



December 21, 2014

Arkansas Department of Environmental Quality
Water Enforcement Branch
5301 Northshore Drive
North Little Rock, AR 72118-5317

RE: NPDES Permit AR0000752 Discharge Monitoring Report for period ending November 30, 2014.

Enclosed you will find the Discharge Monitoring Reports ending November 30, 2014. The DMR's for Outfall 010-A were entered on the blank DMR forms provided by Amy Schluterman, ADEQ Water Enforcement.

If you have any questions regarding this report, please contact David Sartain at (870) 863-1400.

Sincerely,

A handwritten signature in cursive script that reads "Edward L. Pearson".

Edward L. Pearson

Environmental Technician

Enclosures

NON-COMPLIANCE REPORT

Facility Name: **EI Dorado Chemical Company**

Permit Number: **AR0000752**

AFIN:

70-00040

Month / Year: **Nov-14**

Type of Violation	Permit Limit	Date of Violation	Cause of Violation	Corrective Action or Other Narrative
Outfall 010 / TSS (1132.61 lb / day)	750.6 Daily Max	11/16/2014	Unknown	Seasonal Algae bloom. All parameters are back in permitted limits.
Outfall 006 / Zinc Monthly Average (710 ug/L)	115.62 ug/L Monthly Average	11/5/2014	Unknown	EDCC has land applied pelletized lime in the area of outfall 006 in an effort to promote vegetative cover.
Outfall 006 / Zinc Daily Max (710 ug/L)	231.99 ug/L Daily Max	11/5/2014	Unknown	EDCC has land applied pelletized lime in the area of outfall 006 in an effort to promote vegetative cover.
Outfall 006 / Lead Monthly Average (8.9 ug/L)	3.8 ug/L Monthly Average	11/5/2014	Unknown	EDCC has land applied pelletized lime in the area of outfall 006 in an effort to promote vegetative cover.
Outfall 006 / Lead Daily Max (8.9 ug/L)	7.62 ug/L Daily Max.	11/5/2014	Unknown	EDCC has land applied pelletized lime in the area of outfall 006 in an effort to promote vegetative cover.
Outfall 006 / TDS Daily Max (870 mg/L)	436.5 mg/L Daily Max	11/5/2014	Unknown	EDCC has land applied pelletized lime in the area of outfall 006 in an effort to promote vegetative cover.
Outfall 006 / TDS Monthly Average (870 mg/L)	291 mg/L Monthly Average	11/5/2014	Unknown	EDCC has land applied pelletized lime in the area of outfall 006 in an effort to promote vegetative cover.
Outfall 007 / pH Minimum (4.7 su)	6 su/ Minimum	11/5/2014	Unknown	EDCC has land applied pelletized lime in the area of outfall 006 in an effort to promote vegetative cover.
Outfall 007 / Lead Monthly Average (7.9 ug/L)	3.8 ug/L Monthly Average	11/5/2014	Unknown	EDCC has land applied pelletized lime in the area of outfall 006 in an effort to promote vegetative cover.
Outfall 007 / Lead Daily Maximum (7.90 ug/L)	7.62 ug/L Daily Max.	11/5/2014	Unknown	EDCC has land applied pelletized lime in the area of outfall 006 in an effort to promote vegetative cover.
Outfall 007 / Zinc Monthly Average (210 ug/L)	115.62 ug/L Monthly Average	11/5/2014	Unknown	EDCC has land applied pelletized lime in the area of outfall 007 in an effort to promote vegetative cover.
Outfall 007 / TDS Monthly Average (760 mg/L)	291 mg/L Monthly Average	11/5/2014	Unknown	EDCC has land applied pelletized lime in the area of outfall 007 in an effort to promote vegetative cover.
<p>I CERTIFY THAT UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND AM WITH THE INFORMATION SUBMITTED HEREIN; AND BASED ON MY INQUIRY OF THOSE INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR OBTAINING THE INFORMATION, I BELIEVE THE SUBMITTED INFORMATION IS TRUE, ACCURATE AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT. SEE 18 U.S.C 1001 AND 33 U.S.C. 1319. (Penalties under these statutes may include fines up to \$10,000 and or maximum imprisonment of between 6 months and 5 years.)</p>				<p style="text-align: center;"><i>Sheryl Withrow</i> 12/19/14 Signature / Date</p>

Bio-Analytical Laboratories (BAL)
ADEQ#88-0630
Project X5600

Bio-Analytical Laboratories' Executive Summary

Permittee: El Dorado Chemical Company
P.O. Box 231
El Dorado, AR 71731

Project #: X5600

Outfall: Outfall 006 (contaminated storm water)

Permit #: AR0000752/ AFIN #70-00040

Contact: Mr. Eddie Pearson

Test Dates: November 6 - 8, 2014

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

Results:

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 No. TEM6C- 0 - Pass
2. Report the NOEC for survival, Parameter TOM6C - 100.0%.
3. Report the highest (critical dilution or control) Coefficient of Variation, Parameter TQM6C - 6.06%.

For *Daphnia pulex*:

1. If the NOEC for survival is less than the critical dilution (100.0%), enter a "1"; otherwise, enter a "0" for Parameter No. TEM3D- 0-Pass.
2. Report the NOEC for survival, Parameter TOM3D -100.0%.
3. Report the highest (critical dilution or control) Coefficient of Variation, Parameter TQM3D - 11.68%.

This report contains a total of 33 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 data in this report is for monitoring purposes only and should not be reported on discharge monitoring reports.



Bio-Analytical Laboratories

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**THE RESULTS OF TWO 48-HOUR ACUTE
TOXICITY TESTS
FOR OUTFALL 006
AT**

**EL DORADO CHEMICAL COMPANY
El Dorado, Arkansas**

**NPDES #AR0000752
AFIN #70-00040**

EPA Methods 2000.0 and 2021.0

Project X5600

**Test Dates: November 6 - 8, 2014
Report Date: December 18, 2014**

Prepared for:
Mr. Eddie Pearson
El Dorado Chemical Company
P.O. Box 231
El Dorado, AR 71731

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

BAL
ADEQ #88-0630
Project X5600

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BAL
ADEQ #88-0630
Project X5600

1.0 Introduction

Bio-Analytical Laboratories (BAL), Doyline, Louisiana conducted two 48-hour acute toxicity tests for Outfall 006 at El Dorado Chemical Company, El Dorado, Arkansas. The test organisms used were the fathead minnow, *Pimephales promelas* and the cladoceran, *Daphnia pulex*. 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 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. 20th Edition" (APHA 1998. Chemical results using this edition are listed in the report as SM 1997), and BAL's standard operating procedures.

2.2 Test Organisms

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

BAL
ADEQ #88-0630
Project X5600

2.3 Dilution Water

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

2.4 Test Concentrations

The test concentrations used in the acute tests were 100.0, 75.0, 56.0, 45.0, 32.0 and 22.0 percent effluent and a reconstituted water control. The critical dilution was defined as 100.0 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

One sample of Outfall 006 was collected by El Dorado Chemical personnel on November 5, 2014. Upon completion of collection, the sample was packed in ice and personally delivered to the laboratory. The temperature upon arrival was 2.0⁰ Celsius.

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±1⁰ Celsius. The total residual chlorine level (SM4500-Cl D 1997) 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 (SM4500-O G 1997), pH (SM4500-H+ B 1997) and conductivity (SM2510-B 1997) measurements were taken on the control and each test concentration at test initiation, at each renewal and at test termination. Alkalinity (SM2320-B 1997) and hardness (SM2340-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^R dual controlled illuminated incubator at a temperature of 25±1⁰ 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.

2.8 Data Analysis

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

BAL
ADEQ #88-0630
Project X5600

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 critical dilution in either test after 48 hours of exposure ($p=.05$). The NOEC values for both tests was 100.0 percent effluent ($p=.05$). The 48-hour LC_{50} values could not be calculated because greater than 50.0 percent survival occurred in each effluent concentration. See Appendix C- Statistical Analyses, for more information.

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

Percent Effluent	Percent Survival	
	<i>Pimephales promelas</i>	<i>Daphnia pulex</i>
Control	100.0	100.0
22.0	100.0	100.0
32.0	100.0	92.5
45.0	100.0	100.0
56.0	97.5	97.5
75.0	97.5	100.0
100.0	97.5	95.0

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

BAL
ADEQ #88-0630
Project X5600

4.0 Conclusions

The sample of Outfall 006 collected from El Dorado Chemical Company, El Dorado, Arkansas, on November 5, 2014, was not found to be lethally toxic to the fathead minnow test organisms nor the *Daphnia pulex* test organisms in the 100.0 percent critical dilution after 48 hours of exposure ($p=.05$). The 48-hour LC_{50} values could not be calculated because greater than 50.0 percent survival occurred in the effluent dilutions ($p=.05$).

BAL
ADEQ #88-0630
Project X5600

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. 20th 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: El Dorado Chemical Company		Phone: (870) 863-1484		Analysis:						Project Number: X5600 Temp. upon arrival: 2.0°C Therm# 29 EGB 11/6/14 Preservative: (below) ICE						
Address: 4500 Norwest Ave., El Dorado, AR 71731		Fax: (870) 863-7499		Chronic Ceriodaphnia	Chronic minnow	Acute minnow/fresh/marine)	Acute Daphnia species	Acute Mysid	Acute Ceriodaphnia		Fecal Coliform					
Permit #: AR0000752/AFIN 70-00040		Purchase Order:														
Sampler's Signature/Printed Name/Affiliation: Scott Brede <i>[Signature]</i> EDCC																
Date Start Date End	Time Start Time End	C	G							# and type of container		Sample Identification		Lab Control Number:		
11-5-14 11-5-14	1600 1800 2000	✓		6 half gallons	006		X	X	C9916							
Relinquished by/Affiliation: <i>[Signature]</i>				Date: 11-6-14	Time: 11:10	Received by/Affiliation: <i>[Signature]</i>		Date: 11-6-14	Time: 1110							
Relinquished by/Affiliation:				Date:	Time:	Received by/Affiliation:		Date:	Time:							
Relinquished by/Affiliation: <i>[Signature]</i>				Date: 11-6-14	Time: 1230	Received by/Affiliation: C. W. St. Bernard		Date: 11/6/14	Time: 1230							
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:																
COC Rev. 3.0																

APPENDIX B
RAW DATA SHEETS

BIO-ANALYTICAL LABORATORIES
ACUTE TOXICITY TEST WATER QUALITY DATA

X5600
Page 12 of 33

Project# X5600

Client: EDCC/El Dorado Chemical Company

Address: 4500 Northwest Ave El Dorado AR 71731

NPDES#AR0000752 Outfall 006

Technicians: EGB/RC

Test initiated: Date 11/6/14 Time 1545

Test terminated: Date 11/8/14 Time 1515

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

pH Meter: Model #Orion 230A+ Serial #105253

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
C9976	10.7	110/8.2	0.01	NO	3.0	N/A	208.0	16.0	EGB
↓	10.6	115/8.3	↓	↓	↓	↓			↓
	100%	91.1%/AB							

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 H2O	3667	N/A	N/A	N/A	N/A	7.7	48.6	28.6	EGB

Test Species Information

Test Species Info.	Species ID#	Species ID#	Species ID#	Species ID#
	D. pulex L13-K15	P. promelas BAC 11214		
Age	24 hrs	3 days		
Test Container Size	30.0ml	250.0ml		
Test volume	25.0ml	200.0ml		
Feeding: Type	Algae/YCT	Artemia		
Amount	2.0 hours prior to initiation			
Aeration?	N/A	→		
Amount				
Condition of survivors	good → EGB 11/8/14			

Comments:

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

Project# X5600
 Client EDCC

Test started: Date 11/6/14 Time 1530
 Test ended: Date 11/8/14 Time 1405
 Test Species D. pulex ID# I13-K15

Sample Description 006
 Technician: 0hour ENS 24hour RC 48hour EB 72hour _____ 96hour _____
 Time: 0hour 1530 24hour 1210 48hour 455 72hour _____ 96hour _____
 Temperature (°C): 0hour 24.9 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
0	A	NA	8	8	8			8.1	8.0	8.3			7.0	7.4	7.6			172.3	171.2	171.6		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
22	A		8	8	8			8.1	8.1	8.0			7.0	7.3	7.2			329	316	314		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
Chemistry Tech prerenewal/postrenewal																						

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

Project# X5600
 Client EDCC

Test started: Date 11/6/14 Time 1530
 Test ended: Date 11/8/14 Time 1455
 Test Species D. pulex ID# I13-K15

Sample Description 006
 Technician: RC RC RC
 Time: 1530 1530 1530
 Temperature (°C): 24.9 25.0 24.7

72hour RC 96hour RC
 72hour RC 96hour RC
 72hour RC 96hour RC

Test Dilution	Replicate	Test Salinity	# Live Organisms				Dissolved Oxygen				pH				Conductivity										
			0	24	48	72	96	0	24	48	72	96	0	24	48	72	96								
32	A	Na	8	6	6						8.1	7.8	8.0								410	431	416	416	
	B		8	7	7																				
	C		8	8	8																				
	D		8	8	8																				
	E		8	8	8																				
45	A		8	8	8						8.2	7.7	8.2									493	514	508	567
	B		8	8	8																				
	C		8	8	8																				
	D		8	8	8																				
	E		8	8	8																				
Chemistry Tech prerenewal/postrenewal			RC				RC				RC				RC										

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

Project# X5600
 Client EDCC

Test started: Date 11/6/14 Time 1530
 Test ended: Date 11/8/14 Time 1455
 Test Species D. pulex ID# I13-K15

Sample Description 006
 Technician: Ohour EGG 24hour R 48hour EB 72hour _____ 96hour _____
 Time: Ohour 1530 24hour 1210 48hour 1455 72hour _____ 96hour _____
 Temperature (°C): Ohour 24.9 24hour 24.8 48hour 24.7 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
56	A	Na	8	7	7			8.1	7.1	8.0			6.8	7.0	7.0			582	598	586	580	
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
75	A		8	8	8			8.1	7.1	8.1			6.8	6.9	6.9			7.6	7.2	7.6	7.5	
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
Chemistry Tech			EGG RC/EB					EGG RC/EB					EGG RC/EB									
Prerenewal/postrenewal			RC/EB					RC/EB					RC/EB									

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

Project# X5600
 Client EDCC

Test started: Date 11/6/14 Time 1530
 Test ended: Date 11/8/14 Time 1455

Sample Description 006 24hour RC 48hour 818 72hour _____ 96hour _____
 Technician: Ohour EGB 24hour 1210 48hour 1455 72hour _____ 96hour _____
 Time: Ohour 1530 24hour 1410 48hour 1455 72hour _____ 96hour _____
 Temperature (°C): Ohour 24.9 24hour 24.8 48hour 24.7 72hour _____ 96hour _____

Test Species D. pulex ID# TG-K15

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
100	A	Na	8	8	8			8.1	8.2	8.1			6.6	6.8	6.8			685	900	900		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	6	6																	
	B																					
	C																					
	D																					
	E																					
Chemistry Tech prerenewal/postrenewal																						

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

Project# X51000
 Client EDCC

Test started: Date 11/6/14 Time 1545
 Test ended: Date 11/8/14 Time 1615

Sample Description 006
 Technician: RC 24hour RC 48hour RC 72hour _____ 96hour _____
 Time: 1545 24hour 1400 48hour 1515 72hour _____ 96hour _____
 Temperature (°C): 25.0 24hour 25.0 48hour 24.7 72hour _____ 96hour _____
 Test Species P. promelas ID# BAL/11314

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						8.1	7.8	7.0																																							
	B		8	8	8																																															
	C		8	8	8																																															
	D		8	8	8																																															
	E		8	8	8																																															
22	A		8	8	8						8.1	7.6	7.9																																							
	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# X5600
 Client EDCC

Test started: Date 11/6/14 Time 1545
 Test ended: Date 11/8/14 Time 1515

Sample Description 006 Test Species P. promelas ID# BAL/11314
 Technician: Ohour RC 24hour RC 48hour ESB 72hour _____ 96hour _____
 Time: Ohour 1545 24hour 1400 48hour 1515 72hour _____ 96hour _____
 Temperature (°C): Ohour 23.6 24hour 25.0 48hour 24.7 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	
			%																				
32	D	NA	8	8	8			8.1	7.7	7.9			6.9	7.9	7.1			410	414	418			
	B		8	8	8																		
	C		8	8	8																		
	D		8	8	8																		
	E		8	8	8																		
45	D		8	8	8			8.2	7.7	7.8			6.9	7.9	7.0			493	539	544			
	B		8	8	8																		
	C		8	8	8																		
	D		8	8	8																		
	E		8	8	8																		
Chemistry Tech prerenewal/postrenewal			ESB RC ESB					ESB RC ESB					ESB RC ESB										

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

Project# X5600
 Client EDCC

Test started: Date 11/6/14 Time 1545

Test ended: Date 11/8/14 Time 1615

Sample Description 006
 Technician: Ohour RC 24hour RC 48hour EB
 Time: Ohour 1545 24hour 1400 48hour 1515
 Temperature (°C): Ohour 25.0 24hour 25.0 48hour 24.7

Test Species P. promelas ID# BAL/11314
 72hour _____ 96hour _____
 72hour _____ 96hour _____
 72hour _____ 96hour _____

Test Dilution %	Replicate	Test Salinity Na	# 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
56	A		8	8	8			8.1	7.1 8.4	7.8			6.8	7.0 6.9	7.0			582	622 576	626		
	B		8	8	8																	
	C		8	7	7																	
	D		8	8	8																	
	E		8	8	8																	
75	A		8	7	7			8.1	7.7 8.2	7.7			6.8	6.9 6.9	6.9			716	758 726	776		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
Chemistry Tech prerenewal/postrenewal							<u>EB</u> <u>RC</u> <u>EB</u>					<u>EB</u> <u>RC</u> <u>EB</u>					<u>EB</u> <u>RC</u> <u>EB</u>					

APPENDIX C
STATISTICAL ANALYSES

Daphnid Acute Test-48 Hr Survival

X5600
Page 22 of 33

Start Date: 11/6/2014	Test ID: X5600DP	Sample ID: AR0000752
End Date: 11/8/2014	Lab ID: ADEQ880630	Sample Type: EFF2-Industrial
Sample Date: 11/5/2014	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	1.0000	1.0000	1.0000
22	1.0000	1.0000	1.0000	1.0000	1.0000
32	0.7500	0.8750	1.0000	1.0000	1.0000
45	1.0000	1.0000	1.0000	1.0000	1.0000
56	0.8750	1.0000	1.0000	1.0000	1.0000
75	1.0000	1.0000	1.0000	1.0000	1.0000
100	1.0000	1.0000	1.0000	1.0000	0.7500

Conc-%	Transform: Arcsin Square Root						Rank Sum	1-Tailed Critical
	Mean	N-Mean	Mean	Min	Max	CV%		
D-Control	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5	
22	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5	27.50 16.00
32	0.9250	0.9250	1.2872	1.0472	1.3931	12.116	5	22.50 16.00
45	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5	27.50 16.00
56	0.9750	0.9750	1.3564	1.2094	1.3931	6.055	5	25.00 16.00
75	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5	27.50 16.00
100	0.9500	0.9500	1.3239	1.0472	1.3931	11.684	5	25.00 16.00

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.05)	0.72107	0.934	-2.0118	5.23199
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				

Acute Fish Test-48 Hr Survival

X5600

Page 23 of 33

Start Date: 11/6/2014 Test ID: X5600PP Sample ID: AR0000752
 End Date: 11/8/2014 Lab ID: ADEQ880630 Sample Type: EFF2-Industrial
 Sample Date: 11/5/2014 Protocol: EPAAW02-EPA/821/R-02-01 Test Species: PP-Plimephales promelas
 Comments:

Conc-%	1	2	3	4	5
D-Control	1.0000	1.0000	1.0000	1.0000	1.0000
22	1.0000	1.0000	1.0000	1.0000	1.0000
32	1.0000	1.0000	1.0000	1.0000	1.0000
45	1.0000	1.0000	1.0000	1.0000	1.0000
56	1.0000	1.0000	0.8750	1.0000	1.0000
75	0.8750	1.0000	1.0000	1.0000	1.0000
100	0.8750	1.0000	1.0000	1.0000	1.0000

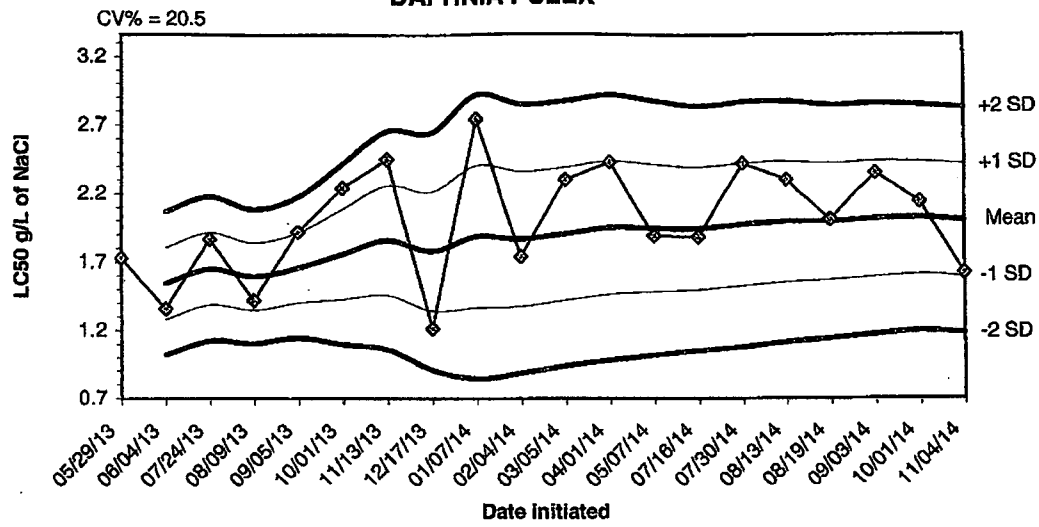
Conc-%	Transform: Arcsin Square Root							Rank Sum	1-Tailed Critical
	Mean	N-Mean	Mean	Min	Max	CV%	N		
D-Control	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5		
22	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5	27.50	16.00
32	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5	27.50	16.00
45	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5	27.50	16.00
56	0.9750	0.9750	1.3564	1.2094	1.3931	6.055	5	25.00	16.00
75	0.9750	0.9750	1.3564	1.2094	1.3931	6.055	5	25.00	16.00
100	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 <= 0.05)	0.58129	0.934	-2.3952	5.50568
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
11/11/14

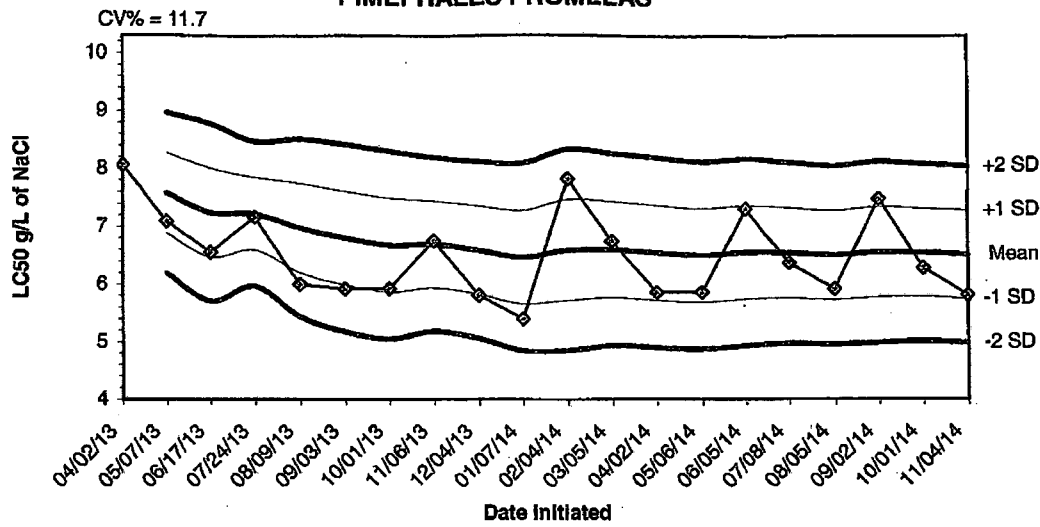
APPENDIX D
QUALITY ASSURANCE CHARTS

**2014 48 HOUR ACUTE REFERENCE TOXICANT TEST RESULTS FOR
DAPHNIA PULEX**



Dates	Values	Mean	-1 SD	-2 SD	+1 SD	+2 SD
05/29/13	1.7300					
06/04/13	1.3600	1.5450	1.2834	1.0217	1.8066	2.0683
07/24/13	1.8700	1.6533	1.3898	1.1263	1.9168	2.1803
08/09/13	1.4200	1.5950	1.3503	1.1055	1.8397	2.0845
09/05/13	1.9200	1.6600	1.4030	1.1460	1.9170	2.1740
10/01/13	2.2400	1.7567	1.4267	1.0966	2.0867	2.4167
11/13/13	2.4500	1.8557	1.4564	1.0571	2.2550	2.6543
12/17/13	1.2100	1.7750	1.3405	0.9060	2.2095	2.6440
01/07/14	2.7400	1.8822	1.3639	0.8456	2.4005	2.9188
02/04/14	1.7400	1.8680	1.3773	0.8865	2.3587	2.8495
03/05/14	2.3000	1.9073	1.4238	0.9404	2.3907	2.8741
04/01/14	2.4300	1.9508	1.4658	0.9808	2.4358	2.9208
05/07/14	1.8900	1.9462	1.4815	1.0168	2.4108	2.8755
07/16/14	1.8800	1.9414	1.4946	1.0479	2.3882	2.8350
07/30/14	2.4200	1.9733	1.5254	1.0775	2.4212	2.8692
08/13/14	2.3000	1.9938	1.5534	1.1130	2.4341	2.8745
08/19/14	2.0100	1.9947	1.5683	1.1419	2.4211	2.8475
09/03/14	2.3500	2.0144	1.5924	1.1703	2.4365	2.8586
10/01/14	2.1400	2.0211	1.6099	1.1987	2.4322	2.8434
11/04/14	1.6200	2.0010	1.5909	1.1807	2.4111	2.8213

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



Dates	Values	Mean	-1 SD	-2 SD	+1 SD	+2 SD
04/02/13	8.0700					
05/07/13	7.0900	7.5800	6.8870	6.1941	8.2730	8.9659
06/17/13	6.5600	7.2400	6.4739	5.7078	8.0061	8.7722
07/24/13	7.1600	7.2200	6.5932	5.9664	7.8468	8.4736
08/09/13	6.0000	6.9780	6.2084	5.4367	7.7456	8.5153
09/03/13	5.9200	6.8000	5.9878	5.1755	7.6122	8.4245
10/01/13	5.9200	6.6743	5.8616	5.0490	7.4869	8.2996
11/06/13	6.7500	6.6838	5.9309	5.1781	7.4366	8.1894
12/04/13	5.8100	6.5867	5.8246	5.0625	7.3487	8.1108
01/07/14	5.4000	6.4680	5.6574	4.8468	7.2786	8.0892
02/04/14	7.8200	6.5909	5.7206	4.8502	7.4613	8.3316
03/05/14	6.7500	6.6042	5.7731	4.9419	7.4353	8.2664
04/02/14	5.8600	6.5469	5.7249	4.9028	7.3690	8.1911
05/06/14	5.8600	6.4979	5.6870	4.8761	7.3087	8.1196
06/05/14	7.3100	6.5520	5.7430	4.9340	7.3610	8.1700
07/08/14	6.3700	6.5406	5.7577	4.9748	7.3235	8.1065
08/05/14	5.9200	6.5041	5.7313	4.9584	7.2770	8.0498
09/02/14	7.4800	6.5583	5.7741	4.9898	7.3426	8.1269
10/01/14	6.2800	6.5437	5.7788	5.0140	7.3085	8.0734
11/04/14	5.8100	6.5070	5.7447	4.9824	7.2693	8.0316

APPENDIX E
AGENCY FORMS

Acute Forms
Daphnia pulex Survival

Permittee: El Dorado Chemical - Outfall 006

NPDES Permit Number: AR0000752/ AFIN 70-00040

Composite Collected

From: 11/5/14

To: 11/5/14

From:

To:

Test Initiated: 11/6/14

Dilution Water Used:

Receiving Water

X Reconstituted Water

Dilution Series Results - Percent Survival

TIME OF READING	REP	0	22.0	32.0	45.0	56.0	75.0	100.0
24-hour	A	100.0	100.0	75.0	100.0	87.5	100.0	100.0
	B	100.0	100.0	87.5	100.0	100.0	100.0	100.0
	C	100.0	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	100.0
	E	100.0	100.0	100.0	100.0	100.0	100.0	75.0
48-hour	A	100.0	100.0	75.0	100.0	87.5	100.0	100.0
	B	100.0	100.0	87.5	100.0	100.0	100.0	100.0
	C	100.0	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	100.0
	E	100.0	100.0	100.0	100.0	100.0	100.0	75.0
	Mean	100.0	100.0	92.5	100.0	97.5	100.0	95.0

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 (100.0%)** 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:

Method of LC₅₀ calculation:

- 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 pulex 48 hour Acute Static Renewal
Chemical Parameters Chart***

Permittee: El Dorado Chemical - Outfall 006
NPDES Number: AR0000752/ AFIN 70-00040
Contact: David Sartain
Analyst: Briggs, Callahan
Sample Collected

From: Date 11/5/14 Time 1600
To: Date 11/5/14 Time 2000
Date 11/6/14 Time 1530
Date 11/8/14 Time 1455

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		8.1	8.5	8.3	24.9	24.8	24.7	28.0			48.0			7.0	7.3	7.6
22.0		8.1	8.5	8.2	24.9	24.8	24.7							7.0	7.1	7.2
32.0		8.1	8.4	8.0	24.9	24.8	24.7							6.9	7.0	7.1
45.0		8.2	8.4	8.2	24.9	24.8	24.7							6.9	6.9	7.0
56.0		7.1	8.4	8.0	24.9	24.8	24.7							6.8	6.9	7.0
75.0		8.1	8.3	8.1	24.9	24.8	24.7							6.8	6.9	6.9
100.0		8.1	8.2	8.1	24.9	24.8	24.7	16.0			208.0			6.6	6.8	6.8

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

Acute Forms
Pimephales promelas Survival

Permittee: El Dorado Chemical - Outfall 006
NPDES Permit Number: AR0000752/ AFIN 70-00040

Composite Collected From: 11/5/14 To: 11/5/14
From: To:

Test Initiated: 11/6/14

Dilution Water Used: Receiving Water X Reconstituted Water

Dilution Series Results - Percent Survival

TIME OF READING	REP	0	22.0	32.0	45.0	56.0	75.0	100.0
24-hour	A	100.0	100.0	100.0	100.0	100.0	87.5	87.5
	B	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	C	100.0	100.0	100.0	100.0	87.5	100.0	100.0
	D	100.0	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	100.0
48-hour	A	100.0	100.0	100.0	100.0	100.0	87.5	87.5
	B	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	C	100.0	100.0	100.0	100.0	87.5	100.0	100.0
	D	100.0	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	100.0
	Mean		100.0	100.0	100.0	100.0	97.5	97.5

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 (100.0%)** 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:

Method of LC₅₀ calculation:

- 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: El Dorado Chemical - Outfall 006
NPDES Number: AR0000752/ AFIN 70-00040
Contact: David Sartain

Analyst: Briggs, Callahan

Sample Collected From: Date 11/5/14 Time 1600

To: Date 11/5/14 Time 2000

Test Begin Date 11/6/14 Time 1545

Test End Date 11/8/14 Time 1515

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	8.1	8.5	7.9	25.0	25.0	24.7	28.0				48.0			7.0	7.3	7.4
22.0	8.1	8.5	7.9	25.0	25.0	24.7								7.0	7.1	7.1
32.0	8.1	8.4	7.9	25.0	25.0	24.7								6.9	7.0	7.1
45.0	8.2	8.4	7.8	25.0	25.0	24.7								6.9	6.9	7.0
56.0	7.1	8.4	7.8	25.0	25.0	24.7								6.8	6.9	6.9
75.0	8.1	8.3	7.7	25.0	25.0	24.7								6.8	6.9	6.9
100.0	8.1	8.2	7.7	25.0	25.0	24.7	16.0				208.0			6.6	6.8	6.7

*This Form is to be submitted with each DMR.

Alkalinity and hardness to be reported as mg/l CaCO₃

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: El Dorado Chemical

Project#: X5600

Chain of Custody Documents Checked by: EGB 12/18/14
Technician/Date

Raw Data Documents Checked by: EGB 12/18/14
Technician/Date

Statistical Analysis Package Checked by: EGB 11/11/14
Quality Manager/Date

Quality Control Data Checked by: EGB 11/11/14
Quality Manager/Date

Report Checked by: EGB 12/18/14
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.

Erin H. Brugg, BS
Quality Manager

12/18/14
Date

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

Bio-Analytical Laboratories (BAL)
ADEQ#88-0630
Project X5601

Bio-Analytical Laboratories' Executive Summary

Permittee: El Dorado Chemical Company
P.O. Box 231
El Dorado, AR 71731

Project #: X5601

Outfall: Outfall 007 (contaminated storm water)

Permit #: AR0000752/ AFIN #70-00040

Contact: Mr. Eddie Pearson

Test Dates: November 6 - 8, 2014

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

Results:

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 No. TEM6C- 1 -**Fail**
2. Report the NOEC for survival, Parameter TOM6C - 56.0%.
3. Report the highest (critical dilution or control) Coefficient of Variation, Parameter TQM6C - 0.00%.

For *Daphnia pulex*:

1. If the NOEC for survival is less than the critical dilution (100.0%), enter a "1"; otherwise, enter a "0" for Parameter No. TEM3D- 1-**Fail**
2. Report the NOEC for survival, Parameter TOM3D -32.0%.
3. Report the highest (critical dilution or control) Coefficient of Variation, Parameter TQM3D - 0.00%.

-Note: Increasing the pH from 4.3 to a range of 6.0-9.0, increased the survival in both tests; however, the *Daphnia pulex* test still failed.

This report contains a total of 35 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 data in this report is for monitoring purposes only and should not be reported on discharge monitoring reports.



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**THE RESULTS OF TWO 48-HOUR ACUTE
TOXICITY TESTS
FOR OUTFALL 007
AT**

**EL DORADO CHEMICAL COMPANY
El Dorado, Arkansas**

**NPDES #AR0000752
AFIN #70-00040**

EPA Methods 2000.0 and 2021.0

Project X5601

**Test Dates: November 6 - 8, 2014
Report Date: December 18, 2014**

Prepared for:
Mr. Eddie Pearson
El Dorado Chemical Company
P.O. Box 231
El Dorado, AR 71731

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

BAL
ADEQ #88-0630
Project X5601

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BAL
ADEQ #88-0630
Project X5601

1.0 Introduction

Bio-Analytical Laboratories (BAL), Doyline, Louisiana conducted two 48-hour acute toxicity tests for Outfall 007 at El Dorado Chemical Company, El Dorado, Arkansas. The test organisms used were the fathead minnow, *Pimephales promelas* and the cladoceran, *Daphnia pulex*. 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. 20th Edition" (APHA 1998. Chemical results using this edition are listed in the report as SM 1997), and BAL's standard operating procedures.

2.2 Test Organisms

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

BAL
ADEQ #88-0630
Project X5601

2.3 Dilution Water

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

2.4 Test Concentrations

The test concentrations used in the tests were 100.0, 75.0, 56.0, 50.0, 45.0, and 32.0 percent effluent and a reconstituted water control. The critical dilution was defined as 100.0 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

One sample of Outfall 007 was collected by El Dorado Chemical personnel on November 5, 2014. Upon completion of collection, the sample was packed in ice and delivered to the laboratory by BAL personnel. The temperature upon arrival was 1.5° Celsius.

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° Celsius. The total residual chlorine level (SM4500-Cl D 1997) 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. An aliquot of the sample was adjusted from an initial pH of 4.3 to a pH range of 6.0-9.0. An extra 100.0 percent dilution was added to each test in order to document any lethality due to low pH. Dissolved oxygen (SM4500-O G 1997), pH (SM4500-H+ B 1997) and conductivity (SM2510-B 1997) measurements were taken on the control and each test concentration at test initiation, at each renewal and at test termination. Alkalinity (SM2320-B 1997) and hardness (SM2340-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^R dual controlled illuminated incubator at a temperature of 25±1° 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.

2.8 Data Analysis

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

BAL
ADEQ #88-0630
Project X5601

3.0 Results and Discussion

The results of the tests can be found in Table 1. Significant differences in survival were noted in the critical dilution in both tests after 48 hours of exposure (p=.05). The NOEC for survival for the *Daphnia pulex* and the fathead minnow test was 32.0 and 56.0 percent, respectively (p=.05). The 48 hour LC₅₀ value for the *Daphnia pulex* and the fathead minnow test was 44.5 and 63.8 percent, respectively (p=.05). Increasing the pH increased the survival rate in both tests.

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

Percent Effluent	Percent Survival	
	<i>Pimephales promelas</i>	<i>Daphnia pulex</i>
Test Organism		
Control	100.0	100.0
32.0	100.0	77.5
45.0	100.0	82.5
50.0	100.0	5.0
56.0	92.5	25.0
75.0	0.0	12.5
100.0	0.0	0.0
100.0 pH adjusted	97.5	52.5

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

BAL
ADEQ #88-0630
Project X5601

4.0 Conclusions

The sample of Outfall 007 collected from El Dorado Chemical Company, El Dorado, Arkansas, on November 5, 2014, was found to be lethally toxic to the fathead minnow test organisms and the *Daphnia pulex* in the 100.0 percent critical dilution after 48 hours of exposure ($p=.05$). Increasing the pH reduced the lethal effect.

BAL
ADEQ #88-0630
Project X5601

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. 20th Edition.

APPENDIX A
CHAIN-OF-CUSTODY DOCUMENTS



Bio-Analytical Laboratories

3240 Spurgin Road
Post Office Box 527
Doyline, LA 71023

(510) 748-2772
1-800-253-1248
Fax: (510) 748-2773

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

Laboratory Use Only:

Company: El Dorado Chemical Company		Phone: (870) 863-1484		Analysis:				Project Number: X560 Temp. upon arrival: 1.5°C Therm #29 ECB 11/6/14 Preservative: (below) ICE			
Address: 4500 Norwest Ave., El Dorado, AR 71731		Fax: (870) 863-7499		Chronic Ceriodaphnia	Chronic minnow	Acute minnow (fresh/marine)	Acute Daphnia species		Acute Mysid	Acute Ceriodaphnia	Fecal Coliform
Permit #: AR0000752/AFIN 70-00040		Purchase Order:									
Sampler's Signature/Printed Name/Affiliation: <i>Scott Brock</i> EDCC											
Date Start Date End	Time Start Time End	C	G					# and type of container			
11-5-14 - 11-5-14	1600 - 2000	✓		6 half gallons	007	09917					
Relinquished by/Affiliation: <i>[Signature]</i>				Date: 11-6-14	Time: 11:10	Received by/Affiliation: <i>[Signature]</i>		Date: 11-6-14	Time: 11:10		
Relinquished by/Affiliation:				Date:	Time:	Received by/Affiliation:		Date:	Time:		
Relinquished by/Affiliation: <i>[Signature]</i>				Date: 11-6-14	Time: 12:30	Received by/Affiliation: <i>[Signature]</i>		Date: 11/6/14	Time: 12:30		
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:											

COC Rev. 3.0

APPENDIX B
RAW DATA SHEETS

BIO-ANALYTICAL LABORATORIES
ACUTE TOXICITY TEST WATER QUALITY DATA

Project# X5601

Client: EDCC/El Dorado Chemical Company

Address: 4500 Northwest Ave El Dorado AR 71731

NPDES#AR0000752 Outfall 007

Technicians: EGB/RC

Test initiated: Date 11/6/14 Time 1630

Test terminated: Date 11/8/14 Time 1530

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

pH Meter: Model #Orion 230A+ Serial #105253

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
CPPT7	11.0	110/11.0	<0.01	NO	1.0	N/A	250.0	<1.0	EGB
↓	11.3	115/11.3	↓	↓	↓	↓			

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 H2O	367	N/A	N/A	N/A	N/A	7.7	48.0	28.6	EGB

Test Species Information

Test Species Info.	Species: <u>D. pulex</u> ID#: <u>113 KB</u>	Species: <u>P. promelas</u> ID#: <u>BAL/11314</u>	Species: .	Species: ID#:
Age	<u><24 hrs</u>	<u>3 days</u>		
Test Container Size	<u>30.0ml</u>	<u>250.0ml</u>		
Test volume	<u>25.0ml</u>	<u>200.0ml</u>		
Feeding: Type	<u>Algae/YCT</u>	<u>Artemia</u>		
Amount	<u>2.0 hours before initiation</u>			
Aeration?	<u>N/A</u>	<u>→</u>		
Amount				
Condition of survivors	<u>good → EGB 11/8/14</u>			

Comments: Adjusted pH of sample using 1.0N NaOH, Labchem, Lot B0187M EGB 11/6/14

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

Project# X5601

Test started: Date 11/6/14 Time 1545

Client EDCC

Test ended: Date 11/8/14 Time 1505

Sample Description 007

Test Species D. pulex ID# I3-K15

Technician: Ohour EGG 24hour RC 48hour EGB 72hour _____ 96hour _____

Time: Ohour 1545 24hour 1515 48hour 1505 72hour _____ 96hour _____

Temperature (°C): Ohour 24.9 24hour 24.8 48hour 24.7 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			8.1	7.9	8.2			7.2	7.2	7.8			176.3	176.3	176.3		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
32	A		8	8	8			8.2	8.0	8.1			6.5	7.3	7.6			348	348	348		460
	B		8	5	5																	
	C		8	5	5																	
	D		8	5	5																	
	E		8	8	8																	
Chemistry Tech prerenewal/postrenewal							EGG	RC	RC	EGB	EGG	RC	RC	EGB	EGG	RC	RC	EGB				

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

Project# X51001
 Client EDC

Sample Description: 007
 Technician: EDB
 Temperature (°C): 24, 24, 24
 Time: 0hour, 24hour, 48hour, 72hour, 96hour

Test Species: D. pulex
 ID# TR-K15

Test started: Date 11/6/14 Time 0545
 Test ended: Date 11/8/14 Time 1505

Conductivity

Test Dilution	Test Salinity	Replicate	Temperature (°C)	Time	Technician	Sample Description	# Live Organisms	Dissolved Oxygen					Conductivity
								0	24	48	72	96	
50		1	24	0	EDB	007	0	8.2	8.1	8.1	8.1	8.1	178
		2	24	0	EDB	007	0	8.2	8.1	8.1	8.1	8.1	178
		3	24	0	EDB	007	0	8.2	8.1	8.1	8.1	8.1	178
		4	24	0	EDB	007	0	8.2	8.1	8.1	8.1	8.1	178
		5	24	0	EDB	007	0	8.2	8.1	8.1	8.1	8.1	178
		6	24	0	EDB	007	0	8.2	8.1	8.1	8.1	8.1	178
		7	24	0	EDB	007	0	8.2	8.1	8.1	8.1	8.1	178
		8	24	0	EDB	007	0	8.2	8.1	8.1	8.1	8.1	178
		9	24	0	EDB	007	0	8.2	8.1	8.1	8.1	8.1	178
		10	24	0	EDB	007	0	8.2	8.1	8.1	8.1	8.1	178
		11	24	0	EDB	007	0	8.2	8.1	8.1	8.1	8.1	178
		12	24	0	EDB	007	0	8.2	8.1	8.1	8.1	8.1	178
		13	24	0	EDB	007	0	8.2	8.1	8.1	8.1	8.1	178
		14	24	0	EDB	007	0	8.2	8.1	8.1	8.1	8.1	178
		15	24	0	EDB	007	0	8.2	8.1	8.1	8.1	8.1	178
		16	24	0	EDB	007	0	8.2	8.1	8.1	8.1	8.1	178
		17	24	0	EDB	007	0	8.2	8.1	8.1	8.1	8.1	178
		18	24	0	EDB	007	0	8.2	8.1	8.1	8.1	8.1	178
		19	24	0	EDB	007	0	8.2	8.1	8.1	8.1	8.1	178
		20	24	0	EDB	007	0	8.2	8.1	8.1	8.1	8.1	178

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

Project# X5601
 Client EDCC

Test started: Date 11/6/14 Time 1645
 Test ended: Date 11/8/14 Time 1505
 Test Species D. pulex ID# I13-K15

Sample Description 007
 Technician: Ohour EGS 24hour RC 48hour EBB 72hour _____ 96hour _____
 Time: Ohour 1645 24hour 1315 48hour 1505 72hour _____ 96hour _____
 Temperature (°C): Ohour 24.9 24hour 24.8 48hour 24.7 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			
56	A	Na	8	5	2			8.1	7.8 8.4	8.1					5.7	6.9 5.6	6.5						479	518 443	567
	B		8	4	0																				
	C		8	8	2																				
	D		8	8	3																				
	E		8	7	3																				
75	A		8	8	1			8.2	7.9 8.3	8.2				4.7	6.4 4.7	6.0						596	625 601	686	
	B		8	6	1																				
	C		8	8	1																				
	D		8	8	1																				
	E		8	5	1																				
Chemistry Tech prerenewal/postrenewal								EBB RC/EBB					EBB RC/EBB					EBB RC/EBB							

ACUTE2 Rev 1.0 * accidentally spilled cup
 unable to recover other 4
 organisms - RC 11/7/14

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

Project# X51001
 Client EDCC

Test started: Date 11/6/14 Time 1645
 Test ended: Date 11/6/14 Time 1605
 Test Species D. pulex ID# I.13-K15

Sample Description 007
 Technician: 0hour EGS 24hour RC 48hour EGS 72hour _____ 96hour _____
 Time: 0hour 1545 24hour 1315 48hour 1525 72hour _____ 96hour _____
 Temperature (°C): 0hour 24.9 24hour 24.8 48hour 24.7 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						
100	A	Na	8	0				8.2	7.8						4.3	4.6							733	767				
	B		8	0																								
	C		8	0																								
	D		8	0																								
	E		8	0																								
100pH adj	A		8	6	6			8.6	7.9	8.3	8.1			6.2	6.1	6.3	6.9						736	750	770	843		
	B		8	4	4																							
	C		8	8	2																							
	D		8	5	5																							
	E		8	4	4																							
Chemistry Tech prerenewal/postrenewal								EGS	RC	EGS				EGS	RC	EGS							EGS	RC	EGS			

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

Project# X5601
 Client EDCC

Test started: Date 11/6/14 Time 1630
 Test ended: Date 11/8/14 Time 1630

Sample Description 007
 Technician: RC 24hour RC 48hour EB
 Time: 1630 24hour 1430 48hour 1530
 Temperature (°C): 25.0 24hour 25.0 48hour 24.7

Test Species P. promelas ID# BAL/11314
 72hour _____ 96hour _____
 72hour _____ 96hour _____
 72hour _____ 96hour _____

Test Dilution	Replicate	Test Salinity	# Live Organisms				Dissolved Oxygen				pH				Conductivity																			
			0	24	48	72	96	0	24	48	72	96	0	24	48	72	96																	
0	A	Na	8	8	8						8.1	7.9	7.8								7.2	7.3	7.5						1763	1770	1795			
	B		8	8	8																													
	C		8	8	8																													
	D		8	8	8																													
32	A		8	8	8						8.2	7.8	7.7																			348	376	383
	B		8	8	8																													
	C		8	8	8																													
	D		8	8	8																													
Chemistry Tech prerenewal/postrenewal										EGG RC/EB				EGG RC/EB				EGG RC/EB																

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

Project# X5601
 Client EDCC

Test started: Date 11/6/14 Time 1630
 Test ended: Date 11/8/14 Time 1530

Sample Description 007 Test Species P. promelas ID# BAL/11314
 Technician: RC 24hour RC 48hour EGB 72hour _____ 96hour _____
 Time: 1630 24hour 1430 48hour 1530 72hour _____ 96hour _____
 Temperature (°C): 25.0 24hour 25.0 48hour 24.7 72hour _____ 96hour _____

Test Dilution	Replicate	Test Salinity	# Live Organisms				Dissolved Oxygen				pH				Conductivity								
			0	24	48	72	96	0	24	48	72	96	0	24	48	72	96						
45	A	Na	8	8	8			8.3	7.8	7.8			6.0	6.8	6.7			432	441	440			
	B		8	8	8																		
	C		8	8	8																		
	D		8	8	8																		
	E		8	8	8																		
50	A		8	8	8			8.2	7.8	7.8			5.9	6.7	6.7			456	446	445			
	B		8	8	8																		
	C		8	8	8																		
	D		8	8	8																		
	E		8	8	8																		
Chemistry Tech prerenewal/postrenewal								RC	EGB				RC	EGB				RC	EGB				

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

Test started: Date 11/6/14
 Test ended: Date 11/8/14
 Project# X5101
 Client EDCC
 Sample Description 007
 Technician: RC
 Time: 09:30
 Temperature (°C): 25.0
 Time: 09:30

Test Species: BB
 24hour RC
 48hour RC
 72hour _____
 96hour _____
 24hour 1930
 48hour 1530
 72hour _____
 96hour _____

conductivity

pH

Dissolved Oxygen

Live Organisms

Test Salinity

Replicate

Test Dilution

Dilution	Replicate	Test Salinity	# Live Organisms	Dissolved Oxygen	pH	conductivity	Chemistry Test pre-rinse/post-rinse																															
							0	24	48	72	96	0	24	48	72	96	0	24	48	72	96																	
5%		NA	8				8	8	8	8	8																											
	B		8				8	8	8	8																												
	B		6				8	8	8																													
	B		8				8	8	8	8																												
75			8				8	8	8	8	1																											
	B		8				8	8	8																													
	B		8				8	8	8																													
	B		8				8	8	8																													
	B		8				8	8	8																													
	B		8				8	8	8																													
	B		8				8	8	8																													
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	B		8				8	8	8																													
	B		8				8	8	8																													
	B		8				8	8	8																													
	B		8				8	8	8																													

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

Project# X5601
 Client EDCC

Test started: Date 11/6/14 Time 1630
 Test ended: Date 11/8/14 Time 1530

Test Species P. promelas ID# BAL/11314

Sample Description 007
 Technician: Ohour RC 24hour RC 48hour ELB 72hour ELB 96hour ELB
 Time: Ohour 1630 24hour 1430 48hour 1530 72hour ELB 96hour ELB
 Temperature (°C): Ohour 25.0 24hour 25.0 48hour 24.7 72hour ELB 96hour ELB

Test Dilution %	Replicate	Test Salinity Na	# Live Organisms					Dissolved Oxygen					pH					Conductivity															
			0 H	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96											
100	A		8	0	0																												
	B		8	0	0																												
	C		8	0	0																												
	D		8	0	0																												
	E		8	0	0																												
100	A		8	7	7																												
pH/dij	B		8	8	8																												
	C		8	8	8																												
	D		8	8	8																												
	E		8	8	8																												
Chemistry Tech								8.6 7.8					6.2 5.1					7.3 6.1															
prereneal/postrenewal								8.6 7.8					6.2 5.1					7.3 6.1															

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APPENDIX C
STATISTICAL ANALYSES

Daphnid Acute Test-48 Hr Survival

X5601
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Start Date: 11/6/2014	Test ID: X5601DP	Sample ID: AR0000752
End Date: 11/8/2014	Lab ID: ADEQ880630	Sample Type: EFF2-Industrial
Sample Date: 11/5/2014	Protocol: EPAAW02-EPA/821/R-02-01	Test Species: DP-Daphnia pulex

Conc-%	1	2	3	4	5
D-Control	1.0000	1.0000	1.0000	1.0000	1.0000
32	1.0000	0.6250	0.6250	0.6250	1.0000
45	0.7500	0.7500	0.8750	0.8750	0.8750
50	0.0000	0.0000	0.1250	0.1250	0.0000
56	0.2500	0.0000	0.2500	0.3750	0.3750
75	0.1250	0.1250	0.1250	0.1250	0.1250
100	0.0000	0.0000	0.0000	0.0000	0.0000
100.0 PH	0.7500	0.5000	0.2500	0.6250	0.5000

Conc-%	Transform: Arcsin Square Root							Rank Sum	1-Tailed Critical
	Mean	N-Mean	Mean	Min	Max	CV%	N		
D-Control	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5		
32	0.7750	0.7750	1.1043	0.9117	1.3931	23.875	5	20.00	16.00
*45	0.8250	0.8250	1.1445	1.0472	1.2094	7.764	5	15.00	16.00
*50	0.0500	0.0500	0.2512	0.1777	0.3614	40.049	5	15.00	16.00
*56	0.2500	0.2500	0.5086	0.1777	0.6591	38.731	5	15.00	16.00
*75	0.1250	0.1250	0.3614	0.3614	0.3614	0.000	5	15.00	16.00
*100	0.0000	0.0000	0.1777	0.1777	0.1777	0.000	5	15.00	16.00
*100.0 PH	0.5250	0.5250	0.8107	0.5236	1.0472	23.875	5	15.00	16.00

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.05)	0.92388	0.94	-0.1439	1.17326
Equality of variance cannot be confirmed				
Hypothesis Test (1-tail, 0.05)				
Steel's Many-One Rank Test indicates significant differences				
Treatments vs D-Control				

Daphnid Acute Test-48 Hr Survival

X5001
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Start Date: 11/6/2014	Test ID: X5601DP	Sample ID: AR0000752
End Date: 11/8/2014	Lab ID: ADEQ880630	Sample Type: EFF2-Industrial
Sample Date: 11/5/2014	Protocol: EPAAW02-EPA/821/R-02-01	Test Species: DP-Daphnia pulex
Comments:		

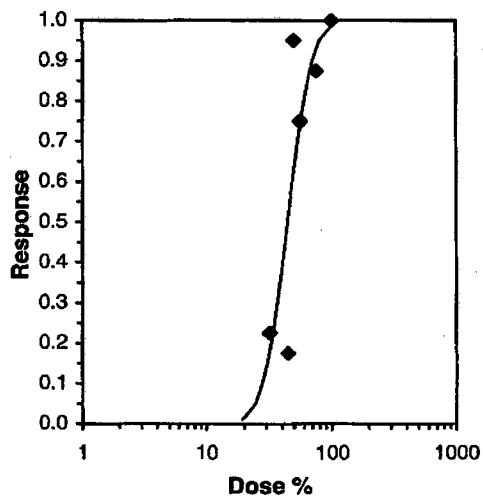
Conc-%	1	2	3	4	5
D-Control	1.0000	1.0000	1.0000	1.0000	1.0000
32	1.0000	0.6250	0.6250	0.6250	1.0000
45	0.7500	0.7500	0.8750	0.8750	0.8750
50	0.0000	0.0000	0.1250	0.1250	0.0000
56	0.2500	0.0000	0.2500	0.3750	0.3750
75	0.1250	0.1250	0.1250	0.1250	0.1250
100	0.0000	0.0000	0.0000	0.0000	0.0000
100.0 PH	0.7500	0.5000	0.2500	0.6250	0.5000

Conc-%	Transform: Arcsin Square Root							Number Resp	Total Number
	Mean	N-Mean	Mean	Min	Max	CV%	N		
D-Control	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5	0	40
32	0.7750	0.7750	1.1043	0.9117	1.3931	23.875	5	9	40
45	0.8250	0.8250	1.1445	1.0472	1.2094	7.764	5	7	40
50	0.0500	0.0500	0.2512	0.1777	0.3614	40.049	5	38	40
56	0.2500	0.2500	0.5086	0.1777	0.6591	38.731	5	30	40
75	0.1250	0.1250	0.3614	0.3614	0.3614	0.000	5	35	40
100	0.0000	0.0000	0.1777	0.1777	0.1777	0.000	5	40	40
100.0 PH	0.5250	0.5250	0.8107	0.5236	1.0472	23.875	5		

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution ($p > 0.05$)	0.94236	0.927	-0.0351	1.08693
Equality of variance cannot be confirmed				

Parameter	Value	SE	95% Fiducial Limits		Maximum Likelihood-Probit						
			Control	Chi-Sq	Critical	P-value	Mu	Sigma	Iter		
Slope	6.42998	2.59078	-0.7632	13.6231	0	38.7884	9.48773	7.7E-08	1.64793	0.15552	3
Intercept	-5.5961	4.39404	-17.796	6.60366							
TSCR											

Point	Probits	%	95% Fiducial Limits
EC01	2.674	19.3255	
EC05	3.355	24.6671	
EC10	3.718	28.0944	
EC15	3.964	30.6719	
EC20	4.158	32.8881	
EC25	4.326	34.9165	
EC40	4.747	40.6002	
EC50	5.000	44.4558	
EC60	5.253	48.6777	
EC75	5.674	56.6013	
EC80	5.842	60.0923	
EC85	6.036	64.4342	
EC90	6.282	70.3457	
EC95	6.845	80.1197	
EC99	7.326	102.265	



Significant heterogeneity detected ($p = 7.70E-08$)

Acute Fish Test-48 Hr Survival

X5601
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Start Date: 11/6/2014 Test ID: X5601PP Sample ID: AR0000752
 End Date: 11/8/2014 Lab ID: ADEQ880630 Sample Type: EFF2-Industrial
 Sample Date: 11/5/2014 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
32	1.0000	1.0000	1.0000	1.0000	1.0000
45	1.0000	1.0000	1.0000	1.0000	1.0000
50	1.0000	1.0000	1.0000	1.0000	1.0000
56	0.8750	0.7500	1.0000	1.0000	1.0000
75	0.0000	0.0000	0.0000	0.0000	0.0000
100	0.0000	0.0000	0.0000	0.0000	0.0000
100.0 PH	0.8750	1.0000	1.0000	1.0000	1.0000

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		
32	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5	27.50	16.00
45	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5	27.50	16.00
50	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5	27.50	16.00
56	0.9250	0.9250	1.2872	1.0472	1.3931	12.116	5	22.50	16.00
*75	0.0000	0.0000	0.1777	0.1777	0.1777	0.000	5	15.00	16.00
*100	0.0000	0.0000	0.1777	0.1777	0.1777	0.000	5	15.00	16.00
100.0 PH	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 <= 0.05)	0.61398	0.94	-2.0558	9.13831
Equality of variance cannot be confirmed				
Hypothesis Test (1-tail, 0.05)				
Steel's Many-One Rank Test indicates significant differences				
Treatments vs D-Control				

Acute Fish Test-48 Hr Survival

X5601

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Start Date: 11/6/2014	Test ID: X5601PP	Sample ID: AR0000752
End Date: 11/8/2014	Lab ID: ADEQ880630	Sample Type: EFF2-Industrial
Sample Date: 11/5/2014	Protocol: EPAAW02-EPA/821/R-02-01	Test Species: PP-Pimephales promelas

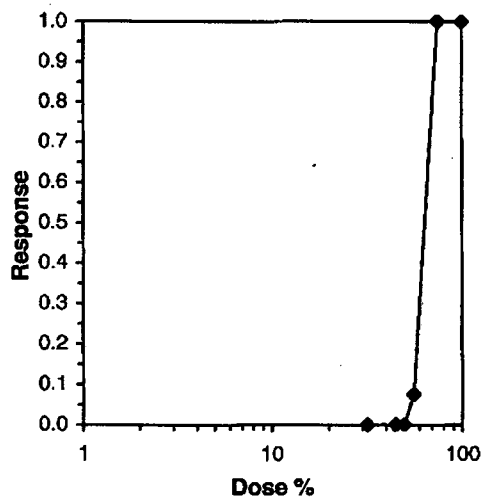
Comments:

Conc-%	1	2	3	4	5
D-Control	1.0000	1.0000	1.0000	1.0000	1.0000
32	1.0000	1.0000	1.0000	1.0000	1.0000
45	1.0000	1.0000	1.0000	1.0000	1.0000
50	1.0000	1.0000	1.0000	1.0000	1.0000
56	0.8750	0.7500	1.0000	1.0000	1.0000
75	0.0000	0.0000	0.0000	0.0000	0.0000
100	0.0000	0.0000	0.0000	0.0000	0.0000
100.0 PH	0.8750	1.0000	1.0000	1.0000	1.0000

Conc-%	Transform: Arcsin Square Root							Number Resp	Total Number
	Mean	N-Mean	Mean	Min	Max	CV%	N		
D-Control	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5	0	40
32	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5	0	40
45	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5	0	40
50	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5	0	40
56	0.9250	0.9250	1.2872	1.0472	1.3931	12.116	5	3	40
75	0.0000	0.0000	0.1777	0.1777	0.1777	0.000	5	40	40
100	0.0000	0.0000	0.1777	0.1777	0.1777	0.000	5	40	40
100.0 PH	0.9750	0.9750	1.3564	1.2094	1.3931	6.055	5		

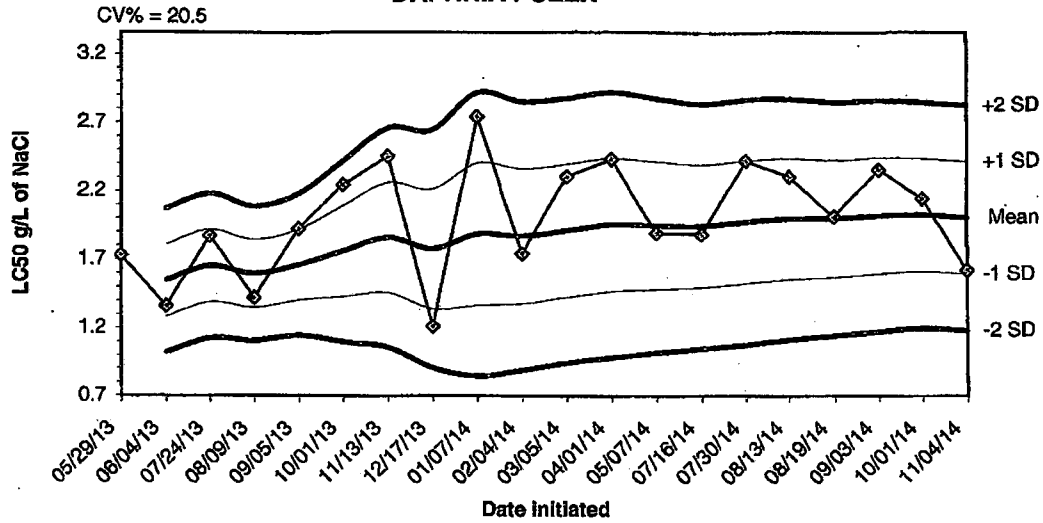
Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test Indicates non-normal distribution (p <= 0.05)	0.69175	0.927	-1.8044	6.37419
Equality of variance cannot be confirmed				

Trim Level	Trimmed Spearman-Kärber		
	EC50	95% CL	
0.0%	63.829	62.761	64.916
5.0%	64.018	62.684	65.380
10.0%	64.044	63.140	64.962
20.0%	64.044	63.140	64.962
Auto-0.0%	63.829	62.761	64.916



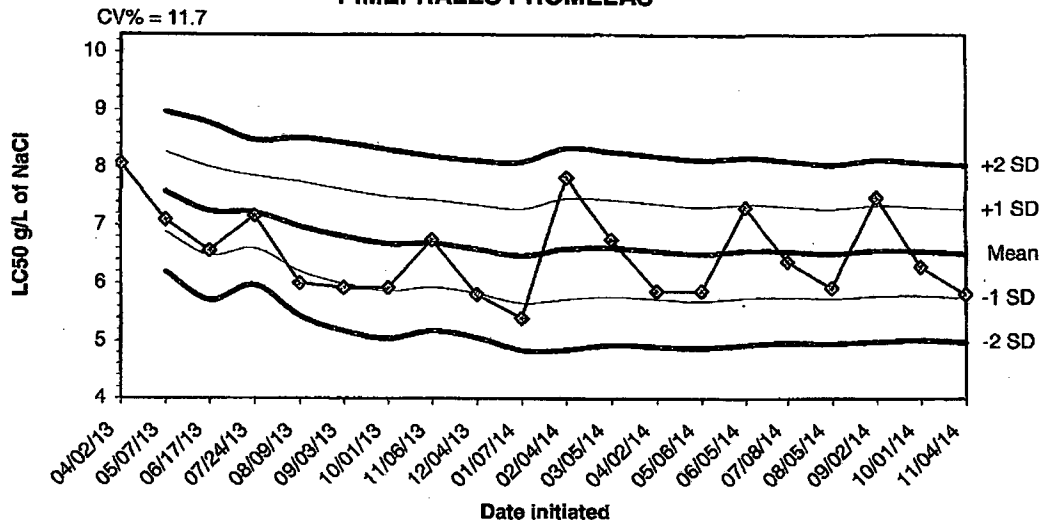
APPENDIX D
QUALITY ASSURANCE CHARTS

**2014 48 HOUR ACUTE REFERENCE TOXICANT TEST RESULTS FOR
DAPHNIA PULEX**



Dates	Values	Mean	-1 SD	-2 SD	+1 SD	+2 SD
05/29/13	1.7300					
06/04/13	1.3600	1.5450	1.2834	1.0217	1.8066	2.0683
07/24/13	1.8700	1.6533	1.3898	1.1263	1.9168	2.1803
08/09/13	1.4200	1.5950	1.3503	1.1055	1.8397	2.0845
09/05/13	1.9200	1.6600	1.4030	1.1460	1.9170	2.1740
10/01/13	2.2400	1.7567	1.4267	1.0966	2.0867	2.4167
11/13/13	2.4500	1.8557	1.4564	1.0571	2.2550	2.6543
12/17/13	1.2100	1.7750	1.3405	0.9060	2.2095	2.6440
01/07/14	2.7400	1.8822	1.3639	0.8456	2.4005	2.9188
02/04/14	1.7400	1.8680	1.3773	0.8865	2.3587	2.8495
03/05/14	2.3000	1.9073	1.4238	0.9404	2.3907	2.8741
04/01/14	2.4300	1.9508	1.4658	0.9808	2.4358	2.9208
05/07/14	1.8900	1.9462	1.4815	1.0168	2.4108	2.8755
07/16/14	1.8800	1.9414	1.4946	1.0479	2.3882	2.8350
07/30/14	2.4200	1.9733	1.5254	1.0775	2.4212	2.8692
08/13/14	2.3000	1.9938	1.5534	1.1130	2.4341	2.8745
08/19/14	2.0100	1.9947	1.5683	1.1419	2.4211	2.8475
09/03/14	2.3500	2.0144	1.5924	1.1703	2.4365	2.8586
10/01/14	2.1400	2.0211	1.6099	1.1987	2.4322	2.8434
11/04/14	1.6200	2.0010	1.5909	1.1807	2.4111	2.8213

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



Dates	Values	Mean	-1 SD	-2 SD	+1 SD	+2 SD
04/02/13	8.0700					
05/07/13	7.0900	7.5800	6.8870	6.1941	8.2730	8.9659
06/17/13	6.5600	7.2400	6.4739	5.7078	8.0061	8.7722
07/24/13	7.1600	7.2200	6.5932	5.9664	7.8468	8.4736
08/09/13	6.0000	6.9760	6.2064	5.4367	7.7456	8.5153
09/03/13	5.9200	6.8000	5.9878	5.1755	7.6122	8.4245
10/01/13	5.9200	6.6743	5.8616	5.0490	7.4869	8.2996
11/06/13	6.7500	6.6838	5.9309	5.1781	7.4366	8.1894
12/04/13	5.8100	6.5867	5.8246	5.0625	7.3487	8.1108
01/07/14	5.4000	6.4680	5.6574	4.8468	7.2786	8.0892
02/04/14	7.8200	6.5909	5.7206	4.8502	7.4613	8.3316
03/05/14	6.7500	6.6042	5.7731	4.9419	7.4353	8.2664
04/02/14	5.8600	6.5469	5.7249	4.9028	7.3690	8.1911
05/06/14	5.8600	6.4979	5.6870	4.8761	7.3087	8.1196
06/05/14	7.3100	6.5520	5.7430	4.9340	7.3610	8.1700
07/08/14	6.3700	6.5406	5.7577	4.9748	7.3235	8.1065
08/05/14	5.9200	6.5041	5.7313	4.9584	7.2770	8.0498
09/02/14	7.4800	6.5583	5.7741	4.9898	7.3426	8.1269
10/01/14	6.2800	6.5437	5.7788	5.0140	7.3085	8.0734
11/04/14	5.8100	6.5070	5.7447	4.9824	7.2693	8.0316

APPENDIX E
AGENCY FORMS

Acute Forms
Daphnia pulex Survival

Permittee: El Dorado Chemical - Outfall 007
NPDES Permit Number: AR0000752/ AFIN 70-00040

Composite Collected From: 11/5/14 To: 11/5/14
From: To:

Test Initiated: 11/6/14

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

Dilution Series Results - Percent Survival

TIME OF READING	REP	0	32.0	45.0	50.0	56.0	75.0	100.0	100.0 pH
24-hour	A	100.0	100.0	100.0	100.0	62.5	100.0	0.0	75.0
	B	100.0	62.5	75.0	100.0	50.0	75.0	0.0	50.0
	C	100.0	62.5	87.5	100.0	100.0	100.0	0.0	100.0
	D	100.0	62.5	100.0	100.0	100.0	100.0	0.0	62.5
	E	100.0	100.0	100.0	100.0	87.5	62.5	0.0	50.0
48-hour	A	100.0	100.0	75.0	0.0	25.0	12.5	0.0	75.0
	B	100.0	62.5	75.0	0.0	0.0	12.5	0.0	50.0
	C	100.0	62.5	87.5	12.5	25.0	12.5	0.0	25.0
	D	100.0	62.5	87.5	12.5	37.5	12.5	0.0	62.5
	E	100.0	100.0	87.5	0.0	37.5	12.5	0.0	50.0
	Mean	100.0	77.5	82.5	5.0	25.0	12.5	0.0	52.5

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 (100.0%) **X** 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 = 44.46% effluent

95 % confidence limits: N/A

Method of LC₅₀ calculation: Probit

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

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 pulex 48 hour Acute Static Renewal
Chemical Parameters Chart*

Permittee: El Dorado Chemical - Outfall 007
 NPDES Number: AR0000752/ AFIN 70-00040

Contact: David Sartain
 Analyst: Briggs, Callahan

Sample Collected From: Date 11/5/14 Time 1600
 To: Date 11/5/14 Time 2000
 Test Begin Date 11/6/14 Time 1545
 Test End Date 11/8/14 Time 1505

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	8.1	8.5	8.2	24.9	24.8	24.7	28.0				48.0			7.2	7.2	7.8
32.0	8.2	8.4	8.1	24.9	24.8	24.7								6.5	6.5	7.6
45.0	8.3	8.4	8.2	24.9	24.8	24.7								6.0	6.0	7.0
50.0	8.2	8.4	8.1	24.9	24.8	24.7								5.9	5.9	6.9
56.0	8.1	8.4	8.1	24.9	24.8	24.7								5.7	5.6	6.0
75.0	8.2	8.3	8.2	24.9	24.8	24.7								4.7	4.7	6.0
100.0	8.2	7.8		24.9	24.8		0.0				252.0			4.6	4.6	
100.0 pH	8.6	8.3	8.1	24.8	24.8	24.7								6.2	7.3	6.9

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

Acute Forms
Pimephales promelas Survival

Permittee: El Dorado Chemical - Outfall 007
NPDES Permit Number: AR0000752/ AFIN 70-00040

Composite Collected From: 11/5/14 To: 11/5/14
From: To:

Test Initiated: 11/6/14

Dilution Water Used: Receiving Water X Reconstituted Water

Dilution Series Results - Percent Survival

TIME OF READING	REP	0	32.0	45.0	50.0	56.0	75.0	100.0	100.0 pH
24-hour	A	100.0	100.0	100.0	100.0	100.0	12.5	0.0	87.5
	B	100.0	100.0	100.0	100.0	75.0	0.0	0.0	100.0
	C	100.0	100.0	100.0	100.0	100.0	0.0	0.0	100.0
	D	100.0	100.0	100.0	100.0	100.0	50.0	0.0	100.0
	E	100.0	100.0	100.0	100.0	100.0	0.0	0.0	100.0
48-hour	A	100.0	100.0	100.0	100.0	87.5	0.0	0.0	87.5
	B	100.0	100.0	100.0	100.0	75.0	0.0	0.0	100.0
	C	100.0	100.0	100.0	100.0	100.0	0.0	0.0	100.0
	D	100.0	100.0	100.0	100.0	100.0	0.0	0.0	100.0
	E	100.0	100.0	100.0	100.0	100.0	0.0	0.0	100.0
	Mean	100.0	100.0	100.0	100.0	92.5	0.0	0.0	97.5

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 (100.0%) X 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} = 63.83% effluent

95 % confidence limits: N/A

Method of LC_{50} calculation: SK

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

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: El Dorado Chemical - Outfall 007
 NPDES Number: AR0000752/ AFIN 70-00040
 Contact: David Sartain
 Analyst: Briggs, Callahan
 Sample Collected

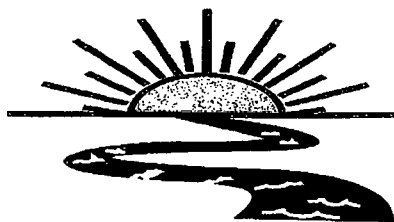
From: Date 11/5/14 Time 1600
 To: Date 11/5/14 Time 2000
 Date 11/6/14 Time 1630
 Date 11/8/14 Time 1530

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	8.1	8.5	7.8	25.0	25.0	24.7	28.0				48.0			7.2	7.2	7.5
32.0	8.2	8.4	7.7	25.0	25.0	24.7								6.5	6.5	7.7
45.0	8.3	8.4	7.8	25.0	25.0	24.7								6.0	6.0	6.7
50.0	8.2	8.4	7.8	25.0	25.0	24.7								5.9	5.9	6.7
56.0	8.1	8.4	7.7	25.0	25.0	24.7								5.7	5.6	6.6
75.0	8.2	8.3	7.0	25.0	25.0	24.7								4.7	4.7	6.0
100.0	8.2	8.0		25.0	25.0		0.0				252.0			4.3	4.3	
100.0 pH	8.6	8.3	7.7	25.0	25.0	24.7								6.2	7.3	5.9

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

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: Eldorado Chemical

Project#: X5601

Chain of Custody Documents Checked by: EGB 12/18/14
Technician/Date

Raw Data Documents Checked by: EGB 12/18/14
Technician/Date

Statistical Analysis Package Checked by: EGB 11/11/14
Quality Manager/Date

Quality Control Data Checked by: EGB 11/11/14
Quality Manager/Date

Report Checked by: EGB 12/18/14
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.

Erin A. Brugg, BS 12/18/14
Quality Manager Date

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From: (870) 863-1400 Origin ID: ELDA
 Eddie Pearson
 ELDORADO CHEMICAL COMPANY
 4500 NORTH WEST AVE
 ELDORADO, AR 71730



Ship Date: 22DEC14
 ActWgt: 1.0 LB
 CAD: 5887030/NET3550

Delivery Address Bar Code



SHIP TO: (870) 863-1484 BILL SENDER
ADEQ - Water Division Enforcement
ADEQ
5301 NORTSHORE DR

NORTH LITTLE ROCK, AR 72118

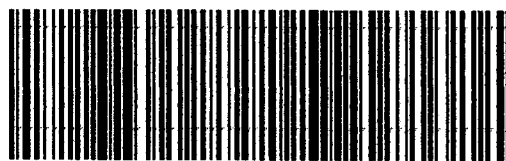
Ref #
 Invoice #
 PO #
 Dept #

TUE - 23 DEC 10:30A
PRIORITY OVERNIGHT

TRK# 7723 4741 3267
 0201

72118
 AR-US
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X2 LITA



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