	PERMIT REQUIREMENT	*****	*****	*****	*****	Req. Mon. 7 DA AVG	*****	pass=0/fail=1		Quarterly	COMPOS
Pass/Fail Statre 7Day Chronic Pimephales Promelas	SAMPLE MEASUREMENT	*****	*****	*****	0	*****	*****		0	QTR	COMPOS
TGP6C 1 0 Effluent Gross	PERMIT REQUIREMENT	*****	*****	*****	*****	Req. Mon. 7 DA AVG	*****	pass=0/fail=1		Quarterly	COMPOS
Low Flow Pass/Fail Survival Test Static Renewal 7 Day Chronic Ceriodaphnia dubia	SAMPLE MEASUREMENT	*****	*****	*****	0	*****	*****		0	QTR	COMPOS
TLP3B 1 0 Effluent Gross	PERMIT REQUIREMENT	*****	*****	*****	*****	Req. Mon. 7 DA AVG	*****	pass=0/fail=1		Quarterly	COMPOS
Low Flow Pass/Fail Survival Test Static Renewal 7 Day Chronic Pimephales promelas	SAMPLE MEASUREMENT	*****	*****	*****	0	*****	*****		0	QTR	COMPOS
TLP6C 1 0 Effluent Gross	PERMIT REQUIREMENT	*****	*****	*****	*****	Req. Mon. 7 DA AVG	*****	pass=0/fail=1		Quarterly	COMPOS
NOEC Lethal Static Renewal 7 Day Chronic Ceriodaphnia dubia	SAMPLE MEASUREMENT	*****	*****	*****	100	*****	*****	%	0	QTR	COMPOS
TOP3B 1 0 Effluent Gross	PERMIT REQUIREMENT	*****	*****	*****	*****	Req. Mon. 7 DA AVG	*****	%		Quarterly	COMPOS

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER	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.	 SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	TELEPHONE	DATE
 TYPED OR PRINTED			479.3942761	08/01/2012

COMMENTS AND EXPLANATION OF ANY VIOLATIONS (Reference all attachments here)

CALENDAR QUARTERS: (JAN-MAR) (APR-JUN) (JUL-SEP) & (OCT-DEC). (PASS=0/FAIL=1) IF NOEC VALUE IS LESS THAN THE CRITICAL DILUTION, REPORT "1"; OTHERWISE, REPORT "0". SEE PART II, CONDITION 11. 57-00042

PERMITTEE NAME/ADDRESS (Include Facility Name/Location If Different)

NAME: MENA, CITY OF - WASTEWATER TREATMENT PLANT

ADDRESS: 323 POLK 53
MENA, AR 71953

FACILITY: MENA WASTEWATER TREATMENT PLANT PLANT

LOCATION: 323 POLK 53
MENA, AR 71953

ATTN: MIKE SPENCER, WW SUPERVISOR

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)

DISCHARGE MONITORING REPORT (DMR)

Form Approved
OMB No. 2040-0004

AR0036692	TX1-Q
PERMIT NUMBER	DISCHARGE NUMBER

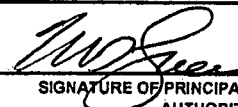
DMR Mailing ZIP CODE: 71953
MAJOR

MONITORING PERIOD	
MM/DD/YYYY	MM/DD/YYYY
7/1/2012	9/30/2012

001-QTRLY-CHRONIC WET TESTING
External Outfall

No Discharge

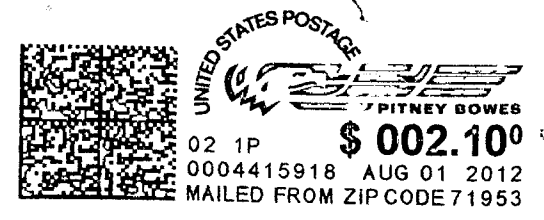
PARAMETER		QUANTITY OR LOADING			QUALITY OR CONCENTRATION				NO. EX	FREQUENCY OF ANALYSIS	SAMPLE TYPE
		VALUE	VALUE	UNITS	VALUE	VALUE	VALUE	UNITS			
NOEC Lethal Static Renewal 7 Day Chronic Pimephales promelas	SAMPLE MEASUREMENT	*****	*****	*****	*****	100	*****	%	0	QTR	Compos
TOP6C 10 Effluent Gross	PERMIT REQUIREMENT	*****	*****	*****	*****	Req. Mon. 7 DA AVG	*****	%		Quarterly	COMPOS
NOEC Sub-Lethal Static Renewal 7 Day Chronic Ceriodaphnia dubia	SAMPLE MEASUREMENT	*****	*****	*****	*****	56	*****	%	0	QTR	Compos
TPP3B 10 Effluent Gross	PERMIT REQUIREMENT	*****	*****	*****	*****	Req. Mon. 7 DA AVG	*****	%		Quarterly	COMPOS
NOEC Sub-Lethal Static Renewal 7 Day Chronic Pimephales promelas	SAMPLE MEASUREMENT	*****	*****	*****	*****	100	*****	%	0	QTR	Compos
TPP6C 10 Effluent Gross	PERMIT REQUIREMENT	*****	*****	*****	*****	Req. Mon. 7 DA AVG	*****	%		Quarterly	COMPOS
Coef Of Var Statre 7Day Chronic Ceriodaphnia	SAMPLE MEASUREMENT	*****	*****	*****	*****	18.6	*****	%	0	QTR	Compos
TQP3B 10 Effluent Gross	PERMIT REQUIREMENT	*****	*****	*****	*****	Req. Mon. 7 DA AVG	*****	%		Quarterly	COMPOS
Coef Of Var Statre 7Day Chronic Pimephales	SAMPLE MEASUREMENT	*****	*****	*****	*****	18.6	*****	%	0	QTR	Compos
TQP6C 10 Effluent Gross	PERMIT REQUIREMENT	*****	*****	*****	*****	Req. Mon. 7 DA AVG	*****	%		Quarterly	COMPOS

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER	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.	 SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	TELEPHONE	DATE	
TYPED OR PRINTED			478.3942761	0801 2012	
			AREA Code	NUMBER	MM/DD/YYYY

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Mena WWTP
303 Polk St
Mena AR
71953



ADEQ
Water Division (Bio monitoring)
5301 North Shore Dr
North Little Rock AR
72118-5317