

Bio-Analytical Laboratories (BAL)
ADEQ Certificate #88-0630
Project X5532

Bio-Analytical Laboratories' Executive Summary

Permittee: Magnolia Wastewater System
P.O. Box 666
Magnolia, AR 71753

Project #: X5532

Outfall: 001 (treated municipal wastewater)

Permit #: AR0043613/ AFIN #14-00059

Contact: Russell Thomas

Dates: September 9 - 17, 2014

Test Type: Chronic Static Renewal Survival and Reproduction Test using *Ceriodaphnia dubia* (EPA Method 1002.0)
Chronic Static Renewal Survival and Growth Test using *Pimephales promelas* (EPA Method 1000.0)

Results:

For *Ceriodaphnia dubia*:

- √1. If the NOEC for survival is less than the critical dilution (100.0%), enter a "1"; otherwise, enter a "0" for Parameter TLP3B - 0 -Pass
- √2. If the NOEC for reproduction is less than the critical dilution, enter a "1"; otherwise, enter a "0" for Parameter TGP3B - 0 - Pass
- √3. Report the NOEC value for survival, Parameter TOP3B - 100.0%.
- √4. Report the NOEC value for reproduction, Parameter TPP3B - 100.0%.
- √5. Report the largest % coefficient of variation between the control and the critical dilution, Parameter TQP3B - 18.41%.

For *Pimephales promelas*:

- √1. If the NOEC for survival is less than the critical dilution (100.0%), enter a "1"; otherwise, enter a "0" for Parameter TLP6C - 0 -Pass
- √2. If the NOEC for growth is less than the critical dilution, enter a "1"; otherwise, enter a "0" for Parameter TGP6C - 0 -Pass
- √3. Report the NOEC value for survival, Parameter TOP6C - 100.0%.
- √4. Report the NOEC value for reproduction, Parameter TPP6C - 100.0%.
5. Report the largest % coefficient of variation between the control and the critical dilution, Parameter TQP6C - 6.27%.

This report contains a total of 43 pages, including this page. The results contained within pertains only to the samples listed on the chain of custody documents in Appendix A. The information meets the standards set forth by ADEQ. The chemical data in this report is for monitoring purposes only and should not be reported on discharge monitoring reports.



Bio-Analytical Laboratories

3240 Spurgin Road
Post Office Box 527
Doyline, LA 71023

(318) 745-2772
1-800-259-1246
Fax: (318) 745-2773

**THE RESULTS OF TWO CHRONIC
DEFINITIVE TOXICITY TESTS
FOR OUTFALL 001**

AT

**MAGNOLIA WASTEWATER SYSTEM
Magnolia, Arkansas**

**NPDES #AR0043613
AFIN #14-00059**

EPA Methods 1000.0 and 1002.0

Project X5532

Test Dates: September 9 - 17, 2014

Report Date: September 24, 2014

Prepared for:
Russell Thomas
Magnolia Wastewater System
P.O. Box 666
Magnolia, AR 71753

Prepared by:
Ginger Briggs
Bio-Analytical Laboratories
P.O. Box 527
Doyline, LA 71023
ADEQ #88-0630

BAL
ADEQ #88-0630
Project X5532

TABLE OF CONTENTS

1.0 Introduction	4
2.0 Methods and Materials	4
2.1 Test Methods	4
2.2 Test Organisms	4
2.3 Dilution Water	4
2.4 Test Concentrations	5
2.5 Sample Collection	5
2.6 Sample Preparation	5
2.7 Monitoring of the Tests	5
2.8 Data Analysis	5
3.0 Results and Discussion	6
4.0 Conclusions	7
5.0 Reference	8
Appendices	
A- Chain-of-Custody Documents	9
B- Raw Data Sheets	13
C- Statistical Analyses	22
D- Quality Assurance Charts	31
E- Agency Forms	35
F- Report Quality Assurance Form	42

BAL
ADEQ #88-0630
Project X5532

1.0 Introduction

Bio-Analytical Laboratories (BAL), Doyline, Louisiana conducted two chronic definitive toxicity tests for Outfall 001 at Magnolia Wastewater System, Magnolia, Arkansas. The test organisms used were the cladoceran, *Ceriodaphnia dubia*, and the fathead minnow, *Pimephales promelas*. The purpose of this study is to determine if appropriately dilute effluent samples adversely affect the survival, reproduction and/or growth of the test organisms. Toxicity is defined as a statistically significant difference at the 95 percent confidence level between the survival, reproduction and/or growth of the test organism in the critical dilution (the effluent concentration representative of the proportion of effluent in the receiving water during critical low flow or critical mixing conditions) compared to the survival, reproduction and/or growth of the test organism in the control. The test endpoint is the No-Observed-Effect-Concentration (NOEC), the highest effluent concentration that is not significantly different from the control.

2.0 Methods and Materials

2.1 Test Methods

All methods followed were according to the latest edition of "Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms" (EPA-821-R-02-013), "Standard Methods for The Examination of Water and Wastewater. 20th Edition" (APHA 1998. Chemical results using this edition are listed in the report as SM 1997), and BAL's standard operating procedure.

2.2 Test Organisms

The *Ceriodaphnia dubia* test organisms were cultured in-house at test temperature and dilution water hardness and were less than 24 hours old at test initiation. The neonates were released within the same 8-hour period. The fathead minnow test organisms were obtained from Environmental Consulting and Testing, Superior, Wisconsin, and were less than 48 hours old at test initiation and hatched within the same 24 hour period. The minnows were acclimated to test temperature and dilution water hardness prior to test initiation. Monthly chronic reference toxicant tests were conducted in order to document organism sensitivity and demonstration of capability.

2.3 Dilution Water

Soft reconstituted water, made per method guidelines, was used as the dilution water and the control for the toxicity tests.

BAL
ADEQ #88-0630
Project X5532

2.4 Test Concentrations

The test concentrations used in the chronic toxicity tests were 100.0, 80.0, 56.0, 42.0 and 32.0 percent effluent and a reconstituted water control. The critical dilution was 100.0 percent effluent. The *Ceriodaphnia* test was conducted using 10 replicates of one animal each for a total of 10 animals per concentration. The fathead minnow test was conducted using five replicates of eight animals each for a total of 40 animals per concentration.

2.5 Sample Collection

Three 24-hour composite samples of Outfall 001 were collected by Magnolia personnel on September 8, 10 and 12, 2014. Upon collection and completion of each composite, the samples were packed in ice and delivered to the laboratory the day of collection by BAL personnel. The sample temperature upon arrival of each sample was 0.4, 3.1 and 3.9° Celsius, respectively.

2.6 Sample Preparation

Upon arrival, the samples were logged in, given an identification number and refrigerated unless needed. Prior to use, the samples were warmed to $25 \pm 1^{\circ}$ Celsius. Total residual chlorine levels were measured with a Capital Controls^R amperometric titrator (SM 4500-CI D 1997) and recorded if present. Total ammonia levels were measured using a HACH^R test strip. Dissolved oxygen (SM 4500-0 G 1997) and pH (SM 4500-H+ B 1997) measurements were measured on the control and each concentration at test initiation, at test renewal and at test termination. Conductivity (SM 2510 B 1997) measurements were also taken at test initiation and at each renewal. Alkalinity (SM 2320 B 1997) and hardness (SM 2340 C 1997) levels were measured on the control and the undiluted effluent samples.

2.7 Monitoring of the Tests

The cladoceran test was run in a Precision^R dual-programmable, illuminated incubator at a temperature of $25 \pm 1^{\circ}$ Celsius. The fathead minnow test was run in a circulating waterbath, using a Remcor^R heated liquid circulator to keep a constant temperature of $25 \pm 1^{\circ}$ Celsius. AEMC^R data-loggers were used to monitor diurnal test temperature. Test temperatures were recorded at the beginning of the day, after test renewal and at the end of the day. Light cycles and intensities were recorded twice a month.

2.8 Data Analysis

Ceriodaphnia dubia survival data was analyzed using Fisher's Exact Test, an equality test comparing concentration data to control data. Reproduction data was analyzed using Steel's Many-One Rank Test, a non-parametric test comparing concentration data to control data.

BAL
ADEQ #88-0630
Project X5532

Fathead minnow survival data was analyzed using Steel's Many-One Rank Test, while the growth data was analyzed using the Bonferroni T-Test, a parametric test comparing concentration data to control data when an unequal number of replicates are analyzed. The chronic endpoints in the reference toxicant tests were obtained by approved EPA methods of analysis.

3.0 Results and Discussion

The results of the *Ceriodaphnia dubia* test can be found in Table 1. Ninety percent survival occurred in the control and in the critical dilution after eight days of exposure. The average number of neonates per female after three broods in the control was 20.8 and the average in the critical dilution was 23.7. The No-Observed-Effect-Concentration (NOEC) for survival and reproduction in this test was 100.0 percent effluent (p=.05).

The fathead minnow test results can be found in Table 2. Ninety-seven-point-five percent survival occurred in the control and in the critical dilution after seven days of exposure. The average weight gained in the control was 0.723 milligram (mg) and the average weight gained in the critical dilution was 0.670 mg. The NOEC for survival and growth in this test was 100.0 percent effluent (p=.05).

Table 1: Results of the Chronic Definitive *Ceriodaphnia dubia* Test

Percent Effluent	Percent Survival	Sig.*	Mean # Neonates-Surviving	Mean # Neonates -Total	Sig.*
Control	90.0		23.1	20.8	
32.0	90.0		25.3	22.1	
42.0	80.0		27.9	25.7	
56.0	80.0		28.6	22.9	
80.0	100.0		25.2	25.2	
100.0	90.0		26.3	23.7	

*significant when compared to the control (p=.05). Test validity based on mean number of neonates per surviving female. NOEC value based on total mean number of neonates.

BAL
ADEQ #88-0630
Project X5532

Table 2: Results of the Chronic Definitive Fathead Minnow Test

Percent Effluent	Percent Survival	Sig.*	Mean Dry Weight (mg)	Sig.*
Control	97.5		0.723/0.743+	
32.0	100.0		0.678	
42.0	97.5		0.733	
56.0	92.5		0.650	
80.0	100.0		0.703	
100.0	97.5		0.670	

*significant when compared to the control (p=.05).+Test validity based on mean dry weight per surviving larvae in the control.

The chronic reference toxicant tests conducted this month showed the test organisms to be within the respective sensitivity range. The graphs of the results of the chronic reference toxicant tests can be found in Appendix D- Quality Assurance Charts.

4.0 Conclusions

The three composite samples of Outfall 001 collected on September 8, 10 and 12, 2014, from Magnolia Wastewater System, Magnolia, Arkansas, were not found to be lethally toxic to the fathead minnow test organisms nor the *Ceriodaphnia dubia* test organisms in the 100.0 percent critical dilution after seven and eight days of exposure, respectively (p=.05). Sub-lethal effects (i.e. lack of growth or reproduction) were not noted in the critical dilution in either test (p=.05).

BAL
ADEQ #88-0630
Project X5532

5.0 References

- EPA, 2002. Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms. Fourth Edition. EPA-821-R-02-013, Office of Water.
- EPA, 2000. Understanding and Accounting for Method Variability in Whole Effluent Toxicity Applications Under the National Pollutant Discharge Elimination System. EPA-833-R-00-003, Office of Wastewater Management.
- EPA, 2000. Method Guidance and Recommendations for Whole Effluent (WET) Testing. EPA-821-B-00-04, Office of Water
- APHA, 1998. Standard Methods for The Examination of Water and Wastewater. 20th Edition.

APPENDIX A
CHAIN-OF-CUSTODY DOCUMENTS

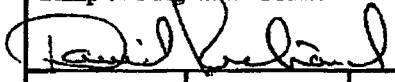

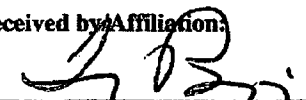



Bio-Analytical Laboratories

3240 Spurgin Road
Post Office Box 527
Covington, LA 71020

(518) 745-2772
1-800-253-7268
Fax: (518) 745-2773

NELAP/LELAP 01975, ADEQ 88-0630, TCEQ T104704278

Company:		Phone:		Analysis:		Laboratory Use Only:				
City of Magnolia		(870) 234-2955				Project Number:				
Address:		Fax:		Chronic Ceriodaphnia	Chronic minnow	Acute minnow (fresh/marine)	Acute Daphnia species			
P.O. Box 666, Magnolia, AR 71753		(870) 234-2203						Acute Mysid	Acute Ceriodaphnia	Fecal Coliform
Permit #:		Purchase Order:								
AR0043613/AFIN 14-00059				Tech: EOB	Date: 9/8/14	-0.4°C				
Sampler's Signature/Printed Name/Affiliation:										
 David Richards mwms										
Date Start	Date End	Time Start	Time End	C	G	# and type of container	Sample Identification	Lab Control Number:	Preservative: (below)	
9/7/14	9/8/14	7:00	2:00	X		6 half gallons	001	C9607	see	
Relinquished by/Affiliation:		Date:	Time:	Received by/Affiliation:		Date:	Time:			
 mwms		9/8/14	105			9/8/14	1215			
Relinquished by/Affiliation:		Date:	Time:	Received by/Affiliation:		Date:	Time:			
						9/8/14	1300			
Method of Shipment: <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Bus <input type="checkbox"/> Fed Ex <input type="checkbox"/> DHL <input type="checkbox"/> UPS <input type="checkbox"/> Client <input type="checkbox"/> Other Tracking # _____										
Comments: Sample checked and collected @ 4°C AR										
COC Rev. 3.0										



Bio-Analytical Laboratories

3240 Spangh Road
Post Office Box 627
Daylene, LA 71029

(510) 745-2772
1-800-266-1248
Fax: (510) 745-2773

NELAP/LRELAP 01975, ADEQ 88-0630, TCEQ T104704278

Laboratory Use Only:

Company: City of Magnolia		Phone: (870) 234-2955		Analysis:				Project Number: X5532			
Address: P.O. Box 666, Magnolia, AR 71753		Fax: (870) 234-2203		Chronic Ceriodaphnia	Chronic minnow	Acute minnow (fresh/marine)	Acute Daphnia species	Acute Mysid	Acute Ceriodaphnia	Temp. upon arrival: 3.18 Thermometer #: 29 Tech: RC Date: 9/10/14 Lab Control Number: Preservative: (below)	
Permit #: AR0043613/AFIN 14-00059		Purchase Order:		Fecal Coliform							
Sampler's Signature/Printed Name/Affiliation: <i>David Richards</i> DAVID RICHARDS MWWS											
Date Start Date End	Time Start Time End	C	G	# and type of container	Sample Identification						
9/9/14 9/10/14	7:50 7:50	X		6 half gallons	001	X	X				C9625 Lee
Relinquished by/Affiliation: <i>David Richards</i> mwws				Date: 9/10/14	Time: 1115	Received by/Affiliation: <i>J. B.</i>		Date: 9/10/14	Time: 1115		
Relinquished by/Affiliation:				Date:	Time:	Received by/Affiliation:		Date:	Time:		
Relinquished by/Affiliation: <i>J. B.</i>				Date: 9/10/14	Time: 1510	Received by/Affiliation: <i>A. S.</i>		Date: 9/10/14	Time: 1310		
Method of Shipment: <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Bus <input type="checkbox"/> Fed Ex <input type="checkbox"/> DHL <input type="checkbox"/> UPS <input type="checkbox"/> Client <input type="checkbox"/> Other Tracking #											
Comments: Samples checked & collected @ 4°C <i>OK</i>											
COC Rev. 3.0											



Bio-Analytical Laboratories

3240 Burpin Road
Post Office Box 227
Coyline, LA 71023

(510) 748-2772
1-800-229-1048
Fax: (510) 748-2773

NELAP/LELAP 01975, ADEQ 88-0630, TCEQ T104704278

Laboratory Use Only:

Company: City of Magnolia		Phone: (870) 234-2955		Analysis:				Project Number: X5532					
Address: P.O. Box 666, Magnolia, AR 71753		Fax: (870) 234-2203		Chronic Ceriodaphnia	Chronic minnow	Acute minnow (fresh/marine)	Acute Daphnia species		Acute Mysid	Acute Ceriodaphnia	Fecal Coliform	Temp. upon arrival: Temperature upon arrival: 3.98	
Permit #: AR0043613/AFIN 14-00059		Purchase Order:											Thermometer #: 29
Sampler's Signature/Printed Name/Affiliation: <i>David Richards</i> David Richards mwus		Date: 9/12/14											
Date Start Date End		Time Start Time End						C					G
9/11/14 9/12/14		7:00 7:00		X				6 half gallons		001		C9646	CC
Relinquished by/Affiliation: <i>David Richards</i> mwus		Date: 9/12/14		Time: 1100		Received by/Affiliation: <i>L. B. J.</i>				Date: 9/12/14			
Relinquished by/Affiliation:		Date:		Time:		Received by/Affiliation:				Date:		Time:	
Relinquished by/Affiliation: <i>L. B. J.</i>		Date: 9/12/14		Time: 1300		Received by/Affiliation: <i>R. Callahan</i>				Date: 9/12/14		Time: 1300	
Method of Shipment: <u>Lab</u> <u>Bus</u> <u>Fed Ex</u> <u>DHL</u> <u>UPS</u> <u>Client</u> <u>Other</u> Tracking # _____													
Comments: <i>Samples checked and collected @ 40c sed</i>													
COC Rev. 3.0													

**APPENDIX B
RAW DATA SHEETS**

BIO-ANALYTICAL LABORATORIES CERIODAPHNIA DUBIA SURVIVAL AND REPRODUCTION TEST

Project# X5532 Date start: 9/9/14 Date end: 9/17/14

Client/Contact: MAGN/Magnolia Waste Water
 Address: P.O. Box 666 Magnolia AR 71753
 NPDES#: AR0043613
 Sample Description: 001 Dilution Water: Soft Reconstituted
 Test Temperature(°C) 25+1° Technicians: EGB/AH/RC

Adults isolated: Date 9/9/14 Time: 0610

Neonates collected: Date 9/9/14 Time: 1305 Board: 295

Dissolved Oxygen Meter: Model YSI55D Serial #06E2089 AU
 pH Meter: Model Orion 230A+ Serial #105253

Conductivity Meter: Model Control Company Serial# 80277924
 Amperometric Titrator: Model Fischer-Porter Serial # 92W445766

Effluent	Aerate?/Minutes	Receiving Water	Aerate?/Minutes
Initial D.O.	/Final D.O.	Initial D.O.	/Final D.O.
(mg/L & %)/Tech	(mg/L & %)/Tech	(mg/L & %)/Tech	(mg/L & %)/Tech
0. <u>10.8/129.28/AH</u>	0. <u>4/25/8.2/95.98/AH</u>	NA	NA
1. <u>11.1/131.28/RC</u>	1. <u>Y/20/8.2/97.38/RC</u>		
2. <u>9.9/116.88/RC</u>	2. <u>X/25/8.2/97.28/RC</u>		
3. <u>10.2/118.18/AH</u>	3. <u>4/25/8.3/97.58/AH</u>		
4. <u>10.5/127.38/AH</u>	4. <u>4/25/8.0/95.88/AH</u>		
5. <u>10.8/130.28/AH</u>	5. <u>4/25/8.2/97.08/AH</u>		
6. <u>10.6/124.68/RC</u>	6. <u>Y/25/8.3/97.28/RC</u>		
7. <u>9.2/113.68/AH</u>	7. <u>4/25/8.1/95.98/AH</u>		

Total Residual Chlorine (mg/L)/Tech	Dechlorinated? Amount?/Tech	Ammonia (NH3) (mg/L)/Tech	BAL Sample # Date in Use
1. <u>LO.01/AH</u>	1. <u>No/AH</u>	1. <u>0.25/AH</u>	1. <u>C9617 9/9/14</u>
2. <u><0.01/RC</u>	2. <u>No/RC</u>	2. <u>0.25/RC</u>	2. <u>C9625 9/11/14</u>
3. <u><0.01/AH</u>	3. <u>No/AH</u>	3. <u>0.25/AH</u>	3. <u>C9646 9/13/14</u>

Comments:

BIO-ANALYTICAL LABORATORIES
NUMBER NEONATES PER BROOD CERIODAPHNIA

Project # X5532 Test Dates 9/9-17/14

Client Magnolia Wastewater

Replicate	% Concentration								
	0	32	42	56	80	100			
A	18	22	29	20	24	21			
B	19	26	23	X	24	27			
C	X	28	31	34	30	29			
D	24	X19	29	32	28	24			
E	25	23	X3	X	13	29			
F	30	34	X31	34	26	31			
G	22	34	25	28	33	26			
H	29	22	23	25	19	22			
I	20	13	32	31	30	28			
J	21	X	31	25	25	X			
Surviving Mean	23.1	25.3	27.9	28.6	25.2	26.3			
Total Mean	20.8	22.1	25.7	22.9	25.2	23.7			
CV%*	18.41	22.50	13.21	17.51	23.12	12.88			

*coefficient of variation = standard deviation x 100/mean (calculation based on young of the surviving adults)

Key: M=male; X=dead adult

Calculated by: E. GB 9/17/14

Calculations checked by: PH 9/17/14

BIO-ANALYTICAL LABORATORIES

CERIODAPHNIA DUBIA SURVIVAL AND REPRODUCTION TEST-LIVE NEONATE PRODUCTION 05532

Project# X5532

Test started: Date 9/9/14 Time 1440

Page 16 of 43

Client Magnolia

Test ended: Date 9/11/14 Time 1315

Technician: Day 0 AM 1 AM 2 AM 3 AM 4 AM 5 AM 6 AM 7 AM 8 AM

Time: Day 0 1100 1100 1200 1200 1300 1300 1400 1400 1500 1500 1600 1600 1700 1700 1800 1800

Temp. (°C): Day 0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0

Conc %	Day	A	B	C	D	E	F	G	H	I	J	Number of Live Adults
0	1	C										0
	2	C										0
	3	C		X	C							0
	4	C				C						0
	5	C				4	4	4	4	3	3	9
	6	C		8		7	6	12	9			9
	7	C		10		12	17	14	18	18	11	12
	8	C										
32	1	C										0
	2	C										0
	3	C									X	0
	4	C										0
	5	C		4	3	3	5	3	4	2	4	0
	6	C		10	9	10	9	13	13	9	10	0
	7	C		12	16	X	9	18	17	12	9	0
	8	C										
42	1	C										0
	2	C										0
	3	C										0
	4	C										0
	5	C		3	4	4	X3	1	3	4	4	0
	6	C		9	11	9		12	12	9	10	0
	7	C		11	16	15		X18	10	10	18	15
	8	C										
56	1	C										0
	2	C		X	C		X					0
	3	C										0
	4	C										0
	5	C										0
	6	C										0
	7	C										0
	8	C										0
80	1	C										0
	2	C										0
	3	C										0
	4	C										0
	5	C		4	4	4	1	3	5	3	3	0
	6	C		10	12	8	0	8	12	6	9	0
	7	C		12	10	14	14	7	15	16	15	18
	8	C										
100	1	C										0
	2	C									X	0
	3	C										0
	4	C										0
	5	C		4	4	3	4	4	1	1	4	0
	6	C		8	9	9	0	10	7	11	10	0
	7	C		15	16	12	14	10	11	12	11	0
	8	C										

Key: X=dead adult, X'=adult had n neonates before death, M=male CERIO2 Rev.2.0

Day/# water used	03/19	1	2	3	4	5	8/5/2	7	8
Concentration:	500								
pH	7.3	7.3	7.2	7.2	7.3	7.3	7.4	7.1	7.3
DO (mg/l)	8.2	8.2	8.2	8.2	8.5	8.6	8.7	8.5	8.3
Cond (umhos/cm)	172.4	178.6	177.0	179.6	178.4	172.7	174.3	176.7	
Alkalinity (mg/L)	360						330	330	
Hardness (mg/L)	520						480	480	
Concentration:	320								
pH	7.4	7.2	7.2	7.3	7.3	7.2	7.7	7.2	7.3
DO (mg/l)	8.1	8.2	8.2	8.2	8.4	8.4	8.5	8.4	8.2
Cond (umhos/cm)	280	290	293	293	295	282	288	276	
Concentration:	420								
pH	7.5	7.2	7.3	7.4	7.3	7.3	7.7	7.3	7.4
DO (mg/l)	8.1	8.2	8.2	8.2	8.4	8.3	8.4	8.4	8.2
Cond (umhos/cm)	312	326	324	324	327	316	315	314	
Concentration:	560								
pH	7.6	7.3	7.4	7.4	7.3	7.3	7.7	7.3	7.5
DO (mg/l)	8.1	8.2	8.2	8.2	8.4	8.2	8.3	8.3	8.1
Cond (umhos/cm)	358	371	370	368	372	364	364	361	
Concentration:	800								
pH	7.6	7.3	7.4	7.5	7.4	7.5	7.7	7.5	7.6
DO (mg/l)	8.0	8.1	8.1	8.2	8.2	8.4	8.1	8.2	8.0
Cond (umhos/cm)	436	451	453	450	450	450	448	442	441
Concentration:	1000								
pH	7.7	7.4	7.4	7.6	7.5	7.6	7.8	7.6	7.7
DO (mg/l)	8.0	8.1	8.1	8.2	8.2	8.4	8.0	8.2	8.0
Cond (umhos/cm)	500	511	520	517	525	520	502	510	
Tech-prerenewal		AH	AH	AH	AH	AH	AH	AH	AH
Tech-postrenewal	AH	RC	RC	AH	AH	AC	RC	AH	AH
Alkalinity (mg/l)	680		640		360				
Hardness (mg/l)	560		560		560				

Key: prerenewal/postrenewal.

BIO-ANALYTICAL LABORATORIES
 PIMEPHALES PROMELAS SURVIVAL AND GROWTH DATA SHEET

X5532
 Page 18 of 43

Project# X5532 Date started: 9/9/14 Date ended 9/16/14

Client/Contact MAGN/Magnolia Waste Water

Address P.O. Box 666 Magnolia AR 71753

NPDES# AR0043613 AFIN14-00059

Sample Description 001 Dilution Water Soft Reconstituted

Test Temperature(°C) 25+1° Celsius Technicians EGB/AH/RC

Test organism age < 48 hr Vendor/ID# ECT/795

Feeding Times

Day	Technician/Time/Amount (per replicate)		
	AM	NOON	PM
0			RC/1455/0.20ml
1	AH/0845/0.10ml	RC/1100/0.10ml	RC/1515/0.10ml
2	RC/0905/0.10ml	RC/1100/0.10ml	RC/1445/0.10ml
3	AH/0850/0.10ml	RC/1125/0.10ml	RC/1650/0.10ml
4	AC/1000/0.20ml		AC/1430/0.20ml
5	AC/1020/0.20ml		AC/1350/0.20ml
6	RC/0855/0.10ml	RC/1045/0.10ml	RC/1610/0.10ml

Dissolved Oxygen Meter: Model YSI55D Serial #06E2089 AU
 pH Meter: Model Orion 230A+ Serial #105253
 Conductivity Meter: Model Control Company Serial #80277924
 Amperometric Titrator: Model Fischer-Porter Serial #92W445766

Effluent Initial DO(mg/L&%) /Tech	Aerate?/Minutes /Final DO (mg/L & %)/Tech	Receiving Water Initial DO (mg/L & %)/Tech	Aerate?/Minutes /Final DO (mg/L & %)/Tech
0. 10.8/129.25/AH	0. 4/25/8.0/95.92/AH	NA	NA
1. 11.1/131.22/RC	1. Y/20/8.2/97.22/RC		
2. 9.9/116.82/RC	2. Y/25/8.2/97.22/RC		
3. 10.2/118.13/AH	3. 4/25/8.3/97.52/AH		
4. 10.5/127.32/AH	4. 4/25/8.0/95.82/AH		
5. 10.8/130.22/AH	5. 4/25/8.2/97.02/AH		
6. 10.6/124.62/RC	6. Y/25/8.3/97.22/RC		

Total Residual Chlorine(mg/L)/Tech	Dechlorinated? Amount?/Tech	Ammonia (NH3) (mg/L)/Tech	BAL Sample # Date in use
1. <0.01/AH	1. NO/AH	1. 0.25/AH	1. C9617 9/9/14
2. <0.01/RC	2. No/RC	2. 0.25/RC	2. C9625 9/11/14
3. <0.01/AH	3. NO/AH	3. 0.25/AH	3. C9606 9/13/14

Comments:

BIO-ANALYTICAL LABORATORIES 7-DAY CHRONIC MINNOW SURVIVAL DATA

Project# X5532 Test started: Date 9/14 Time 1405
 Client Magnolia Test ended: Date 9/14 Time 1130
 Technician: Day 0 PC 1 PC 2 PC 3 PC 4 AC 5 AC 6 PC 7 PC
 Time: PC Day 0 2145 1 1025 2 1223 3 1335 4 1215 5 1148 6 1300 7 1130
 Temperature Day 0 24.7 1 25.0 2 25.3 3 25.3 4 23.8 5 25.1 6 25.1 7 25.2

Conc. %	Rep.	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
0	A	8	8	7	7	7	7	7	7
	B	8	8	8	8	8	8	8	8
	C	8	8	8	8	8	8	8	8
	D	8	8	8	8	8	8	8	8
	E	8	8	8	8	8	8	8	8
32	A	8	8	8	8	8	8	8	8
	B	8	8	8	8	8	8	8	8
	C	8	8	8	8	8	8	8	8
	D	8	8	8	8	8	8	8	8
	E	8	8	8	8	8	8	8	8
42	A	8	8	8	8	8	8	8	8
	B	8	8	8	8	7	7	7	7
	C	8	8	8	8	8	8	8	8
	D	8	8	8	8	8	8	8	8
	E	8	8	8	8	8	8	8	8
56	A	8	8	8	8	7	7	7	7
	B	8	8	8	8	8	8	8	8
	C	8	8	8	8	8	8	7	7
	D	8	8	8	8	7	7	7	7
	E	8	8	8	8	8	8	8	8
80	A	8	8	8	8	8	8	8	8
	B	8	8	8	8	8	8	8	8
	C	8	8	8	8	8	8	8	8
	D	8	8	8	8	8	8	8	8
	E	8	8	8	8	8	8	8	8
100	A	8	8	8	8	8	8	8	8
	B	8	8	8	8	8	8	8	8
	C	8	8	8	8	8	8	8	8
	D	8	8	8	8	8	8	8	8
	E	8	8	8	8	8	8	8	7

Minnow2

Project#/Client: X5532/mg Temp Start (°C) 102°c Tech RC Date: 9/16/14 Time: 1430 X5532
 Temp End (°C) 100°c Tech RC Date: 9/17/14 Time: 0845 Page 20 of 43

Conc. %	Replicate/Pan number	Wt. of pan(g)/Date weighed/ Tech: <u>OH</u>	Wt. of pan + larvae(g)/Date weighed/ Tech: <u>OH</u>	Total wt. of larvae (g)	Original # of larvae at test initiation	Mean Dry wt. of larvae (mg)	Mean Dry wt. - surviving larvae (mg) Control Only*
0	A 66	0.9460	0.9518	0.0058	8	0.725	0.829
	B 67	0.9418	0.9476	0.0058	8	0.725	
	C 68	0.9461	0.9519	0.0058	8	0.725	
	D 69	0.9407	0.9469	0.0062	8	0.775	
	E 70	0.9420	0.9473	0.0053	8	0.663	
32	A 71	0.9474	0.9524	0.0050	8	0.625	
	B 72	0.9412	0.9461	0.0049	8	0.613	
	C 73	0.9478	0.9532	0.0054	8	0.675	
	D 74	0.9411	0.9472	0.0061	8	0.763	
	E 75	0.9408	0.9465	0.0057	8	0.713	
42	A 76	0.9475	0.9529	0.0054	8	0.675	
	B 77	0.9430	0.9484	0.0054	8	0.675	
	C 78	0.9413	0.9472	0.0059	8	0.738	
	D 79	0.9336	0.9399	0.0063	8	0.788	
	E 80	0.9373	0.9436	0.0063	8	0.788	
56	A 81	0.9391	omit - ^{shrimp} ^{unavailable so} ^{dropped} ^{fresh fish}		8		
	B 82	0.9397	0.9449	0.0052	8	0.650	
	C 83	0.9365	0.9406	0.0041	8	0.513	
	D 84	0.9411	0.9468	0.0057	8	0.713	
	E 85	0.9405	0.9463	0.0058	8	0.725	
80	A 86	0.9402	0.9446	0.0044	8	0.550	
	B 87	0.9402	0.9460	0.0058	8	0.725	
	C 88	0.9391	0.9458	0.0067	8	0.838	
	D 89	0.9322	0.9369	0.0047	8	0.588	
	E 90	0.9422	0.9487	0.0065	8	0.813	
100	A 91	0.9363	0.9413	0.0050	8	0.625	
	B 92	0.9456	0.9512	0.0056	8	0.700	
	C 93	0.9378	0.9431	0.0053	8	0.663	
	D 94	0.9403	0.9461	0.0058	8	0.725	
	E 95	0.9402	0.9453	0.0051	8	0.638	

* Test acceptance of control weight based on surviving larvae at end of test.

Calculated by: PH 9/17/14

Calculations checked by: EB 9/22/14

Day/# water used	03/19	1	2	3	4	5	8/5/2	7	8
Concentration: Control <u>504</u>									
pH	7.3	6.7 / 7.3	7.0 / 7.2	7.1 / 7.2	6.9 / 7.3	6.8 / 7.4	6.7 / 7.1	6.9 / 7.1	
DO (mg/l)	8.2	6.7 / 8.2	7.1 / 8.2	7.5 / 8.2	7.3 / 8.6	6.1 / 8.7	6.5 / 8.5	7.0 / 8.5	
Cond (umhos/cm)	172.4	178.6	177.0	179.6	178.4	172.7	174.3		
Alkalinity (mg/L)	36.0						28.0		
Hardness (mg/L)	52.0						48.0		
Concentration: <u>328</u>									
pH	7.4	6.9 / 7.2	7.0 / 7.2	7.2 / 7.3	7.0 / 7.2	6.7 / 7.7	6.7 / 7.2	7.0 / 7.0	
DO (mg/l)	8.1	7.2 / 8.2	6.8 / 8.2	7.6 / 8.2	7.0 / 8.4	5.5 / 8.5	6.1 / 8.4	7.0 / 8.4	
Cond (umhos/cm)	280	290	293	293	295	282	288		
Concentration: <u>428</u>									
pH	7.5	6.9 / 7.2	7.0 / 7.3	7.2 / 7.3	7.0 / 7.3	6.7 / 7.7	6.7 / 7.3	7.2 / 7.2	
DO (mg/l)	8.1	7.1 / 8.2	6.8 / 8.2	7.6 / 8.2	6.7 / 8.3	5.2 / 8.4	5.9 / 8.4	6.9 / 8.4	
Cond (umhos/cm)	312	326	324	324	327	316	315		
Concentration: <u>508</u>									
pH	7.6	7.0 / 7.3	7.1 / 7.4	7.4 / 7.3	7.1 / 7.3	6.8 / 7.7	6.7 / 7.3	7.3 / 7.3	
DO (mg/l)	8.1	7.1 / 8.2	6.9 / 8.2	7.6 / 8.2	6.8 / 8.2	5.4 / 8.3	5.7 / 8.3	6.9 / 8.3	
Cond (umhos/cm)	358	371	370	368	372	364	364		
Concentration: <u>808</u>									
pH	7.6	7.2 / 7.3	7.1 / 7.5	7.4 / 7.4	7.2 / 7.5	6.8 / 7.7	6.8 / 7.5	7.3 / 7.3	
DO (mg/l)	8.0	6.9 / 8.1	6.8 / 8.2	7.5 / 8.2	6.5 / 8.1	5.1 / 8.2	5.2 / 8.2	6.7 / 8.2	
Cond (umhos/cm)	436	451	453	450	456	448	448		
Concentration: <u>1008</u>									
pH	7.7	7.3 / 7.4	7.2 / 7.6	7.5 / 7.5	7.3 / 7.6	6.9 / 7.8	6.9 / 7.6	7.4 / 7.4	
DO (mg/l)	8.0	7.3 / 8.1	6.9 / 8.1	7.5 / 8.2	6.4 / 8.0	4.4 / 8.0	5.4 / 8.2	6.9 / 8.2	
Cond (umhos/cm)	500	511	520	517	525	520	502		
Tech-prerenewal		RC	RC	RC	AC	AC	RC	RC	
Tech-postrenewal	PH	RC	RC	PH	PH	PH	RC		
Alkalinity (mg/l)	68.0		64.0		36.0				
Hardness (mg/l)	56.0		56.0		56.0				

Key: prerenewal/postrenewal

APPENDIX C
STATISTICAL ANALYSES

Ceriodaphnia Survival and Reproduction Test-7 Day Survival

X5532

Start Date: 9/9/2014 Test ID: x5532CD Sample ID: AR0043613 Page 23 of 43
 End Date: 9/17/2014 Lab ID: ADEQ880630 Sample Type: EFF1-POTW
 Sample Date: 9/8/2014 Protocol: EPAFW02-EPA/821/R-02-01 Test Species: CD-Ceriodaphnia dubia
 Comments:

Conc-%	1	2	3	4	5	6	7	8	9	10
D-Control	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
32	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000
42	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	1.0000	1.0000	1.0000	1.0000
56	1.0000	0.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000
80	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
100	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000

Conc-%	Mean	N-Mean	Resp	Not Resp	Total	N	Fisher's Exact P	1-Tailed Critical
D-Control	0.9000	1.0000	1	9	10	10		
32	0.8000	0.8889	2	8	10	10	0.5000	0.0500
42	0.8000	0.8889	2	8	10	10	0.5000	0.0500
56	0.8000	0.8889	2	8	10	10	0.5000	0.0500
80	1.0000	1.1111	0	10	10	10	0.5000	0.0500
100	0.9000	1.0000	1	9	10	10	0.7632	0.0500

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Fisher's Exact Test	100	>100		1
Treatments vs D-Control				

Ceriodaphnia Survival and Reproduction Test-Reproduction

X5532

Start Date: 9/9/2014 Test ID: x5532CD Sample ID: AR0043613 Page 24 of 43
 End Date: 9/17/2014 Lab ID: ADEQ880630 Sample Type: EFF1-POTW
 Sample Date: 9/8/2014 Protocol: EPAFW02-EPA/821/R-02-01 Test Species: CD-Ceriodaphnia dubia
 Comments:

Conc-%	1	2	3	4	5	6	7	8	9	10
D-Control	18.000	19.000	24.000	25.000	30.000	22.000	29.000	20.000	21.000	
32	22.000	28.000	28.000	23.000	34.000	34.000	22.000	13.000		
42	29.000	23.000	31.000	29.000	25.000	23.000	32.000	31.000		
56	20.000	34.000	32.000	34.000	28.000	25.000	31.000	25.000		
80	24.000	24.000	30.000	28.000	13.000	26.000	33.000	19.000	30.000	25.000
100	21.000	27.000	29.000	24.000	29.000	31.000	26.000	22.000	28.000	

Conc-%	Transform: Untransformed							1-Tailed		
	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
D-Control	23.111	1.0000	23.111	18.000	30.000	18.414	9			
32	25.250	1.0925	25.250	13.000	34.000	27.500	8	-0.880	2.410	5.858
42	27.875	1.2061	27.875	23.000	32.000	13.207	8	-1.960	2.410	5.858
56	28.625	1.2386	28.625	20.000	34.000	17.511	8	-2.269	2.410	5.858
80	25.200	1.0904	25.200	13.000	39.000	23.124	10	-0.909	2.410	5.539
100	26.333	1.1394	26.333	21.000	31.000	12.878	9	-1.367	2.410	5.683

Auxiliary Tests		Statistic		Critical		Skew		Kurt			
Kolmogorov D Test indicates normal distribution (p > 0.05)		0.5492		0.895		-0.4185		0.22586			
Bartlett's Test indicates equal variances (p = 0.36)		5.43971		15.0863							
Hypothesis Test (1-tail, 0.05)		NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Bonferroni t Test		100	>100		1	5.68269	0.24589	34.0484	25.0161	0.25643	5, 46
Treatments vs D-Control											

Ceriodaphnia Survival and Reproduction Test-Reproduction

X5532

Start Date: 9/9/2014 Test ID: x5532CD Sample ID: AR0043613 Page 25 of 43
 End Date: 9/17/2014 Lab ID: ADEQ880630 Sample Type: EFF1-POTW
 Sample Date: 9/8/2014 Protocol: EPAFW02-EPA/821/R-02-01 Test Species: CD-Ceriodaphnia dubia
 Comments:

Conc-%	1	2	3	4	5	6	7	8	9	10
D-Control	18.000	19.000	0.000	24.000	25.000	30.000	22.000	29.000	20.000	21.000
32	22.000	26.000	28.000	19.000	23.000	34.000	34.000	22.000	13.000	0.000
42	29.000	23.000	31.000	29.000	3.000	31.000	25.000	23.000	32.000	31.000
56	20.000	0.000	34.000	32.000	0.000	34.000	28.000	25.000	31.000	25.000
80	24.000	24.000	30.000	28.000	13.000	26.000	33.000	19.000	30.000	25.000
100	21.000	27.000	29.000	24.000	29.000	31.000	26.000	22.000	28.000	0.000

Conc-%	Mean	N-Mean	Transform: Untransformed				N	Rank Sum	1-Tailed Critical
			Mean	Min	Max	CV%			
D-Control	20.800	1.0000	20.800	0.000	30.000	40.083	10		
32	22.100	1.0625	22.100	0.000	34.000	45.622	10	112.00	75.00
42	25.700	1.2356	25.700	3.000	32.000	33.725	10	132.50	75.00
56	22.900	1.1010	22.900	0.000	34.000	56.129	10	122.50	75.00
80	25.200	1.2115	25.200	13.000	33.000	23.124	10	124.00	75.00
100	23.700	1.1394	23.700	0.000	31.000	37.637	10	123.00	75.00

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates non-normal distribution ($p \leq 0.05$)	1.68307	0.895	-1.4735	1.80898
Bartlett's Test Indicates equal variances ($p = 0.36$)	5.51298	15.0863		
Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	100	>100		1
Treatments vs D-Control				

Ceriodaphnia Survival and Reproduction Test-Reproduction

X5532

Start Date: 9/9/2014 Test ID: x5532CD Sample ID: AR0043613 Page 27 of 43
 End Date: 9/17/2014 Lab ID: ADEQ880630 Sample Type: EFF1-POTW
 Sample Date: 9/8/2014 Protocol: EPAFW02-EPA/821/R-02-01 Test Species: CD-Ceriodaphnia dubia
 Comments:

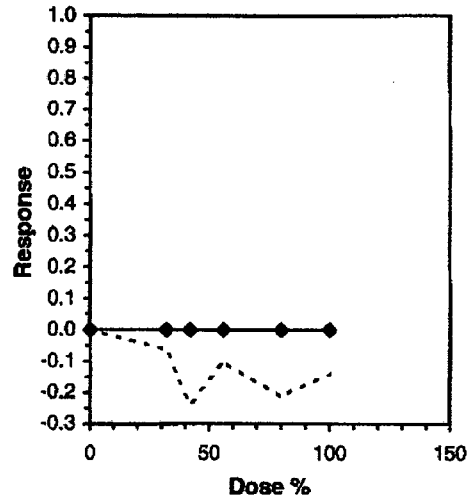
Conc-%	1	2	3	4	5	6	7	8	9	10
D-Control	18.000	19.000	0.000	24.000	25.000	30.000	22.000	29.000	20.000	21.000
32	22.000	26.000	28.000	19.000	23.000	34.000	34.000	22.000	13.000	0.000
42	29.000	23.000	31.000	29.000	3.000	31.000	25.000	23.000	32.000	31.000
56	20.000	0.000	34.000	32.000	0.000	34.000	28.000	25.000	31.000	25.000
80	24.000	24.000	30.000	28.000	13.000	26.000	33.000	19.000	30.000	25.000
100	21.000	27.000	29.000	24.000	29.000	31.000	26.000	22.000	28.000	0.000

Conc-%	Mean	N-Mean	Transform: Untransformed					Isotonic	
			Mean	Min	Max	CV%	N	Mean	N-Mean
D-Control	20.800	1.0000	20.800	0.000	30.000	40.083	10	23.400	1.0000
32	22.100	1.0625	22.100	0.000	34.000	45.622	10	23.400	1.0000
42	25.700	1.2356	25.700	3.000	32.000	33.725	10	23.400	1.0000
56	22.900	1.1010	22.900	0.000	34.000	56.129	10	23.400	1.0000
80	25.200	1.2115	25.200	13.000	33.000	23.124	10	23.400	1.0000
100	23.700	1.1394	23.700	0.000	31.000	37.637	10	23.400	1.0000

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates non-normal distribution (p <= 0.05)	1.68307	0.895	-1.4735	1.80698
Bartlett's Test indicates equal variances (p = 0.36)	5.51298	15.0863		

Linear Interpolation (200 Resamples)

Point	%	SD	95% CL	Skew
IC05	>100			
IC10	>100			
IC15	>100			
IC20	>100			
IC25	>100			
IC40	>100			
IC50	>100			



Larval Fish Growth and Survival Test-7 Day Survival

X5532

Start Date: 9/9/2014 Test ID: X5532PP Sample ID: AR0043613 Page 28 of 43
 End Date: 9/16/2014 Lab ID: ADEQ880630 Sample Type: EFF1-POTW
 Sample Date: 9/8/2014 Protocol: EPAFW02-EPA/821/R-02-01 Test Species: PP-Pimephales promelas
 Comments:

Conc-%	1	2	3	4	5
D-Control	0.8750	1.0000	1.0000	1.0000	1.0000
32	1.0000	1.0000	1.0000	1.0000	1.0000
42	1.0000	0.8750	1.0000	1.0000	1.0000
56	0.8750	1.0000	0.8750	0.8750	1.0000
80	1.0000	1.0000	1.0000	1.0000	1.0000
100	1.0000	1.0000	1.0000	1.0000	1.0000

Conc-%	Mean	N-Mean	Transform: Arcsin Square Root					Rank Sum	1-Tailed Critical
			Mean	Min	Max	CV%	N		
D-Control	0.9750	1.0000	1.3564	1.2094	1.3931	6.055	5		
32	1.0000	1.0256	1.3931	1.3931	1.3931	0.000	5	30.00	16.00
42	0.9750	1.0000	1.3564	1.2094	1.3931	6.055	5	27.50	16.00
56	0.9250	0.9487	1.2829	1.2094	1.3931	7.841	5	22.50	16.00
80	1.0000	1.0256	1.3931	1.3931	1.3931	0.000	5	30.00	16.00
100	1.0000	1.0256	1.3931	1.3931	1.3931	0.000	5	30.00	16.00

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution ($p < 0.05$)	0.82651	0.927	-0.8867	1.97749
Equality of variance cannot be confirmed				
Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	100	>100		1
Treatments vs D-Control				

ECB
9/22/14
Reviewed by:

Larval Fish Growth and Survival Test-7 Day Growth

X5532

Start Date: 9/9/2014 Test ID: X5532PP Sample ID: AR0043613 Page 29 of 43
 End Date: 9/16/2014 Lab ID: ADEQ880630 Sample Type: EFF1-POTW
 Sample Date: 9/8/2014 Protocol: EPAFW02-EPA/821/R-02-01 Test Species: PP-Pimephales promelas
 Comments:

Conc-%	1	2	3	4	5
D-Control	0.7250	0.7250	0.7250	0.7750	0.6625
32	0.6250	0.6125	0.6750	0.7625	0.7125
42	0.6750	0.6750	0.7375	0.7875	0.7875
56	0.6500	0.5125	0.7125	0.7250	
80	0.5500	0.7250	0.8375	0.5875	0.8125
100	0.6250	0.7000	0.6625	0.7250	0.6375
0-SN	0.8286	0.7250	0.7250	0.7750	0.6625

Conc-%	Transform: Untransformed							1-Tailed		
	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
D-Control	0.7225	1.0000	0.7225	0.6625	0.7750	5.526	5			
32	0.6775	0.9377	0.6775	0.6125	0.7625	9.170	5	0.946	2.552	0.1214
42	0.7325	1.0138	0.7325	0.6750	0.7875	7.689	5	-0.210	2.552	0.1214
56	0.6500	0.8997	0.6500	0.5125	0.7250	14.979	4	1.437	2.552	0.1288
80	0.7025	0.9723	0.7025	0.5500	0.8375	18.466	5	0.420	2.552	0.1214
100	0.6700	0.9273	0.6700	0.6250	0.7250	6.272	5	1.103	2.552	0.1214
0-SN	0.7432	1.0287	0.7432	0.6625	0.8286	8.369	5	-0.435	2.552	0.1214

Auxiliary Tests	Statistic	Critical	Skew	Kurt		
Shapiro-Wilk's Test indicates normal distribution ($p > 0.05$)	0.98005	0.933	-0.2959	-0.1549		
Bartlett's Test indicates equal variances ($p = 0.21$)	8.35414	16.8119				
Hypothesis Test (1-tail, 0.05)	MSDu	MSDp	MSB	MSE	F-Prob	df
Bonferroni t Test indicates no significant differences Treatments vs D-Control	0.12144	0.16808	0.00569	0.00588	0.44181	6, 27

Larval Fish Growth and Survival Test-7 Day Growth

X5532

Start Date: 9/9/2014 Test ID: X5532PP Sample ID: AR0043613 Page 30 of 43
 End Date: 9/16/2014 Lab ID: ADEQ880630 Sample Type: EFF1-POTW
 Sample Date: 9/8/2014 Protocol: EPAFW02-EPA/821/R-02-01 Test Species: PP-Pimephales promelas
 Comments:

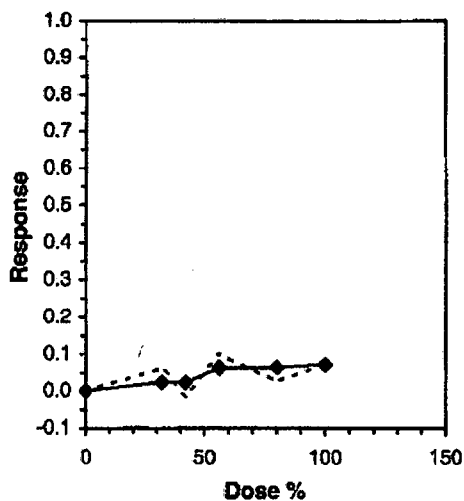
Conc-%	1	2	3	4	5
D-Control	0.7250	0.7250	0.7250	0.7750	0.6625
32	0.6250	0.6125	0.6750	0.7625	0.7125
42	0.6750	0.6750	0.7375	0.7875	0.7875
56	0.6500	0.5125	0.7125	0.7250	
80	0.5500	0.7250	0.8375	0.5875	0.8125
100	0.6250	0.7000	0.6625	0.7250	0.6375
0-SN	0.8286	0.7250	0.7250	0.7750	0.6625

Conc-%	Transform: Untransformed							Isotonic	
	Mean	N-Mean	Mean	Min	Max	CV%	N	Mean	N-Mean
D-Control	0.7225	1.0000	0.7225	0.6625	0.7750	5.526	5	0.7225	1.0000
32	0.6775	0.9377	0.6775	0.6125	0.7625	9.170	5	0.7050	0.9758
42	0.7325	1.0138	0.7325	0.6750	0.7875	7.689	5	0.7050	0.9758
56	0.6500	0.8997	0.6500	0.5125	0.7250	14.979	4	0.6762	0.9360
80	0.7025	0.9723	0.7025	0.5500	0.8375	18.466	5	0.6762	0.9360
100	0.6700	0.9273	0.6700	0.6250	0.7250	6.272	5	0.6700	0.9273
0-SN	0.7432	1.0287	0.7432	0.6625	0.8286	8.369	5		

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)	0.98005	0.933	-0.2959	-0.1549
Bartlett's Test indicates equal variances (p = 0.21)	8.35414	16.8119		

Linear Interpolation (200 Resamples)

Point	%	SD	95% CL(Exp)	Skew
IC05	51.070			
IC10	>100			
IC15	>100			
IC20	>100			
IC25	>100			
IC40	>100			
IC50	>100			

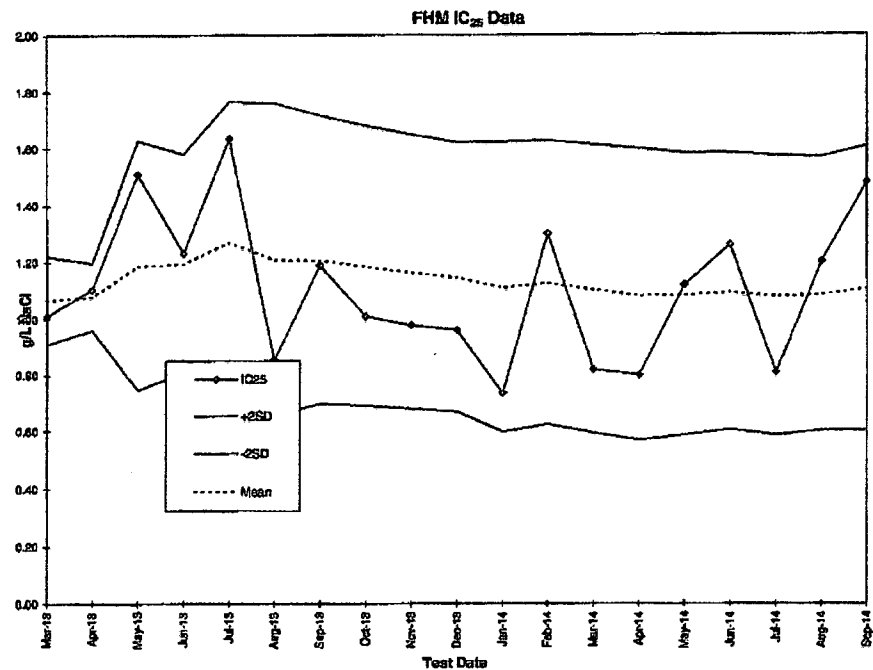


APPENDIX D
QUALITY ASSURANCE CHARTS

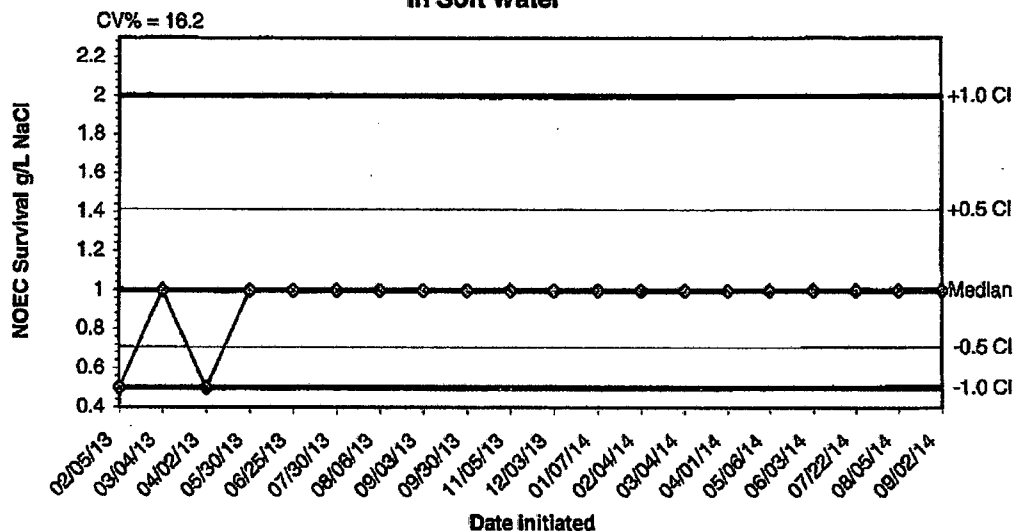
9/22/2014

Test	Date	IC25	+2SD	-2SD	MEAN
1	Feb-13	1.12	#DIV/0!	#DIV/0!	1.12
2	Mar-13	1.01	1.22	0.91	1.07
3	Apr-13	1.10	1.20	0.96	1.08
4	May-13	1.51	1.63	0.74	1.19
5	Jun-13	1.23	1.58	0.81	1.19
6	Jul-13	1.64	1.77	0.77	1.27
7	Aug-13	0.86	1.76	0.66	1.21
8	Sep-13	1.19	1.72	0.70	1.21
9	Oct-13	1.01	1.68	0.69	1.18
10	Nov-13	0.98	1.65	0.68	1.16
11	Dec-13	0.96	1.62	0.67	1.15
12	Jan-14	0.73	1.62	0.60	1.11
13	Feb-14	1.30	1.63	0.62	1.13
14	Mar-14	0.82	1.61	0.59	1.10
15	Apr-14	0.80	1.60	0.57	1.08
16	May-14	1.12	1.58	0.59	1.09
17	Jun-14	1.26	1.59	0.61	1.10
18	Jul-14	0.81	1.57	0.59	1.08
19	Aug-14	1.20	1.57	0.60	1.09
20	Sep-14	1.48	1.61	0.60	1.11

sd 0.25
 cv 23%

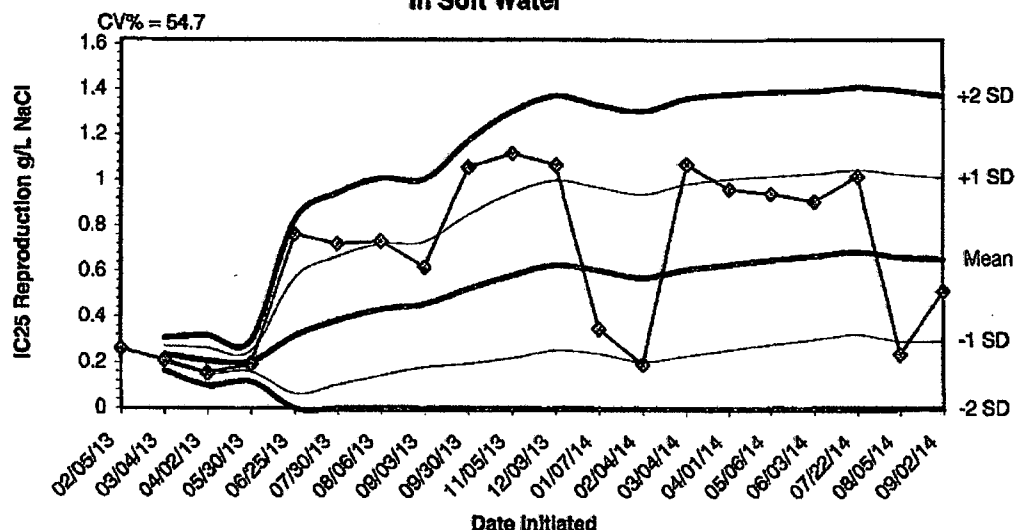


**2014 Chronic Reference Toxicant Test Results for Ceriodaphnia dubia
In Soft Water**



Dates	Values	Median	-0.5 CI	-1.0 CI	+0.5 CI	+1.0 CI
02/05/13	0.5000	1.0000	0.7071	0.5000	1.4142	2.0000
03/04/13	1.0000	1.0000	0.7071	0.5000	1.4142	2.0000
04/02/13	0.5000	1.0000	0.7071	0.5000	1.4142	2.0000
05/30/13	1.0000	1.0000	0.7071	0.5000	1.4142	2.0000
06/25/13	1.0000	1.0000	0.7071	0.5000	1.4142	2.0000
07/30/13	1.0000	1.0000	0.7071	0.5000	1.4142	2.0000
08/06/13	1.0000	1.0000	0.7071	0.5000	1.4142	2.0000
09/03/13	1.0000	1.0000	0.7071	0.5000	1.4142	2.0000
09/30/13	1.0000	1.0000	0.7071	0.5000	1.4142	2.0000
11/05/13	1.0000	1.0000	0.7071	0.5000	1.4142	2.0000
12/03/13	1.0000	1.0000	0.7071	0.5000	1.4142	2.0000
01/07/14	1.0000	1.0000	0.7071	0.5000	1.4142	2.0000
02/04/14	1.0000	1.0000	0.7071	0.5000	1.4142	2.0000
03/04/14	1.0000	1.0000	0.7071	0.5000	1.4142	2.0000
04/01/14	1.0000	1.0000	0.7071	0.5000	1.4142	2.0000
05/06/14	1.0000	1.0000	0.7071	0.5000	1.4142	2.0000
06/03/14	1.0000	1.0000	0.7071	0.5000	1.4142	2.0000
07/22/14	1.0000	1.0000	0.7071	0.5000	1.4142	2.0000
08/05/14	1.0000	1.0000	0.7071	0.5000	1.4142	2.0000
09/02/14	1.0000	1.0000	0.7071	0.5000	1.4142	2.0000

2014 Chronic Reference Toxicant Test Results for Ceriodaphnia dubia
in Soft Water



Dates	Values	Mean	-1 SD	-2 SD	+1 SD	+2 SD
02/05/13	0.2615					
03/04/13	0.2108	0.2362	0.2003	0.1644	0.2720	0.3079
04/02/13	0.1528	0.2084	0.1541	0.0997	0.2627	0.3171
05/30/13	0.1943	0.2049	0.1600	0.1150	0.2498	0.2947
06/25/13	0.7643	0.3168	0.0636	0.0000	0.5699	0.8231
07/30/13	0.7212	0.3842	0.1039	0.0000	0.6644	0.9447
08/06/13	0.7333	0.4340	0.1462	0.0000	0.7219	1.0098
09/03/13	0.6178	0.4570	0.1827	0.0000	0.7313	1.0057
09/30/13	1.0600	0.5240	0.1981	0.0000	0.8500	1.1759
11/05/13	1.1200	0.5836	0.2231	0.0000	0.9441	1.3046
12/03/13	1.0700	0.6278	0.2557	0.0000	0.9999	1.3721
01/07/14	0.3490	0.6046	0.2408	0.0000	0.9684	1.3322
02/04/14	0.1943	0.5730	0.2066	0.0000	0.9395	1.3059
03/04/14	1.0727	0.6087	0.2322	0.0000	0.9853	1.3618
04/01/14	0.9620	0.6323	0.2581	0.0000	1.0064	1.3805
05/06/14	0.9423	0.6517	0.2820	0.0000	1.0213	1.3910
06/03/14	0.9083	0.6667	0.3034	0.0000	1.0300	1.3933
07/22/14	1.0190	0.6863	0.3242	0.0000	1.0484	1.4105
08/05/14	0.2394	0.6628	0.2963	0.0000	1.0293	1.3959
09/02/14	0.5141	0.6554	0.2971	0.0000	1.0137	1.3720

APPENDIX E
AGENCY FORMS

**SUMMARY REPORTING FORMS
CHRONIC BIOMONITORING**

Ceriodaphnia dubia Survival and Reproduction

Permittee: City of Magnolia

NPDES No.: AR0043613/ AFIN 14-00059

	Time	Date	Time	Date
Composite 1 Collected From	0700	9/7/14 To	0700	9/8/14
Composite 2 Collected From	0700	9/9/14 To	0700	9/10/14
Composite 3 Collected From	0700	9/11/14 To	0700	9/12/14
Test initiated:	1440 am/pm		9/9/14	date
Test terminated:	1315 am/pm		9/17/14	date
Dilution water used:	Receiving		Reconstituted	

PERCENT SURVIVAL

Time of Reading	Percent Effluent					
	0	32.0	42.0	56.0	80.0	100.0
24h	100.0	100.0	100.0	100.0	100.0	100.0
48h	100.0	100.0	100.0	80.0	100.0	90.0
End of test	90.0	90.0	80.0	80.0	100.0	90.0

NUMBER OF YOUNG PRODUCED PER FEMALE @ END OF TEST

Rep	0	32.0	42.0	56.0	80.0	100.0
A	18	22	29	20	24	21
B	19	26	23	D	24	27
C	D	28	31	34	30	29
D	24	D19	29	32	28	24
E	25	23	D3	D	13	29
F	30	34	D31	34	26	31
G	22	34	25	28	33	26
H	29	22	23	25	19	22
I	20	13	32	31	30	28
J	21	D	31	25	25	D
Surv. Mean	23.1	25.3	27.9	28.6	25.2	26.3
Total Mean	20.8	22.1	25.7	22.9	25.2	23.7
CV%*	18.41	27.50	13.21	17.51	23.12	12.88

*coefficient of variation = standard deviation x 100/mean. D=dead adult

PMSD = 46.0%

Ceriodaphnia dubia
Survival and Reproduction (cont)

1. Fisher's Exact Test:

Is the mean survival at the end of the test significantly different ($p=.05$) than the control survival for the % effluent corresponding to (lethality):

- | | | | |
|--|-----|---|----|
| a) LOW FLOW OR CRITICAL DILUTION (100.0%): | YES | X | NO |
| b) ½ LOW FLOW DILUTION (N/A %): | YES | | NO |

2. Dunnett's Procedure or Steel's Many-One Rank Test as appropriate:

Is the mean number of young produced per female significantly different ($p=.05$) than the control's number of young per female for the % effluent corresponding to (significant non-lethal effects):

- | | | | |
|--|-----|---|----|
| a) LOW FLOW OR CRITICAL DILUTION (100.0%): | YES | X | NO |
| b) ½ LOW FLOW DILUTION (N/A %): | YES | | NO |

3. If you answered NO to 1. a) and 2. a) enter (0) otherwise enter (1): 0

4. If you answered NO to 1. b) and 2. b) enter (0) otherwise enter (1): N/A

5. Enter response to item 3 on DMR Form, parameter #TEP3B.

6. Enter response to item 4 on DMR Form, parameter #TFP3B.

7. Enter percent effluent corresponding to each NOEC below and circle lowest number:

- | | |
|-----------------------|-----------------|
| a) NOEC survival: | 100.0% effluent |
| b) NOEC reproduction: | 100.0% effluent |
| c) LOEC survival: | N/A % effluent |
| d) LOEC reproduction: | N/A % effluent |

Biomonitoring Form
Chronic Toxicity Summary Form
Ceriodaphnia dubia
Chemical Parameters Chart

Permittee: City of Magnolia
NPDES No.: AR0043613/AFIN 14-00059
Contact: Russell Thomas
Analyst: Haughian, Callahan, Briggs

Sample No. 1 Collected: Date: 9/8/14 Time: 0700
Sample No. 2 Collected: Date: 9/10/14 Time: 0700
Sample No. 3 Collected: Date: 9/12/14 Time: 0700
Test Begin: Date: 9/9/14 Time: 1449
Test End: Date: 9/17/14 Time: 1315

Dilution: 0 Day:									Dilution: 56.0 Day:								
	1	2	3	4	5	6	7	Comments		1	2	3	4	5	6	7	Comments
Temp (C)	25.0	25.0	25.0	25.0	25.0	25.0	25.0		Temp (C)	25.0	25.0	25.0	25.0	25.0	25.0	25.0	
DO Initial	8.3	8.4	8.4	8.5	8.4	8.2	8.2		DO Initial	8.2	8.1	8.2	8.4	8.3	8.2	8.1	
DO Final	8.2	8.2	8.2	8.6	8.7	8.5	8.3		DO Final	8.2	8.2	8.2	8.2	8.3	8.3	8.1	
pH Initial	7.1	7.2	7.2	7.3	7.3	7.1	7.1		pH Initial	7.3	7.4	7.4	7.5	7.4	7.4	7.1	
pH Final	7.3	7.2	7.2	7.3	7.4	7.1	7.3		pH Final	7.3	7.4	7.5	7.3	7.7	7.3	7.5	
Alkalinity	36.0					28.0			Alkalinity								
Hardness	52.0					48.0			Hardness								
Conductivity	178.6	177.0	179.6	178.4	172.7	174.3	176.7		Conductivity	371.0	370.0	368.0	372.0	364.0	364.0	361.0	
Chlorine	<.01					<.01			Chlorine								
Dilution: 32.0 Day:									Dilution: 80.0 Day:								
	1	2	3	4	5	6	7	Comments		1	2	3	4	5	6	7	Comments
Temp (C)	25.0	25.0	25.0	25.0	25.0	25.0	25.0		Temp (C)	25.0	25.0	25.0	25.0	25.0	25.0	25.0	
DO Initial	8.2	8.3	8.3	8.4	8.3	8.2	8.1		DO Initial	8.2	8.1	8.2	8.4	8.3	8.2	8.1	
DO Final	8.2	8.2	8.2	8.4	8.5	8.4	8.2		DO Final	8.1	8.2	8.2	8.1	8.2	8.2	8.0	
pH Initial	7.3	7.3	7.3	7.4	7.3	7.3	7.1		pH Initial	7.4	7.4	7.5	7.6	7.5	7.4	7.2	
pH Final	7.2	7.2	7.3	7.2	7.7	7.2	7.3		pH Final	7.3	7.5	7.4	7.5	7.7	7.5	7.6	
Alkalinity									Alkalinity								
Hardness									Hardness								
Conductivity	290.0	293.0	293.0	295.0	282.0	288.0	276.0		Conductivity	451.0	453.0	450.0	456.0	448.0	442.0	441.0	
Chlorine									Chlorine								
Dilution: 42.0 Day:									Dilution: 100.0 Day:								
	1	2	3	4	5	6	7	Comments		1	2	3	4	5	6	7	Comments
Temp (C)	25.0	25.0	25.0	25.0	25.0	25.0	25.0		Temp (C)	25.0	25.0	25.0	25.0	25.0	25.0	25.0	
DO Initial	8.2	8.2	8.3	8.4	8.3	8.2	8.1		DO Initial	8.2	8.0	8.2	8.4	8.3	8.2	8.0	
DO Final	8.2	8.2	8.2	8.3	8.4	8.4	8.2		DO Final	8.1	8.1	8.2	8.0	8.0	8.2	7.9	
pH Initial	7.3	7.3	7.4	7.4	7.4	7.3	7.1		pH Initial	7.4	7.4	7.5	7.7	7.5	7.4	7.3	
pH Final	7.2	7.3	7.3	7.3	7.7	7.3	7.4		pH Final	7.4	7.6	7.5	7.6	7.8	7.6	7.7	
Alkalinity									Alkalinity	63.0	64.0		36.0				
Hardness									Hardness	56.0	56.0		56.0				
Conductivity	325.0	324.0	324.0	327.0	316.0	315.0	314.0		Conductivity	511.0	520.0	517.0	525.0	520.0	502.0	510.0	
Chlorine									Chlorine	<.01	<.01		<.01				

**SUMMARY REPORTING FORMS CHRONIC BIOMONITORING
FATHEAD MINNOW LARVAE GROWTH AND SURVIVAL
(*Pimephales promelas*)**

Permittee: City of Magnolia

NPDES No.: AR0043613/AFIN 14-00059

	Time	Date	To	Time	Date
Composite 1 Collected from:	0700	9/7/14		0700	9/8/14
Composite 2 Collected from:	0700	9/9/14		0700	9/10/14
Composite 3 Collected from:	0700	9/11/14		0700	9/12/14

Test initiated: 1405 am/pm 9/9/14 date
 Test terminated: 1130 am/pm 9/16/14 date
 Dilution water used: Receiving Reconstituted

DATA TABLE FOR SURVIVAL

Effluent Conc. %	Percent Survival in Replicate Chambers					Mean Percent Survival			CV%*
	A	B	C	D	E	24h	48h	7 days	
0	87.5	100.0	100.0	100.0	100.0	100.0	97.5	97.5	6.06
32.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	0.00
42.0	100.0	87.5	100.0	100.0	100.0	100.0	100.0	97.5	6.06
56.0	87.5	100.0	87.5	87.5	100.0	100.0	100.0	92.5	7.84
80.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	0.00
100.0	100.0	100.0	100.0	100.0	87.5	100.0	100.0	97.5	6.06

DATA TABLE FOR GROWTH

Effluent Conc. %	Average Dry Weight in milligrams in replicate chambers					Mean Dry Weight mg	CV*
	A	B	C	D	E		
0	0.725	0.725	0.725	0.775	0.663	0.723	5.53
32.0	0.625	0.613	0.675	0.763	0.713	0.678	9.17
42.0	0.675	0.675	0.738	0.788	0.788	0.733	7.69
56.0	+	0.650	0.513	0.713	0.725	0.650	14.98
80.0	0.550	0.725	0.838	0.588	0.813	0.703	18.47
100.0	0.625	0.700	0.663	0.725	0.638	0.670	6.27
0-SN	0.829	0.725	0.725	0.775	0.663	0.743	8.37

*coefficient of variation = standard deviation x 100/mean. +dish dropped. Fish lost

PMSD = 16.8%

FATHEAD MINNOW LARVAE GROWTH AND SURVIVAL (cont)
(Pimephales promelas)

1. Dunnett's Procedure or Steels Many-One Rank Test as appropriate:

Is the mean survival at 7 days significantly different ($p=.05$) than the control survival for the % effluent corresponding to:

- | | | | |
|---|-----|---|----|
| a) LOW FLOW OR CRITICAL DILUTION (100.0%) | YES | X | NO |
| b) 1/2 LOW FLOW DILUTION (N/A%) | YES | | NO |

2. Dunnett's Procedure (or appropriate test):

Is the mean dry weight (growth) at 7 days significantly different ($p=.05$) than the control's dry weight for the % effluent corresponding to (significant non-lethal effects):

- | | | | |
|---|-----|---|----|
| a) LOW FLOW OR CRITICAL DILUTION (100.0%) | YES | X | NO |
| b) 1/2 LOW FLOW DILUTION (N/A%) | YES | | NO |

3. If you answered NO to 1. a) and 2. a) enter (0) otherwise enter (1): 0

4. If you answered NO to 1. b) and 2. b) enter (0) otherwise enter (1): N/A

5. Enter response to item 3 on DMR Form, parameter #TEP6C.

6. Enter response to item 4 on DMR Form, parameter #TFP6C.

7. Enter percent effluent corresponding to each NOEC below and circle lowest number:

- | | |
|-------------------|------------------|
| a.) NOEC survival | 100.0% effluent. |
| b.) NOEC growth | 100.0% effluent. |
| c.) LOEC survival | N/A % effluent |
| d.) LOEC growth | N/A % effluent |

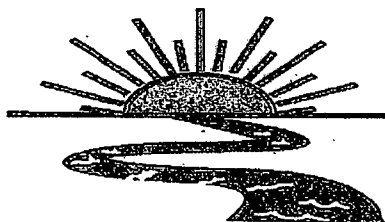
Biomonitoring Form
Chronic Toxicity Summary Form
Pimephales promelas
Chemical Parameters Chart

Permitter: City of Magnolia
NPDES No.: AR0043613/ AFIN 14-00059
Contact: Russell Thomas
Analyst: Briggs, Houghton, Callahan, Colman

Sample No. 1 Collected: Date: 9/8/14 Time: 0700
Sample No. 2 Collected: Date: 9/10/14 Time: 0700
Sample No. 3 Collected: Date: 9/12/14 Time: 0700
Test Begin: Date: 9/9/14 Time: 1405
Test Ends: Date: 9/16/14 Time: 1130

Dilution: 0 Day:									Dilution: 56.0 Day:								
	1	2	3	4	5	6	7	Comments		1	2	3	4	5	6	7	Comments
Temp (C)	25.0	25.3	25.3	23.8	25.1	25.1	25.2		Temp (C)	25.0	25.3	25.3	23.8	25.1	25.1	25.2	
DO Initial	6.7	7.1	7.5	7.3	6.1	6.5	7.0		DO Initial	7.1	6.9	7.6	6.8	5.4	5.7	6.9	
DO Final	8.2	8.2	8.2	8.6	8.7	8.5			DO Final	8.2	8.2	8.2	8.2	8.3	8.3		
pH Initial	6.7	7.0	7.1	6.9	6.8	6.7	6.9		pH Initial	7.0	7.1	7.4	7.1	6.8	6.7	7.3	
pH Final	7.3	7.2	7.2	7.3	7.4	7.1			pH Final	7.3	7.4	7.3	7.3	7.7	7.3		
Alkalinity	36.0					28.0			Alkalinity								
Hardness	52.0					48.0			Hardness								
Conductivity	178.6	177.0	179.6	178.4	172.7	174.3			Conductivity	371.0	370.0	368.0	372.0	364.0	364.0		
Chlorine	<.01					<.01			Chlorine								
Dilution: 32.0 Day:									Dilution: 80.0 Day:								
	1	2	3	4	5	6	7	Comments		1	2	3	4	5	6	7	Comments
Temp (C)	25.0	25.3	25.3	23.8	25.1	25.1	25.2		Temp (C)	25.0	25.3	25.3	23.8	25.1	25.1	25.2	
DO Initial	7.2	6.8	7.6	7.8	5.5	6.1	7.0		DO Initial	6.9	6.8	7.5	6.5	5.1	5.2	6.7	
DO Final	8.2	8.2	8.2	8.4	8.5	8.4			DO Final	8.1	8.2	8.2	8.1	8.2	8.2		
pH Initial	6.9	7.0	7.2	7.0	6.7	6.7	7.0		pH Initial	7.2	7.1	7.4	7.2	6.8	6.8	7.3	
pH Final	7.2	7.3	7.3	7.2	7.7	7.2			pH Final	7.3	7.5	7.4	7.5	7.7	7.5		
Alkalinity									Alkalinity								
Hardness									Hardness								
Conductivity	290.0	293.0	293.0	295.0	282.0	288.0			Conductivity	451.0	453.0	450.0	456.0	441.0	442.0		
Chlorine									Chlorine								
Dilution: 42.0 Day:									Dilution: 100.0 Day:								
	1	2	3	4	5	6	7	Comments		1	2	3	4	5	6	7	Comments
Temp (C)	25.0	25.3	25.3	23.8	25.1	25.1	25.2		Temp (C)	25.0	25.3	25.3	23.8	25.1	25.1	25.2	
DO Initial	7.1	6.8	7.6	6.7	6.2	6.9	6.9		DO Initial	7.3	6.9	7.5	6.4	4.4	5.4	6.9	
DO Final	8.2	8.2	8.2	8.3	8.4	8.4			DO Final	8.1	8.1	8.2	8.0	8.0	8.2		
pH Initial	6.9	7.0	7.2	7.0	6.7	6.7	7.2		pH Initial	7.3	7.2	7.5	7.3	6.9	6.9	7.4	
pH Final	7.2	7.3	7.3	7.3	7.7	7.3			pH Final	7.4	7.6	7.5	7.6	7.8	7.6		
Alkalinity									Alkalinity	68.0	64.0		36.0				
Hardness									Hardness	56.0	56.0		56.0				
Conductivity	326.0	324.0	324.0	327.0	316.0	315.0			Conductivity	511.0	520.0	517.0	525.0	520.0	502.0		
Chlorine									Chlorine	<.01	<.01		<.01				

APPENDIX F
REPORT QUALITY ASSURANCE FORM



Bio-Analytical Laboratories

3240 Spurgin Road
Post Office Box 527
Doyline, LA 71023

(318) 745-2772
1-800-269-1246
Fax: (318) 745-2773

REPORT QUALITY ASSURANCE FORM

Client: Magnolia wastewater

Project#: X5532

Chain of Custody Documents Checked by: AA 9/22/14
Technician/Date

Raw Data Documents Checked by: AA 9/22/14
Technician/Date

Statistical Analysis Package Checked by: EGG 9/22/14
Quality Manager/Date

Quality Control Data Checked by: EGG 9/17/14
Quality Manager/Date

Report Checked by: EGG 9/24/14
Quality Manager/Date

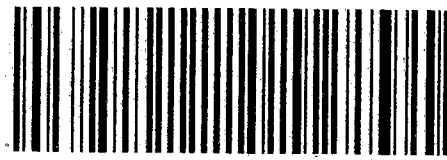
I certify that this document was prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. The information contained in this document, to the best of my knowledge, is true, accurate and complete.

Ernie P. Buapp, BS
Quality Manager

9/24/14
Date

No part of this work may be altered in any form or by any means without written permission from Bio-Analytical Laboratories.

City of Magnolia Big Creek WWTP
P.O. Box 666
Magnolia, AR 71754-0666
Permit # AR0043613
AFIN # 14-00059



7013 0600 0002 2522 3007

		U.S. POSTAGE PAID MAGNOLIA, AR 71753 SEP 30, 14 AMOUNT
		\$8.66 00092238-21
1000	72118	

**RETURN RECEIPT
REQUESTED**

NPDES Enforcement Section
Water Division
ADEQ
5301 North Shore Dr.
North Little Rock, AR 72118-5317

