

Bio-Analytical Laboratories (BAL)
ADEQ#88-0630
Project X4835

Bio-Analytical Laboratories' Executive Summary

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

Project #: X4835

Outfall: Outfall 006

Permit #: AR0000752/ AFIN #70-00040

Contact: Ms. Larken Pennington

Test Dates: August 19 - 21, 2012

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:

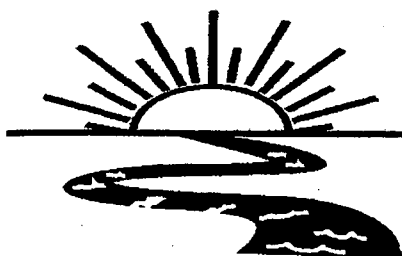
For *Pimephales promelas*:

1. If the NOEC for survival is less than the critical dilution (100%), enter a "1"; otherwise, enter a "0" for Parameter No. TEM6C- 1.
2. Report the NOEC for survival, Parameter TOM6C - 75%.
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%), enter a "1"; otherwise, enter a "0" for Parameter No. TEM3D- 1.
2. Report the NOEC for survival, Parameter TOM3D -75%.
3. Report the highest (critical dilution or control) Coefficient of Variation, Parameter TQM3D - 45.60%.

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.



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 X4835

**Test Dates: August 19 - 21, 2012
Report Date: September 17, 2012**

Prepared for:
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El Dorado Chemical Company
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El Dorado, AR 71731

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ADEQ #88-0630

BAL
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Project X4835

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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 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).

2.2 Test Organisms

The fathead minnows were raised in-house and were approximately one day old at test initiation. The *Daphnia pulex* test organisms were raised in-house 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.

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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, 75.0, 56.0, 42.0, 32.0 and 22.0 percent effluent and a reconstituted water control. The critical dilution was defined as 100 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 August 18, 2012. Upon completion of collection, the sample was chilled to 4^o Celsius and delivered to Bio-Analytical Laboratories by BAL personnel.

2.6 Sample Preparation

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

2.7 Monitoring of the Tests

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

2.8 Data Analysis

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

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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 ($p=.05$). An erratic dose response occurred in the daphnid test; however, it was determined to be a statistical anomaly. The NOEC value for both tests was 75 percent effluent ($p=.05$). The 48-hour LC_{50} value in the *Daphnia pulex* and fathead minnow tests was 88.62 and 85.98 percent, respectively ($p=.05$).

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	92.5
22.0	100.0	77.5
32.0	100.0	75.0
42.0	100.0	72.5
56.0	97.5	80.0
75.0	100.0	75.0
100.0	0.0	10.0

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.

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4.0 Conclusions

The sample of Outfall 006 collected from El Dorado Chemical Company, El Dorado, Arkansas, on August 18, 2012, was found to be lethally toxic to the *Daphnia pulex* test organisms and the fathead minnow test organisms in the 100 percent critical dilution after 48 hours of exposure ($p=.05$).

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5.0 Reference

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

APPENDIX A
CHAIN-OF-CUSTODY DOCUMENTS



Bio-Analytical Laboratories

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

Laboratory Use Only:

Company: El Dorado Chemical Company		Phone: (870) 863-1484		Analysis:				Project Number: X4835 Temp. upon arrival: 0.7°C #29 ECB 8/19/12 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: Larken Pennington / Larken Pennington EDCC									
Date Start Date End	Time Start Time End	C	G					# and type of container	Sample Identification
8/19/12	11:00am		✓	6 half gallon	006	C6006			
Relinquished by/Affiliation: Larken Pennington		Date: 8/19/12	Time: 0845	Received by/Affiliation: J. B...		Date: 8/19/12	Time: 0845		
Relinquished by/Affiliation:		Date:	Time:	Received by/Affiliation:		Date:	Time:		
Relinquished by/Affiliation: J. B...		Date: 8/19/12	Time: 1040	Received by/Affiliation: C. H. B...		Date: 8/19/12	Time: 1040		
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:									

APPENDIX B
RAW DATA SHEETS

BIO-ANALYTICAL LABORATORIES
ACUTE TOXICITY TEST WATER QUALITY DATA

Project# X4835

Client: EDCC/El Dorado Chemical

Address: 4500 Northwest Avenue El Dorado AR 71731

NPDES# AR0000752 AFIN70-00040 Outfall 006

Technicians: EGB/AH/LGZ/RC

Test initiated: Date 8/19/12 Time 1230

Test terminated: Date 8/21/12 Time 1300

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

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

Conductivity Meter: Model # Control Co. Serial #80277924

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

Sample Information

Sample ID#	Initial D.O. (mg/L and %)	Aerate? Minutes/ Final D.O.(mg/L)	Total Residual Chlorine (mg/L)	Dechlorinated? Amount?	Ammonia (NH3) mg/L	Salinity	Hardness	Alkalinity	Tech
<u>C6006</u>	<u>9.5</u> <u>88.1%</u>	<u>N/A</u> <u>8.4/98.3%</u>	<u>0.01</u>	<u>NO</u>	<u>60</u>	<u>N/A</u>	<u>300.0</u>	<u>8.0</u>	<u>EGB</u>
<u>↓</u>	<u>2.4</u> <u>108.2%</u>	<u>1/15</u> <u>8.6/98.3%</u>	<u>↓</u>	<u>↓</u>	<u>↓</u>	<u>↓</u>	<u>↓</u>	<u>↓</u>	<u>LGZ</u>

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
<u>Soft reoon</u>	<u>3365</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>7.6</u>	<u>64.0</u>	<u>32.0</u>	<u>EGB</u>
<u>↓</u>	<u>3370</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>7.9</u>	<u>64.0</u>	<u>32.0</u>	<u>EGB</u>

Test Species Information

Test Species Info.	Species: <u>D.pulex</u> ID#: <u>X7-28</u>	Species: <u>P.promelas</u> ID#: <u>81812</u>	Species: ID#:	Species: ID#:
Age	<u><24 hrs</u>	<u>1 day</u>		
Test Container Size	<u>30ml</u>	<u>250ml</u>		
Test volume	<u>25ml</u>	<u>200ml</u>		
Feeding: Type	<u>Algae/YCT</u>	<u>Artemia</u>		
Amount	<u>acclimation</u>	<u>acclimation</u>		
Aeration?	<u>N/A</u>	<u>N/A</u>		
Amount				
Condition of survivors	<u>Good</u>	<u>Good</u>		

Comments:

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

Project# X4835

Test started: Date 8/19/12 Time 1315

Client El Dorado Chemical

Test ended: Date 8/21/12 Time 1320

Sample Description 006

Test Species D. pulex ID# X7-Z8

Technician: Ohour EBB 24hour RC 48hour AH 72hour _____ 96hour _____

Time: Ohour 1315 24hour 1300 48hour 1320 72hour _____ 96hour _____

Temperature (°C): Ohour 24.6 24hour 24.4 48hour 24.3 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
010																						
0	A	N/A	8	8	7			83	81 / 83	83			73	78 / 79	79			177.3	236 / 174	230		
	B	}	8	8	7																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	7																	
22	A	}	8	8	7			83	81 / 84	82			7.1	7.5 / 7.2	7.5			500	497 / 501	529		
	B		8	6	6																	
	C		8	6	6																	
	D		8	6	5																	
	E		8	7	7																	
Chemistry Tech prerenewal/postrenewal			EBB RC AH					EBB RC AH					EBB RC AH									

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

Project# X4835

Test started: Date 8/9/12 Time 1315

Client Edorado Chemical

Test ended: Date 8/21/12 Time 1330

Sample Description 006

Test Species D. pulex ID# X7-28

Technician: 0hour EGB 24hour PC 48hour PH 72hour _____ 96hour _____
 Time: 0hour 1315 24hour 1300 48hour 1320 72hour _____ 96hour _____
 Temperature (°C): 0hour 24.6 24hour 24.9 48hour 24.3 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	A	UA	8	6	6			83	80 84	81			6.9	7.4 7.0	7.4			661	631 653	688		
	B	}	8	7	7																	
	C		8	6	6																	
	D		8	8	6																	
	E		8	5	5																	
42	A			8	6	6			83	81 84	80			6.8	7.3 7.2	7.2			793	770 796	853	
	B		8	5	5																	
	C		8	6	6																	
	D		8	7	7																	
	E		8	5	5																	
Chemistry Tech prerenal/postrenal								EGB	PC	PH			EGB	PC	PH			EGB	PC	PH		

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

Project# X4835

Test started: Date 8/19/12 Time 1315

Client EIDorado Chemical

Test ended: Date 8/21/12 Time 1300

Sample Description 006

Test Species D. pulex ID# K7-28

Technician: 0hour EBB 24hour RC 48hour AH 72hour _____ 96hour _____

Time: 0hour 1315 24hour 1300 48hour 1300 72hour _____ 96hour _____

Temperature (°C): 0hour 24.6 24hour 24.9 48hour 24.3 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	N/A	8	6	6			8.3	8.0/8.4	8.1			6.9	7.1/6.7	7.1			995	973/981	1038		
	B		8	4	4																	
	C		8	8	8																	
	D		8	7	6																	
	E		8	8	8																	
75	A		8	7	7			8.2	8.1/8.4	8.1			6.2	6.9/6.0	6.9			1252	1211/1244	1299		
	B		8	7	7																	
	C		8	6	6																	
	D		8	4	4																	
	E		8	6	6																	
Chemistry Tech prerenewal/postrenewal								EBB	RC	AH			EBB	RC	AH			EBB	RC	AH		

ACUTE2 020809 Rev.

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

Project# X4835

Test started: Date 8/19/12

Time 1230

client El Dorado Chemical

Test ended: Date 8/19/12

Time 1225

Sample Description 006

Test Species P. promelas ID# 818-81812

Technician: 0hour ES 24hour ES 48hour ES 72hour _____ 96hour _____

Time: 0hour 1230 24hour 120 48hour 1225 72hour _____ 96hour _____

Temperature (°C): 0hour 24.4 24hour 24.5 48hour 24.4 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
0/0																						
0	A	N/A	8	8	8			8.3	7.8/8.3	7.7			7.3	7.8/7.3	7.7			177.3	186.4/174	190		
	B	}	8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
22	A		8	8	8			8.3	7.8/8.4	7.7			7.1	7.4/7.2	7.4			502	495/501	513		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
Chemistry Tech prerenewal/postrenewal								ES	ES	ES			ES	ES	ES			ES	ES	ES		

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

Project# X4835

Test started: Date 8/19/12 Time 1230

client Eidorado Chemical

Test ended: Date 8/21/12 Time 1225

Sample Description 006

Test Species P. promelas ID# 81812

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

Time: Ohour 1230 24hour 1120 48hour 1225 72hour _____ 96hour _____

Temperature (°C): Ohour 24.4 24hour 24.5 48hour 24.4 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
0/0																						
32	A	NA	8	8	8			8.3	7.9 8.4	7.6			6.9	7.3 7.0	7.3			661	652 653	670		
	B	}	8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
42	A	}	8	8	8			8.3	7.9 8.4	7.6			6.8	7.1 6.9	7.2			793	786 786	815		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
Chemistry Tech prerenewal/postrenewal								EGB					EGB					EGB				

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

Project# X4835

Test started: Date 8/19/12 Time 1230

Client Eldorado Chemical

Test ended: Date 8/21/12 Time 1225

Sample Description 006

Test Species P. promelas ID# 81812

Technician: Ohour EBB 24hour EBB 48hour EBB 72hour _____ 96hour _____

Time: Ohour 1230 24hour 1130 48hour 1235 72hour _____ 96hour _____

Temperature (°C): Ohour 24.4 24hour 24.5 48hour 24.4 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	N/A	8	8	8			8.3	7.8	8.4	7.6			6.5	6.9	6.7	6.0			995	987	981	1019			
	B	}	8	8	8																					
	C		8	8	8																					
	D		8	7	7																					
	E		8	8	8																					
75	A		8	8	8			8.2	7.9	8.4	7.6			6.2	6.6	6.5	6.6			1252	1256	1244	1306			
	B		8	8	8																					
	C		8	8	8																					
	D		8	8	8																					
	E		8	8	8																					
Chemistry Tech prerenewal/postrenewal							EBB	EBB	EBB	EBB	EBB	EBB	EBB	EBB	EBB	EBB	EBB	EBB	EBB	EBB	EBB	EBB	EBB	EBB		

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

Project# X4835

Test started: Date 8/19/12 Time 1230

client EIDorado Chemical

Test ended: Date 8/21/12 Time 1225

Sample Description 00LP

Test Species P. promelas ID# 81812

Technician: Ohour EB 24hour EB 48hour EB 72hour _____ 96hour _____

Time: Ohour 1230 24hour 1120 48hour 1235 72hour _____ 96hour _____

Temperature (°C): Ohour 24.9 24hour 24.5 48hour 24.4 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
0/0																						
100	A	N/A	8	0				8.217					6.06.8				105.1634					
	B	}	8	0																		
	C		8	0																		
	D		8	0																		
	E		8	0																		
Chemistry Tech prerenewal/postrenewal			EB					EB					EB									

APPENDIX C
STATISTICAL ANALYSIS

Daphnid Acute Test-48 Hr Survival

Start Date: 8/19/2012 Test ID: X4835DP Sample ID: AR0000752 Outfall 006
 End Date: 8/21/2012 Lab ID: NELAP01975 Sample Type: EFF2-Industrial
 Sample Date: 8/18/2012 Protocol: EPAAW02-EPA/821/R-02-01 Test Species: DP-Daphnia pulex

Comments:

Conc-%	1	2	3	4	5
D-Control	0.8750	0.8750	1.0000	1.0000	0.8750
22	0.8750	0.7500	0.7500	0.6250	0.8750
32	0.7500	0.8750	0.7500	0.7500	0.6250
42	0.7500	0.6250	0.7500	0.8750	0.6250
56	0.7500	0.5000	1.0000	0.7500	1.0000
75	0.8750	0.8750	0.7500	0.5000	0.7500
100	0.2500	0.0000	0.1250	0.0000	0.1250

Conc-%	Mean	N-Mean	Transform: Arcsin Square Root				N	t-Stat	1-Tailed	
			Mean	Min	Max	CV%			Critical	MSD
D-Control	0.9250	1.0000	1.2829	1.2094	1.3931	7.841	5			
22	0.7750	0.8378	1.0850	0.9117	1.2094	11.644	5	1.999	2.409	0.2385
32	0.7500	0.8108	1.0526	0.9117	1.2094	10.024	5	2.327	2.409	0.2385
*42	0.7250	0.7838	1.0255	0.9117	1.2094	12.008	5	2.600	2.409	0.2385
56	0.8000	0.8649	1.1332	0.7854	1.3931	22.963	5	1.512	2.409	0.2385
75	0.7500	0.8108	1.0597	0.7854	1.2094	16.371	5	2.254	2.409	0.2385
*100	0.1000	0.1081	0.3204	0.1777	0.5236	45.603	5	9.722	2.409	0.2385

Auxiliary Tests		Statistic	Critical	Skew	Kurt						
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)		0.97464	0.934	-0.1637	-0.0678						
Bartlett's Test indicates equal variances (p = 0.48)		5.4715	16.8119								
Hypothesis Test (1-tail, 0.05)		NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test Treatments vs D-Control		32	42	36.6606	3.125	0.17177	0.18683	0.47805	0.0245	8.0E-09	6, 28

Daphnid Acute Test-48 Hr Survival

Start Date: 8/19/2012 Test ID: X4835DP Sample ID: AR0000752 Outfall 006
 End Date: 8/21/2012 Lab ID: NELAP01975 Sample Type: EFF2-Industrial
 Sample Date: 8/18/2012 Protocol: EPAAW02-EPA/821/R-02-01 Test Species: DP-Daphnia pulex
 Comments:

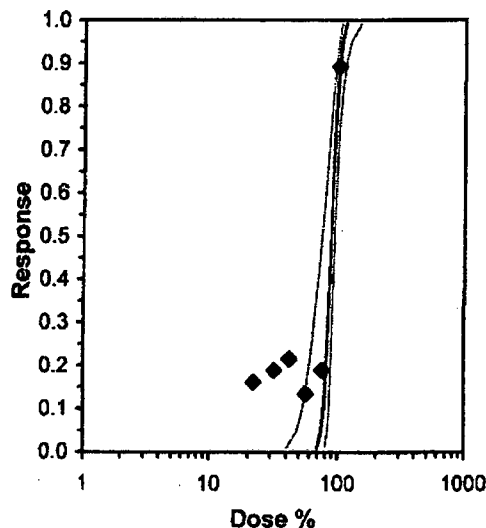
Conc-%	1	2	3	4	5
D-Control	0.8750	0.8750	1.0000	1.0000	0.8750
22	0.8750	0.7500	0.7500	0.6250	0.8750
32	0.7500	0.8750	0.7500	0.7500	0.6250
42	0.7500	0.6250	0.7500	0.8750	0.6250
56	0.7500	0.5000	1.0000	0.7500	1.0000
75	0.8750	0.8750	0.7500	0.5000	0.7500
100	0.2500	0.0000	0.1250	0.0000	0.1250

Conc-%	Transform: Arcsin Square Root							Number Resp	Total Number
	Mean	N-Mean	Mean	Min	Max	CV%	N		
D-Control	0.9250	1.0000	1.2829	1.2094	1.3931	7.841	5	3	40
22	0.7750	0.8378	1.0850	0.9117	1.2094	11.644	5	9	40
32	0.7500	0.8108	1.0526	0.9117	1.2094	10.024	5	10	40
42	0.7250	0.7838	1.0255	0.9117	1.2094	12.008	5	11	40
56	0.8000	0.8649	1.1332	0.7854	1.3931	22.963	5	8	40
75	0.7500	0.8108	1.0597	0.7854	1.2094	16.371	5	10	40
100	0.1000	0.1081	0.3204	0.1777	0.5236	45.603	5	36	40

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)	0.97464	0.934	-0.1637	-0.0678
Bartlett's Test indicates equal variances (p = 0.48)	5.4715	16.8119		

Maximum Likelihood-Probit

Parameter	Value	SE	95% Fiducial Limits		Control	Chi-Sq	Critical	P-value	Mu	Sigma	Iter
Slope	21.8548	6.8488	8.43114	35.2784	0.075	1.804	9.48773	0.77175	1.94754	0.04576	9
Intercept	-37.563	13.5918	-64.203	-10.923							
TSCR	0.205	0.02855	0.14904	0.26096							
Point	Probits	%	95% Fiducial Limits								
EC01	2.674	69.3574	40.3383	79.4145							
EC05	3.355	74.5204	48.4913	83.1958							
EC10	3.718	77.4281	53.4647	85.3271							
EC15	3.964	79.4538	57.0872	86.8233							
EC20	4.158	81.1014	60.1252	88.0536							
EC25	4.326	82.5422	62.8447	89.1446							
EC40	4.747	86.2871	70.1479	92.0954							
EC50	5.000	88.6213	74.8113	94.084							
EC60	5.253	91.0187	79.5896	96.3511							
EC75	5.674	95.1482	87.2907	101.306							
EC80	5.842	96.8385	90.0168	103.954							
EC85	6.036	98.8466	92.8177	107.686							
EC90	6.282	101.433	95.7823	113.378							
EC95	6.645	105.39	99.3832	123.563							
EC99	7.326	113.236	105.057	147.205							



Acute Fish Test-48 Hr Survival

Start Date: 8/19/2012 Test ID: X4835PP Sample ID: AR0000752 Outfall 006
 End Date: 8/21/2012 Lab ID: NELAP01975 Sample Type: EFF2-Industrial
 Sample Date: 8/18/2012 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
22	1.0000	1.0000	1.0000	1.0000	1.0000
32	1.0000	1.0000	1.0000	1.0000	1.0000
42	1.0000	1.0000	1.0000	1.0000	1.0000
56	1.0000	1.0000	1.0000	0.8750	1.0000
75	1.0000	1.0000	1.0000	1.0000	1.0000
100	0.0000	0.0000	0.0000	0.0000	0.0000

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		
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
42	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	0.0000	0.0000	0.1777	0.1777	0.1777	0.000	5		

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.05)	0.41613	0.927	-3.8705	19.8512
Equality of variance cannot be confirmed				
Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	75	100	86.6025	1.33333
Treatments vs D-Control				

Acute Fish Test-48 Hr Survival

Start Date: 8/19/2012 Test ID: X4835PP Sample ID: AR0000752 Outfall 006
 End Date: 8/21/2012 Lab ID: NELAP01975 Sample Type: EFF2-Industrial
 Sample Date: 8/18/2012 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
22	1.0000	1.0000	1.0000	1.0000	1.0000
32	1.0000	1.0000	1.0000	1.0000	1.0000
42	1.0000	1.0000	1.0000	1.0000	1.0000
56	1.0000	1.0000	1.0000	0.8750	1.0000
75	1.0000	1.0000	1.0000	1.0000	1.0000
100	0.0000	0.0000	0.0000	0.0000	0.0000

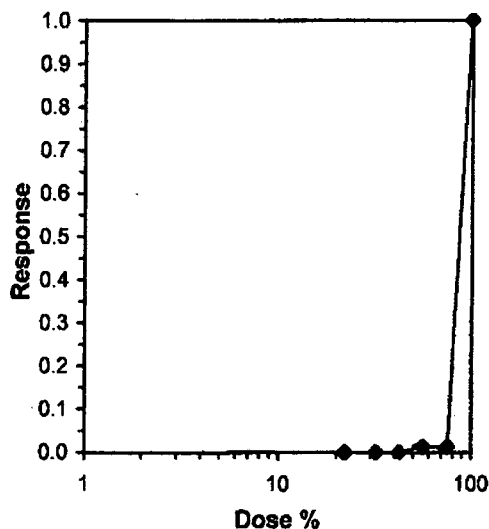
Conc-%	Mean	N-Mean	Transform: Arcsin Square Root					N	Number Resp	Total Number
			Mean	Min	Max	CV%				
D-Control	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5	0	40	
22	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5	0	40	
32	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5	0	40	
42	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5	0	40	
56	0.9750	0.9750	1.3564	1.2094	1.3931	6.055	5	1	40	
75	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5	0	40	
100	0.0000	0.0000	0.1777	0.1777	0.1777	0.000	5	40	40	

Auxiliary Tests

Shapiro-Wilk's Test indicates non-normal distribution ($p \leq 0.05$) Statistic: 0.41613 Critical: 0.927 Skew: -3.8705 Kurt: 19.8512
 Equality of variance cannot be confirmed

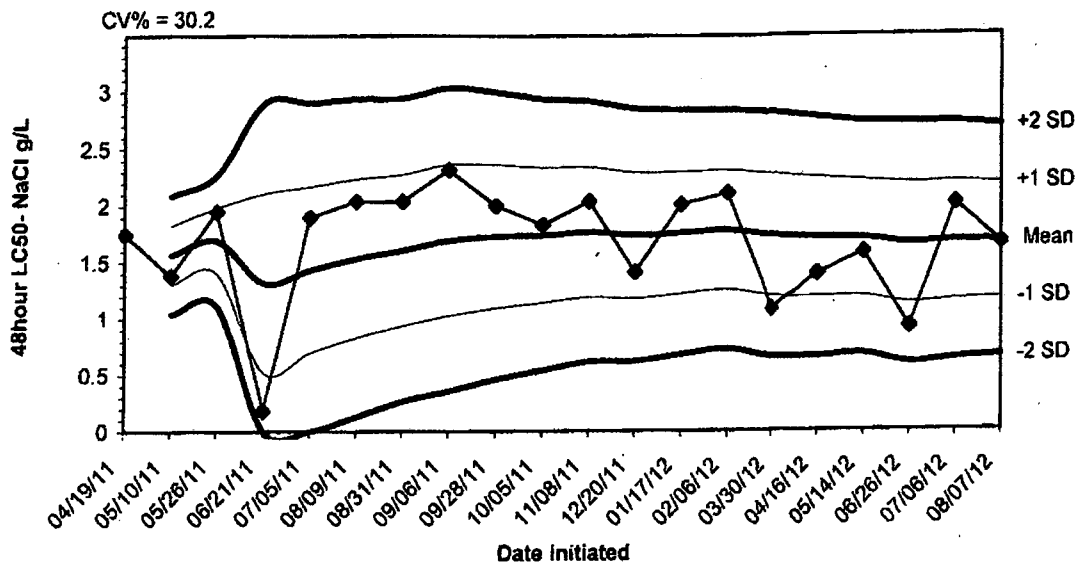
Trimmed Spearman-Kärber

Trim Level	EC50	95% CL	
0.0%	85.977	84.748	87.225
5.0%	86.445	85.998	86.894
10.0%	86.445	85.998	86.894
20.0%	86.445	85.998	86.894
Auto-0.0%	85.977	84.748	87.225



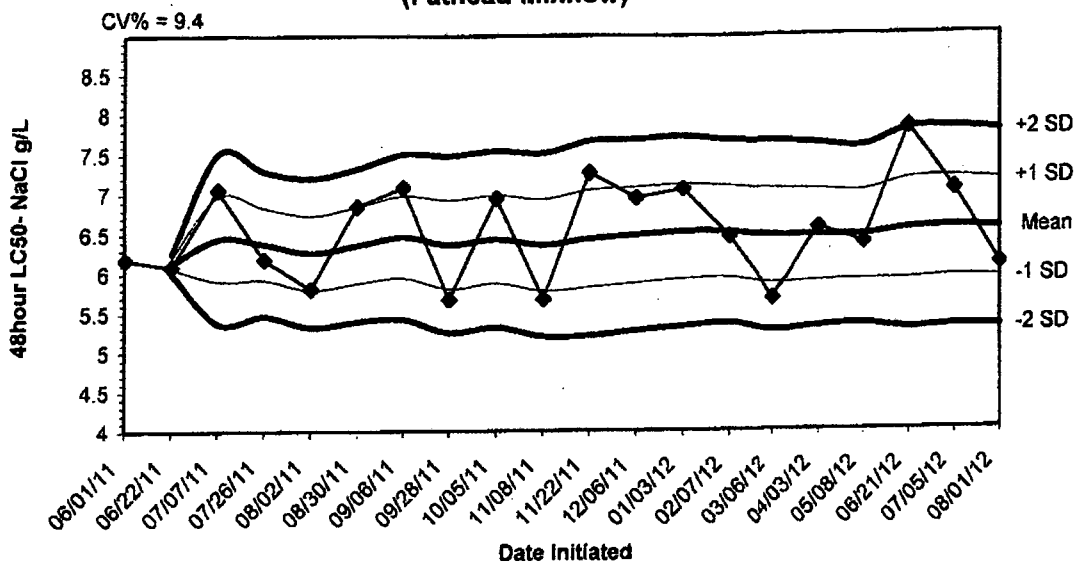
APPENDIX D
QUALITY ASSURANCE CHARTS

2012 48-hour Reference Toxicant Test Results for *Daphnia pulex*



Dates	Values	Mean	-1 SD	-2 SD	+1 SD	+2 SD
04/19/11	1.7500					
05/10/11	1.3800	1.5650	1.3034	1.0417	1.8266	2.0883
05/26/11	1.9500	1.6933	1.4041	1.1149	1.9825	2.2717
06/21/11	0.1800	1.3150	0.5223	0.0000	2.1077	2.9003
07/05/11	1.9000	1.4320	0.6974	0.0000	2.1666	2.9012
08/09/11	2.0400	1.5333	0.8309	0.1286	2.2357	2.9381
08/31/11	2.0400	1.6057	0.9365	0.2674	2.2749	2.9441
09/06/11	2.3200	1.6950	1.0260	0.3569	2.3640	3.0331
09/28/11	2.0000	1.7289	1.0949	0.4608	2.3629	2.9969
10/05/11	1.8300	1.7390	1.1404	0.5418	2.3376	2.9362
11/08/11	2.0400	1.7664	1.1913	0.6162	2.3415	2.9166
12/20/11	1.4100	1.7367	1.1788	0.6209	2.2946	2.8525
01/17/12	2.0100	1.7577	1.2182	0.6787	2.2972	2.8367
02/06/12	2.1100	1.7829	1.2560	0.7292	2.3097	2.8365
03/30/12	1.0800	1.7360	1.1969	0.6578	2.2751	2.8142
04/16/12	1.3900	1.7144	1.1864	0.6584	2.2424	2.7703
05/14/12	1.5800	1.7065	1.1942	0.6820	2.2187	2.7310
06/26/12	0.9200	1.6628	1.1324	0.6020	2.1932	2.7236
07/06/12	2.0100	1.6811	1.1595	0.6379	2.2026	2.7242
08/07/12	1.6600	1.6800	1.1723	0.6646	2.1877	2.6954

**2012 48-hour Reference Toxicant Test Results for Pimephales promelas
(Fathead Minnow)**



Dates	Values	Mean	-1 SD	-2 SD	+1 SD	+2 SD
06/01/11	6.1800					
06/22/11	6.0900	6.1350	6.0714	6.0077	6.1986	6.2623
07/07/11	7.0600	6.4433	5.9074	5.3715	6.9793	7.5152
07/26/11	6.1800	6.3775	5.9205	5.4636	6.8345	7.2914
08/02/11	5.8100	6.2640	5.7939	5.3237	6.7341	7.2043
08/30/11	6.8500	6.3617	5.8779	5.3941	6.8455	7.3293
09/06/11	7.0900	6.4657	5.9453	5.4249	6.9861	7.5065
09/28/11	5.6700	6.3663	5.8083	5.2504	6.9242	7.4821
10/05/11	6.9500	6.4311	5.8741	5.3171	6.9881	7.5451
11/08/11	5.6700	6.3550	5.7773	5.1997	6.9327	7.5103
11/22/11	7.2700	6.4382	5.8246	5.2111	7.0517	7.6853
12/08/11	6.9500	6.4808	5.8775	5.2741	7.0842	7.6876
01/03/12	7.0600	6.5254	5.9258	5.3262	7.1250	7.7246
02/07/12	6.4600	6.5207	5.9444	5.3680	7.0970	7.6734
03/06/12	5.6700	6.4640	5.8668	5.2695	7.0612	7.6585
04/03/12	6.5600	6.4700	5.8925	5.3150	7.0475	7.6250
05/08/12	6.3700	6.4641	5.9045	5.3448	7.0238	7.5834
06/21/12	7.8200	6.5394	5.9094	5.2794	7.1695	7.7995
07/05/12	7.0300	6.5653	5.9427	5.3202	7.1878	7.8103
08/01/12	6.0900	6.5415	5.9263	5.3111	7.1567	7.7719

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: 8/18/12 To: 8/18/12
From: To:

Test Initiated: 8/19/12

Dilution Water Used: Receiving Water X Reconstituted Water

Dilution Series Results - Percent Survival

TIME OF READING	REP	0	22	32	42	56	75	100
24-hour	A	100	100	75.0	75.0	75.0	87.5	75.0
	B	100	75.0	87.5	62.5	50.0	87.5	37.5
	C	100	75.0	75.0	75.0	100	75.0	50.0
	D	100	75.0	100	87.5	87.5	50.0	62.5
	E	100	87.5	62.5	62.5	100	75.0	50.0
48-hour	A	87.5	87.5	75.0	75.0	75.0	87.5	25.0
	B	87.5	75.0	87.5	62.5	50.0	87.5	0.0
	C	100	75.0	75.0	75.0	100	75.0	12.5
	D	100	62.5	75.0	87.5	75.0	50.0	0.0
	E	87.5	87.5	62.5	62.5	100	75.0	12.5
	Mean	92.5	77.5	75.0	72.5	80.0	75.0	10.0

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%) 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} = 88.62% effluent
95 % confidence limits: 74.81 - 94.08 %
Method of LC_{50} 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 48 hour Acute Static Renewal
Chemical Parameters Chart***

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

Contact: Larken Pennington
Analyst: Briggs, Haughton, Callahan

Sample Collected From: Date 8/18/12 Time 1100
 To: Date 8/18/12 Time 1100
Test Begin Date 8/19/12 Time 1315
Test End Date 8/21/12 Time 1320

Parameter	D.O.			Temperature			Alkalinity			Hardness			pH			
	Dilut./Time	Ohrs.	24hrs	48hrs	Ohrs	24hrs	48hrs	Ohrs	24hrs	48hrs	Ohrs	24hrs	48hrs	Ohrs	24hrs	48hrs
0		8.3	8.3	8.3	24.6	24.4	24.3	32.0	32.0		64.0	64.0		7.3	7.8	7.9
22		8.3	8.4	8.2	24.6	24.4	24.3							7.1	7.2	7.5
32		8.3	8.4	8.1	24.6	24.4	24.3							6.9	7.0	7.4
42		8.3	8.4	8.0	24.6	24.4	24.3							6.8	6.9	7.2
56		8.3	8.4	8.1	24.6	24.4	24.3							6.5	6.7	7.1
75		8.2	8.4	8.1	24.6	24.4	24.3							6.2	6.2	6.9
100		8.2	8.4	8.1	24.6	24.4	24.3	8.0			300.0			6.0	6.9	6.4

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

Acute Forms
Pimephales promelas (Fathead minnow) Survival

Permittee: El Dorado Chemical - Outfall 006

NPDES Permit Number: AR0000752/ AFIN 70-00040

Composite Collected

From: 8/18/12

To: 8/18/12

From:

To:

Test Initiated: 8/19/12

Dilution Water Used:

Receiving Water

X

Reconstituted Water

Dilution Series Results - Percent Survival

TIME OF READING	REP	0	22	32	42	56	75	100
24-hour	A	100	100	100	100	100	100	0
	B	100	100	100	100	100	100	0
	C	100	100	100	100	100	100	0
	D	100	100	100	100	87.5	100	0
	E	100	100	100	100	100	100	0
48-hour	A	100	100	100	100	100	100	0
	B	100	100	100	100	100	100	0
	C	100	100	100	100	100	100	0
	D	100	100	100	100	87.5	100	0
	E	100	100	100	100	100	100	0
	Mean	100	100	100	100	97.5	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 (100%) 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 = 85.98% effluent

95 % confidence limits: 84.75 - 87.23%

Method of LC₅₀ calculation: Spearman Karber

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 006
NPDES Number: AR0000752/ AFIN 70-00040**

Contact: Larken Pennington

Analyst: Briggs, Zeagler

Sample Collected From: Date 8/18/12 Time 1100

To: Date 8/18/12 Time 1100

Test Begin Date 8/19/12 Time 1230

Test End Date 8/21/12 Time 1225

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		8.3	8.3	7.7	24.4	24.5	24.4	32.0	32.0		64.0	64.0		7.3	7.8	7.7
22		8.3	8.4	7.7	24.4	24.5	24.4							7.1	7.2	7.4
32		8.3	8.4	7.6	24.4	24.5	24.4							6.9	7.0	7.6
42		8.3	8.4	7.6	24.4	24.5	24.4							6.8	6.9	7.6
56		8.3	8.4	7.6	24.4	24.5	24.4							6.5	6.7	7.0
75		8.2	8.4	7.6	24.4	24.5	24.4							6.2	6.2	6.6
100		8.2	7.7		24.4	24.5	24.4	8.0			300.0			6.0	5.8	

*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 (v. 31612)

Client: Eldorado Chemical

Project#: X4835

Chain of Custody Documents Checked by: EOB 9/14/12
Technician/Date

Raw Data Documents Checked by: EOB 9/14/12
Technician/Date

Statistical Analysis Package Checked by: EOB 8/23/12
Quality Manager/Date

Quality Control Data Checked by: EOB 8/23/12
Quality Manager/Date

Report Checked by: EOB 9/14/12
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. Briggs
Quality Manager

9/14/12
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 X4836

Bio-Analytical Laboratories' Executive Summary

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

Project #: X4836

Outfall: Outfall 007

Permit #: AR0000752/ AFIN #70-00040

Contact: Ms. Larken Pennington

Test Dates: August 19 - 21, 2012

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:

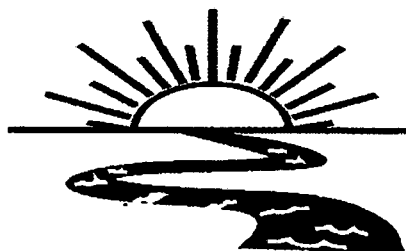
For *Pimephales promelas*:

1. If the NOEC for survival is less than the critical dilution (100%), enter a "1"; otherwise, enter a "0" for Parameter No. TEM6C- 1.
2. Report the NOEC for survival, Parameter TOM6C - 75%.
3. Report the highest (critical dilution or control) Coefficient of Variation, Parameter TQM6C - 23.93%.

For *Daphnia pulex*:

1. If the NOEC for survival is less than the critical dilution (100%), enter a "1"; otherwise, enter a "0" for Parameter No. TEM3D- 1.
2. Report the NOEC for survival, Parameter TOM3D - 0%.
3. Report the highest (critical dilution or control) Coefficient of Variation, Parameter TQM3D - 17.50%.

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 007
AT**

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

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

EPA Methods 2000.0 and 2021.0

Project X4836

**Test Dates: August 19 - 21, 2012
Report Date: September 17, 2012**

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BAL
ADEQ #88-0630
Project X4836

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Project X4836

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 LC₅₀, 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).

2.2 Test Organisms

The fathead minnows were raised in-house and were approximately one day old at test initiation. The *Daphnia pulex* test organisms were raised in-house 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.

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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, 75.0, 56.0, 50.0, 42.0 and 32.0 percent effluent and a reconstituted water control. The critical dilution was defined as 100 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 August 18, 2012. Upon completion of collection, the sample was chilled to 4^o Celsius and delivered to Bio-Analytical Laboratories by BAL personnel.

2.6 Sample Preparation

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

2.7 Monitoring of the Tests

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

2.8 Data Analysis

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

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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 ($p=.05$). The NOEC value for both tests was 75 percent effluent ($p=.05$). The 48-hour LC_{50} value could not be determined in either test because greater than 50 percent survival occurred in the 100 percent dilution.

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	<i>Pimephales promelas</i>	<i>Daphnia pulex</i>
Control	100.0	92.5
32.0	100.0	70.0
42.0	100.0	62.5
50.0	100.0	52.5
56.0	100.0	52.5
75.0	100.0	47.5
100.0	72.5	52.5

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.

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4.0 Conclusions

The sample of Outfall 007 collected from El Dorado Chemical Company, El Dorado, Arkansas, on August 18, 2012, was found to be lethally toxic to the *Daphnia pulex* test organisms and the fathead minnow test organisms in the 100 percent critical dilution after 48 hours of exposure ($p=.05$).

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5.0 Reference

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

APPENDIX A
CHAIN-OF-CUSTODY DOCUMENTS



Bio-Analytical Laboratories

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1-800-258-1246
Fax: (518) 745-2773

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

Laboratory Use Only:

Company: El Dorado Chemical Company		Phone: (870) 863-1484		Analysis:						Project Number: X4836 Temp. upon arrival: 1.2°C #29 EG 8/19/12 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	Chronic Ceriodaphnia Chronic minnow Acute minnow (fresh/marine) Acute Daphnia species Acute Mysid Acute Ceriodaphnia Fecal Coliform	Chronic Ceriodaphnia Chronic minnow Acute minnow (fresh/marine) Acute Daphnia species Acute Mysid Acute Ceriodaphnia Fecal Coliform	Chronic Ceriodaphnia Chronic minnow Acute minnow (fresh/marine) Acute Daphnia species Acute Mysid Acute Ceriodaphnia Fecal Coliform	Chronic Ceriodaphnia Chronic minnow Acute minnow (fresh/marine) Acute Daphnia species Acute Mysid Acute Ceriodaphnia Fecal Coliform		
Permit #: AR0000752/AFIN 70-00040		Purchase Order:							Lab Control Number: C6007	
Sampler's Signature/Printed Name/Affiliation: Larken Pennington / Larken Pennington / EDC										
Date Start Date End	Time Start Time End	C	G							# and type of container
8/18/12	10:50am		✓	6 half gallon	007					
Relinquished by/Affiliation: Larken Pennington				Date: 8/19/12	Time: 0845	Received by/Affiliation: [Signature]		Date: 8/19/12	Time: 0845	
Relinquished by/Affiliation:				Date:	Time:	Received by/Affiliation:		Date:	Time:	
Relinquished by/Affiliation: [Signature]				Date: 8/19/12	Time: 1040	Received by/Affiliation: Clem J. Bucipp		Date: 8/19/12	Time: 1040	
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:										

APPENDIX B
RAW DATA SHEETS

BIO-ANALYTICAL LABORATORIES
ACUTE TOXICITY TEST WATER QUALITY DATA

Project# X4836

Client: EDCC/El Dorado Chemical

Address: 4500 Northwest Avenue, El Dorado, AR 71731

NPDES# AR0000752 AFIN70-00040 Outfall 007

Technicians: EGB/AH/LGZ/RC

Test initiated: Date 8/19/12 Time 1255

Test terminated: Date 8/21/12 Time 1335

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

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

Conductivity Meter: Model # Control Co. Serial #80277924

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

Sample Information

Sample ID#	Initial D.O. (mg/L and %)	Aerate? Minutes/Final D.O.(mg/L & %)	Total Residual Chlorine (mg/L)	Dechlorinated? Amount?	Ammonia (NH3) mg/L	Salinity	Hardness	Alkalinity	Tech
06007	8.7 102.3%	15/8.5 100%	<0.01	NO	6.0	N/A	476.0	0.0	EGB
↓	8.2 94.1%	NI	↓	↓	↓	↓	↓	↓	ahg

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. recon.	3365	N/A	N/A	N/A	N/A	7.6	64.0	32.0	EGB

Test Species Information

Test Species Info.	Species: <u>D. pulex</u> ID#: <u>X7-28</u>	Species: <u>P. promelas</u> ID#: <u>81812</u>	Species: ID#:	Species: ID#:
Age	<u><24 hrs</u>	<u>1 day</u>		
Test Container Size	<u>300ml</u>	<u>250ml</u>		
Test volume	<u>25.0ml</u>	<u>200ml</u>		
Feeding: Type	<u>Algae/YCT</u>	<u>Artemia</u>		
Amount	<u>acclimation</u>	<u>acclimation</u>		
Aeration?	<u>N/A</u>	<u>N/A</u>		
Amount				
Condition of survivors	<u>Good AH 8/21/12 Good AH 8/21/12</u>			

Comments:

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

Project# X4836

Test started: Date 8/19/12 Time 1330

client EIDorado Chemical

Test ended: Date 8/21/12 Time 1335

Sample Description 007

Test Species D. pulex ID# X7-28

Technician: 0hour EB 24hour RC 48hour AH 72hour _____ 96hour _____

Time: 0hour 1330 24hour 1320 48hour 1335 72hour _____ 96hour _____

Temperature (°C): 0hour 24.6 24hour 24.9 48hour 24.3 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
0/0																						
0	A	N/A	8	7	7			8.2	8.1	8.3			7.6	7.9	7.7			17.9	23.9	17.9	20.7	
	B	}	8	7	7																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	7																	
32	A		8	5	3			8.4	8.0	8.2			7.2	7.1	7.3			10.2	16.0	10.2	15.1	
	B		8	8	6																	
	C		8	6	6																	
	D		8	8	8																	
	E		8	6	5																	
Chemistry Tech prerenewal/postrenewal								EB	RC	AH			EB	RC	AH			EB	RC	AH		

ACUTE2 020809 Rev.

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

Project# X4836

Test started: Date 8/19/12 Time 1330

client El Dorado Chemical

Test ended: Date 8/21/12 Time 1335

Sample Description 007

Test Species D. pulex ID# X728

Technician: Ohour EAH 24hour RC 48hour AH 72hour _____ 96hour _____

Time: Ohour 1330 24hour 1330 48hour 1335 72hour _____ 96hour _____

Temperature (°C): Ohour 24.0 24hour 24.9 48hour 24.3 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
0/0																						
42	A	N/A	8	8	5			8.4	8.2	8.2			7.1	7.1	7.2			746	753	750		
	B	}	8	5	5																	
	C		8	5	5																	
	D		8	7	4																	
	E		8	7	6																	
50	A	}	8	7	6			8.4	8.0	8.2			7.0	7.1				855	821	863	802	
	B		8	5	5																	
	C		8	2	2																	
	D		8	5	5																	
	E		8	3	3																	
Chemistry Tech prerenewal/postrenewal								EAH	RC	AH			EAH	RC	AH			EAH	RC	AH		

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

Project# X4836

Test started: Date 8/19/12 Time 1330

Client Eldorado Chemical

Test ended: Date 8/21/12 Time 1335

Sample Description 007

Test Species D. pulex ID# X7-28

Technician: Ohour EBB 24hour RC 48hour AH 72hour _____ 96hour _____

Time: Ohour 1330 24hour 1330 48hour 1335 72hour _____ 96hour _____

Temperature (°C): Ohour 24.6 24hour 24.9 48hour 24.3 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
0/0	A	N/A	8	5	4			8.5	8.0	8.1			6.9	7.3	7.0			926	960	950		
	B	}	8	5	5																	
	C		8	5	5																	
	D		8	5	4																	
	E		8	3	3																	
75	A	}	8	5	5			8.3	8.4	8.0			6.9	7.1	6.9			1169	1073	1205		
	B		8	3	2																	
	C		8	6	5																	
	D		8	5	4																	
	E		8	4	3																	
Chemistry Tech prerenewal/postrenewal							EBB	RC	AH			EBB	RC	AH			EBB	RC	AH			

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

Project# X248310

Test started: Date 8/19/12 Time 1330

Client E1 Dorado Chemical

Test ended: Date 8/21/12 Time 1335

Sample Description 007

Test Species D. pulex ID# X728

Technician: 0hour EB 24hour RC 48hour PH 72hour _____ 96hour _____

Time: 0hour 1330 24hour 1330 48hour 1335 72hour _____ 96hour _____

Temperature (°C): 0hour 24.6 24hour 24.9 48hour 24.3 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
0/0																						
100	A	N/A	8	6	6			8.1	7.9	7.9			6.1	6.4	6.7			505	1346	1490	1535	
	B	}	8	3	3																	
	C		8	5	4																	
	D		8	4	4																	
	E		8	5	4																	
Chemistry Tech prerenewal/postrenewal								EB <u>RC</u> PH					EB <u>RC</u> PH					EB <u>RC</u> PH				

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

Project# X4836

Test started: Date 8/19/12 Time 1255

Client Eldorado Chemical

Test ended: Date 8/21/12 Time 1255

Sample Description 007

Test Species P. promelas ID# 81812

Technician: 0hour SLB 24hour SLB 48hour SLB 72hour _____ 96hour _____
 Time: 0hour 1255 24hour 1300 48hour 1255 72hour _____ 96hour _____
 Temperature (°C): 0hour 24.4 24hour 24.3 48hour 24.4 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
0/0																						
0	A	N/A	8	8	8			8.2	7.8 7.3	7.8			7.6	7.6 7.1			1739	1739 1769	198			
	B	}	8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
32	A		8	8	8			8.4	7.8 7.2	7.7			7.2	7.3 7.1	7.3		612	613 622	641			
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
Chemistry Tech prerenewal/postrenewal								E.S.B. SLB					E.S.B. SLB					E.S.B. SLB				

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

Project# X4836

Test started: Date 8/19/12 Time 1255

Client El Dorado Chemical

Test ended: Date 8/21/12 Time 1255

Sample Description 007

Test Species P. promelas ID# 81812

Technician: Ohour ELB 24hour ELB 48hour ELB 72hour _____ 96hour _____

Time: Ohour 1255 24hour 1300 48hour 1255 72hour _____ 96hour _____

Temperature (°C): Ohour 24.4 24hour 24.3 48hour 24.4 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
0/0																						
42	A	UIA	8	8	8			8.4	7.8	7.7			7.1	7.2	7.2			746	753	779		
	B	}	8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
50	A	}	8	8	8			8.4	7.8	7.7			7.0	7.1	7.1			855	862	896		
	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# X4836

Test started: Date 8/19/12 Time 1255

Client E1 Dorado Chemical

Test ended: Date 8/21/12 Time 1255

Sample Description 007

Test Species P. promelas ID# 81812

Technician: 0hour ELB 24hour ELB 48hour ELB 72hour _____ 96hour _____
 Time: 0hour 1255 24hour 1200 48hour 1255 72hour _____ 96hour _____
 Temperature (°C): 0hour 24.4 24hour 24.3 48hour 24.4 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
0/0																						
5/6	A	N/A	8	8	8			85	7.7	2.0			6.9	7.1	7.1			726	135	934	909	
	B	}	8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
75	A	}	8	8	8			83	7.8	2.0			6.9	6.9	6.9			1169	1200	1178	1230	
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
Chemistry Tech prerenewal/postrenewal			ELB <u>ELB</u>					ELB <u>ELB</u>					ELB <u>ELB</u>									

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

Project# X4836

Test started: Date 8/19/12 Time 1255

client E1 Dorado Chemical

Test ended: Date 8/21/12 Time 1255

Sample Description 007

Test Species P. promelas ID# 81812

Technician: Ohour EBB 24hour EBB 48hour EBB 72hour _____ 96hour _____

Time: Ohour 1255 24hour 1300 48hour 1255 72hour _____ 96hour _____

Temperature (°C): Ohour 24.4 24hour 24.3 48hour 24.4 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	N/A	8	8	7			8.1	7.7 8.5	7.4				6.1	6.5 6.4	6.7			1505	1552 1490	1590			
	B	}	8	8	7																			
	C		8	8	5																			
	D		8	8	7																			
	E		8	8	3																			
Chemistry Tech prerenewal/postrenewal																								

APPENDIX C
STATISTICAL ANALYSIS

Daphnid Acute Test-48 Hr Survival

Start Date: 8/19/2012 Test ID: X4838DP Sample ID: AR0000752 Outfall 007
 End Date: 8/21/2012 Lab ID: NELAP01975 Sample Type: EFF2-Industrial
 Sample Date: 8/18/2012 Protocol: EPAAW02-EPA/821/R-02-01 Test Species: DP-Daphnia pulex

Comments:

Conc-%	1	2	3	4	5
D-Control	0.8750	0.8750	1.0000	1.0000	0.8750
32	0.3750	0.7500	0.7500	1.0000	0.6250
42	0.6250	0.6250	0.6250	0.5000	0.7500
50	0.7500	0.6250	0.2500	0.6250	0.3750
56	0.5000	0.6250	0.6250	0.5000	0.3750
75	0.6250	0.2500	0.6250	0.5000	0.3750
100	0.7500	0.3750	0.5000	0.5000	0.5000

Conc-%	Mean	N-Mean	Transform: Arcsin Square Root					1-Tailed		
			Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
D-Control	0.9250	1.0000	1.2829	1.2094	1.3931	7.841	5			
*32	0.7000	0.7568	1.0117	0.6591	1.3931	26.261	5	2.574	2.409	0.2538
*42	0.6250	0.6757	0.9136	0.7854	1.0472	10.135	5	3.505	2.409	0.2538
*50	0.5250	0.5676	0.8107	0.5236	1.0472	26.296	5	4.482	2.409	0.2538
*56	0.5250	0.5676	0.8107	0.6591	0.9117	13.039	5	4.482	2.409	0.2538
*75	0.4750	0.5135	0.7583	0.5236	0.9117	22.141	5	4.979	2.409	0.2538
*100	0.5250	0.5676	0.8125	0.6591	1.0472	17.496	5	4.464	2.409	0.2538

Auxiliary Tests	Statistic	Critical	Skew	Kurt						
Shapiro-Wilk's Test indicates normal distribution ($p > 0.05$)	0.98567	0.934	0.0164	0.53981						
Bartlett's Test indicates equal variances ($p = 0.30$)	7.19159	16.8119								
Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test Treatments vs D-Control	<32	32			0.1852	0.20144	0.16793	0.02776	3.7E-04	6, 28

Acute Fish Test-48 Hr Survival

Start Date: 8/19/2012 Test ID: X4836PP Sample ID: AR0000752 Outfall 007
 End Date: 8/21/2012 Lab ID: NELAP01975 Sample Type: EFF2-Industrial
 Sample Date: 8/18/2012 Protocol: EPAAW02-EPA/821/R-02-01 Test Species: PP-Pimephales promelas
 Comments:

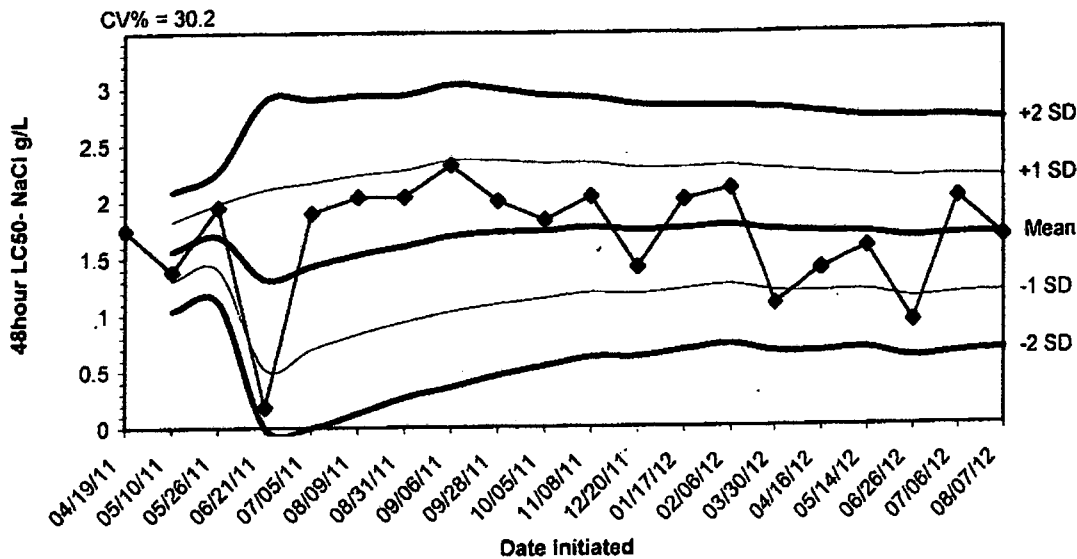
Conc-%	1	2	3	4	5
D-Control	1.0000	1.0000	1.0000	1.0000	1.0000
32	1.0000	1.0000	1.0000	1.0000	1.0000
42	1.0000	1.0000	1.0000	1.0000	1.0000
50	1.0000	1.0000	1.0000	1.0000	1.0000
56	1.0000	1.0000	1.0000	1.0000	1.0000
75	1.0000	1.0000	1.0000	1.0000	1.0000
100	0.8750	0.8750	0.6250	0.8750	0.3750

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
42	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	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5	27.50	16.00
75	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5	27.50	16.00
*100	0.7250	0.7250	1.0398	0.6591	1.2094	23.931	5	15.00	16.00

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.05)	0.4973	0.934	-2.1404	12.4346
Equality of variance cannot be confirmed				
Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	75	100	86.6025	1.33333
Treatments vs D-Control				

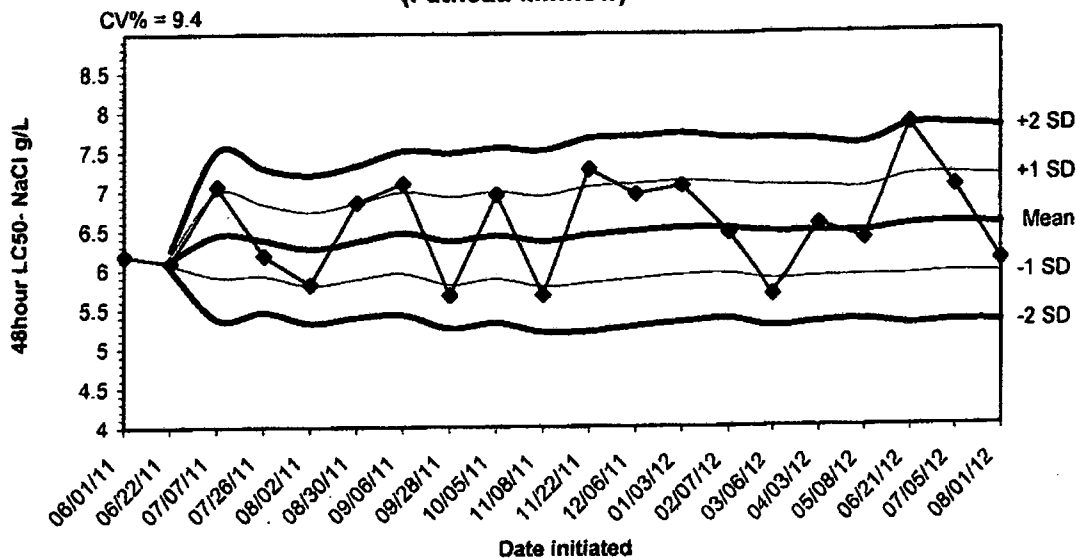
APPENDIX D
QUALITY ASSURANCE CHARTS

2012 48-hour Reference Toxicant Test Results for *Daphnia pulex*



Dates	Values	Mean	-1 SD	-2 SD	+1 SD	+2 SD
04/19/11	1.7500					
05/10/11	1.3800	1.5650	1.3034	1.0417	1.8266	2.0883
05/26/11	1.9500	1.6933	1.4041	1.1149	1.9825	2.2717
06/21/11	0.1800	1.3150	0.5223	0.0000	2.1077	2.9003
07/05/11	1.9000	1.4320	0.6974	0.0000	2.1666	2.9012
08/09/11	2.0400	1.5333	0.8309	0.1286	2.2357	2.9381
08/31/11	2.0400	1.6057	0.9365	0.2674	2.2749	2.9441
09/06/11	2.3200	1.6950	1.0260	0.3569	2.3640	3.0331
09/28/11	2.0000	1.7289	1.0949	0.4608	2.3629	2.9969
10/05/11	1.8300	1.7390	1.1404	0.5418	2.3376	2.9362
11/08/11	2.0400	1.7664	1.1913	0.6162	2.3415	2.9166
12/20/11	1.4100	1.7367	1.1788	0.6209	2.2946	2.8525
01/17/12	2.0100	1.7577	1.2182	0.6787	2.2972	2.8367
02/06/12	2.1100	1.7829	1.2560	0.7292	2.3097	2.8365
03/30/12	1.0800	1.7360	1.1969	0.6578	2.2751	2.8142
04/16/12	1.3900	1.7144	1.1864	0.6584	2.2424	2.7703
05/14/12	1.5800	1.7065	1.1942	0.6820	2.2187	2.7310
06/26/12	0.9200	1.6628	1.1324	0.6020	2.1932	2.7236
07/06/12	2.0100	1.6811	1.1595	0.6379	2.2026	2.7242
08/07/12	1.6600	1.6800	1.1723	0.6646	2.1877	2.6954

**2012 48-hour Reference Toxicant Test Results for Pimephales promelas
(Fathead Minnow)**



Dates	Values	Mean	-1 SD	-2 SD	+1 SD	+2 SD
06/01/11	6.1800					
06/22/11	6.0900	6.1350	6.0714	6.0077	6.1986	6.2623
07/07/11	7.0600	6.4433	5.9074	5.3715	6.9793	7.5152
07/26/11	6.1800	6.3775	5.9205	5.4636	6.8345	7.2914
08/02/11	5.8100	6.2640	5.7939	5.3237	6.7341	7.2043
08/30/11	6.8500	6.3617	5.8779	5.3941	6.8455	7.3293
09/06/11	7.0900	6.4657	5.9453	5.4249	6.9861	7.5065
09/28/11	5.6700	6.3663	5.8083	5.2504	6.9242	7.4821
10/05/11	6.9500	6.4311	5.8741	5.3171	6.9881	7.5451
11/08/11	5.6700	6.3550	5.7773	5.1997	6.9327	7.5103
11/22/11	7.2700	6.4382	5.8246	5.2111	7.0517	7.6653
12/06/11	6.9500	6.4808	5.8775	5.2741	7.0842	7.6876
01/03/12	7.0600	6.5254	5.9258	5.3262	7.1250	7.7246
02/07/12	6.4600	6.5207	5.9444	5.3680	7.0970	7.6734
03/06/12	5.6700	6.4640	5.8668	5.2695	7.0612	7.6585
04/03/12	6.5600	6.4700	5.8925	5.3150	7.0475	7.6250
05/08/12	6.3700	6.4641	5.9045	5.3448	7.0238	7.5834
06/21/12	7.8200	6.5394	5.9094	5.2794	7.1695	7.7995
07/05/12	7.0300	6.5653	5.9427	5.3202	7.1878	7.8103
08/01/12	6.0900	6.5415	5.9263	5.3111	7.1567	7.7719

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: 8/18/12

To: 8/18/12

From:

To:

Test Initiated: 8/19/12

Dilution Water Used:

Receiving Water

X

Reconstituted Water

Dilution Series Results - Percent Survival

TIME OF READING	REP	0	32	42	50	56	75	100
24-hour	A	87.5	62.5	100	87.5	62.5	62.5	75.0
	B	87.5	100	62.5	62.5	62.5	37.5	37.5
	C	100	75.0	62.5	25.0	62.5	75.0	62.5
	D	100	100	87.5	62.5	62.5	62.5	50.0
	E	100	75.0	87.5	37.5	37.5	50.0	62.5
48-hour	A	87.5	37.5	62.5	75.0	50.0	62.5	75.0
	B	87.5	75.0	62.5	62.5	62.5	25.0	37.5
	C	100	75.0	62.5	25.0	62.5	62.5	50.0
	D	100	100	50.0	62.5	50.0	50.0	50.0
	E	87.5	62.5	75.0	37.5	37.5	37.5	50.0
	Mean		92.5	70.0	62.5	52.5	52.5	47.5

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

2. Enter percent effluent corresponding to the LC₅₀ below:

LC₅₀ = N/A% effluent

95 % confidence limits: N/A

Method of LC₅₀ calculation: N/A

3. If you answered NO to 1.a) enter (P) otherwise enter (F): 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 48 hour Acute Static Renewal
Chemical Parameters Chart***

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

Contact: Larken Pennington
Analyst: Briggs, Haughton, Callahan

Sample Collected From: Date 8/18/12 Time 1050
To: Date 8/18/12 Time 1050
Test Begin Date 8/19/12 Time 1330
Test End Date 8/21/12 Time 1335

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	8.3	24.6	24.9	24.3	32.0			64.0			7.6	7.9	7.7
32		8.4	8.2	8.2	24.6	24.9	24.3							7.2	7.1	7.3
42		8.4	8.2	8.2	24.6	24.9	24.3							7.1	6.9	7.2
50		8.4	8.2	8.2	24.6	24.9	24.3							7.0	6.8	7.1
56		8.5	8.2	8.1	24.6	24.9	24.3							6.9	6.7	7.0
75		8.3	8.4	8.0	24.6	24.9	24.3							6.9	6.7	6.9
100		8.4	8.5	7.9	24.6	24.9	24.3	0			476.0			6.1	6.4	6.7

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

Acute Forms
Pimephales promelas (Fathead minnow) Survival

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

Composite Collected From: 8/18/12 To: 8/18/12
From: To:

Test Initiated: 8/19/12

Dilution Water Used: Receiving Water X Reconstituted Water

Dilution Series Results - Percent Survival

TIME OF READING	REP	0	32	42	50	56	75	100
24-hour	A	100	100	100	100	100	100	100
	B	100	100	100	100	100	100	100
	C	100	100	100	100	100	100	100
	D	100	100	100	100	100	100	100
	E	100	100	100	100	100	100	100
48-hour	A	100	100	100	100	100	100	87.5
	B	100	100	100	100	100	100	87.5
	C	100	100	100	100	100	100	62.5
	D	100	100	100	100	100	100	87.5
	E	100	100	100	100	100	100	37.5
	Mean	100	100	100	100	100	100	72.5

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

2. Enter percent effluent corresponding to the LC₅₀ below:

LC₅₀ = N/A% effluent

95 % confidence limits: N/A

Method of LC₅₀ calculation: N/A

3. If you answered NO to 1.a) enter (P) otherwise enter (F): 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: Larken Pennington
Analyst: Briggs, Haughton, Callahan**

**Sample Collected From: Date 8/18/12 Time 1050
 To: Date 8/18/12 Time 1050
Test Begin Date 8/19/12 Time 1255
Test End Date 8/21/12 Time 1255**

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	7.8	24.4	24.3	24.4	32.0			64.0			7.6	7.9	7.7
32		8.4	8.2	7.7	24.4	24.3	24.4							7.2	7.1	7.3
42		8.4	8.2	7.7	24.4	24.3	24.4							7.1	6.9	7.2
50		8.4	8.2	7.7	24.4	24.3	24.4							7.0	6.8	7.1
56		8.5	8.2	7.6	24.4	24.3	24.4							6.9	6.7	7.1
75		8.3	8.4	7.6	24.4	24.3	24.4							6.9	6.7	6.9
100		8.4	8.5	7.4	24.4	24.3	24.4	0			476.0			6.1	6.4	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 (v. 31612)

Client: El Dorado Chemical

Project#: X4836

Chain of Custody Documents Checked by: EOB 9/14/12
Technician/Date

Raw Data Documents Checked by: EOB 9/14/12
Technician/Date

Statistical Analysis Package Checked by: EOB 8/23/12
Quality Manager/Date

Quality Control Data Checked by: EOB 8/23/12
Quality Manager/Date

Report Checked by: EOB 9/14/12
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 D. Bragg
Quality Manager

9/17/12
Date

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

From: (870) 863-1125
Larken Pennington
EL DORADO CHEMICAL COMPANY
4500 Northwest Ave.

Origin ID: ELDA



J12201207160325

Ship Date: 21SEP12
ActWgt: 1.0 LB
CAD: 5887030/INET3300

El Dorado, AR 71730

Delivery Address Bar Code



SHIP TO: (501) 682-0632

BILL SENDER

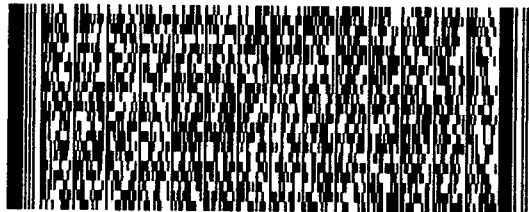
ADEQ - Water Division Enforcement
5301 NORTHSHORE DR

NORTH LITTLE ROCK, AR 72118

Ref #
Invoice #
PO #
Dept #

MON - 24 SEP A4
PRIORITY OVERNIGHT

TRK# 7990 1553 9505
0201



X2 LITA

72118
AR-US
LIT

