

## Sanitary Sewer Overflow (SSO) Monthly Report

Facility Name: CADDEN WATER UTILITIES NPDES Permit No.: AR0022365 Monitoring Period (Month/Year): 08/2014

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	HO-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

Thomas K Bellard 09-15-2014  
 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."

# Environmental Services Company, Inc.

Corporate Office  
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 Little Rock, AR 72211  
 Tel. (501)221-2565 Fax (501)221-1341

Northwest Arkansas Branch  
 1107 Century Avenue  
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Control Number: 1408010325	Composite Date: 08/19/14 - 08/20/14	Collected By: ANNETTE STRICKL
Customer Name : CAMDEN WATER & WASTEWATER UTILTY	Sample Time : 0700-0700	Delivery By : TMO
Customer Number : 1550	Sample Type : COMPOSITE WATER	Work Order :
Report Date : 08/22/14	Sample From : EFFLUENT	Purchase Order :

<u>Laboratory Analysis</u>							<u>Quality Assurance</u>		
<u>Analysis</u>							<u>Precision</u>	<u>Accuracy</u>	
<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>
08/22	0900	NTR	Phosphorous, Total (as P)	0.43 mg/L			EPA 365.3	0.00	103.0 *
08/21	1130	NTR	Nitrate + Nitrite	2.08 mg/L			SM 2000 4500-NO3 E	1.80	93.7

\* 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.

Bio-Analytical Laboratories (BAL)  
ADEQ#88-0630  
Project X5525

### Bio-Analytical Laboratories' Executive Summary

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

**Project #:** X5525

**Outfall:** Outfall 002 (treated municipal wastewater)

**Permit #:** AR0022365/ AFIN 52-00073

**Contact:** David Richardson

**Test Dates:** August 27 - 29, 2014

**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 (28.0%), enter a "1"; otherwise, enter a "0" for Parameter No. TEM3D- 0 (Pass)
2. Report the NOEC for survival, Parameter TOM3D - 37.0%.
3. Report the highest (critical dilution or control) Coefficient of Variation, Parameter TQM3D - 14.58%.

**For *Pimephales promelas* (Fathead Minnow):**

1. If the NOEC for survival is less than the critical dilution (28.0%), enter a "1"; otherwise, enter a "0" for Parameter No. TEM6C- 0 (Pass).
2. Report the NOEC for survival, Parameter TOM6C - 37.0%.
3. Report the highest (critical dilution or control) Coefficient of Variation, Parameter TQM6C - 0.00%.

This report contains a total of 31 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 X5525**

**Test Dates: August 27 - 29, 2014  
Report Date: September 10, 2014**

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

**Prepared by:**  
Ginger Briggs  
Bio-Analytical Laboratories  
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BAL  
ADEQ #88-0630  
Project X5525

### 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	5
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 References	8
Appendices	
A- Chain-of-Custody Documents	9
B- Raw Data Sheets	12
C- Statistical Analyses	20
D- Quality Assurance Charts	22
E- Agency Forms	25
F- Report Quality Assurance Form	30

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Project X5525

## 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  $LC_{50}$ , the concentration in which 50 percent of the test organisms died.

## 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), "Standard Methods for The Examination of Water and Wastewater, 20<sup>th</sup> 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 *Daphnia pulex* test organisms were raised in-house at test temperature and were less than 24 hours old at test initiation. The fathead minnow test organisms were also raised in-house at test temperature and were approximately six days at 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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Project X5525

### **2.3 Dilution Water**

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

### **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 28.0 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 August 26 - 27, 2014. Upon completion of collection, the samples were chilled then packed in ice and delivered to Bio-Analytical Laboratories by BAL personnel. Sample temperature upon arrival was 4.8° Celsius.

### **2.6 Sample Preparation**

Upon arrival, the samples were logged in, given an identification number and refrigerated unless needed. Prior to use, each sample was warmed to 25±1° Celsius. The total residual chlorine level was measured with a Capital Controls<sup>R</sup> amperometric titrator (SM 4500-CI D 1997) and recorded if present. The total ammonia level was measured using a HACH<sup>R</sup> 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 highest effluent concentration.

### **2.7 Monitoring of the Tests**

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

### **2.8 Data Analysis**

The NOEC and LC<sub>50</sub> values were obtained by approved EPA methods of analysis, using the ToxCalc statistical program.

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Project X5525

### 3.0 Results and Discussion

The results of the tests can be found in Table 1. Significant differences in survival were not noted in the 28.0 percent critical dilution in either test. An erratic dose response occurred in the *Daphnia pulex* test; however, this was determined to be an anomaly. The NOEC value for both tests was 37.0 percent effluent ( $p=.05$ ). The 48-hour  $LC_{50}$  value for both tests was  $>37.0$  percent effluent ( $p=.05$ ).

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

Percent Effluent	Percent Survival	
	<i>Daphnia pulex</i>	Fathead minnow
Test Organism		
Control	97.5	100.0
12.0	77.5	100.0
16.0	85.0	100.0
21.0	90.0	100.0
28.0	85.0	100.0
37.0	87.5	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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Project X5525

#### 4.0 Conclusions

The two composite samples of Outfall 002 collected from Camden Water Utilities, Camden, Arkansas, on August 26 and 27, 2014, were not found to be lethally toxic to the fathead minnow test organisms nor the *Daphnia pulex* test organisms in the 28.0 percent critical dilution after 48 hours of exposure ( $p=.05$ ).

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Project X5525

### 5.0 References

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.

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. 20<sup>th</sup> Edition.

**APPENDIX A**  
**CHAIN-OF-CUSTODY DOCUMENTS**



**Bio-Analytical Laboratories**

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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: <b>X5525</b>	
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	Temp. upon arrival: <b>4.8°C</b>	
Permit #: AR0022365/ AFIN 52-00073		Purchase Order:									Thermometer #: <b>29</b>	
Sampler's Signature/Printed Name/Affiliation:											Tech: <b>RC</b>	
Date Start Date End		Time Start Time End		C	G	# and type of container	Sample Identification		Date: <b>8/27/14</b>		Preservative: (below)	
<b>8-25 8-26</b>		<b>8:00 AM 8:00 AM</b>		<b>X</b>		<b>* 2 half gallons</b>	<b>002</b>		<b>8/27/14</b>		<b>6 CE</b>	
Relinquished by/Affiliation: <i>Amelia DePaul</i>				Date: <b>8-27-14</b>	Time: <b>9:30 AM</b>	Received by/Affiliation: <i>J. R. Jones</i>				Date: <b>8-27-14</b>	Time: <b>0930</b>	
Relinquished by/Affiliation:				Date:	Time:	Received by/Affiliation:				Date:	Time:	
Relinquished by/Affiliation: <i>J. R. Jones</i>				Date: <b>8-27-14</b>	Time: <b>1215</b>	Received by/Affiliation: <i>R. Callahan</i>				Date: <b>8/27/14</b>	Time: <b>1215</b>	
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: <b>only 1 jug labeled for 8/25-8/26/14-RC</b>												

COC Rev. 3.0



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

Laboratory Use Only:

Company: Camden Water Utilities		Phone: (870) 836-4329		Analysis:				Fecal Coliform Acute Ceriodaphnia Acute Mysis Acute Daphnia species Acute minnow/fresh/marine) Chronic minnow Chronic Ceriodaphnia	Project Number: <b>X5525</b>	Temp. upon arrival: <b>48°</b>	
Address: P.O. Box J, Camden, AR 71711		Fax: (870) 836-5190									Temperature upon arrival: <b>48°</b> Thermometer #: <b>29</b> Tech: <b>RC</b> Date: <b>8/27/14</b> Lab Control Number:
Permit #: AR0022365/ AFIN 52-00073		Purchase Order:									
Sampler's Signature/Printed Name/Affiliation:											
Date Start Date End	Time Start Time End	C	G	# and type of container	Sample Identification						
8-26 8-27	8:00 AM 8:00 AM	X		*2 half gallons	002		X	X	C9577	ME	
Relinquished by/Affiliation:				Date:	Time:	Received by/Affiliation:		Date:	Time:		
<i>Annette Strickland</i>				8-27-14	9:30am	<i>[Signature]</i>		8-27-14	0930		
Relinquished by/Affiliation:				Date:	Time:	Received by/Affiliation:		Date:	Time:		
Relinquished by/Affiliation: <i>[Signature]</i>				8-27-14	1215	<i>R Callahan</i>		8/27/14	1215		
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: <b>*3 bags labeled 8/26-8/27/14-RC</b>											
COC Rev. 3.0											

**APPENDIX B  
RAW DATA SHEETS**

BIO-ANALYTICAL LABORATORIES  
ACUTE TOXICITY TEST WATER QUALITY DATA

X5525  
Page 13 of 31

Project# X5525

Client: CMDN/Camden Water Utilities

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

NPDES# AR0022365 Outfall 002

Technicians: EGB/AH/RC

Test initiated: Date 8/27/14 Time 1420

Test terminated: Date 8/29/14 Time 1425

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 & %) RC 8/27/14	Total Residual Chlorine (mg/L)	Dechlorinated? Amount?	Ammonia (NH3) mg/L	Salinity	Hardness	Alkalinity	Tech
C9576	8.6/102.0%	Y/10/8.1 96.8%	<0.01	NO	0.5	N/A	37% 52.0	37% 28.0	RC
C9577	6.7/78.1%	Y/25/8.1 95.7%	<0.01	↓	0.5	↓	60.0	32.0	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 <sub>2</sub> O	3646	NA	NA	NA	NA	7.4	48.0	32.0	AH
↓	3647					7.2	44.0	36.0	AH

Test Species Information

Test Species Info.	Species: <u>D. pulex</u> ID#: <u>BA/13-14</u>	Species: <u>P. promelas</u> ID#: <u>BA/182114</u>	Species: ID#:	Species: ID#:
Age	<u>&lt;24h</u>	<u>6 days</u>		
Test Container Size	<u>30ml</u>	<u>200ml</u>		
Test volume	<u>25ml</u>	<u>200ml</u>		
Feeding: Type	<u>VCT: Algae</u>	<u>Artemia</u>		
Amount	<u>Fed 2hrs</u>	<u>prior to test initiation</u>		
Aeration?	<u>NA</u>	<u>NA</u>		
Amount				
Condition of survivors	<u>Good RC 8/29/14</u>	<u>Good RC 8/29/14</u>		

Comments:

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

Project# X5525

Test started: Date 8/27/14 Time 1510

Client Camden

Test ended: Date 8/29/14 Time 1425

Sample Description 002

Test Species D. Pulex ID# BAU I3-I4

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

Time: 0hour 1510 24hour 1425 48hour 1425 72hour     96hour    

Temperature (°C): 0hour 24.8 24hour 24.7 48hour 24.6 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	8			8.2	<del>7.9</del> 8.3	8.0			7.5	<del>7.2</del> 7.3	7.2			157.0	<del>148</del> 182	181.5		
	B		8	8	8																	
	C		8	8	7																	
	D		8	8	8																	
	E		8	8	8																	
12	A		8	8	5			8.1	<del>7.8</del> 8.3	7.6			7.5	<del>7.2</del> 7.1	7.1			173.3	<del>182</del> 181.2	203		
	B		8	8	7																	
	C		8	8	5																	
	D		8	8	8																	
	E		8	8	6																	
Chemistry Tech prerenewal/postrenewal							RC	<del>RC</del> RC	RC				RC	<del>RC</del> RC	RC			RC	<del>RC</del> RC	RC		



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

Project# X5525

Test started: Date 8/27/14 Time 1510

Client Camden

Test ended: Date 8/29/14 Time 1425

Sample Description 002

Test Species D. pulex ID# BAU I3-I4

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

Time: 0hour 1510 24hour 1425 48hour 1425 72hour RC 96hour RC

Temperature (°C): 0hour 24.8 24hour 24.7 48hour 24.6 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
16	A	Na	8	8	7			8.1	<del>7.8</del> 8.3	7.8			7.4	<del>7.2</del> 7.2	7.1			176.8	<del>214</del> 193.4	207		
	B		8	8	5																	
	C		8	8	8																	
	D		8	8	7																	
	E		8	8	7																	
21	A		8	8	8			8.1	<del>7.8</del> 8.3	7.8			7.4	<del>7.2</del> 7.2	7.1			182.8	<del>215</del> 187.4	212		
	B		8	8	6																	
	C		8	8	7																	
	D		8	8	7																	
	E		8	8	8																	
Chemistry Tech prerenewal/postrenewal								RC	<del>RC</del>	RC			RC	<del>RC</del>	RC			RC	<del>RC</del>	RC		

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

Project# X5525

Test started: Date 8/27/14 Time 1510

Time 1510

Client Camden

Test ended: Date 8/29/14 Time 1425

Time 1425

Sample Description 002

Test Species D. Pulex

ID# 094 I3-I4

Technician: 0hour RC 24hour RC 48hour RC 72hour RC 96hour RC  
 Time: 0hour 1510 24hour 1425 48hour 1425 72hour RC 96hour RC  
 Temperature (°C): 0hour 24.8 24hour 24.7 48hour 24.6 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
28	A	Na	8	8	8			8.1	7.8	7.8			7.4	7.2	7.2			1915	225	225		
	B		8	8	7			RC	8/29/14	7.8			RC	8/29/14	7.1			RC	8/29/14	223		
	C		8	8	5																	
	D		8	8	7																	
	E		8	8	7																	
37	A		8	8	8			8.1	7.9	7.8			7.3	7.2	7.1			202	242	240		
	B		8	8	8																	
	C		8	8	6																	
	D		8	8	7																	
	E		8	8	6																	
Chemistry tech prerenewal/postrenewal								RC	RC	RC			RC	RC	RC			RC	RC	RC		

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

Project# X5525

Test started: Date 8/27/14 Time 1420

Client Camden

Test ended: Date 8/27/14 Time 1405

Sample Description 002 0hour RC 24hour RC 48hour RC 72hour RC 96hour RC

Test Species P. promelas ID# BAL82114

Technician: 0hour RC 24hour 1445 48hour 1405 72hour RC 96hour RC

Time: 0hour 24.8 24hour 24.7 48hour 24.6 72hour RC 96hour RC

Temperature (°C): 0hour 24.8 24hour 24.7 48hour 24.6 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
0	A	Un	8	8	8			8.2	7.7 / 8.3	7.7			7.5	7.0 / 7.3	7.0			157.0	171.8 / 162.0	173.1		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
12	A		8	8	8			8.1	7.6 / 8.3	7.7			7.5	6.9 / 7.1	7.1			173.3	192.1 / 181.2	194.3		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
Chemistry Tech prerenewal/postrenewal								RC	RC / RC	RC			RC	RC / RC	RC			RC	RC / RC	RC		

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

Project# X5525

Test started: Date 8/27/14 Time 1420

Client Camden

Test ended: Date 8/29/14 Time 1405

Sample Description 002

Test Species P. promelas ID# BAU 82114

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

Time: 0hour 1420 24hour 1445 48hour 1405 72hour RC 96hour RC

Temperature (°C): 0hour 24.8 24hour 24.7 48hour 24.6 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
16	A	Na	8	8	8			8.1	<del>7.5</del> 8.3	7.6			7.4	<del>6.8</del> 7.2	6.9			176.8	<del>193.4</del> 183.4	198		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
21	A		8	8	8			8.1	<del>7.4</del> 8.3	7.6			7.4	<del>6.8</del> 7.2	6.9			182.8	<del>201</del> 181.4	206		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
Chemistry Tech prerenewal/postrenewal								RC	<del>RC</del> RC	RC			RC	<del>RC</del> RC	RC			RC	<del>RC</del> RC	RC		

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

Project# X5525

Test started: Date 8/27/14 Time 1420

Client Camden

Test ended: Date 8/29/14 Time 1405

Sample Description 002  
 Technician: Ohour RC 24hour RC 48hour RC 72hour RC 96hour RC  
 Time: Ohour 1426 24hour 1445 48hour 1405 72hour RC 96hour RC  
 Temperature (°C): Ohour 24.8 24hour 24.7 48hour 24.6 72hour RC 96hour RC

Test Species P. promelas ID# BAU 24 <sup>RC 8/27/14</sup>  
82114

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	8			8.1	<del>7.6</del> 8.2	7.6			7.4	<del>6.9</del> 7.2	7.0			191.5	<del>208</del> 205	216		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
37	A		8	8	8			8.1	<del>7.4</del> 8.2	7.5			7.3	<del>6.9</del> 7.2	7.0			202	<del>230</del> 217	234		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
Chemistry Tech prerenewal/postrenewal								RC	<del>RC</del> RC	RC			RC	<del>RC</del> RC	RC			RC	<del>RC</del> RC	RC		

**APPENDIX C**  
**STATISTICAL ANALYSIS**

**Daphnid Acute Test-48 Hr Survival**

X5525

Start Date: 8/27/2014	Test ID: X5525DP	Sample ID: AR0022365	Page 21 of 31
End Date: 8/29/2014	Lab ID: ADEQ880630	Sample Type: EFF1-POTW	
Sample Date: 8/26/2014	Protocol: EPAAW02-EPA/821/R-02-01	Test Species: DP-Daphnia pulex	

Comments:

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

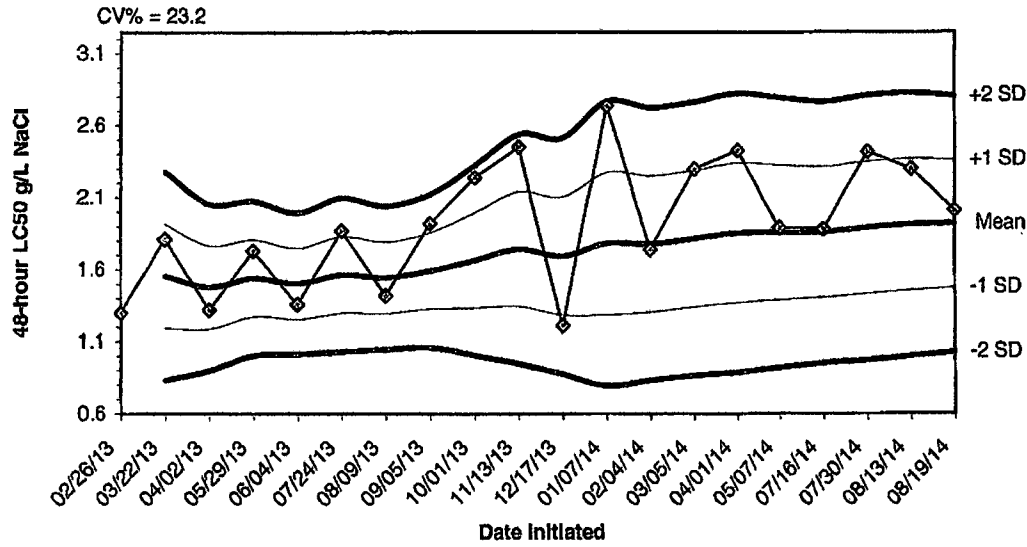
Conc-%	Mean	N-Mean	Transform: Arcsin Square Root				N	t-Stat	1-Tailed	
			Mean	Min	Max	CV%			Critical	MSD
D-Control	0.9750	1.0000	1.3564	1.2094	1.3931	6.055	5			
*12	0.7750	0.7949	1.0946	0.9117	1.3931	18.911	5	2.528	2.360	0.2443
16	0.8500	0.8718	1.1866	0.9117	1.3931	14.581	5	1.640	2.360	0.2443
21	0.9000	0.9231	1.2504	1.0472	1.3931	11.683	5	1.023	2.360	0.2443
28	0.8500	0.8718	1.1866	0.9117	1.3931	14.581	5	1.640	2.360	0.2443
37	0.8750	0.8974	1.2180	1.0472	1.3931	14.204	5	1.337	2.360	0.2443

Auxiliary Tests		Statistic	Critical	Skew	Kurt						
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)		0.95097	0.927	-0.146	-0.576						
Bartlett's Test indicates equal variances (p = 0.71)		2.93066	15.0863								
Hypothesis Test (1-tail, 0.05)		NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnnett's Test		37	>37		2.7027	0.15081	0.15796	0.03734	0.02679	0.26191	5, 24
Treatments vs D-Control											

**APPENDIX D**  
**QUALITY ASSURANCE CHARTS**

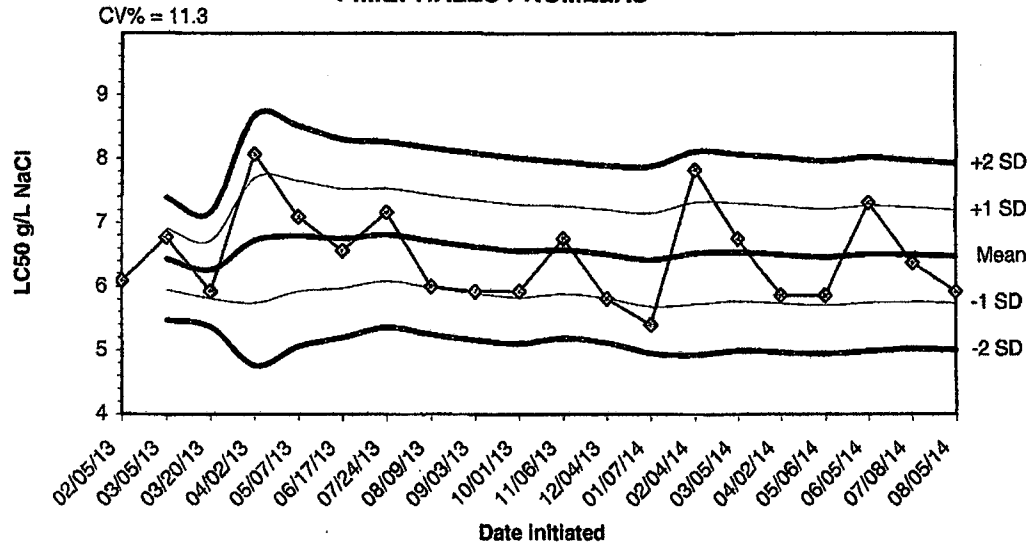


2014 48-Hour Reference Toxicant Test Results for *Daphnia pulex*



Dates	Values	Mean	-1 SD	-2 SD	+1 SD	+2 SD
02/26/13	1.3000					
03/22/13	1.8100	1.5550	1.1944	0.8338	1.9156	2.2762
04/02/13	1.3200	1.4767	1.1878	0.8990	1.7655	2.0544
05/29/13	1.7300	1.5400	1.2723	1.0046	1.8077	2.0754
06/04/13	1.3600	1.5040	1.2586	1.0132	1.7494	1.9948
07/24/13	1.8700	1.5650	1.2995	1.0339	1.8305	2.0961
08/09/13	1.4200	1.5443	1.2958	1.0472	1.7928	2.0413
09/05/13	1.9200	1.5913	1.3256	1.0599	1.8569	2.1226
10/01/13	2.2400	1.6633	1.3339	1.0045	1.9928	2.3222
11/13/13	2.4500	1.7420	1.3441	0.9461	2.1399	2.5379
12/17/13	1.2100	1.6936	1.2835	0.8733	2.1038	2.5140
01/07/14	2.7400	1.7808	1.2867	0.7925	2.2750	2.7691
02/04/14	1.7400	1.7777	1.3044	0.8312	2.2509	2.7242
03/05/14	2.3000	1.8150	1.3394	0.8637	2.2906	2.7663
04/01/14	2.4300	1.8560	1.3709	0.8859	2.3411	2.8261
05/07/14	1.8900	1.8581	1.3894	0.9207	2.3268	2.7955
07/16/14	1.8800	1.8594	1.4056	0.9517	2.3132	2.7671
07/30/14	2.4200	1.8906	1.4309	0.9712	2.3502	2.8099
08/13/14	2.3000	1.9121	1.4556	0.9991	2.3686	2.8251
08/19/14	2.0100	1.9170	1.4721	1.0273	2.3619	2.8067

**2014 48-HOUR ACUTE REFERENCE TOXICANT TEST RESULTS FOR  
PIMEPHALES PROMELAS**



Dates	Values	Mean	-1 SD	-2 SD	+1 SD	+2 SD
02/05/13	6.0900					
03/05/13	6.7700	6.4300	5.9492	5.4683	6.9108	7.3917
03/20/13	5.9200	6.2600	5.8102	5.3604	6.7098	7.1596
04/02/13	8.0700	6.7125	5.7358	4.7592	7.6892	8.6658
05/07/13	7.0900	6.7880	5.9255	5.0630	7.6505	8.5130
06/17/13	6.5600	6.7500	5.9730	5.1959	7.5270	8.3041
07/24/13	7.1600	6.8086	6.0825	5.3564	7.5346	8.2607
08/09/13	6.0000	6.7075	5.9770	5.2466	7.4380	8.1684
09/03/13	5.9200	6.6200	5.8880	5.1560	7.3520	8.0840
10/01/13	5.9200	6.5500	5.8252	5.1005	7.2748	7.9995
11/06/13	6.7500	6.5682	5.8780	5.1878	7.2584	7.9486
12/04/13	5.8100	6.5050	5.8115	5.1180	7.1985	7.8920
01/07/14	5.4000	6.4200	5.6887	4.9574	7.1513	7.8826
02/04/14	7.8200	6.5200	5.7240	4.9279	7.3160	8.1121
03/05/14	6.7500	6.5353	5.7660	4.9966	7.3047	8.0741
04/02/14	5.8600	6.4931	5.7309	4.9687	7.2553	8.0176
05/06/14	5.8600	6.4559	5.7021	4.9482	7.2097	7.9635
06/05/14	7.3100	6.5033	5.7448	4.9863	7.2619	8.0204
07/08/14	6.3700	6.4963	5.7585	5.0207	7.2341	7.9719
08/05/14	5.9200	6.4675	5.7379	5.0083	7.1971	7.9267

**APPENDIX E**  
**AGENCY FORMS**

**Acute Forms**  
**Daphnia pulex Survival**

Permittee: Camden Water Utilities

NPDES Permit Number: AR0022365/ AFIN 52-00073

Composite Collected

From: 8/25/14

To: 8/26/14

From: 8/26/14

To: 8/27/14

Test Initiated: 8/27/14

Dilution Water Used:

Receiving Water

**Reconstituted Water**

**Dilution Series Results - Percent Survival**

TIME OF READING	REP	0	12.0	16.0	21.0	28.0	37.0
24-hour	A	100.0	100.0	100.0	100.0	100.0	100.0
	B	100.0	100.0	100.0	100.0	100.0	100.0
	C	100.0	100.0	100.0	100.0	100.0	100.0
	D	100.0	100.0	100.0	100.0	100.0	100.0
	E	100.0	100.0	100.0	100.0	100.0	100.0
48-hour	A	100.0	62.5	87.5	100.0	100.0	100.0
	B	100.0	87.5	62.5	75.0	87.5	100.0
	C	87.5	62.5	100.0	87.5	75.0	75.0
	D	100.0	100.0	87.5	87.5	87.5	87.5
	E	100.0	75.0	87.5	100.0	87.5	75.0
	Mean	97.5	77.5	85.0	90.0	85.0	87.5

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 (28.0%)      YES       NO  
 b.) 1/2 LOW FLOW OR 2X CRITICAL DILUTION (N/A%)      YES      NO

2. Enter percent effluent corresponding to the  $LC_{50}$  below:

$LC_{50}$  = >37.0% effluent

95 % confidence limits: N/A

Method of  $LC_{50}$  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: Callahan  
 Sample Collected From: Date 8/25/14 Time 0800  
 To: Date 8/26/14 Time 0800  
 Test Begin Date 8/27/14 Time 1510  
 Test End Date 8/29/14 Time 1425

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	8.3	8.0	24.8	24.7	24.6	32.0	36.0		48.0	44.0		7.5	7.3	7.2
12.0		8.1	8.3	7.6	24.8	24.7	24.6							7.5	7.1	7.1
16.0		8.1	8.3	7.8	24.8	24.7	24.6							7.4	7.2	7.1
21.0		8.1	8.3	7.8	24.8	24.7	24.6							7.4	7.2	7.1
28.0		8.1	8.2	7.8	24.8	24.7	24.6							7.4	7.2	7.1
37.0		8.1	8.2	7.8	24.8	24.7	24.6	28.0	32.0		52.0	60.0		7.3	7.2	7.1

\*This Form is to be submitted with each DMR.  
 Alkalinity and hardness to be reported as mg/l CaCO<sub>3</sub>

**Acute Forms**  
**Pimephales promelas (Fathead minnow) Survival**

**Permittee: Camden Water Utilities**

**NPDES Permit Number: AR0022365/ AFIN 52-00073**

**Composite Collected**      **From: 8/25/14**      **To: 8/26/14**  
    **From: 8/26/14**      **To: 8/27/14**

**Test Initiated: 8/27/14**

**Dilution Water Used:**      **Receiving Water**      **Reconstituted Water**

**Dilution Series Results - Percent Survival**

TIME OF READING	REP	0	12.0	16.0	21.0	28.0	37.0
24-hour	A	100.0	100.0	100.0	100.0	100.0	100.0
	B	100.0	100.0	100.0	100.0	100.0	100.0
	C	100.0	100.0	100.0	100.0	100.0	100.0
	D	100.0	100.0	100.0	100.0	100.0	100.0
	E	100.0	100.0	100.0	100.0	100.0	100.0
48-hour	A	100.0	100.0	100.0	100.0	100.0	100.0
	B	100.0	100.0	100.0	100.0	100.0	100.0
	C	100.0	100.0	100.0	100.0	100.0	100.0
	D	100.0	100.0	100.0	100.0	100.0	100.0
	E	100.0	100.0	100.0	100.0	100.0	100.0
	Mean	100.0	100.0	100.0	100.0	100.0	100.0

**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 (28.0%)**      **YES**      **X NO**  
 b.) **½ LOW FLOW OR 2X CRITICAL DILUTION (N/A%)**      **YES**      **NO**

**2. Enter percent effluent corresponding to the LC<sub>50</sub> below:**

**LC<sub>50</sub> =            >37.0% effluent**

**95 % confidence limits: N/A**

**Method of LC<sub>50</sub> 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: Callahan**

**Sample Collected                      From:                      Date 8/25/14                      Time 0800**

**To:    Date 8/26/14                      Time 0800**

**Test Begin                                      Date 8/27/14                      Time 1420**

**Test End                                        Date 8/29/14                      Time 1405**

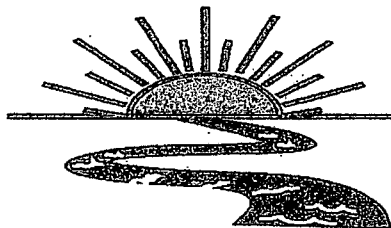
Parameter	D.O.			Temperature			Alkalinity			Hardness			pH			
	Dilut./Time	0hrs	24hrs	48hrs	0hrs	24hrs	48hrs	0hrs	24hrs	48hrs	0hrs	24hrs	48hrs	0hrs	24hrs	48hrs
0		8.2	8.3	7.7	24.8	24.7	24.6	32.0	36.0		48.0	44.0		7.5	7.3	7.0
12.0		8.1	8.3	7.7	24.8	24.7	24.6							7.5	7.1	7.1
16.0		8.1	8.3	7.6	24.8	24.7	24.6							7.4	7.2	6.9
21.0		8.1	8.3	7.6	24.8	24.7	24.6							7.4	7.2	6.9
28.0		8.1	8.2	7.6	24.8	24.7	24.6							7.4	7.2	7.0
37.0		8.1	8.2	7.5	24.8	24.7	24.6	28.0	32.0		52.0	60.0		7.3	7.2	7.0

\*This Form is to be submitted with each DMR.

Alkalinity and hardness to be reported as mg/l CaCO<sub>3</sub>

**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

Client: Camden Water

Project#: X5525

Chain of Custody Documents Checked by: AH 9/2/14  
Technician/Date

Raw Data Documents Checked by: AH 9/2/14  
Technician/Date

Statistical Analysis Package Checked by: EOB 9/3/14  
Quality Manager/Date

Quality Control Data Checked by: EOB 9/2/14  
Quality Manager/Date

Report Checked by: EOB 9/10/14  
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.

Kevin H. Bropp, BS  
Quality Manager

9/10/14  
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. Box J  
Camden, AR 71711



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