

April 28, 2016

Test Results of  
Second Quarter  
Chronic 7-Day Renewal  
Biomonitoring Testing  
for  
Outfall 001  
Cabot

Control No. 201336-1

Prepared for:

Mr. Matt Bienvenu  
McClelland Consulting Engineers, Inc.  
Post Office Box 34087  
Little Rock, AR 72203-4087

Prepared by:

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



McClelland Consulting Engineers, Inc.  
ATTN: Mr. Matt Bienvenu  
Post Office Box 34087  
Little Rock, AR 72203-4087

Re: Chronic 7-Day Renewal utilizing *Pimephales promelas* (Fathead minnow) and *Ceriodaphnia dubia*  
Outfall 001 - Cabot  
NPDES Permit No. AR0021661 AFIN:43-00059

Dear Mr. Matt Bienvenu:

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 Chief Operating Officer 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  
Chief Operating Officer

PDF cc: McClelland Consulting Engineers, Inc.  
ATTN: Mr. Matt Bienvenu  
mbienvenu@mcclelland-engrs.com

McClelland Consulting Engineers, Inc.  
ATTN: Mr. Dan Beranek  
dberanek@mcclelland-engrs.com

McClelland Consulting Engineers, Inc.  
ATTN: Mr. David Gregory  
dgregory@mcclelland-engrs.com

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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	0.377	PASS
Control Growth CV < or = 40%	2.47	PASS
Growth Minimum Significant Difference 12 to 30%	6.81	BELOW
Critical Dilution CV < or = 40%	5.44	PASS

*Ceriodaphnia dubia* Method 1002.0

CRITERIA	RESULTS	PASS/FAIL
Control Survival > or = 80%	100	PASS
Control Reproduction > or = 15 per Surviving Female	21.4	PASS
Control CV < or = 40% per Surviving Female	28.0	PASS
Reproduction Minimum Significant Difference 13 to 47%	30.3	PASS
Critical Dilution CV < or = 40%	36.0	PASS

II. Outlined Report

A. Introduction

1. Permit Number: AR0021661 AFIN:43-00059
2. Test Requirements: Test Methods 1000.0 and 1002.0
3. Receiving Stream:

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)	8.0	7.8	7.8
pH (standard units)	7.3	7.6	7.3
Alkalinity (mg/l as CaCO <sub>3</sub> )	78	76	59
Hardness (mg/l as CaCO <sub>3</sub> )	81	86	72
Conductivity (umhos/cm)	370	380	270
Residual Chlorine (mg/l)	<0.05	<0.05	<0.05
Ammonia as N (mg/l)	<0.1	0.26	0.20

2. Dilution Water Samples: Synthetic Moderately Hard Water #4321

- a. Dates Prepared: April 9 through April 23, 2016
- b. Chemical Data:

Analysis	Sample 1	Sample 2	Sample 3
Dissolved oxygen (mg/l)	7.9	7.5	7.7
pH (standard units)	7.8	8.0	7.8
Alkalinity (mg/l as CaCO <sub>3</sub> )	64	64	64
Hardness (mg/l as CaCO <sub>3</sub> )	88	98	98
Conductivity (umhos/cm)	330	340	340
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: April 19, 2016 at 0925  
Date & Time Test Terminated: April 26, 2015 at 0830  
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: April 19, 2016 at 1030  
Date & Time Test Terminated: April 25, 2016 at 1145  
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 April 12, 2016 at 1415 to April 19, 2016 at 1355

The results were as follows: (Control No. 201374-1.)

Survival LC-50: 4013 mg/l

Growth IC-25: 3341 mg/l

Growth PMSD: 20.1

*Ceriodaphnia dubia*

Chronic reference tests are performed monthly.

A chronic reference test was performed on April 12, 2016 at 1530 to April 20, 2016 at 1500

The results were as follows: (Control No. 201374-2.)

Survival LC-50: 1673 mg/l

Growth IC-25: 1101 mg/l

Growth PMSD: 17.9

V. Chemical Analysis/Quality Control

Parameter	Method	% Recovery	Relative % Difference
Alkalinity	SM 2320 B	NA	1.51
Hardness	EPA 200.7	97.2	1.57
pH	SM 4500-H+ B	101	0.00
Conductivity	EPA 120.1	105	2.56

VI. Organism History

*Pimephales promelas* (Fathead minnow)

Date: April 19, 2016

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: April 19, 2016

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

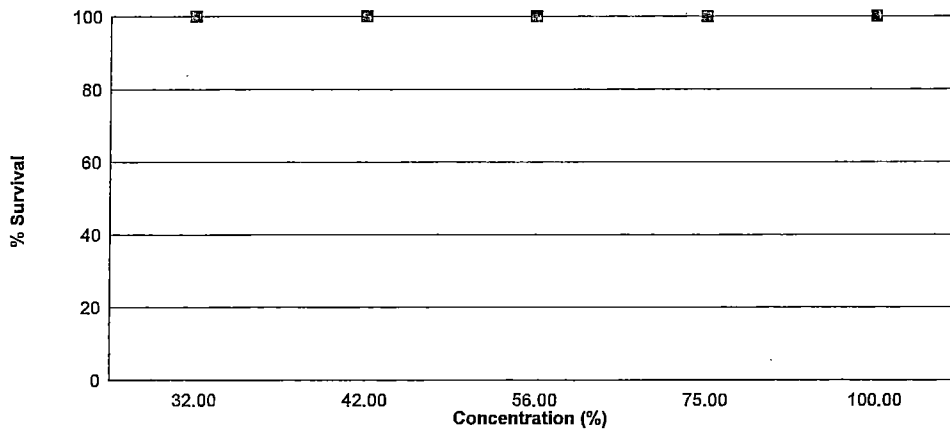
Larvae are exposed in a static renewal system for seven days to different concentrations of effluent with dilution water. Test results are based on the survival and growth (increase in weight) of the larvae.

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 April 19, 2016 at 0925 and continued through April 26, 2015 at 0830. 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	0.377
32 %	100	0.386
42 %	100	0.353
56 %	100	0.365
75 %	100	0.356
100 %	100	0.355

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

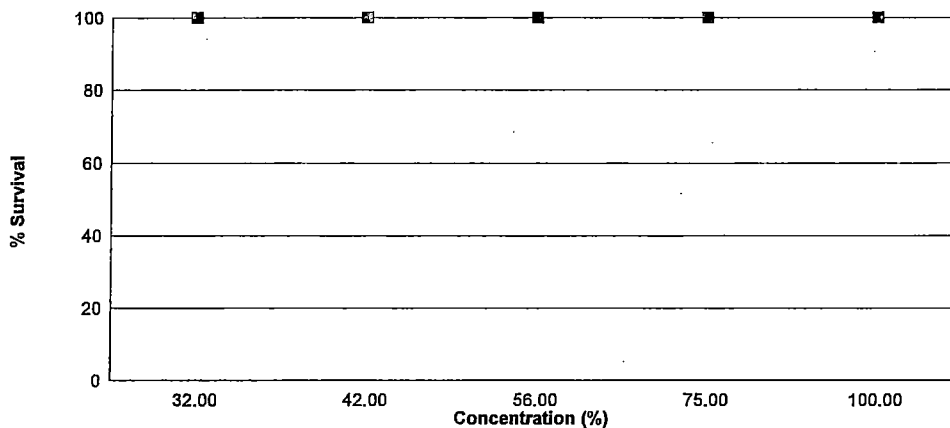
Neonates are exposed in a static renewal system to different concentrations of effluent with dilution water until 60% of surviving control organisms have three broods of offspring with an average of at least 15 young per female.

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 April 19, 2016 at 1030 and continued through April 25, 2016 at 1145. 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 6-day <i>Ceriodaphnia dubia</i> Survival and Reproduction Data		
Concentration	Percent Survival	Mean Reproduction
Control	100	21.4
32 %	100	19.7
42 %	100	25.7
56 %	100	22.9
75 %	100	21.8
100 %	100	18.3



Appendix A1: Test 1000.0

*Pimephales promelas* (Fathead Minnow) 7-Day Survival

Date and Time Test Initiated: April 19, 2016 at 0925  
Date and Time Test Terminated: April 26, 2015 at 0830

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	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: April 19, 2016 at 0925  
Test Terminated: April 26, 2015 at 0830

Drying Started: April 25, 2016 at 1442  
Drying Ended: April 28, 2016 at 1305

Concentration	Replicate	Weight of pan	Weight of pan + fish	Total weight of fish (g)	Original # of fish	Mean dry weight (mg)
Control	A	.94265	.94566	0.00301	8	0.376
	B	.94618	.94931	0.00313	8	0.391
	C	.94724	.95018	0.00294	8	0.368
	D	.95165	.95460	0.00295	8	0.369
	E	.94874	.95177	0.00303	8	0.379
32 %	A	.94730	.95046	0.00316	8	0.395
	B	.94512	.94819	0.00307	8	0.384
	C	.93745	.94056	0.00311	8	0.389
	D	.95054	.95363	0.00309	8	0.386
	E	.94155	.94454	0.00299	8	0.374
42 %	A	.94702	.94999	0.00297	8	0.371
	B	.94084	.94342	0.00258	8	0.322
	C	.94059	.94332	0.00273	8	0.341
	D	.94250	.94525	0.00275	8	0.344
	E	.94605	.94913	0.00308	8	0.385
56 %	A	.94345	.94632	0.00287	8	0.359
	B	.94294	.94563	0.00269	8	0.336
	C	.94250	.94541	0.00291	8	0.364
	D	.94272	.94570	0.00298	8	0.372
	E	.94205	.94520	0.00315	8	0.394
75 %	A	.94508	.94798	0.00290	8	0.362
	B	.93927	.94203	0.00276	8	0.345
	C	.94231	.94502	0.00271	8	0.339
	D	.94146	.94443	0.00297	8	0.371
	E	.95063	.95352	0.00289	8	0.361
100 %	A	.94867	.95143	0.00276	8	0.345
	B	.94097	.94359	0.00262	8	0.328
	C	.94698	.94995	0.00297	8	0.371
	D	.94522	.94808	0.00286	8	0.358
	E	.94512	.94812	0.00300	8	0.375

Appendix A1: Test 1002.0

*Ceriodaphnia dubia* Survival and Reproduction

Date and Time Test Initiated: April 19, 2016 at 1030  
Date and Time Test Terminated: April 25, 2016 at 1145

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	4	3	0	4	0	0	4	0	0	0	15	10	1.50	
4	0	1	5	0	5	6	0	4	6	5	32	10	3.20	
5	11	11	10	7	0	9	7	10	10	8	83	10	8.30	
6	13	10	0	13	11	0	12	13	12	0	84	10	8.40	
7														
8														
TOTAL	28	25	15	24	16	15	23	27	28	13	214	10	21.4	

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	3	0	0	2	0	0	3	0	0	0	8	10	0.800	
4	0	4	5	5	0	5	0	5	5	4	33	10	3.30	
5	12	8	10	0	9	11	8	10	11	0	79	10	7.90	
6	15	14	1	9	14	0	14	2	0	8	77	10	7.70	
7														
8														
TOTAL	30	26	16	16	23	16	25	17	16	12	197	10	19.7	

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	4	4	0	4	0	0	3	0	0	0	15	10	1.50	
4	0	0	4	0	3	4	0	5	4	4	24	10	2.40	
5	12	10	7	9	1	9	8	10	8	11	85	10	8.50	
6	18	15	8	13	10	13	13	15	15	13	133	10	13.3	
7														
8														
TOTAL	34	29	19	26	14	26	24	30	27	28	257	10	25.7	

Appendix A1: Test 1002.0

*Ceriodaphnia dubia* Survival and Reproduction

Date and Time Test Initiated: April 19, 2016 at 1030

Date and Time Test Terminated: April 25, 2016 at 1145

Concentration: 56 %														
Day	Replicate										No. of Young	No. of Adults	Young per Adult	
	1	2	3	4	5	6	7	8	9	10				
1	0	0	0	0	0	0	0	0	0	0	0	0	10	0.00
2	0	0	0	0	0	0	0	0	0	0	0	0	10	0.00
3	5	0	0	3	0	0	0	0	0	0	8	10	0.800	
4	0	4	5	0	4	6	4	4	5	5	37	10	3.70	
5	11	7	10	7	0	11	8	9	9	11	83	10	8.30	
6	13	12	14	13	9	12	13	0	15	0	101	10	10.1	
7														
8														
<b>TOTAL</b>	29	23	29	23	13	29	25	13	29	16	229	10	22.9	

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	4	0	0	4	0	0	4	0	0	0	12	10	1.20
4	0	4	4	0	4	4	0	4	5	5	30	10	3.00
5	11	8	8	8	0	11	6	8	8	8	76	10	7.60
6	17	14	10	12	8	12	14	0	1	12	100	10	10.0
7													
8													
<b>TOTAL</b>	32	26	22	24	12	27	24	12	14	25	218	10	21.8

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	4	0	0	4	4	0	0	0	0	0	12	10	1.20
4	0	4	2	0	0	3	4	3	3	5	24	10	2.40
5	10	4	7	7	7	3	7	6	1	6	58	10	5.80
6	15	11	10	13	9	0	8	10	5	8	89	10	8.90
7													
8													
<b>TOTAL</b>	29	19	19	24	20	6	19	19	9	19	183	10	18.3

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	1.00000	1.39310
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))
<p>D = 0 W = 0 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 %	27.50	16.00	5.00	
4	56 %	27.50	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 = 0.007072 W = 0.9761 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 = 7.117 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	0.004465	0.000893	3.029	
Within (Error)	24	0.007075	0.0002948		
Total	29	0.01154			
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	0.3766	0.3766			
2	32 %	0.3856	0.3856	-0.8288		
3	42 %	0.3526	0.3526	2.21		
4	56 %	0.365	0.365	1.068		
5	75 %	0.3556	0.3556	1.934		
6	100 %	0.3554	0.3554	1.952		
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	0.02563	6.81	-0.009		
3	42 %	5	0.02563	6.81	0.024		
4	56 %	5	0.02563	6.81	0.0116		
5	75 %	5	0.02563	6.81	0.021		
6	100 %	5	0.02563	6.81	0.0212		



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 = 0.158 D* = 1.24 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 %	101.00	75.00	10.00	
3	42 %	126.00	75.00	10.00	
4	56 %	115.00	75.00	10.00	
5	75 %	102.00	75.00	10.00	
6	100 %	94.50	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	330.7	66.14	1.679	
Within (Error)	54	2127	39.39		
Total	59	2458			
Critical F = 3.38 (alpha = 0.01, df = 5,54)					
2.38 (alpha = 0.05, df = 5,54)					
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	21.4	21.4			
2	32 %	19.7	19.7	0.6057		
3	42 %	25.7	25.7	-1.532		
4	56 %	22.9	22.9	-0.5344		
5	75 %	21.8	21.8	-0.1425		
6	100 %	18.3	18.3	1.104		
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	6.484	30.3	1.7	
3	42 %	10	6.484	30.3	-4.3	
4	56 %	10	6.484	30.3	-1.5	
5	75 %	10	6.484	30.3	-0.4	
6	100 %	10	6.484	30.3	3.1	

Appendix A3: Water Chemistry

Routine Chemical and Physical Data

Date and Time Test Initiated: April 19, 2016 at 0814

Date and Time Test Terminated: April 26, 2016 at 0830

Effluent Conc.: Control		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
DO, mg/l	Initial	7.9	7.3	7.5	7.8	7.7	7.6	7.6
	Final *1	7.5	8.2	7.0	6.7	7.5	7.3	7.1
	Final *2	7.4	7.8	7.6	7.2	8.3	7.3	
pH, units	Initial	7.8	7.8	8.0	8.0	7.8	7.9	7.8
	Final *1	7.9	7.8	7.7	7.5	7.8	7.8	7.9
	Final *2	8.2	8.1	8.1	8.0	8.1	8.2	
Alkalinity, mg CaCO <sub>3</sub> /l		64	NA	64	NA	64	NA	NA
Hardness, mg CaCO <sub>3</sub> /l		88	NA	98	NA	98	NA	NA
Conductivity, umhos/cm		330	330	340	330	340	350	340
Res. Chlorine, mg/l		<0.05	NA	<0.05	NA	<0.05	NA	NA

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

Effluent Conc.: 42 %		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
DO, mg/l	Initial	7.8	7.7	7.8	7.6	7.7	7.7	7.6
	Final *1	7.4	7.5	7.1	6.9	7.4	7.1	6.9
	Final *2	7.8	8.1	8.1	7.4	8.1	7.8	
pH, units	Initial	7.5	7.6	7.8	7.8	7.4	7.8	7.5
	Final *1	7.8	7.8	7.7	7.5	7.9	7.8	7.8
	Final *2	8.2	8.2	8.2	8.1	8.1	8.2	

Appendix A3: Water Chemistry

Routine Chemical and Physical Data

Date and Time Test Initiated: April 19, 2016 at 0814

Date and Time Test Terminated: April 26, 2016 at 0830

Effluent Conc.: 56 %		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
DO, mg/l	Initial	7.9	7.4	7.6	7.6	8.0	7.3	7.3
	Final *1	7.4	7.3	6.8	6.7	7.4	7.2	7.1
	Final *2	7.8	7.5	8.2	7.4	8.0	7.6	
pH, units	Initial	7.4	7.6	7.7	7.7	7.4	7.8	7.4
	Final *1	7.9	7.8	7.7	7.5	7.9	7.8	7.8
	Final *2	8.2	8.1	8.2	8.1	8.0	8.1	

Effluent Conc.: 75 %		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
DO, mg/l	Initial	8.2	7.4	7.9	7.8	7.9	7.4	7.3
	Final *1	7.5	7.4	6.5	6.7	7.6	7.4	6.8
	Final *2	7.6	7.6	8.1	8.0	8.0	7.6	
pH, units	Initial	7.4	7.5	7.7	7.7	7.2	7.7	7.2
	Final *1	7.8	7.9	7.6	7.5	7.9	7.9	7.9
	Final *2	8.2	8.2	8.3	8.1	8.0	8.1	

Effluent Conc.: 100 %		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
DO, mg/l	Initial	8.0	7.6	7.8	7.6	7.8	7.5	7.7
	Final *1	7.4	7.5	6.6	6.5	7.6	7.3	7.0
	Final *2	7.7	7.6	8.1	7.9	8.0	7.8	
pH, units	Initial	7.3	7.6	7.6	7.5	7.3	7.6	7.4
	Final *1	7.8	7.9	7.6	7.4	7.9	8.0	7.8
	Final *2	8.2	8.2	8.3	8.1	8.1	8.1	
Alkalinity, mg CaCO <sub>3</sub> /l	78	NA	76	NA	59	NA	NA	
Hardness, mg CaCO <sub>3</sub> /l	81	NA	86	NA	72	NA	NA	
Conductivity, umhos/cm	370	370	380	380	270	280	270	
Res. Chlorine, mg/l	<0.05	NA	<0.05	NA	<0.05	NA	NA	

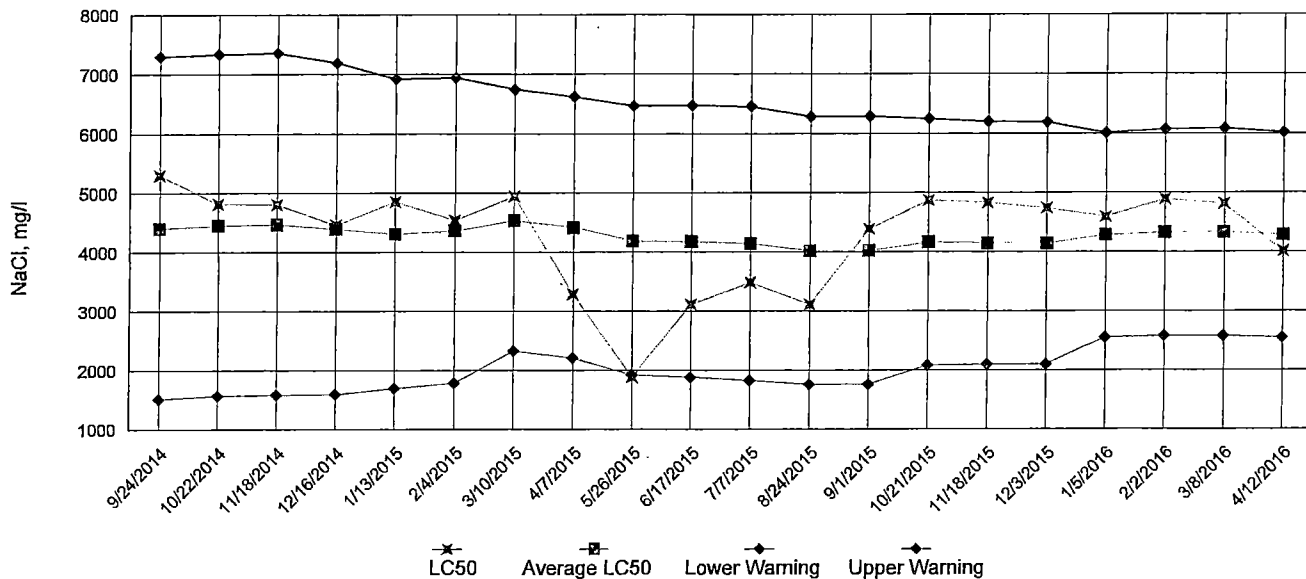
\*1 = data from the *Pimephales promelas* (Fathead Minnow) test

\*2 = data from the *Ceriodaphnia dubia* test

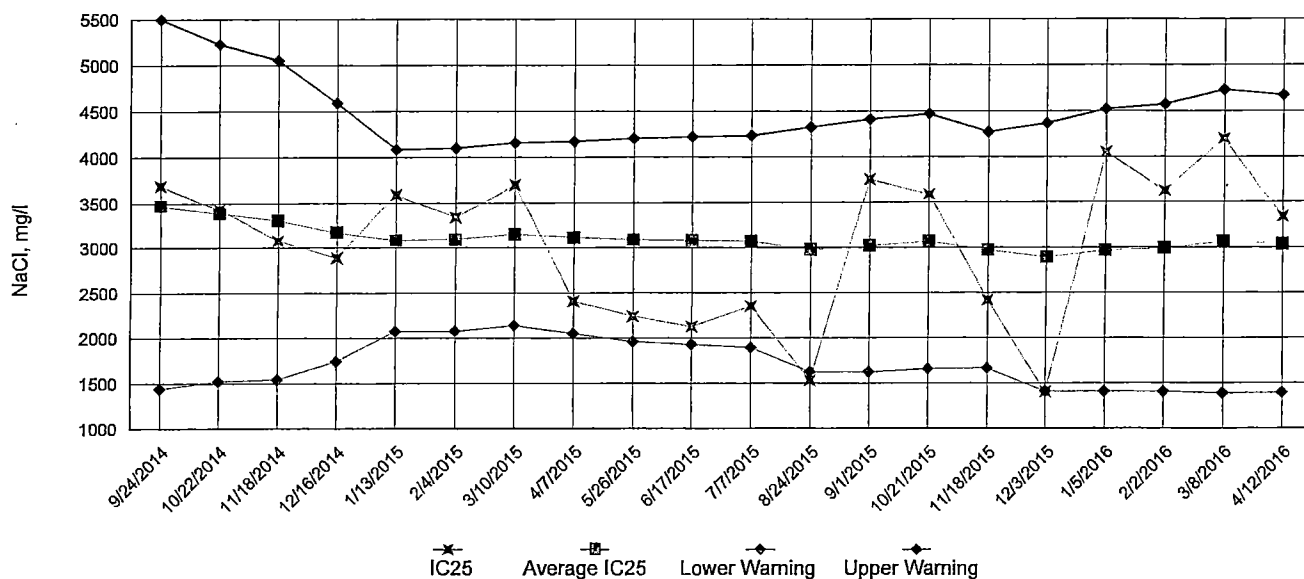
Appendix A4: Test 1000.0

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

LC50 Survival Data



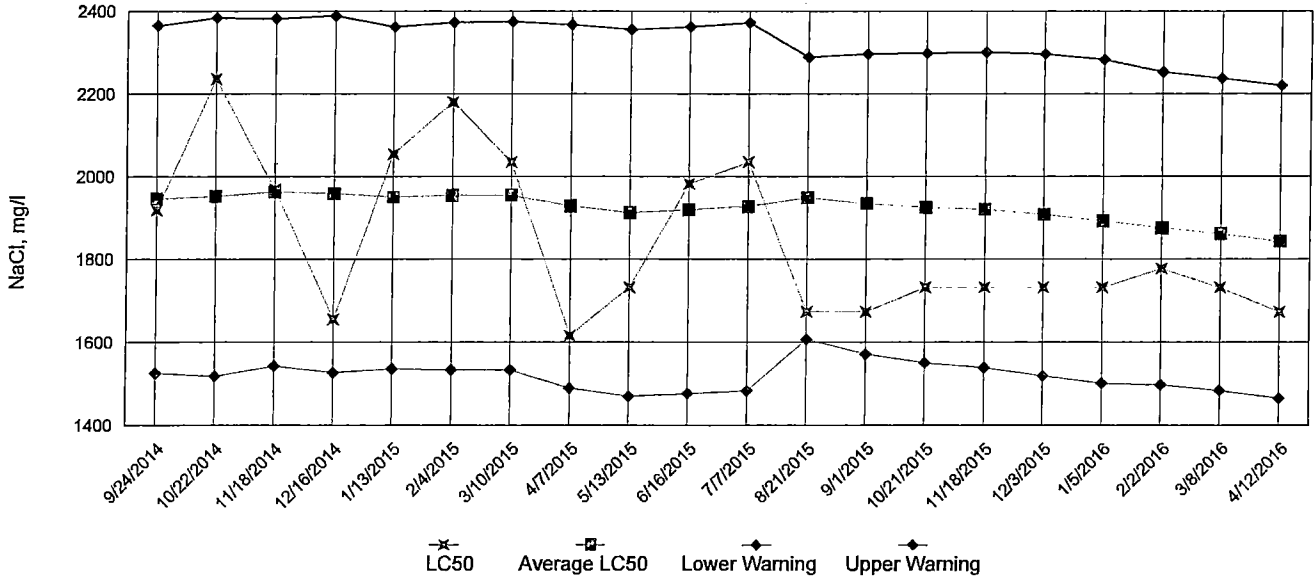
IC25 Growth Data



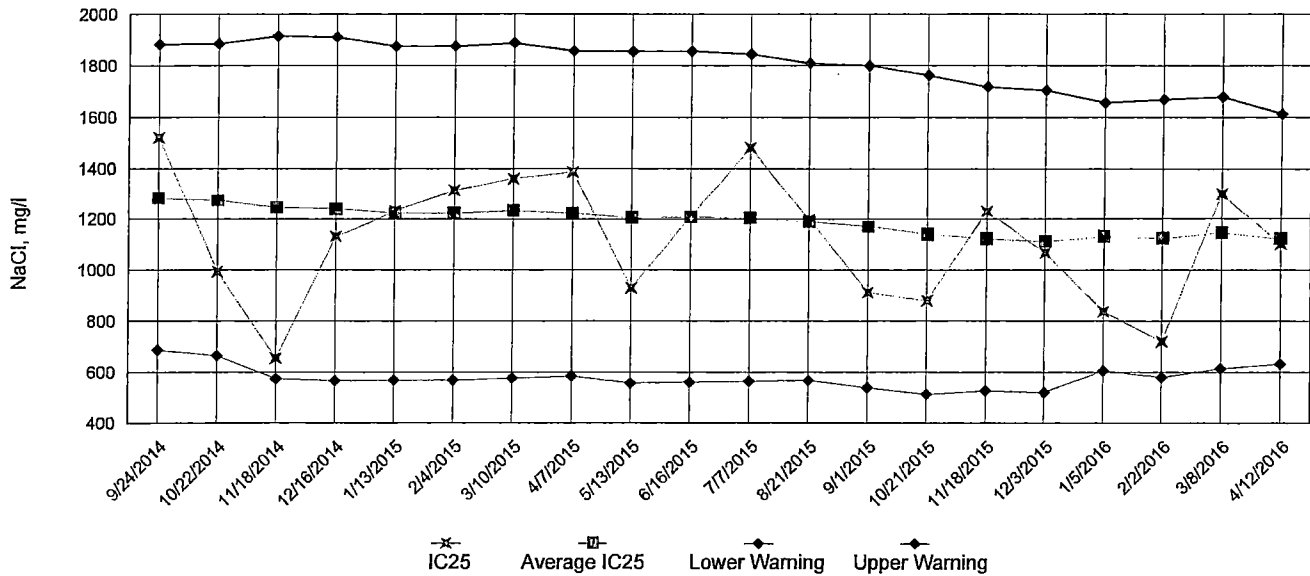


Appendix A4: Test 1002.0  
Chronic Reference Toxicant, *Ceriodaphnia dubia*

LC50 Survival Data



IC25 Reproduction Data



Appendix B: Test 1000.0

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

Permittee: McClelland Consulting Engineers, Inc.

NPDES No.: AR0021661 AFIN:43-00059

Date and Time Test Initiated: April 19, 2016 at 0925

Date and Time Test Terminated: April 26, 2015 at 0830

Dilution water used: Synthetic Moderately Hard Water #4321

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 %	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	0.376	0.391	0.368	0.369	0.379	0.377	2.47
32 %	0.395	0.384	0.389	0.386	0.374	0.386	2.00
42 %	0.371	0.322	0.341	0.344	0.385	0.353	7.14
56 %	0.359	0.336	0.364	0.372	0.394	0.365	5.76
75 %	0.362	0.345	0.339	0.371	0.361	0.356	3.71
100 %	0.345	0.328	0.371	0.358	0.375	0.355	5.44

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:  5.44  (TQP6C)

Appendix B: Test 1000.0

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

PERMITTEE: McClelland Consulting Engineers, SAMPLE No. 1 COLLECTED ending: DATE: April 18, 2016 TIME: 1008  
 NPDES NO.: AR0021661 AFIN:43-00059 SAMPLE No. 2 COLLECTED ending: DATE: April 19, 2016 TIME: 0830  
 CONTACT: Mr. Matt Bienvenu SAMPLE No. 3 COLLECTED ending: DATE: April 21, 2016 TIME: 0837  
 ANALYST: 280, 304, 310, 314 Test Initiated: DATE: April 19, 2016 TIME: 0925  
 Test Terminated: DATE: April 26, 2015 TIME: 0830

DILUTION	DAY						
	1	2	3	4	5	6	7
Control							
D.O. Initial	7.9	7.3	7.5	7.8	7.7	7.6	7.6
Final	7.5	8.2	7.0	6.7	7.5	7.3	7.1
pH Initial	7.8	7.8	8.0	8.0	7.8	7.9	7.8
Final	7.9	7.8	7.7	7.5	7.8	7.8	7.9
Alkalinity	64	NA	64	NA	64	NA	NA
Hardness	88	NA	98	NA	98	NA	NA
Conductivity	330	330	340	330	340	350	340
Chlorine	<0.05	NA	<0.05	NA	<0.05	NA	NA

DILUTION	DAY						
	1	2	3	4	5	6	7
32 %							
D.O. Initial	7.7	7.5	7.7	7.6	7.9	7.5	7.6
Final	7.3	8.3	7.2	6.9	7.4	7.1	6.9
pH Initial	7.7	7.7	7.8	7.8	7.5	7.8	7.6
Final	7.8	7.8	7.8	7.5	7.9	7.8	7.8
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	340	340	350	350	320	330	330
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION	DAY						
	1	2	3	4	5	6	7
42 %							
D.O. Initial	7.8	7.7	7.8	7.6	7.7	7.7	7.6
Final	7.4	7.5	7.1	6.9	7.4	7.1	6.9
pH Initial	7.5	7.6	7.8	7.8	7.4	7.8	7.5
Final	7.8	7.8	7.7	7.5	7.9	7.8	7.8
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	350	350	360	350	320	320	320
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION	DAY						
	1	2	3	4	5	6	7
56 %							
D.O. Initial	7.9	7.4	7.6	7.6	8.0	7.3	7.3
Final	7.4	7.3	6.8	6.7	7.4	7.2	7.1
pH Initial	7.4	7.6	7.7	7.7	7.4	7.8	7.4
Final	7.9	7.8	7.7	7.5	7.9	7.8	7.8
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	350	350	360	360	310	320	310
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION	DAY						
	1	2	3	4	5	6	7
75 %							
D.O. Initial	8.2	7.4	7.9	7.8	7.9	7.4	7.3
Final	7.5	7.4	6.5	6.7	7.6	7.4	6.8
pH Initial	7.4	7.5	7.7	7.7	7.2	7.7	7.2
Final	7.8	7.9	7.6	7.5	7.9	7.9	7.9
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	360	360	370	370	280	300	290
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION	DAY						
	1	2	3	4	5	6	7
100 %							
D.O. Initial	8.0	7.6	7.8	7.6	7.8	7.5	7.7
Final	7.4	7.5	6.6	6.5	7.6	7.3	7.0
pH Initial	7.3	7.6	7.6	7.5	7.3	7.6	7.4
Final	7.8	7.9	7.6	7.4	7.9	8.0	7.8
Alkalinity	78	NA	76	NA	59	NA	NA
Hardness	81	NA	86	NA	72	NA	NA
Conductivity	370	370	380	380	270	280	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: McClelland Consulting Engineers, Inc.

NPDES No.: AR0021661 AFIN:43-00059

Date and Time Test Initiated: April 19, 2016 at 1030

Date and Time Test Terminated: April 25, 2016 at 1145

Dilution water used: Synthetic Moderately Hard Water #4321

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
6 day	100	100	100	100	100	100

NUMBER OF YOUNG PRODUCED PER FEMALE @ 6 DAYS

Replicates	Control	Percent Effluent				
		32 %	42 %	56 %	75 %	100 %
A	28	30	34	29	32	29
B	25	26	29	23	26	19
C	15	16	19	29	22	19
D	24	16	26	23	24	24
E	16	23	14	13	12	20
F	15	16	26	29	27	6
G	23	25	24	25	24	19
H	27	17	30	13	12	19
I	28	16	27	29	14	9
J	13	12	28	16	25	19
Mean per Adult	21.4	19.7	25.7	22.9	21.8	18.3
Mean per Surviving Adult	21.4	19.7	25.7	22.9	21.8	18.3
CV %	28.0	29.6	22.1	29.0	31.4	36.0

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: 36 (TQP3B)

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

PERMITTEE: McClelland Consulting Engineers, SAMPLE No. 1 COLLECTED ending: DATE: April 18, 2016 TIME: 1008  
 NPDES NO.: AR0021661 AFIN:43-00059 SAMPLE No. 2 COLLECTED ending: DATE: April 19, 2016 TIME: 0830  
 CONTACT: Mr. Matt Bienvenu SAMPLE No. 3 COLLECTED ending: DATE: April 21, 2016 TIME: 0837  
 ANALYST: 280, 304, 310, 314 Test Initiated: DATE: April 19, 2016 TIME: 1030  
 Test Terminated: DATE: April 25, 2016 TIME: 1145

DILUTION Control	DAY						
	1	2	3	4	5	6	7
D.O. Initial	7.9	7.3	7.5	7.8	7.7	7.6	7.6
Final	7.4	7.8	7.6	7.2	8.3	7.3	—
pH Initial	7.8	7.8	8.0	8.0	7.8	7.9	7.8
Final	8.2	8.1	8.1	8.0	8.1	8.2	—
Alkalinity	64	NA	64	NA	64	NA	NA
Hardness	88	NA	98	NA	98	NA	NA
Conductivity	330	330	340	330	340	350	340
Chlorine	<0.05	NA	<0.05	NA	<0.05	NA	NA

DILUTION 32 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	7.7	7.5	7.7	7.6	7.9	7.5	7.6
Final	7.6	8.0	8.0	7.6	8.1	7.4	—
pH Initial	7.7	7.7	7.8	7.8	7.5	7.8	7.6
Final	8.2	8.2	8.2	8.0	8.1	8.2	—
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	340	340	350	350	320	330	330
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION 42 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	7.8	7.7	7.8	7.6	7.7	7.7	7.6
Final	7.8	8.1	8.1	7.4	8.1	7.8	—
pH Initial	7.5	7.6	7.8	7.8	7.4	7.8	7.5
Final	8.2	8.2	8.2	8.1	8.1	8.2	—
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	350	350	360	350	320	320	320
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION 56 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	7.9	7.4	7.6	7.6	8.0	7.3	7.3
Final	7.8	7.5	8.2	7.4	8.0	7.6	—
pH Initial	7.4	7.6	7.7	7.7	7.4	7.8	7.4
Final	8.2	8.1	8.2	8.1	8.0	8.1	—
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	350	350	360	360	310	320	310
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION 75 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	8.2	7.4	7.9	7.8	7.9	7.4	7.3
Final	7.6	7.6	8.1	8.0	8.0	7.6	—
pH Initial	7.4	7.5	7.7	7.7	7.2	7.7	7.2
Final	8.2	8.2	8.3	8.1	8.0	8.1	—
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	360	360	370	370	280	300	290
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION 100 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	8.0	7.6	7.8	7.6	7.8	7.5	7.7
Final	7.7	7.6	8.1	7.9	8.0	7.8	—
pH Initial	7.3	7.6	7.6	7.5	7.3	7.6	7.4
Final	8.2	8.2	8.3	8.1	8.1	8.1	—
Alkalinity	78	NA	76	NA	59	NA	NA
Hardness	81	NA	86	NA	72	NA	NA
Conductivity	370	370	380	380	270	280	270
Chlorine	<0.05	NA	<0.05	NA	<0.05	NA	NA



CHAIN OF CUSTODY / ANALYSIS REQUEST FORM

Client: <b>MCE</b>			PO No.		NO OF BOTTLES	ANALYSES REQUESTED										AIC CONTROL NO: <b>201336</b>			
Project Reference:			MATRIX			1st Day Bioremediating											AIC PROPOSAL NO:		
Project Manager: <b>Matt Bienvenu</b>			WATER SOIL														Carrier:		
Sampled By:			G R A B	C O M P	W A T E R	S O I L	NO OF BOTTLES											Received Temperature C <b>8.1</b>	
AIC No.	Sample Identification	Date/Time Collected																Remarks	
<b>1</b>	<b>cabot</b>	<b>4/17/16 2nd Spill 4/18/16 100%</b>					<b>3</b>												
Container Type							<b>P</b>											Field pH calibration	
Preservative							<b>ICE</b>											on _____ @ _____	
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 = (NH <sub>4</sub> ) <sub>2</sub> SO <sub>4</sub> , NH <sub>4</sub> OH			Buffer:			
Turnaround Time Requested: (Please circle) NORMAL or EXPEDITED IN _____ DAYS							Relinquished By: <b>Jessie Brown</b>		Date/Time: <b>4/18/16 1009</b>		Received By: <b>Jessie Brown</b>		Date/Time: <b>4/18/16 1008</b>						
Expedited results requested by: _____							Relinquished By: <b>Jessie Brown</b>		Date/Time: <b>4/18/16 1121</b>		Received in Lab By: <b>[Signature]</b>		Date/Time: <b>4/18/16 1121</b>						
Who should AIC contact with questions:							Comments:												
Phone: _____ Fax: _____																			
Report Attention to:																			
Report Address to:																			
Email Address:																			

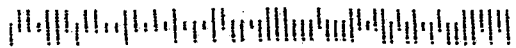




CHAIN OF CUSTODY / ANALYSIS REQUEST FORM

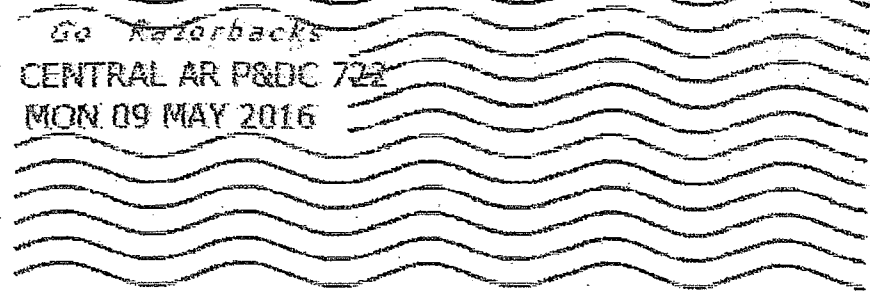
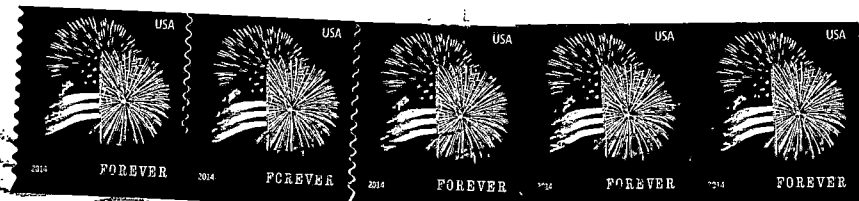
Client: <b>MCE</b>			PO No.		NO OF BOTTLES <b>10/3 Bio Monitoring</b>	ANALYSES REQUESTED										AIC CONTROL NO: <b>201336</b>			
Project Reference:																AIC PROPOSAL NO:			
Project Manager: <b>Matt Bienvenu</b>			MATRIX													Carrier:			
Sampled By: <b>Kevin Stalwater</b>			GR	COMP	WATER	SOIL											Received Temperature C <b>0.1</b>		
AIC No.	Sample Identification	Date/Time Collected	GR	COMP	WATER	SOIL	NO OF BOTTLES											Remarks	
<b>2</b>	<b>Cabot</b>	<b>4/18/16 08:30</b>	<b>BA</b>	<b>P</b>	<b>✓</b>		<b>3</b>												
Container Type															Field pH calibration on _____ @ _____				
Preservative															Buffer:				
G = Glass NO = none			P = Plastic S = Sulfuric acid pH2		V = VOA vials N = Nitric acid pH2		H = HCl to pH2 B = NaOH to pH12		T = Sodium Thiosulfate Z = Zinc acetate		A = (NH <sub>4</sub> ) <sub>2</sub> SO <sub>4</sub> , NH <sub>4</sub> OH								
Turnaround Time Requested: (Please circle) NORMAL or EXPEDITED IN _____ DAYS					Relinquished By: <b>[Signature]</b>		Date/Time: <b>4/19/16 08:30</b>		Received By: <b>[Signature]</b>		Date/Time: <b>4/19/16 1300</b>								
Expedited results requested by: _____					Relinquished By: <b>[Signature]</b>		Date/Time: <b>4/19/16 1300</b>		Received in Lab By: <b>[Signature]</b>		Date/Time: <b>4/19/16 1505</b>								
Who should AIC contact with questions: Phone: _____ Fax: _____					Comments:														
Report Attention to: Report Address to:																			
Email Address:																			





**CABOT**

One City Plaza, Suite B  
P.O. Box 1287  
Cabot, Arkansas 72023



*Go Razorbacks*

CENTRAL AR P&DC 722

MON 09 MAY 2016

Arkansas Department of Environmental Quality  
NPDES Branch, Water Division  
5301 Northshore Drive  
Little Rock, Arkansas 72118