

Biomonitoring
1st Quarter
(Jan, Feb, Mar) 2015

February 2, 2015

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

Control No. 186795-1

Prepared for:

Mr. Jonathon Buff
Benton Utilities
616 West Hazel
Benton, AR 72015

Prepared by:

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



Benton Utilities
ATTN: Mr. Jonathon Buff
616 West Hazel
Benton, AR 72015

Re: Chronic 7-Day Renewal utilizing *Pimephales promelas* (Fathead minnow) and *Ceriodaphnia dubia*
Outfall 001 - Benton, AR
NPDES Permit No. AR0036498 AFIN# 63-00063

Dear Mr. Jonathon Buff:

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: Due to the calculated minimum significant difference of 33.5% being outside of the acceptance range, the test will need to be repeated. It is believed the failure is the result of pathogen interference (bacteria).

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

John Overbey
Laboratory Director

PDF cc: Benton Utilities
ATTN: Mr. Jonathon Buff
jwbuff@bentonar.org

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I. Control Acceptance Criteria

Pimephales promelas (Fathead minnow) Method 1000.0

CRITERIA	RESULTS	PASS/FAIL
Control Survival > or = 80%	97.5	PASS
Control Growth > or = 0.25 mg per Surviving minnow	0.275	PASS
Control Growth CV < or = 40%	12.9	PASS
Growth Minimum Significant Difference 12 to 30%	33.5	FAIL
Critical Dilution CV < or = 40%	8.39	PASS

Ceriodaphnia dubia Method 1002.0

CRITERIA	RESULTS	PASS/FAIL
Control Survival > or = 80%	100	PASS
Control Reproduction > or = 15 per Surviving Female	33.9	PASS
Control CV < or = 40% per Surviving Female	17.3	PASS
Reproduction Minimum Significant Difference 13 to 47%	25.8	PASS
Critical Dilution CV < or = 40%	38.7	PASS

II. Outlined Report

A. Introduction

1. Permit Number: AR0036498 AFIN# 63-00063
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: Outfall 001
- b. Chemical Data:

Analysis	Sample 1	Sample 2	Sample 3
Dissolved oxygen (mg/l)	8.5	8.6	9.0
pH (standard units)	7.0	7.2	7.0
Alkalinity (mg/l as CaCO ₃)	32	31	29
Hardness (mg/l as CaCO ₃)	70	76	74
Conductivity (umhos/cm)	280	260	260
Residual Chlorine (mg/l)	<0.05	<0.05	<0.05
Ammonia as N (mg/l)	<0.1	0.19	0.18

2. Dilution Water Samples: Synthetic Soft Water #4174

- a. Dates Prepared: January 7 through January 21, 2015
- b. Chemical Data:

Analysis	Sample 1	Sample 2	Sample 3
Dissolved oxygen (mg/l)	8.2	8.3	8.4
pH (standard units)	7.5	7.4	7.7
Alkalinity (mg/l as CaCO ₃)	31	31	31
Hardness (mg/l as CaCO ₃)	44	46	46
Conductivity (umhos/cm)	150	140	150
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: January 20, 2015 at 1520
Date & Time Test Terminated: January 27, 2015 at 1410
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: January 20, 2015 at 1440
Date & Time Test Terminated: January 27, 2015 at 1330
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

The results were as follows: (Control No. 186586-1.)

Survival LC-50: mg/l

Growth IC-25: mg/l

Growth PMSD:

Ceriodaphnia dubia

Chronic reference tests are performed monthly.

A chronic reference test was performed on

The results were as follows: (Control No. 186586-2.)

Survival LC-50: mg/l

Growth IC-25: mg/l

Growth PMSD:

V. Chemical Analysis/Quality Control

Parameter	Method	% Recovery	Relative % Difference
Alkalinity	SM 2320 B	NA	1.11
Hardness	EPA 200.7	100	1.06
pH	SM 4500-H+ B	100	0.815
Conductivity	EPA 120.1	102	9.72

VI. Organism History

Pimephales promelas (Fathead minnow)

Date: January 20, 2015

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: January 20, 2015

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

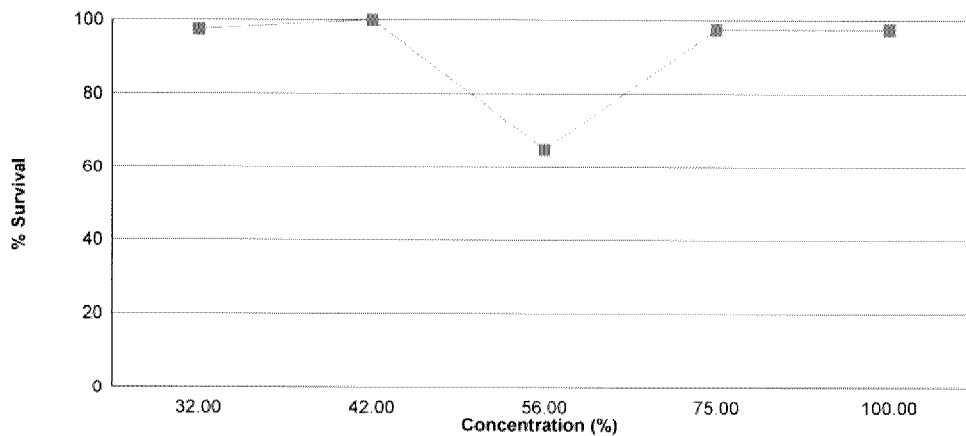
Larvae are exposed in a static renewal system for seven days to different concentrations of effluent with dilution water. Test results are based on the survival and growth (increase in weight) of the larvae.

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 January 20, 2015 at 1520 and continued through January 27, 2015 at 1410. 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	97.5	0.268
32 %	97.5	0.311
42 %	100	0.344
56 %	65.0	0.187
75 %	97.5	0.331
100 %	97.5	0.324

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

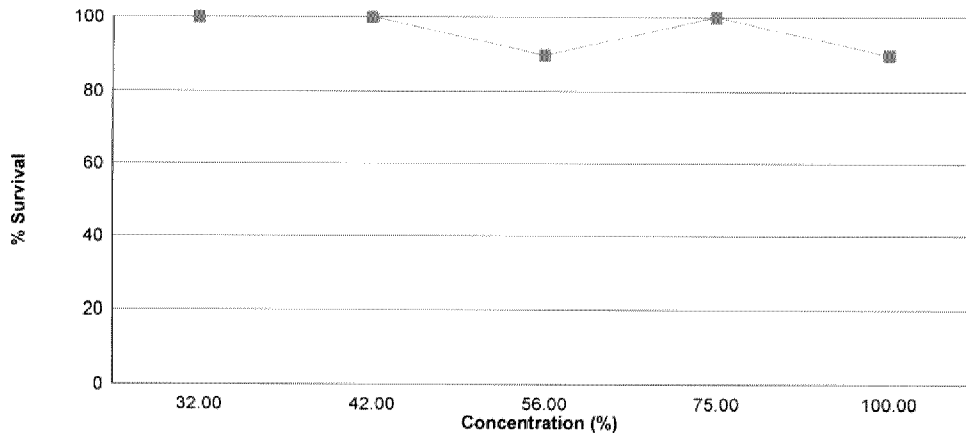
Neonates are exposed in a static renewal system to different concentrations of effluent with dilution water until 60% of surviving control organisms have three broods of offspring with an average of at least 15 young per female.

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 January 20, 2015 at 1440 and continued through January 27, 2015 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 reproduction = 100 % effluent



Summary of the 7-day <i>Ceriodaphnia dubia</i> Survival and Reproduction Data		
Concentration	Percent Survival	Mean Reproduction
Control	100	33.9
32 %	100	33.3
42 %	100	32.1
56 %	90.0	31.3
75 %	100	34.7
100 %	90.0	29.9

Appendix A1: Test 1000.0

Pimephales promelas (Fathead Minnow) 7-Day Survival

Date and Time Test Initiated: January 20, 2015 at 1520

Date and Time Test Terminated: January 27, 2015 at 1410

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	7	7	7	7	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
32 %	A	7	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
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	7	7	7	3	0
	C	8	8	8	8	8	8	8
	D	8	8	8	8	8	8	8
	E	8	8	8	8	8	7	2
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	7	7	7	7	7	7	7
	E	8	8	8	8	8	8	8
100 %	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	7	7
	E	8	8	8	8	8	8	8

Appendix A1: Test 1000.0

Pimephales promelas (Fathead Minnow) 7-Day Growth

Test Initiated: January 20, 2015 at 1520
Test Terminated: January 27, 2015 at 1410

Drying Started: January 22, 2015 at 1045
Drying Ended: January 28, 2015 at 1100

Concentration	Replicate	Weight of pan	Weight of pan + fish	Total weight of fish (g)	Original # of fish	Mean dry weight (mg)
Control	A	.92773	.92994	0.00221	8	0.276
	B	.93650	.93821	0.00171	8	0.214
	C	.92781	.93005	0.00224	8	0.280
	D	.92742	.92951	0.00209	8	0.261
	E	.92785	.93031	0.00246	8	0.308
32 %	A	.93066	.93260	0.00194	8	0.242
	B	.93260	.93508	0.00248	8	0.310
	C	.93041	.93311	0.00270	8	0.338
	D	.92833	.93102	0.00269	8	0.336
	E	.92946	.93210	0.00264	8	0.330
42 %	A	.93903	.94156	0.00253	8	0.316
	B	.92910	.93167	0.00257	8	0.321
	C	.93173	.93426	0.00253	8	0.316
	D	.93348	.93658	0.00310	8	0.388
	E	.93646	.93949	0.00303	8	0.379
56 %	A	.93887	.94110	0.00223	8	0.279
	B	0.00000	0.00000	0.00000	8	0.000
	C	.93514	.93752	0.00238	8	0.298
	D	.93161	.93349	0.00188	8	0.235
	E	.93090	.93189	0.00099	8	0.124
75 %	A	.93254	.93507	0.00253	8	0.316
	B	.93388	.93696	0.00308	8	0.385
	C	.93652	.93886	0.00234	8	0.292
	D	.93928	.94178	0.00250	8	0.312
	E	.93998	.94279	0.00281	8	0.351
100 %	A	.93922	.94145	0.00223	8	0.279
	B	.93943	.94223	0.00280	8	0.350
	C	.93428	.93686	0.00258	8	0.322
	D	.93103	.93374	0.00271	8	0.339
	E	.93052	.93315	0.00263	8	0.329

Appendix A1: Test 1002.0

Ceriodaphnia dubia Survival and Reproduction

Date and Time Test Initiated: January 20, 2015 at 1440

Date and Time Test Terminated: January 27, 2015 at 1330

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	6	3	6	4	3	7	3	6	8	6	52	10	5.20	
5	9	11	15	13	9	0	11	10	15	13	106	10	10.6	
6	0	14	0	16	14	16	15	0	17	0	92	10	9.20	
7	15	0	20	0	0	19	0	16	0	19	89	10	8.90	
8														
TOTAL	30	28	41	33	26	42	29	32	40	38	339	10	33.9	

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	3	0	3	4	10	10	1.00	
4	3	3	4	2	2	6	0	5	0	0	25	10	2.50	
5	12	8	13	13	10	13	10	0	13	15	107	10	10.7	
6	17	17	1	16	13	0	18	12	16	19	129	10	12.9	
7	0	0	20	0	19E	21	0	21	14E	0	62	10	6.20	
8														
TOTAL	32	28	38	31	25	40	31	38	32	38	333	10	33.3	

E = Excluded fourth brood neonates

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	3	0	4	0	7	10	0.700	
4	3	3	5	6	7	6	0	6	0	5	41	10	4.10	
5	0	10	13	15	10	12	10	0	12	10	92	10	9.20	
6	0	13	0	18	0	0	17	12	18	0	78	10	7.80	
7	0	0	25	0	24	17	19E	17	0	20	103	10	10.3	
8														
TOTAL	3	26	43	39	41	35	30	35	34	35	321	10	32.1	

E = Excluded fourth brood neonates

Appendix A1: Test 1002.0

Ceriodaphnia dubia Survival and Reproduction

Date and Time Test Initiated: January 20, 2015 at 1440

Date and Time Test Terminated: January 27, 2015 at 1330

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	0	0	0	0	0	X	5	5	9	0.556
4	5	4	6	4	6	7	2	6	X	0	40	9	4.44
5	11	12	10	11	0	0	9	0	X	14	67	9	7.44
6	3	17	0	0	10	14	13	11	X	17	85	9	9.44
7	22	0	19	18	20	21	0	16	X	0	116	9	12.9
8													
TOTAL	41	33	35	33	36	42	24	33	0	36	313	10	31.3

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	1	0	1	0	6	0	8	10	0.800
4	3	4	5	3	0	7	0	6	0	6	34	10	3.40
5	0	10	15	13	10	0	9	0	12	10	79	10	7.90
6	11	16	0	0	16	18	17	10	17	0	105	10	10.5
7	20	0	21	21	0	20	14E	17	1	21	121	10	12.1
8													
TOTAL	34	30	41	37	27	45	27	33	36	37	347	10	34.7

E = Excluded fourth brood neonates

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	X	0	1	1	9	0.111
4	2	3	4	5	7	7	6	X	5	0	39	9	4.33
5	0	12	14	12	0	0	0	X	14	13	65	9	7.22
6	0	15	16	2	16	13	12	X	13	18	105	9	11.7
7	0	0	0	25	22	21	20	X	0	1	89	9	9.89
8													
TOTAL	2	30	34	44	45	41	38	0	32	33	299	10	29.9

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	0.87500	1.20940
1	Control	3	1.00000	1.39310
1	Control	4	1.00000	1.39310
1	Control	5	1.00000	1.39310
2	32 %	1	0.87500	1.20940
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	0.00000	0.17771
4	56 %	3	1.00000	1.39310
4	56 %	4	1.00000	1.39310
4	56 %	5	0.25000	0.52360
5	75 %	1	1.00000	1.39310
5	75 %	2	1.00000	1.39310
5	75 %	3	1.00000	1.39310
5	75 %	4	0.87500	1.20940
5	75 %	5	1.00000	1.39310
6	100 %	1	1.00000	1.39310
6	100 %	2	1.00000	1.39310
6	100 %	3	1.00000	1.39310
6	100 %	4	0.87500	1.20940
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))
<p>D = 1.472 W = 0.7295 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 %	27.50	16.00	5.00	
3	42 %	30.00	16.00	5.00	
4	56 %	24.00	16.00	5.00	
5	75 %	27.50	16.00	5.00	
6	100 %	27.50	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 = 0.08691 W = 0.9274 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 = 14.75 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	0.0858	0.01716	4.739	
Within (Error)	24	0.0869	0.003621		
Total	29	0.1727			
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	0.2678	0.2678			
2	32 %	0.3112	0.3112	-1.14		
3	42 %	0.344	0.344	-2.002		
4	56 %	0.1872	0.1872	2.118		
5	75 %	0.3312	0.3312	-1.666		
6	100 %	0.3238	0.3238	-1.471		
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	0.08982	33.5	-0.0434	
3	42 %	5	0.08982	33.5	-0.0762	
4	56 %	5	0.08982	33.5	0.0806	
5	75 %	5	0.08982	33.5	-0.0634	
6	100 %	5	0.08982	33.5	-0.056	

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 %	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.

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	1	
4	75 %	10	0	
5	100 %	10	1	

Appendix A2: Statistics

Ceriodaphnia dubia Reproduction

Kolmogorov Test for Normality	No Transformation
D = 0.1552 D* = 1.218 Critical D* = 1.035 (alpha = 0.01, N = 60)	
Data FAIL 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	32 %	100.50	75.00	10.00	
3	42 %	108.50	75.00	10.00	
4	56 %	107.50	75.00	10.00	
5	75 %	108.50	75.00	10.00	
6	100 %	109.50	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	49.99	9.998	0.1467	
Within (Error)	52	3543	68.13		
Total	57	3593			
Critical F = 3.39 (alpha = 0.01, df = 5,52)					
2.39 (alpha = 0.05, df = 5,52)					
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	33.9	33.9			
2	32 %	33.3	33.3	0.1625		
3	42 %	32.1	32.1	0.4876		
4	56 %	34.778	34.778	-0.2315		
5	75 %	34.7	34.7	-0.2167		
6	100 %	33.222	33.222	0.1788		
Dunnett's critical value = 2.31 (1 Tailed, alpha = 0.05, df [used] = 5,40) (Actual df = 5,52)						
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	8.527	25.2	0.6		
3	42 %	10	8.527	25.2	1.8		
4	56 %	9	8.761	25.8	-0.878		
5	75 %	10	8.527	25.2	-0.8		
6	100 %	9	8.761	25.8	0.678		

Appendix A3: Water Chemistry

Routine Chemical and Physical Data

Date and Time Test Initiated: January 20, 2015 at 1113

Date and Time Test Terminated: January 27, 2015 at 1410

Effluent Conc.: Control		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
DO, mg/l	Initial	8.2	8.3	8.3	8.2	8.4	8.2	8.2
	Final *1	7.7	7.2	7.7	6.8	7.9	7.6	8.0
	Final *2	8.0	8.2	8.3	8.3	8.3	8.2	8.2
pH, units	Initial	7.5	7.6	7.4	7.3	7.7	7.7	7.5
	Final *1	7.3	7.2	7.2	6.9	7.4	7.4	7.3
	Final *2	7.6	7.7	7.8	7.9	7.8	7.7	7.6
Alkalinity, mg CaCO ₃ /l	31	NA	31	NA	31	NA	NA	NA
Hardness, mg CaCO ₃ /l	44	NA	46	NA	46	NA	NA	NA
Conductivity, umhos/cm	150	270	140	140	150	150	160	160
Res. Chlorine, mg/l	<0.05	NA	<0.05	NA	<0.05	NA	NA	NA

Effluent Conc.: 32 %		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
DO, mg/l	Initial	8.1	8.2	8.4	8.3	8.6	8.4	8.3
	Final *1	8.0	7.4	7.3	7.1	7.8	7.5	7.5
	Final *2	8.1	8.0	8.2	8.3	8.2	8.2	7.8
pH, units	Initial	7.3	7.3	7.3	7.3	7.4	7.5	7.4
	Final *1	7.2	7.3	7.2	7.0	7.4	7.3	7.3
	Final *2	7.7	7.7	7.9	8.0	7.8	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	8.2	8.0	8.4	8.4	8.5	8.3	8.2
	Final *1	7.8	7.4	6.9	6.9	7.8	7.4	7.2
	Final *2	8.0	8.0	8.1	8.2	8.1	8.0	7.9
pH, units	Initial	7.3	7.3	7.3	7.3	7.4	7.4	7.3
	Final *1	7.3	7.3	7.2	7.0	7.4	7.4	7.2
	Final *2	7.6	7.7	7.9	7.9	7.8	7.8	7.6

Appendix A3: Water Chemistry

Routine Chemical and Physical Data

Date and Time Test Initiated: January 20, 2015 at 1113

Date and Time Test Terminated: January 27, 2015 at 1410

Effluent Conc.: 56 %		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
DO, mg/l	Initial	8.3	8.1	8.4	8.3	8.7	8.3	8.1
	Final *1	7.8	7.3	7.2	6.9	7.9	7.4	7.2
	Final *2	8.0	7.9	8.1	8.2	8.0	8.0	8.0
pH, units	Initial	7.2	7.3	7.2	7.2	7.3	7.4	7.3
	Final *1	7.3	7.3	7.2	7.0	7.4	7.4	7.3
	Final *2	7.7	7.7	7.8	7.9	7.7	7.7	7.6

Effluent Conc.: 75 %		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
DO, mg/l	Initial	8.8	8.1	8.7	8.2	8.7	8.3	8.2
	Final *1	7.6	7.1	6.9	7.0	7.9	7.5	7.3
	Final *2	8.0	8.2	8.2	8.2	8.2	8.1	8.1
pH, units	Initial	7.1	7.2	7.1	7.2	7.2	7.3	7.2
	Final *1	7.2	7.2	7.2	7.0	7.4	7.4	7.2
	Final *2	7.7	7.7	7.8	7.9	7.7	7.7	7.6

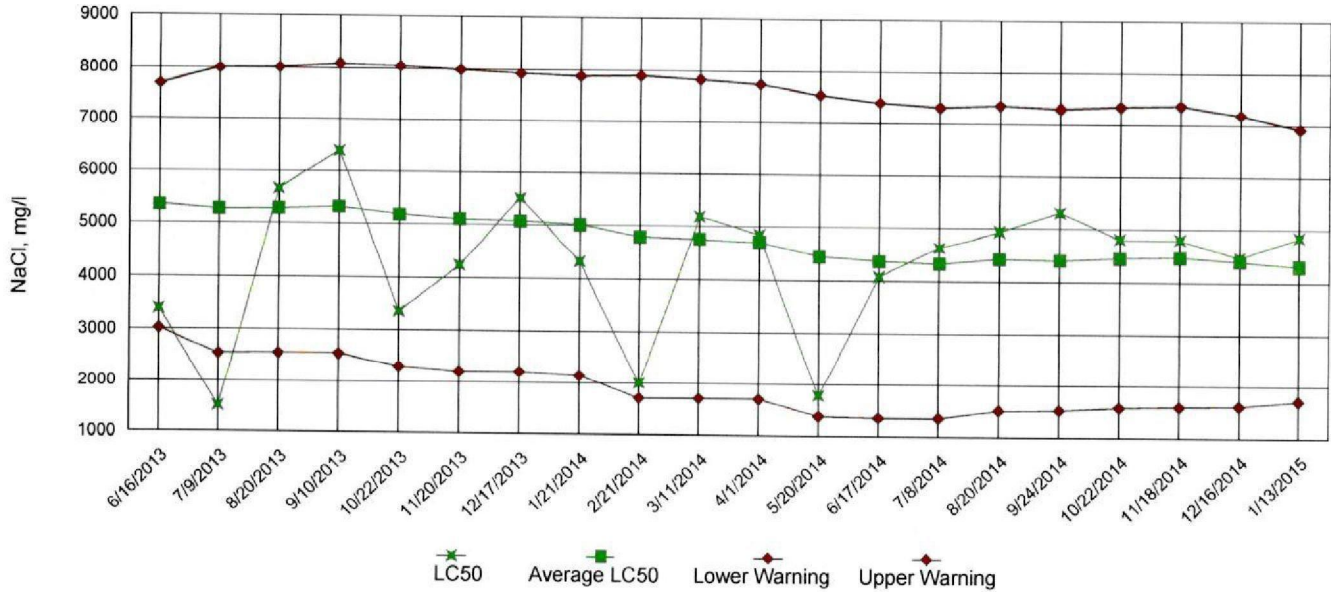
Effluent Conc.: 100 %		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
DO, mg/l	Initial	8.5	8.5	8.6	8.5	9.0	8.6	8.2
	Final *1	7.7	7.3	7.2	7.1	8.0	7.4	7.3
	Final *2	8.2	8.2	8.3	8.3	8.2	8.2	7.9
pH, units	Initial	7.0	7.1	7.2	7.0	7.0	7.1	7.1
	Final *1	7.2	7.3	7.3	7.0	7.4	7.4	7.2
	Final *2	7.7	7.8	8.0	8.0	7.8	7.8	7.7
Alkalinity, mg CaCO ₃ /l	32	NA	31	NA	29	NA	NA	NA
Hardness, mg CaCO ₃ /l	70	NA	76	NA	74	NA	NA	NA
Conductivity, umhos/cm	280	270	260	260	260	260	260	270
Res. Chlorine, mg/l	<0.05	NA	<0.05	NA	<0.05	NA	NA	NA

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

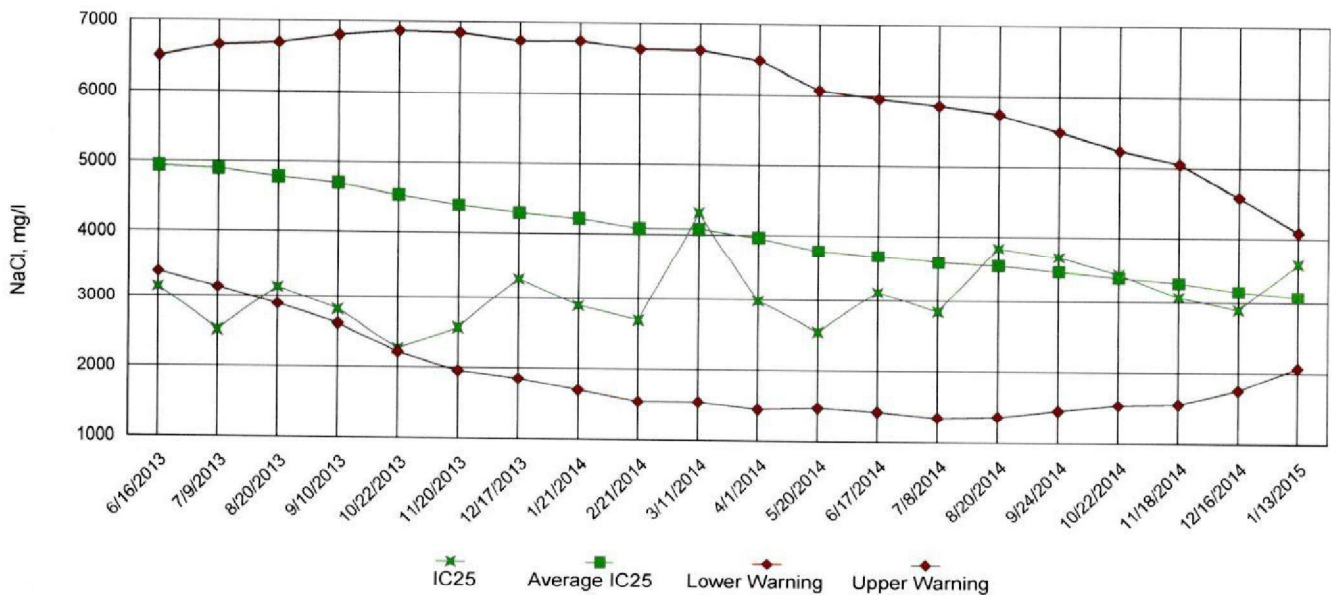
 *2 = data from the *Ceriodaphnia dubia* test

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

LC50 Survival Data

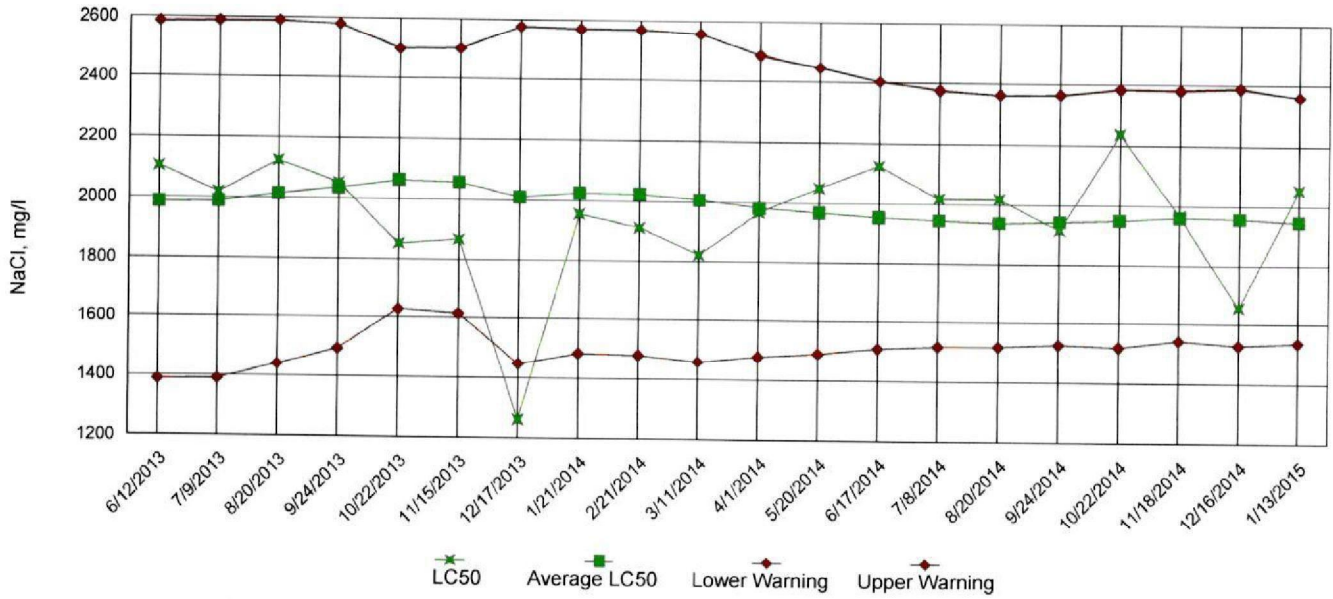


IC25 Growth Data

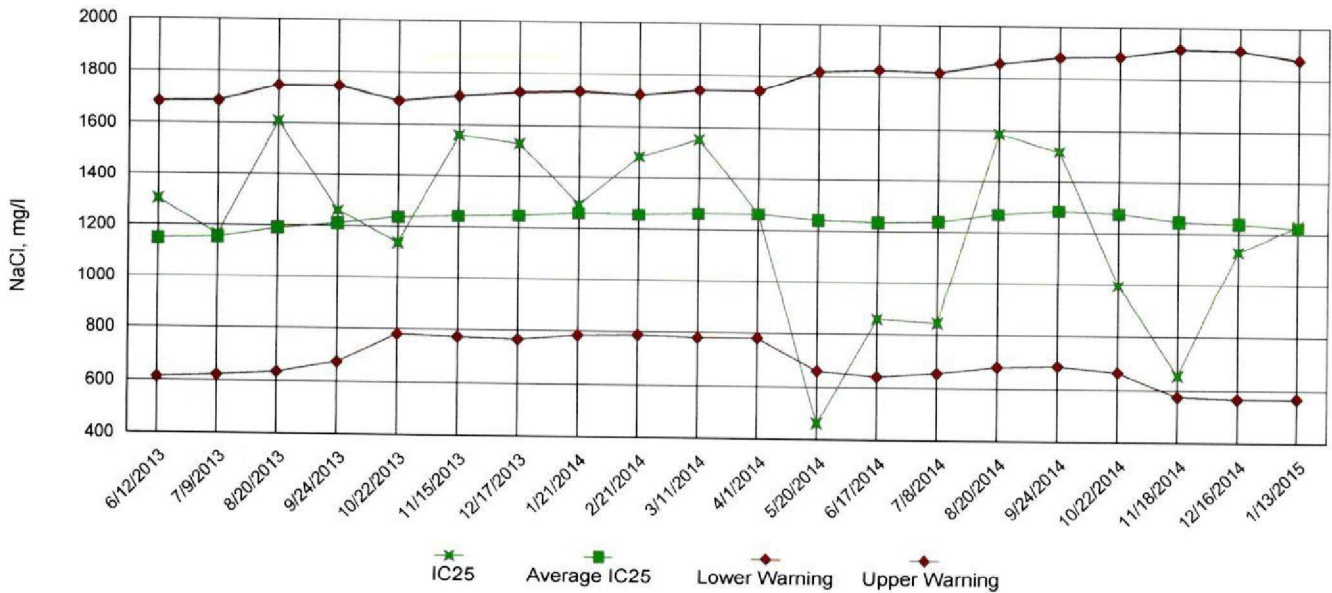


Appendix A4: Test 1002.0
Chronic Reference Toxicant, *Ceriodaphnia dubia*

LC50 Survival Data



IC25 Reproduction Data



Appendix B: Test 1000.0

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

Permittee: Benton Utilities

NPDES No.: AR0036498 AFIN# 63-00063

Date and Time Test Initiated: January 20, 2015 at 1520

Date and Time Test Terminated: January 27, 2015 at 1410

Dilution water used: Synthetic Soft Water #4174

DATA TABLE FOR SURVIVAL

Effluent Conc. %	Percent Survival in replicate chambers					Mean percent survival			CV%
	A	B	C	D	E	24 hr	48 hr	7 days	
Control	100	87.5	100	100	100	100	100	97.5	5.73
32 %	87.5	100	100	100	100	97.5	97.5	97.5	5.73
42 %	100	100	100	100	100	100	100	100	0.00
56 %	100	0.00	100	100	25.0	100	100	65.0	75.0
75 %	100	100	100	87.5	100	97.5	97.5	97.5	5.73
100 %	100	100	100	87.5	100	100	100	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	0.276	0.214	0.280	0.261	0.308	0.268	12.9
32 %	0.242	0.310	0.338	0.336	0.330	0.311	12.9
42 %	0.316	0.321	0.316	0.388	0.379	0.344	10.5
56 %	0.279	0.000	0.298	0.235	0.124	0.187	66.5
75 %	0.316	0.385	0.292	0.312	0.351	0.331	11.1
100 %	0.279	0.350	0.322	0.339	0.329	0.324	8.39

CV = Coefficient of variation = standard deviation * 100 / mean

Appendix B: Test 1000.0

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

PERMITTEE: Benton Utilities SAMPLE No. 1 COLLECTED ending: DATE: January 20, 2015 TIME: 0830
 NPDES NO.: AR0036498 AFIN# 63-00063 SAMPLE No. 2 COLLECTED ending: DATE: January 22, 2015 TIME: 0900
 CONTACT: Mr. Jonathon Buff SAMPLE No. 3 COLLECTED ending: DATE: January 23, 2015 TIME: 0830
 ANALYST: 280, 304, 310 Test Initiated: DATE: January 20, 2015 TIME: 1520
 Test Terminated: DATE: January 27, 2015 TIME: 1410

DILUTION Control	DAY						
	1	2	3	4	5	6	7
D.O. Initial	8.2	8.3	8.3	8.2	8.4	8.2	8.2
Final	7.7	7.2	7.7	6.8	7.9	7.6	8.0
pH Initial	7.5	7.6	7.4	7.3	7.7	7.7	7.5
Final	7.3	7.2	7.2	6.9	7.4	7.4	7.3
Alkalinity	31	NA	31	NA	31	NA	NA
Hardness	44	NA	46	NA	46	NA	NA
Conductivity	150	270	140	140	150	150	160
Chlorine	<0.05	NA	<0.05	NA	<0.05	NA	NA

DILUTION 32 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	8.1	8.2	8.4	8.3	8.6	8.4	8.3
Final	8.0	7.4	7.3	7.1	7.8	7.5	7.5
pH Initial	7.3	7.3	7.3	7.3	7.4	7.5	7.4
Final	7.2	7.3	7.2	7.0	7.4	7.3	7.3
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	190	190	180	180	180	180	190
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION 42 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	8.2	8.0	8.4	8.4	8.5	8.3	8.2
Final	7.8	7.4	6.9	6.9	7.8	7.4	7.2
pH Initial	7.3	7.3	7.3	7.3	7.4	7.4	7.3
Final	7.3	7.3	7.2	7.0	7.4	7.4	7.2
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	200	200	190	190	190	190	200
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION 56 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	8.3	8.1	8.4	8.3	8.7	8.3	8.1
Final	7.8	7.3	7.2	6.9	7.9	7.4	7.2
pH Initial	7.2	7.3	7.2	7.2	7.3	7.4	7.3
Final	7.3	7.3	7.2	7.0	7.4	7.4	7.3
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	210	220	210	210	210	210	210
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION 75 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	8.8	8.1	8.7	8.2	8.7	8.3	8.2
Final	7.6	7.1	6.9	7.0	7.9	7.5	7.3
pH Initial	7.1	7.2	7.1	7.2	7.2	7.3	7.2
Final	7.2	7.2	7.2	7.0	7.4	7.4	7.2
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	240	240	230	230	230	230	230
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION 100 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	8.5	8.5	8.6	8.5	9.0	8.6	8.2
Final	7.7	7.3	7.2	7.1	8.0	7.4	7.3
pH Initial	7.0	7.1	7.2	7.0	7.0	7.1	7.1
Final	7.2	7.3	7.3	7.0	7.4	7.4	7.2
Alkalinity	32	NA	31	NA	29	NA	NA
Hardness	70	NA	76	NA	74	NA	NA
Conductivity	280	270	260	260	260	260	270
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: Benton Utilities

NPDES No.: AR0036498 AFIN# 63-00063

Date and Time Test Initiated: January 20, 2015 at 1440

Date and Time Test Terminated: January 27, 2015 at 1330

Dilution water used: Synthetic Soft Water #4174

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	90.0	100	90.0

NUMBER OF YOUNG PRODUCED PER FEMALE @ 7 DAYS

Replicates	Control	Percent Effluent				
		32 %	42 %	56 %	75 %	100 %
A	30	32	3	41	34	2
B	28	28	26	33	30	30
C	41	38	43	35	41	34
D	33	31	39	33	37	44
E	26	25	41	36	27	45
F	42	40	35	42	45	41
G	29	31	30	24	27	38
H	32	38	35	33	33	0
I	40	32	34	0	36	32
J	38	38	35	36	37	33
Mean per Adult	33.9	33.3	32.1	31.3	34.7	29.9
Mean per Surviving Adult	33.9	33.3	32.1	34.8	34.7	33.2
CV %	17.3	14.9	35.4	15.1	16.7	38.7

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 %)	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO
b.) 1/2 LOW FLOW DILUTION	(NA)	<input type="checkbox"/> YES	<input type="checkbox"/> NO

2. Steel's Many-One Rank Test:

Is the mean number of young produced per female significantly different ($p=0.05$) than the control's number of young per female for the % effluent corresponding to (significant non-lethal effects):

a.) LOW FLOW OR CRITICAL DILUTION	(100 %)	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO
b.) 1/2 LOW FLOW DILUTION	(NA)	<input type="checkbox"/> YES	<input type="checkbox"/> NO

3. If you answered NO to 1.a) enter [0] otherwise enter [1]: 0 (TLP3B)
4. If you answered NO to 2.a) enter [0] otherwise enter [1]: 0 (TGP3B)
5. NOEC Ceriodaphnia Lethality: 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: 38.7 (TQP3B)

Appendix B: Test 1002.0

CHRONIC TOXICITY SUMMARY FORM
Ceriodaphnia dubia
CHEMICAL PARAMETERS CHART

PERMITTEE: Benton Utilities
NPDES NO.: AR0036498 AFIN# 63-00063
CONTACT: Mr. Jonathon Buff
ANALYST: 280, 304, 310

SAMPLE No. 1 COLLECTED ending: DATE: January 20, 2015 TIME: 0830
SAMPLE No. 2 COLLECTED ending: DATE: January 22, 2015 TIME: 0900
SAMPLE No. 3 COLLECTED ending: DATE: January 23, 2015 TIME: 0830
Test Initiated: DATE: January 20, 2015 TIME: 1440
Test Terminated: DATE: January 27, 2015 TIME: 1330

DILUTION Control	DAY						
	1	2	3	4	5	6	7
D.O. Initial	8.2	8.3	8.3	8.2	8.4	8.2	8.2
Final	8.0	8.2	8.3	8.3	8.3	8.2	8.2
pH Initial	7.5	7.6	7.4	7.3	7.7	7.7	7.5
Final	7.6	7.7	7.8	7.9	7.8	7.7	7.6
Alkalinity	31	NA	31	NA	31	NA	NA
Hardness	44	NA	46	NA	46	NA	NA
Conductivity	150	270	140	140	150	150	160
Chlorine	<0.05	NA	<0.05	NA	<0.05	NA	NA

DILUTION 32 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	8.1	8.2	8.4	8.3	8.6	8.4	8.3
Final	8.1	8.0	8.2	8.3	8.2	8.2	7.8
pH Initial	7.3	7.3	7.3	7.3	7.4	7.5	7.4
Final	7.7	7.7	7.9	8.0	7.8	7.8	7.6
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	190	190	180	180	180	180	190
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION 42 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	8.2	8.0	8.4	8.4	8.5	8.3	8.2
Final	8.0	8.0	8.1	8.2	8.1	8.0	7.9
pH Initial	7.3	7.3	7.3	7.3	7.4	7.4	7.3
Final	7.6	7.7	7.9	7.9	7.8	7.8	7.6
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	200	200	190	190	190	190	200
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION 56 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	8.3	8.1	8.4	8.3	8.7	8.3	8.1
Final	8.0	7.9	8.1	8.2	8.0	8.0	8.0
pH Initial	7.2	7.3	7.2	7.2	7.3	7.4	7.3
Final	7.7	7.7	7.8	7.9	7.7	7.7	7.6
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	210	220	210	210	210	210	210
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION 75 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	8.8	8.1	8.7	8.2	8.7	8.3	8.2
Final	8.0	8.2	8.2	8.2	8.2	8.1	8.1
pH Initial	7.1	7.2	7.1	7.2	7.2	7.3	7.2
Final	7.7	7.7	7.8	7.9	7.7	7.7	7.6
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	240	240	230	230	230	230	230
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION 100 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	8.5	8.5	8.6	8.5	9.0	8.6	8.2
Final	8.2	8.2	8.3	8.3	8.2	8.2	7.9
pH Initial	7.0	7.1	7.2	7.0	7.0	7.1	7.1
Final	7.7	7.8	8.0	8.0	7.8	7.8	7.7
Alkalinity	32	NA	31	NA	29	NA	NA
Hardness	70	NA	76	NA	74	NA	NA
Conductivity	280	270	260	260	260	260	270
Chlorine	<0.05	NA	<0.05	NA	<0.05	NA	NA

CHAIN OF CUSTODY / ANALYSIS REQUEST FORM

Client: <u>Benton Utilities</u>			PO No.		NO OF BOTTLES	ANALYSES REQUESTED												AIC CONTROL NO: <u>186795</u>					
Project Reference:			MATRIX			Chromic Cont	NH3N.BIO													AIC PROPOSAL NO:			
Project Manager:			G R A B	C O M P	W A T E R			S O I L	4	X	X												
Sampled By: <u>Sean Hepton</u>																		Received Temperature C <u>1.7</u>					
AIC No.	Sample Identification	Date/Time Collected													Remarks								
<u>2</u>	<u>Outfall 001</u>	<u>1/21-22/15</u> <u>1000-0900</u>																					
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		A = (NH4)2SO4, NH4OH													
Turnaround Time Requested: (Please circle) NORMAL or EXPEDITED IN _____ DAYS					Relinquished By: <u>Sean Hepton</u>			Date/Time <u>1-22-15</u> <u>1215</u>			Received By:			Date/Time									
Expedited results requested by: _____					Relinquished By:			Date/Time			Received in Lab By: <u>[Signature]</u>			Date/Time <u>1/22/15</u> <u>1215</u>									
Who should AIC contact with questions: Phone: _____ Fax: _____					Comments: <u>Tech. Time = 1 Hour 15 min</u>																		
Report Attention to: Report Address to: Email Address:																							

