



May 29, 2014
Control No. 178814-1
Page 1 of 30

May 29, 2014

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

Control No. 178814-1

Prepared for:

Mr. Bill Eoff
Huntsville Water Utilities
Post Office Box 430
Huntsville, AR 72740

Prepared by:

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



Huntsville Water Utilities
ATTN: Mr. Bill Eoff
Post Office Box 430
Huntsville, AR 72740

Re: Chronic 7-Day Renewal utilizing *Pimephales promelas* (Fathead minnow) and *Ceriodaphnia dubia*
Outfall 001 - Huntsville, AR
NPDES Permit No. AR0022004 AFIN# 44-00018

Dear Mr. Bill Eoff:

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 %. Any statistical difference with sublethal effects cannot be considered toxic due to the minimum significant difference (PMSD) calculated result being below the lower PMSD bounds. **The sample, therefore PASSED both lethal and sub-lethal effects for the Fathead minnow test.**

Method 1002.0 Chronic *Ceriodaphnia dubia* Survival and Reproduction Test: The No Observable Effects Concentration (NOEC) for survival occurred at 100 % effluent, which is equal to the critical dilution of 100 %. The NOEC for reproduction 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 *Ceriodaphnia dubia* test.**

AMERICAN INTERPLEX CORPORATION

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

John Overbey
Laboratory Director

PDF cc: Huntsville Water Utilities
ATTN: Mr. Bill Eoff
bill9eoff@hotmail.com

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%	100	PASS
Control Growth > or = 0.25 mg per Surviving minnow	0.433	PASS
Control Growth CV < or = 40%	7.22	PASS
Growth Minimum Significant Difference 12 to 30%	10.8	BELOW
Critical Dilution CV < or = 40%	3.75	PASS

Ceriodaphnia dubia Method 1002.0

CRITERIA	RESULTS	PASS/FAIL
Control Survival > or = 80%	100	PASS
Control Reproduction > or = 15 per Surviving Female	19.5	PASS
Control CV < or = 40% per Surviving Female	11.9	PASS
Reproduction Minimum Significant Difference 13 to 47%	18.0	PASS
Critical Dilution CV < or = 40%	11.4	PASS

II. Outlined Report
A. Introduction

1. Permit Number: AR0022004 AFIN# 44-00018
2. Test Requirements: Chronic Biomonitoring, Quarterly Test Methods 1000.0 and 1002.0
3. Receiving Stream: White River Basin

B. Source of Effluent/Dilution Water
1. Effluent Samples:

- a. Sampling Point: Outfall 001
- b. Chemical Data:

Analysis	Sample 1	Sample 2	Sample 3
Dissolved oxygen (mg/l)	7.4	8.1	7.7
pH (standard units)	7.4	7.7	7.9
Alkalinity (mg/l as CaCO ₃)	130	150	120
Hardness (mg/l as CaCO ₃)	190	180	180
Conductivity (umhos/cm)	870	890	1000
Residual Chlorine (mg/l)	<0.05	<0.05	<0.05
Ammonia as N (mg/l)	0.10	1.6	0.15

2. Dilution Water Samples: Synthetic Moderately Hard Water #4099

- a. Dates Prepared: May 14 through May 28, 2014
- b. Chemical Data:

Analysis	Sample 1	Sample 2	Sample 3
Dissolved oxygen (mg/l)	8.1	8.3	8.2
pH (standard units)	7.6	7.6	8.0
Alkalinity (mg/l as CaCO ₃)	62	62	62
Hardness (mg/l as CaCO ₃)	82	81	81
Conductivity (umhos/cm)	290	300	300
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: May 20, 2014 at 1400
Date & Time Test Terminated: May 27, 2014 at 1330
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: May 20, 2014 at 1455
Date & Time Test Terminated: May 27, 2014 at 1255
Type & Volume of Test Chamber: 30 ml disposable beaker
Volume of Sample: 15 ml
Number of Organisms per replicate: 1
Number of Replicates per dilution: 10

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

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

D. Test Organisms

1. Scientific Name

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

III. Data Analysis

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

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

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

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

IV. Standard Reference Toxicants

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

Pimephales promelas (Fathead minnow)

Chronic reference tests are performed monthly.

A chronic reference test was performed on April 1, 2014 at 1715 to April 8, 2014 at 1655

The results were as follows: (Control No. 177015-1.)

Survival LC-50: 4852.9 mg/l

Growth IC-25: 2979 mg/l

Growth PMSD: 11.8

Ceriodaphnia dubia

Chronic reference tests are performed monthly.

A chronic reference test was performed on April 1, 2014 at 1700 to April 8, 2014 at 1510

The results were as follows: (Control No. 177015-2.)

Survival LC-50: 1968 mg/l

Growth IC-25: 1264 mg/l

Growth PMSD: 14.6

V. Chemical Analysis/Quality Control

Parameter	Method	% Recovery	Relative % Difference
Alkalinity	SM 2320 B	NA	0.00
Hardness	EPA 200.7	102	1.04
pH	SM 4500-H+ B	100	0.805
Conductivity	EPA 120.1	102	0.660

VI. Organism History

Pimephales promelas (Fathead minnow)

Date: May 20, 2014

Age: <24 hours

Source: In-house culture

Water Chemistry Record:

Alkalinity: 57-64 mg/l

Hardness: 80-100 mg/l

Temperature: 25 deg.C

Ceriodaphnia dubia

Date: May 20, 2014

Age: <24 hours

Source: In-house culture

Water Chemistry Record:

Alkalinity: 57-64 mg/l

Hardness: 80-100 mg/l

Temperature: 25 deg.C

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

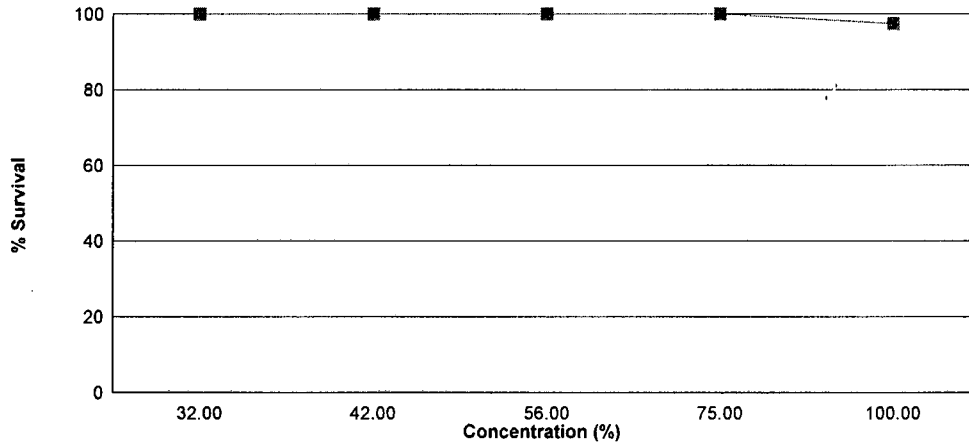
Larvae are exposed in a static renewal system for seven days to different concentrations of effluent with dilution water. Test results are based on the survival and growth (increase in weight) of the larvae.

Effluent dilutions for this test were 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 May 20, 2014 at 1400 and continued through May 27, 2014 at 1330. 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	100	0.433
32 %	100	0.446
42 %	100	0.417
56 %	100	0.451
75 %	100	0.439
100 %	97.5	0.425

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

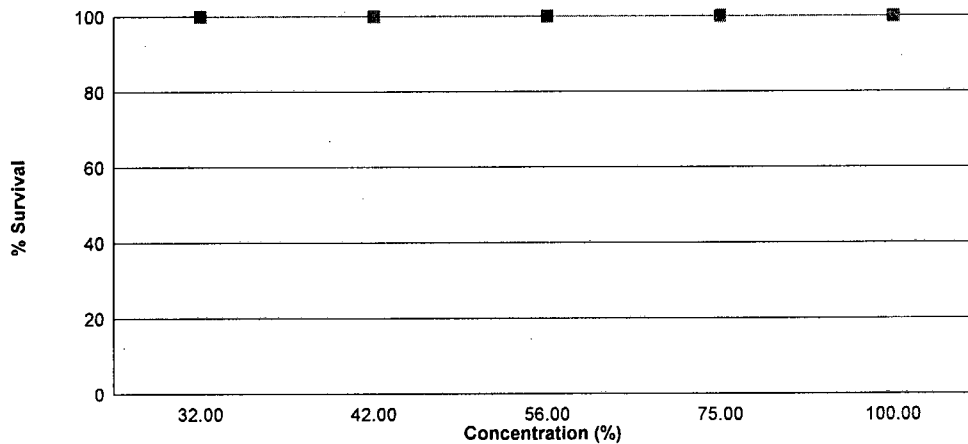
Neonates are exposed in a static renewal system to different concentrations of effluent with dilution water until 60% of surviving control organisms have three broods of offspring with an average of at least 15 young per female.

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 May 20, 2014 at 1455 and continued through May 27, 2014 at 1255. 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 = 100 % effluent



Concentration	Percent Survival	Mean Reproduction
Control	100	19.5
32 %	100	27.7
42 %	100	27.7
56 %	100	27.7
75 %	100	29.7
100 %	100	26.7

Appendix A1: Test 1000.0

Pimephales promelas (Fathead Minnow) 7-Day Survival

Date and Time Test Initiated: May 20, 2014 at 1400

Date and Time Test Terminated: May 27, 2014 at 1330

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	8	8	8
	E	8	8	8	8	8	8	8
32 %	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
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	8	8	8
	E	8	8	8	8	8	8	8
56 %	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
75 %	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
100 %	A	8	7	7	7	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

Appendix A1: Test 1000.0

Pimephales promelas (Fathead Minnow) 7-Day Growth

 Test Initiated: May 20, 2014 at 1400
 Test Terminated: May 27, 2014 at 1330

 Drying Started: May 24, 2014 at 1730
 Drying Ended: May 28, 2014 at 1050

Concentration	Replicate	Weight of pan	Weight of pan + fish	Total weight of fish (g)	Original # of fish	Mean dry weight (mg)
Control	A	.92368	.92680	0.00312	8	0.390
	B	.92968	.93324	0.00356	8	0.445
	C	.92912	.93290	0.00378	8	0.472
	D	.92966	.93298	0.00332	8	0.415
	E	.92594	.92947	0.00353	8	0.441
32 %	A	.92865	.93247	0.00382	8	0.478
	B	.92662	.93048	0.00386	8	0.482
	C	.92872	.93207	0.00335	8	0.419
	D	.92859	.93209	0.00350	8	0.438
	E	.92750	.93082	0.00332	8	0.415
42 %	A	.92929	.93219	0.00290	8	0.362
	B	.92733	.93048	0.00315	8	0.394
	C	.91499	.91866	0.00367	8	0.459
	D	.93087	.93444	0.00357	8	0.446
	E	.92503	.92842	0.00339	8	0.424
56 %	A	.92621	.92986	0.00365	8	0.456
	B	.93028	.93384	0.00356	8	0.445
	C	.93425	.93757	0.00332	8	0.415
	D	.93060	.93441	0.00381	8	0.476
	E	.92946	.93316	0.00370	8	0.462
75 %	A	.92978	.93283	0.00305	8	0.381
	B	.92912	.93262	0.00350	8	0.438
	C	.93451	.93842	0.00391	8	0.489
	D	.92997	.93347	0.00350	8	0.438
	E	.93042	.93403	0.00361	8	0.451
100 %	A	.92462	.92782	0.00320	8	0.400
	B	.92668	.93019	0.00351	8	0.439
	C	.92432	.92771	0.00339	8	0.424
	D	.92755	.93094	0.00339	8	0.424
	E	.93337	.93688	0.00351	8	0.439

Appendix A1: Test 1002.0

Ceriodaphnia dubia Survival and Reproduction

 Date and Time Test Initiated: May 20, 2014 at 1455
 Date and Time Test Terminated: May 27, 2014 at 1255

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	10	0.00
2	0	0	0	0	0	0	0	0	0	0	0	10	0.00
3	0	0	0	0	3	0	0	0	0	0	3	10	0.300
4	4	3	5	3	0	4	2	5	3	4	33	10	3.30
5	0	0	0	0	8	0	6	0	5	9	28	10	2.80
6	9	7	7	6	9	8	8	8	8	0	70	10	7.00
7	9	10	8	8	0	9	0	8	0	9	61	10	6.10
8													
TOTAL	22	20	20	17	20	21	16	21	16	22	195	10	19.5

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	4	5	4	5	5	3	3	4	2	5	40	10	4.00
5	0	0	12	0	8	8	8	8	8	12	64	10	6.40
6	10	12	0	8	0	12	13	12	17	0	84	10	8.40
7	14	16	15	13	14	0	0	0	0	17	89	10	8.90
8													
TOTAL	28	33	31	26	27	23	24	24	27	34	277	10	27.7

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	2	0	4	0	0	0	0	0	6	10	0.600
4	5	6	0	5	0	4	4	2	3	4	33	10	3.30
5	0	0	8	0	8	10	9	7	11	10	63	10	6.30
6	10	12	13	11	14	14	12	12	15	0	113	10	11.3
7	17	13	0	16	0	0	0	0	0	16	62	10	6.20
8													
TOTAL	32	31	23	32	26	28	25	21	29	30	277	10	27.7

Appendix A1: Test 1002.0

Ceriodaphnia dubia Survival and Reproduction

 Date and Time Test Initiated: May 20, 2014 at 1455
 Date and Time Test Terminated: May 27, 2014 at 1255

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	10	0.00
2	0	0	0	0	0	0	0	0	0	0	0	10	0.00
3	0	0	0	2	4	0	0	0	3	0	9	10	0.900
4	5	5	2	0	0	5	4	4	0	5	30	10	3.00
5	0	0	10	8	6	9	10	0	10	11	64	10	6.40
6	12	11	12	10	15	14	12	13	15	0	114	10	11.4
7	15	15	0	0	0	0	0	17	0	13	60	10	6.00
8													
TOTAL	32	31	24	20	25	28	26	34	28	29	277	10	27.7

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	4	4	5	0	0	0	3	0	16	10	1.60
4	5	4	0	0	0	3	5	2	0	5	24	10	2.40
5	12	0	10	8	10	9	12	11	12	11	95	10	9.50
6	0	10	14	15	16	14	17	13	18	0	117	10	11.7
7	13	18	0	0	0	0	0	0	0	14	45	10	4.50
8													
TOTAL	30	32	28	27	31	26	34	26	33	30	297	10	29.7

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	2	0	0	0	4	4	0	10	10	1.00
4	2	4	2	0	5	2	4	0	0	4	23	10	2.30
5	13	0	9	8	8	9	8	10	12	10	87	10	8.70
6	11	10	16	13	0	15	14	15	17	0	111	10	11.1
7	0	8	0	0	14	0	0	0	0	14	36	10	3.60
8													
TOTAL	26	22	27	23	27	26	26	29	33	28	267	10	26.7

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	1.00000	1.39310
1	Control	5	1.00000	1.39310
2	32 %	1	1.00000	1.39310
2	32 %	2	1.00000	1.39310
2	32 %	3	1.00000	1.39310
2	32 %	4	1.00000	1.39310
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	1.00000	1.39310
3	42 %	5	1.00000	1.39310
4	56 %	1	1.00000	1.39310
4	56 %	2	1.00000	1.39310
4	56 %	3	1.00000	1.39310
4	56 %	4	1.00000	1.39310
4	56 %	5	1.00000	1.39310
5	75 %	1	1.00000	1.39310
5	75 %	2	1.00000	1.39310
5	75 %	3	1.00000	1.39310
5	75 %	4	1.00000	1.39310
5	75 %	5	1.00000	1.39310
6	100 %	1	0.87500	1.20940
6	100 %	2	1.00000	1.39310
6	100 %	3	1.00000	1.39310
6	100 %	4	1.00000	1.39310
6	100 %	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 = 0.027 W = 0.4161 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	32 %	27.50	16.00	5.00	
3	42 %	27.50	16.00	5.00	
4	56 %	27.50	16.00	5.00	
5	75 %	27.50	16.00	5.00	
6	100 %	25.00	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
D = 0.02331 W = 0.9698 Critical W = 0.9 (alpha = 0.01, N = 30) Critical W = 0.927 (alpha = 0.05, N = 30)	
Data PASS normality test (alpha = 0.01).	

Bartlett's Test for Homogeneity of Variance	No Transformation
Calculated B1 statistic = 3.634 Critical B = 15.086 (alpha = 0.01, df = 5)	
Data PASS B1 homogeneity test at 0.01 level.	

Appendix A2: Statistics

Pimephales promelas (Fathead minnow) Growth

ANOVA Table				No Transformation	
SOURCE	DF	SS	MS	F	
Between	5	0.004122	0.0008244	0.8484	
Within (Error)	24	0.02332	0.0009717		
Total	29	0.02744			
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	0.4326	0.4326			
2	32 %	0.4464	0.4464	-0.7		
3	42 %	0.417	0.417	0.7913		
4	56 %	0.4508	0.4508	-0.9232		
5	75 %	0.4394	0.4394	-0.3449		
6	100 %	0.4252	0.4252	0.3753		
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	0.04653	10.8	-0.0138		
3	42 %	5	0.04653	10.8	0.0156		
4	56 %	5	0.04653	10.8	-0.0182		
5	75 %	5	0.04653	10.8	-0.0068		
6	100 %	5	0.04653	10.8	0.0074		

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 %	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	32 %	10	0	
2	42 %	10	0	
3	56 %	10	0	
4	75 %	10	0	
5	100 %	10	0	

Appendix A2: Statistics

Ceriodaphnia dubia Reproduction

Kolmogorov Test for Normality	No Transformation
D = 0.1026 D* = 0.805 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 = 3.902 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	636	127.2	10.99	
Within (Error)	54	625	11.57		
Total	59	1261			
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	19.5	19.5			
2	32 %	27.7	27.7	-5.391		
3	42 %	27.7	27.7	-5.391		
4	56 %	27.7	27.7	-5.391		
5	75 %	29.7	29.7	-6.705		
6	100 %	26.7	26.7	-4.733		
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	3.514	18	-8.2	
3	42 %	10	3.514	18	-8.2	
4	56 %	10	3.514	18	-8.2	
5	75 %	10	3.514	18	-10.2	
6	100 %	10	3.514	18	-7.2	

Appendix A3: Water Chemistry

Routine Chemical and Physical Data

 Date and Time Test Initiated: May 20, 2014 at 0958
 Date and Time Test Terminated: May 27, 2014 at 1330

Effluent Conc.: Control		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
DO, mg/l	Initial	8.1	8.3	8.3	7.8	8.2	7.9	7.8
	Final *1	8.1	7.5	7.4	7.0	7.7	7.9	7.0
	Final *2	8.2	8.0	8.2	7.5	7.6	8.0	7.4
pH, units	Initial	7.6	7.6	7.6	7.7	8.0	8.0	7.8
	Final *1	7.8	7.7	7.5	7.5	7.9	7.7	7.5
	Final *2	7.6	7.9	7.7	7.9	8.0	7.7	7.4
Alkalinity, mg CaCO ₃ /l		62	NA	62	NA	62	NA	NA
Hardness, mg CaCO ₃ /l		82	NA	81	NA	81	NA	NA
Conductivity, umhos/cm		290	300	300	300	300	310	300
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	7.9	8.2	8.0	7.9	7.8	7.7	7.8
	Final *1	8.0	7.1	7.4	6.9	7.9	7.8	6.6
	Final *2	8.1	8.0	8.1	7.5	7.7	8.2	7.4
pH, units	Initial	7.5	7.7	7.7	7.7	8.0	8.2	7.9
	Final *1	8.0	7.7	7.7	7.6	8.2	7.9	7.6
	Final *2	7.8	8.0	7.8	8.1	8.1	7.8	7.6

Effluent Conc.: 42 %		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
DO, mg/l	Initial	8.0	8.0	8.2	7.9	8.0	7.6	7.8
	Final *1	7.8	7.2	7.4	7.1	7.6	7.8	7.3
	Final *2	8.1	8.0	8.0	7.4	7.7	8.2	7.3
pH, units	Initial	7.5	7.7	7.8	7.7	8.0	8.2	7.9
	Final *1	8.0	7.8	7.7	7.7	8.2	8.0	7.8
	Final *2	7.9	8.1	7.9	8.2	8.1	7.9	7.6

Appendix A3: Water Chemistry

Routine Chemical and Physical Data

Date and Time Test Initiated: May 20, 2014 at 0958

Date and Time Test Terminated: May 27, 2014 at 1330

Effluent Conc.: 56 %		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
DO, mg/l	Initial	7.9	8.1	8.0	8.0	7.8	7.6	8.0
	Final *1	8.0	7.2	7.6	7.0	7.7	7.9	7.1
	Final *2	8.0	7.8	8.2	7.6	7.8	8.2	7.5
pH, units	Initial	7.5	7.7	7.8	7.7	8.0	8.2	8.0
	Final *1	8.1	7.9	7.8	7.8	8.3	8.0	7.8
	Final *2	7.9	8.1	8.0	8.3	8.2	7.9	7.7

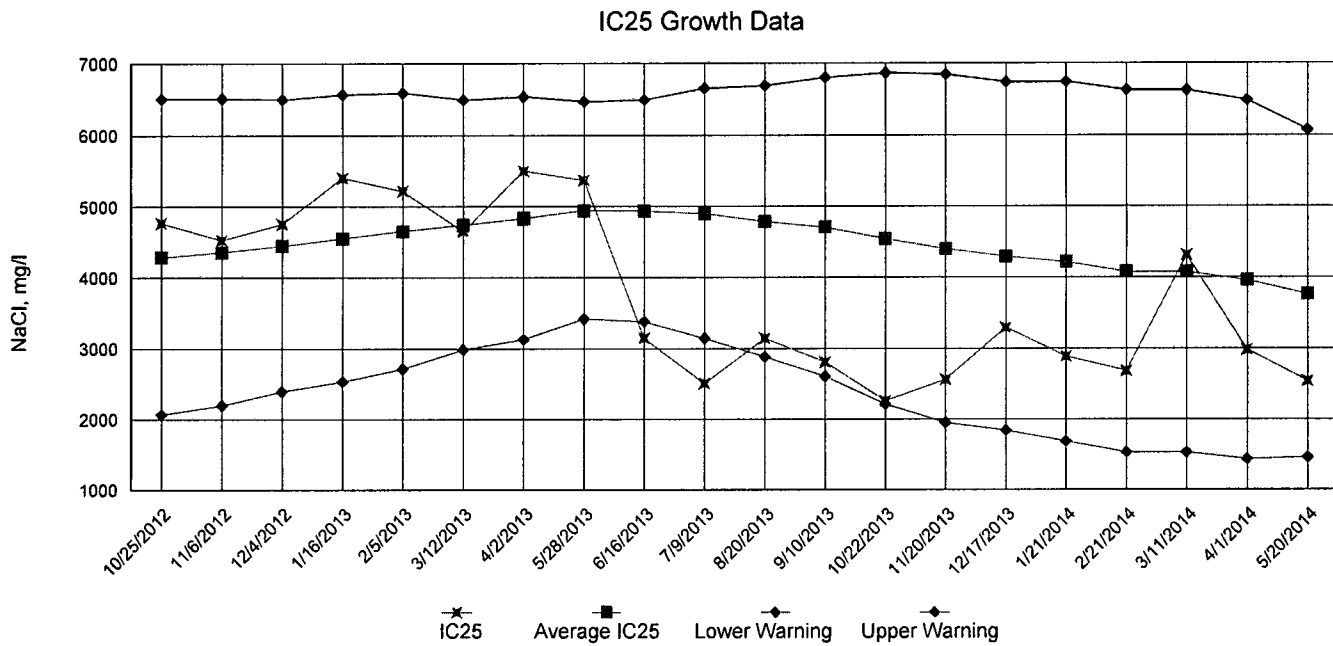
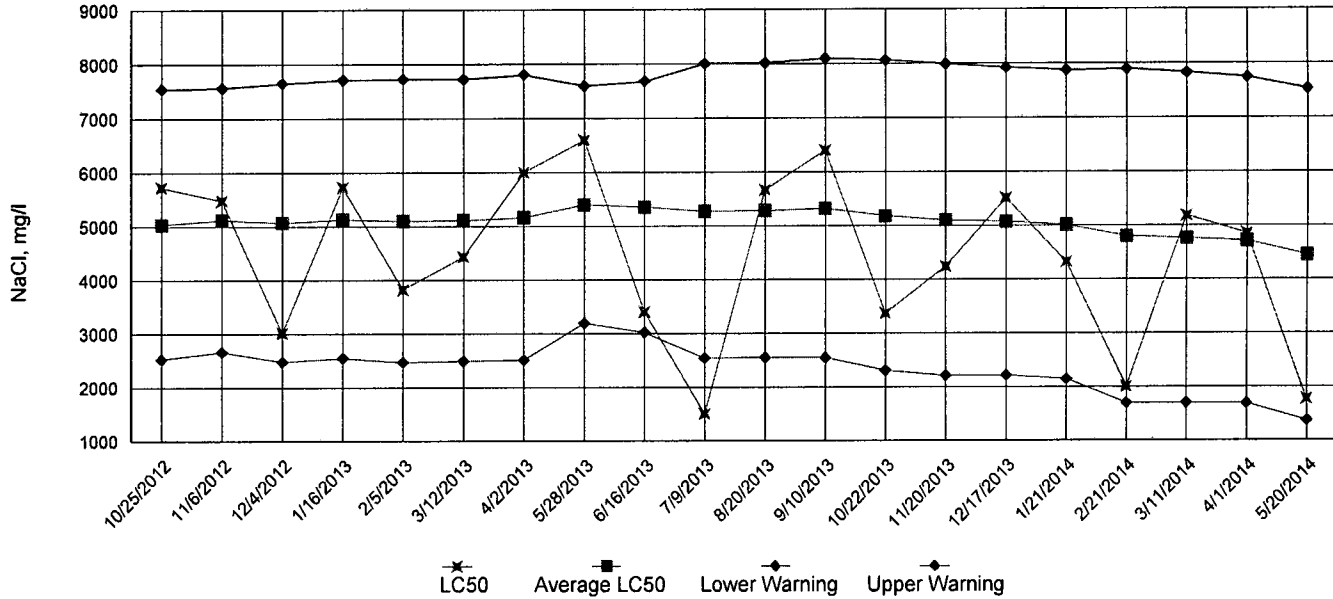
Effluent Conc.: 75 %		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
DO, mg/l	Initial	7.7	7.9	8.2	7.7	7.9	7.6	8.0
	Final *1	7.9	7.1	7.4	7.1	7.7	7.9	7.3
	Final *2	8.1	7.6	7.8	7.5	7.6	8.0	7.4
pH, units	Initial	7.4	7.6	7.8	7.6	8.0	8.3	8.0
	Final *1	8.1	8.0	7.9	7.9	8.4	8.1	7.9
	Final *2	8.0	8.2	8.0	8.3	8.2	8.0	7.8

Effluent Conc.: 100 %		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
DO, mg/l	Initial	7.4	7.9	8.1	7.6	7.7	7.5	7.7
	Final *1	8.1	7.3	7.5	6.9	7.6	7.9	6.8
	Final *2	8.0	7.5	7.8	7.5	7.7	8.2	7.5
pH, units	Initial	7.4	7.5	7.7	7.5	7.9	8.3	8.0
	Final *1	8.2	8.0	8.0	7.9	8.4	8.2	7.8
	Final *2	8.0	8.2	8.1	8.4	8.3	8.1	7.8
Alkalinity, mg CaCO ₃ /l	130	NA	150	NA	120	NA	NA	NA
Hardness, mg CaCO ₃ /l	190	NA	180	NA	180	NA	NA	NA
Conductivity, umhos/cm	870	870	890	920	1000	1000	1000	1000
Res. Chlorine, mg/l	<0.05	NA	<0.05	NA	<0.05	NA	NA	NA

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

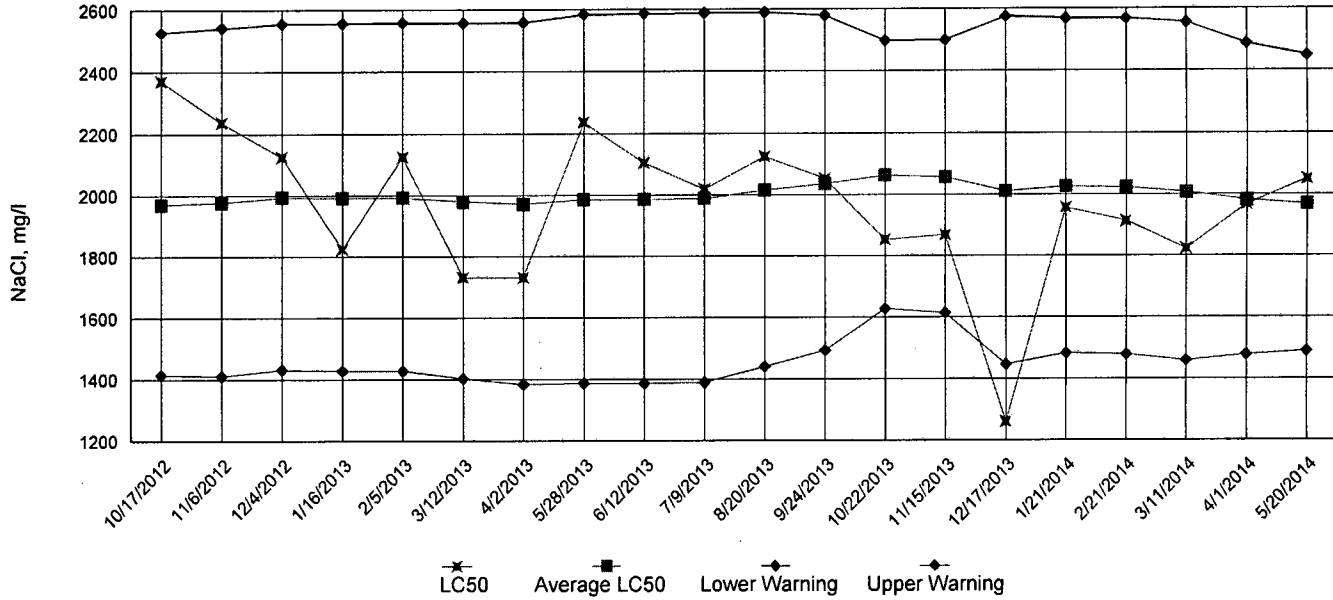
Appendix A4: Test 1000.0
Chronic Reference Toxicant, *Pimephales promelas* (Fathead Minnow)

LC50 Survival Data

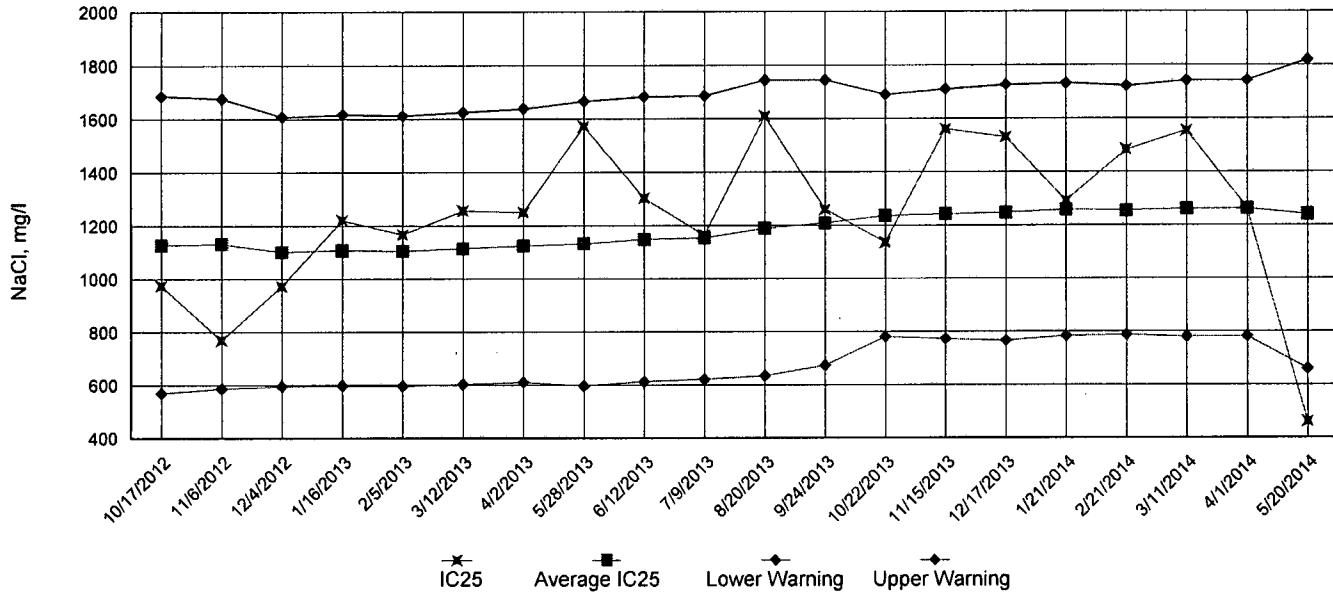


Appendix A4: Test 1002.0
Chronic Reference Toxicant, *Ceriodaphnia dubia*

LC50 Survival Data



IC25 Reproduction Data



Appendix B: Test 1000.0

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

Permittee: Huntsville Water Utilities

NPDES No.: AR0022004 AFIN# 44-00018

Date and Time Test Initiated: May 20, 2014 at 1400

Date and Time Test Terminated: May 27, 2014 at 1330

Dilution water used: Synthetic Moderately Hard Water #4099

DATA TABLE FOR SURVIVAL

Effluent Conc. %	Percent Survival in replicate chambers					Mean percent survival			CV%
	A	B	C	D	E	24 hr	48 hr	7 days	
Control	100	100	100	100	100	100	100	100	0.00
32 %	100	100	100	100	100	100	100	100	0.00
42 %	100	100	100	100	100	100	100	100	0.00
56 %	100	100	100	100	100	100	100	100	0.00
75 %	100	100	100	100	100	100	100	100	0.00
100 %	87.5	100	100	100	100	100	97.5	97.5	5.73

DATA TABLE FOR GROWTH

Effluent Conc. %	Average dry weight, mg replicate chambers					Mean dry weight, mg	CV%
	A	B	C	D	E		
Control	0.390	0.445	0.472	0.415	0.441	0.433	7.22
32 %	0.478	0.482	0.419	0.438	0.415	0.446	7.15
42 %	0.362	0.394	0.459	0.446	0.424	0.417	9.45
56 %	0.456	0.445	0.415	0.476	0.462	0.451	5.09
75 %	0.381	0.438	0.489	0.438	0.451	0.439	8.82
100 %	0.400	0.439	0.424	0.424	0.439	0.425	3.75

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: 7.22 (TQP6C)

Appendix B: Test 1000.0

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

PERMITTEE: <u>Huntsville Water Utilities</u>	SAMPLE No. 1 COLLECTED ending: <u>DATE: May 19, 2014</u>	TIME: <u>0500</u>
NPDES NO.: <u>AR0022004 AFIN# 44-00018</u>	SAMPLE No. 2 COLLECTED ending: <u>DATE: May 21, 2014</u>	TIME: <u>0500</u>
CONTACT: <u>Mr. Bill Eoff</u>	SAMPLE No. 3 COLLECTED ending: <u>DATE: May 23, 2014</u>	TIME: <u>0500</u>
ANALYST: <u>280, 304, 307, 310</u>	Test Initiated: <u>DATE: May 20, 2014</u>	TIME: <u>1400</u>
	Test Terminated: <u>DATE: May 27, 2014</u>	TIME: <u>1330</u>

DILUTION Control	DAY						
	1	2	3	4	5	6	7
D.O. Initial	8.1	8.3	8.3	7.8	8.2	7.9	7.8
Final	8.1	7.5	7.4	7.0	7.7	7.9	7.0
pH Initial	7.6	7.6	7.6	7.7	8.0	8.0	7.8
Final	7.8	7.7	7.5	7.5	7.9	7.7	7.5
Alkalinity	62	NA	62	NA	62	NA	NA
Hardness	82	NA	81	NA	81	NA	NA
Conductivity	290	300	300	300	300	310	300
Chlorine	<0.05	NA	<0.05	NA	<0.05	NA	NA

DILUTION 32 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	7.9	8.2	8.0	7.9	7.8	7.7	7.8
Final	8.0	7.1	7.4	6.9	7.9	7.8	6.6
pH Initial	7.5	7.7	7.7	7.7	8.0	8.2	7.9
Final	8.0	7.7	7.7	7.6	8.2	7.9	7.6
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	480	480	490	510	530	520	520
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION 42 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	8.0	8.0	8.2	7.9	8.0	7.6	7.8
Final	7.8	7.2	7.4	7.1	7.6	7.8	7.3
pH Initial	7.5	7.7	7.8	7.7	8.0	8.2	7.9
Final	8.0	7.8	7.7	7.7	8.2	8.0	7.8
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	530	530	540	570	590	590	590
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION 56 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	7.9	8.1	8.0	8.0	7.8	7.6	8.0
Final	8.0	7.2	7.6	7.0	7.7	7.9	7.1
pH Initial	7.5	7.7	7.8	7.7	8.0	8.2	8.0
Final	8.1	7.9	7.8	7.8	8.3	8.0	7.8
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	610	610	620	660	690	690	690
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION 75 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	7.7	7.9	8.2	7.7	7.9	7.6	8.0
Final	7.9	7.1	7.4	7.1	7.7	7.9	7.3
pH Initial	7.4	7.6	7.8	7.6	8.0	8.3	8.0
Final	8.1	8.0	7.9	7.9	8.4	8.1	7.9
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	720	720	730	780	820	820	820
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION 100 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	7.4	7.9	8.1	7.6	7.7	7.5	7.7
Final	8.1	7.3	7.5	6.9	7.6	7.9	6.8
pH Initial	7.4	7.5	7.7	7.5	7.9	8.3	8.0
Final	8.2	8.0	8.0	7.9	8.4	8.2	7.8
Alkalinity	130	NA	150	NA	120	NA	NA
Hardness	190	NA	180	NA	180	NA	NA
Conductivity	870	870	890	920	1000	1000	1000
Chlorine	<0.05	NA	<0.05	NA	<0.05	NA	NA

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

 Permittee: Huntsville Water Utilities

 NPDES No.: AR0022004 AFIN# 44-00018

Date and Time Test Initiated: May 20, 2014 at 1455

Date and Time Test Terminated: May 27, 2014 at 1255

Dilution water used: Synthetic Moderately Hard Water #4099

PERCENT SURVIVAL

Time of Reading	Control	Percent Effluent				
		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	100

NUMBER OF YOUNG PRODUCED PER FEMALE @ 7 DAYS

Replicates	Control	Percent Effluent				
		32 %	42 %	56 %	75 %	100 %
A	22	28	32	32	30	26
B	20	33	31	31	32	22
C	20	31	23	24	28	27
D	17	26	32	20	27	23
E	20	27	26	25	31	27
F	21	23	28	28	26	26
G	16	24	25	26	34	26
H	21	24	21	34	26	29
I	16	27	29	28	33	33
J	22	34	30	29	30	28
Mean per Adult	19.5	27.7	27.7	27.7	29.7	26.7
Mean per Surviving Adult	19.5	27.7	27.7	27.7	29.7	26.7
CV %	11.9	13.8	13.8	14.9	9.66	11.4

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> </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: 100 % (TOP3B)

6. LOEC Ceriodaphnia Lethality: 100 % (TXP3B)

7. NOEC Ceriodaphnia Sublethality: 100 % (TPP3B)

8. LOEC Ceriodaphnia Sublethality: 100 % (TYP3B)

9. Coefficient of variation for Ceriodaphnia Reproduction: 11.9 (TQP3B)

Appendix B: Test 1002.0

CHRONIC TOXICITY SUMMARY FORM
Ceriodaphnia dubia
CHEMICAL PARAMETERS CHART

PERMITTEE: Huntsville Water Utilities SAMPLE No. 1 COLLECTED ending: DATE: May 19, 2014 TIME: 0500
 NPDES NO.: AR0022004 AFIN# 44-00018 SAMPLE No. 2 COLLECTED ending: DATE: May 21, 2014 TIME: 0500
 CONTACT: Mr. Bill Eoff SAMPLE No. 3 COLLECTED ending: DATE: May 23, 2014 TIME: 0500
 ANALYST: 280, 304, 307, 310 Test Initiated: DATE: May 20, 2014 TIME: 1455
 Test Terminated: DATE: May 27, 2014 TIME: 1255

DILUTION Control	DAY						
	1	2	3	4	5	6	7
D.O. Initial	8.1	8.3	8.3	7.8	8.2	7.9	7.8
Final	8.2	8.0	8.2	7.5	7.6	8.0	7.4
pH Initial	7.6	7.6	7.6	7.7	8.0	8.0	7.8
Final	7.6	7.9	7.7	7.9	8.0	7.7	7.4
Alkalinity	62	NA	62	NA	62	NA	NA
Hardness	82	NA	81	NA	81	NA	NA
Conductivity	290	300	300	300	300	310	300
Chlorine	<0.05	NA	<0.05	NA	<0.05	NA	NA

DILUTION 32 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	7.9	8.2	8.0	7.9	7.8	7.7	7.8
Final	8.1	8.0	8.1	7.5	7.7	8.2	7.4
pH Initial	7.5	7.7	7.7	7.7	8.0	8.2	7.9
Final	7.8	8.0	7.8	8.1	8.1	7.8	7.6
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	480	480	490	510	530	520	520
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION 42 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	8.0	8.0	8.2	7.9	8.0	7.6	7.8
Final	8.1	8.0	8.0	7.4	7.7	8.2	7.3
pH Initial	7.5	7.7	7.8	7.7	8.0	8.2	7.9
Final	7.9	8.1	7.9	8.2	8.1	7.9	7.6
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	530	530	540	570	590	590	590
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION 56 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	7.9	8.1	8.0	8.0	7.8	7.6	8.0
Final	8.0	7.8	8.2	7.6	7.8	8.2	7.5
pH Initial	7.5	7.7	7.8	7.7	8.0	8.2	8.0
Final	7.9	8.1	8.0	8.3	8.2	7.9	7.7
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	610	610	620	660	690	690	690
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION 75 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	7.7	7.9	8.2	7.7	7.9	7.6	8.0
Final	8.1	7.6	7.8	7.5	7.6	8.0	7.4
pH Initial	7.4	7.6	7.8	7.6	8.0	8.3	8.0
Final	8.0	8.2	8.0	8.3	8.2	8.0	7.8
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	720	720	730	780	820	820	820
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION 100 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	7.4	7.9	8.1	7.6	7.7	7.5	7.7
Final	8.0	7.5	7.8	7.5	7.7	8.2	7.5
pH Initial	7.4	7.5	7.7	7.5	7.9	8.3	8.0
Final	8.0	8.2	8.1	8.4	8.3	8.1	7.8
Alkalinity	130	NA	150	NA	120	NA	NA
Hardness	190	NA	180	NA	180	NA	NA
Conductivity	870	870	890	920	1000	1000	1000
Chlorine	<0.05	NA	<0.05	NA	<0.05	NA	NA



8600 Kanis Road
 Little Rock, AR 72204-2322
 (501) 224-5060
 FAX (501) 224-5072

CHAIN OF CUSTODY / ANALYSIS REQUEST FORM

PAGE 1 OF 3

Client: <u>Huntsville Water Utilities</u>			PO No.		NO OF BOTTLES	ANALYSES REQUESTED										AIC CONTROL NO: <u>178814</u>			
Project: <u>Bio Monitoring</u>			SAMPLE MATRIX			Cd & Fh Chronic											AIC PROPOSAL NO:		
Project: <u>Manager: Bill Eoff</u>			G A B	C O M P	W A T E R		S O I L	3											Carrier: <u>FedEx</u>
Sampled By: <u>Bill Eoff</u>																Received on Ice (4°C)? <u>YES</u> 2.3°C NO			
AIC No.	Sample Identification	Date/Time Collected																Remarks	
①	<u>Huntsville#1</u>	<u>5-18-14 07:00- 5-19-14 05:00</u>		X	X			3	X										
Container Type <u>P</u>			Field pH calibration on _____ @ _____																
Preservative <u>4C</u>			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) NORMAL or EXPEDITED IN _____ DAYS							Relinquished By: <u>[Signature]</u>		Date/Time: <u>5/19/14 08:00</u>		Received By:		Date/Time:						
Expedited results requested by: _____							Relinquished By:		Date/Time:		Received in Lab By: <u>[Signature]</u>		Date/Time: <u>5/20/14 0800</u>						
Who should AIC contact with questions: <u>Bill Eoff</u>							Comments: <u>FedEx 8019 4081 1977</u>												
Phone: <u>(479) - 738 - 2088</u> Fax: <u>(479) - 738 - 1285</u>																			
Report Attention to: <u>Bill Eoff</u>																			
Report Address to: <u>Bill Eoff Huntsville Water Utilities P.O. Box 430</u>																			



8600 Kanis Road
 Little Rock, AR 72204-2322
 (501) 224-5060
 FAX (501) 224-5072

CHAIN OF CUSTODY / ANALYSIS REQUEST FORM

PAGE OF

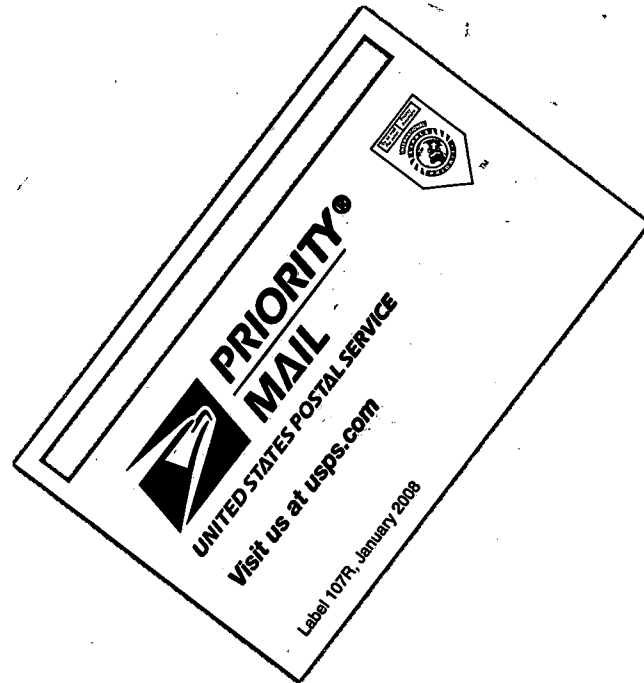
Client: Huntsville Water Utilities			PO No.		NO OF BOTTLES	ANALYSES REQUESTED										AIC CONTROL NO: 178814			
Project Reference: Bio Monitoring			SAMPLE MATRIX			Cd & Pb Chronic													
Project Manager: Bill Eoff			GRAMP	WATER	SOIL		S	L	3	X									
Sampled By: Bill Eoff																			
AIC No.	Sample Identification	Date/Time Collected																	Remarks
2	Huntsville#2	5/20/14 07:00 - 5/21/14 05:00		X	X														
																		Field pH calibration	
																		on _____ @ _____	
																		Buffer:	
G = Glass P = Plastic V = VOA vials H = HCl to pH2 T = Sodium Thiosulfate			NO = none S = Sulfuric acid pH2 N = Nitric acid pH2 B = NaOH to pH12 Z = Zinc acetate																
Turnaround Time Requested: (Please circle) NORMAL or EXPEDITED IN _____ DAYS						Relinquished By: <i>Bill Eoff</i>		Date/Time: 5/21/14 @ 8:00		Received By:		Date/Time:							
Expedited results requested by: _____						Relinquished By:		Date/Time:		Received in Lab By: <i>Walter Hopton</i>		Date/Time: 5-22-14 0815							
Who should AIC contact with questions: Bill Eoff						Comments:													
Phone: (479) - 738 - 208 Fax: (479) - 738 - 1285																			
Report Attention to: Bill Eoff																			
Report Address to: Bill Eoff Huntsville Water Utilities P.O. Box 430																			



CHAIN OF CUSTODY / ANALYSIS REQUEST FORM

Client: <u>City of Siloam Springs</u>			PO No.		NO OF BOTTLES	ANALYSES REQUESTED ¹										AIC CONTROL NO: <u>178816</u>								
Project Reference: <u>WET</u>			SAMPLE MATRIX			WET											AIC PROPOSAL NO:							
Project Manager: <u>T Myers</u>			WATER	SOIL													Carrier/Tracking No. <u>UPS</u>							
Sampled By: <u>J Harrison</u>							G	COMP											Received Temperature C <u>1.7</u>					
AIC No.	Sample Identification	Date/Time Collected	GRAB	COMP	WATER	SOIL			BOTTLES											Remarks				
③	<u>Plant Effluent</u>	<u>5/22-23/14 1000-0900</u>		X	X		3	X											<u>2nd Quarter</u>					
																			<u>start temp 2.6</u>					
																			<u>stop temp 3.7</u>					
																			Field pH calibration					
			Container Type					<u>G</u>											on _____ @ _____					
			Preservative					<u>NO</u>											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>Jake Harrison</u>					Date/Time <u>5/23/14 1130</u>					Received By:					Date/Time				
Expedited results requested by: _____					Relinquished By:					Date/Time					Received in Lab By: <u>Shawn Ray</u>					Date/Time <u>5-24-14 (1005)</u>				
Who should AIC contact with questions: <u>T Myers</u>					Comments:																			
Phone: <u>479 524 5023</u> Fax: <u>479 524 4653</u>																								
Report Attention to: <u>T Myers</u>																								
Report Address to: <u>PO BOX 80 Siloam Springs AR 72761</u>																								

Huntsville Water Utilities
P.O. Box 430
Huntsville, AR 72740



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

