



June 15, 2012
Control No. 158336-1
Page 1 of 31

June 15, 2012

Test Results of
Second Quarter
Chronic 7-Day Renewal
Biomonitoring Testing
for
Plant Effluent
Searcy, AR

Control No. 158336-1

Prepared for:

Mr. Paul Abernathy
Searcy Water and Sewer System
Post Office Box 1319
Searcy, AR 72145

Prepared by:

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



Searcy Water and Sewer System
ATTN: Mr. Paul Abernathy
Post Office Box 1319
Searcy, AR 72145

Re: Chronic 7-Day Renewal utilizing *Pimephales promelas* (Fathead minnow) and *Ceriodaphnia dubia*
Plant Effluent - Searcy, AR
NPDES Permit No. AR0021601 AFIN# 73-00055

Dear Mr. Paul Abernathy:

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 25 % effluent, which is above the critical dilution of 19 %. The NOEC for growth occurred at 25 % effluent, which is above the critical dilution of 19 %. **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 25 % effluent, which is above the critical dilution of 19 %. The NOEC for reproduction occurred at 25 % effluent, which is above the critical dilution of 19 %. **The sample, therefore, PASSED both lethal and sub-lethal effects for the *Ceriodaphnia dubia* test.**

AMERICAN INTERPLEX CORPORATION

John Overbey
Laboratory Director

A handwritten signature in black ink is written over a horizontal line. Below the signature, the name 'John Overbey' and title 'Laboratory Director' are printed in a standard font.

Table of Contents

- I. Control Acceptance Criteria
- II. Outlined Report
- III. Data Analysis
- IV. Standard Reference Toxicants
- V. Chemical Analysis/Quality Control
- VI. Organism History
- VII. Results Summary
 - Pimephales promelas* (Fathead minnow)
 - Ceriodaphnia dubia*

Appendix A: Raw Data

- A1: Test 1000.0
 - Pimephales promelas* (Fathead minnow) Survival and Growth
- Test 1002.0
 - Ceriodaphnia dubia* Survival and Reproduction
- A2: Statistics
- A3: Water Chemistry
- A4: Reference Toxicant

Appendix B: Chains of Custody

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	0.658	PASS
Control Growth CV < or = 40%	9.88	PASS
Growth Minimum Significant Difference 12 to 30%	14.1	PASS
Critical Dilution CV < or = 40%	9.62	PASS

Ceriodaphnia dubia Method 1002.0

CRITERIA	RESULTS	PASS/FAIL
Control Survival > or = 80%	100	PASS
Control Reproduction > or = 15 per Surviving Female	20.5	PASS
Control CV < or = 40% per Surviving Female	25.3	PASS
Reproduction Minimum Significant Difference 13 to 47%	26.3	PASS
Critical Dilution CV < or = 40%	35.3	PASS

II. Outlined Report

A. Introduction

1. Permit Number: AR0021601 AFIN# 73-00055
2. Test Requirements: Chronic Biomonitoring, Quarterly
Test Methods 1000.0 and 1002.0
3. Receiving Stream: Little Red River

B. Source of Effluent/Dilution Water

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

Analysis	Sample 1	Sample 2	Sample 3
Dissolved oxygen (mg/l)	7.3	7.3	7.5
pH (standard units)	7.3	7.2	7.9
Alkalinity (mg/l as CaCO ₃)	35	39	32
Hardness (mg/l as CaCO ₃)	49	42	41
Conductivity (umhos/cm)	300	270	230
Residual Chlorine (mg/l)	<0.05	<0.05	<0.05
Ammonia as N (mg/l)	0.61	1.2	1.0

2. Dilution Water Samples: Synthetic Soft Water #3877

- a. Dates Prepared: May 23 through June 6, 2012
- b. Chemical Data:

Analysis	Sample 1	Sample 2	Sample 3
Dissolved oxygen (mg/l)	7.5	7.4	7.5
pH (standard units)	7.4	7.4	7.9
Alkalinity (mg/l as CaCO ₃)	31	31	31
Hardness (mg/l as CaCO ₃)	42	41	41
Conductivity (umhos/cm)	110	100	100
Residual Chlorine (mg/l)	<0.05	<0.05	<0.05

C. Test Methods

1. Test methods used:

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

2. Endpoint: No Observable Effects Concentration (NOEC)

3. Test Conditions:

Pimephales promelas (Fathead minnow) Survival and Growth Method 1000.0

Date & Time Test Initiated: June 6, 2012 at 1240
Date & Time Test Terminated: June 13, 2012 at 1310
Type & Volume of Test Chamber: 500 ml disposable beaker
Volume of Sample: 250 ml
Number of Organisms per replicate: 8
Number of Replicates per dilution: 5

Ceriodaphnia dubia Survival and Growth Method 1002.0

Date & Time Test Initiated: June 6, 2012 at 1235
Date & Time Test Terminated: June 12, 2012 at 1400
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 May 8, 2012 at 1645 to May 15, 2012 at 1505

The results were as follows: (Control No. 157572-2.)

Survival LC-50: 5482.6 mg/l

Growth IC-25: 4443 mg/l

Growth PMSD: 18.7

Ceriodaphnia dubia

Chronic reference tests are performed monthly.

A chronic reference test was performed on May 8, 2012 at 1435 to May 15, 2012 at 1510

The results were as follows: (Control No. 157572-1.)

Survival LC-50: 1673 mg/l

Growth IC-25: 1086 mg/l

Growth PMSD: 31.2

V. Chemical Analysis/Quality Control

Parameter	Method	% Recovery	Relative % Difference
Alkalinity	SM 2320 B	NA	0.00
Hardness	EPA 200.7	103	1.31
pH	SM 4500-H+ B	99.7	0.271
Conductivity	EPA 120.1	101	0.471

VI. Organism History

Pimephales promelas (Fathead minnow)

Date: June 6, 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: June 6, 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

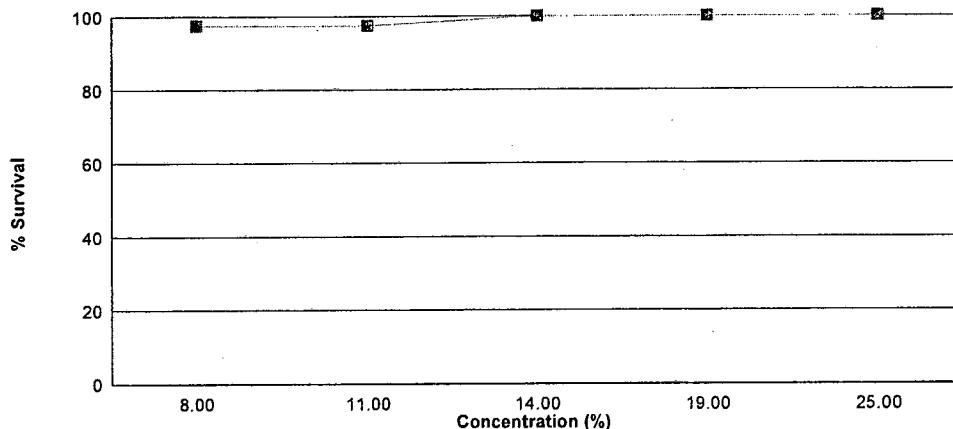
Larvae are exposed in a static renewal system for seven days to different concentrations of effluent with dilution water. Test results are based on the survival and growth (increase in weight) of the larvae.

Effluent dilutions for this test were 8 %, 11 %, 14 %, 19 %, 25 % in accordance with the NPDES permit.

The low flow or 'critical' dilution is specified in the NPDES permit as 19 % effluent.

The test was initiated on June 6, 2012 at 1240 and continued through June 13, 2012 at 1310. Statistical analyses were performed on the observed data and the no observable effects concentrations (NOECs) were as follows:

- a.) NOEC survival = 25 % effluent
- b.) NOEC growth = 25 % effluent



Summary of the 7-day Fathead Minnow Survival and Growth		
Concentration	Percent Survival	Mean Growth (mg)
Control	97.5	0.642
8 %	97.5	0.705
11 %	97.5	0.756
14 %	100	0.697
19 %	100	0.751
25 %	100	0.757

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

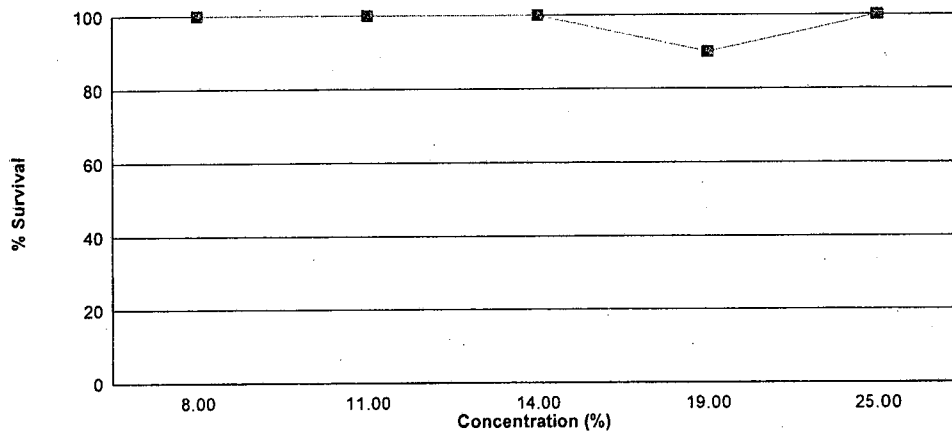
Neonates are exposed in a static renewal system to different concentrations of effluent with dilution water until 60% of surviving control organisms have three broods of offspring with an average of at least 15 young per female.

Effluent dilutions for this test were 8 %, 11 %, 14 %, 19 %, 25 % in accordance with the NPDES permit.

The low flow or 'critical' dilution is specified in the NPDES permit as 19 % effluent.

The test was initiated on June 6, 2012 at 1235 and continued through June 12, 2012 at 1400. Statistical analyses were performed on the observed data and the no observable effects concentrations (NOECs) were as follows:

- a.) NOEC survival = 25 % effluent
- b.) NOEC reproduction = 25 % effluent



Summary of the 6-day <i>Ceriodaphnia dubia</i> Survival and Reproduction Data		
Concentration	Percent Survival	Mean Reproduction
Control	100	20.5
8 %	100	22.5
11 %	100	21.6
14 %	100	19.9
19 %	90.0	14.8
25 %	100	18.9

Appendix A1: Test 1000.0

Pimephales promelas (Fathead Minnow) 7-Day Survival

Date and Time Test Initiated: June 6, 2012 at 1240

Date and Time Test Terminated: June 13, 2012 at 1310

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	8	7	7	7
	E	8	8	8	8	8	8	8
8 %	A	8	8	8	8	7	7	7
	B	8	8	8	8	8	8	8
	C	8	8	8	8	8	8	8
	D	8	8	8	8	8	8	8
	E	8	8	8	8	8	8	8
11 %	A	8	8	8	8	8	8	8
	B	8	8	8	8	8	8	8
	C	8	7	7	7	7	7	7
	D	8	8	8	8	8	8	8
	E	8	8	8	8	8	8	8
14 %	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	8	8	8
	E	8	8	8	8	8	8	8
19 %	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	8	8	8
	E	8	8	8	8	8	8	8
25 %	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	8	8	8
	E	8	8	8	8	8	8	8

Appendix A1: Test 1000.0

Pimephales promelas (Fathead Minnow) 7-Day Growth

Test Initiated: June 6, 2012 at 1240
Test Terminated: June 13, 2012 at 1310

Drying Started: June 12, 2012 at 1047
Drying Ended: June 14, 2012 at 1630

Concentration	Replicate	Weight of pan	Weight of pan + fish	Total weight of fish (g)	Original # of fish	Mean dry weight (mg)
Control	A	.92465	.93054	0.00589	8	0.736
	B	.92415	.92885	0.00470	8	0.588
	C	.92506	.93021	0.00515	8	0.644
	D	.92534	.92997	0.00463	8	0.579
	E	.92456	.92985	0.00529	8	0.661
8 %	A	.92389	.92883	0.00494	8	0.618
	B	.92307	.92835	0.00528	8	0.660
	C	.92298	.92824	0.00526	8	0.658
	D	.92186	.92789	0.00603	8	0.754
	E	.92065	.92733	0.00668	8	0.835
11 %	A	.92208	.92847	0.00639	8	0.799
	B	.92271	.92864	0.00593	8	0.741
	C	.92160	.92766	0.00606	8	0.758
	D	.92069	.92683	0.00614	8	0.768
	E	.92042	.92615	0.00573	8	0.716
14 %	A	.91984	.92511	0.00527	8	0.659
	B	.91877	.92472	0.00595	8	0.744
	C	.91788	.92385	0.00597	8	0.746
	D	.92847	.93381	0.00534	8	0.668
	E	.92860	.93394	0.00534	8	0.668
19 %	A	.92812	.93374	0.00562	8	0.702
	B	.92737	.93422	0.00685	8	0.856
	C	.92961	.93581	0.00620	8	0.775
	D	.93143	.93748	0.00605	8	0.756
	E	.93372	.93906	0.00534	8	0.668
25 %	A	.93400	.94039	0.00639	8	0.799
	B	.93349	.93935	0.00586	8	0.732
	C	.93300	.93922	0.00622	8	0.778
	D	.93168	.93798	0.00630	8	0.788
	E	.92796	.93347	0.00551	8	0.689

Appendix A1: Test 1002.0

Ceriodaphnia dubia Survival and Reproduction

Date and Time Test Initiated: June 6, 2012 at 1235
Date and Time Test Terminated: June 12, 2012 at 1400

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	3	4	4	3	0	3	0	0	0	0	17	10	1.70	
4	0	1	0	0	4	0	4	3	4	3	19	10	1.90	
5	11	8	8	9	9	8	8	8	8	7	84	10	8.40	
6	10	12	12	13	9	12	0	0	9	8	85	10	8.50	
7														
8														
TOTAL	24	25	24	25	22	23	12	11	21	18	205	10	20.5	

Concentration: 8 %														
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	3	3	3	3	0	0	0	0	0	0	12	10	1.20	
4	0	0	0	0	4	0	2	3	3	3	15	10	1.50	
5	10	10	9	10	9	9	9	10	9	10	95	10	9.50	
6	14	10	15	13	9	12	11	0	10	9	103	10	10.3	
7														
8														
TOTAL	27	23	27	26	22	21	22	13	22	22	225	10	22.5	

Concentration: 11 %														
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	2	2	2	3	0	3	0	0	0	0	12	10	1.20	
4	0	0	0	0	4	0	4	2	3	2	15	10	1.50	
5	13	8	6	11	8	8	9	9	8	8	88	10	8.80	
6	14	11	9	13	10	11	14	0	10	9	101	10	10.1	
7														
8														
TOTAL	29	21	17	27	22	22	27	11	21	19	216	10	21.6	

Appendix A1: Test 1002.0

Ceriodaphnia dubia Survival and Reproduction

Date and Time Test Initiated: June 6, 2012 at 1235
Date and Time Test Terminated: June 12, 2012 at 1400

Concentration: 14 %														
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	4	2	0	3	0	0	0	0	0	0	0	9	10	0.900
4	0	0	4	0	5	3	3	3	4	3	25	10	2.50	
5	11	10	7	8	9	7	6	9	7	8	82	10	8.20	
6	11	14	11	10	8	9	9	0	11	0	83	10	8.30	
7														
8														
TOTAL	26	26	22	21	22	19	18	12	22	11	199	10	19.9	

Concentration: 19 %														
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	X	3	0	0	0	0	0	0	3	9	0.333	
4	3	4	X	0	3	4	4	2	3	4	27	9	3.00	
5	10	8	X	6	8	0	7	6	7	8	60	9	6.67	
6	11	12	X	9	9	7	0	1	9	0	58	9	6.44	
7														
8														
TOTAL	24	24	0	18	20	11	11	9	19	12	148	10	14.8	

Concentration: 25 %														
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	3	3	2	0	0	0	0	0	0	0	8	10	0.800	
4	0	0	0	6	4	3	3	4	4	3	27	10	2.70	
5	8	9	4	12	9	8	9	7	7	9	82	10	8.20	
6	10	12	8	0	11	11	10	0	10	0	72	10	7.20	
7														
8														
TOTAL	21	24	14	18	24	22	22	11	21	12	189	10	18.9	

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	0.87500	1.20940	
1	Control	5	1.00000	1.39310	
2	8 %	1	0.87500	1.20940	
2	8 %	2	1.00000	1.39310	
2	8 %	3	1.00000	1.39310	
2	8 %	4	1.00000	1.39310	
2	8 %	5	1.00000	1.39310	
3	11 %	1	1.00000	1.39310	
3	11 %	2	1.00000	1.39310	
3	11 %	3	0.87500	1.20940	
3	11 %	4	1.00000	1.39310	
3	11 %	5	1.00000	1.39310	
4	14 %	1	1.00000	1.39310	
4	14 %	2	1.00000	1.39310	
4	14 %	3	1.00000	1.39310	
4	14 %	4	1.00000	1.39310	
4	14 %	5	1.00000	1.39310	
5	19 %	1	1.00000	1.39310	
5	19 %	2	1.00000	1.39310	
5	19 %	3	1.00000	1.39310	
5	19 %	4	1.00000	1.39310	
5	19 %	5	1.00000	1.39310	
6	25 %	1	1.00000	1.39310	
6	25 %	2	1.00000	1.39310	
6	25 %	3	1.00000	1.39310	
6	25 %	4	1.00000	1.39310	
6	25 %	5	1.00000	1.39310	

Appendix A2: Statistics

Pimephales promelas (Fathead minnow) Survival

Shapiro - Wilk's Test for Normality		Transform: Arc Sin(Square Root(Y))
D = 0.08099		
W = 0.5968		
Critical W = 0.9	(alpha = 0.01, N = 30)	
Critical W = 0.927	(alpha = 0.05, N = 30)	
Data FAIL normality test (alpha = 0.01).		

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	8 %	27.50	16.00	5.00	
3	11 %	27.50	16.00	5.00	
4	14 %	30.00	16.00	5.00	
5	19 %	30.00	16.00	5.00	
6	25 %	30.00	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 = 0.08808 W = 0.9604 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 = 4.909 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	0.05287	0.01057	2.882	
Within (Error)	24	0.08803	0.003668		
Total	29	0.1409			
Critical F = 3.9 (alpha = 0.01, df = 5,24)					
2.62 (alpha = 0.05, df = 5,24)					
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	0.6416	0.6416			
2	8 %	0.705	0.705	-1.655		
3	11 %	0.7564	0.7564	-2.997		
4	14 %	0.697	0.697	-1.446		
5	19 %	0.7514	0.7514	-2.867		
6	25 %	0.7572	0.7572	-3.018		
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	8 %	5	0.0904	14.1	-0.0634		
3	11 %	5	0.0904	14.1	-0.1148		
4	14 %	5	0.0904	14.1	-0.0554		
5	19 %	5	0.0904	14.1	-0.1098		
6	25 %	5	0.0904	14.1	-0.1156		

Appendix A2: Statistics

Ceriodaphnia dubia Survival

Fisher's Exact Test			
Identification	Alive	Dead	Total Animals
Control	10	0	10
8 %	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
11 %	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
14 %	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
19 %	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.

Appendix A2: Statistics

Ceriodaphnia dubia Survival

Fisher's Exact Test			
Identification	Alive	Dead	Total Animals
Control	10	0	10
25 %	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.

Summary of Fisher's Exact Test				
Group	Identification	Exposed	Dead	Sig 0.05
0	Control	10	0	
1	8 %	10	0	
2	11 %	10	0	
3	14 %	10	0	
4	19 %	10	1	
5	25 %	10	0	

Appendix A2: Statistics

Ceriodaphnia dubia Reproduction

Chi-Square Test for Normality	No Transformation
Chi-Square = 15.442 Critical Chi-Square = 13.28	(alpha = 0.01, df = 4)
Data FAIL normality test (alpha = 0.01).	

Kolmogorov Test for Normality	No Transformation
D = 0.1158 D* = 0.9085 Critical D* = 1.035	(alpha = 0.01, N = 60)
Data PASS normality test (alpha = 0.01).	

Steel's Many-One Rank Test				No Transformation	
Ho: Control < Treatment					
Group	Identification	Rank Sum	Critical Value	DF	Sig 0.05
1	Control				
2	8 %	114.00	75.00	10.00	
3	11 %	106.50	75.00	10.00	
4	14 %	99.50	75.00	10.00	
5	19 %	80.00	75.00	10.00	
6	25 %	91.50	75.00	10.00	

Critical values are 1 tailed (k=5)

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	216.5	43.3	1.682	
Within (Error)	53	1364	25.74		
Total	58	1580			
Critical F = 3.39 (alpha = 0.01, df = 5,53)					
2.39 (alpha = 0.05, df = 5,53)					
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	20.5	20.5			
2	8 %	22.5	22.5	-0.8815		
3	11 %	21.6	21.6	-0.4848		
4	14 %	19.9	19.9	0.2644		
5	19 %	16.444	16.444	1.74		
6	25 %	18.9	18.9	0.7052		
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	8 %	10	5.241	25.6	-2	
3	11 %	10	5.241	25.6	-1.1	
4	14 %	10	5.241	25.6	0.6	
5	19 %	9	5.385	26.3	4.056	
6	25 %	10	5.241	25.6	1.6	

Appendix A3: Water Chemistry

Routine Chemical and Physical Data

Date and Time Test Initiated: June 6, 2012 at 0922
Date and Time Test Terminated: June 13, 2012 at 1310

Effluent Conc.: Control		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
DO, mg/l	Initial	7.5	7.8	7.4	7.6	7.5	7.6	6.6
	Final *1	7.4	7.2	6.8	6.7	6.2	5.8	5.7
	Final *2	8.1	7.6	7.6	7.7	7.7	7.9	NA
pH, units	Initial	7.4	7.8	7.4	8.1	7.9	7.4	7.4
	Final *1	7.1	7.6	7.7	7.9	7.6	7.4	7.3
	Final *2	8.2	8.1	8.0	8.1	7.6	8.0	NA
Alkalinity, mg CaCO ₃ /l		31	NA	31	NA	31	NA	NA
Hardness, mg CaCO ₃ /l		42	NA	41	NA	41	NA	NA
Conductivity, umhos/cm		110	110	100	100	100	130	110
Res. Chlorine, mg/l		<0.05	NA	<0.05	NA	<0.05	NA	NA

Effluent Conc.: 8 %		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
DO, mg/l	Initial	7.7	7.8	7.6	7.4	7.5	7.4	6.6
	Final *1	6.7	6.5	6.5	6.6	5.8	6.1	5.4
	Final *2	8.1	7.6	7.6	7.7	7.7	7.7	NA
pH, units	Initial	7.4	7.7	7.4	7.9	7.9	7.5	7.4
	Final *1	7.1	7.5	7.6	7.8	7.5	7.4	7.3
	Final *2	8.1	8.0	8.1	8.1	7.7	8.0	NA

Effluent Conc.: 11 %		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
DO, mg/l	Initial	7.6	7.9	7.4	7.4	7.4	7.5	6.5
	Final *1	6.6	6.4	6.5	6.2	5.6	5.6	5.1
	Final *2	7.9	7.6	7.4	7.6	7.6	7.8	NA
pH, units	Initial	7.4	7.6	7.4	7.8	7.9	7.5	7.4
	Final *1	7.1	7.5	7.6	7.7	7.5	7.3	7.3
	Final *2	8.1	8.1	8.2	8.2	7.8	8.0	NA

Appendix A3: Water Chemistry

Routine Chemical and Physical Data

Date and Time Test Initiated: June 6, 2012 at 0922
Date and Time Test Terminated: June 13, 2012 at 1310

Effluent Conc.: 14 %		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
DO, mg/l	Initial	7.4	7.7	7.5	7.4	7.2	7.6	7.0
	Final *1	6.6	6.4	6.7	6.4	6.2	6.0	5.2
	Final *2	7.8	7.5	7.2	7.6	7.4	7.5	NA
pH, units	Initial	7.5	7.6	7.4	7.8	7.9	7.5	7.4
	Final *1	7.1	7.4	7.6	7.8	7.5	7.3	7.3
	Final *2	8.1	8.0	8.1	8.2	7.8	7.9	NA

Effluent Conc.: 19 %		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
DO, mg/l	Initial	7.5	7.7	7.4	7.4	7.5	7.6	7.0
	Final *1	6.6	6.4	6.5	6.6	6.3	5.6	5.7
	Final *2	8.1	7.2	7.6	7.7	7.7	7.5	NA
pH, units	Initial	7.5	7.6	7.4	7.7	7.9	7.5	7.4
	Final *1	7.1	7.4	7.5	7.7	7.5	7.3	7.3
	Final *2	8.1	7.9	8.1	8.2	7.8	7.9	NA
Alkalinity, mg CaCO ₃ /l	36	NA	34	NA	35	NA	NA	NA
Hardness, mg CaCO ₃ /l	44	NA	42	NA	42	NA	NA	NA
Conductivity, umhos/cm	150	140	120	130	120	170	150	
Res. Chlorine, mg/l	<0.05	NA	<0.05	NA	<0.05	NA	NA	NA

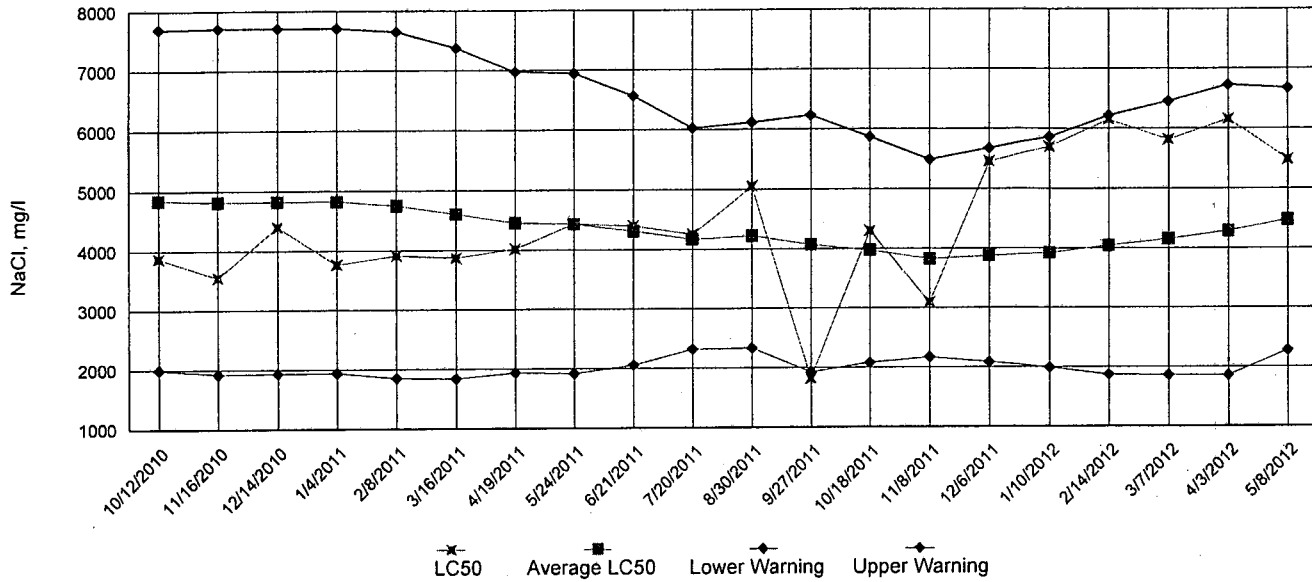
Effluent Conc.: 25 %		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
DO, mg/l	Initial	7.4	7.8	7.3	7.5	7.5	7.5	7.0
	Final *1	6.8	6.3	6.5	6.8	6.3	5.5	5.5
	Final *2	8.1	7.4	7.6	7.6	7.7	7.5	NA
pH, units	Initial	7.4	7.6	7.4	7.7	7.9	7.5	7.4
	Final *1	7.2	7.4	7.5	7.8	7.5	7.3	7.3
	Final *2	8.1	7.9	8.2	8.2	7.9	8.0	NA

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

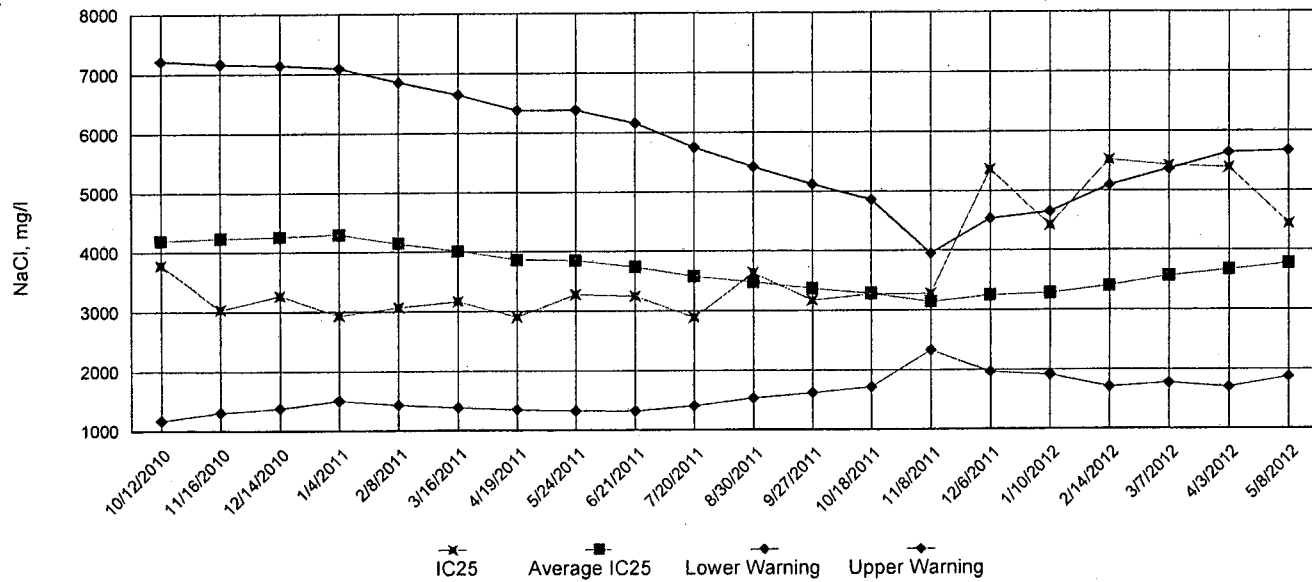
Appendix A4: Test 1000.0

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

LC50 Survival Data

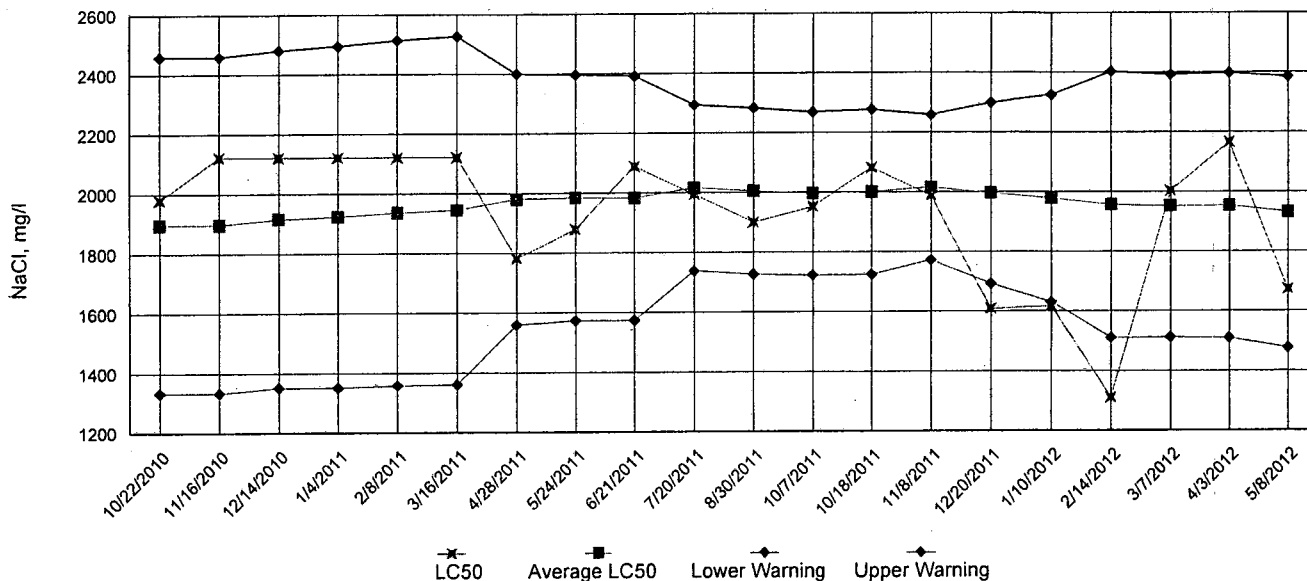


IC25 Growth Data

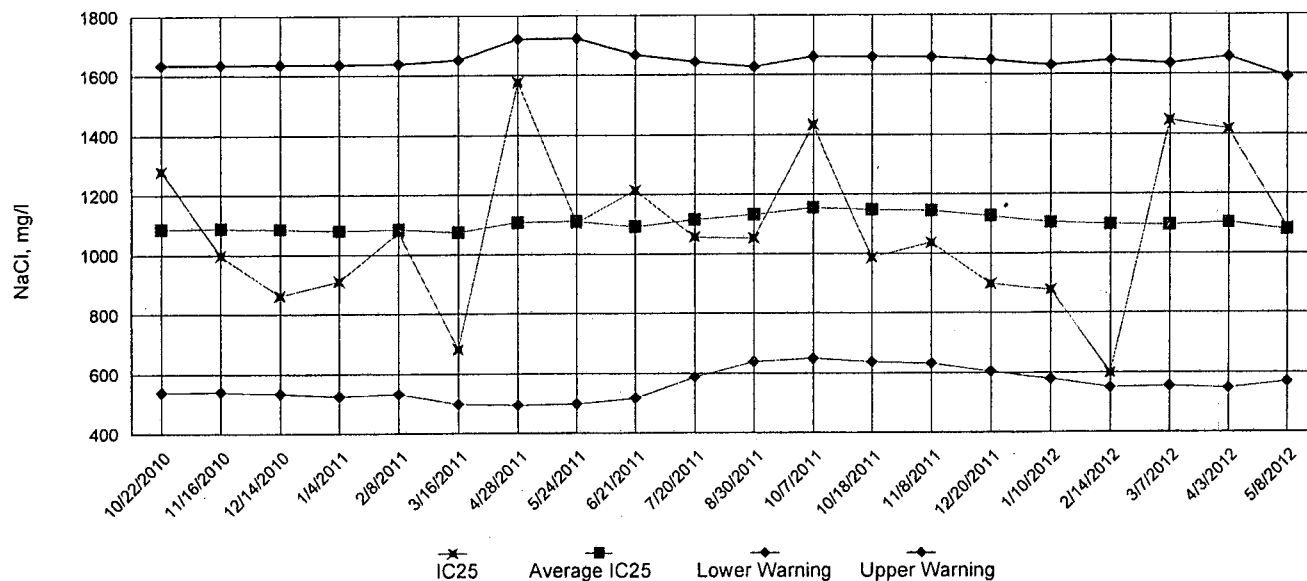


Appendix A4: Test 1002.0
Chronic Reference Toxicant, *Ceriodaphnia dubia*

LC50 Survival Data



IC25 Reproduction Data



Appendix B: Test 1000.0

SUMMARY REPORTING FORMS
CHRONIC BIOMONITORING
Pimephales promelas (Fathead Minnow)
SURVIVAL AND GROWTH

Permittee: Searcy Water and Sewer System

NPDES No.: AR0021601 AFIN# 73-00055

Date and Time Test Initiated: June 6, 2012 at 1240

Date and Time Test Terminated: June 13, 2012 at 1310

Dilution water used: Synthetic Soft Water #3877

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	87.5	100	100	100	97.5	5.73
8 %	87.5	100	100	100	100	100	100	97.5	5.73
11 %	100	100	87.5	100	100	100	97.5	97.5	5.73
14 %	100	100	100	100	100	100	100	100	0.00
19 %	100	100	100	100	100	100	100	100	0.00
25 %	100	100	100	100	100	100	100	100	0.00

DATA TABLE FOR GROWTH

Effluent Conc. %	Average dry weight, mg replicate chambers					Mean dry weight, mg	CV%
	A	B	C	D	E		
Control	0.736	0.588	0.644	0.579	0.661	0.642	9.88
8 %	0.618	0.660	0.658	0.754	0.835	0.705	12.5
11 %	0.799	0.741	0.758	0.768	0.716	0.756	4.09
14 %	0.659	0.744	0.746	0.668	0.668	0.697	6.31
19 %	0.702	0.856	0.775	0.756	0.668	0.751	9.62
25 %	0.799	0.732	0.778	0.788	0.689	0.757	6.06

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	(19 %)	<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	(19 %)	<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: 25 % (TOP6C)

6. LOEC Pimephales Lethality: 25 % (TXP6C)

7. NOEC Pimephales Sublethality: 25 % (TPP6C)

8. LOEC Pimephales Sublethality: 25 % (TYP6C)

9. Coefficient of variation for Pimephales growth: 9.88 (TQP6C)

Appendix B: Test 1000.0

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

PERMITTEE: Searcy Water and Sewer System SAMPLE No. 1 COLLECTED ending: DATE: June 5, 2012 TIME: 1145
NPDES NO.: AR0021601 AFIN# 73-00055 SAMPLE No. 2 COLLECTED ending: DATE: June 7, 2012 TIME: 1140
CONTACT: Mr. Paul Abernathy SAMPLE No. 3 COLLECTED ending: DATE: June 10, 2012 TIME: 1145
ANALYST: 275, 280, 298, 304 Test Initiated: DATE: June 6, 2012 TIME: 1240
Test Terminated: DATE: June 13, 2012 TIME: 1310

DILUTION	DAY						
	1	2	3	4	5	6	7
Control							
D.O. Initial	7.5	7.8	7.4	7.6	7.5	7.6	6.6
Final	7.4	7.2	6.8	6.7	6.2	5.8	5.7
pH Initial	7.4	7.8	7.4	8.1	7.9	7.4	7.4
Final	7.1	7.6	7.7	7.9	7.6	7.4	7.3
Alkalinity	31	NA	31	NA	31	NA	NA
Hardness	42	NA	41	NA	41	NA	NA
Conductivity	110	110	100	100	100	130	110
Chlorine	<0.05	NA	<0.05	NA	<0.05	NA	NA

DILUTION	DAY						
	1	2	3	4	5	6	7
8 %							
D.O. Initial	7.7	7.8	7.6	7.4	7.5	7.4	6.6
Final	6.7	6.5	6.5	6.6	5.8	6.1	5.4
pH Initial	7.4	7.7	7.4	7.9	7.9	7.5	7.4
Final	7.1	7.5	7.6	7.8	7.5	7.4	7.3
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	130	120	120	110	110	140	130
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION	DAY						
	1	2	3	4	5	6	7
11 %							
D.O. Initial	7.6	7.9	7.4	7.4	7.4	7.5	6.5
Final	6.6	6.4	6.5	6.2	5.6	5.6	5.1
pH Initial	7.4	7.6	7.4	7.8	7.9	7.5	7.4
Final	7.1	7.5	7.6	7.7	7.5	7.3	7.3
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	130	140	120	110	96	150	140
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION	DAY						
	1	2	3	4	5	6	7
14 %							
D.O. Initial	7.4	7.7	7.5	7.4	7.2	7.6	7.0
Final	6.6	6.4	6.7	6.4	6.2	6.0	5.2
pH Initial	7.5	7.6	7.4	7.8	7.9	7.5	7.4
Final	7.1	7.4	7.6	7.8	7.5	7.3	7.3
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	140	130	130	120	110	160	140
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION	DAY						
	1	2	3	4	5	6	7
19 %							
D.O. Initial	7.5	7.7	7.4	7.4	7.5	7.6	7.0
Final	6.6	6.4	6.5	6.6	6.3	5.6	5.7
pH Initial	7.5	7.6	7.4	7.7	7.9	7.5	7.4
Final	7.1	7.4	7.5	7.7	7.5	7.3	7.3
Alkalinity	36	NA	34	NA	35	NA	NA
Hardness	44	NA	42	NA	42	NA	NA
Conductivity	150	140	120	130	120	170	150
Chlorine	<0.05	NA	<0.05	NA	<0.05	NA	NA

DILUTION	DAY						
	1	2	3	4	5	6	7
25 %							
D.O. Initial	7.4	7.8	7.3	7.5	7.5	7.5	7.0
Final	6.8	6.3	6.5	6.8	6.3	5.5	5.5
pH Initial	7.4	7.6	7.4	7.7	7.9	7.5	7.4
Final	7.2	7.4	7.5	7.8	7.5	7.3	7.3
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	160	160	140	140	130	180	160
Chlorine	NA	NA	NA	NA	NA	NA	NA

Appendix B: Test 1002.0

SUMMARY REPORTING FORMS
CHRONIC BIOMONITORING
Ceriodaphnia dubia
SURVIVAL AND REPRODUCTION

Permittee: Searcy Water and Sewer System

NPDES No.: AR0021601 AFIN# 73-00055

Date and Time Test Initiated: June 6, 2012 at 1235

Date and Time Test Terminated: June 12, 2012 at 1400

Dilution water used: Synthetic Soft Water #3877

PERCENT SURVIVAL

Time of Reading	Control	Percent Effluent				
		8 %	11 %	14 %	19 %	25 %
24 hour	100	100	100	100	100	100
48 hour	100	100	100	100	100	100
6 day	100	100	100	100	90.0	100

NUMBER OF YOUNG PRODUCED PER FEMALE @ 6 DAYS

Replicates	Control	Percent Effluent				
		8 %	11 %	14 %	19 %	25 %
A	24	27	29	26	24	21
B	25	23	21	26	24	24
C	24	27	17	22	0	14
D	25	26	27	21	18	18
E	22	22	22	22	20	24
F	23	21	22	19	11	22
G	12	22	27	18	11	22
H	11	13	11	12	9	11
I	21	22	21	22	19	21
J	18	22	19	11	12	12
Mean per Adult	20.5	22.5	21.6	19.9	14.8	18.9
Mean per Surviving Adult	20.5	22.5	21.6	19.9	16.4	18.9
CV %	25.3	17.9	24.6	25.7	35.3	25.9

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	(19 %)	<u> </u> YES	<u> X </u> NO
b.) 1/2 LOW FLOW DILUTION	(NA)	<u> </u> YES	<u> </u> 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	(19 %)	<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 (TLP3B)

4. If you answered NO to 2.a) enter [0] otherwise enter [1]: 0 (TGP3B)

5. NOEC *Ceriodaphnia* Lethality: 25 % (TOP3B)

6. LOEC *Ceriodaphnia* Lethality: 25 % (TXP3B)

7. NOEC *Ceriodaphnia* Sublethality: 25 % (TPP3B)

8. LOEC *Ceriodaphnia* Sublethality: 25 % (TYP3B)

9. Coefficient of variation for *Ceriodaphnia* Reproduction: 35.3 (TQP3B)

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

PERMITTEE: Searcy Water and Sewer System SAMPLE No. 1 COLLECTED ending: DATE: June 5, 2012 TIME: 1145
 NPDES NO.: AR0021601 AFIN# 73-00055 SAMPLE No. 2 COLLECTED ending: DATE: June 7, 2012 TIME: 1140
 CONTACT: Mr. Paul Abernathy SAMPLE No. 3 COLLECTED ending: DATE: June 10, 2012 TIME: 1145
 ANALYST: 275, 280, 298, 304 Test Initiated: DATE: June 6, 2012 TIME: 1235
 Test Terminated: DATE: June 12, 2012 TIME: 1400

DILUTION Control	DAY						
	1	2	3	4	5	6	7
D.O. Initial	7.5	7.8	7.4	7.6	7.5	7.6	6.6
Final	8.1	7.6	7.6	7.7	7.7	7.9	NA
pH Initial	7.4	7.8	7.4	8.1	7.9	7.4	7.4
Final	8.2	8.1	8.0	8.1	7.6	8.0	NA
Alkalinity	31	NA	31	NA	31	NA	NA
Hardness	42	NA	41	NA	41	NA	NA
Conductivity	110	110	100	100	100	130	110
Chlorine	<0.05	NA	<0.05	NA	<0.05	NA	NA

DILUTION 8 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	7.7	7.8	7.6	7.4	7.5	7.4	6.6
Final	8.1	7.6	7.6	7.7	7.7	7.7	NA
pH Initial	7.4	7.7	7.4	7.9	7.9	7.5	7.4
Final	8.1	8.0	8.1	8.1	7.7	8.0	NA
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	130	120	120	110	110	140	130
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION 11 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	7.6	7.9	7.4	7.4	7.4	7.5	6.5
Final	7.9	7.6	7.4	7.6	7.6	7.8	NA
pH Initial	7.4	7.6	7.4	7.8	7.9	7.5	7.4
Final	8.1	8.1	8.2	8.2	7.8	8.0	NA
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	130	140	120	110	96	150	140
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION 14 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	7.4	7.7	7.5	7.4	7.2	7.6	7.0
Final	7.8	7.5	7.2	7.6	7.4	7.5	NA
pH Initial	7.5	7.6	7.4	7.8	7.9	7.5	7.4
Final	8.1	8.0	8.1	8.2	7.8	7.9	NA
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	140	130	130	120	110	160	140
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION 19 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	7.5	7.7	7.4	7.4	7.5	7.6	7.0
Final	8.1	7.2	7.6	7.7	7.7	7.5	NA
pH Initial	7.5	7.6	7.4	7.7	7.9	7.5	7.4
Final	8.1	7.9	8.1	8.2	7.8	7.9	NA
Alkalinity	36	NA	34	NA	35	NA	NA
Hardness	44	NA	42	NA	42	NA	NA
Conductivity	150	140	120	130	120	170	150
Chlorine	<0.05	NA	<0.05	NA	<0.05	NA	NA

DILUTION 25 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	7.4	7.8	7.3	7.5	7.5	7.5	7.0
Final	8.1	7.4	7.6	7.6	7.7	7.5	NA
pH Initial	7.4	7.6	7.4	7.7	7.9	7.5	7.4
Final	8.1	7.9	8.2	8.2	7.9	8.0	NA
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	160	160	140	140	130	180	160
Chlorine	NA	NA	NA	NA	NA	NA	NA

CHAIN OF CUSTODY / ANALYSIS REQUEST FORM

Client: <i>Searcy</i>			PO No.		No of BOTTLES <i>2</i>	Analyses Requested											AIC Control No: <i>158336</i>		
Project Reference:			Sample Matrix			<i>Residuals</i>												AIC Proposal No:	
Project Manager: <i>Paul Abernathy</i>			WATER SOIL															Carrier:	
Sampled By: <i>Gorey Hale</i>			G	C														Received Temperature °C <i>2</i>	
AIC No.	Sample Identification	Date/Time Collected	A	O												Remarks			
<i>(1)</i>	<i>Plant EFF</i>	<i>6-4-12 11:45</i> <i>6-5-12 11:45</i>		<input checked="" type="checkbox"/>															
																Field pH calibration			
			Container Type													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>Kryziah</i>		Date/Time <i>6-6-12</i> <i>06:00</i>		Received By: <i>Tom Hartsfield</i>		Date/Time <i>6-6-12</i> <i>06:00</i>							
Expedited results requested by: _____						Relinquished By: <i>Tom Hartsfield</i>		Date/Time <i>6-6-12</i> <i>08:16</i>		Received in Lab By: <i>Luca Hopton</i>		Date/Time <i>6-6-12</i> <i>0816</i>							
Who should AIC contact with questions: _____						Comments:													
Phone: _____ Fax: _____																			
Report Attention to: _____																			
Report Address to: <i>Searcy Water & Sewer</i> <i>P.O. Box 1319</i> <i>Searcy, AR 72145</i>																			

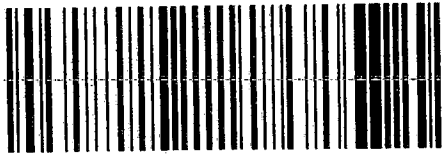
CHAIN OF CUSTODY / ANALYSIS REQUEST FORM

Client: <u>Searcy Water</u>			PO No.		NO OF BOTTLES	ANALYSES REQUESTED										AIC CONTROL NO: <u>158336</u>								
Project Reference:			SAMPLE MATRIX			Bioremediation											AIC PROPOSAL NO:							
Project Manager: <u>Paul Abernathy</u>			WATER SOIL														Carrier:							
Sampled By: <u>Johnny Fowler</u>			GRA	COMP	WATER	SOIL	NO OF BOTTLES											Received Temperature C <u>21c</u>						
AIC No.	Sample Identification	Date/Time Collected																Remarks						
<u>2</u>	<u>FFP</u>	<u>Start 6-6-12/11:45am</u> <u>Stop 6-7-12/11:46am</u>		<input checked="" type="checkbox"/>		<u>2</u>	<input checked="" type="checkbox"/>																	
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) <u>NORMAL</u> or EXPEDITED IN _____ DAYS							Relinquished By: <u>Johnny Fowler</u>		Date/Time <u>6-8-12</u> <u>06:00</u>		Received By: <u>Tom Hartstedt</u>			Date/Time <u>6-8-12</u> <u>06:00</u>										
Expedited results requested by: _____							Relinquished By: <u>Tom Hartstedt</u>		Date/Time <u>6-8-12</u> <u>08:47</u>		Received in Lab By: <u>Shan Parker</u>			Date/Time <u>6-8-12</u> <u>08:47am</u>										
Who should AIC contact with questions: _____							Comments:																	
Phone: _____ Fax: _____																								
Report Attention to: Report Address to: <u>Searcy Water & Sewer</u> <u>P.O. Box 1319</u> <u>Searcy, AR 72145</u>																								

CHAIN OF CUSTODY / ANALYSIS REQUEST FORM

Client: <u>Searcy</u>			PO No.			No of BOTTLES <u>Blomhouthy</u> 2	Analyses Requested										AIC Control No: <u>158336</u>		
Project Reference:			Sample Matrix														AIC Proposal No:		
Project Manager: <u>Johnny Fowler</u>			G R A B	C O M P	W A T E R		S O I L											Carrier:	
Sampled By: <u>Johnny Fowler</u>																		Received Temperature °C <u>2 C</u>	
AIC No.	Sample Identification	Date/Time Collected																	Remarks
<u>3</u>	<u>EPA STAT</u>	<u>6-9-12 / 11:45 AM</u> <u>STOP 6-12-12 / 11:45 AM</u>		<input checked="" type="checkbox"/>															
		Container Type																	Field pH calibration on _____ @ _____
		Preservative																	Buffer:
G = Glass P = Plastic V = VOA vials H = HCl to pH2 T = Sodium Thiosulfate			NO = none S = Sulfuric acid pH2 N = Nitric acid pH2 B = NaOH to pH12 Z = Zinc acetate																
Turnaround Time Requested: (Please circle) <u>NORMAL</u> or EXPEDITED IN ____ DAYS						Relinquished By: <u>Johnny Fowler</u>		Date/Time <u>06:00</u> <u>6-11-12</u>		Received By: <u>Tom Hartsfield</u>		Date/Time <u>06:00</u> <u>6-11-12</u>							
Expedited results requested by: _____						Relinquished By: <u>Tom Hartsfield</u>		Date/Time <u>6:11:12</u> <u>6-11-12</u>		Received in Lab By: <u>John Kuhn</u>		Date/Time <u>6:11:12</u> <u>09:12</u>							
Who should AIC contact with questions: _____						Comments:													
Phone: _____ Fax: _____																			
Report Attention to: _____																			
Report Address to: <u>Searcy Water & Sewer</u> <u>P.O. Box 1319</u> <u>Searcy, AR 72145</u>																			

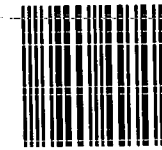
CERTIFIED MAIL™



7009 0820 0002 0865 0393



1000



72118

U.S. POSTAGE
PAID
SEARCY, AR.
72143
JUL 16, 12
AMOUNT

\$7.60
00051413-05

SEARCY WATER AND SEWER SYSTEM

300 NORTH ELM STREET

P.O. BOX 1319

SEARCY, ARKANSAS. 72145-1319

**RETURN RECEIPT
REQUESTED**

NPDES Enforcement Division
A.D.E.Q.
5301 Northshore Dr.
North Little Rock, AR 72118-5317

