

Environmental Services Company, Inc.

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 13715 West Markham
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 Tel. (501)221-2565 Fax (501)221-1341

Northwest Arkansas Branch
 1107 Century Avenue
 Springdale, AR 72762
 Tel. (479)750-1170 Fax (479)750-1172

Control Number: 1304010432	Composite Date: 04/16/13 - 04/16/13	Collected By: ANNETT STRICKLA
Customer Name : CAMDEN WATER & WASTEWATER UTILTY	Sample Time : 1000-1500	Delivery By : TMO
Customer Number : 1550	Sample Type : COMP WATER	Work Order :
Report Date : 05/02/13	Sample From : FINAL EFFLUENT	Purchase Order :

<u>Laboratory Analysis</u>							<u>Quality Assurance</u>		
Analysis							Precision	Accuracy	
<u>Date</u>	<u>Time</u>	<u>By</u>	<u>Parameter</u>	<u>Result</u>	<u>Notes</u>	<u>Quantity</u>	<u>Method</u>	<u>% RPD</u>	<u>% Recovery</u>
05/02	0800	NTR	Phosphorous, Total (as P)	0.30 mg/L			EPA 365.3	0.83	100.4 *
05/01	0900	NTR	Nitrate + Nitrite	0.81 mg/L			SM 18th 4500-NO3 E	0.60	99.6 *

* QA data shown is from a different sample or standard on the same date.

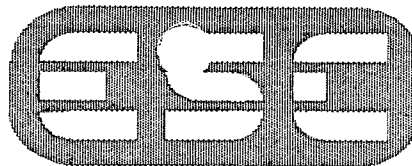
All equipment used is checked and/or calibrated daily. All NPDES testing is conducted in accordance with 40 CFR Part 136. A minimum of 10% spiked and duplicate samples is run on each parameter where applicable for Quality Assurance purposes. Quality Assurance Plan on file with Arkansas Department of Environmental Quality. Analysis time indicates the time of the start of the analytical batch in which the specific sample was included.

Signature
 Environmental Services Co., Inc.

Environmental Services Company, Inc.

Corporate Office

13715 West Markham P.O. Box 55146
 Little Rock, AR 72211 Little Rock, AR 72215
 website: www.esclabs.com



Environmental Services Company, Inc.

Northwest Branch

1107 Century
 Springdale, AR 72764

Phone: 501-221-2565 Fax: 501-221-1341

CHAIN OF CUSTODY

Phone 479-750-1170 Fax: 479-750-1172

Client Information				Project Information						Requested Parameters				
Company Name: Camden Water Utility				Permit/Project #:						Total P(25), NO3+NO2(91)				
Address: P.O. Drawer J				Purchase Order #:										
Camden, AR 71711				Work Order #:										
Telephone: 870-836-7331				Sampler Name(s): <u>Annette Strickland</u>										
FAX: 870-836-5190				and Signature(s): <u>Annette Strickland</u>										
Contact:				ESC Client Number: 1550 (Monthly)										
Sample Identification		Sample Collection				Sample Containers								
Identification	ESC Control #	Date	Time	Type	Matrix	Type	Volume	Preservative	#					
Final Effluent	1304010432	4-16-13	1000 to 1500	Comp	Water	Plastic	1 Liter	H2SO4	1	X				
Relinquished By: (Signature and Printed Name)		Date	Time	Received By: (Signature and Printed Name)		Date	Time	Custody Seals:						
<u>Annette Strickland Annette Strickland</u>		4-17-13	3:02	<u>Timothy O'Neal Timothy O'Neal</u>		4-17-13	1902	Used? <input checked="" type="checkbox"/> Intact? <input type="checkbox"/>						
Relinquished By: (Signature and Printed Name)		Date	Time	Received By: (Signature and Printed Name)		Date	Time	Turnaround:						
								Regular <input checked="" type="checkbox"/> Special <input type="checkbox"/>						
Relinquished By: (Signature and Printed Name)		Date	Time	Received for Lab By: (Signature and Printed Name)		Date	Time	Were samples properly preserved:						
<u>Timothy O'Neal Timothy O'Neal</u>		4-17-13	1925	<u>Timothy O'Neal Timothy O'Neal</u>		4-17-13	1925	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>						
Cool all samples to ≤ 6 degrees C with ice.				Flow Data		Field Test		Time	Analyst	Result	Result	Units		
Comments:				Analyst:		pH:								
				Time:										
				Reading:										
				Units:										
				Chlorinated? Y N		Fecal Start:		This Document is Page__ of__						

Sanitary Sewer Overflow (SSO) Monthly Report

Facility Name: CAMDEN WATER UTILITIES NPDES Permit No.: AR0022365 Monitoring Period (Month/Year): 04/2013

No Sanitary Sewer Overflows This Monitoring Period

Summary Report Code Descriptions				
Cause(s) of SSO		SSO Impact	Action(s) Taken	Ultimate Discharge Location
CO-Construction	D-Debris	NEAH-No Evidence Adverse Health/ Environmental Impact		CR-Creek/Stream/River (specify)
E-Equipment Failure	G-Grease	OEHC-Observed or Evidence of Human Contact	EC-Environmental Cleanup	DI-Ditch
HC-Hydro Clean	LF-Line Failure	EFK-Evidence of Fish Kill	HC-Hydro Cleaned	DR-Drop Inlet
R-Rainfall	RG-Roots / Grease		HR-Hand Rodded	GR-Ground Surface
RO-Roots	V-Vandalism		EN-Referred to Engineering	PA-Paved Area
			PN-Public Notification	CB-Contained in Building

Location	Manhole #	Start Date of SSO	End Date of SSO	Estimated Volume (in gallons)	Cause of SSO	Environmental Impact	Action (s) Taken to Address SSO	Discharge Location
228 Pope	N/A	04/29/2013	04/29/2013	200 gals	G	NEAH	HC	GR
527 Agee	N/A	04/30/2013	04/30/2013	100 gals	RO	NEAH	HR	GR

Thomas K Bellard

05/15/2013

Signature of Cognizant or Ranking Official

Date

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Bio-Analytical Laboratories (BAL)
ADEQ#88-0630
Project X5050

Bio-Analytical Laboratories' Executive Summary

Permittee: Camden Water Utilities
P.O. Drawer J
Camden, AR 71711

Project #: X5050

Outfall: Outfall 002 (treated municipal wastewater)

Permit #: AR0022365

Contact: David Richardson

Test Dates: March 13 - 27, 2013

Test Type: 48-hour acute definitive toxicity test using *Daphnia pulex* (EPA 2021.0)
48-hour acute definitive toxicity test using *Pimephales promelas* (EPA 2000.0)

Results:

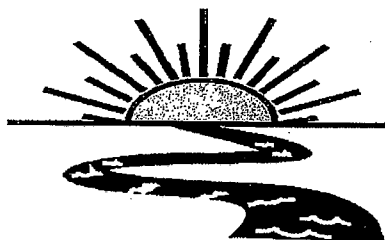
For *Daphnia pulex*:

1. If the NOEC for survival is less than the critical dilution (28%), enter a "1"; otherwise, enter a "0" for Parameter No. TEM3D- 0.
2. Report the NOEC for survival, Parameter TOM3D - 37%.
3. Report the highest (critical dilution or control) Coefficient of Variation, Parameter TQM3D - 14.08%.

For *Pimephales promelas* (Fathead Minnow):

1. If the NOEC for survival is less than the critical dilution (28%), enter a "1"; otherwise, enter a "0" for Parameter No. TEM6C- 0.
2. Report the NOEC for survival, Parameter TOM6C - 37%.
3. Report the highest (critical dilution or control) Coefficient of Variation, Parameter TQM6C - 0.00%.

This report contains a total of 42 pages, including this page. The results pertain only to the samples listed in the chain of custody documents in Appendix A. The information contained within meets the requirements set forth by ADEQ. The chemical results in this report are for monitoring purposes only and should not be included on discharge monitoring reports.



Bio-Analytical Laboratories

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**THE RESULTS OF TWO 48-HOUR ACUTE
DEFINITIVE TOXICITY TESTS
FOR OUTFALL 002
AT**

**CAMDEN WATER UTILITIES
Camden, Arkansas**

NPDES #AR0022365

EPA Methods 2000.0 and 2021.0

Project X5050

**Test Dates: March 13 - 27, 2013
Report Date: April 17, 2013**

Prepared for:
Mr. David Richardson
Camden Water Utilities
P.O. Drawer J
Camden, AR 71711

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

BAL
ADEQ #88-0630
Project X5050

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BAL
ADEQ #88-0630
Project X5050

1.0 Introduction

Bio-Analytical Laboratories (BAL), Doyline, Louisiana conducted two 48-hour acute definitive toxicity tests for Outfall 002 at Camden Water Utilities, Camden, Arkansas. The test organisms used were the cladoceran, *Daphnia pulex*, and the fathead minnow, *Pimephales promelas*. The purpose of this study is to determine if an appropriately dilute effluent sample adversely affects the survival of the test organism. Toxicity is defined as a statistically significant difference at the 95 percent confidence level between the survival of the test organisms 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 of the test organisms in the control. The test endpoints are the No-Observed-Effect-Concentration (NOEC), which is defined as the highest effluent concentration that is not statistically different from the control, and the 48-hour LC₅₀, the concentration in which 50 percent of the test organisms died.

Both tests were initiated on March 13, 2013; however, the receiving water, used as the dilution water and the control, invalidated the *Daphnia pulex* test because it failed to meet the test acceptance requirements. The *Daphnia* test was initiated again on March 27, 2013 using reconstituted lab water as the dilution water and the control. This report summarizes the valid tests. All valid and invalid test data can be found in the appendices.

2.0 Methods and Materials

2.1 Test Methods

All methods followed were according to the latest edition of "Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms" (EPA-821-R-02-012).

2.2 Test Organisms

The *Daphnia pulex* test organisms were raised in-house and were less than 24 hours old at test initiation. The fathead minnow test organisms were also raised in-house and were approximately eight days old at test initiation. The test organisms were acclimated to test temperature and dilution water hardness prior to test initiation. Forty-eight hour reference toxicant tests were conducted monthly in order to document organism sensitivity and demonstration of capability.

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ADEQ #88-0630
Project X5050

2.3 Dilution Water

Grab samples of receiving water, collected upstream from Outfall 002, was used as the dilution water and the control for the minnow test. Soft reconstituted water made per EPA guidelines was used as the dilution water and the control for the *Daphnia pulex* test.

2.4 Test Concentrations

The test concentrations used in the acute toxicity tests were 37.0, 28.0, 21.0, 16.0 and 12.0 percent effluent and a control. The critical dilution was defined as 28 percent effluent. The tests were conducted using five replicates of eight animals each for a total of 40 animals per concentration.

2.5 Sample Collection

Two 24-hour composite samples of Outfall 002 were collected by Camden Water Utilities personnel on March 12 and 13, 2013, for the fathead minnow test, and on March 26 and 27, 2013 for the daphnid test. One grab sample of receiving water, used in the fathead minnow test, was collected on March 13, 2013. Upon completion of collection, the sample was chilled to 4^o Celsius and delivered to Bio-Analytical Laboratories by BAL personnel.

2.6 Sample Preparation

Upon arrival, the sample was logged in, given an identification number and refrigerated unless needed. Prior to use, the sample was warmed to 25±1^o Celsius. The receiving water was passed through a 60 micron plankton net in order to remove any wild organisms that might interfere with the test. The total residual chlorine level was measured with a Capital Controls^R amperometric titrator and recorded if present. The total ammonia level was measured using a HACH^R test strip. Dissolved oxygen, pH and conductivity measurements were taken on the control and each test concentration at test initiation, at each renewal and at test termination. Alkalinity and hardness levels were measured on the control and the highest effluent concentration.

2.7 Monitoring of the Tests

The tests were run in a Precision^R dual controlled illuminated incubator at a temperature of 25±1^o Celsius. An AEMC^R data logger was used to monitor diurnal temperature throughout the testing period. Light cycle and intensity were recorded twice a month.

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ADEQ #88-0630
Project X4961

2.8 Data Analysis

The NOEC and LC₅₀ values values were obtained by approved EPA methods of analysis, using the ToxCalc statistical program.

3.0 Results and Discussion

The results of the tests can be found in Table 1. Significant differences in survival were not noted in either test. The NOEC value for both tests was 37 percent effluent (p=.05).

Table 1: Results of the 48-hour Acute Definitive Toxicity Test

Percent Effluent	Percent Survival	
	<i>Daphnia pulex</i>	Fathead minnow
Test Organism	<i>Daphnia pulex</i>	Fathead minnow
Control	92.5	100.0
12.0	90.0	100.0
16.0	80.0	97.5
21.0	85.0	100.0
28.0	75.0	100.0
37.0	80.0	100.0

The 48-hour reference toxicant test results indicate that the test organisms were within the respective sensitivity range. The graphs of the acute reference toxicant tests can be found in Appendix D- Quality Assurance Charts.

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ADEQ #88-0630
Project X5050

4.0 Conclusions

The two composite samples of Outfall 002 collected from Camden Water Utilities, Camden, Arkansas, on March 12 and 13, 2013, were not found to be lethally toxic to the fathead minnow test organisms in the 28 percent critical dilution after 48 hours of exposure ($p=.05$). The composite samples collected on March 26 and 27, 2013, were not found to be lethally toxic to the *Daphnia pulex* test organisms in the 28 percent critical dilution after 48 hours of exposure ($p=.05$).

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ADEQ #88-0630
Project X5050

5.0 Reference

EPA, 2002. Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, Fifth Edition. EPA-821-R-02-012, Office of Water.

APPENDIX A
CHAIN-OF-CUSTODY DOCUMENTS



Bio-Analytical Laboratories

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NE/LAP/LELAP 01975, ADEQ 88-0630, TCEQ T104704278

Laboratory Use Only:

Company: Camden Water Utilities Address: P.O. Box J, Camden, AR 71711 Permit #: AR0022365/ AFIN 52-00073 Purchase Order: Sampler's Signature/Printed Name/Affiliation: Mike Langley/Camden Water		Phone: (870) 836-4329 Fax: (870) 836-5190		Project Number: 15050 Temp upon arrival: 0.7 °C Thermometer #: 89 Tech: AS Date: 3/13/13 Lab Control Number: C7076 C7077 Preservative: (below)	
Analysis: Fecal Coliform Acute Ceriodaphnia Acute Mysis Acute Daphnia species Acute minnow (fresh/marine) Chronic minnow Chronic Ceriodaphnia		Received by/Affiliation: J. Biggs Received by/Affiliation: C. W. Haughton		Date: 3-13-13 Date: 3-13-13 Date: 3/13/13	
Relinquished by/Affiliation: Mike Langley		Time: 10:14		Time: 1010	
Relinquished by/Affiliation: J. Biggs		Time: 1320		Time: 1320	
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"/> Other		Tracking # _____		Comments: _____	



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

Laboratory Use Only:

Company: Camden Water Utilities		Phone: (870) 836-4329		Analysis:					Project Number: X5050 Temp. upon arrival: Temperature upon arrival: 0.7 °C Thermometer #: 24 Tech: PH Date: 3/13/13 Lab Control Number: C7078 Preservative: (below) ICE		
Address: P.O. Box J, Camden, AR 71711		Fax: (870) 836-5190		Chronic Ceriodaphnia	Chronic minnow	Acute minnow (fresh/marine)	Acute Daphnia species	Acute Mysid		Acute Ceriodaphnia	Fecal Coliform
Permit #: AR0022365/ AFIN 52-00073		Purchase Order:									
Sampler's Signature/Printed Name/Affiliation: <i>Mike Langley / Mike Langley / Camden Water</i>											
Date Start Date End	Time Start Time End	C	G	# and type of container	Sample Identification						
3-12-13 3-13-13	8:00 A 6:00 A	X		2 half gallons	002			X	X		
Relinquished by/Affiliation: <i>Mike Langley</i>				Date: 3-13-13	Time: 10:10	Received by/Affiliation: <i>JRj</i>				Date: 3-13-13	Time: 1010
Relinquished by/Affiliation:				Date:	Time:	Received by/Affiliation:				Date:	Time:
Relinquished by/Affiliation: <i>JRj</i>				Date: 3-13-13	Time: 1320	Received by/Affiliation: <i>Clementine Houghton</i>				Date: 3/13/13	Time: 1320
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:											



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Laboratory Use Only:

Company: Camden Water Utilities		Phone: (870) 836-4329		Analysis:				Project Number: X5050 Temp. upon arrival: Temperature upon arrival: 0.9°C Thermometer #: 89 Tech: AH Date: 3/27/13 Lab Control Number: Preservative: (below)					
Address: P.O. Box J, Camden, AR 71711		Fax: (870) 836-5190		Chronic Ceriodaphnia Chronic minnow Acute minnow(fresh/marine) Acute Daphnia species Acute Mysid Acute Ceriodaphnia Fecal Coliform	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
Permit #: AR0022365/ AFIN 52-00073		Purchase Order:							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Sampler's Signature/Printed Name/Affiliation:												<input type="checkbox"/>	<input type="checkbox"/>
Date Start Date End 3-25-3-26	Time Start Time End 8:00 AM-6 AM	C X	G					# and type of container 2 half gallons					

Relinquished by/Affiliation: Annette Strickland	Date: 3-27-13	Time: 9:35	Received by/Affiliation: Crew S. Beupp	Date: 3/27/13	Time: 0935
Relinquished by/Affiliation:	Date:	Time:	Received by/Affiliation:	Date:	Time:
Relinquished by/Affiliation: Crew S. Beupp	Date: 3/27/13	Time: 1220	Received by/Affiliation: Aimee Haughton	Date: 3/27/13	Time: 1220

Method of Shipment: Lab ___ Bus ___ Fed Ex ___ DHL ___ UPS ___ Client ___ Other ___ Tracking # ___
Comments:



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

Laboratory Use Only:

Company: Camden Water Utilities		Phone: (870) 836-4329		Analysis:				Project Number: X5050 Temp. upon arrival: 0.9°C Thermometer #: 29 Tech: AH Date: 3/27/13 Lab Control Number: Preservative: (below)						
Address: P.O. Box J, Camden, AR 71711		Fax: (870) 836-5190		Chronic Ceriodaphnia Chronic minnow Acute minnow (fresh/marine) Acute Daphnia species Acute Mysid Acute Ceriodaphnia Fecal Coliform	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>							
Permit #: AR0022365/ AFIN 52-00073		Purchase Order:							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
Sampler's Signature/Printed Name/Affiliation:														
Date Start Date End 3-26-3-27	Time Start Time End 8:00 AM - 6 AM	C X	G					# and type of container 2 half gallons				Sample Identification 002	<input type="checkbox"/>	<input type="checkbox"/>
Relinquished by/Affiliation: Annette Strickland				Date: 3-27-13	Time: 9:35	Received by/Affiliation: Curt J. Baupp		Date: 3/27/13	Time: 0935					
Relinquished by/Affiliation:				Date:	Time:	Received by/Affiliation:		Date:	Time:					
Relinquished by/Affiliation: Curt J. Baupp				Date: 3/27/13	Time: 1220	Received by/Affiliation: Curt J. Baupp		Date: 3/27/13	Time: 1220					
Method of Shipment: ___ Lab ___ Bus ___ Fed Ex ___ DHL ___ UPS ___ Client ___ Other ___ Tracking # _____														
Comments:														

APPENDIX B
RAW DATA SHEETS

BIO-ANALYTICAL LABORATORIES
ACUTE TOXICITY TEST WATER QUALITY DATA

Project# X 5050

Client: CMDN/Camden Water Utilities

Address: P.O. Box J, Camden, AR 71711

NPDES# AR0022365 Outfall 002

Technicians: EGB/AH/LGZ/RC

Test initiated: Date 3/27/13 Time 1435

Test terminated: Date 3/29/13 Time 1410

Dissolved Oxygen Meter: Model # YSI 55D Serial #06E2089 AU

pH Meter: Model #Orion 230A+ Serial #015253

Conductivity Meter: Model # Control Co. Serial #80277924

Amperometric Titrator: Model #Fischer-Porter Serial #92W445766

Sample Information

Sample ID#	Initial D.O. (mg/L and %)	Aerate? Minutes/ Final D.O(mg/L & %)	Total Residual Chlorine (mg/L)	Dechlorinated? Amount?	Ammonia (NH3) mg/L	Salinity	Hardness	Alkalinity	Tech
							37%	37%	
C7163	10.5/ 125.4%	Y/20/ 8.4/97.4%	<0.01	NO	0.25	N/A	44.0	20.0	RC
C7164	9.9/ 115.7%	Y/20/ 8.7/99.1%	<0.01	↓	0.25	↓	44.0	20.0	RC

Dilution Water Information

Dilution Water	ID#	Initial D.O (mg/L & %)	Aerate? Minutes/D.O (mg/L & %)	Total Residual Chlorine (mg/L)	Ammonia (NH3) mg/L	pH	Hardness	Alkalinity	Tech
Soft H ₂ O	3469	NA	NA	NA	NA	7.7	52.0	32.0	ahg
↓	↓	↓	↓	↓	↓				

Test Species Information

Test Species Info.	Species: ID#:	Species: ID#:	Species: ID#:	Species: ID#:
Age	Douley BAU03-F4 24 hrs			
Test Container Size	30ml			
Test volume	25ml			
Feeding: Type Amount	X feed 2 hrs prior to test initiation VET: Algae			
Aeration? Amount	NA			
Condition of survivors	Fair AH 3/29/13			

Comments:

BIO-ANALYTICAL LABORATORIES ACUTE TOXICITY TEST SURVIVAL AND WATER QUALITY DATA

Project# X5050

Test started: Date 3/27/13 Time 1435

Client Camden

Test ended: Date 3/29/13 Time 1410

Sample Description 002

Test Species D. pulex ID# BAUD3-F4

Technician: Ohour RC 24hour RC 48hour AH 72hour / 96hour /
 Time: Ohour 1435 24hour 1410 48hour 1440 72hour / 96hour /
 Temperature (°C): Ohour 24.3 24hour 24.3 48hour 24 72hour / 96hour /

Test Dilution	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity				
			0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
0	A	NA	8	8	7			8.2	8.3	8.6			7.7	7.8	7.0			173	235	218		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	7																	
	E		8	8	7																	
12	A		8	8	6			8.2	8.3	8.5			7.7	7.8	7.5			181	237	214		
	B		8	8	8																	
	C		8	8	7																	
	D		8	8	8																	
	E		8	8	7																	
Chemistry Tech prerenewal/postrenewal								RC	RC	AH			RC	RC	AH			RC	RC	AH		

ACUTE2 020809 Rev.

BIO-ANALYTICAL LABORATORIES ACUTE TOXICITY TEST SURVIVAL AND WATER QUALITY DATA

Project# X5050

Test started: Date 3/27/13 Time 1435

Client Camden

Test ended: Date 3/29/13 Time 1410

Sample Description 002

Test Species D. pulex ID# BAU D3-F4

Technician: Ohour RC 24hour RC 48hour AH 72hour / 96hour /
 Time: Ohour 1435 24hour 1410 48hour 1410 72hour / 96hour /
 Temperature (°C): Ohour 24.3 24hour 24.3 48hour 24 72hour / 96hour /

Test Dilution	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity				
			0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
16	A	NA	8	8	7			8.2	8.3/8.3	8.5			7.7	7.7/7.3	7.6			181	183/182.7	215		
	B		8	7	6																	
	C		8	8	8																	
	D		8	8	7																	
	E		8	8	4																	
21	A		8	6	6			8.2	8.3/8.4	8.5			7.7	7.7/7.4	7.5			181.9	183/182.5	215		
	B		8	8	8																	
	C		8	8	8																	
	D		8	5	5																	
	E		8	7	7																	
Chemistry Tech prerenewal/postrenewal								RC	RC/AH				RC	RC/AH				RC	RC/AH			

ACUTE2 020809 Rev.

BIO-ANALYTICAL LABORATORIES ACUTE TOXICITY TEST SURVIVAL AND WATER QUALITY DATA

Project# X5050

Test started: Date 3/27/13 Time 1435

Client Camden

Test ended: Date 3/29/13 Time 1410

Sample Description 002

Test Species D. pulex ID# BAUD3-F4

Technician: Ohour RC 24hour RC 48hour AH 72hour / 96hour /
 Time: Ohour 1435 24hour 1410 48hour 1410 72hour / 96hour /
 Temperature (°C): Ohour 24.3 24hour 24.3 48hour 24 72hour / 96hour /

Test Dilution	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity				
			0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
28	A	NA	8	8	6			8.2	8.2	8.5			7.7	7.7	7.5			183	183	218		
	B		8	7	7																	
	C		8	8	7																	
	D		8	8	5																	
	E		8	8	5																	
37	A		8	8	6			8.2	8.2	8.5			7.6	7.6	7.4			186	186	224		
	B		8	8	8																	
	C		8	8	6																	
	D		8	7	7																	
	E		8	8	5																	
Chemistry Tech prerenewal/postrenewal							RC	RC	AH			RC	RC	AH			RC	RC	AH			

ACUTE2 020809 Rev.

BIO-ANALYTICAL LABORATORIES
ACUTE TOXICITY TEST WATER QUALITY DATA

Project# X5050

Client: CMDN/Camden Water Utilities

Address: P.O. Box J, Camden, AR 71711

NPDES# AR0022365 Outfall 002

Technicians: EGB/AH/LGZ/RC

Test initiated: Date 3/13/13 Time 1530

Test terminated: Date 3/15/13 Time 1405

Dissolved Oxygen Meter: Model # YSI 55D Serial #06E2089 AU

pH Meter: Model #Orion 230A+ Serial #015253

Conductivity Meter: Model # Control Co. Serial #80277924

Amperometric Titrator: Model #Fischer-Porter Serial #92W445766

Sample Information

Sample ID#	Initial D.O. (mg/L and %)	Aerate? Minutes/Final D.O.(mg/L & %)	Total Residual Chlorine (mg/L)	Dechlorinated? Amount?	Ammonia (NH3) mg/L	Salinity	Hardness	Alkalinity	Tech
C7076	9.8/170%	Y120/85 98.6%	40.01	NO	0.25	N/A	440	8.0	AH
C7078	9.3/115.6%	Y20 8.6/98.9%	40.01	↓	0.25	↓	56.0	12.0	AH

Dilution Water Information

Dilution Water	ID#	Initial D.O (mg/L & %)	Aerate? Minutes/D.O (mg/L & %)	Total Residual Chlorine (mg/L)	Ammonia (NH3) mg/L	pH	Hardness	Alkalinity	Tech
Rec. H2O	C7077	9.8/177.6%	Y18.5/1 98.5%	40.01	0.25	7.4	440	200	AH
↓	↓	9.9/119.5%	Y20 8.5/98.9%	↓	↓				AH

Test Species Information

Test Species Info.	Species: <u>Daphnia</u> ID#: <u>BA10-E2</u>	Species: <u>Pomacea</u> ID#: <u>BA13513</u>	Species: ID#:	Species: ID#:
Age	<u>424h</u>	<u>8 days</u>		
Test Container Size	<u>30ml</u>	<u>250ml</u>		
Test volume	<u>25ml</u>	<u>200ml</u>		
Feeding: Type	<u>YCT: Algae</u>	<u>Artemia</u>		
Amount	<u>Feed 2hrs prior to test initiation</u>			
Aeration?	<u>NA</u>	<u>NA</u>		
Amount				
Condition of survivors	<u>Good</u>			

Comments:

Good
along
3/15/13

BIO-ANALYTICAL LABORATORIES ACUTE TOXICITY TEST SURVIVAL AND WATER QUALITY DATA

Project# X5050

Test started: Date 3/13/13 Time 1530

Client Camden

Test ended: Date 3/13/13 Time 1405

Sample Description 002

Test Species P. promelas ID# BA/3513

Technician: Ohour RC 24hour RC 48hour RC 72hour RC 96hour RC
 Time: Ohour 1530 24hour 1405 48hour 1405 72hour RC 96hour RC
 Temperature (°C): Ohour 24.2 24hour 20.4 48hour 24.2 72hour RC 96hour RC

Test Dilution	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity						
			0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96		
SV	A	NA	8	8	8			8.4	8.0/8.3	7.7			7.8	7.5/7.6	7.5			171.8	169.5/171.3	175				
	B		8	8	8																			
	C		8	8	8																			
	D		8	8	8																			
	E		8	7	7																			
OR	A		8	8	8			8.4	8.0/8.5	7.7			7.7	7.3/7.8	7.5			72.5	71.9/76.1	85				
	B		8	8	8																			
	C		8	8	8																			
	D		8	8	8																			
	E		8	8	8																			
Chemistry Tech prerenewal/postrenewal								RC					RC					RC						

BIO-ANALYTICAL LABORATORIES ACUTE TOXICITY TEST SURVIVAL AND WATER QUALITY DATA

Project# X5050

Test started: Date 3/13/13 Time 1530

Client Camden

Test ended: Date 3/15/13 Time 1425

Sample Description 002

Test Species P. promelas ID# BR/3513

Technician: 0hour RC 24hour AM 48hour AM 72hour AM 96hour AM

Time: 0hour 1530 24hour 1405 48hour 1405 72hour 1405 96hour 1405

Temperature (°C): 0hour 24.2 24hour 24.4 48hour 24.2 72hour 24.2 96hour 24.2

Test Dilution	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity				
			0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
12	A	NA	8	8	8			8.4 ^{7.9}	8.5	7.6			7.5 ^{7.4}	7.5			94.4 ^{110.58}	103.1	105.5			
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
16	A		8	8	8			8.5 ^{7.9}	8.5	7.6			7.5 ^{7.4}	7.5			103.9 ^{101.8}	101.1	113.8			
	B		8	8	7																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
Chemistry Tech prerenewal/postrenewal							RC					RC					RC					

ACUTE2 020809 Rev.

BIO-ANALYTICAL LABORATORIES ACUTE TOXICITY TEST SURVIVAL AND WATER QUALITY DATA

Project# X5050

Test started: Date 3/13/13 Time 1530

Client Camden

Test ended: Date 3/15/13 Time 1408

Sample Description 002

Test Species P. promelas ID# BA/3513

Technician: Ohour RC 24hour RC 48hour RC 72hour RC 96hour RC
 Time: Ohour 1530 24hour 1425 48hour 1405 72hour 1345 96hour 1245
 Temperature (°C): Ohour 24.2 24hour 24.4 48hour 24.2 72hour 24.2 96hour 24.2

Test Dilution	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH				Conductivity					
			0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
21	A	NA	8	8	8			8.5	7.1	7.6			7.4	7.3	7.4			112	131.5	121		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
28	A		8	8	8			8.5	7.8	7.6			7.4	7.3	7.3			122.5	142.8	137		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
Chemistry Tech prerenewal/postrenewal			RC					RC					RC									

BIO-ANALYTICAL LABORATORIES ACUTE TOXICITY TEST SURVIVAL AND WATER QUALITY DATA

Project# X5050
 Client Camden

Test started: Date 3/13/13 Time 1530
 Test ended: Date 3/15/13 Time 1405

Sample Description 002
 Technician: RC 24hour AM 48hour AM 72hour AM 96hour AM
 Time: 1530 24hour 1405 48hour 1405 72hour AM 96hour AM
 Temperature (°C): 24.2 24hour 24.4 48hour 24.2 72hour AM 96hour AM

Test Species P. promelas ID# BA/3513

Test Dilution	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity							
			0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96			
37	A	NA	8	8	8			8.5	7.5			7.3	7.2	7.2			139.9	166.3	134	157.5					
	B		8	8	8																				
	C		8	8	8																				
	D		8	8	8																				
	E		8	8	8																				
Chemistry Tech prerenewal/postrenewal								RC				RC					RC								

**INVALID TEST(S)
RAW DATA SHEETS**

BIO-ANALYTICAL LABORATORIES ACUTE TOXICITY TEST SURVIVAL AND WATER QUALITY DATA

Project# X5050
 client Camden

Test started: Date 3/13/13 Time 1535
 Test ended: Date 3/15/13 Time 1400
 Test Species D. pulex ID# BR4 D1-F2

Sample Description 002
 Technician: Ohour AH 24hour AH 48hour AH 72hour 96hour
 Time: Ohour 1525 24hour 1415 48hour 1400 72hour 96hour
 Temperature (°C): Ohour 24.2 24hour 24.8 48hour 24.2 72hour 96hour

Test Dilution	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity				
			0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
			NA																			
SV	A		8	8	8			8.4	8.3	8.0			7.8	7.6	7.5			171.9	171.8	171.0		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	7																	
	E		8	6	6																	
OR	A		8	5	2			8.4	8.5	8.1			7.7	7.6	7.7			72.5	72.1	71.5		
	B		8	7	6																	
	C		8	6	5																	
	D		8	6	5																	
	E		8	7	6																	
Chemistry Tech prerenewal/postrenewal			RC <u>AH</u>					RC <u>AH</u>					RC <u>AH</u>									

BIO-ANALYTICAL LABORATORIES ACUTE TOXICITY TEST SURVIVAL AND WATER QUALITY DATA

Project# X5050

Test started: Date 3/13/13

Time 1535

Client Camden

Test ended: Date 3/15/13

Time 1400

Sample Description 002

Test Species D. pulex

ID# BAU01-F2

Technician: Ohour AH 24hour AH 48hour AH 72hour 96hour

Time: Ohour 1535 24hour 1415 48hour 1400 72hour 96hour

Temperature (°C): Ohour 21.2 24hour 21.8 48hour 24.2 72hour 96hour

Test Dilution	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity				
			0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
			NA																			
12	A		8	8	8			8.4	8.4	8.1			7.5	7.4	7.0			94.4	132.9	131.8		
	B		8	7	7																	
	C		8	8	8																	
	D		8	5	4																	
	E		8	7	7																	
16	A		8	8	8			8.5	8.4	8.2			7.5	7.5	7.0			103.9	129.0	131.3		
	B		8	7	7																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
Chemistry Tech prerenewal/postrenewal							RC/AH					RC/AH					RC/AH					

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BIO-ANALYTICAL LABORATORIES ACUTE TOXICITY TEST SURVIVAL AND WATER QUALITY DATA

Project# X5050

Test started: Date 3/13/13

Time 1535

client Camden

Test ended: Date 3/15/13

Time 1400

Sample Description 002

Test Species D. pulex

ID# BR4D1-F2

Technician: Ohour PH 24hour PH 48hour PH 72hour PH 96hour PH

Time: Ohour 1535 24hour 1415 48hour 1400 72hour PH 96hour PH

Temperature (°C): Ohour 21.2 24hour 21.8 48hour 21.8 72hour PH 96hour PH

Test Dilution	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity							
			0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96			
			NA																						
21	A		8	7	7			8.5	8.4	8.2			7.4	7.4	7.4			112.4	110.7	110.3					
	B		8	8	10																				
	C		8	6	6																				
	D		8	7	7																				
	E		8	6	6																				
28	A		8	5	4			8.5	8.4	8.3			7.4	7.4	7.3			102.4	100.2	100.0					
	B		8	8	7																				
	C		8	8	8																				
	D		8	8	8																				
	E		8	8	7																				
Chemistry Tech prerenewal/postrenewal								RC	PH	PH			RC	PH	PH			RC	PH	PH					

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BIO-ANALYTICAL LABORATORIES ACUTE TOXICITY TEST SURVIVAL AND WATER QUALITY DATA

Project# X5050
 Client Camden

Test started: Date 2/13/13 Time 1535
 Test ended: Date 2/15/13 Time 1400

Sample Description 002
 Technician: Ohour AM 24hour AM 48hour AM 72hour AM 96hour AM
 Time: Ohour 1535 24hour 1415 48hour 1400 72hour AM 96hour AM
 Temperature (°C): Ohour 24.2 24hour 24.8 48hour 24.2 72hour AM 96hour AM

Test Species D. Dulex ID# BAU/DI-Fa

Test Dilution	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity				
			0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
37	A	NA	8	8	7			8.5	8.5	8.2			7.3	7.4	7.5			13.9	14.6	14.7		
	B		8	8	7																	
	C		8	8	8																	
	D		8	8	6																	
	E		8	7	7																	
	D		8																			
	B		8																			
	C		8																			
	D		8																			
	E		8																			
Chemistry Tech prerenewal/postrenewal																						

ACUTE2 020809 Rev.

APPENDIX C
STATISTICAL ANALYSIS

Daphnid Acute Test-48 Hr Survival

Start Date: 3/27/2013 Test ID: X5050DP Sample ID: 2
 End Date: 3/29/2013 Lab ID: ADFEQ880630 Sample Type: EFF1-POTW
 Sample Date: 3/27/2013 Protocol: EPAAW02-EPA/821/R-02-01 Test Species: DP-Daphnia pulex
 Comments:

Conc-%	1	2	3	4	5
D-Control	0.8750	1.0000	1.0000	0.8750	0.8750
12	0.7500	1.0000	0.8750	1.0000	0.8750
16	0.8750	0.7500	1.0000	0.8750	0.5000
21	0.7500	1.0000	1.0000	0.6250	0.8750
28	0.7500	0.8750	0.8750	0.6250	0.6250
37	0.7500	1.0000	0.7500	0.8750	0.6250

Conc-%	Mean	N-Mean	Transform: Arcsin Square Root					1-Tailed		
			Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
D-Control	0.9250	1.0000	1.2829	1.2094	1.3931	7.841	5			
12	0.9000	0.9730	1.2504	1.0472	1.3931	11.683	5	0.292	2.360	0.2620
16	0.8000	0.8649	1.1289	0.7854	1.3931	20.172	5	1.387	2.360	0.2620
21	0.8500	0.9189	1.1909	0.9117	1.3931	17.846	5	0.829	2.360	0.2620
28	0.7500	0.8108	1.0579	0.9117	1.2094	14.081	5	2.027	2.360	0.2620
37	0.8000	0.8649	1.1217	0.9117	1.3931	16.470	5	1.452	2.360	0.2620

Auxiliary Tests		Statistic	Critical	Skew	Kurt						
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)		0.9663	0.927	-0.1793	-0.6516						
Bartlett's Test indicates equal variances (p = 0.71)		2.9221	15.0863								
Hypothesis Test (1-tail, 0.05)		NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test		37	>37		2.7027	0.19246	0.20933	0.03621	0.0308	0.35006	5, 24
Treatments vs D-Control											

Acute Fish Test-48 Hr Survival

Start Date: 3/13/2013 Test ID: X5050PP Sample ID: 2
 End Date: 3/15/2013 Lab ID: ADEQ880630 Sample Type: EFF1-POTW
 Sample Date: 3/13/2013 Protocol: EPAAW02-EPA/821/R-02-01 Test Species: PP-Pimephales promelas

Comments:

Conc-%	1	2	3	4	5
D-Control	1.0000	1.0000	1.0000	1.0000	1.0000
12	1.0000	1.0000	1.0000	1.0000	1.0000
16	1.0000	0.8750	1.0000	1.0000	1.0000
21	1.0000	1.0000	1.0000	1.0000	1.0000
28	1.0000	1.0000	1.0000	1.0000	1.0000
37	1.0000	1.0000	1.0000	1.0000	1.0000
SOFT CHECK	1.0000	1.0000	1.0000	1.0000	0.8750

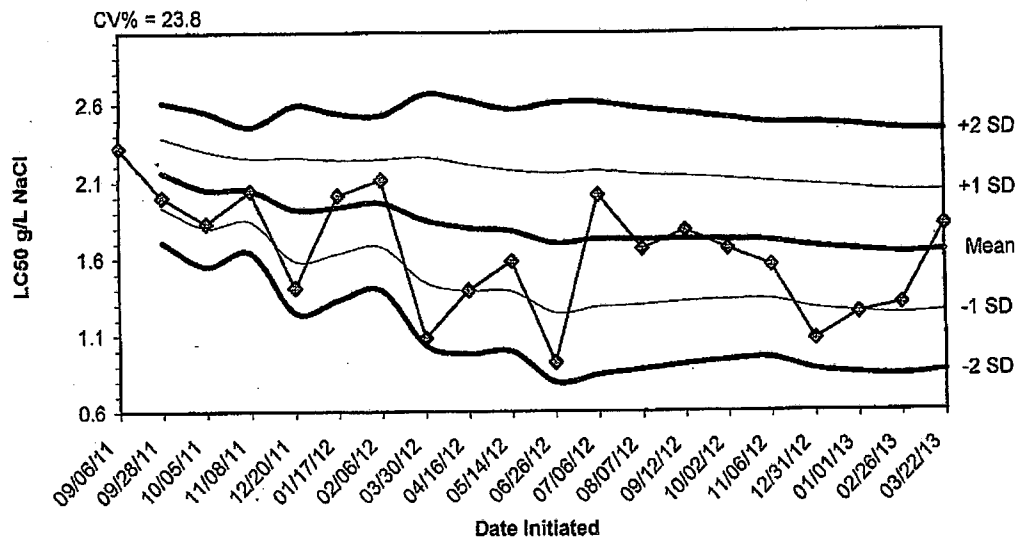
Conc-%	Mean	N-Mean	Transform: Arcsin Square Root					N	Rank Sum	1-Tailed Critical
			Mean	Min	Max	CV%				
D-Control	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5			
12	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5	27.50	16.00	
16	0.9750	0.9750	1.3564	1.2094	1.3931	6.055	5	25.00	16.00	
21	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5	27.50	16.00	
28	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5	27.50	16.00	
37	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5	27.50	16.00	
SOFT CHECK	0.9750	0.9750	1.3564	1.2094	1.3931	6.055	5	25.00	16.00	

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution ($p \leq 0.05$)	0.51902	0.934	-2.9335	9.90057
Equality of variance cannot be confirmed				
Hypothesis Test (1-tail, 0.05)				
Steel's Many-One Rank Test indicates no significant differences				
Treatments vs D-Control				

EOB
4/4/13

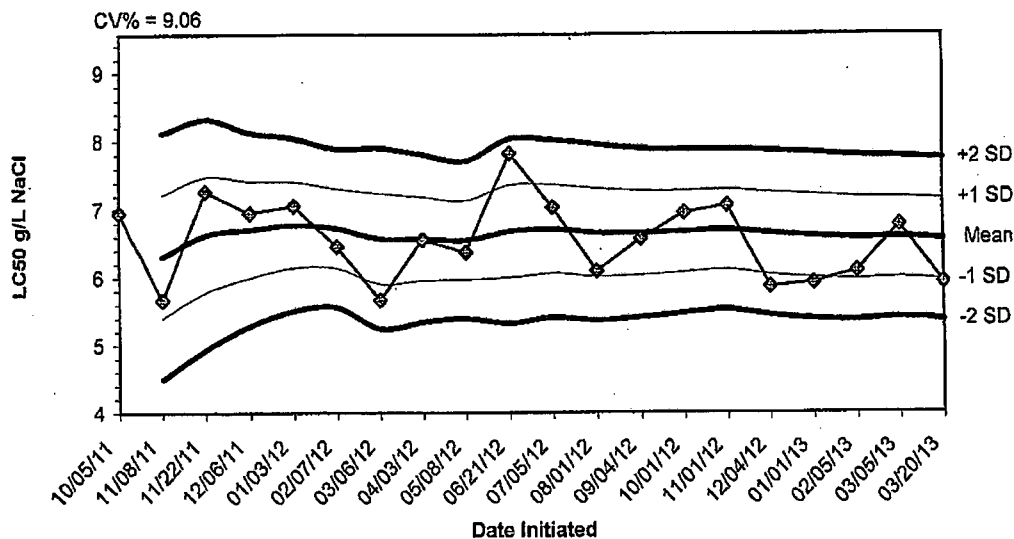
APPENDIX D
QUALITY ASSURANCE CHARTS

2013 48-hour Reference Toxicant Test Results for *Daphnia pulex*



Dates	Values	Mean	-1 SD	-2 SD	+1 SD	+2 SD
09/06/11	2.3200					
09/28/11	2.0000	2.1600	1.9337	1.7075	2.3863	2.6125
10/05/11	1.8300	2.0500	1.8012	1.5524	2.2988	2.5476
11/08/11	2.0400	2.0475	1.8443	1.6411	2.2507	2.4539
12/20/11	1.4100	1.9200	1.5850	1.2499	2.2550	2.5901
01/17/12	2.0100	1.9350	1.6331	1.3312	2.2369	2.5388
02/06/12	2.1100	1.9600	1.6766	1.3931	2.2434	2.5269
03/30/12	1.0800	1.8500	1.4430	1.0360	2.2570	2.6640
04/16/12	1.3900	1.7989	1.3884	0.9780	2.2093	2.6198
05/14/12	1.5800	1.7770	1.3839	0.9908	2.1701	2.5632
06/26/12	0.9200	1.6991	1.2454	0.7917	2.1528	2.6065
07/06/12	2.0100	1.7250	1.2832	0.8414	2.1668	2.6086
08/07/12	1.6600	1.7200	1.2966	0.8732	2.1434	2.5668
09/12/12	1.7800	1.7243	1.3172	0.9101	2.1314	2.5385
10/02/12	1.6600	1.7200	1.3274	0.9347	2.1126	2.5053
11/06/12	1.5500	1.7094	1.3277	0.9460	2.0911	2.4728
12/31/12	1.0700	1.6718	1.2710	0.8702	2.0725	2.4733
01/01/13	1.2400	1.6478	1.2459	0.8439	2.0497	2.4516
02/26/13	1.3000	1.6295	1.2308	0.8322	2.0281	2.4268
03/22/13	1.8100	1.6385	1.2484	0.8583	2.0286	2.4187

2013 48-hour Reference Toxicant Test Results for *Pimephales promelas*



Dates	Values	Mean	-1 SD	-2 SD	+1 SD	+2 SD
10/05/11	6.9500					
11/08/11	5.6700	6.3100	5.4049	4.4998	7.2151	8.1202
11/22/11	7.2700	6.6300	5.7834	4.9367	7.4766	8.3233
12/06/11	6.9500	6.7100	6.0004	5.2909	7.4196	8.1291
01/03/12	7.0600	6.7800	6.1459	5.5118	7.4141	8.0482
02/07/12	6.4600	6.7267	6.1446	5.5626	7.3087	7.8907
03/06/12	5.6700	6.5757	5.9110	5.2464	7.2404	7.9051
04/03/12	6.5600	6.5738	5.9584	5.3430	7.1891	7.8045
05/08/12	6.3700	6.5511	5.9715	5.3918	7.1308	7.7104
06/21/12	7.8200	6.6780	6.0000	5.3220	7.3560	8.0340
07/05/12	7.0300	6.7100	6.0581	5.4062	7.3619	8.0138
08/01/12	6.0900	6.6583	6.0115	5.3647	7.3051	7.9519
09/04/12	6.5700	6.6515	6.0318	5.4120	7.2713	7.8911
10/01/12	6.9500	6.6729	6.0721	5.4713	7.2736	7.8744
11/01/12	7.0600	6.6987	6.1112	5.5237	7.2861	7.8736
12/04/12	5.8600	6.6463	6.0412	5.4362	7.2513	7.8563
01/01/13	5.9200	6.6035	5.9918	5.3801	7.2153	7.8270
02/05/13	6.0900	6.5750	5.9693	5.3636	7.1807	7.7864
03/05/13	6.7700	6.5853	5.9949	5.4046	7.1756	7.7659
03/20/13	5.9200	6.5520	5.9585	5.3650	7.1455	7.7390

APPENDIX E
AGENCY FORMS

**Acute Forms
Daphnia pulex Survival**

Permittee: Camden Water Utilities

NPDES Permit Number: AR0022365/AFIN 52-00073

Composite Collected

From: 3/25/13

To: 3/26/13

From: 3/26/13

To: 3/27/13

Test Initiated: 3/27/13

Dilution Water Used:

Receiving Water

Reconstituted Water

Dilution Series Results - Percent Survival

TIME OF READING	REP	0	12	16	21	28	37
24-hour	A	100	100	100	75.0	100	100
	B	100	100	87.5	100	87.5	100
	C	100	100	100	100	100	100
	D	100	100	100	62.5	100	87.5
	E	100	100	100	87.5	100	100
48-hour	A	87.5	75.0	87.5	75.0	75.0	75.0
	B	100	100	75.0	100	87.5	100
	C	100	87.5	100	100	87.5	75.0
	D	87.5	100	87.5	62.5	62.5	87.5
	E	87.5	87.5	50.0	87.5	62.5	62.5
	Mean	92.5	90.0	80.0	85.0	75.0	80.0

1. Dunnett's Procedure or Steel's Many-One Rank Test as appropriate: Is the mean survival at 48 hours significantly different (p=.05) than the control survival for the % effluent corresponding to:

- a.) LOW FLOW OR CRITICAL DILUTION (28%) YES X NO
 b.) 1/2 LOW FLOW OR 2X CRITICAL DILUTION (N/A %) YES NO

2. Enter percent effluent corresponding to the LC₅₀ below:

LC₅₀ = N/A % effluent

95 % confidence limits: N/A

Method of LC₅₀ calculation: N/A

3. If you answered NO to 1.a) enter (P) otherwise enter (F): P

4. Enter response to item 3 on DMR Form, parameter TEM3D

5. If you answered NO to 1.b) enter (P) otherwise enter (F): N/A

6. Enter response to item 5 on DMR Form, parameter TFM3D

**Biomonitoring
Daphnia 48 hour Acute Static Renewal
Chemical Parameters Chart***

Permittee: Camden Water Utilities
 NPDES Number: AR0022365/ AFIN 52-00073
 Contact: David Richardson
 Analyst: Haughton
 Sample Collected

From: Date 3/25/13 Time 0800
 To: Date 3/26/13 Time 0600
 Date 3/27/13 Time 1435
 Date 3/28/13 Time 1410

Test Begin
 Test End

Parameter	D.O.			Temperature			Alkalinity			Hardness			pH			
	Dilut./Time	0hrs.	24hrs	48hrs	0hrs	24hrs	48hrs	0hrs	24hrs	48hrs	0hrs	24hrs	48hrs	0hrs	24hrs	48hrs
0		8.2	8.2	8.6	24.3	24.3	24.0	32.0			52.0			7.7	7.5	7.6
12		8.2	8.4	8.5	24.3	24.3	24.0							7.7	7.4	7.5
16		8.2	8.3	8.5	24.3	24.3	24.0							7.7	7.3	7.6
21		8.2	8.4	8.5	24.3	24.3	24.0							7.7	7.4	7.5
28		8.2	8.3	8.5	24.3	24.3	24.0							7.7	7.3	7.5
37		8.2	8.4	8.5	24.3	24.3	24.0	20.0	20.0		44.0	44.0		7.6	7.3	7.4

*This Form is to be submitted with each DMR.
 Alkalinity and hardness to be reported as mg/l CaCO₃

Acute Forms
Pimephales promelas (Fathead minnow) Survival

Permittee: Camden Water Utilities
NPDES Permit Number: AR0022365/AFIN 52-00073

Composite Collected From: 3/11/13 To: 3/12/13
From: 3/12/13 To: 3/13/13

Test Initiated: 3/13/13

Dilution Water Used: Receiving Water Reconstituted Water

Dilution Series Results - Percent Survival

TIME OF READING	REP	0	12	16	21	28	37
24-hour	A	100	100	100	100	100	100
	B	100	100	100	100	100	100
	C	100	100	100	100	100	100
	D	100	100	100	100	100	100
	E	100	100	100	100	100	100
48-hour	A	100	100	100	100	100	100
	B	100	100	87.5	100	100	100
	C	100	100	100	100	100	100
	D	100	100	100	100	100	100
	E	100	100	100	100	100	100
	Mean	100	100	97.5	100	100	100

1. Dunnett's Procedure or Steel's Many-One Rank Test as appropriate: Is the mean survival at 48 hours significantly different (p=.05) than the control survival for the % effluent corresponding to:

- a.) **LOW FLOW OR CRITICAL DILUTION (28%)** YES X NO
b.) **1/2 LOW FLOW OR 2X CRITICAL DILUTION (N/A%)** YES NO

2. Enter percent effluent corresponding to the LC₅₀ below:

LC₅₀ = N/A% effluent

95 % confidence limits: N/A

Method of LC₅₀ calculation: N/A

- 3. If you answered NO to 1.a) enter (P) otherwise enter (F): P**
4. Enter response to item 3 on DMR Form, parameter TEM3D
5. If you answered NO to 1.b) enter (P) otherwise enter (F): N/A
6. Enter response to item 5 on DMR Form, parameter TFM3D

**Biomonitoring
Fathead minnow 48 hour Acute Static Renewal
Chemical Parameters Chart***

Permittee: Camden Water Utilities
 NPDES Number: AR0022365/ AFIN 52-00073
 Contact: David Richardson
 Analyst: Haughton
 Sample Collected

From: Date 3/11/13 Time 0800
 To: Date 3/12/13 Time 0600
 Date 3/13/13 Time 1530
 Date 3/15/13 Time 1405

Test Begin
 Test End

Parameter	D.O.			Temperature			Alkalinity			Hardness			pH			
	Dilut./Time	0hrs.	24hrs	48hrs	0hrs	24hrs	48hrs	0hrs	24hrs	48hrs	0hrs	24hrs	48hrs	0hrs	24hrs	48hrs
0		8.4	8.5	7.7	24.2	24.4	24.2	20.0			44.0			7.7	7.8	7.5
12		8.4	8.5	7.6	24.2	24.4	24.2							7.5	7.5	7.5
16		8.5	8.5	7.6	24.2	24.4	24.2							7.5	7.4	7.5
21		8.5	8.5	7.6	24.2	24.4	24.2							7.4	7.3	7.4
28		8.5	8.5	7.6	24.2	24.4	24.2							7.4	7.2	7.3
37		8.5	8.5	7.5	24.2	24.4	24.2	8.0	12.0		44.0	56.0		7.3	7.2	7.2

*This Form is to be submitted with each DMR.
 Alkalinity and hardness to be reported as mg/l CaCO₃

Acute Forms
Daphnia pulex Survival

Permittee: Camden Water Utilities

NPDES Permit Number: AR0022365/ AFIN 52-00073

Composite Collected

From: 3/11/13

To: 3/12/13

From: 3/12/13

To: 3/13/13

Test Initiated: 3/13/13

Dilution Water Used:

Receiving Water

Reconstituted Water

Dilution Series Results - Percent Survival

TIME OF READING	REP	0	Soft Check				
24-hour	A	62.5	100				
	B	87.5	100				
	C	75.0	100				
	D	75.0	100				
	E	87.5	75.0				
48-hour	A	25.0	100				
	B	75.0	100				
	C	62.5	100				
	D	62.5	87.5				
	E	75.0	75.0				
	Mean	60.0	92.5				

1. Dunnett's Procedure or Steel's Many-One Rank Test as appropriate: Is the mean survival at 48 hours significantly different (p=.05) than the control survival for the % effluent corresponding to:

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

2. Enter percent effluent corresponding to the LC₅₀ below:

LC₅₀ = N/A % effluent

95 % confidence limits: N/A

Method of LC₅₀ calculation: N/A

3. If you answered NO to 1.a) enter (P) otherwise enter (F): N/A

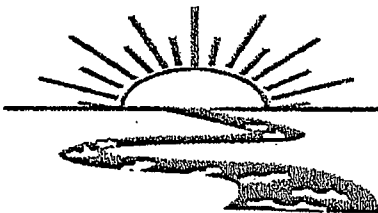
4. Enter response to item 3 on DMR Form, parameter TEM3D

5. If you answered NO to 1.b) enter (P) otherwise enter (F): N/A

6. Enter response to item 5 on DMR Form, parameter TFM3D

Test invalid because the receiving water control did not meet the test acceptance requirements.

APPENDIX F
REPORT QUALITY ASSURANCE FORM



Bio-Analytical Laboratories

3240 Spurgin Road
Post Office Box 527
Doyline, LA 71023

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

REPORT QUALITY ASSURANCE FORM (v. 31612)

Client: Camden Water

Project#: X5050

Chain of Custody Documents Checked by: AH 4/4/13
Technician/Date

Raw Data Documents Checked by: AH 4/4/13
Technician/Date

Statistical Analysis Package Checked by: EGB 4/4/13
Quality Manager/Date

Quality Control Data Checked by: EGB 4/1/13
Quality Manager/Date

Report Checked by: EGB 4/17/13
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.

Erin H. Baupp, BS 4/17/13
Quality Manager Date

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

Camden Water Utilities
P.O. Drawer J
Camden, AR 71711



CENTRAL AR PDIC 722
WED 15 MAY 2013

A. D. E. Q.
NPDES ENFORCEMENT DIV.
5301 NORTSHORE DR.
N. LITTLE ROCK AR 72118-5317