

NON-COMPLIANCE REPORT

Arkansas Department of Environmental Quality
 NPDES Enforcement Section
 5301 Northshore Drive
 North Little Rock, AR 72118

RE: NPDES Permit No: AR0022187 Discharge Number: 001

Facility: Clarksuille Light + Water

Address: P.O. Box 1807

City: Clarksuille State: AR Zip: 72830

Contact: Gregg Rainey Phone: 477-754-7929

Date of Non-Compliance	Parameter Exceeded	Quantity or Loading	Quality or Concentration	Permit Limits
6-25-2013	Bio Monitoring			flea reproduction failure at 100% dilution

We feel this problem was due to:

C. dubia flea failed reproduction on 100% effluent
We were having problems with settling added
Polymers Lab thinks this could be problem.

We plan on correcting the problem in this manner:

Stopping one of Polymers

Time estimated that it will take to correct problem:

Done

(TALKED to Michele 6-25-2013)

Sincerely,

Gregg Rainey
 Authorized Signature

6-25-2013
 Date

**ENVIRONMENTAL ENTERPRISE GROUP
 CITY OF CLARKSVILLE WWTP – OUTFALL 001
 NPDES PERMIT NO. AR0022187
 AFIN NO. 36-00038
 BIOMONITORING REPORTING
 TEST DATE: 06/11/13**

II. *Ceriodaphnia dubia*

	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. TLP3B.	0
B. If the No Observed Effect Concentration (NOEC) for reproduction is less than the critical dilution, enter a "1"; otherwise, enter a "0". Parameter No. TGP3B.	1
C. Report the NOEC value for survival, Parameter No. TOP3B.	100%
D. Report the NOEC value for reproduction, Parameter No. TPP3B.	75%
E. Report the highest (critical dilution or control) Coefficient of Variation, Parameter No. TQP3B.	57.27%

I. *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. 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.	8.21%

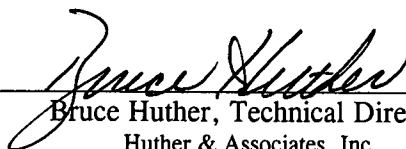
**ENVIRONMENTAL ENTERPRISE GROUP
CITY OF CLARKSVILLE WWTP
OUTFALL 001**

Chronic Biomonitoring Report
Permit Number NPDES AR0022187
AFIN Number 36-00038

Ceriodaphnia dubia
Pimephales promelas

June 11, 2013

Reviewed by:



Bruce Huther, Technical Director
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TOXICITY TEST REPORT - CHRONIC

Client Environmental Enterprise Group Sample..... Outfall 001
Facility City of Clarksville WWTP Laboratory I.D.20812
Permit No. NPDES AR0022187 Begin DateJune 11, 2013

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

SAMPLE COLLECTION

Composite effluent samples from Environmental Enterprise Group, City of Clarksville WWTP were delivered to Huther & Associates by United Parcel Service courier on June 11, June 13, and June 15, 2013. 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 and receiving water 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 receiving 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, June 11, 2013. Five concentrations were prepared (32%, 42%, 56%, 75%, and 100% effluent) utilizing receiving water (Lake Dardanelle) as dilution water. The test was conducted in 25 mL distilled water rinsed plastic beakers containing 15 mL of solution (one neonate 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 true control of ten replicate chambers containing one neonate each in receiving water was conducted concurrently with the test. There was 100% survival in the true control. In addition, a performance control of ten replicate chambers containing one neonate each in synthetic laboratory water was conducted concurrently with the test. The purpose of the performance control was to assess the health of the test organisms and to identify receiving water toxicity. The performance control data was not used in the statistical analysis of the test data. There was 100% survival in the performance control. The test ended at 1400 hours, June 18, 2013. 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 was a statistically significant difference between the control and the 100% effluent concentration.

LOEC: 100% Effluent **PMSD: 9.1%**
NOEC: 75% Effluent

TEST SETUP
Pimephales promelas



The seven-day *Pimephales promelas* larval survival and growth test was initiated at 1525 hours, June 11, 2013. Five concentrations were prepared (32%, 42%, 56%, 75%, and 100% effluent) utilizing receiving water (Lake Dardanelle) as dilution water. 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 true control of five replicate chambers of eight larvae each in receiving water was conducted concurrently with the test. There was 100% survival in the true control. In addition, a performance control of five replicate chambers of eight larvae each in synthetic laboratory water was conducted concurrently with the test. The purpose of the performance control was to assess the health of the test larvae and to identify receiving water toxicity. The performance control data was not used in the statistical analysis of the test data. There was 100% survival in the performance control. At the end of the test, all larvae were sacrificed, dried, and weighed. The test ended at 1525 hours, June 18, 2013. 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 **PMSD: 10.6%**
NOEC: 100% Effluent

SUMMARY

There were no statistically significant differences between the control and the critical low flow concentration (100% effluent) for *C. dubia* survival and *P. promelas* survival and growth. There was a statistically significant differences between the control and the critical low flow concentration (100% effluent) for *C. dubia* reproduction. Based on biomonitoring requirements for Outfall 001 contained in Permit Number NPDES AR0022187 for Environmental Enterprise Group, City of Clarksville WWTP, Outfall 001 passed *C. dubia* survival and *P. promelas* survival and growth and failed *C. dubia* reproduction for this period.

Huther and Associates

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

CLIENT EEG, City of Clarksville WWTP
 NPDES # AR0022187
 LAB ID # 20812
 TEST TYPE 7 Day Chronic
 TEST ORGANISM *Ceriodaphnia dubia*
 ORGANISM AGE < 24 Hours
 ORGANISM SOURCE In House
 RECEIVING WATER Lake Dardonelle
 DILUTION WATER Lake Dardonelle

SAMPLE TYPE 24 Hour Composite
 DATE COLLECTED 06/10/13 06/12/13 06/14/13
 DATE RECEIVED 06/11/13 06/13/13 06/15/13
 BEGIN DATE/TIME 06/11/13 1400
 END DATE/TIME 06/18/13 1400
 TEST TEMPERATURE (°C) 25 ± 1
 PHOTO PERIOD 16-hr. Light 8-hr. Dark
 LIGHT INTENSITY 50-100 ft. candl.
 TECHNICIAN N. Lehr

SURVIVAL & REPRODUCTION SUMMARY

Performance Control

Date	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
06/12/13	A	A	A	A	A	A	A	A	A	A
06/13/13	0	0	0	0	0	0	0	0	0	0
06/14/13	A	A	A	A	A	A	A	A	A	A
06/15/13	0	0	0	0	0	0	0	0	0	0
06/16/13	2	2	3	2	3	3	2	4	2	3
06/17/13	7	6	6	6	7	8	7	9	6	8
06/18/13	12	14	13	11	13	11	12	13	12	12
06/18/13	21	22	22	19	23	22	21	26	20	23

x # Young 21.9 C.V. 8.73%
 x% Survival 100% C.V. 0.00%

True Control

Date	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
06/12/13	A	A	A	A	A	A	A	A	A	A
06/13/13	0	0	0	0	0	0	0	0	0	0
06/14/13	A	A	A	A	A	A	A	A	A	A
06/15/13	0	0	0	0	0	0	0	0	0	0
06/16/13	3	4	2	2	2	2	3	A	2	3
06/17/13	10	8	7	8	6	7	9	4	8	6
06/18/13	13	12	9	10	8	9	12	4	10	9
06/18/13	26	27	21	24	21	22	26	31	22	23

x # Young 24.3 C.V. 13.16%
 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
06/12/13	A	A	A	A	A	A	A	A	A	A
06/13/13	0	0	0	0	0	0	0	0	0	0
06/14/13	A	A	A	A	A	A	A	A	A	A
06/15/13	0	0	0	0	0	0	0	0	0	0
06/16/13	4	3	3	4	2	3	3	3	4	3
06/17/13	7	9	7	6	8	6	7	8	7	7
06/18/13	11	12	10	10	10	9	10	11	11	10
06/18/13	24	26	22	25	23	21	23	25	24	24

x # Young 23.7 C.V. 6.31%
 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
06/12/13	A	A	A	A	A	A	A	A	A	A
06/13/13	0	0	0	0	0	0	0	0	0	0
06/14/13	A	A	A	A	A	A	A	A	A	A
06/15/13	0	0	0	0	0	0	0	0	0	0
06/16/13	3	2	4	2	3	2	4	3	5	4
06/17/13	9	8	8	10	7	6	9	8	10	8
06/18/13	12	10	12	12	10	8	13	11	15	12
06/18/13	26	25	24	25	22	21	28	25	28	26

x # Young 25.0 C.V. 9.04%
 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

EEG, City of Clarksville WWTP

Lab ID# 20812

Test Date: June 11, 2013

56% Effluent

Date	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10	
06/12/13	A	A	A	A	A	A	A	A	A	A	
	0	0	0	0	0	0	0	0	0	0	
06/13/13	A	A	A	A	A	A	A	A	A	A	
	0	0	0	0	0	0	0	0	0	0	
06/14/13	A	A	A	A	A	A	A	A	A	A	
	0	0	0	0	0	0	0	0	0	0	
06/15/13	3	2	2	2	4	3	3	A	A	A	
	3	2	2	2	4	3	3	0	0	0	
06/16/13	8	6	9	7	6	9	8	4	3	3	
	11	8	11	9	10	12	11	4	3	3	
06/17/13	A	A	A	A	A	A	A	9	9	10	
	11	8	11	9	10	12	11	13	12	13	
06/18/13	14	13	15	14	14	12	14	13	15	13	
	25	21	26	23	24	24	25	26	27	26	
x# Young		24.7				C.V.		7.15%			
x% Survival		100%				C.V.		0.00%			

75% Effluent

Date	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10	
06/12/13	A	A	A	A	A	A	A	A	A	A	
	0	0	0	0	0	0	0	0	0	0	
06/13/13	A	A	A	A	A	A	A	A	A	A	
	0	0	0	0	0	0	0	0	0	0	
06/14/13	A	A	A	A	A	A	A	A	A	A	
	0	0	0	0	0	0	0	0	0	0	
06/15/13	4	2	3	3	2	A	A	A	A	A	
	4	2	3	3	2	0	0	0	0	0	
06/16/13	10	7	6	8	10	2	2	3	2	3	
	14	9	9	11	12	2	2	3	2	3	
06/17/13	A	A	A	A	A	8	7	6	9	8	
	14	9	9	11	12	10	9	9	11	11	
06/18/13	13	14	15	13	14	13	15	14	14	12	
	27	23	24	24	26	23	24	23	25	23	
x# Young		24.2				C.V.		5.78%			
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	
06/12/13	A	A	A	A	A	A	A	A	A	A	
	0	0	0	0	0	0	0	0	0	0	
06/13/13	A	A	A	A	A	A	A	A	A	A	
	0	0	0	0	0	0	0	0	0	0	
06/14/13	A	A	A	A	A	A	A	A	A	A	
	0	0	0	0	0	0	0	0	0	0	
06/15/13	A	A	A	A	A	A	A	A	A	A	
	0	0	0	0	0	0	0	0	0	0	
06/16/13	2	2	3	3	3	4	2	3	2	3	
	2	2	3	3	3	4	2	3	2	3	
06/17/13	A	6	A	A	A	A	A	6	A	A	
	2	8	3	3	3	4	2	3	8	3	
06/18/13	A	A	A	A	A	A	A	A	A	A	
	2	8	3	3	3	4	2	3	8	3	
x# Young		3.9				C.V.		57.27%			
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 of Clarksville WWTP

Lab ID# 20812

Test Date: June 11, 2013

WET CHEMISTRY MEASUREMENTS

Date	Time	Temp	Samp. No.	pH of Solution						Analyst	
				PCON	TCON	32%	42%	56%	75%		100%
06/11/13	Start	25.0	1	7.94	8.24	7.91	7.86	7.72	7.37	6.64	STC
06/12/13	24 Hr.	26.0	1	8.28	8.09	8.00	7.93	7.88	7.84	7.54	GZK
06/12/13	Renew	26.0	1	7.94	8.24	7.63	7.58	7.43	7.25	6.64	GZK
06/13/13	48 Hr.	26.0	1	8.23	8.06	7.96	7.90	7.82	7.71	7.45	GZK
06/13/13	Renew	25.0	2	8.30	8.24	7.96	7.84	7.70	7.47	6.64	GZK
06/14/13	72 Hr.	25.9	2	8.02	7.86	7.81	7.76	7.72	7.67	7.53	MJK
06/14/13	Renew	25.8	2	8.10	7.58	7.50	7.41	7.27	7.18	6.90	MJK
06/15/13	96 Hr.	25.5	2	8.22	7.83	7.77	7.73	7.70	7.64	7.47	MJK
06/15/13	Renew	25.0	3	8.10	8.35	7.78	7.67	7.63	7.57	6.65	MJK
06/16/13	120 Hr.	26.0	3	7.68	7.49	7.37	7.30	7.28	7.14	6.88	STC
06/16/13	Renew	25.9	3	8.10	7.50	7.40	7.39	7.35	7.31	7.07	STC
06/17/13	144 Hr.	25.8	3	8.17	8.11	8.04	7.97	7.92	7.85	7.69	STC
06/17/13	Renew	26.0	3	8.10	7.53	7.45	7.50	7.40	7.41	7.29	STC
06/18/13	168 Hr.	26.0	3	8.10	8.08	8.00	7.92	7.87	7.75	7.57	STC

Date	Time	Temp	Samp. No.	DO (mg/L) of Solution						Analyst	
				PCON	TCON	32%	42%	56%	75%		100%
06/11/13	Start	25.0	1	8.42	8.54	8.48	8.46	8.92	8.55	8.31	STC
06/12/13	24 Hr.	26.0	1	7.38	7.15	7.15	7.24	7.00	7.22	7.22	GZK
06/12/13	Renew	26.0	1	8.42	8.54	8.16	8.20	8.12	7.57	8.31	GZK
06/13/13	48 Hr.	26.0	1	8.68	8.47	8.35	8.37	8.51	8.22	8.63	GZK
06/13/13	Renew	25.0	2	8.00	8.54	8.36	8.85	8.57	8.87	8.31	GZK
06/14/13	72 Hr.	25.9	2	6.82	6.81	6.67	6.62	6.68	6.77	6.60	MJK
06/14/13	Renew	25.80	2	7.90	7.38	7.80	7.77	7.72	7.70	7.54	MJK
06/15/13	96 Hr.	25.5	2	6.37	6.42	7.17	7.21	7.15	7.16	7.30	MJK
06/15/13	Renew	25.0	3	7.90	8.52	6.63	7.07	7.06	7.06	8.30	MJK
06/16/13	120 Hr.	26.0	3	8.31	7.53	7.97	7.74	7.82	7.79	7.70	STC
06/16/13	Renew	25.6	3	7.90	8.41	8.40	8.70	8.66	8.80	8.90	STC
06/17/13	144 Hr.	25.8	3	8.12	8.13	8.03	7.96	8.02	7.99	7.70	STC
06/17/13	Renew	26.0	3	7.90	7.54	7.55	7.78	7.88	8.01	8.19	STC
06/18/13	168 Hr.	26.0	3	8.97	8.81	8.74	8.72	8.54	8.52	8.46	STC

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

EEG, City of Clarksville WWTP

Lab ID# 20812

Test Date: June 11, 2013

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
06/11/13	1	6.64	8.31	88	22	295	<0.01	N/A	TN
06/13/13	2	6.68	8.32	88	22	296	<0.01	N/A	TN
06/15/13	3	6.65	8.30	84	24	299	<0.01	N/A	TN

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
06/11/13	RS1	8.24	8.54	160	102	581	<0.01	N/A	TN
06/13/13	RS2	8.34	8.54	160	100	581	<0.01	N/A	TN
06/15/13	RS3	8.35	8.52	160	102	580	<0.01	N/A	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	31.000	24.300
2	32% Effluent	10	21.000	26.000	23.700
3	42% Effluent	10	21.000	28.000	25.000
4	56% Effluent	10	21.000	27.000	24.700
5	75% Effluent	10	23.000	27.000	24.200
6	100% Effluent	10	2.000	8.000	3.900

Summary Statistics on Transformed Data Table 2 of 2

Grp	Identification	Variance	Sd	Sem	C.V.%
1	Control	10.233	3.199	1.012	13.16
2	32% Effluent	2.233	1.494	0.473	6.31
3	42% Effluent	5.111	2.261	0.715	9.04
4	56% Effluent	3.122	1.767	0.559	7.15
5	75% Effluent	1.956	1.398	0.442	5.78
6	100% Effluent	4.989	2.234	0.706	57.27

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	3	13	26	13	5

Calculated Chi-Square goodness of fit test statistic = 1.2298
 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 = 8.53

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	3505.133	701.027	152.152
Within (Error)	54	248.800	4.607	
Total	59	3753.933		

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	Mean	T Stat	Sig
			Calculated In Original Units		
1	Control	24.300	24.300		
2	32% Effluent	23.700	23.700	0.625	
3	42% Effluent	25.000	25.000	-0.729	
4	56% Effluent	24.700	24.700	-0.417	
5	75% Effluent	24.200	24.200	0.104	
6	100% Effluent	3.900	3.900	21.251	*

Dunnett table value = 2.31 (1 Tailed Value, P=0.05, DF=40,5)

* Statistically significant difference

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

Grp	Identification	Num of Reps	Minimum Sig Diff	% of Control	Difference
			(In Orig. Units)		from Control
1	Control	10			
2	32% Effluent	10	2.217	9.1	0.600
3	42% Effluent	10	2.217	9.1	-0.700
4	56% Effluent	10	2.217	9.1	-0.400
5	75% Effluent	10	2.217	9.1	0.100
6	100% Effluent	10	2.217	9.1	20.400

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

CLIENT	EEG, City of Clarksville WWTP	SAMPLE TYPE	24 Hour Composite
NPDES #	AR0022187	DATE COLLECTED	06/10/13 06/12/13 06/14/13
LAB ID #	20812	DATE RECEIVED	06/11/13 06/13/13 06/15/13
TEST TYPE	7 Day Chronic	BEGIN DATE/TIME	06/11/13 1525
TEST ORGANISM	<i>Ceriodaphnia dubia</i>	END DATE/TIME	06/18/13 1525
ORGANISM AGE	< 24 Hours	TEST TEMPERATURE (°C)	25 ± 1
ORGANISM SOURCE	In House	PHOTO PERIOD	16-hr. Light 8-hr. Dark
RECEIVING WATER	Lake Dardonelle	LIGHT INTENSITY	50-100 ft. cndl.
DILUTION WATER	Lake Dardonelle	TECHNICIAN	J. Lopez

SURVIVAL SUMMARY

Conc.	06/12/13					06/13/13					06/14/13					06/15/13					06/16/13				
	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
Pcon	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
Tcon	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.	06/17/13					06/18/13					x % Survival	C.V. %
	A	B	C	D	E	A	B	C	D	E		
Pcon	8	8	8	8	8	8	8	8	8	8	100.0	0.00
Tcon	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. %
Pcon	0.4820	0.5030	0.4960	0.4280	0.4760	0.4770	6.17
Tcon	0.4450	0.4820	0.4160	0.4950	0.4200	0.4516	7.92
32%	0.4670	0.4180	0.5020	0.4760	0.4920	0.4710	6.92
42%	0.4470	0.5020	0.4460	0.4810	0.5030	0.4758	5.92
56%	0.4650	0.4710	0.4200	0.4790	0.5040	0.4678	6.54
75%	0.5040	0.4420	0.4750	0.4810	0.4500	0.4704	5.30
100%	0.4250	0.5060	0.4910	0.4260	0.4850	0.4666	8.21

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

EEG, City of Clarksville WWTP

Lab ID# 20812

Test Date: June 11, 2013

WET CHEMISTRY MEASUREMENTS

Date	Time	Temp	Samp. No.	pH of Solution						Analyst	
				PCON	TCON	32%	42%	56%	75%		100%
06/11/13	Start	25.0	1	7.94	8.24	7.91	7.86	7.72	7.37	6.64	STC
06/12/13	24 Hr.	26.0	1	8.27	8.10	7.97	7.93	7.87	7.66	7.37	GZK
06/12/13	Renew	26.0	1	7.94	8.24	7.63	7.58	7.43	7.25	6.64	GZK
06/13/13	48 Hr.	26.0	1	8.22	8.00	7.91	7.78	7.73	7.57	7.29	GZK
06/13/13	Renew	25.0	2	8.30	8.24	7.96	7.84	7.70	7.47	6.64	GZK
06/14/13	72 Hr.	26.0	2	8.15	8.01	7.90	7.85	7.77	7.64	7.37	MJK
06/14/13	Renew	25.8	2	8.10	7.58	7.50	7.41	7.27	7.18	6.90	MJK
06/15/13	96 Hr.	26.0	2	8.22	8.04	7.97	7.90	7.81	7.69	7.38	MJK
06/15/13	Renew	25.0	3	8.10	8.35	7.78	7.67	7.63	7.57	6.65	MJK
06/16/13	120 Hr.	26.0	3	8.20	8.00	7.93	7.87	7.83	7.75	7.69	STC
06/16/13	Renew	25.9	3	8.10	7.50	7.40	7.39	7.35	7.31	7.07	STC
06/17/13	144 Hr.	26.0	3	7.84	7.64	7.48	7.52	7.43	7.26	6.96	STC
06/17/13	Renew	26.0	3	8.10	7.53	7.45	7.50	7.40	7.41	7.29	STC
06/18/13	168 Hr.	26.0	3	8.06	7.89	7.78	7.74	7.65	7.54	7.21	STC

Date	Time	Temp	Samp. No.	DO (mg/L) of Solution						Analyst	
				PCON	TCON	32%	42%	56%	75%		100%
06/11/13	Start	25.0	1	8.42	8.54	8.48	8.46	8.92	8.55	8.31	STC
06/12/13	24 Hr.	26.0	1	8.23	7.96	7.82	7.87	7.86	7.61	7.61	GZK
06/12/13	Renew	26.0	1	8.42	8.54	8.16	8.20	8.12	7.57	8.31	GZK
06/13/13	48 Hr.	26.0	1	7.75	7.69	7.62	7.48	7.63	7.62	7.54	GZK
06/13/13	Renew	25.0	2	8.00	8.54	8.36	8.85	8.57	8.87	8.31	GZK
06/14/13	72 Hr.	26.0	2	6.90	6.91	6.88	6.80	6.81	6.97	6.96	MJK
06/14/13	Renew	25.8	2	7.90	7.38	7.80	7.77	7.72	7.70	7.54	MJK
06/15/13	96 Hr.	26.0	2	7.22	7.26	7.24	7.24	7.25	7.17	7.21	MJK
06/15/13	Renew	25.0	3	7.90	8.52	6.63	7.07	7.06	7.06	8.30	MJK
06/16/13	120 Hr.	26.0	3	7.96	7.96	7.83	7.82	7.80	7.79	7.74	STC
06/16/13	Renew	25.9	3	7.90	8.41	8.40	8.70	8.66	8.80	8.90	STC
06/17/13	144 Hr.	26.0	3	8.32	8.33	8.18	8.31	7.84	7.77	8.02	STC
06/17/13	Renew	26.0	3	7.90	7.54	7.55	7.78	7.88	8.01	8.19	STC
06/18/13	168 Hr.	26.0	3	7.66	7.57	7.59	7.61	7.52	7.54	7.50	STC

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

EEG, City of Clarksville WWTP

Lab ID# 20812

Test Date: June 11, 2013

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
06/11/13	1	6.64	8.31	88	22	295	<0.01	N/A	TN
06/13/13	2	6.68	8.32	88	22	296	<0.01	N/A	TN
06/15/13	3	6.65	8.30	84	24	299	<0.01	N/A	TN

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
06/11/13	RS1	8.24	8.54	160	102	581	<0.01	N/A	TN
06/13/13	RS2	8.34	8.54	160	100	581	<0.01	N/A	TN
06/15/13	RS3	8.35	8.52	160	102	580	<0.01	N/A	TN

¹ 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	0.416	0.495	0.452
2	32% Effluent	5	0.418	0.502	0.471
3	42% Effluent	5	0.446	0.503	0.476
4	56% Effluent	5	0.420	0.504	0.468
5	75% Effluent	5	0.442	0.504	0.470
6	100% Effluent	5	0.425	0.506	0.467

Summary Statistics on Transformed Data Table 2 of 2

Grp	Identification	Variance	Sd	Sem	C.V.%
1	Control	0.001	0.036	0.016	7.92
2	32% Effluent	0.001	0.033	0.015	6.92
3	42% Effluent	0.001	0.028	0.013	5.92
4	56% Effluent	0.001	0.031	0.014	6.54
5	75% Effluent	0.001	0.025	0.011	5.30
6	100% Effluent	0.001	0.038	0.017	8.21

Shapiro - Wilk's Test For Normality

D = 0.025

W = 0.931

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 = 0.88

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	0.334
Within (Error)	24	0.025	0.001	
Total	29	0.026		

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
			Calculated In Original Units		
1	Control	0.452	0.452		
2	32% Effluent	0.471	0.471	-0.958	
3	42% Effluent	0.476	0.476	-1.194	
4	56% Effluent	0.468	0.468	-0.800	
5	75% Effluent	0.470	0.470	-0.928	
6	100% Effluent	0.467	0.467	-0.740	

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	0.048	10.6	-0.019
3	42% Effluent	5	0.048	10.6	-0.024
4	56% Effluent	5	0.048	10.6	-0.016
5	75% Effluent	5	0.048	10.6	-0.019
6	100% Effluent	5	0.048	10.6	-0.015

**APPENDIX A
RAW DATA**

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

CLIENT EEG Clarksville
OUTFALL 001
LAB ID # 20812

START DATE/TIME 6-11-13 NL 1400
END DATE/TIME 6-18-13 NL 1400

Pcon

Date	Rep1	Rep2	Rep3	Rep4	Rep5	Rep6	Rep7	Rep8	Rep9	Rep10	Analyst	Time
6/12	A	A	A	A	A	A	A	A	A	A	ZG	1400
6/13	A	A	A	A	A	A	A	A	A	A	MH	1510
6/14	A	A	A	A	A	A	A	A	A	A	NL	1315
6/15	A	A	A	A	A	A	A	A	A	A	MH	1200
6/16	2	2	3	2	3	3	2	4	2	3	MH	1315
6/17	7	6	6	6	7	8	7	9	6	8	ZG	1145
6/18	12	14	13	11	13	11	12	13	12	12	NL	1400

\bar{x} # Young w/o Dead = 21.9 CV% = 8.73
 \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
6/12	A	A	A	A	A	A	A	A	A	A	ZG	1400
6/13	A	A	A	A	A	A	A	A	A	A	MH	1510
6/14	A	A	A	A	A	A	A	A	A	A	NL	1315
6/15	4	3	3	4	2	3	3	3	4	3	MH	1200
6/16	7	9	7	6	8	6	7	8	7	7	MH	1315
6/17	A	A	A	A	A	A	A	A	A	A	ZG	1145
6/18	13	14	12	5	13	12	13	14	13	14	NL	1400

\bar{x} # Young w/o Dead = 23.7 CV% = 6.31
 \bar{x} # Young w/Dead = CV% =
 \bar{x} % Survival = 100.0 CV% = 0.00

Tcon

Date	Rep1	Rep2	Rep3	Rep4	Rep5	Rep6	Rep7	Rep8	Rep9	Rep10	Analyst	Time
6/12	A	A	A	A	A	A	A	A	A	A	ZG	1400
6/13	A	A	A	A	A	A	A	A	A	A	MH	1510
6/14	A	A	A	A	A	A	A	A	A	A	NL	1315
6/15	3	4	2	2	2	2	3	A	2	3	MH	1200
6/15	10	8	7	8	6	7	9	4	8	6	MH	1315
6/17	A	A	A	A	A	A	A	12	A	A	ZG	1145
6/18	13	15	12	14	13	13	14	15	12	14	NL	1400

\bar{x} # Young w/o Dead = 24.3 CV% = 13.16
 \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
6/12	A	A	A	A	A	A	A	A	A	A	ZG	1400
6/13	A	A	A	A	A	A	A	A	A	A	MH	1510
6/14	A	A	A	A	A	A	A	A	A	A	NL	1315
6/15	3	2	4	2	3	2	4	3	5	4	MH	1200
6/16	9	8	8	10	7	6	9	8	10	8	MH	1315
6/17	A	A	A	A	A	A	A	A	A	A	ZG	1145
6/18	14	15	12	13	12	13	15	14	13	14	NL	1400

\bar{x} # Young w/o Dead = 25.0 CV% = 9.04
 \bar{x} # Young w/Dead = CV% =
 \bar{x} % Survival = 100.0 CV% = 0.00

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

CLIENT/FACILITY EEG Clarksville
 OUTFALL # 001 PROJECT # 20812
 ORGANISM ID# PP0-13-161

DATE/TIME STARTED 6-11-13 JL 1525
 DATE/TIME ENDED 6-18-13 JL 1525

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					
pcon	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
Tcon	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	<u>6-12-13 JL 1525</u>					<u>6-13-13 JL 0855</u>					<u>6-14-13 JL 0815</u>					<u>6-15-13 MH 0930</u>					<u>6-16-13 MH 0850</u>									

Conc.	A					B					Mean Survival	C.V. %
	A	B	C	D	E	A	B	C	D	E		
pcon	8	8	8	8	8	8	8	8	8	8	100%	0.00
Tcon	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	<u>6-17-13 JL 1115</u>					<u>6-18-13 JL 1525</u>						

Client / Facility EEG Clarksville
 Lab ID Number 20812
 Outfall Number 001
 Test Date 6-11-13

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	Analyst
6/11	1	6.64	8.31	88	22	295	6.01	Na	TJ
6/13	2	6.68	8.32	88	22	296	§	§	§
6/15	3	6.65	8.30	84	24	299	§	§	§

INITIAL CHEMISTRY MEASUREMENTS @ RECEIVING WATER

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	Analyst
6/11	RS1	8.24	8.54	160	102	581	6.01	Na	TJ
6/13	RS2	8.34	8.51	160	100	581	§	§	§
6/15	RS3	8.35	8.52	160	102	580	§	§	§

Notes:

**APPENDIX B
REFERENCE TOXICANTS**

CHRONIC REFERENCE TOXICANT TEST RESULTS

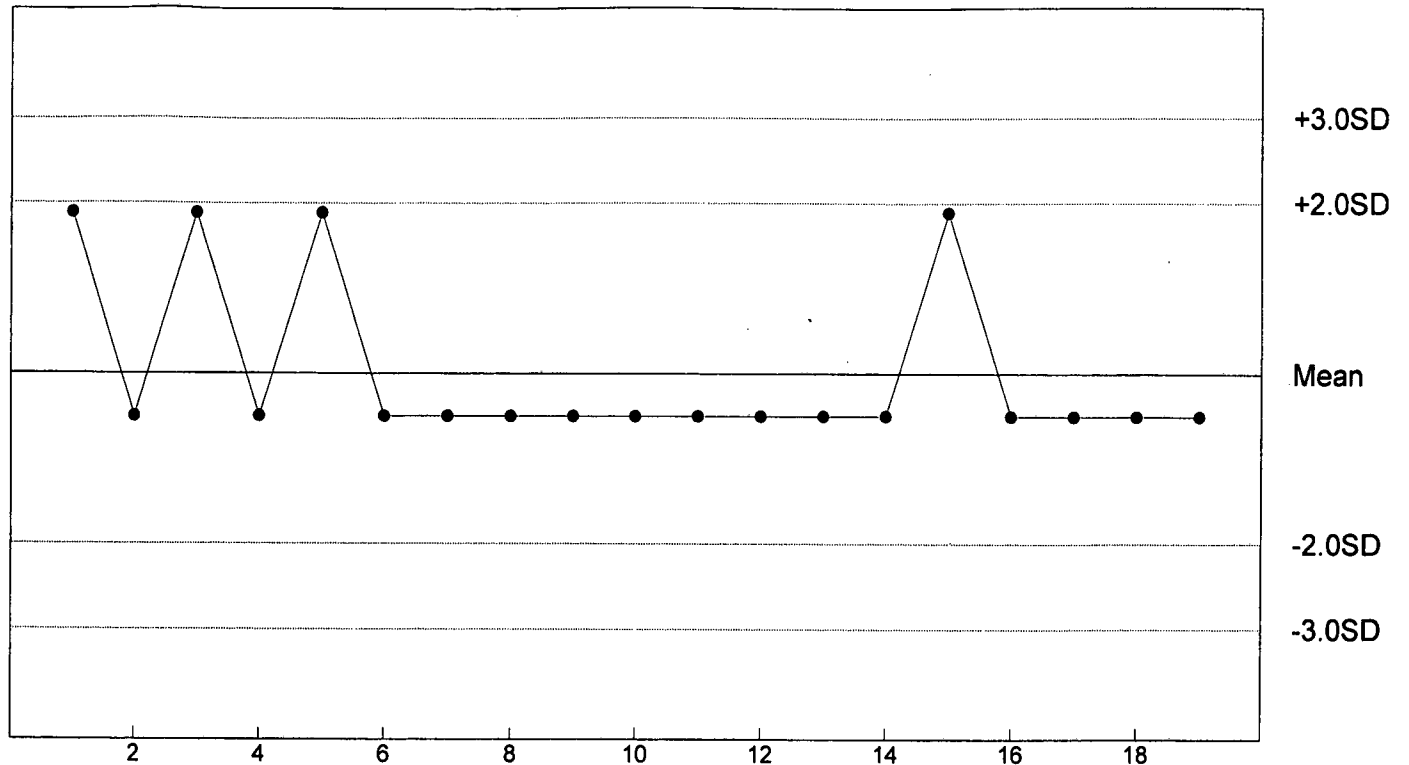
SPECIES: *Ceriodaphnia dubia*
 CHEMICAL: Sodium Chloride
 DURATION: 7-Days
 TEST NUMBER: 6
 TEST DATE/TIME: 05/29/13 - 06/05/13
 1045 Hrs - 1045 Hrs
 STATISTICAL METHOD: Fishers, Dunnetts/Steels

CONCENTRATION (g/L)	NUMBER EXPOSED	NUMBER DEAD
0.5	10	0
1.0	10	0
1.5	10	0
2.0	10	7
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

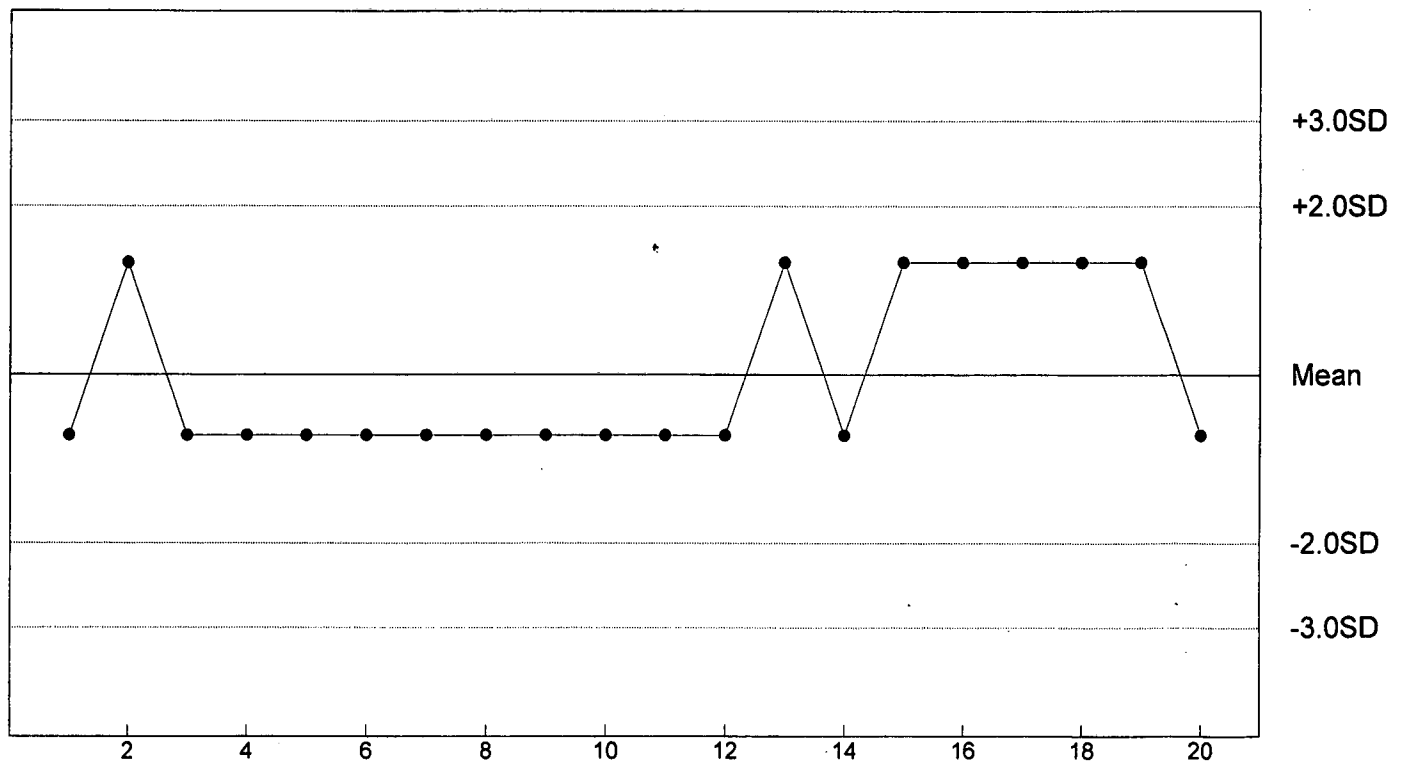
C. dubia Survival - NOEC



n= 19 Mean= 1.605 SD= 0.209 CV= 13.05% Min= 1.500 Max= 2.000

Reference Tox Sodium Chloride g/L

C. dubia Reproduction - NOEC



n= 20 Mean= 0.675 SD= 0.245 CV= 36.25% Min= 0.500 Max= 1.000

CHRONIC REFERENCE TOXICANT TEST RESULTS

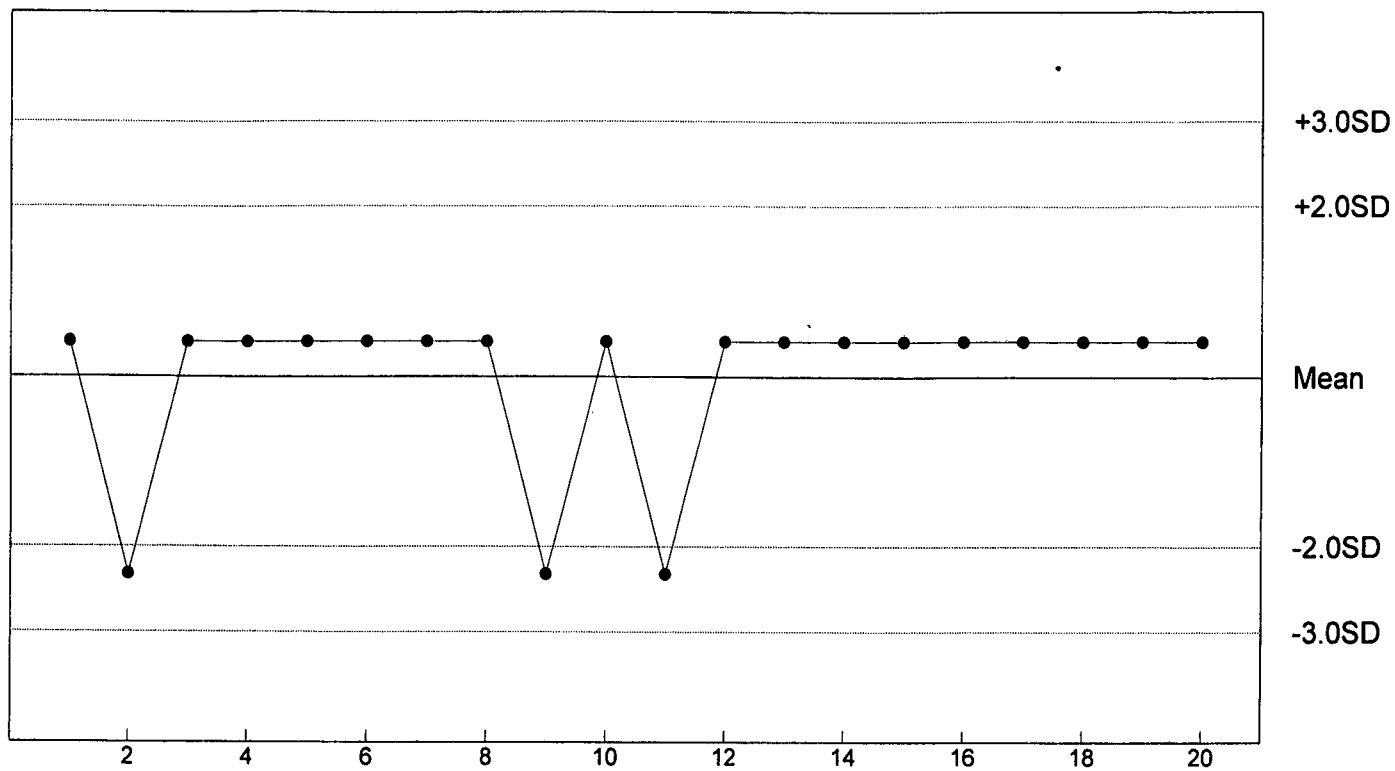
SPECIES: *Pimephales promelas*
 CHEMICAL: Copper Nitrate
 DURATION: 7-Days
 TEST NUMBER: 6
 TEST DATE/TIME: 05/29/13 - 06/05/13
 1425 Hrs - 1425 Hrs
 STATISTICAL METHOD: Dunnetts/Steels

CONCENTRATION (ug/L)	NUMBER EXPOSED	NUMBER DEAD
12.5	40	0
25	40	0
50	40	3
100	40	4
200	40	13
400	40	33
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

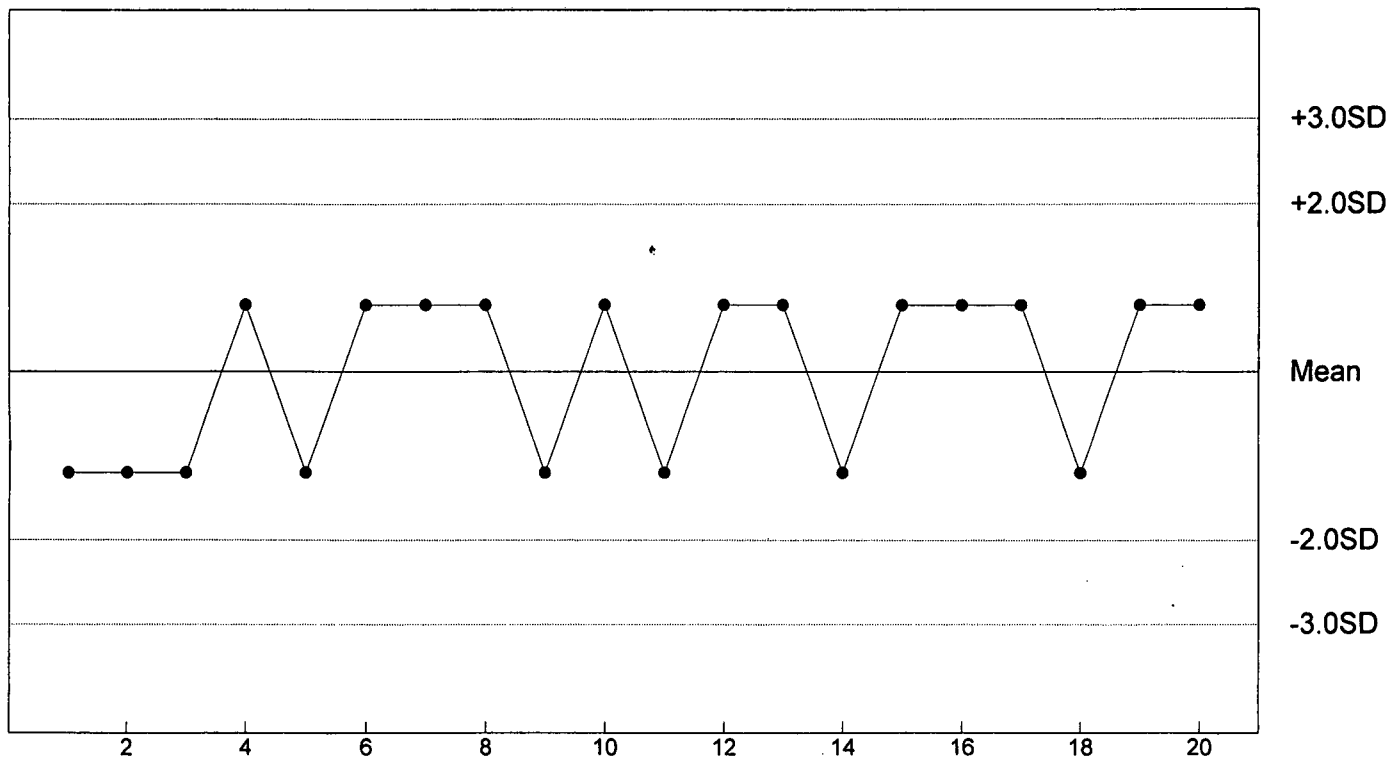
P. promelas Chronic Survival - NOEC



n= 20 Mean= 92.500 SD= 18.317 CV= 19.80% Min= 50.000 Max= 100.000

Reference Tox Copper Nitrate ug/L

P. promelas Growth - NOEC



n= 20 Mean= 80.000 SD= 25.131 CV= 31.41% Min= 50.000 Max= 100.000

APPENDIX C
CHAIN OF CUSTODY SHEETS

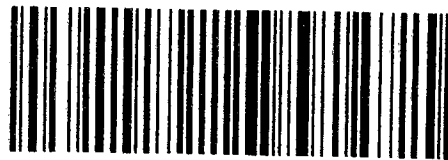


Environmental Enterprise Group, Inc.
PROVIDING CUSTOMIZED SERVICES NATIONWIDE

L444-047154

Company Name:		Phone #:		Requested Analysis										Laboratory Control Number	Remarks (Please note special detection limits below.)						
Clarksville Light and Water		(479) 754-7929		7-Day Chronic Bio-Monitoring																	
Address:		Fax #:																			
P.O. Box 1807 Clarksville, AR 72830		(479) 754-8181																			
Project Name or Number:		Purchase Order #:																			
Bio-Monitoring		Printed:																			
Sampling Personnel Signature(s):		Alan Bratton																			
Sample I.D.	Date	Time	Comp.	Grab	Cont. Type		# of Containers	Method Preserved				Sample Matrix				7-Day Chronic Bio-Monitoring					
					Plast.	Glass		H2SO4	HNO3	NAOH	HCL	Ice	None	Water	Soil			Air	Sludge	Other	
Receiving Water	6/10/13	1027		X	X		1				X		X					X		06/10/89	
Relinquished by:		Date:		Time:		Received By:				Date:		Time:									
Megan Hatcher		6-10-13		1200																	
Received by:		Date:		Time:		Relinquished By:				Date:		Time:									
Megan Hatcher		6-10-13		1250																	
Relinquished by:		Date:		Time:		Received by Laboratory:				Date:		Time:									
Megan Hatcher		6-10-13		1240		Jesse [Signature]				6-11-13		1030									
Comments:																					
ups 1.8°																					

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CLARKSVILLE LIGHT & WATER CO.

400 WEST MAIN • P.O. BOX 1807
CLARKSVILLE, AR 72830
PHONE (479) 754-3148

To

ADEQ
5301 Northshore Dr
North Little Rock, AR 72118