

received
10/17/12

**CITY CORPORATION – RUSSELLVILLE WSS
NPDES PERMIT NO. AR0021768
BIOMONITORING REPORTING
TEST DATE: 10/2/12**

I. *Ceriodaphnia dubia*

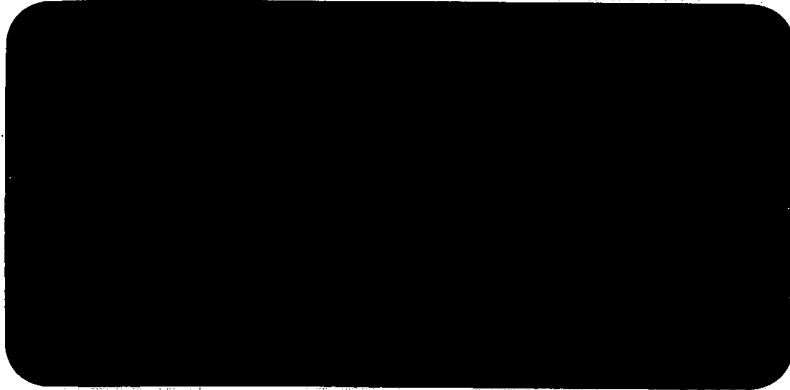
Response

(A) If the NOEC for survival is less than the critical dilution, enter a "1"; otherwise, enter a "0". Parameter No. TLP3B.	0
(B)) If the NOEC for reproduction is less than the critical dilution, enter a "1"; otherwise, enter a "0". Parameter No. TGP3B.	0
(C) Report the NOEC value for survival, Parameter No. TOP3B.	100%
(D) Report the NOEC value for reproduction, Parameter No. TPP3B.	100%
(E) Report the higher (critical dilution or control) Coefficient of Variation, Parameter No. TQP3B.	7.62%

II. *Pimephales promelas* (fathead minnow)

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) 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
(C) Report the NOEC value for survival, Parameter No. TOP6C.	100%
(D) Report the NOEC value for growth, Parameter No. TPP6C.	100%
(E) Report the highest (critical dilution or control) Coefficient of Variation, Parameter No. TQP6C.	7.79%



Huther and Associates, Inc.

**ENVIRONMENTAL ENTERPRISE GROUP
CITY CORPORATION - RUSSELLVILLE WWS
OUTFALL 001**

Chronic Biomonitoring Report
Permit Number NPDES AR0021768
AFIN Number 58-00740

Ceriodaphnia dubia
Pimephales promelas

October 2, 2012

Reviewed by:



Bruce Huther

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TOXICITY TEST REPORT - CHRONIC

Client Environmental Enterprise Group Sample Outfall 001
Facility City Corporation – Russellville WWS Laboratory I.D. 20158
Permit No. NPDES AR0021768 Begin Date October 2, 2012

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 Environmental Enterprise Group, City Corporation – Russellville WWS were delivered by United Parcel Service courier to Huther & Associates on October 2, October 4, and October 6, 2012. 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, 20th 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 1405 hours, October 2, 2012. Five concentrations were prepared (32%, 42%, 56%, 75%, and 100% effluent) utilizing distilled, deionized laboratory water reconstituted to match the hardness, alkalinity and pH of the receiving stream (Whig Creek). 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 1405 hours, October 9, 2012. 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 were normally distributed at the 0.01 alpha level (13.277) using Chi-Square test for normality. Reproduction 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 *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: 7.6%

TEST SETUP
Pimephales promelas



The seven-day *Pimephales promelas* larval survival and growth test was initiated at 1500 hours, October 2, 2012. Five concentrations were prepared (32%, 42%, 56%, 75%, and 100% effluent) utilizing distilled, deionized laboratory water reconstituted to match the hardness, alkalinity and pH of the receiving stream (Whig Creek). 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 1500 hours, October 9, 2012. 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: 11.4%

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 AR0021768 for Environmental Enterprise Group, City Corporation - Russellville WWS, Outfall 001 passed for this testing period.

Huther and Associates

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

CLIENT EEG, City Corporation - Russellville WWS
 NPDES # AR0021768
 LAB ID # 20158
 TEST TYPE 7 Day Chronic
 TEST ORGANISM *Ceriodaphnia dubia*
 ORGANISM AGE < 24 Hours
 ORGANISM SOURCE In House
 RECEIVING WATER Whig Creek
 DILUTION WATER Laboratory Adjusted

SAMPLE TYPE 24 Hour Composite
 DATE COLLECTED 10/01/12 10/03/12 10/05/12
 DATE RECEIVED 10/02/12 10/04/12 10/06/12
 BEGIN DATE/TIME 10/02/12 1405
 END DATE/TIME 10/09/12 1405
 TEST TEMPERATURE (°C) 25 ± 1
 PHOTO PERIOD 16-hr. Light 8-hr. Dark
 LIGHT INTENSITY 50-100 ft. cndl.
 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
10/03/12	A	A	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
10/04/12	A	A	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
10/05/12	A	A	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
10/06/12	A	5	4	3	3	6	5	4	4	A
	0	5	4	3	3	6	5	4	4	0
10/07/12	2	A	A	A	A	A	A	A	A	4
	2	5	4	3	3	6	5	4	4	4
10/08/12	9	8	7	8	8	9	8	7	8	8
	11	13	11	11	11	15	13	11	12	12
10/09/12	11	10	12	11	10	10	10	11	12	11
	22	23	23	22	21	25	23	22	24	23
x # Young 22.8 C.V. 4.98% 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
10/03/12	A	A	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
10/04/12	A	A	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
10/05/12	A	A	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
10/06/12	A	2	2	A	A	A	A	A	A	2
	0	2	2	0	0	0	0	0	0	2
10/07/12	4	A	A	4	2	3	4	4	3	A
	4	2	2	4	2	3	4	4	3	2
10/08/12	9	8	6	8	8	9	9	8	8	9
	13	10	8	12	10	12	13	12	11	11
10/09/12	12	11	11	11	14	11	12	11	11	12
	25	21	19	23	24	23	25	23	22	23
x # Young 22.8 C.V. 7.95% 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
10/03/12	A	A	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
10/04/12	A	A	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
10/05/12	A	A	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
10/06/12	3	2	2	A	2	2	4	2	2	A
	3	2	2	0	2	2	4	2	2	0
10/07/12	A	A	A	3	A	A	A	A	A	2
	3	2	2	3	2	2	4	2	2	2
10/08/12	6	7	6	9	7	6	8	6	6	9
	9	9	8	12	9	8	12	8	8	11
10/09/12	12	12	11	10	14	12	12	11	11	12
	21	21	19	22	23	20	24	19	19	23
x # Young 21.1 C.V. 8.78% 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
10/03/12	A	A	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
10/04/12	A	A	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
10/05/12	A	A	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
10/06/12	2	A	A	4	A	A	2	A	A	A
	2	0	0	4	0	0	2	0	0	0
10/07/12	A	3	3	A	3	3	A	4	2	4
	2	3	3	4	3	3	4	4	2	4
10/08/12	9	8	9	7	8	8	9	9	8	8
	11	11	12	11	11	11	13	11	10	12
10/09/12	10	12	11	14	14	12	11	11	10	12
	21	23	23	25	25	23	22	24	20	24
x # Young 23.0 C.V. 7.10% x% Survival 100% C.V. 0.00%										

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

ex 1:

A	alive today
4	total young to date

ex 2:

5	alive, 5 young today
12	total young to date

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

EEG, City Corp. - Russellville WWS

Lab ID# 20158

Test Date: October 2, 2012

75% Effluent

Date	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
10/03/12	A	A	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
10/04/12	A	A	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
10/05/12	A	A	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
10/06/12	A	2	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
10/07/12	4	3	A	3	3	4	4	3	2	4
	4	3	2	3	3	4	4	3	2	4
10/08/12	9	8	8	9	9	7	8	8	9	7
	13	11	10	12	12	11	12	11	11	11
10/09/12	14	12	11	11	11	12	14	14	14	13
	27	23	21	23	23	23	26	25	25	24
x# Young		24.0			C.V.		7.35%			
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
10/03/12	A	A	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
10/04/12	A	A	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
10/05/12	A	A	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
10/06/12	A	A	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
10/07/12	4	3	4	4	4	2	4	3	3	2
	4	3	4	4	4	2	4	3	3	2
10/08/12	9	7	8	8	8	8	7	9	9	9
	13	10	12	12	12	10	11	12	12	11
10/09/12	12	11	13	13	14	12	11	10	13	14
	25	21	25	25	26	22	22	22	25	25
x# Young		23.8			C.V.		7.62%			
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

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

EEG, City Corp. - Russellville WWS

Lab ID# 20158

Test Date: October 2, 2012

WET CHEMISTRY MEASUREMENTS

Date	Time	Temp	Samp No	pH of Solution						Analyst
				CON	32%	42%	56%	75%	100%	
10/02/12	Start	25.0	1	8.23	8.05	7.93	7.86	7.70	7.59	STC
10/03/12	24 Hr	24.9	1	7.52	7.59	7.66	7.69	7.71	7.71	MJ
10/03/12	Renew	24.6	1	7.55	7.72	7.71	7.70	7.68	7.61	MJ
10/04/12	48 Hr	25.2	1	8.21	8.04	8.07	8.13	8.07	8.00	STC
10/04/12	Renew	25.0	2	8.05	7.84	7.75	7.66	7.54	7.50	STC
10/05/12	72 Hr	25.2	2	8.24	8.16	8.24	8.74	8.63	8.51	SK
10/05/12	Renew	25.1	2	8.13	8.07	7.89	7.84	7.77	7.72	SK
10/06/12	96 Hr	25.3	2	7.98	7.93	7.86	7.82	7.76	7.67	SK
10/06/12	Renew	25.0	3	8.09	7.97	7.89	7.85	7.75	7.67	SK
10/07/12	120 Hr	25.2	3	8.18	8.12	8.09	8.08	8.06	8.06	SK
10/07/12	Renew	25.0	3	8.02	7.84	7.74	7.73	7.69	7.64	SK
10/08/12	144 Hr	24.0	3	8.10	8.11	8.11	8.12	8.13	8.15	STC
10/08/12	Renew	24.2	3	8.04	7.91	7.88	7.88	7.78	7.71	STC
10/09/12	168 Hr	25.8	3	7.40	8.16	8.16	8.20	8.19	8.19	MJ

Date	Time	Temp	Samp No	DO (mg/L) of Solution						Analyst
				CON	32%	42%	56%	75%	100%	
10/02/12	Start	25.0	1	8.11	8.07	8.21	8.37	8.49	8.76	STC
10/03/12	24 Hr	24.9	1	7.99	8.07	8.06	8.07	8.02	8.03	MJ
10/03/12	Renew	24.6	1	8.30	8.35	8.37	8.43	8.48	8.51	MJ
10/04/12	48 Hr	25.2	1	8.19	8.22	8.08	8.11	8.19	8.17	STC
10/04/12	Renew	25.0	2	8.03	8.02	8.13	8.25	8.51	8.70	STC
10/05/12	72 Hr	25.2	2	8.05	8.00	7.91	7.58	7.61	7.69	SK
10/05/12	Renew	25.1	2	8.56	8.50	8.41	8.47	8.41	8.45	SK
10/06/12	96 Hr	25.3	2	8.38	8.30	8.38	8.47	8.48	8.84	SK
10/06/12	Renew	25.0	3	8.08	8.07	8.15	8.26	8.30	8.59	SK
10/07/12	120 Hr	25.2	3	7.82	7.82	7.80	7.76	7.70	7.66	SK
10/07/12	Renew	25.0	3	8.20	8.16	7.78	7.85	7.83	7.86	SK
10/08/12	144 Hr	24.0	3	8.56	8.55	8.52	8.47	8.41	8.36	STC
10/08/12	Renew	24.2	3	8.25	8.21	8.17	8.14	8.16	8.05	STC
10/09/12	168 Hr	25.8	3	7.75	7.93	7.97	8.02	7.93	7.90	MJ

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

EEG, City Corp. - Russellville WWS

Lab ID# 20158

Test Date: October 2, 2012

INITIAL CHEMISTRY MEASUREMENTS @ 100% EFFLUENT

Date	Samp. No.	pH	DO	Hardness mg/L CaCO ₃	Alkalinity mg/L CaCO ₃	Conduct. umhos/cm	Resid. Cl ₂ mg/L	Dechlor(mL) Na ₂ S ₂ O ₃ mg/L	Analyst
10/02/12	1	7.59	8.76	64	88	407	<0.01	N/A	TN
10/04/12	2	7.50	8.70	68	92	403	<0.01	N/A	TN
10/06/12	3	7.67	8.59	64	90	400	<0.01	N/A	TN
10/02/12	Con	8.23	8.11	96	62	294	-	-	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	21.000	25.000	22.800
2	32% Effluent	10	19.000	25.000	22.800
3	42% Effluent	10	19.000	24.000	21.100
4	56% Effluent	10	20.000	25.000	23.000
5	75% Effluent	10	21.000	27.000	24.000
6	100% Effluent	10	21.000	26.000	23.800

Summary Statistics on Transformed Data Table 2 of 2

Grp	Identification	Variance	Sd	Sem	C.V. %
1	Control	1.289	1.135	0.359	4.98
2	32% Effluent	3.289	1.814	0.573	7.95
3	42% Effluent	3.433	1.853	0.586	8.78
4	56% Effluent	2.667	1.633	0.516	7.10
5	75% Effluent	3.111	1.764	0.558	7.35
6	100% Effluent	3.289	1.814	0.573	7.62

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	5	17	16	19	3

Calculated Chi-Square goodness of fit test statistic = 4.3928
 Table Chi-Square value (alpha = 0.01) = 13.277

Data Pass normality test. Continue analysis.

Bartlett's Test For Homogeneity of Variance

Calculated B1 statistic = 2.52

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	52.883	10.577	3.716
Within (Error)	54	153.700	2.846	
Total	59	206.583		

Critical F value = 2.45 (0.05,5,40)
 Since F > Critical F REJECT Ho: All equal

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

Grp	Identification	Transformed	Mean	T Stat	Sig
		Mean	Calculated In Original Units		
1	Control	22.800	22.800		
2	32% Effluent	22.800	22.800	0.000	
3	42% Effluent	21.100	21.100	2.253	
4	56% Effluent	23.000	23.000	-0.265	
5	75% Effluent	24.000	24.000	-1.590	
6	100% Effluent	23.800	23.800	-1.325	

Dunnett table value = 2.31 (1 Tailed Value, P=0.05, DF=40,5)
 No statistically significant difference

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

Grp	Identification	Num of Reps	Minimum Sig Diff	% of Control	Difference from Control
			(In Orig. Units)		
1	Control	10			
2	32% Effluent	10	1.743	7.6	0.000
3	42% Effluent	10	1.743	7.6	1.700
4	56% Effluent	10	1.743	7.6	-0.200
5	75% Effluent	10	1.743	7.6	-1.200
6	100% Effluent	10	1.743	7.6	-1.000

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

CLIENT	EEG, City Corporation - Russellville, WVA	SAMPLE TYPE	24 Hour Composite
NPDES #	AR0021768	DATE COLLECTED	10/01/12 10/03/12 10/05/12
LAB ID #	20158	DATE RECEIVED	10/02/12 10/04/12 10/06/12
TEST TYPE	7 Day Chronic	BEGIN DATE/TIME	10/02/12 1500
TEST ORGANISM	<i>Pimephales promelas</i>	END DATE/TIME	10/09/12 1500
ORGANISM AGE	< 24 Hours	TEST TEMPERATURE (°C)	25 ± 1
ORGANISM SOURCE	In House	PHOTO PERIOD	16-hr. Light 8-hr. Dark
RECEIVING WATER	Whig Creek	LIGHT INTENSITY	50-100 ft. cndl.
DILUTION WATER	Laboratory Adjusted	TECHNICIAN	M. Horner

SURVIVAL SUMMARY

Conc.	10/03/12					10/04/12					10/05/12					10/06/12					10/07/12				
	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.	10/08/12					10/09/12					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	0.4690	0.4170	0.5020	0.4260	0.4760	0.4580	7.79
32%	0.4850	0.5040	0.4490	0.4720	0.5040	0.4828	4.82
42%	0.4200	0.4690	0.5030	0.4180	0.5050	0.4630	9.21
56%	0.4650	0.5040	0.4920	0.4210	0.4850	0.4734	6.87
75%	0.4920	0.4150	0.5060	0.4450	0.4920	0.4700	8.18
100%	0.4650	0.4520	0.5040	0.5010	0.4230	0.4690	7.29

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

EEG, City Corp. - Russellville WWS

Lab ID# 20158

Test Date: October 2, 2012

WET CHEMISTRY MEASUREMENTS

Date	Time	Temp	Samp. No.	pH of Solution						Analyst
				CON	32%	42%	56%	75%	100%	
10/02/12	Start	25.0	1	8.23	8.05	7.93	7.86	7.70	7.59	STC
10/03/12	24 Hr.	25.0	1	8.08	8.05	7.99	7.96	7.94	7.92	MJ
10/03/12	Renew	24.6	1	7.55	7.72	7.71	7.70	7.68	7.61	MJ
10/04/12	48 Hr.	25.2	1	8.07	8.02	7.95	7.89	7.85	7.72	STC
10/04/12	Renew	25.0	2	8.05	7.84	7.75	7.66	7.54	7.50	STC
10/05/12	72 Hr.	25.4	2	8.09	8.08	8.08	8.07	7.99	7.94	SK
10/05/12	Renew	25.1	2	8.13	8.07	7.89	7.84	7.77	7.72	SK
10/06/12	96 Hr.	25.3	2	7.99	7.97	7.91	7.94	7.93	7.87	SK
10/06/12	Renew	25.0	3	8.09	7.97	7.89	7.85	7.75	7.67	SK
10/07/12	120 Hr.	25.1	3	8.10	8.05	8.04	8.04	7.95	7.87	SK
10/07/12	Renew	25.0	3	8.02	7.84	7.74	7.73	7.69	7.64	SK
10/08/12	144 Hr.	24.3	3	8.04	8.00	7.96	7.98	7.89	7.89	STC
10/08/12	Renew	24.2	3	8.04	7.91	7.88	7.88	7.78	7.71	STC
10/09/12	168 Hr.	24.6	3	8.01	7.97	7.95	7.93	7.87	7.92	STC

Date	Time	Temp	Samp. No.	DO (mg/L) of Solution						Analyst
				CON	32%	42%	56%	75%	100%	
10/02/12	Start	25.0	1	8.11	8.07	8.21	8.37	8.49	8.76	STC
10/03/12	24 Hr.	25.0	1	7.99	8.14	8.14	8.13	8.13	8.19	MJ
10/03/12	Renew	24.6	1	8.30	8.35	8.37	8.43	8.48	8.51	MJ
10/04/12	48 Hr.	25.2	1	8.42	8.36	8.28	8.13	8.01	7.83	STC
10/04/12	Renew	25.0	2	8.03	8.02	8.13	8.25	8.51	8.70	STC
10/05/12	72 Hr.	25.4	2	8.07	8.04	8.04	8.00	7.94	7.87	SK
10/05/12	Renew	25.1	2	8.56	8.50	8.41	8.47	8.41	8.45	SK
10/06/12	96 Hr.	25.3	2	8.43	8.43	8.44	8.48	8.59	8.46	SK
10/06/12	Renew	25.0	3	8.08	8.07	8.15	8.26	8.30	8.59	SK
10/07/12	120 Hr.	25.1	3	8.39	8.42	8.32	8.35	8.38	8.04	SK
10/07/12	Renew	25.0	3	8.20	8.16	7.78	7.85	7.83	7.86	SK
10/08/12	144 Hr.	24.3	3	8.17	8.22	8.17	8.16	8.15	7.91	STC
10/08/12	Renew	24.2	3	8.25	8.21	8.17	8.14	8.16	8.05	STC
10/09/12	168 Hr.	24.6	3	7.92	7.89	7.82	7.81	7.73	7.58	STC

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

EEG, City Corp. - Russellville WWS

Lab ID# 20158

Test Date: October 2, 2012

INITIAL CHEMISTRY MEASUREMENTS @ 100% EFFLUENT

Date	Samp. No.	pH	DO	Hardness mg/L CaCO ₃	Alkalinity mg/L CaCO ₃	Conduct. umhos/cm	Resid. Cl ₂ mg/L	Dechlor(mL) Na ₂ S ₂ O ₃ mg/L	Analyst
10/02/12	1	7.59	8.76	64	88	407	<0.01	N/A	TN
10/04/12	2	7.50	8.70	68	92	403	<0.01	N/A	TN
10/06/12	3	7.67	8.59	64	90	400	<0.01	N/A	TN
10/02/12	Con	8.23	8.11	96	62	294	-	-	TN

Measurements taken in 100% solution.

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	0.502	0.458
2	32% Effluent	5	0.449	0.504	0.483
3	42% Effluent	5	0.418	0.505	0.463
4	56% Effluent	5	0.421	0.504	0.473
5	75% Effluent	5	0.415	0.506	0.470
6	100% Effluent	5	0.423	0.504	0.469

Summary Statistics on Transformed Data Table 2 of 2

Grp	Identification	Variance	Sd	Sem	C.V.%
1	Control	0.001	0.036	0.016	7.79
2	32% Effluent	0.001	0.023	0.010	4.82
3	42% Effluent	0.002	0.043	0.019	9.21
4	56% Effluent	0.001	0.033	0.015	6.87
5	75% Effluent	0.001	0.038	0.017	8.18
6	100% Effluent	0.001	0.034	0.015	7.29

Shapiro - Wilk's Test For Normality

D = 0.029

W = 0.915

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 = 1.38

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	0.002	0.000	0.300
Within (Error)	24	0.029	0.001	
Total	29	0.031		

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	Transformed Mean	Mean		T Stat	Sig
			Original Units	Calculated In		
1	Control	0.458	0.458			
2	32% Effluent	0.483	0.483		-1.121	
3	42% Effluent	0.463	0.463		-0.226	
4	56% Effluent	0.473	0.473		-0.696	
5	75% Effluent	0.470	0.470		-0.543	
6	100% Effluent	0.469	0.469		-0.497	

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)	Difference from Control	
				% of Control	
1	Control	5			
2	32% Effluent	5	0.052	11.4	-0.025
3	42% Effluent	5	0.052	11.4	-0.005
4	56% Effluent	5	0.052	11.4	-0.015
5	75% Effluent	5	0.052	11.4	-0.012
6	100% Effluent	5	0.052	11.4	-0.011

**APPENDIX A
RAW DATA**

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

CLIENT EEG Russellville
OUTFALL 001
LAB ID # 20158 -
CON

START DATE/TIME 10-2-12 112 1405
END DATE/TIME 10-9-12 112 1405

Date	Rep1	Rep2	Rep3	Rep4	Rep5	Rep6	Rep7	Rep8	Rep9	Rep10	Analyst	Time
10/3	A	A	A	A	A	A	A	A	A	A	112	1405
10/4	A	A	A	A	A	A	A	A	A	A	MH	1500
10/5	A	A	A	A	A	A	A	A	A	A	MH	1035
10/6	K	S	4	3	3	6	5	4	4	A	WD	1310
10/7	2	A	A	A	A	A	A	A	A	4	JK	1245
10/8	9	8	7	8	8	9	8	7	8	8	112	1115
10/9	11	10	12	11	10	10	10	11	12	11	112	1405
	22	23	23	22	21	25	23	22	24	23		

\bar{x} # Young w/o Dead = 22.8 CV% = 4.98
 \bar{x} # Young w/Dead = CV% =
 \bar{x} % Survival = 100.0 CV% = 0.00

32

Date	Rep1	Rep2	Rep3	Rep4	Rep5	Rep6	Rep7	Rep8	Rep9	Rep10	Analyst	Time
10/3	A	A	A	A	A	A	A	A	A	A	112	1405
10/4	A	A	A	A	A	A	A	A	A	A	MH	1500
10/5	A	A	A	A	A	A	A	A	A	A	MH	1035
10/6	A	2	2	A	A	A	A	A	A	2	WD	1310
10/7	4	A	A	4	2	3	4	4	3	A	JK	1245
10/8	9	8	6	8	8	9	9	8	8	9	112	1115
10/9	12	11	11	11	14	11	12	11	11	12	112	1405
	25	21	19	23	24	23	25	23	22	23		

\bar{x} # Young w/o Dead = 22.8 CV% = 7.95
 \bar{x} # Young w/Dead = CV% =
 \bar{x} % Survival = 100.0 CV% = 0.00

42

Date	Rep1	Rep2	Rep3	Rep4	Rep5	Rep6	Rep7	Rep8	Rep9	Rep10	Analyst	Time
10/3	A	A	A	A	A	A	A	A	A	A	112	1405
10/4	A	A	A	A	A	A	A	A	A	A	MH	1500
10/5	A	A	A	A	A	A	A	A	A	A	MH	1035
10/6	3	2	2	A	2	2	4	2	2	A	WD	1310
10/7	A	A	A	3	A	4	4	A	A	2	JK	1245
10/8	6	7	6	9	7	6	8	6	6	9	112	1115
10/9	12	12	11	10	14	12	12	11	11	12	112	1405
	21	21	19	22	23	20	24	19	19	23		

\bar{x} # Young w/o Dead = 21.1 CV% = 8.78
 \bar{x} # Young w/Dead = CV% =
 \bar{x} % Survival = 100.0 CV% = 0.00

56

Date	Rep1	Rep2	Rep3	Rep4	Rep5	Rep6	Rep7	Rep8	Rep9	Rep10	Analyst	Time
10/3	A	A	A	A	A	A	A	A	A	A	112	1405
10/4	A	A	A	A	A	A	A	A	A	A	MH	1500
10/5	A	A	A	A	A	A	A	A	A	A	MH	1035
10/6	2	A	A	4	A	A	2	A	A	A	WD	1310
10/7	A	3	3	A	3	3	A	4	2	4	JK	1245
10/8	9	8	9	7	8	8	9	9	8	8	112	1115
10/9	10	12	11	14	14	12	11	11	10	12	112	1405
	21	23	27	25	25	27	22	24	22	24		

\bar{x} # Young w/o Dead = 23.0 CV% = 7.10
 \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 EFG Russellville
 OUTFALL 001
 LAB ID # 20158

START DATE/TIME 10-2-12 12 1405
 END DATE/TIME 10-9-12 12 1405

75

Date	Rep1	Rep2	Rep3	Rep4	Rep5	Rep6	Rep7	Rep8	Rep9	Rep10	Analyst	Time
10/3	A	A	A	A	A	A	A	A	A	A	MD	1405
10/4	A	A	A	A	A	A	A	A	A	A	MH	1500
10/5	A	A	A	A	A	A	A	A	A	A	MH	1035
10/6	A	A	2	A	A	A	A	A	A	A	WD	1310
10/7	4	3	A	3	3	4	4	3	2	4	gt	1245
10/8	9	8	8	9	9	7	8	8	9	7	MD	1115
10/9	14	12	11	11	11	12	14	14	14	12	MD	1405
	27	23	21	23	23	23	26	25	25	24		

\bar{x} # Young w/o Dead = 24.0 CV% = 7.35
 \bar{x} # Young w/Dead = CV% =
 \bar{x} % Survival = 100.0 CV% = 0.00

100

Date	Rep1	Rep2	Rep3	Rep4	Rep5	Rep6	Rep7	Rep8	Rep9	Rep10	Analyst	Time
10/3	A	A	A	A	A	A	A	A	A	A	MD	1405
10/4	A	A	A	A	A	A	A	A	A	A	MH	1500
10/5	A	A	A	A	A	A	A	A	A	A	MH	1035
10/6	A	A	A	A	A	A	A	A	A	A	WD	170
10/7	4	3	4	4	4	2	4	3	3	2	gt	1245
10/8	9	7	8	8	8	8	7	9	9	9	MD	1115
10/9	12	11	12	13	14	12	11	10	13	14	MD	1405
	25	21	25	25	26	22	22	22	25	25		

\bar{x} # Young w/o Dead = 23.8 CV% = 7.62
 \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 FEG Russelville
 OUTFALL # 001 PROJECT # 20158
 ORGANISM ID# PP0-12-275

DATE/TIME STARTED 10-2-12 MH 1500
 DATE/TIME ENDED 10-9-12 /L 1500

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
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
Initials Date/Time	<u>10-3-12 /L 1500</u>					<u>10-4-12 /L 0920</u>					<u>10-5-12 MH 0815</u>					<u>10-6-12 /L 0820</u>					<u>10-7-12 /L 0830</u>				

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	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
Initials Date/Time	<u>10-8-12 MH 0805</u>					<u>10-9-12 /L 1500</u>						

Client / Facility EEG Russellville
 Lab ID Number 20158
 Outfall Number 001
 Test Date 10/2/12

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
10/2	1	7.59	8.76	64	88	407	6.01	Na	TN
10/4	2	7.50	8.70	68	92	403	~	~	~
10/6	3	7.67	8.59	64	90	400	~	~	~
10/2	CON	8.23	8.11	96	62	294	-	-	~

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

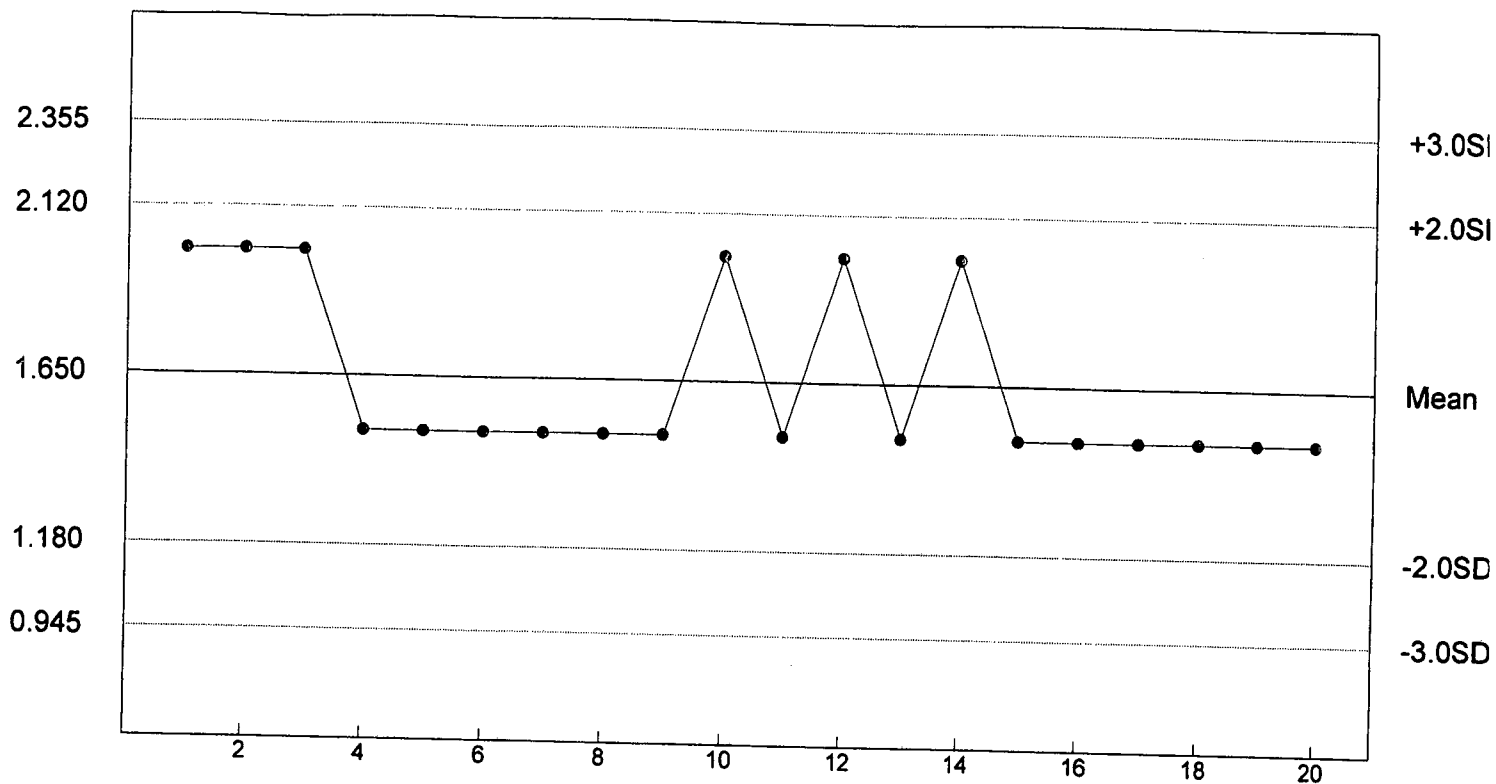
SPECIES: *Ceriodaphnia dubia*
 CHEMICAL: Sodium Chloride
 DURATION: 7-Days
 TEST NUMBER: 10
 TEST DATE/TIME: 10/01/12 - 10/07/12
 1630 Hrs - 1630 Hrs
 STATISTICAL METHOD: Fishers, Dunnetts/Steels

CONCENTRATION (g/L)	NUMBER EXPOSED	NUMBER DEAD
0.5	10	0
1.0	10	0
1.5	10	1
2.0	10	5
2.5	10	10
3.0	10	10
4.0	10	10

LOEC FOR SURVIVAL	NOEC FOR SURVIVAL	LOEC FOR REPRODUCTION	NOEC FOR REPRODUCTION
2.0 g/L	1.5 g/L	1.0 g/L	0.5 g/L

Reference Tox Sodium Chloride g/L

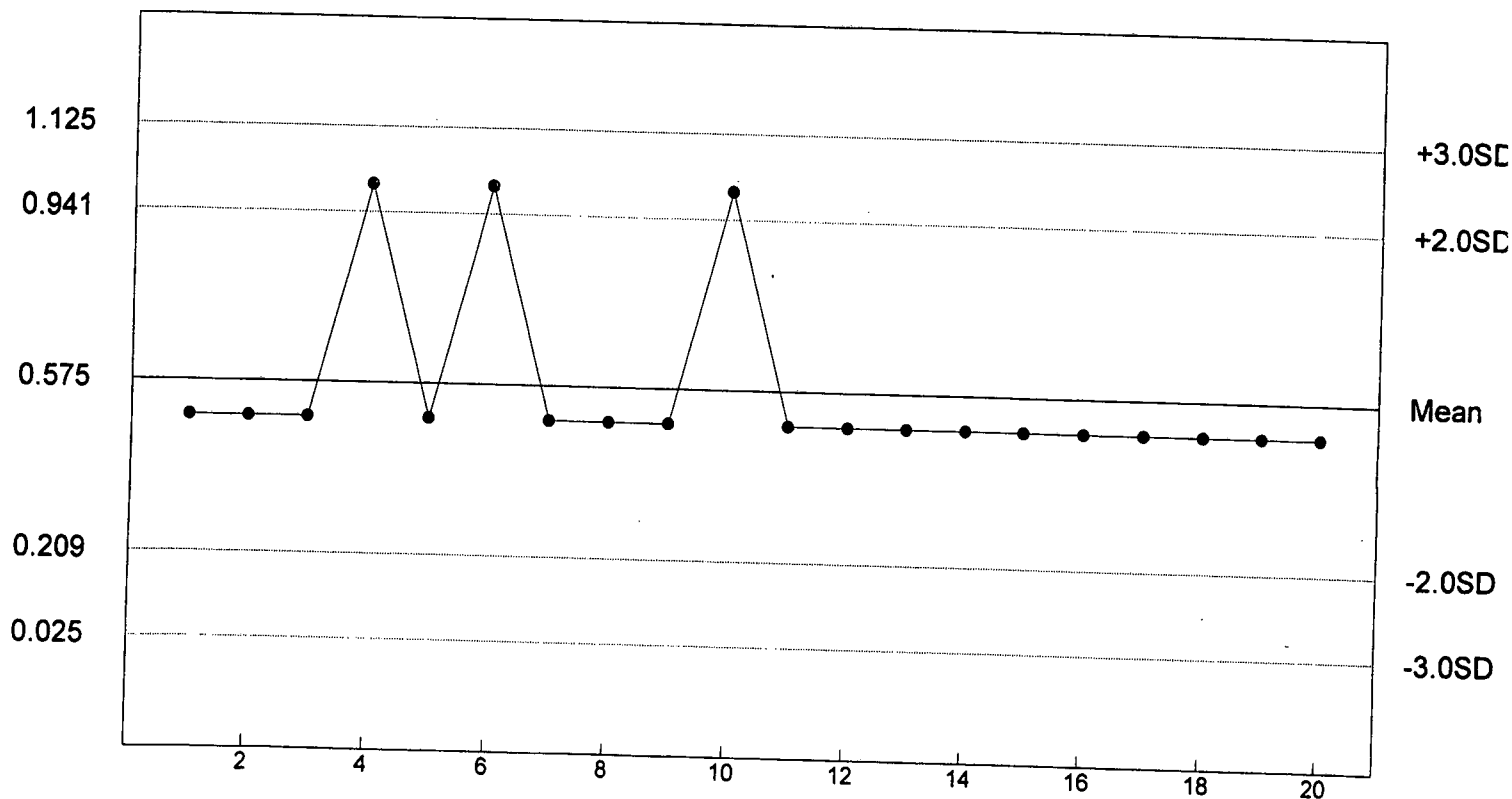
C. dubia Survival - NOEC



n= 20 Mean= 1.650 SD= 0.235 CV= 14.25% Min= 1.500 Max= 2.000

Reference Tox Sodium Chloride g/L

C. dubia Reproduction - NOEC



n= 20 Mean= 0.575 SD= 0.183 CV= 31.86% Min= 0.500 Max= 1.000

CHRONIC REFERENCE TOXICANT TEST RESULTS

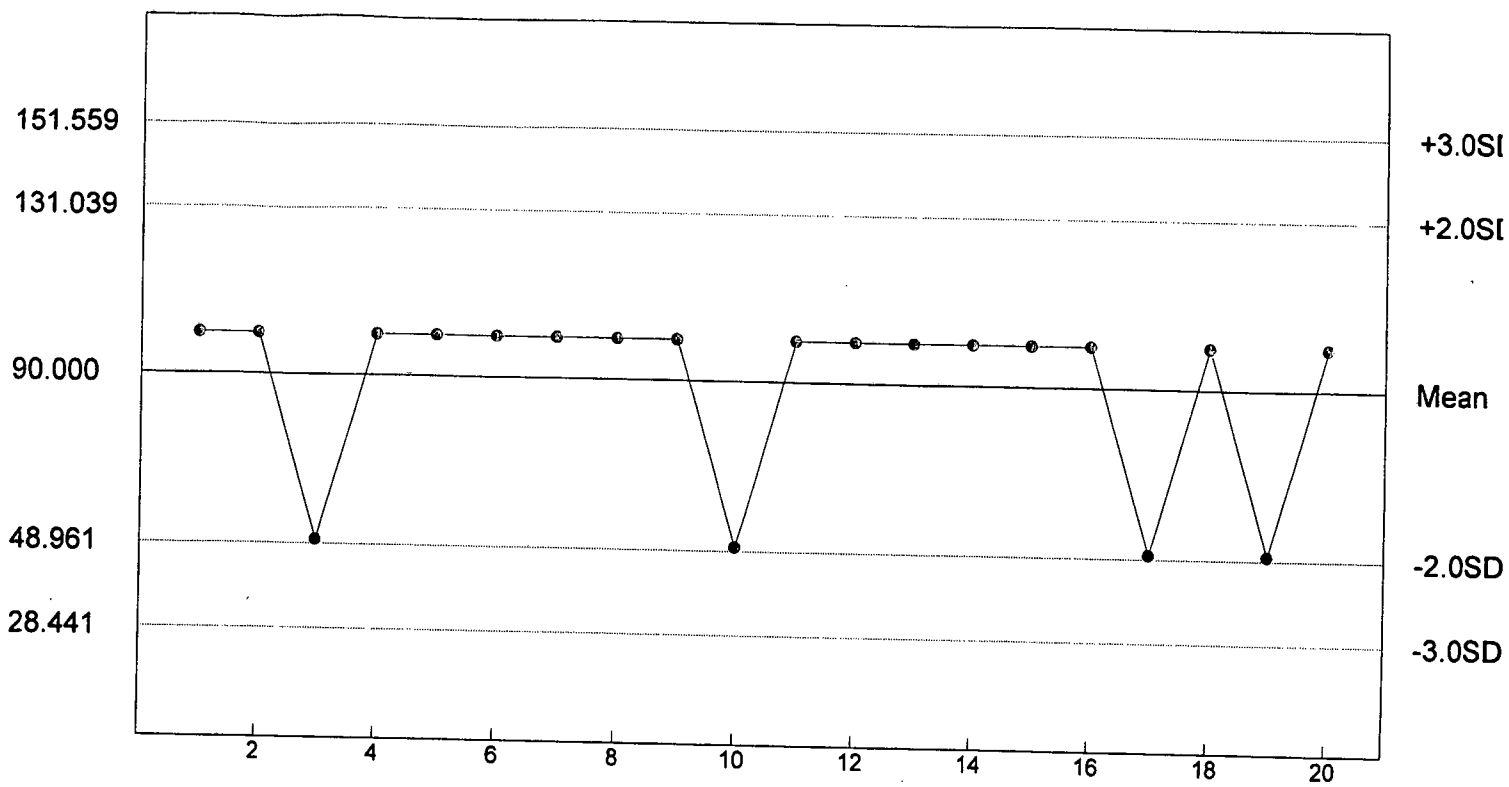
SPECIES: *Pimephales promelas*
 CHEMICAL: Copper Nitrate
 DURATION: 7-Days
 TEST NUMBER: 10
 TEST DATE/TIME: 10/01/12 - 10/07/12
 1625 Hrs - 1625 Hrs
 STATISTICAL METHOD: Dunnetts/Steels

CONCENTRATION (ug/L)	NUMBER EXPOSED	NUMBER DEAD
12.5	40	0
25	40	0
50	40	0
100	40	3
200	40	25
400	40	38
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

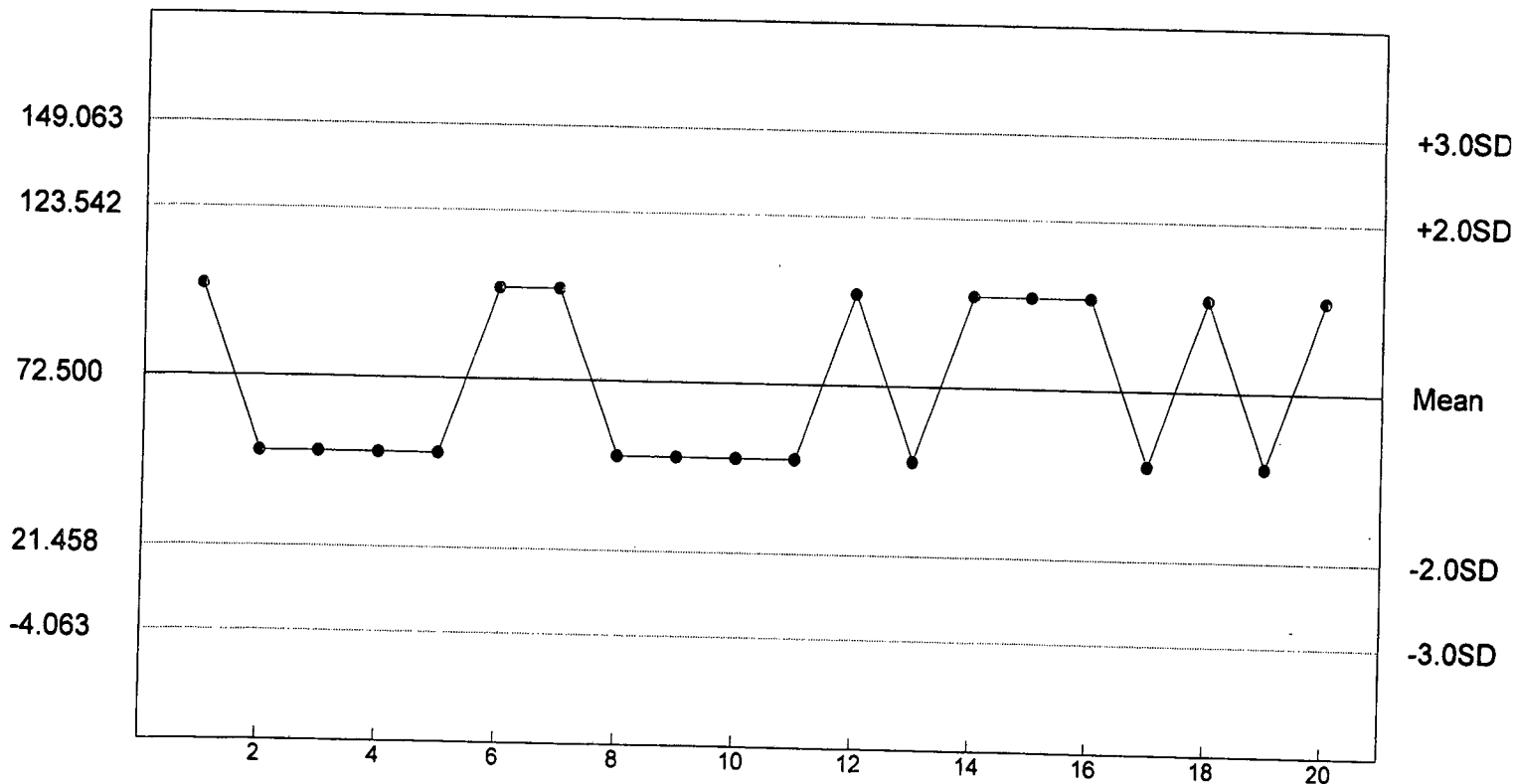
P. promelas Chronic Survival - NOEC



n= 20 Mean= 90.000 SD= 20.520 CV= 22.80% Min= 50.000 Max= 100.000

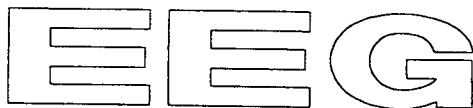
Reference Tox Copper Nitrate ug/L

P. promelas Growth - NOEC



n= 20 Mean= 72.500 SD= 25.521 CV= 35.20% Min= 50.000 Max= 100.000

**APPENDIX C
CHAIN OF CUSTODY SHEETS**



Environmental Enterprise Group, Inc.

PROVIDING CUSTOMIZED SERVICES NATIONWIDE

L246-046187

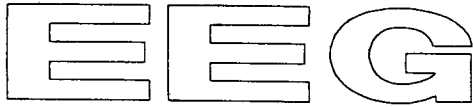
Environmental Enterprise Group, Inc.

220 North Knoxville

Russellville, Arkansas 72801

(479) 968-6767 Fax (479) 968-1956

Company Name: City Corporation			Phone #: (479) 968-4989					Requested Analysis											Laboratory Control Number	Remarks (Please note special detection limits below.)					
Address: P.O. Box 3186 Russellville, AR 72811-3186			Fax #: (479) 968-3430																						
Project Name or Number:			Purchase Order #:																						
WET Testing																									
Sampling Personnel Signature(s): <i>Charlotte Petrick</i>			Printed: Charlotte Petrick																						
Sample I.D.	Date	Time	24hr Comp.	Grab	Cont. Type Plast. Glass		# of Containers	Method Preserved H2SO4 HNO3 NaOH HCL				Sample Matrix Ice None Water Soil Air Sludge Other							WET Testing						
Outfall 001	on 9/30/12 off 10/1/12	on 646 off 751	x			x	1																	1012001	
Relinquished by: <i>Charlotte Petrick</i>			Date: 10/1/12	Time: 845	Received by:				Date:	Time:	Relinquished by:			Date:	Time:										
Received by: <i>Stacyner</i>			Date: 10/1/12	Time: 0845	Received by Laboratory: <i>Matt Horner</i>				Date: 10-2-12	Time: 1015															
Comments: <i>4.5°C</i>																									



Environmental Enterprise Group, Inc.

PROVIDING CUSTOMIZED SERVICES NATIONWIDE

L246-046187

Environmental Enterprise Group, Inc.
 220 North Knoxville
 Russellville, Arkansas 72801
 (479) 968-6767 Fax (479) 968-1956

Company Name:						Phone #:						Requested Analysis											Laboratory Control Number	Remarks (Please note special detection limits below.)													
City Corporation						(479) 968-4989																															
Address:						Fax #:																															
P.O. Box 3186 Russellville, AR 72811-3186						(479) 968-3430																															
Project Name or Number:						Purchase Order #:																															
WET Testing																																					
Sampling Personnel Signature(s):						Printed:																															
<i>Charlotte Petrick</i>						Charlotte Petrick																															
Sample I.D.	Date	Time	24hr Comp.	Grab	Cont. Type		# of Containers	Method Preserved							Sample Matrix							WET Testing															
					Plast.	Glass		H2SO4	HNO3	NaOH	HCL	ice	None	Water	Soil	Air	Sludge	Other																			
Outfall 001	on 10/1/12 off 10/3/12	on 741 off 737	x		x		1								x													1012001									
Relinquished by:						Date:			Time:			Received by:						Date:			Time:																
<i>Charlotte Petrick</i>						10/3/12			934																												
Received by:						Date:			Time:			Relinquished by:						Date:			Time:																
<i>Staugner</i>						10/3/12			834																												
Relinquished by:						Date:			Time:			Received by Laboratory:						Date:			Time:																
<i>Staugner</i>						10/3/12			1600			<i>Matt Horen</i>						10-4-12			1020																
Comments:													-0.1 °C																								

**CITY CORPORATION – RUSSELLVILLE WSS
 NPDES PERMIT NO. AR0021768
 BIOMONITORING REPORTING
 TEST DATE: 10/2/12**

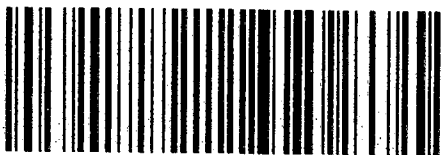
I. *Ceriodaphnia dubia*

	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)) If the NOEC for reproduction is less than the critical dilution, enter a "1"; otherwise, enter a "0". Parameter No. TGP3B.	0 -----
(C) Report the NOEC value for survival, Parameter No. TOP3B.	100% -----
(D) Report the NOEC value for reproduction, Parameter No. TPP3B.	100% -----
(E) Report the higher (critical dilution or control) Coefficient of Variation, Parameter No. TQP3B.	7.62% -----

II. *Pimephales promelas* (fathead minnow)

	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) 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 -----
(C) Report the NOEC value for survival, Parameter No. TOP6C.	100% -----
(D) Report the NOEC value for growth, Parameter No. TPP6C.	100% -----
(E) Report the highest (critical dilution or control) Coefficient of Variation, Parameter No. TQP6C.	7.79% -----

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10/22/2012

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From

CITY CORPORATION

Russellville Water & Sewer System
P.O. Box 3186 Russellville, AR 72811

To: Enforcement Branch / Water Division
ADEA
5301 Northshore Dr
North Little Rock, AR
72118