4500 NORTH WEST AVE. • P.O. BOX 231 • EL DORADO, AR. 71731 • (870) 863-1400

EL DORADO
CHEMICAL COMPANY

March 23, 2015

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 February 28 , 2015.

Enclosed you will find the Discharge Monitoring Reports ending February 28, 2015. 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 Edward L Pearson at (870) 863-1400.

Sincerely,

Edward L Pearson

Edward L Pearson

Environmental Technician

Enclosures

NON-COMPLIANCE REPORT

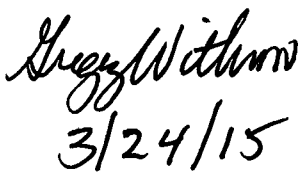
Facility Name: El Dorado Chemical Company

Permit Number: AR0000752 **AFIN:** 70-00040

Month / Year: Feb-15

Type of Violation	Permit Limit	Date of Violation	Cause of Violation	Corrective Action or Other Narrative
Outfall 006/Zinc Monthly Average (530 ug/L)	115.62 ug/L Monthly Average	2/16/2015	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 (530 ug/L)	231.99 ug/L Daily Max	2/16/2015	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 (73 ug/L)	3.8 ug/L Monthly Average	2/16/2015	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. (73 ug/L)	7.62 ug/L Daily Max.	2/16/2015	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 (480 ug/L)	115.62 ug/L Monthly Average	2/16/2015	Unknown	EDCC has land applied pelletized lime in the area of outfall 007 in an effort to promote vegetative cover.
Outfall 007 / Zinc Daily Max(480 ug/L)	231.99 ug/L Daily Max	2/16/2015	Unknown	EDCC has land applied pelletized lime in the area of outfall 007 in an effort to promote vegetative cover.
Outfall 007 / Lead Monthly Average (25 ug/L)	3.8 ug/L Monthly Average	2/16/2015	Unknown	EDCC has land applied pelletized lime in the area of outfall 007 in an effort to promote vegetative cover.
Outfall 007 / Lead Daily Max (25 ug/L)	7.62 ug/L Daily Max	2/16/2015	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 (780 mg/L)	291 mg/L Monthly Average	2/16/2015	Unknown	EDCC has land applied pelletized lime in the area of outfall 007 in an effort to promote vegetative cover.
Outfall 007/TDS Daily Max(780 mg/L)	436.5 mg/L Daily Max	2/16/2015	Unknown	EDCC has land applied pelletized lime in the area of outfall 007 in an effort to promote vegetative cover.

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.)



3/24/15

Signature / Date

February 23, 2015

Test Results of
First Quarter
Chronic 7-Day Renewal
Biomonitoring Testing
for
Outfall 010
El Dorado, AR

Control No. 187471-1

Prepared for:

Mr. Eddie Pearson
El Dorado Chemical Company
4500 North West Avenue
El Dorado, AR 71730

Prepared by:

AMERICAN INTERPLEX CORPORATION
8600 Kanis Road
Little Rock, AR 72204-2322

AMERICAN INTERPLEX CORPORATION
LABORATORIES

El Dorado Chemical Company
ATTN: Mr. Eddie Pearson
4500 North West Avenue
El Dorado, AR 71730

Re: Chronic 7-Day Renewal utilizing *Pimephales promelas* (Fathead minnow) and *Ceriodaphnia dubia*
Outfall 010 - El Dorado, AR
NPDES Permit No. AR0000752

Dear Mr. Eddie Pearson:

This report is the analytical results and supporting information for the samples submitted to American Interplex Corporation (AIC). The following results are applicable only to the sample identified by the control number referenced above. Accurate assessment of the data requires access to the entire document. Each section of the report has been reviewed and approved by the laboratory director or qualified designee.

Testing procedures and Quality Assurance were in accordance with "Short Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms" EPA-821-R-02-013, Fourth Edition, October 2002. Test results are summarized below:

Method 1000.0 Chronic *Pimephales promelas* (Fathead minnow) Survival and Growth Test: The No Observable Effects Concentration (NOEC) for survival occurred at 2.1 % effluent, which is above the critical dilution of 1.6 %. Any statistical difference with sublethal effects cannot be considered toxic due to the minimum significant difference (PMSD) calculated result being below the lower PMSD bounds. **The sample, therefore PASSED both lethal and sub-lethal effects for the Fathead minnow test.**

Method 1002.0 Chronic *Ceriodaphnia dubia* Survival and Reproduction Test: The No Observable Effects Concentration (NOEC) for survival occurred at 2.1 % effluent, which is above the critical dilution of 1.6 %. Any statistical difference with sublethal effects cannot be considered toxic due to the minimum significant difference (PMSD) calculated result being below the lower PMSD bounds. **The sample, therefore PASSED both lethal and sub-lethal effects for the *Ceriodaphnia dubia* test.**

AMERICAN INTERPLEX CORPORATION

John Overbey
Laboratory Director

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Table of Contents

I. Control Acceptance Criteria

Pimephales promelas (Fathead minnow) Method 1000.0

CRITERIA	RESULTS	PASS/FAIL
Control Survival > or = 80%	92.5	PASS
Control Growth > or = 0.25 mg per Surviving minnow	0.346	PASS
Control Growth CV < or = 40%	5.87	PASS
Growth Minimum Significant Difference 12 to 30%	8.61	BELOW
Critical Dilution CV < or = 40%	4.50	PASS

Ceriodaphnia dubia Method 1002.0

CRITERIA	RESULTS	PASS/FAIL
Control Survival > or = 80%	100	PASS
Control Reproduction > or = 15 per Surviving Female	17.1	PASS
Control CV < or = 40% per Surviving Female	15.2	PASS
Reproduction Minimum Significant Difference 13 to 47%	12.4	BELOW
Critical Dilution CV < or = 40%	12.2	PASS

II. Outlined Report

A. Introduction

1. Permit Number: AR0000752
2. Test Requirements:
   Test Methods 1000.0 and 1002.0
3. Receiving Stream:

B. Source of Effluent/Dilution Water

1. Effluent Samples:
   a. Sampling Point: Outfall 010
   b. Chemical Data:

Analysis	Sample 1	Sample 2	Sample 3
Dissolved oxygen (mg/l)	8.2	7.8	7.5
pH (standard units)	6.9	6.9	6.8
Alkalinity (mg/l as CaCO3)	36	39	18
Hardness (mg/l as CaCO3)	42	39	42
Conductivity (umhos/cm)	450	500	450
Residual Chlorine (mg/l)	0.050	<0.05	0.060
Ammonia as N (mg/l)	10	9.8	9.2

2. Dilution Water Samples: Synthetic Soft Water #4183
   a. Dates Prepared: February 3 through February 17, 2015
   b. Chemical Data:

Analysis	Sample 1	Sample 2	Sample 3
Dissolved oxygen (mg/l)	8.9	8.5	7.6
pH (standard units)	7.2	7.3	7.3
Alkalinity (mg/l as CaCO3)	31	31	31
Hardness (mg/l as CaCO3)	44	44	48
Conductivity (umhos/cm)	140	140	140
Residual Chlorine (mg/l)	<0.05	<0.05	<0.05

C. Test Methods
1. Test methods used:
Short Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, EPA-821-R-02-013; test Methods 1000.0 and 1002.0, Fathead Minnow Survival and Growth and *Ceriodaphnia dubia* Survival and Reproduction.
2. Endpoint: No Observable Effects Concentration (NOEC)
3. Test Conditions:

Pimephales promelas (Fathead minnow) Survival and Growth Method 1000.0

Date & Time Test Initiated:	February 10, 2015 at 1630
Date & Time Test Terminated:	February 17, 2015 at 1500
Type & Volume of Test Chamber:	500 ml disposable beaker
Volume of Sample:	250 ml
Number of Organisms per replicate:	8
Number of Replicates per dilution:	5

Ceriodaphnia dubia Survival and Growth Method 1002.0

Date & Time Test Initiated:	February 10, 2015 at 1530
Date & Time Test Terminated:	February 17, 2015 at 1640
Type & Volume of Test Chamber:	30 ml disposable beaker
Volume of Sample:	15 ml
Number of Organisms per replicate:	1
Number of Replicates per dilution:	10

4. Acclimation of test organisms: Obtained from in-house cultures
5. Test Temperature: 25 +/- 1 degree Celsius

D. Test Organisms
1. Scientific Name
a. Test 1000.0 *Pimephales promelas*
b. Test 1002.0 *Ceriodaphnia dubia*

III. Data Analysis

The data was analyzed using American Interplex Corporation's Laboratory Information Management Software based on Toxstat.

Pimephales promelas (Fathead minnow) survival data was transformed using the Arc Sine transformation. Normality and homogeneity of variance were checked using Shapiro-Wilk's. The survival data was then analyzed using Steel's Many-One Rank Test to determine the No Observable Effects Concentration (NOEC).

Fathead minnow growth data was analyzed for normality and homogeneity of variance using Shapiro-Wilk's and Bartlett's test. Dunnett's Test was used to determine the No Observable Effects Concentration (NOEC) for growth.

Ceriodaphnia dubia survival data was analyzed with Fisher's Exact Test. Reproduction data was analyzed using Kolmogorov's Test for Normality and analyzed with Steel's Many-One Rank Test to determine the No Observable Effects Concentration (NOEC) for Reproduction. Dunnett's Test was used to calculate the PMSD.

IV. Standard Reference Toxicants

American Interplex Corporation has an ongoing test organism culturing program. The sensitivity of the offspring is determined by performing a standard reference toxicant test with each effluent test. Sodium chloride in synthetic moderately hard water is used as prescribed in EPA-821-R-02-013.

Pimephales promelas (Fathead minnow)

Chronic reference tests are performed monthly.
A chronic reference test was performed on February 4, 2015 at 1425 to February 11, 2015 at 1310
The results were as follows: (Control No. 187315-1.)

Survival LC-50: 4540 mg/l
Growth IC-25: 3331 mg/l
Growth PMSD: 16.3

Ceriodaphnia dubia

Chronic reference tests are performed monthly.
A chronic reference test was performed on February 4, 2015 at 1530 to February 10, 2015 at 1530
The results were as follows: (Control No. 187315-2.)

Survival LC-50: 2180 mg/l
Growth IC-25: 1316 mg/l
Growth PMSD: 23.4

V. Chemical Analysis/Quality Control

Parameter	Method	% Recovery	Relative % Difference
Alkalinity	SM 2320 B	NA	2.17
Hardness	EPA 200.7	98.9	0.767
pH	SM 4500-H+ B	101	0.134
Conductivity	EPA 120.1	104	5.37

VI. Organism History

Pimephales promelas (Fathead minnow)

Date: February 10, 2015
Age: <24 hours
Source: In-house culture
Water Chemistry Record:

Alkalinity: 57-64 mg/l
Hardness: 80-100 mg/l
Temperature: 25 deg.C

Ceriodaphnia dubia

Date: February 10, 2015
Age: <24 hours
Source: In-house culture
Water Chemistry Record:

Alkalinity: 57-64 mg/l
Hardness: 80-100 mg/l
Temperature: 25 deg.C

VII. Results Summary *Pimephales promelas*, Fathead minnow Larval Survival and Growth Test -- Method 1000.0

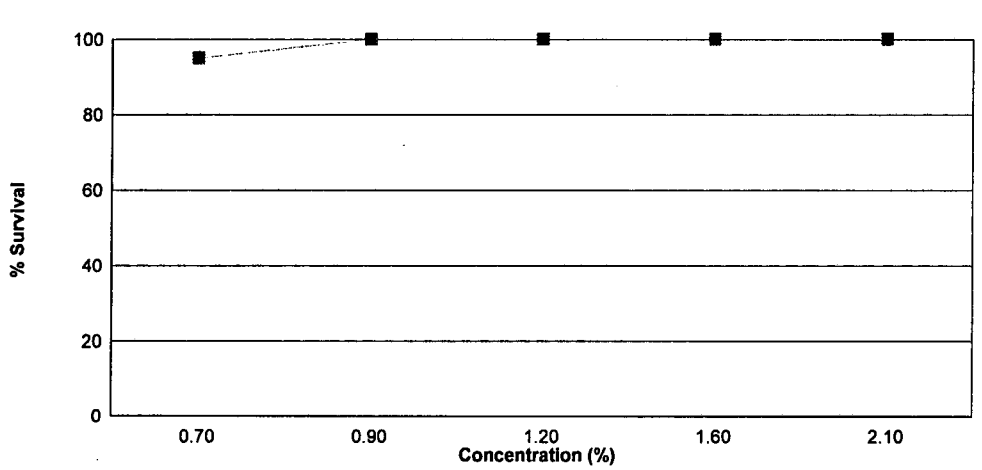
Larvae are exposed in a static renewal system for seven days to different concentrations of effluent with dilution water. Test results are based on the survival and growth (increase in weight) of the larvae.

Effluent dilutions for this test were 0.7 %, 0.9 %, 1.2 %, 1.6 %, 2.1 % in accordance with the NPDES permit.

The low flow or 'critical' dilution is specified in the NPDES permit as 1.6 % effluent.

The test was initiated on February 10, 2015 at 1630 and continued through February 17, 2015 at 1500. Statistical analyses were performed on the observed data and the no observable effects concentrations (NOECs) were as follows:

a.) NOEC survival = 2.1 % effluent
b.) NOEC growth = 2.1 % effluent



Summary of the 7-day Fathead Minnow Survival and Growth		
Concentration	Percent Survival	Mean Growth (mg)
Control	92.5	0.320
0.7 %	95.0	0.301
0.9 %	100	0.329
1.2 %	100	0.299
1.6 %	100	0.314
2.1 %	100	0.319

VII. Results Summary *Ceriodaphnia dubia*, Cladoceran Survival and Reproduction Test -- Method 1002.0

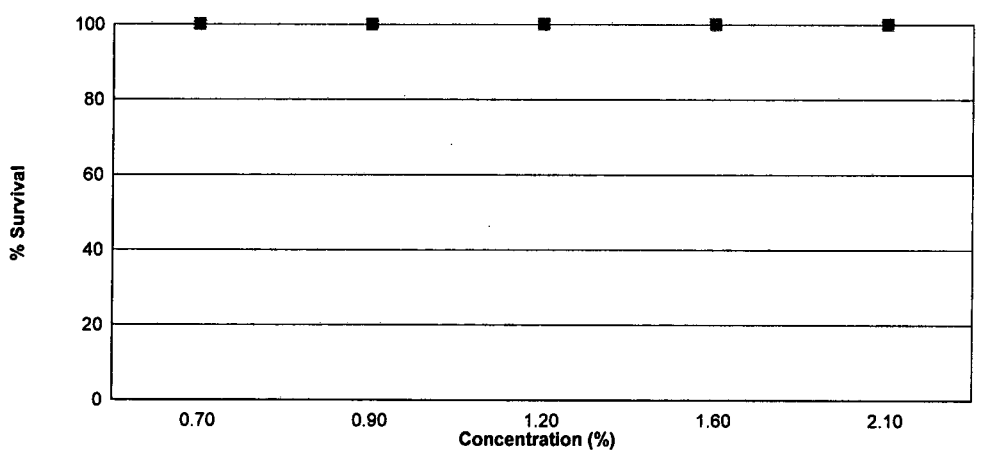
Neonates are exposed in a static renewal system to different concentrations of effluent with dilution water until 60% of surviving control organisms have three broods of offspring with an average of at least 15 young per female.

Effluent dilutions for this test were 0.7 %, 0.9 %, 1.2 %, 1.6 %, 2.1 % in accordance with the NPDES permit.

The low flow or 'critical' dilution is specified in the NPDES permit as 1.6 % effluent.

The test was initiated on February 10, 2015 at 1530 and continued through February 17, 2015 at 1640. Statistical analyses were performed on the observed data and the no observable effects concentrations (NOECs) were as follows:

a.) NOEC survival = 2.1 % effluent
b.) NOEC reproduction = 2.1 % effluent



Summary of the 7-day *Ceriodaphnia dubia* Survival and Reproduction Data		
Concentration	Percent Survival	Mean Reproduction
Control	100	17.1
0.7 %	100	16.6
0.9 %	100	16.4
1.2 %	100	17.4
1.6 %	100	17.7
2.1 %	100	16.8

Appendix A1: Test 1000.0

Pimephales promelas (Fathead Minnow) 7-Day Survival

Date and Time Test Initiated: February 10, 2015 at 1630
Date and Time Test Terminated: February 17, 2015 at 1500

Concentration	Replicate	Number of Survivors						
		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
Control	A	7	7	5	5	5	5	5
	B	8	8	8	8	8	8	8
	C	8	8	8	8	8	8	8
	D	8	8	8	8	8	8	8
	E	8	8	8	8	8	8	8
0.7 %	A	8	8	8	8	8	8	8
	B	8	8	7	7	7	6	6
	C	8	8	8	8	8	8	8
	D	8	8	8	8	8	8	8
	E	8	8	8	8	8	8	8
0.9 %	A	8	8	8	8	8	8	8
	B	8	8	8	8	8	8	8
	C	8	8	8	8	8	8	8
	D	8	8	8	8	8	8	8
	E	8	8	8	8	8	8	8
1.2 %	A	8	8	8	8	8	8	8
	B	8	8	8	8	8	8	8
	C	8	8	8	8	8	8	8
	D	8	8	8	8	8	8	8
	E	8	8	8	8	8	8	8
1.6 %	A	8	8	8	8	8	8	8
	B	8	8	8	8	8	8	8
	C	8	8	8	8	8	8	8
	D	8	8	8	8	8	8	8
	E	8	8	8	8	8	8	8
2.1 %	A	8	8	8	8	8	8	8
	B	8	8	8	8	8	8	8
	C	8	8	8	8	8	8	8
	D	8	8	8	8	8	8	8
	E	8	8	8	8	8	8	8

Appendix A1: Test 1000.0

Pimephales promelas (Fathead Minnow) 7-Day Growth

Test Initiated: February 10, 2015 at 1630
Test Terminated: February 17, 2015 at 1500
Drying Started: February 13, 2015 at 1551
Drying Ended: February 18, 2015 at 1420

Concentration	Replicate	Weight of pan	Weight of pan + fish	Total weight of fish (g)	Original # of fish	Mean dry weight (mg)
Control	A	.94045	.94278	0.00233	8	0.291
	B	.93664	.93930	0.00266	8	0.332
	C	.94293	.94554	0.00261	8	0.326
	D	.93544	.93815	0.00271	8	0.339
	E	.93198	.93449	0.00251	8	0.314
0.7 %	A	.93257	.93492	0.00235	8	0.294
	B	.93267	.93496	0.00229	8	0.286
	C	.93211	.93459	0.00248	8	0.310
	D	.93613	.93849	0.00236	8	0.295
	E	.93694	.93948	0.00254	8	0.318
0.9 %	A	.93712	.93967	0.00255	8	0.319
	B	.93632	.93891	0.00259	8	0.324
	C	.93597	.93857	0.00260	8	0.325
	D	.93301	.93581	0.00280	8	0.350
	E	.93398	.93659	0.00261	8	0.326
1.2 %	A	.93391	.93610	0.00219	8	0.274
	B	.93351	.93564	0.00213	8	0.266
	C	.93571	.93830	0.00259	8	0.324
	D	.93880	.94126	0.00246	8	0.308
	E	.93912	.94170	0.00258	8	0.322
1.6 %	A	.93847	.94110	0.00263	8	0.329
	B	.93519	.93781	0.00262	8	0.328
	C	.93290	.93529	0.00239	8	0.299
	D	.93243	.93492	0.00249	8	0.311
	E	.93534	.93776	0.00242	8	0.302
2.1 %	A	.93960	.94204	0.00244	8	0.305
	B	.93657	.93891	0.00234	8	0.292
	C	.93482	.93737	0.00255	8	0.319
	D	.93516	.93786	0.00270	8	0.338
	E	.93982	.94255	0.00273	8	0.341

Appendix A1: Test 1002.0

Ceriodaphnia dubia Survival and Reproduction

Date and Time Test Initiated: February 10, 2015 at 1530
Date and Time Test Terminated: February 17, 2015 at 1640

Concentration: Control													
Day	Replicate										No. of Young	No. of Adults	Young per Adult
	1	2	3	4	5	6	7	8	9	10			
1	0	0	0	0	0	0	0	0	0	0	0	10	0.00
2	0	0	0	0	0	0	0	0	0	0	0	10	0.00
3	0	0	0	0	0	0	0	0	0	0	0	10	0.00
4	5	4	4	4	3	4	6	4	4	4	42	10	4.20
5	0	0	0	0	1	0	0	0	0	0	1	10	0.100
6	10	2	3	2	4	3	5	3	4	3	39	10	3.90
7	8	9	9	10	10	10	9	8	8	8	89	10	8.90
8													
TOTAL	23	15	16	16	18	17	20	15	16	15	171	10	17.1

Concentration: 0.7 %													
Day	Replicate										No. of Young	No. of Adults	Young per Adult
	1	2	3	4	5	6	7	8	9	10			
1	0	0	0	0	0	0	0	0	0	0	0	10	0.00
2	0	0	0	0	0	0	0	0	0	0	0	10	0.00
3	0	0	0	0	0	0	0	0	0	0	0	10	0.00
4	4	5	4	4	4	5	4	4	6	4	44	10	4.40
5	0	0	0	0	0	0	0	1	0	0	1	10	0.100
6	3	4	5	3	1	3	4	0	3	2	28	10	2.80
7	9	10	9	8	10	9	8	10	10	10	93	10	9.30
8													
TOTAL	16	19	18	15	15	17	16	15	19	16	166	10	16.6

Concentration: 0.9 %													
Day	Replicate										No. of Young	No. of Adults	Young per Adult
	1	2	3	4	5	6	7	8	9	10			
1	0	0	0	0	0	0	0	0	0	0	0	10	0.00
2	0	0	0	0	0	0	0	0	0	0	0	10	0.00
3	0	0	0	0	0	0	0	0	0	0	0	10	0.00
4	4	4	5	4	4	4	4	3	4	4	40	10	4.00
5	0	0	0	0	0	0	0	2	1	0	3	10	0.300
6	3	2	3	3	3	3	4	3	3	4	31	10	3.10
7	9	9	8	9	9	10	10	8	8	10	90	10	9.00
8													
TOTAL	16	15	16	16	16	17	18	16	16	18	164	10	16.4

Appendix A1: Test 1002.0

Ceriodaphnia dubia Survival and Reproduction

Date and Time Test Initiated: February 10, 2015 at 1530
Date and Time Test Terminated: February 17, 2015 at 1640

Concentration: 1.2 %													
Day	Replicate										No. of Young	No. of Adults	Young per Adult
	1	2	3	4	5	6	7	8	9	10			
1	0	0	0	0	0	0	0	0	0	0	0	10	0.00
2	0	0	0	0	0	0	0	0	0	0	0	10	0.00
3	0	0	0	0	0	0	0	0	0	0	0	10	0.00
4	4	5	4	4	3	4	4	6	4	4	42	10	4.20
5	0	0	0	0	2	0	0	0	0	0	2	10	0.200
6	4	4	6	3	3	3	4	3	3	4	37	10	3.70
7	8	10	11	10	9	8	10	8	10	9	93	10	9.30
8													
TOTAL	16	19	21	17	17	15	18	17	17	17	174	10	17.4

Concentration: 1.6 %													
Day	Replicate										No. of Young	No. of Adults	Young per Adult
	1	2	3	4	5	6	7	8	9	10			
1	0	0	0	0	0	0	0	0	0	0	0	10	0.00
2	0	0	0	0	0	0	0	0	0	0	0	10	0.00
3	0	0	0	0	0	0	0	1	0	0	1	10	0.100
4	4	5	4	4	0	4	5	3	4	4	37	10	3.70
5	0	0	0	0	5	0	0	1	0	0	6	10	0.600
6	3	3	2	3	4	3	5	4	2	10	39	10	3.90
7	10	9	9	10	8	10	11	9	10	8	94	10	9.40
8													
TOTAL	17	17	15	17	17	17	21	18	16	22	177	10	17.7

Concentration: 2.1 %													
Day	Replicate										No. of Young	No. of Adults	Young per Adult
	1	2	3	4	5	6	7	8	9	10			
1	0	0	0	0	0	0	0	0	0	0	0	10	0.00
2	0	0	0	0	0	0	0	0	0	0	0	10	0.00
3	0	0	0	0	0	0	0	0	0	0	0	10	0.00
4	4	4	4	6	4	4	5	4	4	4	43	10	4.30
5	1	0	0	0	0	0	0	0	0	0	1	10	0.100
6	3	4	5	2	4	3	3	3	2	10	39	10	3.90
7	8	9	10	8	8	10	9	7	7	9	85	10	8.50
8													
TOTAL	16	17	19	16	16	17	17	14	13	23	168	10	16.8

Appendix A2: Statistics

Pimephales promelas (Fathead minnow) Survival

		Transformation of Data		Transform: Arc Sin(Square Root(Y))
Group	Identification	Rep	Value	Transformed
1	Control	1	0.62500	0.91174
1	Control	2	1.00000	1.39310
1	Control	3	1.00000	1.39310
1	Control	4	1.00000	1.39310
1	Control	5	1.00000	1.39310
2	0.7 %	1	1.00000	1.39310
2	0.7 %	2	0.75000	1.04720
2	0.7 %	3	1.00000	1.39310
2	0.7 %	4	1.00000	1.39310
2	0.7 %	5	1.00000	1.39310
3	0.9 %	1	1.00000	1.39310
3	0.9 %	2	1.00000	1.39310
3	0.9 %	3	1.00000	1.39310
3	0.9 %	4	1.00000	1.39310
3	0.9 %	5	1.00000	1.39310
4	1.2 %	1	1.00000	1.39310
4	1.2 %	2	1.00000	1.39310
4	1.2 %	3	1.00000	1.39310
4	1.2 %	4	1.00000	1.39310
4	1.2 %	5	1.00000	1.39310
5	1.6 %	1	1.00000	1.39310
5	1.6 %	2	1.00000	1.39310
5	1.6 %	3	1.00000	1.39310
5	1.6 %	4	1.00000	1.39310
5	1.6 %	5	1.00000	1.39310
6	2.1 %	1	1.00000	1.39310
6	2.1 %	2	1.00000	1.39310
6	2.1 %	3	1.00000	1.39310
6	2.1 %	4	1.00000	1.39310
6	2.1 %	5	1.00000	1.39310

Appendix A2: Statistics

Pimephales promelas (Fathead minnow) Survival

Shapiro - Wilk's Test for Normality		Transform: Arc Sin(Square Root(Y))
D = 0.2811		
W = 0.5739		
Critical W = 0.9	(alpha = 0.01, N = 30)	
Critical W = 0.927	(alpha = 0.05, N = 30)	

Data FAIL normality test (alpha = 0.01).

Steel's Many-One Rank Test					Transform: Arc Sin(Square Root(Y))
Ho:Control<Treatment					
Group	Identification	Rank Sum	Critical Value	DF	Sig 0.05
1	Control				
2	0.7 %	28.00	16.00	5.00	
3	0.9 %	30.00	16.00	5.00	
4	1.2 %	30.00	16.00	5.00	
5	1.6 %	30.00	16.00	5.00	
6	2.1 %	30.00	16.00	5.00	

Critical values are 1 tailed (k=5)

Appendix A2: Statistics

Pimephales promelas (Fathead minnow) Growth

Shapiro - Wilk's Test for Normality		No Transformation
D = 0.008205		
W = 0.9465		
Critical W = 0.9	(alpha = 0.01, N = 30)	
Critical W = 0.927	(alpha = 0.05, N = 30)	
Data PASS normality test (alpha = 0.01).		

Bartlett's Test for Homogeneity of Variance		No Transformation
Calculated B1 statistic = 3.698		
Critical B = 15.086	(alpha = 0.01, df = 5)	
Data PASS B1 homogeneity test at 0.01 level.		

Appendix A2: Statistics

Pimephales promelas (Fathead minnow) Growth

ANOVA Table				No Transformation
SOURCE	DF	SS	MS	F
Between	5	0.003473	0.0006946	2.031
Within (Error)	24	0.008207	0.000342	
Total	29	0.01168		

Critical F = 3.9 (alpha = 0.01, df = 5,24)
2.62 (alpha = 0.05, df = 5,24)

Since F < Critical F FAIL TO REJECT Ho: All equal (alpha = 0.05)

Dunnett's Test - Table 1 of 2					No Transformation
Ho:Control<Treatment					
Group	Identification	Transformed Mean	Mean In Original Units	T Stat	Sig 0.05
1	Control	0.3204	0.3204		
2	0.7 %	0.3006	0.3006	1.693	
3	0.9 %	0.3288	0.3288	-0.7182	
4	1.2 %	0.2988	0.2988	1.847	
5	1.6 %	0.3138	0.3138	0.5643	
6	2.1 %	0.319	0.319	0.1197	

Dunnett's critical value = 2.36 (1 Tailed, alpha = 0.05, df = 5,24)

Dunnett's Test - Table 2 of 2					No Transformation
Ho:Control<Treatment					
Group	Identification	Num of Reps	Min Sig Diff (In Orig. Units)	% of Control	Difference From Control
1	Control	5			
2	0.7 %	5	0.0276	8.61	0.0198
3	0.9 %	5	0.0276	8.61	-0.0084
4	1.2 %	5	0.0276	8.61	0.0216
5	1.6 %	5	0.0276	8.61	0.0066
6	2.1 %	5	0.0276	8.61	0.0014

Appendix A2: Statistics

Ceriodaphnia dubia Survival

Fisher's Exact Test

Identification	Alive	Dead	Total Animals
Control	10	0	10
0.7 %	10	0	10
Total	20	0	20

Critical Fisher's value (10,10,10) (alpha=0.05) is 6. b value is 10. Since b is greater than 6 there is NO SIGNIFICANT DIFFERENCE between CONTROL and TREATMENT at the 0.05 level.

Fisher's Exact Test

Identification	Alive	Dead	Total Animals
Control	10	0	10
0.9 %	10	0	10
Total	20	0	20

Critical Fisher's value (10,10,10) (alpha=0.05) is 6. b value is 10. Since b is greater than 6 there is NO SIGNIFICANT DIFFERENCE between CONTROL and TREATMENT at the 0.05 level.

Fisher's Exact Test

Identification	Alive	Dead	Total Animals
Control	10	0	10
1.2 %	10	0	10
Total	20	0	20

Critical Fisher's value (10,10,10) (alpha=0.05) is 6. b value is 10. Since b is greater than 6 there is NO SIGNIFICANT DIFFERENCE between CONTROL and TREATMENT at the 0.05 level.

Fisher's Exact Test

Identification	Alive	Dead	Total Animals
Control	10	0	10
1.6 %	10	0	10
Total	20	0	20

Critical Fisher's value (10,10,10) (alpha=0.05) is 6. b value is 10. Since b is greater than 6 there is NO SIGNIFICANT DIFFERENCE between CONTROL and TREATMENT at the 0.05 level.

Appendix A2: Statistics

Ceriodaphnia dubia Survival

Fisher's Exact Test			
Identification	Alive	Dead	Total Animals
Control	10	0	10
2.1 %	10	0	10
Total	20	0	20

Critical Fisher's value (10,10,10) (alpha=0.05) is 6. b value is 10. Since b is greater than 6 there is NO SIGNIFICANT DIFFERENCE between CONTROL and TREATMENT at the 0.05 level.

Summary of Fisher's Exact Test				
Group	Identification	Exposed	Dead	Sig 0.05
0	Control	10	0	
1	0.7 %	10	0	
2	0.9 %	10	0	
3	1.2 %	10	0	
4	1.6 %	10	0	
5	2.1 %	10	0	

Appendix A2: Statistics

Ceriodaphnia dubia Reproduction

Kolmogorov Test for Normality		No Transformation
D = 0.2126 D* = 1.668 Critical D* = 1.035	(alpha = 0.01, N = 60)	
Data FAIL normality test (alpha = 0.01).		

Steel's Many-One Rank Test					No Transformation
Ho:Control<Treatment					
Group	Identification	Rank Sum	Critical Value	DF	Sig 0.05
1	Control				
2	0.7 %	103.00	75.00	10.00	
3	0.9 %	105.00	75.00	10.00	
4	1.2 %	118.00	75.00	10.00	
5	1.6 %	119.00	75.00	10.00	
6	2.1 %	105.50	75.00	10.00	
Critical values are 1 tailed (k=5)					

Appendix A2: Statistics

Ceriodaphnia dubia Reproduction

Dunnett's Test for PMSD Calculation (excluding deaths if applicable)

ANOVA Table — No Transformation

SOURCE	DF	SS	MS	F
Between	5	12.2	2.44	0.5836
Within (Error)	54	225.8	4.181	
Total	59	238		

Critical F = 3.38 (alpha = 0.01, df = 5,54)
2.38 (alpha = 0.05, df = 5,54)

Since F < Critical F FAIL TO REJECT Ho: All equal (alpha = 0.05)

Dunnett's Test - Table 1 of 2 — No Transformation

Ho:Control<Treatment

Group	Identification	Transformed Mean	Mean In Original Units	T Stat	Sig 0.05
1	Control	17.1	17.1		
2	0.7 %	16.6	16.6	0.5468	
3	0.9 %	16.4	16.4	0.7655	
4	1.2 %	17.4	17.4	-0.3281	
5	1.6 %	17.7	17.7	-0.6561	
6	2.1 %	16.8	16.8	0.3281	

Dunnett's critical value = 2.31 (1 Tailed, alpha = 0.05, df [used] = 5,40) (Actual df = 5,54)

Dunnett's Test - Table 2 of 2 — No Transformation

Ho:Control<Treatment

Group	Identification	Num of Reps	Min Sig Diff (In Orig. Units)	% of Control	Difference From Control
1	Control	10			
2	0.7 %	10	2.112	12.4	0.5
3	0.9 %	10	2.112	12.4	0.7
4	1.2 %	10	2.112	12.4	-0.3
5	1.6 %	10	2.112	12.4	-0.6
6	2.1 %	10	2.112	12.4	0.3

Appendix A3: Water Chemistry

Routine Chemical and Physical Data

Date and Time Test Initiated: February 10, 2015 at 0908
Date and Time Test Terminated: February 17, 2015 at 1640

Effluent Conc.: Control		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
DO, mg/l	Initial	8.9	8.0	8.5	8.2	7.6	7.7	7.5
	Final *1	7.4	7.9	7.6	7.5	7.9	7.2	7.5
	Final *2	7.8	7.2	8.3	7.9	7.9	7.9	8.0
pH, units	Initial	7.2	7.1	7.3	7.1	7.3	7.5	7.4
	Final *1	7.3	7.2	7.5	7.6	7.8	7.3	7.1
	Final *2	7.6	7.3	7.9	7.7	7.7	7.6	7.4
Alkalinity, mg CaCO3/l		31	NA	31	NA	31	NA	NA
Hardness, mg CaCO3/l		44	NA	44	NA	48	NA	NA
Conductivity, umhos/cm		140	140	140	130	140	150	150
Res. Chlorine, mg/l		<0.05	NA	<0.05	NA	<0.05	NA	NA

Effluent Conc.: 0.7 %		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
DO, mg/l	Initial	9.0	7.7	8.2	8.2	7.6	7.4	7.2
	Final *1	7.5	7.8	7.8	7.6	8.1	7.0	7.6
	Final *2	7.9	7.9	8.2	7.7	7.6	7.8	8.2
pH, units	Initial	7.2	7.0	7.3	7.1	7.4	7.5	7.4
	Final *1	7.3	7.2	7.5	7.7	7.8	7.3	7.1
	Final *2	7.5	7.4	7.8	7.7	7.7	7.7	7.5

Effluent Conc.: 0.9 %		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
DO, mg/l	Initial	8.7	7.8	8.1	8.1	7.7	7.7	7.3
	Final *1	7.2	7.8	8.0	7.6	8.1	7.1	7.4
	Final *2	8.0	7.9	8.2	7.7	7.9	7.7	8.2
pH, units	Initial	7.2	7.0	7.3	7.2	7.4	7.5	7.3
	Final *1	7.2	7.1	7.5	7.6	7.8	7.3	7.1
	Final *2	7.5	7.4	7.8	7.7	7.7	7.6	7.6

Appendix A3: Water Chemistry

Routine Chemical and Physical Data

Date and Time Test Initiated: February 10, 2015 at 0908
Date and Time Test Terminated: February 17, 2015 at 1640

Effluent Conc.: 1.2 %		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
DO, mg/l	Initial	8.8	7.7	8.2	8.0	7.8	7.7	7.4
	Final *1	7.4	7.8	7.9	7.7	8.0	7.2	7.8
	Final *2	7.8	7.8	8.2	7.7	8.0	8.0	8.3
pH, units	Initial	7.2	7.1	7.3	7.1	7.4	7.5	7.4
	Final *1	7.2	7.1	7.5	7.7	7.7	7.3	7.2
	Final *2	7.5	7.5	7.8	7.7	7.7	7.6	7.6

Effluent Conc.: 1.6 %		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
DO, mg/l	Initial	8.8	8.0	8.1	8.0	7.6	7.5	7.5
	Final *1	7.4	7.9	7.8	7.7	8.1	7.2	7.5
	Final *2	7.9	7.5	8.4	7.8	8.0	8.0	8.3
pH, units	Initial	7.2	7.0	7.2	7.1	7.4	7.5	7.4
	Final *1	7.3	7.2	7.6	7.6	7.8	7.3	7.1
	Final *2	7.5	7.5	7.8	7.8	7.8	7.7	7.7
Alkalinity, mg CaCO3/l		32	NA	48	NA	37	NA	NA
Hardness, mg CaCO3/l		46	NA	44	NA	49	NA	NA
Conductivity, umhos/cm		140	150	140	140	150	160	160
Res. Chlorine, mg/l		<0.05	NA	0.060	NA	<0.05	NA	NA

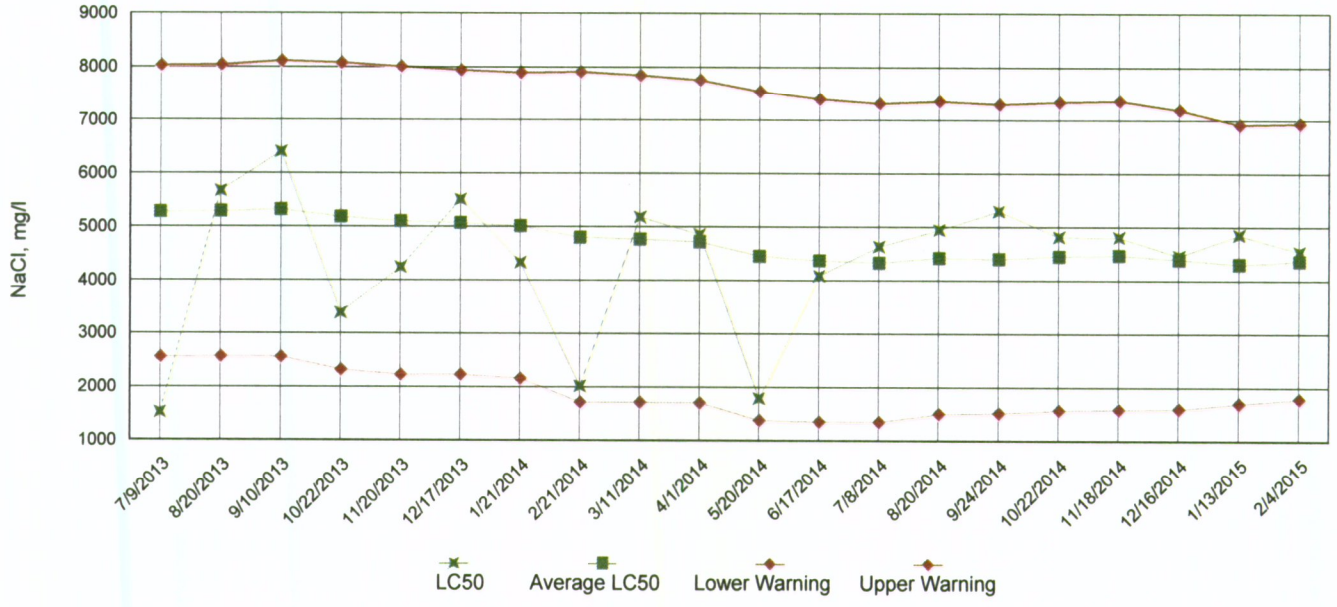
Effluent Conc.: 2.1 %		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
DO, mg/l	Initial	8.8	7.8	8.1	8.1	8.1	7.6	7.5
	Final *1	7.4	7.7	7.9	7.5	8.1	7.4	7.4
	Final *2	7.6	7.9	8.2	8.0	7.9	8.0	8.3
pH, units	Initial	7.2	7.1	7.3	7.1	7.4	7.5	7.4
	Final *1	7.3	7.1	7.5	7.7	7.7	7.4	7.2
	Final *2	7.6	7.5	7.8	7.7	7.8	7.7	7.7

*1 = data from the *Pimephales promelas* (Fathead Minnow) test *2 = data from the *Ceriodaphnia dubia* test

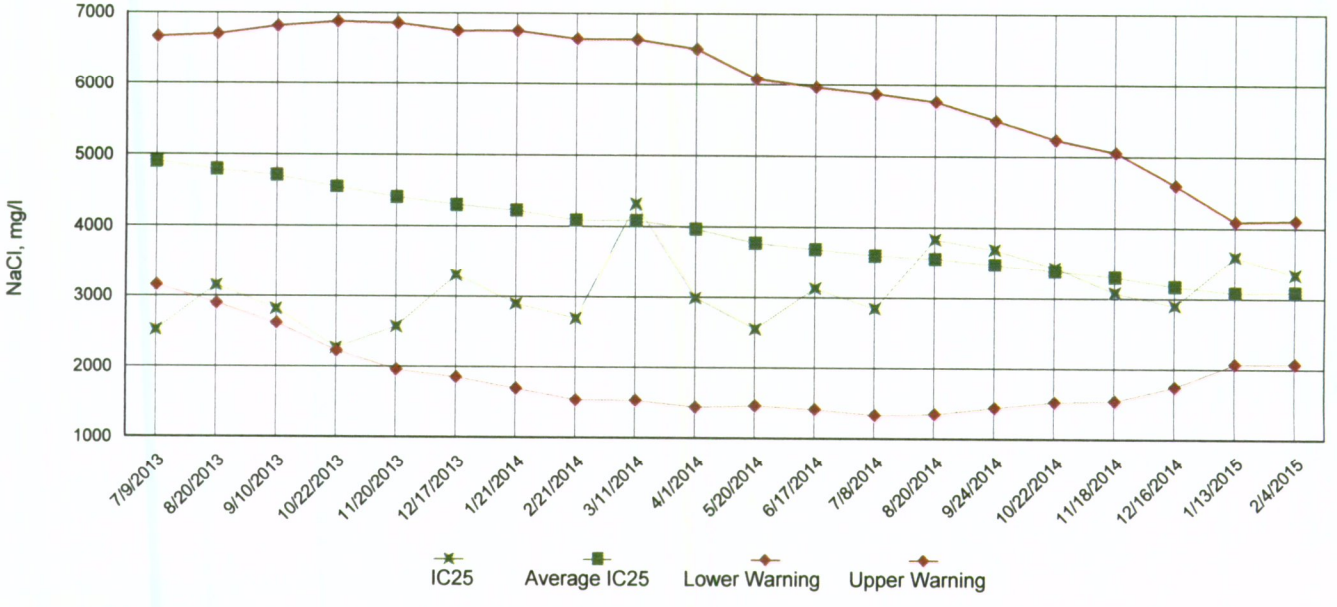
Appendix A4: Test 1000.0

Chronic Reference Toxicant, *Pimephales promelas* (Fathead Minnow)

LC50 Survival Data



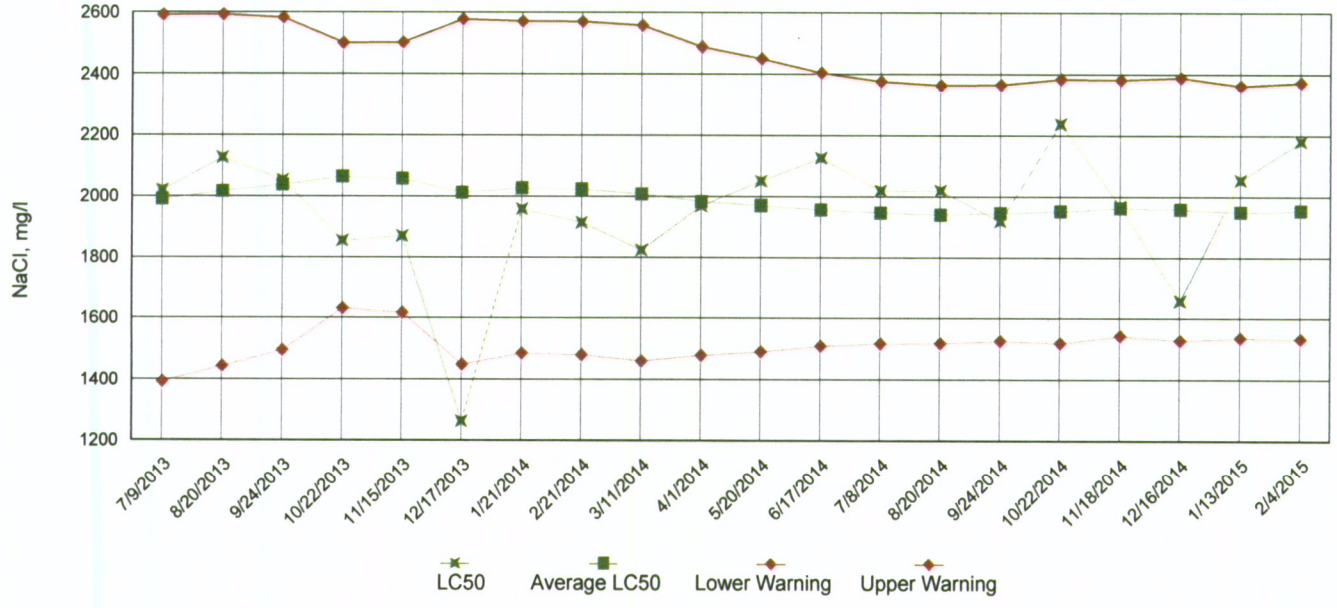
IC25 Growth Data



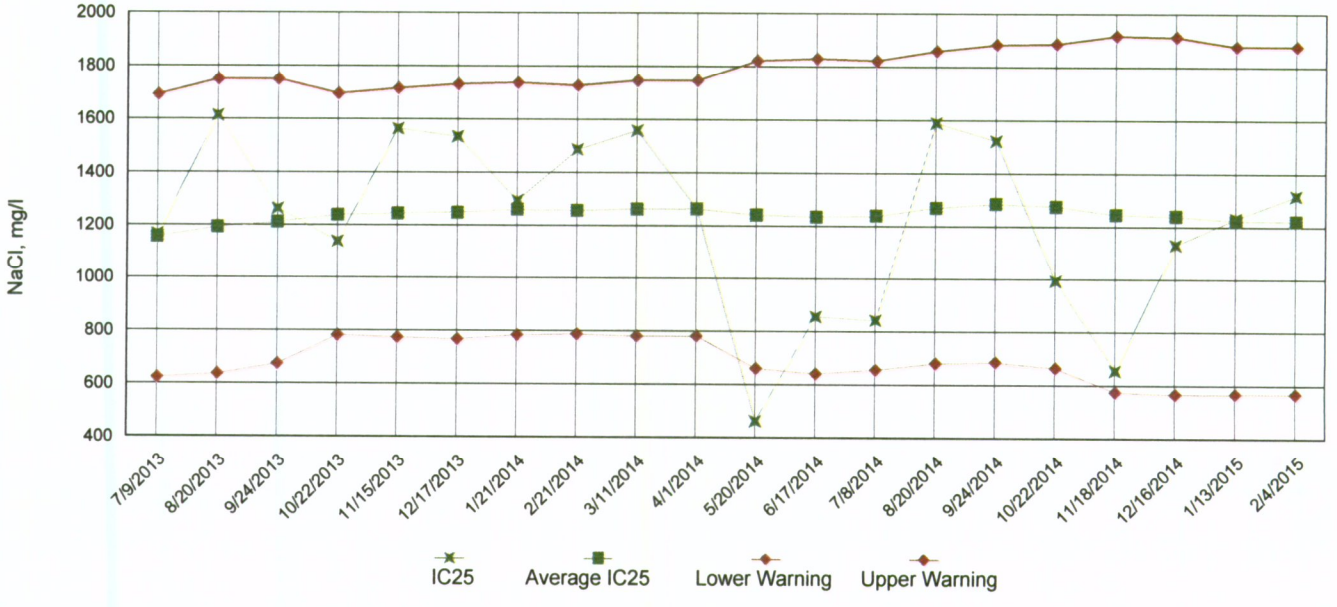
Appendix A4: Test 1002.0

Chronic Reference Toxicant, *Ceriodaphnia dubia*

LC50 Survival Data



IC25 Reproduction Data



Appendix B: Test 1000.0

SUMMARY REPORTING FORMS
CHRONIC BIOMONITORING
Pimephales promelas (Fathead Minnow)
SURVIVAL AND GROWTH

Permittee: El Dorado Chemical Company

NPDES No.: AR0000752

Date and Time Test Initiated: February 10, 2015 at 1630
Date and Time Test Terminated: February 17, 2015 at 1500
Dilution water used: Synthetic Soft Water #4183

DATA TABLE FOR SURVIVAL

Effluent Conc. %	Percent Survival in replicate chambers A	B	C	D	E	Mean percent survival 24 hr	48 hr	7 days	CV%
Control	62.5	100	100	100	100	97.5	97.5	92.5	18.1
0.7 %	100	75.0	100	100	100	100	100	95.0	11.8
0.9 %	100	100	100	100	100	100	100	100	0.00
1.2 %	100	100	100	100	100	100	100	100	0.00
1.6 %	100	100	100	100	100	100	100	100	0.00
2.1 %	100	100	100	100	100	100	100	100	0.00

DATA TABLE FOR GROWTH

Effluent Conc. %	Average dry weight, mg replicate chambers A	B	C	D	E	Mean dry weight, mg	CV%
Control	0.291	0.332	0.326	0.339	0.314	0.32	5.87
0.7 %	0.294	0.286	0.310	0.295	0.318	0.301	4.33
0.9 %	0.319	0.324	0.325	0.350	0.326	0.329	3.70
1.2 %	0.274	0.266	0.324	0.308	0.322	0.299	9.09
1.6 %	0.329	0.328	0.299	0.311	0.302	0.314	4.50
2.1 %	0.305	0.292	0.319	0.338	0.341	0.319	6.59

CV = Coefficient of variation = standard deviation * 100 / mean

Appendix B: Test 1000.0

SUMMARY REPORTING FORMS
CHRONIC BIOMONITORING
Pimephales promelas (Fathead Minnow)
SURVIVAL AND GROWTH

1. Steel's Many-One Rank Test:

   Is the mean survival significantly different (p=0.05) than the control survival for the % effluent corresponding to (lethality):

   a.) LOW FLOW OR CRITICAL DILUTION (1.6 %) ____YES __X__ NO
   b.) 1/2 LOW FLOW DILUTION (NA) ____YES ____ NO

2. Dunnett's Test:

   Is the mean dry weight (growth) significantly different (p=0.05) than the control's dry weight (growth) for the % effluent corresponding to (significant non-lethal effects):

   a.) LOW FLOW OR CRITICAL DILUTION (1.6 %) ____YES __X__ NO
   b.) 1/2 LOW FLOW DILUTION (NA) ____YES ____ NO

3. If you answered NO to 1.a) enter [0] otherwise enter [1]: 0 (TLP6C)

4. If you answered NO to 2.a) enter [0] otherwise enter [1]: 0 (TGP6C)

5. NOEC Pimephales Lethality: 2.1 % (TOP6C)

6. LOEC Pimephales Lethality: 2.1 % (TXP6C)

7. NOEC Pimephales Sublethality: 2.1 % (TPP6C)

8. LOEC Pimephales Sublethality: 2.1 % (TYP6C)

9. Coefficient of variation for Pimephales growth: 5.87 (TQP6C)

Appendix B: Test 1000.0

CHRONIC TOXICITY SUMMARY FORM
Pimephales promelas (Fathead minnow)
CHEMICAL PARAMETERS CHART

PERMITTEE: El Dorado Chemical Company
NPDES NO.: AR0000752
CONTACT: Mr. Eddie Pearson
ANALYST: 280, 304, 310

Test Initiated: DATE: February 10, 2015 TIME: 1630
Test Terminated: DATE: February 17, 2015 TIME: 1500

DILUTION Control	DAY 1	2	3	4	5	6	7
D.O. Initial	8.9	8.0	8.5	8.2	7.6	7.7	7.5
Final	7.4	7.9	7.6	7.5	7.9	7.2	7.5
pH Initial	7.2	7.1	7.3	7.1	7.3	7.5	7.4
Final	7.3	7.2	7.5	7.6	7.8	7.3	7.1
Alkalinity	31	NA	31	NA	31	NA	NA
Hardness	44	NA	44	NA	48	NA	NA
Conductivity	140	140	140	130	140	150	150
Chlorine	<0.05	NA	<0.05	NA	<0.05	NA	NA

DILUTION 0.7 %	DAY 1	2	3	4	5	6	7
D.O. Initial	9.0	7.7	8.2	8.2	7.6	7.4	7.2
Final	7.5	7.8	7.8	7.6	8.1	7.0	7.6
pH Initial	7.2	7.0	7.3	7.1	7.4	7.5	7.4
Final	7.3	7.2	7.5	7.7	7.8	7.3	7.1
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	140	140	140	140	150	160	150
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION 0.9 %	DAY 1	2	3	4	5	6	7
D.O. Initial	8.7	7.8	8.1	8.1	7.7	7.7	7.3
Final	7.2	7.8	8.0	7.6	8.1	7.1	7.4
pH Initial	7.2	7.0	7.3	7.2	7.4	7.5	7.3
Final	7.2	7.1	7.5	7.6	7.8	7.3	7.1
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	140	150	140	140	140	160	160
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION 1.2 %	DAY 1	2	3	4	5	6	7
D.O. Initial	8.8	7.7	8.2	8.0	7.8	7.7	7.4
Final	7.4	7.8	7.9	7.7	8.0	7.2	7.8
pH Initial	7.2	7.1	7.3	7.1	7.4	7.5	7.4
Final	7.2	7.1	7.5	7.7	7.7	7.3	7.2
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	140	150	140	140	140	160	160
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION 1.6 %	DAY 1	2	3	4	5	6	7
D.O. Initial	8.8	8.0	8.1	8.0	7.6	7.5	7.5
Final	7.4	7.9	7.8	7.7	8.1	7.2	7.5
pH Initial	7.2	7.0	7.2	7.1	7.4	7.5	7.4
Final	7.3	7.2	7.6	7.6	7.8	7.3	7.1
Alkalinity	32	NA	48	NA	37	NA	NA
Hardness	46	NA	44	NA	49	NA	NA
Conductivity	140	150	140	140	150	160	160
Chlorine	<0.05	NA	0.060	NA	<0.05	NA	NA

DILUTION 2.1 %	DAY 1	2	3	4	5	6	7
D.O. Initial	8.8	7.8	8.1	8.1	8.1	7.6	7.5
Final	7.4	7.7	7.9	7.5	8.1	7.4	7.4
pH Initial	7.2	7.1	7.3	7.1	7.4	7.5	7.4
Final	7.3	7.1	7.5	7.7	7.7	7.4	7.2
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	140	150	150	140	150	160	160
Chlorine	NA	NA	NA	NA	NA	NA	NA

Appendix B: Test 1002.0

SUMMARY REPORTING FORMS
CHRONIC BIOMONITORING
Ceriodaphnia dubia
SURVIVAL AND REPRODUCTION

Permittee: El Dorado Chemical Company

NPDES No.: AR0000752

Date and Time Test Initiated: February 10, 2015 at 1530
Date and Time Test Terminated: February 17, 2015 at 1640
Dilution water used: Synthetic Soft Water #4183

PERCENT SURVIVAL

Time of Reading	Control	Percent Effluent 0.7 %	0.9 %	1.2 %	1.6 %	2.1 %
24 hour	100	100	100	100	100	100
48 hour	100	100	100	100	100	100
7 day	100	100	100	100	100	100

NUMBER OF YOUNG PRODUCED PER FEMALE @ 7 DAYS

Replicates	Control	Percent Effluent 0.7 %	0.9 %	1.2 %	1.6 %	2.1 %
A	23	16	16	16	17	16
B	15	19	15	19	17	17
C	16	18	16	21	15	19
D	16	15	16	17	17	16
E	18	15	16	17	17	16
F	17	17	17	15	17	17
G	20	16	18	18	21	17
H	15	15	16	17	18	14
I	16	19	16	17	16	13
J	15	16	18	17	22	23
Mean per Adult	17.1	16.6	16.4	17.4	17.7	16.8
Mean per Surviving Adult	17.1	16.6	16.4	17.4	17.7	16.8
CV %	15.2	9.50	5.89	9.46	12.2	16.3

CV = Coefficient of variation = standard deviation * 100 / mean
(calculated based on young produced by surviving females)

Appendix B: Test 1002.0

SUMMARY REPORTING FORMS
CHRONIC BIOMONITORING
Ceriodaphnia dubia
SURVIVAL AND REPRODUCTION

1. Fisher's Exact Test:

   Is the mean survival significantly different (p=0.05) than the control survival for the % effluent corresponding to (lethality):

   a.) LOW FLOW OR CRITICAL DILUTION (1.6 %) ____YES ___X___ NO
   b.) 1/2 LOW FLOW DILUTION (NA) ____YES ____ NO

2. Steel's Many-One Rank Test:

   Is the mean number of young produced per female significantly different (p=0.05) than the control's number of young per female for the % effluent corresponding to (significant non-lethal effects):

   a.) LOW FLOW OR CRITICAL DILUTION (1.6 %) ____YES ___X___ NO
   b.) 1/2 LOW FLOW DILUTION (NA) ____YES ____ NO

3. If you answered NO to 1.a) enter [0] otherwise enter [1]: 0 (TLP3B)

4. If you answered NO to 2.a) enter [0] otherwise enter [1]: 0 (TGP3B)

5. NOEC Ceriodaphnia Lethality: 2.1 % (TOP3B)

6. LOEC Ceriodaphnia Lethality: 2.1 % (TXP3B)

7. NOEC Ceriodaphnia Sublethality: 2.1 % (TPP3B)

8. LOEC Ceriodaphnia Sublethality: 2.1 % (TYP3B)

9. Coefficient of variation for Ceriodaphnia Reproduction: 15.2 (TQP3B)

AMERICAN INTERPLEX CORPORATION LABORATORIES

Appendix B: Test 1002.0

CHRONIC TOXICITY SUMMARY FORM
Ceriodaphnia dubia
CHEMICAL PARAMETERS CHART

PERMITTEE: El Dorado Chemical Company
NPDES NO.: AR0000752
CONTACT: Mr. Eddie Pearson
ANALYST: 280, 304, 310

Test Initiated: DATE: February 10, 2015 TIME: 1530
Test Terminated: DATE: February 17, 2015 TIME: 1640

DILUTION Control	DAY 1	2	3	4	5	6	7
D.O. Initial	8.9	8.0	8.5	8.2	7.6	7.7	7.5
Final	7.8	7.2	8.3	7.9	7.9	7.9	8.0
pH Initial	7.2	7.1	7.3	7.1	7.3	7.5	7.4
Final	7.6	7.3	7.9	7.7	7.7	7.6	7.4
Alkalinity	31	NA	31	NA	31	NA	NA
Hardness	44	NA	44	NA	48	NA	NA
Conductivity	140	140	140	130	140	150	150
Chlorine	<0.05	NA	<0.05	NA	<0.05	NA	NA

DILUTION 0.7 %	DAY 1	2	3	4	5	6	7
D.O. Initial	9.0	7.7	8.2	8.2	7.6	7.4	7.2
Final	7.9	7.9	8.2	7.7	7.6	7.8	8.2
pH Initial	7.2	7.0	7.3	7.1	7.4	7.5	7.4
Final	7.5	7.4	7.8	7.7	7.7	7.7	7.5
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	140	140	140	140	150	160	150
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION 0.9 %	DAY 1	2	3	4	5	6	7
D.O. Initial	8.7	7.8	8.1	8.1	7.7	7.7	7.3
Final	8.0	7.9	8.2	7.7	7.9	7.7	8.2
pH Initial	7.2	7.0	7.3	7.2	7.4	7.5	7.3
Final	7.5	7.4	7.8	7.7	7.7	7.6	7.6
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	140	150	140	140	140	160	160
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION 1.2 %	DAY 1	2	3	4	5	6	7
D.O. Initial	8.8	7.7	8.2	8.0	7.8	7.7	7.4
Final	7.8	7.8	8.2	7.7	8.0	8.0	8.3
pH Initial	7.2	7.1	7.3	7.1	7.4	7.5	7.4
Final	7.5	7.5	7.8	7.7	7.7	7.6	7.6
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	140	150	140	140	140	160	160
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION 1.6 %	DAY 1	2	3	4	5	6	7
D.O. Initial	8.8	8.0	8.1	8.0	7.6	7.5	7.5
Final	7.9	7.5	8.4	7.8	8.0	8.0	8.3
pH Initial	7.2	7.0	7.2	7.1	7.4	7.5	7.4
Final	7.5	7.5	7.8	7.8	7.8	7.7	7.7
Alkalinity	32	NA	48	NA	37	NA	NA
Hardness	46	NA	44	NA	49	NA	NA
Conductivity	140	150	140	140	150	160	160
Chlorine	<0.05	NA	0.060	NA	<0.05	NA	NA

DILUTION 2.1 %	DAY 1	2	3	4	5	6	7
D.O. Initial	8.8	7.8	8.1	8.1	8.1	7.6	7.5
Final	7.6	7.9	8.2	8.0	7.9	8.0	8.3
pH Initial	7.2	7.1	7.3	7.1	7.4	7.5	7.4
Final	7.6	7.5	7.8	7.7	7.8	7.7	7.7
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	140	150	150	140	150	160	160
Chlorine	NA	NA	NA	NA	NA	NA	NA

AMERICAN INTERPLEX CORPORATION
LABORATORIES

CHAIN OF CUSTODY / ANALYSIS REQUEST FORM

Client: El Dorado Chemical Company
Project Reference: Quarterly - Permit AR0000752
Project Manager: Mr. Eddie Pearson
Sampled By: Edward L Pearson

PO No.

MATRIX

AIC CONTROL NO: 187471
AIC PROPOSAL NO:
Carrier: Gold Star
Received Temperature C: 2.0
Remarks

AIC No.	Sample Identification	Date/Time Collected	GRAB	COMP	WATER	SOIL	NO OF BOTTLES	ANALYSES REQUESTED: Chronic - CD, FH
1	010	2-9-15 1000		X	X		1	X
		Container Type						P
		Preservative						NO

Field pH calibration
on _____ @ _____
Buffer:

G = Glass P = Plastic V = VOA vials H = HCl to pH2 T = Sodium Thiosulfate
NO = none S = Sulfuric acid pH2 N = Nitric acid pH2 B = NaOH to pH12 Z = Zinc acetate A=$(NH_4)_2SO_4$, NH_4OH

Turnaround Time Requested: (Please circle)
(NORMAL) or EXPEDITED IN ____ DAYS
Expedited results requested by: _____
Who should AIC contact with questions:
Phone 870-312-1397 Fax:
Report Attention to: Mr. Eddie Pearson
Report Address to: 4500 North West Avenue
El Dorado, AR 71730
epearson@edc-ark.com

Relinquished By:	Date/Time	Received By:	Date/Time
Edward L Pearson	2-9-15 1100		
Relinquished By:	Date/Time	Received in Lab By:	Date/Time
		Crystal Hopkins	2-9-15 1500

Comments:

FORM 0060

AMERICAN INTERPLEX CORPORATION
LABORATORIES

CHAIN OF CUSTODY / ANALYSIS REQUEST FORM

Client: El Dorado Chemical Company
Project Reference: Quarterly - Permit AR0000752
Project Manager: Mr. Eddie Pearson
Sampled By: Edward L Pearson

PO No.

MATRIX

AIC No.	Sample Identification	Date/Time Collected	GRAB	COMP	WATER	SOIL		NO OF BOTTLES	ANALYSES REQUESTED: Chronic - CD, FH											
2	010	2-11-15 1030		X	X			1	X											
		Container Type							P											
		Preservative							NO											

AIC CONTROL NO: 187471
AIC PROPOSAL NO:
Carrier: Gold Star
Received Temperature C: 2.0
Remarks
Field pH calibration
on _____ @ _____
Buffer:

G = Glass P = Plastic V = VOA vials H = HCl to pH2 T = Sodium Thiosulfate
NO = none S = Sulfuric acid pH2 N = Nitric acid pH2 B = NaOH to pH12 Z = Zinc acetate A=$(NH_4)_2SO_4$, NH_4OH

Turnaround Time Requested: (Please circle)
(NORMAL) or EXPEDITED IN ____ DAYS
Expedited results requested by: _____
Who should AIC contact with questions:
Phone 870-312-1397 Fax:
Report Attention to: Mr. Eddie Pearson
Report Address to: 4500 North West Avenue
El Dorado, AR 71730
epearson@edc-ark.com

Relinquished By:	Date/Time	Received By:	Date/Time
Edward L Pearson	2-11-15 1130		
Relinquished By:	Date/Time	Received in Lab By:	Date/Time
		Susan Hyatt	2-11-15 1705

Comments:

FORM 0060

AMERICAN INTERPLEX CORPORATION
LABORATORIES

CHAIN OF CUSTODY / ANALYSIS REQUEST FORM

Client: El Dorado Chemical Company
Project Reference: Quarterly - Permit AR0000752
Project Manager: Mr. Eddie Pearson
Sampled By: Edward L Pearson

PO No.:

AIC CONTROL NO: 18747
AIC PROPOSAL NO:
Carrier: Gold Star
Received Temperature C: 1.7

AIC No.	Sample Identification	Date/Time Collected	GRAB	COMP	MATRIX WATER	MATRIX SOIL	NO OF BOTTLES	ANALYSES REQUESTED: Chronic - CD, FH	Remarks
3	010	2-13-15 1100		X	X		1	X	
		Container Type						P	
		Preservative						NO	

Field pH calibration on _____ @ _____
Buffer:

G = Glass P = Plastic V = VOA vials H = HCl to pH2 T = Sodium Thiosulfate
NO = none S = Sulfuric acid pH2 N = Nitric acid pH2 B = NaOH to pH12 Z = Zinc acetate A=$(NH_4)_2SO_4$, NH_4OH

Turnaround Time Requested: (Please circle)
NORMAL or EXPEDITED IN ____ DAYS
Expedited results requested by: _____
Who should AIC contact with questions:
Phone 870-312-1397 Fax:
Report Attention to: Mr. Eddie Pearson
Report Address to: 4500 North West Avenue
El Dorado, AR 71730
epearson@edc-ark.com

Relinquished By:	Date/Time	Received By:	Date/Time
Edward L Pearson	2-13-15 1100		
Relinquished By:	Date/Time	Received in Lab By:	Date/Time
		Lynn Hopkins	2-13-15 1625

Comments:

FORM 0060

006

Bio-Analytical Laboratories (BAL)
ADEQ#88-0630
Project X5673

Bio-Analytical Laboratories' Executive Summary

Permittee: El Dorado Chemical Company
P.O. Box 231
El Dorado, AR 71731
Project #: X5673
Outfall: Outfall 006 (contaminated storm water)
Permit #: AR0000752/ AFIN #70-00040
Contact: Mr. David Sartain
Test Dates: February 17 - 19, 2015
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 - 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- 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 - 0.00%.

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

3240 Spurgin Road
Post Office Box 527
Doyline, LA 71023

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

THE RESULTS OF TWO 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 X5673

Test Dates: February 17 - 19, 2015
Report Date: February 24, 2015

Prepared for:
Mr. David Sartain
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 X5673

TABLE OF CONTENTS

BAL
ADEQ #88-0630
Project X5673

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),"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.

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 February 16, 2015. Upon completion of collection, the sample was packed in ice and delivered to the laboratory by BAL personnel. The temperature upon arrival was 0.6^0 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 ± 1^0 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 ± 1^0 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 LC_{50} values values were obtained by approved EPA methods of analysis, using the ToxCalc statistical program.

BAL
ADEQ #88-0630
Project X5673

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 neither test after 48 hours of exposure (p=.05). The NOEC values for the 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	
Test Organism	*Pimephales promelas*	*Daphnia pulex*
Control	100.0	100.0
22.0	97.5	100.0
32.0	100.0	100.0
45.0	100.0	100.0
56.0	100.0	95.0
75.0	100.0	95.0
100.0	100.0	100.0

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 X5673

4.0 Conclusions

The sample of Outfall 006 collected from El Dorado Chemical Company, El Dorado, Arkansas, on February 16, 2015, 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 X5673

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 627
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(318) 745-2772
1-800-259-1246
Fax: (318) 746-2773

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

Laboratory Use Only:

Company: El Dorado Chemical Company	Phone: (870) 863-1484	Analysis:								
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	Lab Control Number:	Project Number: X5673
Permit #: AR0000752/AFIN 70-00040	Purchase Order:									Temp. upon arrival: 0.6°C #29 EGB 2/17/15
Sampler's Signature/Printed Name/Affiliation: Edward L Pearson / Edward L Pearson / EDCC										Preservative: (below)

Date Start / Date End	Time Start / Time End	C	G	# and type of container	Sample Identification									
2-16-15 / 2-16-15	0700 / 1300	X		6 half gallons	006			X	X				C10547	ICE

Relinquished by/Affiliation:	Date:	Time:	Received by/Affiliation:	Date:	Time:
Edward L Pearson / EDCC	2/17/15	1020 EGB 2/17	Eric D. Bruce	2/17/15	1020
Eric D. Bruce	2/17/15	1210	R Culbertson	2/17/15	1210

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

Comments:

COC Rev. 3.0

APPENDIX B
RAW DATA SHEETS

BIO-ANALYTICAL LABORATORIES
ACUTE TOXICITY TEST WATER QUALITY DATA

Project# X5673

Client: EDCC/El Dorado Chemical Company

Address: 4500 Northwest Ave El Dorado AR 71731

NPDES#AR0000752 Outfall 006

Technicians: EGB/RC/JH

Test initiated: Date 2/17/15 Time 1500

Test terminated: Date 2/19/15 Time 1540

Dissolved Oxygen Meter: Model # YSI550A Serial #06E2089 AV
pH Meter: Model #Orion 230A+ Serial #015253
Conductivity Meter: Model # Control Co. Serial #122175539
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
C10547	10.2/ 121.7%	Y/35/8.2 99.9%	<0.01	NO	3.0	N/A	88.0	24.0	RC
↓	10.0/ 113.8%	Y/35/8.3 99.2%	↓	↓	3.0	↓	↓	↓	RC

Dilution Water Information

Dilution Water	ID#	Initial D.O (mg/L & %)	Aerate? Minutes/D.O (mg/L & %)	Total Residual Chlorine (mg/L)	Ammonia (NH3) mg/L	pH	Hardness	Alkalinity	Tech
Soft H2O	369.2	N/A	N/A	N/A	N/A	7.2	44.0	28.0	EGB

Test Species Information

Test Species Info.	Species: ID#: D.pulex M12-N12	Species: ID#: P.promelas BAC/021415	Species: ID#:	Species: ID#:
Age	<24 hrs	3 days		
Test Container Size	30 ml	300 ml		
Test volume	20 ml	200 ml		
Feeding: Type	2 hrs prior to test			
Amount	initiation	—		
Aeration?	N/A	N/A		
Amount				
Condition of survivors	Good RC 2/19/15	Good JH 2/19/15		

Comments:

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

Project# X5673

Client El Dorado Chemical

Sample Description 006

Test started: Date 2/17/15 Time 1500

Test ended: Date 2/19/15 Time 1540

Test Species D. pulex ID# Mia-Nia

Technician:	Ohour EB	24hour EB	48hour RC	72hour	96hour
Time:	Ohour 1500	24hour 1610	48hour 1540	72hour	96hour
Temperature (°C):	Ohour 24.6	24hour 24.1	48hour 24.1	72hour	96hour

Test Dilution %	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity				
			0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
		NA																				
0 s	A		8	8	8			8.5	8.5	8.0			7.3	7.4	7.4			170	210 / 168	219		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
22.0	A		8	8	8			8.5	8.2 / 8.4	8.0			7.1	7.3 / 7.1	7.3			264	282 / 269	288		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
Chemistry Tech prerenewal/postrenewal								RC	EB / RC	RC			RC	EB / RC	RC			RC	EB / RC	RC		

ACUTE2 Rev 1.0

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

Project# X5673

Client El Dorado Chemical

Test started: Date 2/17/15 Time 1500

Test ended: Date 2/19/15 Time 1540

Test Species D. pulex ID# M12-N12

Sample Description 006

Technician: Ohour EB 24hour EB 48hour RC 72hour ____ 96hour ____

Time: Ohour 1500 24hour 1010 48hour 1540 72hour ____ 96hour ____

Temperature (°C): Ohour 24.6 24hour 24.1 48hour 24.1 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
		4a																	309	302	336		
32.0	A		8	8	8			8.6	8.4	7.9			7.1	7.0	7.2							
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
									8.2					7.1					355			
45.0	A		8	8	8			8.6	8.4	8.0			7.1	7.0	7.1			364	344	367		
	B		8	8	8				RC 2/18/15													
	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		

ACUTE2 Rev 1.0

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

Project# X5673

Client El Dorado Chemical

Sample Description QQC

Technician: Ohour EB 24hour EB 48hour RC 72hour ____ 96hour ____

Time: Ohour 1500 24hour 1010 48hour 1540 72hour ____ 96hour ____

Temperature (°C): Ohour 24.6 24hour 24.1 48hour 24.1 72hour ____ 96hour ____

Test started: Date 2/17/15 Time 1506

Test ended: Date 2/19/15 Time 1540

Test Species D. pulex ID# M12-N12

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
		Ua																				
56.0	A		8	8	8			8.5	8.1/8.3	7.9			7.1	7.9/7.0	7.1			410	383/394	409		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	6																	
																		485	462/479	465		
75.0	A		8	8	6			8.5	8.1/8.3	7.9			7.0	7.0/7.0	7.0							
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
									EB					EB					EB			
Chemistry Tech prerenewal/postrenewal								RC	RC	RC			RC	RC	RC			RC	RC	RC		

ACUTE2 Rev 1.0

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

Project# X5673

Client El Dorado Chemical

Sample Description 006

Technician: Ohour EAB 24hour EAB 48hour RC 72hour _____ 96hour _____

Time: Ohour 1500 24hour 1610 48hour 1540 72hour _____ 96hour _____

Temperature (°C): Ohour 24.6 24hour 24.1 48hour 24.1 72hour _____ 96hour _____

Test started: Date 2/17/15 Time 1500

Test ended: Date 2/19/15 Time 1540

Test Species D. pulex ID# M12-N12

Test Dilution %	Replicate	Test Salinity	# Live Organisms 0 hr	24	48	72	96	Dissolved Oxygen 0	24	48	72	96	pH 0	24	48	72	96	Conductivity 0	24	48	72	96
		NA						8.4	7.8 8.1	7.9			7.0	6.9 6.9	7.0			591	557 526	474		
100.0	A		8	8	8																	
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
	A																					
	B																					
	C																					
	D																					
	E																					
Chemistry Tech prerenewal/postrenewal								RC	RC	RC			RC	RC	RC			RC	RC	RC		

ACUTE2 Rev 1.0

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

Project# X5673

Client El Dorado Chemical

Test started: Date 2/17/15 Time 1540

Test ended: Date 2/19/15 Time 1540

Test Species P. promelas ID# BAL/021415

Sample Description 006

Technician: Ohour RC 24hour RC 48hour JH 72hour ____ 96hour ____

Time: Ohour 1540 24hour 1620 48hour 1540 72hour ____ 96hour ____

Temperature (°C): Ohour 24.5 24hour 24.6 48hour 24.6 72hour ____ 96hour ____

Test Dilution	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity				
			0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
%		ppt																				
0 s	A		8	8	8			8.5	8.1/8.5	7.1			7.3	7.0/7.4	7.9			1104	1167/1163	1173		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
																		264	258/260	258		
22.0	A		8	8	8			8.5	8.1/8.4	7.0			7.1	6.9/7.1	7.9							
	B		8	8	7																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
Chemistry Team prerenewal/postrenewal								RC	RC/RC	JH			RC	RC/RC	JH			RC	RC/RC	JH		

ACUTE2 Rev 1.0

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

Project# X5673

Client El Dorado Chemical

Test started: Date 2/17/15 Time 1540

Test ended: Date 2/19/15 Time 1540

Test Species P. promelas ID# BAL/021415

Sample Description 006

Technician: Ohour RC 24hour RC 48hour JH 72hour ____ 96hour ____

Time: Ohour 1540 24hour 1620 48hour 1540 72hour ____ 96hour ____

Temperature (°C): Ohour 24.5 24hour 24.6 48hour 24.5 72hour ____ 96hour ____

Test Dilution %	Replicate	Test Salinity	# Live Organisms: 0 hr	24	48	72	96	Dissolved Oxygen: 0	24	48	72	96	pH: 0	24	48	72	96	Conductivity: 0	24	48	72	96
		NA																				
32.0	A		8	8	8			8.6	8.0/8.4	7.0			7.1	6.9/7.0	7.8			309	299/302	298		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
45.0	A		8	8	8			8.6	7.9/8.4	7.0			7.1	6.9/7.0	7.7			364	351/345	345		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
Chemistry Tech prerenewal/postrenewal								RC	RC/RC	JH			RC	RC/RC	JH			RC	RC/RC	JH		

ACUTE2 Rev 1.0

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

Project# X5673

Client El Dorado Chemical

Sample Description 006

Test started: Date 2/17/15 Time 1540

Test ended: Date ~~2/19/15~~ 2/19/15 JH Time 1540

Test Species P. promelas ID# BAL/021415

Technician:	Ohour RC	24hour RC	48hour JH	72hour ____	96hour ____
Time:	Ohour 1540	24hour 1620	48hour 1540	72hour ____	96hour ____
Temperature (°C):	Ohour 24.5	24hour ~~24.5~~ 24.4 (ice chest)	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
		NA																				
56.0	A		8	8	8	8		8.5	7.8 / 8.3	6.9			7.1	6.8 / 7.0	7.8			410	394	391		
	B		8	8	8	8																
	C		8	8	8	8	JH															
	D		8	8	8	8	2/19/15															
	E		8	8	8	8																
75.0	A		8	8	8			8.5	7.8 / 8.3	6.9			7.0	6.8 / 7.0	7.7			485	469 / 479	465		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
Chemistry Tech prerenewal/postrenewal								RC	RC / RC	JH			RC	RC / RC	JH			RC	RC / RC	JH		

ACUTE2 Rev 1.0

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

Project# X5673

Client El Dorado Chemical

Sample Description 006

Test started: Date 2/17/15 Time 1540

Test ended: Date 2/19/15 Time 1540

Test Species P. promelas ID# BAL021415

Technician:	Ohour RC	24hour RC	48hour JH	72hour	96hour
Time:	Ohour 1540	24hour 1620	48hour 1540	72hour	96hour
Temperature (°C):	Ohour 24.5	24hour 24.6	48hour 24.5	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
%		ppt							7.7					6.7					563			
100.0	A		8	8	8			8.4	8.1	6.8			7.0	6.9	7.0			591	574	571		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
	A																					
	B																					
	C																					
	D																					
	E																					
Chemistry Tech prerenewal/postrenewal								RC	RC/RC	JH			RC	RC/RC	JH			RC	RC/RC	JH		

ACUTE2 Rev 1.0

APPENDIX C
STATISTICAL ANALYSES

Daphnid Acute Test-48 Hr Survival

Start Date:	2/17/2015	Test ID:	X5673DP	Sample ID:	AR0000752
End Date:	2/19/2015	Lab ID:	ADEQ880630	Sample Type:	EFF2-Industrial
Sample Date:	2/16/2015	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	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	1.0000	1.0000	0.7500
75	0.7500	1.0000	1.0000	1.0000	1.0000
100	1.0000	1.0000	1.0000	1.0000	1.0000

			Transform: Arcsin Square Root					Rank	1-Tailed
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical
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	0.9500	0.9500	1.3239	1.0472	1.3931	11.684	5	25.00	16.00
75	0.9500	0.9500	1.3239	1.0472	1.3931	11.684	5	25.00	16.00
100	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5	27.50	16.00

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.05)	0.51902	0.934	-2.9335	9.90057
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				

ToxCalc v5.0.23

Reviewed by EGB 2/24/15

Acute Fish Test-48 Hr Survival

Start Date:	2/17/2015	Test ID:	X5673PP	Sample ID:	AR0000752
End Date:	2/19/2015	Lab ID:	ADEQ880630	Sample Type:	EFF2-Industrial
Sample Date:	2/16/2015	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	0.8750	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	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	1.0000

			Transform: Arcsin Square Root					Rank	1-Tailed
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical
D-Control	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5		
22	0.9750	0.9750	1.3564	1.2094	1.3931	6.055	5	25.00	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	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	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5	27.50	16.00

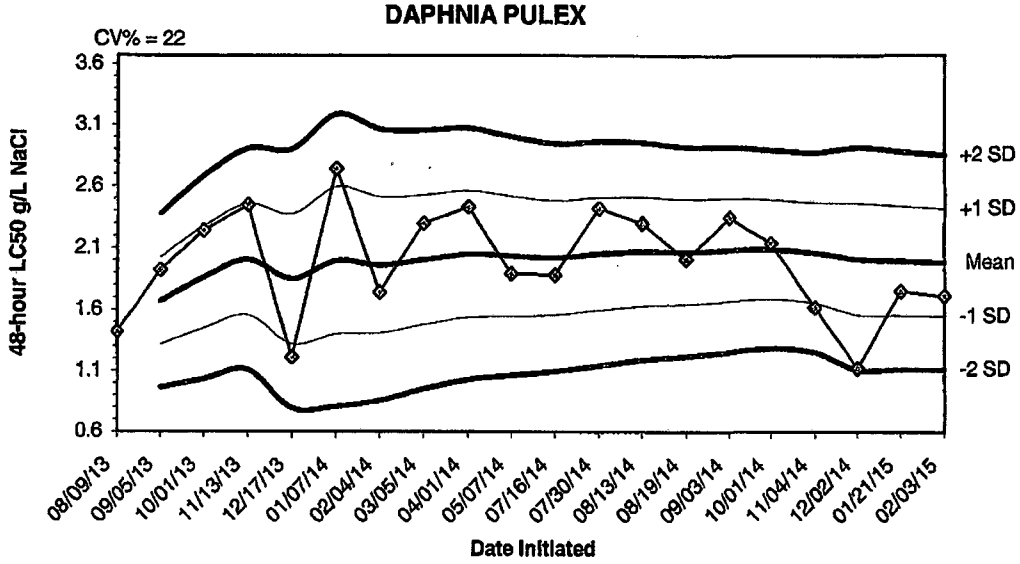
Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.05)	0.38831	0.934	-4.1486	23.0852
Equality of variance cannot be confirmed				

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	100	>100		1
Treatments vs D-Control				

EBB 2/24/15

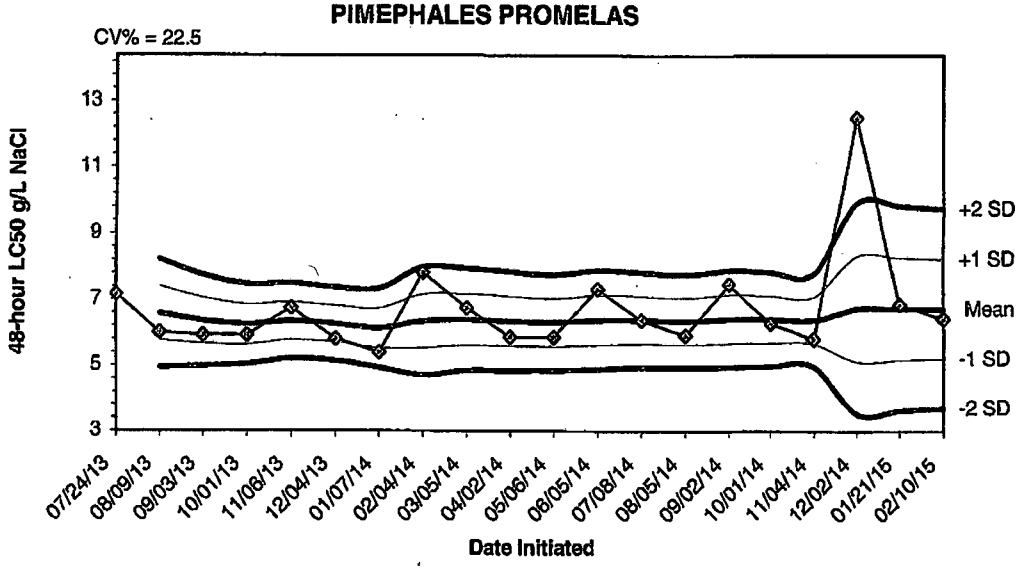
APPENDIX D
QUALITY ASSURANCE CHARTS

2015 48-HOUR ACUTE REFERENCE TOXICANT TEST RESULTS FOR DAPHNIA PULEX



Dates	Values	Mean	-1 SD	-2 SD	+1 SD	+2 SD
08/09/13	1.4200					
09/05/13	1.9200	1.6700	1.3164	0.9629	2.0236	2.3771
10/01/13	2.2400	1.8600	1.4467	1.0334	2.2733	2.6866
11/13/13	2.4500	2.0075	1.5593	1.1111	2.4557	2.9039
12/17/13	1.2100	1.8480	1.3209	0.7937	2.3751	2.9023
01/07/14	2.7400	1.9967	1.4009	0.8052	2.5924	3.1881
02/04/14	1.7400	1.9600	1.4076	0.8552	2.5124	3.0648
03/05/14	2.3000	2.0025	1.4771	0.9517	2.5279	3.0533
04/01/14	2.4300	2.0500	1.5383	1.0266	2.5617	3.0734
05/07/14	1.8900	2.0340	1.5489	1.0639	2.5191	3.0041
07/16/14	1.8800	2.0200	1.5575	1.0950	2.4825	2.9450
07/30/14	2.4200	2.0533	1.5975	1.1416	2.5092	2.9650
08/13/14	2.3000	2.0723	1.6305	1.1887	2.5141	2.9559
08/19/14	2.0100	2.0679	1.6431	1.2183	2.4926	2.9174
09/03/14	2.3500	2.0867	1.6709	1.2552	2.5024	2.9182
10/01/14	2.1400	2.0900	1.6881	1.2862	2.4919	2.8938
11/04/14	1.6200	2.0624	1.6569	1.2514	2.4678	2.8733
12/02/14	1.1200	2.0100	1.5583	1.1065	2.4617	2.9135
01/21/15	1.7500	1.9963	1.5533	1.1102	2.4394	2.8824
02/03/15	1.7100	1.9820	1.5460	1.1101	2.4180	2.8539

2015 48-HOUR ACUTE REFERENCE TOXICANT TEST RESULTS FOR PIMEPHALES PROMELAS



Dates	Values	Mean	-1 SD	-2 SD	+1 SD	+2 SD
07/24/13	7.1600					
08/09/13	6.0000	6.5800	5.7598	4.9395	7.4002	8.2205
09/03/13	5.9200	6.3600	5.6660	4.9721	7.0540	7.7479
10/01/13	5.9200	6.2500	5.6422	5.0343	6.8578	7.4657
11/06/13	6.7500	6.3500	5.7781	5.2061	6.9219	7.4939
12/04/13	5.8100	6.2600	5.7030	5.1459	6.8170	7.3741
01/07/14	5.4000	6.1371	5.5336	4.9301	6.7407	7.3442
02/04/14	7.8200	6.3475	5.5313	4.7151	7.1637	7.9799
03/05/14	6.7500	6.3922	5.6170	4.8418	7.1674	7.9426
04/02/14	5.8600	6.3390	5.5890	4.8390	7.0890	7.8390
05/06/14	5.8600	6.2955	5.5694	4.8434	7.0215	7.7475
06/05/14	7.3100	6.3800	5.6284	4.8767	7.1316	7.8833
07/08/14	6.3700	6.3792	5.6596	4.9400	7.0989	7.8185
08/05/14	5.9200	6.3464	5.6442	4.9420	7.0486	7.7509
09/02/14	7.4800	6.4220	5.6847	4.9475	7.1593	7.8965
10/01/14	6.2800	6.4131	5.7000	4.9868	7.1263	7.8394
11/04/14	5.8100	6.3776	5.6718	4.9660	7.0835	7.7893
12/02/14	12.5000	6.7178	5.1205	3.5232	8.3150	9.9123
01/21/15	6.8500	6.7247	5.1722	3.6196	8.2773	9.8299
02/10/15	6.4200	6.7095	5.1968	3.6841	8.2222	9.7349

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: 2/16/15** **To: 2/16/15**
From: **To:**
Test Initiated: 2/17/15
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	100.0	100.0
	B	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	C	100.0	100.0	100.0	100.0	100.0	100.0	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	75.0	100.0
	B	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	C	100.0	100.0	100.0	100.0	100.0	100.0	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	75.0	100.0	100.0
	Mean	100.0	100.0	100.0	100.0	95.0	95.0	100.0

1. Dunnett's Procedure or Steel's Many-One Rank Test as appropriate: Is the mean survival at 48 hours significantly different (p=.05) than the control survival for the % effluent corresponding to:
a.) LOW FLOW OR CRITICAL DILUTION (100.0%) **YES** **X NO**
b.)½ LOW FLOW OR 2X CRITICAL DILUTION (N/A%) **YES** **NO**
2. Enter percent effluent corresponding to the LC_{50} below:
LC_{50} = N/A% effluent
95 % confidence limits:
Method of LC_{50} 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 2/16/15** **Time 0700**
To: **Date 2/16/15** **Time 1300**
Test Begin **Date 2/17/15** **Time 1500**
Test End **Date 2/19/15** **Time 1540**

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	8.5	8.5	8.0	24.6	24.1	24.1	28.0			44.0			7.3	7.4	7.4
22.0	8.5	8.4	8.0	24.6	24.1	24.1							7.1	7.1	7.3
32.0	8.6	8.4	7.9	24.6	24.1	24.1							7.1	7.0	7.2
45.0	8.6	8.4	8.0	24.6	24.1	24.1							7.1	7.0	7.1
56.0	8.5	8.3	7.9	24.6	24.1	24.1							7.1	7.0	7.1
75.0	8.5	8.3	7.9	24.6	24.1	24.1							7.0	7.0	7.0
100.0	8.4	8.1	7.9	24.6	24.1	24.1	24.0			88.0			7.0	6.9	7.0

*This Form is to be submitted with each DMR.
Alkalinity and hardness to be reported as mg/l $CaCO_3$

Acute Forms
Pimephales promelas Survival

Permittee: El Dorado Chemical - Outfall 006
NPDES Permit Number: AR0000752/ AFIN 70-00040
Composite Collected **From: 2/16/15** **To: 2/16/15**
From: **To:**
Test Initiated: 2/17/15
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	100.0	100.0
	B	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	C	100.0	100.0	100.0	100.0	100.0	100.0	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	100.0	100.0
	B	100.0	87.5	100.0	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	100.0
	Mean	100.0	97.5	100.0	100.0	100.0	100.0	100.0

1. Dunnett's Procedure or Steel's Many-One Rank Test as appropriate: Is the mean survival at 48 hours significantly different (p=.05) than the control survival for the % effluent corresponding to:
a.) LOW FLOW OR CRITICAL DILUTION (100.0%) **YES** **X NO**
b.)½ LOW FLOW OR 2X CRITICAL DILUTION (N/A%) **YES** **NO**
2. Enter percent effluent corresponding to the LC_{50} below:
LC_{50} = N/A% effluent
95 % confidence limits:
Method of LC_{50} 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
Pimephales promelas 48 hour Acute Static Renewal
Chemical Parameters Chart*

Permittee: El Dorado Chemical - Outfall 006
NPDES Number: AR0000752/ AFIN 70-00040
Contact: David Sartain
Analyst: Callahan. Hadwin
Sample Collected **From:** **Date 2/16/15** **Time 0700**
To: **Date 2/16/15** **Time 1300**
Test Begin **Date 2/17/15** **Time 1540**
Test End **Date 2/19/15** **Time 1540**

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	8.5	8.5	7.1	24.5	24.6	24.5	28.0			44.0			7.3	7.4	7.9
22.0	8.5	8.4	7.0	24.5	24.6	24.5							7.1	7.1	7.9
32.0	8.6	8.4	7.0	24.5	24.6	24.5							7.1	7.0	7.8
45.0	8.6	8.4	7.0	24.5	24.6	24.5							7.1	7.0	7.7
56.0	8.5	8.3	6.9	24.5	24.6	24.5							7.1	7.0	7.8
75.0	8.5	8.3	6.9	24.5	24.6	24.5							7.0	7.0	7.7
100.0	8.4	8.1	6.8	24.5	24.6	24.5	24.0			88.0			7.0	6.9	7.6

*This Form is to be submitted with each DMR.
Alkalinity and hardness to be reported as mg/l $CaCO_3$

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#: X5673

Chain of Custody Documents Checked by: EGB/2-24-15
Technician/Date

Raw Data Documents Checked by: EGB/2-23-15
Technician/Date

Statistical Analysis Package Checked by: EGB/224-15
Quality Manager/Date

Quality Control Data Checked by: EGB/2-13-15
Quality Manager/Date

Report Checked by: EGB/2-24-15
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.

Chris P. Bruggo, BS
Quality Manager

2-24-15
Date

Report Rev. 3.0

007

Bio-Analytical Laboratories (BAL)
ADEQ#88-0630
Project X5674

Bio-Analytical Laboratories' Executive Summary

Permittee: El Dorado Chemical Company
P.O. Box 231
El Dorado, AR 71731
Project #: X5674
Outfall: Outfall 007 (contaminated storm water)
Permit #: AR0000752/ AFIN #70-00040
Contact: Mr. David Sartain
Test Dates: February 17 - 19, 2015
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 - 50.0%.
3.Report the highest (critical dilution or control) Coefficient of Variation, Parameter TQM3D - 0.00%.

-Note: Increasing the pH from 3.9 to a range of 6.0-9.0, significantly increased the survival in both tests.

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 007 AT

EL DORADO CHEMICAL COMPANY
El Dorado, Arkansas

NPDES #AR0000752
AFIN #70-00040

EPA Methods 2000.0 and 2021.0

Project X5674

Test Dates: February 17 - 19, 2015
Report Date: February 24, 2015

Prepared for:
Mr. David Sartain
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 X5674

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BAL
ADEQ #88-0630
Project X5674

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 X5674

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 February 16, 2015. Upon completion of collection, the sample was packed in ice and delivered to the laboratory by BAL personnel. The temperature upon arrival was -0.9^0 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$\pm$1^0 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 3.9 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$\pm$1^0 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 LC_{50} values values were obtained by approved EPA methods of analysis, using the ToxCalc statistical program.

BAL
ADEQ #88-0630
Project X5674

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 50.0 and 56.0 percent effluent, respectively (p=.05). The 48 hour LC_{50} value for the *Daphnia pulex* and the fathead minnow test was 52.78 and 64.56 percent, respectively (p=.05). Increasing the pH significantly increased the survival rate in both tests.

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

Percent Effluent	Percent Survival	
Test Organism	*Pimephales promelas*	*Daphnia pulex*
Control	100.0	100.0
32.0	100.0	95.0
45.0	100.0	80.0
50.0	97.5	70.0
56.0	100.0	40.0
75.0	0.0	0.0
100.0	0.0	0.0
100.0 pH adjusted	97.5	100.0

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 X5674

4.0 Conclusions

The sample of Outfall 007 collected from El Dorado Chemical Company, El Dorado, Arkansas, on February 16, 2015, was found to be lethally toxic to the fathead minnow test organisms and the *Daphnia pulex* test organisms in the 100.0 percent critical dilution after 48 hours of exposure (p=.05). Increasing the pH significantly reduced the lethal effect in both tests.

BAL
ADEQ #88-0630
Project X5674

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

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

Laboratory Use Only:

Company: El Dorado Chemical Company	Phone: (870) 863-1484	Analysis:								
Address: 4500 Norwest Ave., El Dorado, AR 71731	Fax: (870) 863-7499									
Permit #: AR0000752/AFIN 70-00040	Purchase Order:									
Sampler's Signature/Printed Name/Affiliation: Edward L Pearson / Edward L Pearson / EDC										

Date Start / Date End	Time Start / Time End	C	G	# and type of container	Sample Identification	Chronic Ceriodaphnia	Chronic minnow	Acute minnow(fresh/marine)	Acute Daphnia species	Acute Mysid	Acute Ceriodaphnia	Fecal Coliform	Lab Control Number:	Project Number: X5674 / Preservative: (below)
2-16-15 / 2-16-15	0730 / 1330	X		6 half gallons	007			X	X				C10548	Temp. upon arrival: -0.9°C #29 EC02/17/15 / ICE

Relinquished by/Affiliation:	Date:	Time:	Received by/Affiliation:	Date:	Time:
Edward L Pearson	2/17/15	1020 ~~1250~~	Erin S. Boggs 2/17/15	2/17/15	1020
Erin S. Boggs	2/17/15	1210	R Callahe	2/17/15	1210

Method of Shipment: ✓ Lab ____ Bus ____ Fed Ex ____ DHL ____ UPS ____ Client ____ Other Tracking #____

Comments:

COC Rev. 3.0

APPENDIX B
RAW DATA SHEETS

BIO-ANALYTICAL LABORATORIES
ACUTE TOXICITY TEST WATER QUALITY DATA

Project# X5674

Client: EDCC/El Dorado Chemical Company

Address: 4500 Northwest Ave El Dorado AR 71731

NPDES#AR0000752 Outfall 007

Technicians: EGB/RC/JH

Test initiated: Date 2/17/15 Time 1435

Test terminated: Date 2/19/15 Time 1415

Dissolved Oxygen Meter: Model # YSI550A Serial #06E2089 AV
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
C10548	11.2/ 139.3%	Y/25/8.2 99.9%	<0.01	NO	3.0	N/A	252.0	0	RC
↓	10.8/ 121.6%	Y/25/8.4 99.9%	↓	↓	6.0	↓	↓	↓	RC

Dilution Water Information

Dilution Water	ID#	Initial D.O (mg/L & %)	Aerate? Minutes/D.O (mg/L & %)	Total Residual Chlorine (mg/L)	Ammonia (NH3) mg/L	pH	Hardness	Alkalinity	Tech
Soft H2O	3693	N/A	N/A	N/A	N/A	7.2	44.0	28.0	EGB
↓	↓	↓	↓	↓	↓				

Test Species Information

Test Species Info.	Species: ID#: D.pulex M12-N12	Species: ID#: P. promelas BAC/021415	Species: ID#:	Species: ID#:
Age	< 24 hrs	3 days		
Test Container Size	30 ml	300 ml		
Test volume	20 ml	200 ml		
Feeding: Type	2 hrs prior to			
Amount	Test initiation			
Aeration?	N/A	N/A		
Amount	↓	↓		
Condition of survivors	Good RC 2/19/15	Good JH		

Comments: 2/17/15 - original pH 5.9 on 100% - added NaOH to bring pH to ≥6.0 - RC

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

Project# X5674

Client El Dorado Chemical

Test started: Date 2/17/15 Time 1435

Test ended: Date 2/19/15 Time 1525

Test Species D. pulex ID# M12-N12

Sample Description 007

	0hour	24hour	48hour	72hour	96hour
Technician:	EB	EB	RC		
Time:	1435	1635	1525		
Temperature (°C):	24.6	24.7	24.1		

Test Dilution	Replicate	Test Salinity	# Live Organisms 0 hr	24	48	72	96	Dissolved Oxygen 0	24	48	72	96	pH 0	24	48	72	96	Conductivity 0	24	48	72	96
%		NA						8.6	8.2/8.4	8.0			7.3	7.4/7.3	7.3			174.5	214/161.3	230		
0 s	A		8	8	8																	
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
								8.6	8.1/8.4	8.1			6.5	6.9/6.3	7.2			393	403/378	427		
32.0	A		8	8	8																	
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	6																	
Chemistry Tech prerenewal/postrenewal								RC	EB/RC	RC	-		RC	EB/RC	RC			RC	EB/RC	RC		

ACUTE2 Rev 1.0

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

Project# X5674

Client El Dorado Chemical

Sample Description 007

Test started: Date 2/17/15 Time 1435

Test ended: Date 2/19/15 Time 1525

Test Species D. pulex ID# M12-N12

Technician:	Ohour RB	24hour EGB	48hour RC	72hour	96hour
Time:	Ohour 1435	24hour 1635	48hour 1525	72hour	96hour
Temperature (°C):	Ohour 24.6	24hour 24.1	48hour 24.1	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
%		ua																				
45.0	A		8	8	8			8.6	8.8/8.5	8.0			5.9	6.8/5.8	7.0			473	478/453	501		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	0																	
50.0	A		8	8	6			8.6	8.1/8.5	8.0			5.5	6.7/5.6	6.9			501	502/489	527		
	B		8	8	6																	
	C		8	8	8																	
	D		8	8	0																	
	E		8	8	8																	
Chemistry Tech prerenewal/postrenewal								RC	EGB/RC	RC			RC	EGB/RC	RC			RC	EGB/RC	RC		

ACUTE2 Rev 1.0

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

Project# X5674

Client El Dorado Chemical

Sample Description 007

Technician: Ohour EB 24hour EB 48hour RC 72hour ____ 96hour ____

Time: Ohour 1435 24hour 1435 48hour 1525 72hour ____ 96hour ____

Temperature (°C): Ohour 24.6 24hour 24.1 48hour 24.7 72hour ____ 96hour ____

Test started: Date 2/17/15 Time 1435

Test ended: Date 2/19/15 Time 1525

Test Species D. pulex ID# MaNa

Test Dilution	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity				
			0 hr	24	48	72	96	0	24	48	72	96	0 EB 2/18	24	48	72	96	0	24	48	72	96
%		Na																				
56.0	A		8	8	3			8.5	8.4	7.9			5.2	5.3	7.0			534	561	545		
	B		8	8	3				RC 2/19/15	7.1				RC 2/19/15	6.9				Rc 2/19/15	556		
	C		8	8	7																	
	D		8	8	3																	
	E		8	8	0																	
75.0	A		8	0	—			8.4	8.3	—			4.4	4.3	—			659	634	—		
	B		8	0	—													Rc 2/19/15				
	C		8	0	—																	
	D		8	0	—																	
	E		8	0	—																	
Chemistry Tech prerenewal/postrenewal								RC	RC	RC			RC	RC	RC			RC	RC	RC		

ACUTE2 Rev 1.0

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

Project# X5674

Client El Dorado Chemical

Test started: Date 2/17/15 Time 1435

Test ended: Date 2/19/15 Time 1525

Sample Description 007

Test Species D. pulex ID# M12-N12

Technician:	Ohour EB	24hour EB	48hour RC	72hour ____ 96hour ____
Time:	Ohour 1435	24hour 1635	48hour 1525	72hour ____ 96hour ____
Temperature (°C):	Ohour 24.6	24hour 24.1	48hour 24.1	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	0	—			8.3	8.0 / 8.1 RC 2/18/15	—			4.1	4.7 / 4.0 RC 2/18/15	—			823	820 / 822 RC 2/19/15	—		
	B		8	0	—																	
	C		8	0	—																	
	D		8	0	—																	
	E		8	0	—																	
100 pH adj	A		8	8	8			8.2	8.1 / 8.1	7.9			6.4	7.1 / 7.0	7.0			832	813 / 819	558 875		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
Chemistry Tech prerenewal/postrenewal								RC	8.0 / RC	RC			RC	8.0 / RC	RC			RC	7.9 / RC	RC		

ACUTE2 Rev 1.0

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

Project# X5674

Client El Dorado Chemical

Test started: Date 2/17/15 Time 1640

Test ended: Date 2/19/15 Time 1615

Test Species P. promelas ID# BAL02141S

Sample Description 007

Technician:	Ohour RC	24hour RC	48hour JH	72hour	96hour
Time:	Ohour 1640	24hour 1650	48hour 1615	72hour	96hour
Temperature (°C):	Ohour 24.5	24hour 24.5	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
		NA							8.1					7.0					1833			
0 s	A		8	8	8			8.6	8.4	7.0			7.3	7.3	8.1			1745	1615	182		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
									8.2					6.7					3823			
32.0	A		8	8	8			8.6	8.4	8.0			6.5	6.3	6.8			3723	3718	3854		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
Chemistry Tech prerenewal/postrenewal								RC	RC/RC	JH			RC	RC/RC	JH			RC	RC/RC	JH		

ECB 2/19/15

ACUTE2 Rev 1.0

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

Project# X5674

Client El Dorado Chemical

Sample Description 007

Test started: Date 2/17/15 Time 1650

Test ended: Date 2/19/15 Time 1615

Test Species P. promelas ID# BAL/021415

Technician:	Ohour RC	24hour RC	48hour JH	72hour	96hour
Time:	Ohour 1640	24hour 1650	48hour 1615	72hour	96hour
Temperature (°C):	Ohour 20.5	24hour 24.5	48hour 21	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
%		Ua																				
45.0	A		8	8	7			8.6	8.1/8.5	7.9			5.9	6.5/5.8	6.8			473	401/453	383		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
					2/19/20																	
50.0	A		8	8	7 JH			8.6	8.0/8.5	7.8			5.5	6.4/5.4	6.4			501	494/485	499		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
Chemistry Tech prerenewal/postrenewal								RC	RC/RC	JH			RC	RC/RC	JH			RC	RC/RC	JH		

ACUTE2 Rev 1.0

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

Project# X5674

Client El Dorado Chemical

Sample Description 007

Test started: Date 2/17/15 Time 1640

Test ended: Date 2/19/15 Time 1615

Test Species P. promelas ID# BAL 03 1415

Technician: Ohour RC 24hour RC 48hour JH 72hour ____ 96hour ____

Time: Ohour 1640 24hour 1650 48hour 1615 72hour ____ 96hour ____

Temperature (°C): Ohour 24.5 24hour 24.5 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
		Ua																				
56.0	A		8	8	8			8.5	8.0/8.4	7.8			5.3	6.3/5.3	6.2			534	534/537	530		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
75.0	A		8	0	8	0		8.4	8.0/8.3				4.4	4.6/4.3				659	638/634			
	B		8	0	8	0																
	C		8	0	8	0																
	D		8	0	8	0																
	E		8	0	8	0																
	Chemistry Tech prerenewal/postrenewal							RC	RC/RC	JH			RC	RC/RC	JH			RC	RC/RC	JH		

2/19/15 JH

ACUTE2 Rev 1.0

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

Project# X5674

Client El Dorado Chemical

Sample Description 007

Test started: Date 2/17/15 Time 1648

Test ended: Date 2/19/15 Time 1615

Test Species P. promelas ID# BAL021415

Technician:	Ohour RC	24hour RC	48hour JH	72hour	96hour
Time:	Ohour 1640	24hour 1656	48hour 1615	72hour	96hour
Temperature (°C):	Ohour 24.3	24hour 24.5	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	N/A	8	0	8			8.3	7.9				4.1	4.0				823	796			
	B		8	0	8	0 JH 2/19/15																
	C		8	0	8																	
	D		8	0	8																	
	E		8	0	8																	
100 pH adj	A		8	8	7			8.2	7.8 / 8.1	7.7			6.4	6.9 / 7.0	7.1			830	859 / 797	857		
	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			

ACUTE2 Rev 1.0

APPENDIX C
STATISTICAL ANALYSES

Daphnid Acute Test-48 Hr Survival

Start Date:	2/17/2015	Test ID:	X5674DP	Sample ID:	AR0000752
End Date:	2/19/2015	Lab ID:	ADEQ880630	Sample Type:	EFF2-Industrial
Sample Date:	2/16/2015	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	1.0000	1.0000	1.0000	0.7500
45	1.0000	1.0000	1.0000	1.0000	0.0000
50	0.7500	0.7500	1.0000	0.0000	1.0000
56	0.3750	0.3750	0.8750	0.3750	0.0000
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 ADJ	1.0000	1.0000	1.0000	1.0000	1.0000

			Transform: Arcsin Square Root					Rank	1-Tailed
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical
D-Control	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5		
32	0.9500	0.9500	1.3239	1.0472	1.3931	11.684	5	25.00	16.00
45	0.8000	0.8000	1.1500	0.1777	1.3931	47.263	5	25.00	16.00
50	0.7000	0.7000	1.0117	0.1777	1.3931	49.151	5	20.00	16.00
*56	0.4000	0.4000	0.6729	0.1777	1.2094	54.284	5	15.00	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 ADJ	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5		

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.05)	0.75119	0.934	-1.7389	4.9051
Equality of variance cannot be confirmed				

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	50	56	52.915	2
Treatments vs D-Control				

ToxCalc v5.0.23

Reviewed by: EQB 2/24/15

Daphnid Acute Test-48 Hr Survival

Start Date:	2/17/2015	Test ID:	X5674DP	Sample ID:	AR0000752
End Date:	2/19/2015	Lab ID:	ADEQ880630	Sample Type:	EFF2-Industrial
Sample Date:	2/16/2015	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	1.0000	1.0000	1.0000	0.7500
45	1.0000	1.0000	1.0000	1.0000	0.0000
50	0.7500	0.7500	1.0000	0.0000	1.0000
56	0.3750	0.3750	0.8750	0.3750	0.0000
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 ADJ	1.0000	1.0000	1.0000	1.0000	1.0000

			Transform: Arcsin Square Root					Number	Total
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Resp	Number
D-Control	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5	0	40
32	0.9500	0.9500	1.3239	1.0472	1.3931	11.684	5	2	40
45	0.8000	0.8000	1.1500	0.1777	1.3931	47.263	5	8	40
50	0.7000	0.7000	1.0117	0.1777	1.3931	49.151	5	12	40
56	0.4000	0.4000	0.6729	0.1777	1.2094	54.284	5	24	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 ADJ	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5		

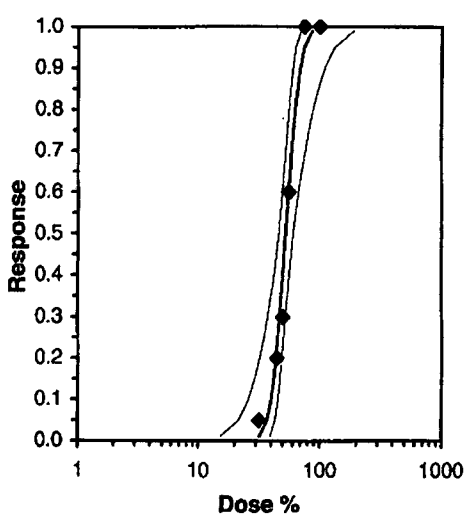
Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.05)	0.78782	0.927	-1.6223	3.86406
Equality of variance cannot be confirmed				

Maximum Likelihood-Probit

Parameter	Value	SE	95% Fiducial Limits		Control	Chi-Sq	Critical	P-value	Mu	Sigma	Iter
Slope	10.8354	2.35061	4.30909	17.3618	0	11.1653	9.48773	2.5E-02	1.72245	0.09229	5
Intercept	-13.663	4.03994	-24.88	-2.4468							
TSCR											

Point	Probits	%	95% Fiducial Limits	
EC01	2.674	32.1922	15.2181	39.3551
EC05	3.355	37.2088	21.73	43.4218
EC10	3.718	40.1953	26.1929	45.9007
EC15	3.964	42.3445	29.6393	47.7682
EC20	4.158	44.1343	32.6232	49.4209
EC25	4.326	45.73	35.3328	51.0118
EC40	4.747	50.0113	42.4136	56.2774
EC50	5.000	52.7776	46.379	60.9402
EC60	5.253	55.6969	49.799	67.2033
EC75	5.674	60.9113	54.4689	81.3679
EC80	5.842	63.1135	56.1223	88.2833
EC85	6.036	65.7812	57.9823	97.308
EC90	6.282	69.2985	60.2726	110.237
EC95	6.645	74.8605	63.651	133.008
EC99	7.326	86.5262	70.168	190.086

Significant heterogeneity detected (p = 2.48E-02)



ToxCalc v5.0.23

Reviewed by EGB 2/24/15

Acute Fish Test-48 Hr Survival

Start Date:	2/17/2015	Test ID:	X5674PP	Sample ID:	AR0000752
End Date:	2/19/2015	Lab ID:	ADEQ880630	Sample Type:	EFF2-Industrial
Sample Date:	2/16/2015	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	0.8750	1.0000	1.0000	1.0000	1.0000
56	1.0000	1.0000	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 ADJ	0.8750	1.0000	1.0000	1.0000	1.0000

			Transform: Arcsin Square Root					Rank	1-Tailed
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical
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	0.9750	0.9750	1.3564	1.2094	1.3931	6.055	5	25.00	16.00
56	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5	27.50	16.00
75	0.0000	0.0000	0.1777	0.1777	0.1777	0.000	5		
100	0.0000	0.0000	0.1777	0.1777	0.1777	0.000	5		
100.0 PH ADJ	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)	0.5466	0.927	-2.7369	8.25694
Equality of variance cannot be confirmed				
Hypothesis Test (1-tail, 0.05)				
Steel's Many-One Rank Test indicates no significant differences				
Treatments vs D-Control				

ToxCalc v5.0.23

Reviewed by: EQB 2/24/15

Acute Fish Test-48 Hr Survival

Start Date:	2/17/2015	Test ID:	X5674PP	Sample ID:	AR0000752
End Date:	2/19/2015	Lab ID:	ADEQ880630	Sample Type:	EFF2-Industrial
Sample Date:	2/16/2015	Protocol:	EPAAW02-EPA/821/R-02-01	Test Species:	PP-Pimephales promelas

Comments:

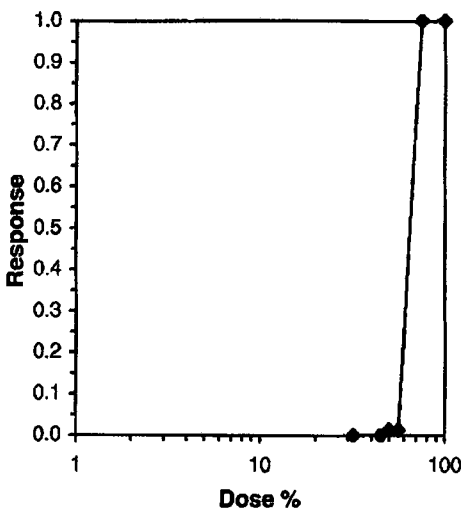
Conc-%	1	2	3	4	5
D-Control	1.0000	1.0000	1.0000	1.0000	1.0000
32	1.0000	1.0000	1.0000	1.0000	1.0000
45	1.0000	1.0000	1.0000	1.0000	1.0000
50	0.8750	1.0000	1.0000	1.0000	1.0000
56	1.0000	1.0000	1.0000	1.0000	1.0000
75	0.0000	0.0000	0.0000	0.0000	0.0000
100	0.0000	0.0000	0.0000	0.0000	0.0000
100.0 PH ADJ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

			Transform: Arcsin Square Root					Number	Total
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Resp	Number
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	0.9750	0.9750	1.3564	1.2094	1.3931	6.055	5	1	40
56	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5	0	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 ADJ	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)	0.5466	0.927	-2.7369	8.25694
Equality of variance cannot be confirmed				

Trimmed Spearman-Karber

Trim Level	EC50	95% CL	
0.0%	64.555	64.035	65.080
5.0%	64.688	64.348	65.029
10.0%	64.688	64.348	65.029
20.0%	64.688	64.348	65.029
Auto-0.0%	64.555	64.035	65.080

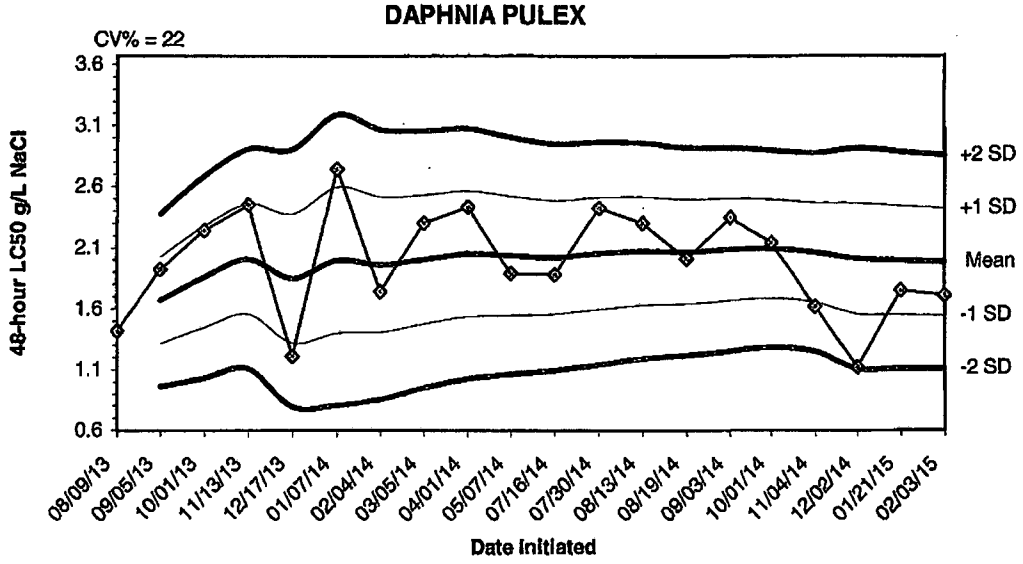


ToxCalc v5.0.23

Reviewed by: EQB 2/24/15

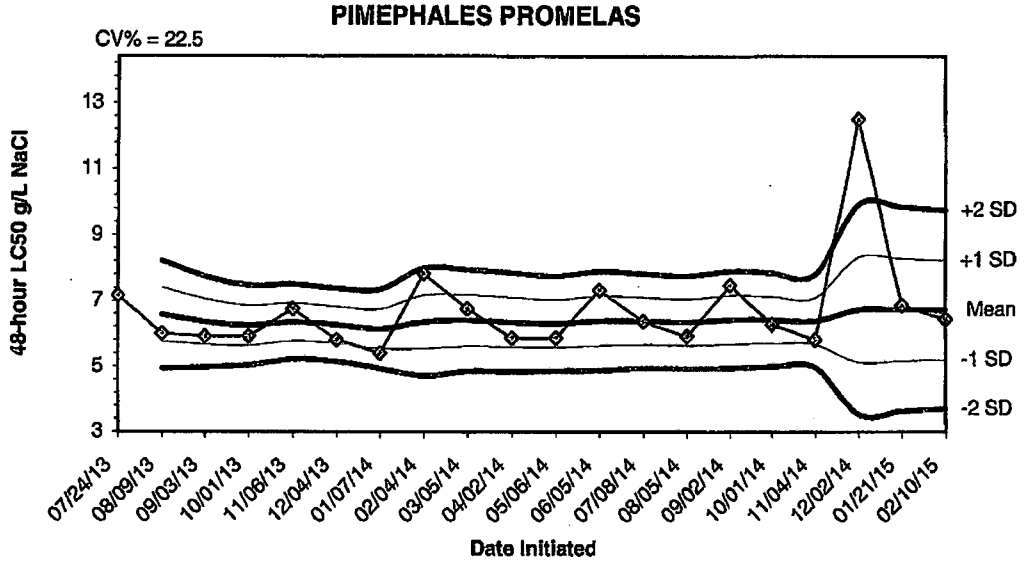
APPENDIX D
QUALITY ASSURANCE CHARTS

2015 48-HOUR ACUTE REFERENCE TOXICANT TEST RESULTS FOR DAPHNIA PULEX



Dates	Values	Mean	-1 SD	-2 SD	+1 SD	+2 SD
08/09/13	1.4200					
09/05/13	1.9200	1.6700	1.3164	0.9629	2.0236	2.3771
10/01/13	2.2400	1.8600	1.4467	1.0334	2.2733	2.6866
11/13/13	2.4500	2.0075	1.5593	1.1111	2.4557	2.9039
12/17/13	1.2100	1.8480	1.3209	0.7937	2.3751	2.9023
01/07/14	2.7400	1.9967	1.4009	0.8052	2.5924	3.1881
02/04/14	1.7400	1.9600	1.4076	0.8552	2.5124	3.0648
03/05/14	2.3000	2.0025	1.4771	0.9517	2.5279	3.0533
04/01/14	2.4300	2.0500	1.5383	1.0266	2.5617	3.0734
05/07/14	1.8900	2.0340	1.5489	1.0639	2.5191	3.0041
07/16/14	1.8800	2.0200	1.5575	1.0950	2.4825	2.9450
07/30/14	2.4200	2.0533	1.5975	1.1416	2.5092	2.9650
08/13/14	2.3000	2.0723	1.6305	1.1887	2.5141	2.9559
08/19/14	2.0100	2.0679	1.6431	1.2183	2.4926	2.9174
09/03/14	2.3500	2.0867	1.6709	1.2552	2.5024	2.9182
10/01/14	2.1400	2.0900	1.6881	1.2862	2.4919	2.8938
11/04/14	1.6200	2.0624	1.6569	1.2514	2.4678	2.8733
12/02/14	1.1200	2.0100	1.5583	1.1065	2.4617	2.9135
01/21/15	1.7500	1.9963	1.5533	1.1102	2.4394	2.8824
02/03/15	1.7100	1.9820	1.5460	1.1101	2.4180	2.8539

2015 48-HOUR ACUTE REFERENCE TOXICANT TEST RESULTS FOR PIMEPHALES PROMELAS



Dates	Values	Mean	-1 SD	-2 SD	+1 SD	+2 SD
07/24/13	7.1600					
08/09/13	6.0000	6.5800	5.7598	4.9395	7.4002	8.2205
09/03/13	5.9200	6.3600	5.6660	4.9721	7.0540	7.7479
10/01/13	5.9200	6.2500	5.6422	5.0343	6.8578	7.4657
11/06/13	6.7500	6.3500	5.7781	5.2061	6.9219	7.4939
12/04/13	5.8100	6.2600	5.7030	5.1459	6.8170	7.3741
01/07/14	5.4000	6.1371	5.5336	4.9301	6.7407	7.3442
02/04/14	7.8200	6.3475	5.5313	4.7151	7.1637	7.9799
03/05/14	6.7500	6.3922	5.6170	4.8418	7.1674	7.9426
04/02/14	5.8600	6.3390	5.5890	4.8390	7.0890	7.8390
05/06/14	5.8600	6.2955	5.5694	4.8434	7.0215	7.7475
06/05/14	7.3100	6.3800	5.6284	4.8767	7.1316	7.8833
07/08/14	6.3700	6.3792	5.6596	4.9400	7.0989	7.8185
08/05/14	5.9200	6.3464	5.6442	4.9420	7.0486	7.7509
09/02/14	7.4800	6.4220	5.6847	4.9475	7.1593	7.8965
10/01/14	6.2800	6.4131	5.7000	4.9868	7.1263	7.8394
11/04/14	5.8100	6.3776	5.6718	4.9660	7.0835	7.7893
12/02/14	12.5000	6.7178	5.1205	3.5232	8.3150	9.9123
01/21/15	6.8500	6.7247	5.1722	3.6196	8.2773	9.8299
02/10/15	6.4200	6.7095	5.1968	3.6841	8.2222	9.7349

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: 2/16/15** **To: 2/16/15**
From: **To:**
Test Initiated: 2/17/15
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	100.0	0.0	100.0
	B	100.0	100.0	100.0	100.0	100.0	100.0	0.0	100.0
	C	100.0	100.0	100.0	100.0	100.0	100.0	0.0	100.0
	D	100.0	100.0	100.0	100.0	100.0	100.0	0.0	100.0
	E	100.0	100.0	100.0	100.0	100.0	100.0	0.0	100.0
48-hour	A	100.0	100.0	100.0	75.0	37.5	0.0	0.0	100.0
	B	100.0	100.0	100.0	75.0	37.5	0.0	0.0	100.0
	C	100.0	100.0	100.0	100.0	87.5	0.0	0.0	100.0
	D	100.0	100.0	100.0	0.0	37.5	0.0	0.0	100.0
	E	100.0	75.0	0.0	100.0	0.0	0.0	0.0	100.0
	Mean	100.0	95.0	80.0	70.0	40.0	0.0	0.0	100.0

1. Dunnett's Procedure or Steel's Many-One Rank Test as appropriate: Is the mean survival at 48 hours significantly different (p=.05) than the control survival for the % effluent corresponding to:
a.) LOW FLOW OR CRITICAL DILUTION (100.0%) **X YES** **NO**
b.)½ LOW FLOW OR 2X CRITICAL DILUTION (N/A%) **YES** **NO**
2. Enter percent effluent corresponding to the LC_{50} below:
LC_{50} = 52.78% effluent
95 % confidence limits: 60.94-46.38%
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

Adjusting the pH of the sample to neutral significantly increased survival.

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 2/16/15**	**Time 0730**
	To:	**Date 2/16/15**	**Time 1330**
Test Begin		**Date 2/17/15**	**Time 1435**
Test End		**Date 2/19/15**	**Time 1525**

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	8.6	8.4	8.0	24.6	24.1	24.1	28.0			44.0			7.3	7.3	7.3
32.0	8.6	8.4	8.1	24.6	24.1	24.1							6.5	6.3	7.2
45.0	8.6	8.5	8.0	24.6	24.1	24.1							5.9	5.8	7.0
50.0	8.6	8.5	8.0	24.6	24.1	24.1							5.5	5.6	6.9
56.0	8.5	8.4	7.7	24.6	24.1	24.1							53	5.3	6.9
75.0	8.4	8.0		24.6	24.1								4.4	4.9	
100.0	8.3	8.0		24.6	24.1		0.0			252.0			4.1	4.9	
100.0 pH	8.2	8.1	7.9	24.6	24.1	24.1							6.4	7.0	7.0

*This Form is to be submitted with each DMR.
Alkalinity and hardness to be reported as mg/l $CaCO_3$

Acute Forms
Pimephales promelas Survival

Permittee: El Dorado Chemical - Outfall 007
NPDES Permit Number: AR0000752/ AFIN 70-00040
Composite Collected **From: 2/16/15** **To: 2/16/15**
From: **To:**
Test Initiated: 2/17/15
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	0.0	0.0	100.0
	B	100.0	100.0	100.0	100.0	100.0	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
48-hour	A	100.0	100.0	100.0	87.5	100.0	0.0	0.0	87.5
	B	100.0	100.0	100.0	100.0	100.0	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	97.5	100.0	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.)½ LOW FLOW OR 2X CRITICAL DILUTION (N/A%) **YES** **NO**
2. Enter percent effluent corresponding to the LC_{50} below:
LC_{50} = 64.56% effluent
95 % confidence limits: 65.08 - 64.04%
Method of LC_{50} 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

Adjusting the pH of the sample to neutral significantly increased survival.

Biomonitoring
Pimephales promelas 48 hour Acute Static Renewal
Chemical Parameters Chart*

Permittee: El Dorado Chemical - Outfall 007
NPDES Number: AR0000752/ AFIN 70-00040
Contact: David Sartain
Analyst: Callahan, Hadwin
Sample Collected **From:** **Date 2/16/15** **Time 0730**
To: **Date 2/16/15** **Time 1330**
Test Begin **Date 2/17/15** **Time 1640**
Test End **Date 2/19/15** **Time 1615**

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	8.6	8.4	8.1	24.5	24.5	24.7	28.0			44.0			7.3	7.3	7.0
32.0	8.6	8.4	8.0	24.5	24.5	24.7							6.5	6.3	6.8
45.0	8.6	8.5	7.9	24.5	24.5	24.7							5.9	5.8	6.8
50.0	8.6	8.5	7.8	24.5	24.5	24.7							5.5	5.6	6.4
56.0	8.5	8.4	7.8	24.5	24.5	24.7							53	5.3	6.2
75.0	8.4	8.0		24.5	24.5								4.4	4.9	
100.0	8.3	8.0		24.5	24.5		0.0			252.0			4.1	4.9	
100.0 pH	8.2	8.1	7.7	24.5	24.5	24.7							6.4	7.0	7.1

*This Form is to be submitted with each DMR.
Alkalinity and hardness to be reported as mg/l $CaCO_3$

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#: X5674

Chain of Custody Documents Checked by: EGB/2-24-15
Technician/Date

Raw Data Documents Checked by: EGB/2-23-15
Technician/Date

Statistical Analysis Package Checked by: EGB/2-24-15
Quality Manager/Date

Quality Control Data Checked by: EGB/2-13-15
Quality Manager/Date

Report Checked by: EGB/2-24-15
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.

Ernest L. Boggs, BS — 2-24-15

Quality Manager — **Date**

Report Rev. 3.0

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

ELDORADO, AR 71730

FedEx Express

J151215022303uv

Ship Date: 25MAR15
ActWgt: 5.0 LB
CAD: 5887030/INET3610

Delivery Address Bar Code

SHIP TO: (501) 682-0744 BILL SENDER

Water Enforcement Branch
ADEQ - AR DEPT. of ENVIR. QUAL.
5301 NORTHSHORE DRIVE

NORTH LITTLE ROCK, AR 72118

Ref #
Invoice #
PO #
Dept #

THU - 26 MAR 10:30A
PRIORITY OVERNIGHT

TRK# 0201 7732 0936 8079

72118
AR-US
LIT

X2 LITA

537J1/879A/EE4B