



Forrest City Water Utility
303 N. Rosser St.
Forrest City, AR 72335

10/24/2014

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

Transmittal Letter

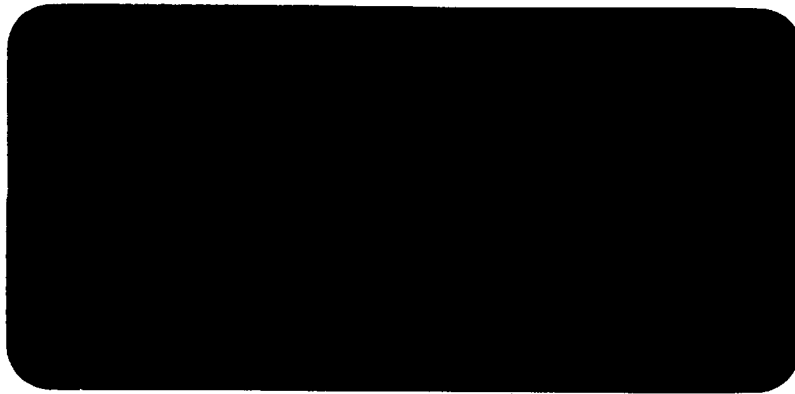
Please find enclosed for your distribution the following:

SEMI-ANNUAL 2014 CHRONIC WET TEST REPORT

Sincerely,
Forrest City Water Utility

A handwritten signature in black ink, appearing to read "W.H. Calvin Murdock", is written over the typed name.

W.H. Calvin Murdock, Manager
870.633.2921 Office
870.261.2846 Cell
WHCM2@forrestcitywater.com




Huther and Associates, Inc.

CITY OF FORREST CITY
OUTFALL 001

Chronic Biomonitoring Report
Permit Number NPDES AR0020087
AFIN Number: 62-00070

Ceriodaphnia dubia
Pimephales promelas

September 30, 2014


FORREST CITY WATER
UTILITY 3
OCT 17 2014
CASH CHECK

Reviewed by:



Toni Nesbitt, QA/QC Officer
Huther & Associates, Inc.
1156 North Bonnie Brae
Denton, Texas 76201
(940) 387-1025, Fax: (940) 387-1036

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TOXICITY TEST REPORT - CHRONIC

Client City of Forrest City Laboratory I.D. 22899
Permit No. NPDES AR0020087 Begin Date September 30, 2014
Sample Outfall 001

Results: Pass *Ceriodaphnia dubia* survival and reproduction and *Pimephales promelas* survival and growth at the critical low flow concentration (100% effluent).

SAMPLE COLLECTION

Composite effluent samples from City of Forrest City were delivered by Greyhound Package Express courier to Huther & Associates on September 30, October 2 and October 4, 2014. Effluent samples were collected and composited from Outfall 001 using an automatic sampler. Two toxicity tests were requested: a seven-day *Ceriodaphnia dubia* survival and reproduction test (EPA Method 1002.0), and a seven-day *Pimephales promelas* larval survival and growth test (EPA Method 1000.0). Test organisms, procedures and quality assurance requirements were in accordance with the EPA manual, "Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, Fourth Edition" (EPA-821-R-02-013).

The effluent samples were analyzed for total residual chlorine (Standard Methods, 22nd Edition, 4500-Cl D) and contained <0.01 mg/L, <0.01 mg/L, and <0.01 mg/L, respectively. Effluent and laboratory dilution water hardness, alkalinity, conductivity, pH, and dissolved oxygen data were collected and recorded.

TEST SETUP
Ceriodaphnia dubia



The seven-day *Ceriodaphnia dubia* survival and reproduction test was initiated at 1400 hours, September 30, 2014. Five concentrations were prepared (32%, 42%, 56%, 75%, 100% effluent) utilizing distilled, deionized laboratory water reconstituted to match the hardness, alkalinity and pH of the receiving stream (unnamed tributary of L'Anguille River). The test was conducted in 25 mL distilled water rinsed plastic beakers containing 15 mL of solution (one organism per beaker, ten beakers per concentration). *C. dubia* neonates were less than 24 hours old and within eight hours of the same age at test initiation. Neonates were placed in beakers following a randomized block test design. Fresh solutions were prepared and renewed daily. Daily feeding consisted of 0.5 mL *Selenastrum capricornutum* and cerophyll per test chamber. The test proceeded for seven days during which survival, reproduction and water quality data were collected daily.

A control of 10 replicate beakers containing one neonate each in distilled, deionized, reconstituted water (same as diluent) was conducted concurrently with the test. There was 100% survival in the control. The test ended at 1400 hours, October 7, 2014. Survival and reproduction data were statistically analyzed ($p = 0.05$) according to EPA procedures to determine the Lowest Observable Effect Concentration (LOEC) and the No Observable Effect Concentration (NOEC).

SURVIVAL*Ceriodaphnia dubia*

There was 100% survival to *C. dubia* in all of the effluent concentrations tested. Therefore, statistical analyses were not required to determine a no effect concentration.

LOEC: Not Applicable

NOEC: 100% Effluent

REPRODUCTION*Ceriodaphnia dubia*

C. dubia reproduction data failed Chi-Square test for normality at the 0.01 alpha level (13.277). Bartlett's test for homogeneity is sensitive to non-normal data and should not be performed on the non-normally distributed data. Therefore, a nonparametric test was performed on the data. Steel's Many-One Rank test on *C. dubia* reproduction data demonstrated that there were no statistically significant differences between the control and any of the effluent concentrations.

LOEC: Not Applicable

NOEC: 100% Effluent

PMSD: 10.6%

TEST SETUP*Pimephales promelas*

The seven-day *Pimephales promelas* larval survival and growth test was initiated at 1450 hours, September 30, 2014. Five concentrations were prepared (32%, 42%, 56%, 75%, 100% effluent) utilizing distilled, deionized laboratory water reconstituted to match the hardness, alkalinity and pH of the receiving stream (unnamed tributary of L'Anguille River). The test was conducted in 300 mL distilled water rinsed plastic beakers containing 250 mL of solution (eight larvae per beaker, five beakers per concentration). *P. promelas* larvae were less than 24-hours old at test initiation and originated from a minimum of three in-house spawnings. Fresh solutions were prepared and renewed daily. Larvae in each test chamber were fed <24-hour-old *Artemia* (brine shrimp) three times per day. The test proceeded for seven days during which survival and water quality data were collected daily.

A control of five replicate chambers containing eight larvae each in distilled, deionized, reconstituted water (same as diluent) was conducted concurrently with the test. There was 100% survival in the control. The test ended at 1450 hours, October 7, 2014. At test termination, all larvae were sacrificed, dried for 24-hours, and weighed. Survival and growth (weight) data were statistically analyzed ($p = 0.05$) according to EPA procedures to determine the Lowest Observable Effect Concentration (LOEC) and the No Observable Effect Concentration (NOEC).

SURVIVAL
Pimephales promelas

There was 100% survival to *P. promelas* in all of the effluent concentrations tested. Therefore, statistical analyses were not required to determine a no effect concentration.

LOEC: Not Applicable
NOEC: 100% Effluent

GROWTH
Pimephales promelas

P. promelas growth data were normally distributed at the 0.01 alpha level (0.900) using Shapiro Wilk's test for normality. Growth data were homogeneous using Bartlett's test at the 0.01 alpha level (15.09) without data transformations. Therefore, a parametric test was performed on the homogeneous data. Dunnett's test on *P. promelas* growth data demonstrated that there were no statistically significant differences between the control and any of the effluent concentrations.

LOEC: Not Applicable
NOEC: 100% Effluent

PMSD: 8.9%

SUMMARY

There were no statistically significant differences between the control and the critical low flow concentration (100% effluent) for *C. dubia* survival and reproduction and *P. promelas* survival and growth. Based on biomonitoring requirements for Outfall 001 contained in Permit Number NPDES AR0020087 for City of Forrest City, Outfall 001 **passed** for this testing period.

Huther and Associates
7-Day/3 Brood *Ceriodaphnia dubia* Survival and Reproduction Chronic Toxicity Test

CLIENT **City of Forrest City**
 NPDES # **AR0020087**
 LAB ID # **22899**
 TEST TYPE **7 Day Chronic**
 TEST ORGANISM ***Ceriodaphnia dubia***
 ORGANISM AGE **< 24 Hours**
 ORGANISM SOURCE **In House**
 RECEIVING WATER **unnamed tributary of L. Anguille River**
 DILUTION WATER **Laboratory Adjusted**

SAMPLE TYPE **24 Hour Composite**
 DATE COLLECTED **09/29/14 10/01/14 10/03/14**
 DATE RECEIVED **09/30/14 10/02/14 10/04/14**
 BEGIN DATE/TIME **09/30/14 1400**
 END DATE/TIME **10/07/14 1400**
 TEST TEMPERATURE (°C) **25 ± 1**
 PHOTO PERIOD **16-hr Light 8-hr Dark**
 LIGHT INTENSITY **50-100 ft cnd**
 TECHNICIAN **N. Lehr**

SURVIVAL & REPRODUCTION SUMMARY

Control										
Date	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
10/01/14	A	A	A	A	A	A	A	A	A	A
10/02/14	A	A	A	A	A	A	A	A	A	A
10/03/14	A	A	A	A	A	A	A	A	A	A
10/04/14	3	A	A	A	4	3	A	4	2	A
10/05/14	3	3	2	3	A	A	3	A	A	3
10/06/14	6	6	10	9	9	7	8	8	7	6
10/07/14	12	12	13	13	13	12	11	13	12	11
x # Young 22.8 C.V. 9.65% x% Survival 100% C.V. 0.00%										

32% Effluent										
Date	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
10/01/14	A	A	A	A	A	A	A	A	A	A
10/02/14	A	A	A	A	A	A	A	A	A	A
10/03/14	A	A	A	A	A	A	A	A	A	A
10/04/14	3	2	3	3	A	2	3	2	4	A
10/05/14	3	2	3	3	0	2	3	2	4	0
10/06/14	7	10	8	9	11	A	7	11	11	8
10/07/14	12	13	11	12	13	14	13	13	12	12
x # Young 24.5 C.V. 8.22% x% Survival 100% C.V. 0.00%										

42% Effluent										
Date	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
10/01/14	A	A	A	A	A	A	A	A	A	A
10/02/14	A	A	A	A	A	A	A	A	A	A
10/03/14	A	A	A	A	A	A	A	A	A	A
10/04/14	3	A	A	A	A	A	4	A	3	A
10/05/14	3	4	3	3	2	3	A	3	A	4
10/06/14	6	8	11	6	7	6	9	10	9	9
10/07/14	12	11	13	14	12	11	13	15	12	12
x # Young 23.8 C.V. 11.34% x% Survival 100% C.V. 0.00%										

56% Effluent										
Date	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
10/01/14	A	A	A	A	A	A	A	A	A	A
10/02/14	A	A	A	A	A	A	A	A	A	A
10/03/14	A	A	A	A	A	A	A	A	A	A
10/04/14	3	A	A	A	4	A	3	4	A	3
10/05/14	3	4	4	3	4	5	A	A	3	A
10/06/14	8	11	10	7	6	8	7	9	10	8
10/07/14	12	14	12	13	12	14	12	12	13	12
x # Young 24.6 C.V. 9.62% x% Survival 100% C.V. 0.00%										

where: A = Alive
 5 = Alive, 5 young
 D = Dead
 D5 = 5 Young, Female died

ex 1:

A
4

 alive today
 total young to date

ex 2:

5
12

 alive, 5 young today
 total young to date

Huthur and Associates
7-Day/3 Brood *Ceriodaphnia dubia* Survival and Reproduction Chronic Toxicity Test

City of Forrest City

Lab ID# 22899

Test Date: September 30, 2014

75% Effluent

Date	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
10/01/14	A	A	A	A	A	A	A	A	A	A
10/02/14	A	A	A	A	A	A	A	A	A	A
10/03/14	A	A	A	A	A	A	A	A	A	A
10/04/14	3	4	2	2	3	A	4	3	3	A
10/05/14	A	A	A	A	A	3	A	A	A	4
10/06/14	8	10	6	7	6	8	8	6	9	6
10/07/14	12	13	14	13	12	14	15	13	12	12
x # Young 23.5 C.V. 9.25% x% Survival 100% C.V. 0.00%										

100% Effluent

Date	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
10/01/14	A	A	A	A	A	A	A	A	A	A
10/02/14	A	A	A	A	A	A	A	A	A	A
10/03/14	A	A	A	A	A	A	A	A	A	A
10/04/14	2	4	3	2	A	A	2	A	3	3
10/05/14	7	A	A	A	4	3	A	5	A	A
10/06/14	A	6	11	8	9	6	6	7	8	11
10/07/14	12	13	12	12	14	12	12	14	13	12
x # Young 23.6 C.V. 10.79% x% Survival 100% C.V. 0.00%										

where: A = Alive
 5 = Alive, 5 young
 D = Dead
 D5 = 5 Young, Female died

ex 1:

A
4

 alive today
 total young to date

ex 2:

5
12

 alive, 5 young today
 total young to date

Huthner and Associates
7-Day/3 Brood *Ceriodaphnia dubia* Survival and Reproduction Chronic Toxicity Test

City of Forrest City

Lab ID# 22899

Test Date: September 30, 2014

WET CHEMISTRY MEASUREMENTS

Date	Time	Temp	Samp No.	pH of Solution						Analyst
				CON	32%	42%	56%	75%	100%	
09/30/14	Start	25.5	1	8.25	8.24	8.23	8.25	8.26	7.92	CS
10/01/14	24 Hr	24.9	1	8.21	8.37	8.46	8.51	8.56	8.62	WLB
10/01/14	Renew	24.9	1	8.01	8.02	8.04	8.03	8.04	8.04	WLB
10/02/14	48 Hr	24.8	1	8.18	8.24	8.27	8.28	8.35	8.43	WLB
10/02/14	Renew	25.0	2	7.93	8.01	8.02	8.03	8.02	8.04	WLB
10/03/14	72 Hr	25.1	2	8.26	8.07	8.45	8.50	8.56	8.63	EMS
10/03/14	Renew	25.1	2	7.82	7.83	7.91	7.92	7.92	7.89	EMS
10/04/14	96 Hr	24.3	2	7.78	7.79	7.83	7.85	7.89	7.93	CS
10/04/14	Renew	24.3	3	7.76	7.73	7.68	7.65	7.71	8.04	CS
10/05/14	120 Hr	25.2	3	7.90	8.09	8.21	8.24	8.28	8.39	EMS
10/05/14	Renew	25.2	3	8.11	8.16	8.18	8.19	8.19	8.12	EMS
10/06/14	144 Hr	25.2	3	7.96	8.07	8.15	8.18	8.24	8.31	EMS
10/06/14	Renew	25.2	3	8.02	8.03	8.04	8.03	8.04	7.99	EMS
10/07/14	168 Hr	25.7	3	8.15	8.25	8.27	8.28	8.26	8.23	CS

Date	Time	Temp	Samp No.	DO (mg/L) of Solution						Analyst
				CON	32%	42%	56%	75%	100%	
09/30/14	Start	25.5	1	8.00	8.04	8.03	8.02	8.11	8.50	CS
10/01/14	24 Hr	24.9	1	8.12	8.24	8.24	8.25	8.02	8.14	WLB
10/01/14	Renew	24.9	1	8.49	8.50	8.56	8.85	8.65	8.92	WLB
10/02/14	48 Hr	24.8	1	8.23	8.25	8.10	8.14	8.08	8.08	WLB
10/02/14	Renew	25.0	2	8.30	8.65	8.70	8.89	8.62	8.85	WLB
10/03/14	72 Hr	25.1	2	7.79	8.40	7.57	7.72	8.28	8.01	EMS
10/03/14	Renew	25.1	2	8.41	8.47	8.58	8.61	8.56	8.77	EMS
10/04/14	96 Hr	24.3	2	8.32	8.41	8.52	8.59	8.53	8.47	CS
10/04/14	Renew	24.3	3	8.22	8.32	8.48	8.52	8.40	8.87	CS
10/05/14	120 Hr	25.2	3	8.83	8.75	8.97	8.85	8.84	8.99	EMS
10/05/14	Renew	25.2	3	7.87	8.94	8.51	8.68	8.73	8.63	EMS
10/06/14	144 Hr	25.2	3	8.16	8.92	8.87	8.93	8.96	8.55	EMS
10/06/14	Renew	25.2	3	8.50	8.15	7.74	8.26	8.73	8.50	EMS
10/07/14	168 Hr	25.7	3	7.97	7.93	8.03	8.00	8.01	8.23	CS

Huthier and Associates
7-Day/3 Brood *Ceriodaphnia dubia* Survival and Reproduction Chronic Toxicity Test

City of Forrest City

Lab ID# 22899

Test Date: September 30, 2014

INITIAL CHEMISTRY MEASUREMENTS @ 100% EFFLUENT

Date	Samp. No.	pH	DO	Hardness mg/L CaCO ₃	Alkalinity mg/L CaCO ₃ ¹	Conduct. umhos/cm	Resid. Cl ₂ mg/L	Dechlor(mL) Na ₂ S ₂ O ₃ mg/L	Analyst
09/30/14	1	7.92	8.50	272	252	843	<0.01	N/A	TN
10/02/14	2	8.04	8.85	280	258	838	<0.01	N/A	TN
10/04/14	3	8.04	8.87	280	262	837	<0.01	N/A	TN
09/30/14	Con	8.25	8.00	100	96	383	-	-	TN

¹ Measurements taken in 100% solution.

CERIODAPHNIA DUBIA STATISTICAL ANALYSES
 Reproduction

Summary Statistics on Transformed Data Table 1 of 2

Grp	Identification	N	Min	Max	Mean
1	Control	10	20.000	26.000	22.800
2	32% Effluent	10	22.000	28.000	24.500
3	42% Effluent	10	20.000	28.000	23.800
4	56% Effluent	10	22.000	29.000	24.600
5	75 Effluent	10	21.000	27.000	23.500
6	100% Effluent	10	20.000	27.000	23.600

Chi-Square Test For Normality: Actual And Expected Frequencies

Interval	< -1.5	-1.5 to -0.5	-0.5 to 0.5	> 0.5 to 1.5	> 1.5
Expected	4.020	14.520	22.920	14.520	4.020
Observed	0	24	15	16	5

Calculated Chi-Square goodness of fit test statistic = 13.3359
 Table Chi-Square value (alpha = 0.01) = 13.277

Data Fail normality test. Try another transformation.

Summary Statistics on Transformed Data Table 2 of 2

Grp	Identification	Variance	Sd	Sem	C.V.%
1	Control	4.844	2.201	0.696	9.65
2	32% Effluent	4.056	2.014	0.637	8.22
3	42% Effluent	7.289	2.700	0.854	11.34
4	56% Effluent	5.600	2.366	0.748	9.62
5	75 Effluent	4.722	2.173	0.687	9.25
6	100% Effluent	6.489	2.547	0.806	10.79

Steel's Many-One Rank Test - Ho:Control < Treatment

Grp	Identification	Transformed Mean	Rank Sum	Crit. Value	Df	Sig
1	Control	22.800				
2	32% Effluent	24.500	126.00	75.00	10.00	
3	42% Effluent	23.800	115.50	75.00	10.00	
4	56% Effluent	24.600	129.50	75.00	10.00	
5	75 Effluent	23.500	117.00	75.00	10.00	
6	100% Effluent	23.600	116.00	75.00	10.00	

Critical values use k = 5, are 1 tailed, and alpha = 0.05
 No statistically significant difference

Huthur and Associates

7-Day *Pimephales promelas* Survival and Growth Chronic Toxicity Test

CLIENT City of Forrest City SAMPLE TYPE 24 Hour Composite
 NPDES # ARO020087 DATE COLLECTED 09/29/14, 10/01/14, 10/03/14
 LAB ID # 22899 DATE RECEIVED 09/30/14, 10/02/14, 10/04/14
 TEST TYPE 7 Day Chronic BEGIN DATE/TIME 09/30/14, 1450
 TEST ORGANISM *Pimephales promelas* END DATE/TIME 10/07/14, 1450
 ORGANISM AGE < 24 Hours TEST TEMPERATURE (°C) 25 ± 1
 ORGANISM SOURCE In House PHOTO PERIOD 16-hr Light 8-hr Dark
 RECEIVING WATER unnamed tributary of the L'Anguille River LIGHT INTENSITY 50-100 ft. candl.
 DILUTION WATER Laboratory Adjusted TECHNICIAN L. Brandon

SURVIVAL SUMMARY

Conc.	10/01/14					10/02/14					10/03/14					10/04/14					10/05/14				
	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E
Con	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
32%	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
42%	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
56%	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
75%	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
100%	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8

Conc.	10/06/14					10/07/14					x % Survival	C.V. %
	A	B	C	D	E	A	B	C	D	E		
Con	8	8	8	8	8	8	8	8	8	8	100.0	0.00
32%	8	8	8	8	8	8	8	8	8	8	100.0	0.00
42%	8	8	8	8	8	8	8	8	8	8	100.0	0.00
56%	8	8	8	8	8	8	8	8	8	8	100.0	0.00
75%	8	8	8	8	8	8	8	8	8	8	100.0	0.00
100%	8	8	8	8	8	8	8	8	8	8	100.0	0.00

MEAN DRY WEIGHT PER REP

% Effluent	Rep A	Rep B	Rep C	Rep D	Rep E	x	C.V. %
Con	0.4820	0.4250	0.4170	0.4860	0.4290	0.4478	7.45
32%	0.4450	0.4760	0.5010	0.4460	0.4750	0.4686	5.02
42%	0.4780	0.5030	0.4650	0.4760	0.4920	0.4828	3.07
56%	0.4560	0.5020	0.4450	0.4690	0.4820	0.4708	4.73
75%	0.5040	0.4460	0.4710	0.4520	0.5030	0.4752	5.77
100%	0.4160	0.4490	0.5020	0.4860	0.4450	0.4596	7.48

Huther and Associates
7-Day *Pimephales promelas* Survival and Growth Chronic Toxicity Test

City of Forrest City

Lab ID# 22899

Test Date: September 30, 2014

WET CHEMISTRY MEASUREMENTS

Date	Time	Temp	Samp. No.	pH of Solution						Analyst
				CON	32%	42%	56%	75%	100%	
09/30/14	Start	25.5	1	8.25	8.24	8.23	8.25	8.26	7.92	CS
10/01/14	24 Hr	25.4	1	7.56	7.57	8.08	8.14	8.22	8.27	WLB
10/01/14	Renew	24.9	1	8.01	8.02	8.04	8.03	8.04	8.04	WLB
10/02/14	48 Hr	25.5	1	7.97	8.22	8.31	8.37	8.42	8.47	WLB
10/02/14	Renew	25.0	2	7.93	8.01	8.02	8.03	8.02	8.04	WLB
10/03/14	72 Hr	25.0	2	7.88	7.89	7.98	8.04	8.03	8.13	EMS
10/03/14	Renew	25.0	2	7.82	7.83	7.91	7.92	7.92	7.89	EMS
10/04/14	96 Hr	24.3	2	7.59	7.61	7.65	7.66	7.69	7.72	CS
10/04/14	Renew	25.0	3	7.76	7.73	7.68	7.65	7.71	8.04	CS
10/05/14	120 Hr	25.0	3	7.73	8.18	8.20	8.18	8.34	8.28	EMS
10/05/14	Renew	25.0	3	8.11	8.16	8.18	8.19	8.19	8.12	EMS
10/06/14	144 Hr	25.5	3	7.65	8.08	8.09	8.10	8.22	8.24	EMS
10/06/14	Renew	25.5	3	8.02	8.03	8.04	8.03	8.04	7.99	EMS
10/07/14	168 Hr	25.7	3	8.54	8.55	8.58	8.67	8.63	8.44	CS

Date	Time	Temp	Samp. No.	DO (mg/L) of Solution						Analyst
				CON	32%	42%	56%	75%	100%	
09/30/14	Start	25.5	1	8.00	8.04	8.03	8.02	8.11	8.50	CS
10/01/14	24 Hr	25.4	1	7.92	8.10	7.96	7.16	7.21	7.84	WLB
10/01/14	Renew	24.9	1	8.49	8.50	8.56	8.85	8.65	8.92	WLB
10/02/14	48 Hr	25.5	1	8.94	8.55	8.46	8.75	8.53	7.87	WLB
10/02/14	Renew	25.0	2	8.30	8.65	8.70	8.89	8.62	8.85	WLB
10/03/14	72 Hr	25.0	2	8.85	8.89	8.10	7.72	7.71	7.86	EMS
10/03/14	Renew	25.0	2	8.41	8.47	8.58	8.61	8.56	8.77	EMS
10/04/14	96 Hr	24.3	2	7.74	7.76	7.80	7.86	7.92	8.08	CS
10/04/14	Renew	25.0	3	8.22	8.32	8.48	8.52	8.40	8.87	CS
10/05/14	120 Hr	25.0	3	8.67	8.30	8.66	8.52	8.95	8.34	EMS
10/05/14	Renew	25.0	3	7.87	8.94	8.51	8.68	8.73	8.63	EMS
10/06/14	144 Hr	25.5	3	8.75	8.17	8.20	8.19	8.38	8.42	EMS
10/06/14	Renew	25.5	3	8.50	8.15	7.74	8.26	8.73	8.50	EMS
10/07/14	168 Hr	25.7	3	7.71	7.75	7.82	7.81	7.86	8.01	CS

Huthur and Associates
7-Day *Pimephales promelas* Survival and Growth Chronic Toxicity Test

City of Forrest City

Lab ID# 22899

Test Date: September 30, 2014

INITIAL CHEMISTRY MEASUREMENTS @ 100% EFFLUENT

Date	Samp No	pH	DO	Hardness mg/L CaCO ₃	Alkalinity mg/L CaCO ₃	Conduct umhos/cm ¹	Resid. Cl ₂ mg/L	Dechlor(mL) Na ₂ S ₂ O ₃ mg/L ¹	Analyst
09/30/14	1	7.92	8.50	272	252	843	<0.01	N/A	TN
10/02/14	2	8.04	8.85	280	258	838	<0.01	N/A	TN
10/04/14	3	8.04	8.87	280	262	837	<0.01	N/A	TN
09/30/14	Con	8.25	8.00	100	96	383	-	-	TN

¹ Measurements taken in 100% solution.

Huther and Associates, Inc.
 Begin Date: September 30, 2014
 Lab I.D.# 22899

PIMEPHALES PROMELAS STATISTICAL ANALYSES
 Growth

Summary Statistics on Transformed Data Table 1 of 2

Grp	Identification	N	Min	Max	Mean
1	Control	5	0.417	0.486	0.448
2	32% Effluent	5	0.445	0.501	0.469
3	42% Effluent	5	0.465	0.503	0.483
4	56% Effluent	5	0.445	0.502	0.471
5	75% Effluent	5	0.446	0.504	0.475
6	100% Effluent	5	0.416	0.502	0.460

Summary Statistics on Transformed Data Table 2 of 2

Grp	Identification	Variance	Sd	Sem	C.V.%
1	Control	0.001	0.033	0.015	7.45
2	32% Effluent	0.001	0.024	0.011	5.02
3	42% Effluent	0.000	0.015	0.007	3.07
4	56% Effluent	0.000	0.022	0.010	4.73
5	75% Effluent	0.001	0.027	0.012	5.77
6	100% Effluent	0.001	0.034	0.015	7.48

Shapiro - Wilk's Test For Normality

D = 0.017

W = 0.937

Critical W (P = 0.05) (n = 30) = 0.927

Critical W (P = 0.01) (n = 30) = 0.900

Data Pass normality test at P=0.01 level. Continue analysis.

Bartlett's Test For Homogeneity of Variance

Calculated B1 statistic = 3.07

Table Chi-square value = 15.09 (alpha = 0.01, DF = 5)

Table Chi-square value = 11.07 (alpha = 0.05, DF = 5)

Data Pass B1 homogeneity test at 0.01 level. Continue analysis.

ANOVA Table

SOURCE	DF	SS	MS	F
Between	5	0.004	0.001	1.051
Within (Error)	24	0.017	0.001	
Total	29	0.021		

Critical F value = 2.62 (0.05,5,24)

Since F < Critical F Fail to Reject Ho: All equal

Dunnett's Test - Table 1 of 2 Ho:Control < Treatment

Grp	Identification	Mean		T Stat	Sig
		Transformed Mean	Calculated In Original Units		
1	Control	0.448	0.448		
2	32% Effluent	0.469	0.469	-1.226	
3	42% Effluent	0.483	0.483	-2.063	
4	56% Effluent	0.471	0.471	-1.356	
5	75% Effluent	0.475	0.475	-1.615	
6	100% Effluent	0.460	0.460	-0.696	

Dunnett table value = 2.36 (1 Tailed Value, P=0.05, DF=24,5)

No statistically significant difference

Dunnett's Test - Table 1 of 2 Ho:Control < Treatment

Grp	Identification	Num of Reps	Minimum Sig Diff (In Orig. Units)	% of Control	Difference from
					Control
1	Control	5			
2	32% Effluent	5	0.040	8.9	-0.021
3	42% Effluent	5	0.040	8.9	-0.035
4	56% Effluent	5	0.040	8.9	-0.023
5	75% Effluent	5	0.040	8.9	-0.027
6	100% Effluent	5	0.040	8.9	-0.012

**APPENDIX A
RAW DATA**

7-DAY CERIODAPHNIA DUBIA SURVIVAL & REPRODUCTION
DAILY RAW DATA TABLE
PAGE 1 OF 2

CLIENT Forrest City

START DATE/TIME 9-30-14 NL 1400

OUTFALL 001

END DATE/TIME 10-7-14 NL 1400

LAB ID # 22899

Con

32

Date	Rep1	Rep2	Rep3	Rep4	Rep5	Rep6	Rep7	Rep8	Rep9	Rep10	Analyst	Time
10/1	A	A	A	A	A	A	A	A	A	A	ZG	1400
10/2	A	A	A	A	A	A	A	A	A	A	NL	1440
10/3	A	A	A	A	A	A	A	A	A	A	MH	1140
10/4	3	A	A	A	4	3	A	4	2	A	NL	1345
10/5	A	3	2	3	A	A	3	A	A	3	ZG	1020
10/6	6	6	10	9	9	7	8	8	7	6	MH	1000
10/7	12	12	13	13	13	12	11	13	12	11	NL	1400
	21	21	25	25	26	22	22	25	21	20		

Date	Rep1	Rep2	Rep3	Rep4	Rep5	Rep6	Rep7	Rep8	Rep9	Rep10	Analyst	Time
10/1	A	A	A	A	A	A	A	A	A	A	ZG	1400
10/2	A	A	A	A	A	A	A	A	A	A	NL	1440
10/3	A	A	A	A	A	A	A	A	A	A	MH	1140
10/4	3	2	3	3	A	2	3	2	4	A	NL	1345
10/5	A	A	A	A	4	8	A	A	A	4	ZG	1020
10/6	7	10	8	9	11	A	7	11	11	8	MH	1000
10/7	12	13	11	12	13	14	13	13	12	12	NL	1400
	22	25	22	24	28	24	23	26	27	24		

\bar{x} # Young w/o Dead = 22.8 CV% = 9.65
 \bar{x} # Young w/Dead = CV% =
 \bar{x} % Survival = 100.0 CV% = 0.00

\bar{x} # Young w/o Dead = 24.5 CV% = 8.22
 \bar{x} # Young w/Dead = CV% =
 \bar{x} % Survival = 100.0 CV% = 0.00

42

56

Date	Rep1	Rep2	Rep3	Rep4	Rep5	Rep6	Rep7	Rep8	Rep9	Rep10	Analyst	Time
10/1	A	A	A	A	A	A	A	A	A	A	ZG	1400
10/2	A	A	A	A	A	A	A	A	A	A	NL	1440
10/3	A	A	A	A	A	A	A	A	A	A	MH	1140
10/4	3	A	A	A	A	4	A	3	A		NL	1345
10/5	A	4	3	3	2	3	A	3	A	4	ZG	1020
10/6	6	8	11	6	7	6	9	10	9	9	MH	1000
10/7	12	11	13	14	12	11	13	15	12	12	NL	1400
	21	23	27	23	21	20	26	28	24	25		

Date	Rep1	Rep2	Rep3	Rep4	Rep5	Rep6	Rep7	Rep8	Rep9	Rep10	Analyst	Time
10/1	A	A	A	A	A	A	A	A	A	A	ZG	1400
10/2	A	A	A	A	A	A	A	A	A	A	NL	1440
10/3	A	A	A	A	A	A	A	A	A	A	MH	1140
10/4	3	A	A	A	4	3	4	A	3		NL	1345
10/5	A	4	4	3	A	5	A	A	3	A	ZG	1020
10/6	8	11	10	7	6	8	7	9	10	8	MH	1000
10/7	12	14	12	13	12	14	12	12	13	12	NL	1400
	23	29	26	23	22	27	22	25	26	23		

\bar{x} # Young w/o Dead = 23.8 CV% = 11.34
 \bar{x} # Young w/Dead = CV% =
 \bar{x} % Survival = 100.0 CV% = 0.00

\bar{x} # Young w/o Dead = 24.6 CV% = 9.62
 \bar{x} # Young w/Dead = CV% =
 \bar{x} % Survival = 100.0 CV% = 0.00

7-DAY CERIODAPHNIA DUBIA SURVIVAL & REPRODUCTION
 DAILY RAW DATA TABLE
 PAGE 2 OF 2

CLIENT Forrest City
 OUTFALL 001
 LAB ID # 22899
75

START DATE/TIME 9-30-14 NL 1400
 END DATE/TIME 10-7-14 NL 1400
100

Date	Rep1	Rep2	Rep3	Rep4	Rep5	Rep6	Rep7	Rep8	Rep9	Rep10	Analyst	Time
10/1	A	A	A	A	A	A	A	A	A	A	ZG	1400
10/2	A	A	A	A	A	A	A	A	A	A	NL	1440
10/3	A	A	A	A	A	A	A	A	A	A	MH	1140
10/4	3	4	2	2	3	A	4	3	3	A	NL	1345
10/5	A	A	A	A	A	3	A	A	A	4	ZG	1020
10/6	8	10	6	7	6	8	8	6	9	6	MH	1000
10/7	12	13	14	13	12	14	15	13	12	12	NL	1400
	23	27	22	22	21	25	27	22	24	22		

Date	Rep1	Rep2	Rep3	Rep4	Rep5	Rep6	Rep7	Rep8	Rep9	Rep10	Analyst	Time
10/1	A	A	A	A	A	A	A	A	A	A	ZG	1400
10/2	A	A	A	A	A	A	A	A	A	A	NL	1440
10/3	A	A	A	A	A	A	A	A	A	A	MH	1140
10/4	2	4	3	2	A	A	2	A	3	3	NL	1345
10/5	7	A	A	A	4	3	A	5	A	A	ZG	1020
10/6	A	6	11	8	9	6	6	7	8	11	MH	1000
10/7	12	13	12	12	14	12	12	14	13	12	NL	1400
	21	23	26	22	27	21	20	26	24	26		

\bar{x} # Young w/o Dead = 23.5 CV% = 9.25
 \bar{x} # Young w/Dead = CV% =
 \bar{x} % Survival = 100.0 CV% = 0.00

\bar{x} # Young w/o Dead = 23.6 CV% = 10.79
 \bar{x} # Young w/Dead = CV% =
 \bar{x} % Survival = 100.0 CV% = 0.00

Date	Rep1	Rep2	Rep3	Rep4	Rep5	Rep6	Rep7	Rep8	Rep9	Rep10	Analyst	Time

\bar{x} # Young w/o Dead = CV% =
 \bar{x} # Young w/Dead = CV% =
 \bar{x} % Survival = CV% =

Date	Rep1	Rep2	Rep3	Rep4	Rep5	Rep6	Rep7	Rep8	Rep9	Rep10	Analyst	Time

\bar{x} # Young w/o Dead = CV% =
 \bar{x} # Young w/Dead = CV% =
 \bar{x} % Survival = CV% =

**7-DAY CHRONIC TOXICITY TEST
PIMEPHALES PROMELAS (fathead minnow) SURVIVAL**

CLIENT/FACILITY Forrest City
 OUTFALL # 001 PROJECT # 22899
 ORGANISM ID# PP0-14-272

DATE/TIME STARTED 9-30-14 WLB 1450
 DATE/TIME ENDED 10-7-14 WLB 1450

Conc.	A					B					C					D					E									
	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E					
Con	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
32	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
42	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
56	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
75	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
100	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Initials Date/Time	10-1-14 MH 1450					10-2-14 MH 0810					10-3-14 WLB 0835					10-4-14 NL 0820					10-5-14 ZG 0903									

Conc.	A					B					Mean Survival	C.V. %
	A	B	C	D	E	A	B	C	D	E		
Con	8	8	8	8	8	8	8	8	8	8	100	0.00
32	8	8	8	8	8	8	8	8	8	8	100	0.00
42	8	8	8	8	8	8	8	8	8	8	100	0.00
56	8	8	8	8	8	8	8	8	8	8	100	0.00
75	8	8	8	8	8	8	8	8	8	8	100	0.00
100	8	8	8	8	8	8	8	8	8	8	100	0.00
Initials Date/Time	10-6-14 WLB 0825					10-7-14 WLB 1450						

Client / Facility Forrest City
 Lab ID Number 22899
 Outfall Number 001
 Test Date 9-30-14

INITIAL CHEMISTRY MEASUREMENTS @ 100% EFFLUENT

Date	Samp. No.	pH	DO	Hardness mg/L CaCO ₃ ¹	Alkalinity mg/L CaCO ₃ ¹	Conduct. umhos/cm ¹	Resid. Cl ₂ mg/L ¹	Dechlor(mL) Na ₂ S ₂ O ₃ mg/L ¹	Analyst
9/30	1	7.92	8.50	272	252	843	0.01	NB	TN
10/2	2	8.04	8.85	280	258	838	5	5	5
10/4	3	8.04	8.87	280	262	837	5	5	5
9/30	CON	8.25	8.00	100	96	383	—	—	5

INITIAL CHEMISTRY MEASUREMENTS @ RECEIVING WATER

Date	Samp. No.	pH	DO	Hardness mg/L CaCO ₃ ¹	Alkalinity mg/L CaCO ₃ ¹	Conduct. umhos/cm ¹	Resid. Cl ₂ mg/L ¹	Dechlor(mL) Na ₂ S ₂ O ₃ mg/L ¹	Analyst

Notes:

APPENDIX B
REFERENCE TOXICANTS

CHRONIC REFERENCE TOXICANT TEST RESULTS

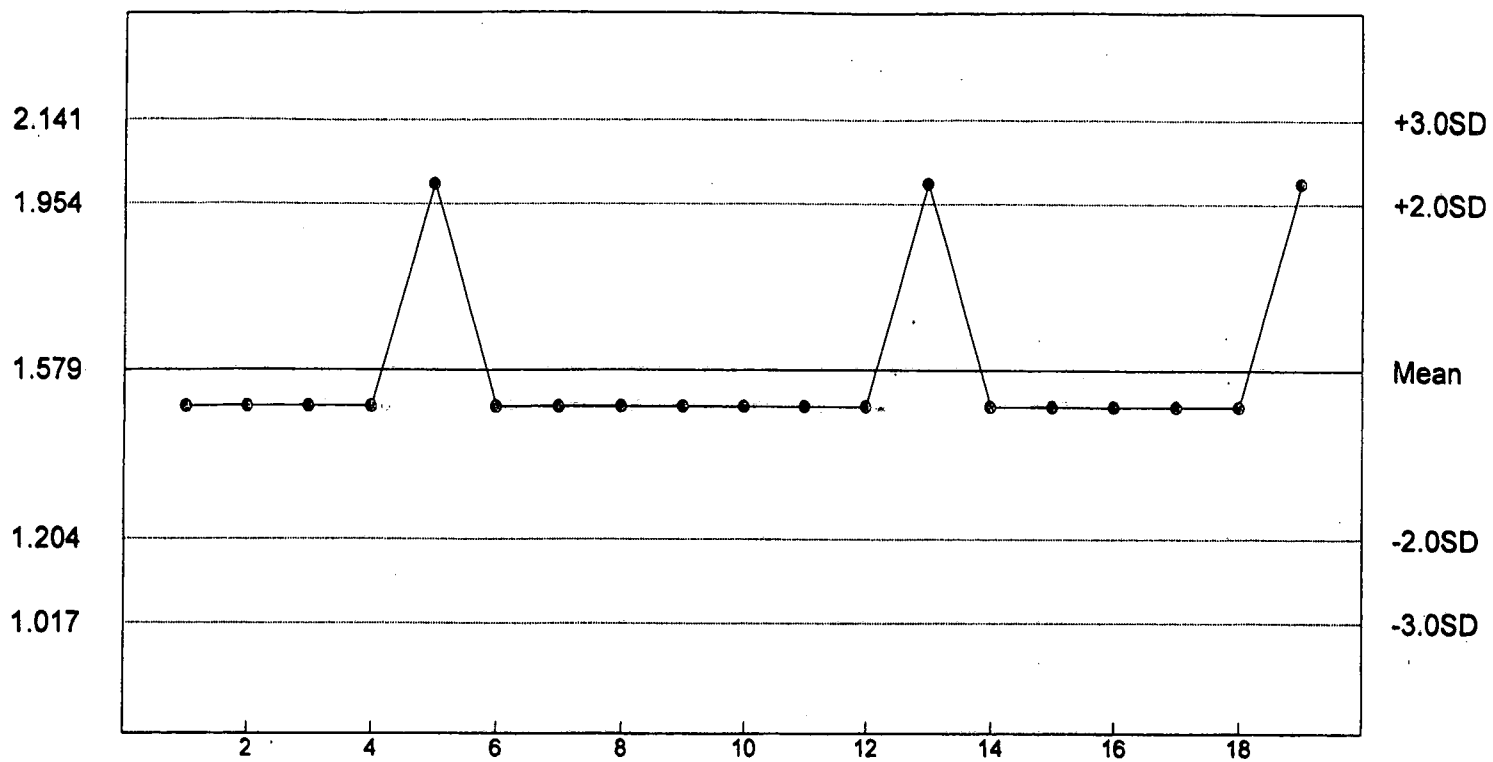
SPECIES: *Ceriodaphnia dubia*
 CHEMICAL: Sodium Chloride
 DURATION: 7-Days
 TEST NUMBER: 09
 TEST DATE/TIME: 09/02/14 - 09/09/14
 1315 Hrs - 1315 Hrs
 STATISTICAL METHOD: Fishers, Dunnetts/Steels

CONCENTRATION (g/L)	NUMBER EXPOSED	NUMBER DEAD
0.5	10	0
1.0	10	0
1.5	10	0
2.0	10	1
2.5	10	10
3.0	10	10
4.0	10	10

LOEC FOR SURVIVAL	NOEC FOR SURVIVAL	LOEC FOR REPRODUCTION	NOEC FOR REPRODUCTION
2.5 g/L	2.0 g/L	1.5 g/L	1.5 g/L

Reference Tox Sodium Chloride g/L

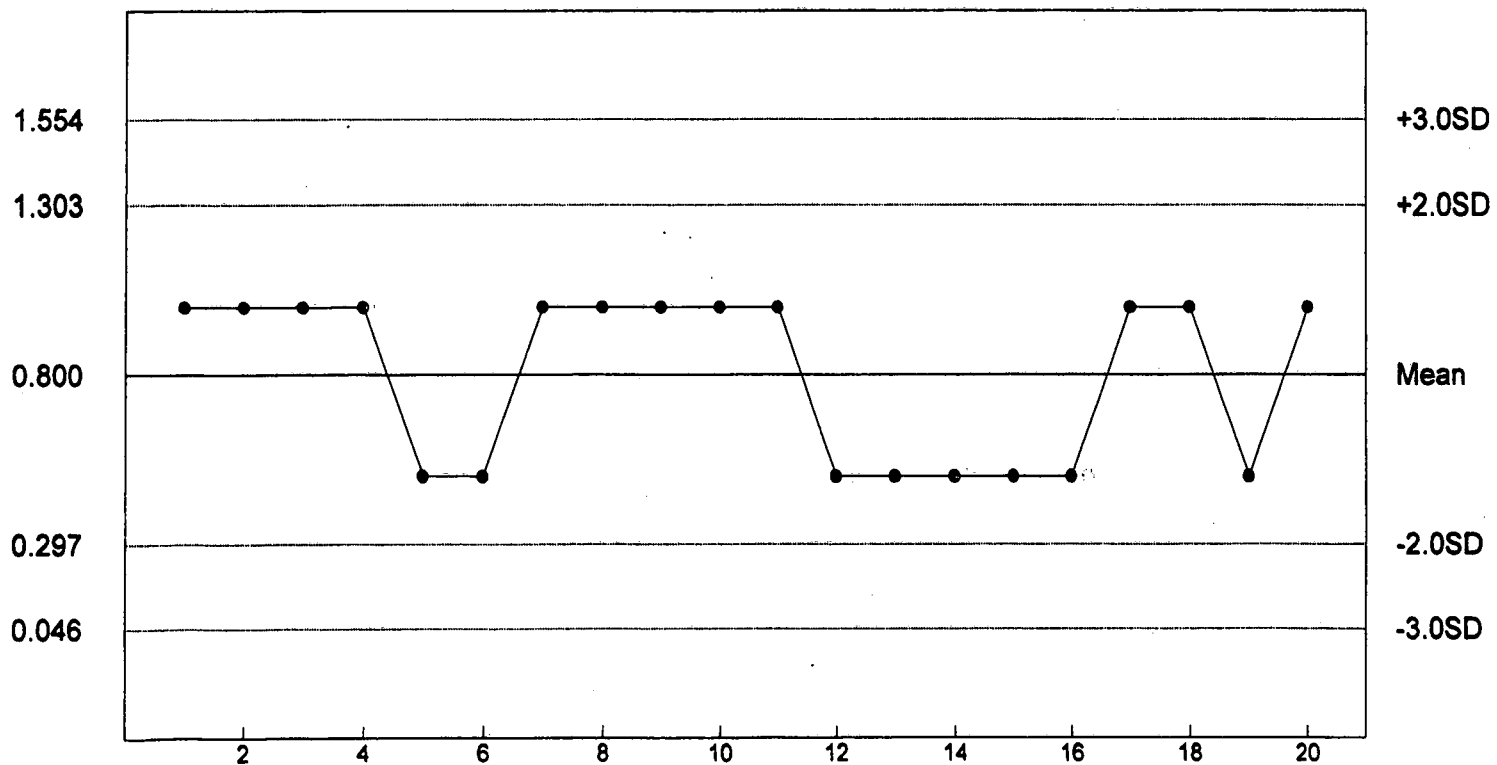
C. dubia Survival - NOEC



n= 19 Mean= 1.579 SD= 0.187 CV= 11.86% Min= 1.500 Max= 2.000

Reference Tox Sodium Chloride g/L

C. dubia Reproduction - NOEC



n= 20 Mean= 0.800 SD= 0.251 CV= 31.41% Min= 0.500 Max= 1.000

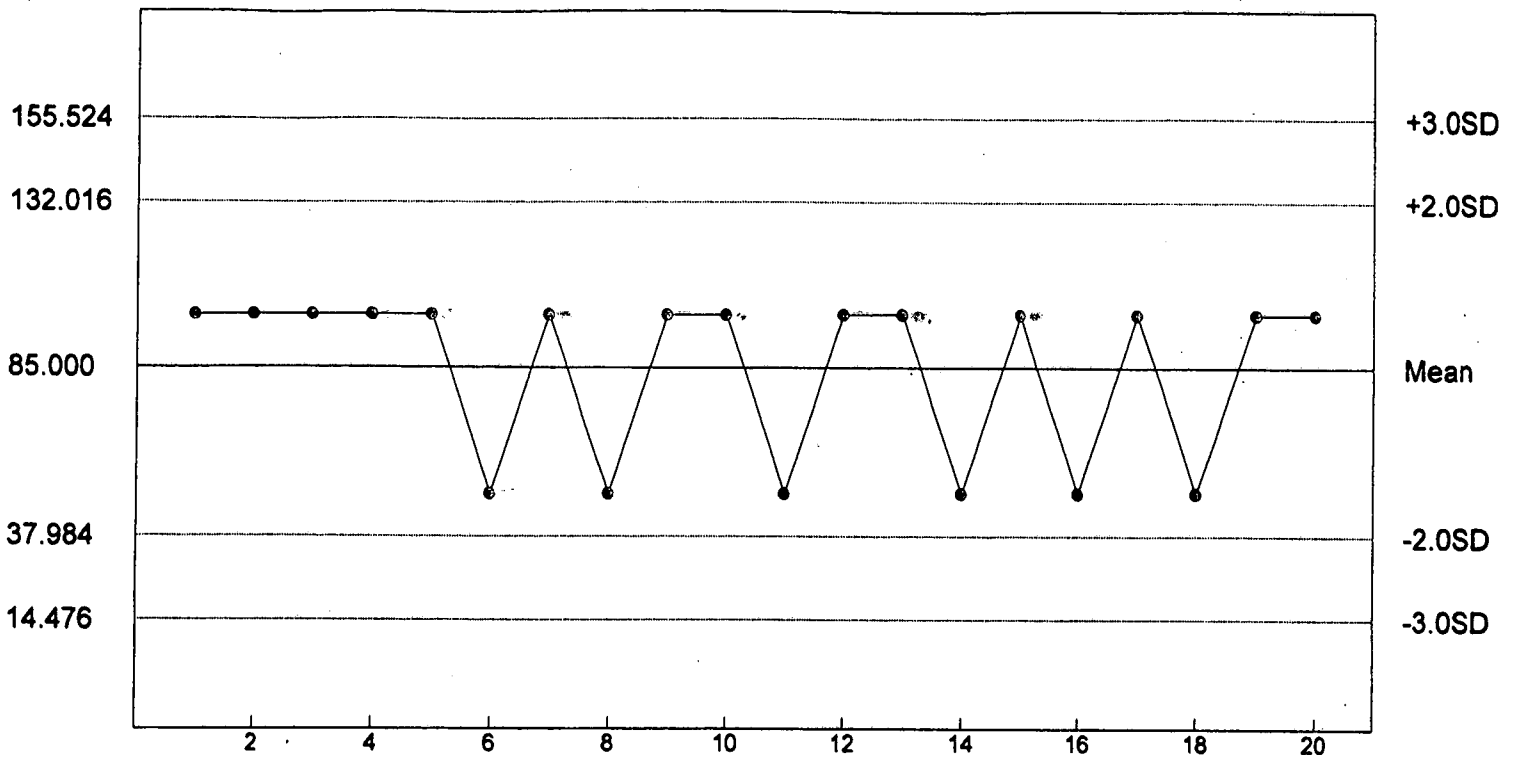
CHRONIC REFERENCE TOXICANT TEST RESULTS

SPECIES: *Pimephales promelas*
 CHEMICAL: Copper Nitrate
 DURATION: 7-Days
 TEST NUMBER: 09
 TEST DATE/TIME: 09/02/14 - 09/09/14
 1600 Hrs - 1600 Hrs
 STATISTICAL METHOD: Dunnetts/Steels

CONCENTRATION (ug/L)	NUMBER EXPOSED	NUMBER DEAD
12.5	40	0
25	40	0
50	40	3
100	40	5
200	40	19
400	40	40
800	40	40

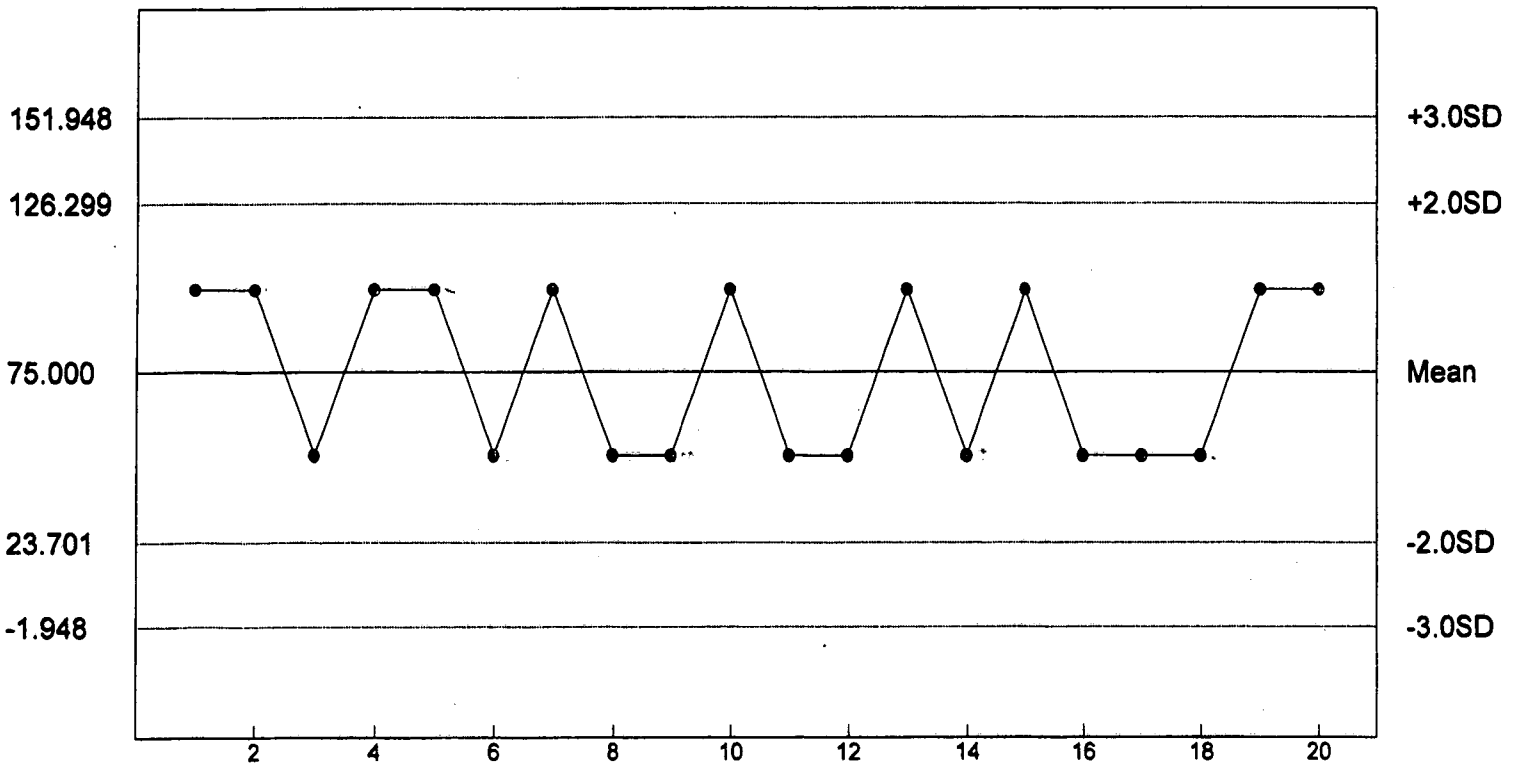
LOEC FOR SURVIVAL	NOEC FOR SURVIVAL	LOEC FOR GROWTH	NOEC FOR GROWTH
200 ug/L	100 ug/L	200 ug/L	100 ug/L

Reference Tox Copper Nitrate ug/L
P. promelas Chronic Survival - NOEC



n= 20 Mean= 85.000 SD= 23.508 CV= 27.66% Min= 50.000 Max= 100.000

Reference Tox Copper Nitrate ug/L
P. promelas Growth - NOEC



n= 20 Mean= 75.000 SD= 25.649 CV= 34.20% Min= 50.000 Max= 100.000

**APPENDIX C
CHAIN OF CUSTODY SHEETS**

HUTHER & ASSOCIATES
 1156 NORTH BONNIE BRAE STREET
 DENTON, TX 76201
 (940) 387-1025 • FAX (940) 387-1036

CHAIN OF CUSTODY RECORD

PROJECT # 22899 PROJECT NAME Forrest City PERMIT# NPDES AP002008

OUTFALL SAMPLES

24-Hr Flow Weighted Composite Other _____

OUTFALL NUMBER	PERSON TAKING SAMPLE	START DATE/TIME	END DATE/TIME	# OF PORTIONS COMPOSITED	METHODS OF COLLECTION AND COMPOSITE			# OF CONTAINERS TO BE SHIPPED
					AUTO COLL. AUTO COMP.	MANUAL COLL. MANUAL COMP.	AUTO COLL. MANUAL COMP.	
001	Joel R. Thetford	9-28-14 10:00 AM	9-29-14 10:00 AM	220	<input checked="checked" type="checkbox"/>			1

RECEIVING WATER SAMPLES

SAMPLE IDENTIFICATION (FOR REC'G) H ₂ O GRABS, GIVE NAME OF STREAM AND LOCATION	PERSON TAKING SAMPLE	DATE	TIME	# OF CONTAINERS TO BE SHIPPED

TYPE OF TEST 7 day C/E
 NAME OF RECEIVING WATER unnamed trib.
 DILUTION WATER USED FOR THIS TEST lab

RELINQUISHED BY: Joel R Thetford DATE: 9-29-14 TIME: 10:40 AM RECEIVED BY AT THIS DATE/TIME _____

RELINQUISHED BY: _____ DATE: _____ TIME: _____ RECEIVED BY AT THIS DATE/TIME _____

RELINQUISHED BY: _____ DATE: _____ TIME: _____ RECEIVED BY AT THIS DATE/TIME _____

METHOD OF SHIPMENT: Greyhound Pick Up _____ Client Delivered _____ Other _____

RECEIVED: Matt Horner DATE: 9-30-14 TIME: 1055 SAMPLE TEMP. @ RECEIPT. -1/1

HUTHER & ASSOCIATES
 1156 NORTH BONNIE BRAE STREET
 DENTON, TX 76201
 (940) 387-1025 • FAX (940) 387-1036

CHAIN OF CUSTODY RECORD

PROJECT # 22899 PROJECT NAME Forrest City PERMIT# NPDES AL0020087

OUTFALL SAMPLES

24-Hr Flow Weighted Composite Other _____

OUTFALL NUMBER	PERSON TAKING SAMPLE	START DATE/TIME	END DATE/TIME	# OF PORTIONS COMPOSITED	METHODS OF COLLECTION AND COMPOSITE			# OF CONTAINERS TO BE SHIPPED
					AUTO COLL. AUTO COMP.	MANUAL COLL. MANUAL COMP.	AUTO COLL. MANUAL COMP.	
001	Joe L. Thetford	9-30-14 10:00AM	10-1-14 10:00AM	231	<input checked="" type="checkbox"/>			1

RECEIVING WATER SAMPLES

SAMPLE IDENTIFICATION (FOR REC'NG) H ₂ O GRABS, GIVE NAME OF STREAM AND LOCATION	PERSON TAKING SAMPLE	DATE	TIME	# OF CONTAINERS TO BE SHIPPED

TYPE OF TEST 7day C/F
 NAME OF RECEIVING WATER unnamed trib.
 DILUTION WATER USED FOR THIS TEST lab

RELINQUISHED BY: Joe L. Thetford DATE: 10-1-14 TIME: 11:00AM RECEIVED BY AT THIS DATE/TIME _____

RELINQUISHED BY: _____ DATE: _____ TIME: _____ RECEIVED BY AT THIS DATE/TIME _____

RELINQUISHED BY: _____ DATE: _____ TIME: _____ RECEIVED BY AT THIS DATE/TIME _____

METHOD OF SHIPMENT: Greyhound Pick Up _____ Client Delivered _____ Other _____

RECEIVED: Matt Horner DATE: 10-2-14 TIME: 1025 SAMPLE TEMP. @ RECEIPT. -0.9

HUTHER & ASSOCIATES
 1156 NORTH BONNIE BRAE STREET
 DENTON, TX 76201
 (940) 387-1025 • FAX (940) 387-1036

CHAIN OF CUSTODY RECORD

PROJECT # 22899 PROJECT NAME Forrest City PERMIT# NADES AR 002008

OUTFALL SAMPLES

24-Hr Flow Weighted Composite Other _____

OUTFALL NUMBER	PERSON TAKING SAMPLE	START DATE/TIME	END DATE/TIME	# OF PORTIONS COMPOSITED	METHODS OF COLLECTION AND COMPOSITE			# OF CONTAINERS TO BE SHIPPED
					AUTO COLL. AUTO COMP.	MANUAL COLL. MANUAL COMP.	AUTO COLL. MANUAL COMP.	
001	Joel R. Thetford	10-2-14 10:00AM	10-3-14 10:00AM	137	<input checked="" type="checkbox"/>			1

RECEIVING WATER SAMPLES

SAMPLE IDENTIFICATION (FOR REC'NG) H ₂ O GRABS, GIVE NAME OF STREAM AND LOCATION	PERSON TAKING SAMPLE	DATE	TIME	# OF CONTAINERS TO BE SHIPPED

TYPE OF TEST 7day C/F
 NAME OF RECEIVING WATER unnamed trib.
 DILUTION WATER USED FOR THIS TEST lab

RELINQUISHED BY: Joel R. Thetford DATE: 10-3-14 TIME: 11:00AM RECEIVED BY AT THIS DATE/TIME _____

RELINQUISHED BY: _____ DATE: _____ TIME: _____ RECEIVED BY AT THIS DATE/TIME _____

RELINQUISHED BY: _____ DATE: _____ TIME: _____ RECEIVED BY AT THIS DATE/TIME _____

METHOD OF SHIPMENT: Greyhound Pick Up _____ Client Delivered _____ Other _____

RECEIVED: Atasha Zulu DATE: 10-4-14 TIME: 1:00P SAMPLE TEMP. @ RECEIPT. 3.6°

CITY OF FORREST CITY
 NPDES PERMIT NO. AR0020087
 BIOMONITORING REPORTING
 TEST DATE: 09/30/14

I. *Ceriodaphnia dubia*

Response

a. If the NOEC for survival is less than the critical dilution, enter a "1"; otherwise, enter a "0". Parameter No. TLP3B.	0
b. Report the NOEC value for survival, Parameter No. TOP3B.	100%
c. Report the NOEC value for reproduction, Parameter No. TPP3B.	100%
d. If the NOEC for reproduction is less than the critical dilution, enter a "1"; otherwise, enter a "0". Parameter No. TGP3B.	0
e. Report the higher coefficient of variation (critical dilution or control), Parameter No. TQP3B.	10.79%

II. *Pimephales promelas*

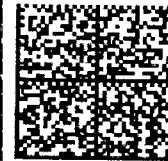
Response

a. If the No Observed Effect Concentration (NOEC) for survival is less than the critical dilution, enter a "1"; otherwise, enter a "0". Parameter No. TLP6C.	0
b. Report the NOEC value for survival, Parameter No. TOP6C.	100%
c. Report the NOEC value for growth, Parameter No. TPP6C.	100%
d. If the No Observed Effect Concentration (NOEC) for growth is less than the critical dilution, enter a "1"; otherwise, enter a "0". Parameter No. TGP6C.	0
e. Report the highest coefficient of variation (critical dilution or control) Parameter No. TQP6C.	7.48%



For

303 N. Rosser Street
Post Office Box 816
Forrest City, AR 72335



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Arkansas Department of
Environmental Quality
5301 North Shore Drive
North Little Rock, AR 72118-5317