



Springdale Water Utilities

526 Oak Avenue P.O. Box 769 Springdale, Arkansas 72765-0769 (479) 751-5751

Enforcement Branch
Arkansas Dept. of Environmental Quality
P. O. Box 8913
Little Rock, AR 72219-8913

RE: NPDES Permit No. AR0022063
Springdale, AR
AFIN # 72-00003

September 13, 2012

Dear Sir or Madam:

Enclosed please find the results of annual Table II and third quarter Table III analyses performed on Springdale Water Utilities' wastewater treatment facility influent, effluent, and sludge. Also please find third quarter C. dubia (biomonitoring) and P. promelas (biomonitoring) testing performed on Springdale Water Utilities' wastewater treatment facility effluent. These analyses are required by our NPDES Permit.

Please feel free to call Ms. Jennifer Enos at (479) 756-3657 if you have any questions concerning these analyses.

Sincerely yours,

Rene Langston
Executive Director

JEE/jee
Enclosures

CC: Jennifer Enos, SWU
John Fazio, ADEQ
Mary Barnett, ADEQ
File

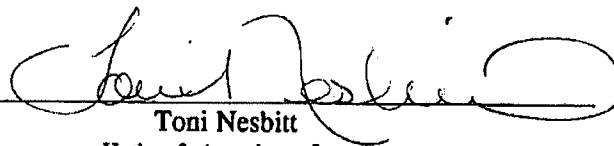
**CITY OF SPRINGDALE WWTF
OUTFALL 001**

**Chronic Biomonitoring Report
Permit Number NPDES AR0022063
AFIN Number: 72-00003**

Ceriodaphnia dubia
Pimephales promelas

July 31, 2012

Reviewed by:



Toni Nesbitt

**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 Springdale WWTF Laboratory I.D.19909
Permit No. NPDES AR0022063 Begin Date July 31, 2012
Sample Outfall 001

Results: Pass *Ceriodaphnia dubia* survival and reproduction and *Pimephales promelas* survival and growth at the critical low flow concentration (97% effluent).

SAMPLE COLLECTION

Composite effluent samples from City of Springdale WWTF were delivered by Greyhound Package Express courier to Huther & Associates on July 31, August 2, and August 4, 2012. The first effluent sample was manually collected and composited from Outfall 001 by facility personnel. The second and third 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 1615 hours, July 31, 2012. Five concentrations were prepared (31%, 41%, 55%, 73%, and 97% effluent) utilizing distilled, deionized laboratory water reconstituted to match the hardness, alkalinity and pH of the receiving stream (Spring 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 1615 hours, August 7, 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: 97% 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: 97% Effluent

PMSD: 5.6%

TEST SETUP
Pimephales promelas



The seven-day *Pimephales promelas* larval survival and growth test was initiated at 1640 hours, July 31, 2012. Five concentrations were prepared (31%, 41%, 55%, 73%, and 97% effluent) utilizing distilled, deionized laboratory water reconstituted to match the hardness, alkalinity and pH of the receiving stream (Spring 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 1640 hours, August 7, 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: 97% 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: 10.4%

NOEC: 97% Effluent

SUMMARY

There were no statistically significant differences between the control and the critical low flow concentration (97% 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 AR0022063 for City of Springdale WWTF, 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 Springdale, W.W.T.P.
 NPDES #: AR0022063
 LAB ID #: 19909
 TEST TYPE: 7 Day Chronic
 TEST ORGANISM: Ceriodaphnia dubia
 ORGANISM AGE: < 24 Hours
 ORGANISM SOURCE: In House
 RECEIVING WATER: Spring Creek
 DILUTION WATER: Laboratory Adjusted

SAMPLE TYPE: 24 Hour Composite
 DATE COLLECTED: 07/30/12, 08/01/12, 08/03/12
 DATE RECEIVED: 07/31/12, 08/02/12, 08/04/12
 BEGIN DATE/TIME: 07/31/12, 1615
 END DATE/TIME: 08/07/12, 1615
 TEST TEMPERATURE (°C): 25 ± 1
 PHOTO PERIOD: 16-hr Light, 8-hr Dark
 LIGHT INTENSITY: 50-100 ft-cand
 TECHNICIAN: K. Demore

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
08/01/12	A	A	A	A	A	A	A	A	A	A
08/02/12	A	A	A	A	A	A	A	A	A	A
08/03/12	A	A	A	A	A	A	A	A	A	A
08/04/12	A	2	2	A	3	2	3	3	A	A
08/05/12	3	A	2	A	4	A	A	A	A	3
08/06/12	8	10	9	8	8	9	10	8	9	9
08/07/12	13	12	12	13	12	11	13	12	13	14
x # Young 24.2 C.V. 8.10% x% Survival 100% C.V. 0.00%										

31% Effluent										
Date	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
08/01/12	A	A	A	A	A	A	A	A	A	A
08/02/12	A	A	A	A	A	A	A	A	A	A
08/03/12	A	A	A	A	A	A	A	A	A	A
08/04/12	2	3	2	3	A	2	4	3	3	3
08/05/12	A	A	A	A	4	A	A	A	A	A
08/06/12	9	8	8	8	8	10	8	7	8	7
08/07/12	13	12	14	13	14	14	15	13	14	15
x # Young 24.8 C.V. 5.95% x% Survival 100% C.V. 0.00%										

41% Effluent										
Date	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
08/01/12	A	A	A	A	A	A	A	A	A	A
08/02/12	A	A	A	A	A	A	A	A	A	A
08/03/12	A	A	A	A	A	A	A	A	A	A
08/04/12	2	3	3	2	4	A	4	3	3	2
08/05/12	A	A	A	A	A	A	A	A	A	A
08/06/12	9	7	7	10	8	8	9	8	7	8
08/07/12	13	12	14	13	14	13	12	13	14	13
x # Young 24.2 C.V. 4.86% x% Survival 100% C.V. 0.00%										

55% Effluent										
Date	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
08/01/12	A	A	A	A	A	A	A	A	A	A
08/02/12	A	A	A	A	A	A	A	A	A	A
08/03/12	A	A	A	A	A	A	A	A	A	A
08/04/12	2	A	3	2	4	A	A	2	3	2
08/05/12	A	3	A	A	A	4	3	A	A	A
08/06/12	10	7	8	7	9	8	8	8	9	8
08/07/12	12	13	13	14	14	13	13	14	15	13
x # Young 24.8 C.V. 5.81% 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

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

City of Springdale WWTF

Lab ID# 19909

Test Date: July 31, 2012

73% Effluent

Date	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10	
08/01/12	A	A	A	A	A	A	A	A	A	A	
08/02/12	A	A	A	A	A	A	A	A	A	A	
08/03/12	A	A	A	A	A	A	A	A	A	A	
08/04/12	3	A	2	A	4	3	4	3	3	4	
08/05/12	A	2	A	4	A	A	A	A	A	A	
08/06/12	8	10	7	8	7	8	8	9	7	8	
08/07/12	11	12	11	12	11	12	12	12	10	12	
	13	12	14	13	12	13	13	13	12	14	
	24	24	23	25	23	25	25	25	22	26	
		x# Young 24.2		C.V. 5.08%							
		x% Survival 100%		C.V. 0.00%							

97% Effluent

Date	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10	
08/01/12	A	A	A	A	A	A	A	A	A	A	
08/02/12	A	A	A	A	A	A	A	A	A	A	
08/03/12	A	A	A	A	A	A	A	A	A	A	
08/04/12	2	2	A	3	4	A	2	3	A	A	
08/05/12	A	A	4	A	A	4	A	A	2	4	
08/06/12	7	8	7	8	8	8	7	8	8	7	
08/07/12	9	10	11	9	12	12	9	11	10	11	
	13	13	12	12	12	13	14	12	13	12	
	22	23	23	21	24	25	23	23	23	23	
		x# Young 23.0		C.V. 4.58%							
		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

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

City of Springdale WWTF

Lab ID# 19909

Test Date: July 31, 2012

WET CHEMISTRY MEASUREMENTS

Date	Time	Temp	Samp. No.	pH of Solution						Analyst
				CON	31%	41%	55%	73%	97%	
07/31/12	Start	25.0	1	8.44	8.38	8.29	8.23	8.16	8.06	STC
08/01/12	24 Hr.	25.1	1	8.11	8.08	8.04	8.04	8.02	8.00	MJ
08/01/12	Renew	25.1	1	8.02	7.99	7.93	7.89	7.87	7.86	MJ
08/02/12	48 Hr.	24.8	1	8.51	8.46	8.38	8.33	8.30	8.28	SK
08/02/12	Renew	25.0	2	8.14	7.94	7.87	7.81	7.64	7.46	SK
08/03/12	72 Hr.	25.4	2	8.64	8.54	8.47	8.34	8.28	8.19	SK
08/03/12	Renew	25.4	2	8.30	8.16	8.10	8.03	7.95	7.84	SK
08/04/12	96 Hr.	24.9	2	8.23	8.19	8.23	8.16	8.11	8.06	SK
08/04/12	Renew	25.0	3	8.29	8.23	8.17	8.14	8.01	7.84	SK
08/05/12	120 Hr.	24.8	3	8.18	8.18	8.15	8.15	8.12	8.03	SK
08/05/12	Renew	25.4	3	8.21	8.10	8.03	7.96	7.87	7.74	SK
08/06/12	144 Hr.	25.1	3	8.40	8.46	8.61	8.46	8.39	8.43	SK
08/06/12	Renew	25.5	3	8.39	8.32	8.43	8.24	8.14	8.17	SK
08/07/12	168 Hr.	25.1	3	8.24	8.22	8.22	8.19	8.15	8.13	STC

Date	Time	Temp	Samp. No.	DO (mg/L) of Solution						Analyst
				CON	31%	41%	55%	73%	97%	
07/31/12	Start	25.0	1	8.55	8.48	8.99	8.89	8.86	8.44	STC
08/01/12	24 Hr.	25.1	1	8.90	8.39	8.24	8.16	8.11	8.07	MJ
08/01/12	Renew	25.1	1	8.49	8.70	8.76	8.74	8.79	8.75	MJ
08/02/12	48 Hr.	24.8	1	7.73	7.74	7.58	7.69	7.69	7.68	SK
08/02/12	Renew	25.0	2	7.73	7.90	7.93	7.98	8.38	8.49	SK
08/03/12	72 Hr.	25.4	2	8.51	8.58	8.69	8.80	8.81	8.84	SK
08/03/12	Renew	25.4	2	7.98	8.08	8.27	8.31	8.39	8.39	SK
08/04/12	96 Hr.	24.9	2	8.09	8.41	8.49	8.40	8.33	8.30	SK
08/04/12	Renew	25.0	3	7.66	7.73	7.83	7.69	7.76	7.77	SK
08/05/12	120 Hr.	24.8	3	8.43	8.29	8.30	8.32	8.26	8.29	SK
08/05/12	Renew	25.4	3	8.31	8.23	8.28	8.23	8.32	8.33	SK
08/06/12	144 Hr.	25.1	3	7.99	8.05	8.26	8.11	8.10	8.17	SK
08/06/12	Renew	25.5	3	7.85	7.93	8.09	8.02	7.96	8.13	SK
08/07/12	168 Hr.	25.1	3	8.16	7.91	7.77	7.68	7.65	7.64	STC

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

City of Springdale WWTF

Lab ID# 19909

Test Date: July 31, 2012

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
07/31/12	1	7.52	8.94	80	80	682	<0.01	N/A	TN
08/02/12	2	7.22	8.42	80	76	679	<0.01	N/A	TN
08/04/12	3	7.39	8.21	84	82	670	<0.01	N/A	TN
07/31/12	Con	8.44	8.55	164	110	590	-	-	TN

¹ Measurements taken in 100% solution.

Huther and Associates, Inc.
 Begin Date: July 31, 2012
 Lab I.D.# 19909

CERIODAPHNIA DUBIA STATISTICAL ANALYSES
 Reproduction

Summary Statistics on Transformed Data Table 1 of 2

Grp	Identification	N	Min	Max	Mean
1	Control	10	22.000	26.000	24.200
2	31% Effluent	10	23.000	27.000	24.800
3	41% Effluent	10	22.000	26.000	24.200
4	55% Effluent	10	23.000	27.000	24.600
5	73% Effluent	10	22.000	26.000	24.200
6	97% Effluent	10	21.000	25.000	23.000

ANOVA Table

SOURCE	DF	SS	MS	F
Between	5	19.533	3.907	2.273
Within (Error)	54	92.800	1.719	
Total	59	112.333		

Critical F value = 2.45 (0.05,5,40)
 Since F < Critical F Fail to Reject Ho: All equal

Summary Statistics on Transformed Data Table 2 of 2

Grp	Identification	Variance	Sd	Sem	C.V.%
1	Control	2.178	1.476	0.467	6.10
2	31% Effluent	2.178	1.476	0.467	5.95
3	41% Effluent	1.289	1.135	0.359	4.69
4	55% Effluent	2.044	1.430	0.452	5.81
5	73% Effluent	1.511	1.229	0.389	5.08
6	97% Effluent	1.111	1.054	0.333	4.58

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

Grp	Identification	Transformed	Mean	T Stat	Sig
		Mean	Calculated In Original Units		
1	Control	24.200	24.200		
2	31% Effluent	24.800	24.800	-1.023	
3	41% Effluent	24.200	24.200	0.000	
4	55% Effluent	24.600	24.600	-0.682	
5	73% Effluent	24.200	24.200	0.000	
6	97% Effluent	23.000	23.000	2.047	

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

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	15	22	16	4

Calculated Chi-Square goodness of fit test statistic = 0.4626
 Table Chi-Square value (alpha = 0.01) = 13.277

Data Pass normality test. Continue analysis.

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

Grp	Identification	Num of Reps	Minimum Sig Diff (In Orig. Units)	Difference	
				% of Control	from Control
1	Control	10			
2	31% Effluent	10	1.354	5.6	-0.600
3	41% Effluent	10	1.354	5.6	0.000
4	55% Effluent	10	1.354	5.6	-0.400
5	73% Effluent	10	1.354	5.6	0.000
6	97% Effluent	10	1.354	5.6	1.200

Bartlett's Test For Homogeneity of Variance

Calculated B1 statistic = 1.74

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.

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

CLIENT: City of Springdale WWTF	SAMPLE TYPE: 24-Hour Composite
NPDES #: AR0022063	DATE COLLECTED: 07/30/12, 08/01/12, 08/03/12
LAB ID #: 19909	DATE RECEIVED: 07/31/12, 08/02/12, 08/04/12
TEST TYPE: 7-Day Chronic	BEGIN DATE/TIME: 07/31/12, 1640
TEST ORGANISM: <i>Pimephales promelas</i>	END DATE/TIME: 08/07/12, 1640
ORGANISM AGE: < 24 Hours	TEST TEMPERATURE (°C): 25 ± 1
ORGANISM SOURCE: In House	PHOTO PERIOD: 16-hr Light, 8-hr Dark
RECEIVING WATER: Spring Creek	LIGHT INTENSITY: 50-100 ft. candl.
DILUTION WATER: Laboratory Adjusted	TECHNICIAN: J. Lopez

SURVIVAL SUMMARY

Conc.	04/25/12					08/01/12					08/02/12					08/03/12					08/04/12				
	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
31%	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
41%	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
55%	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
73%	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
97%	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.	08/05/12					08/06/12					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
31%	8	8	8	8	8	8	8	8	8	8	100.0	0.00
41%	8	8	8	8	8	8	8	8	8	8	100.0	0.00
55%	8	8	8	8	8	8	8	8	8	8	100.0	0.00
73%	8	8	8	8	8	8	8	8	8	8	100.0	0.00
97%	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	0.4250	0.4960	0.4280	0.4970	0.4850	0.4662	7.84
31%	0.5020	0.4470	0.4960	0.4750	0.4500	0.4740	5.35
41%	0.4820	0.4160	0.5040	0.4470	0.4920	0.4682	7.71
55%	0.4910	0.4260	0.4810	0.5040	0.4690	0.4742	6.30
73%	0.4470	0.4520	0.4960	0.4190	0.5020	0.4632	7.57
97%	0.4650	0.4270	0.5020	0.4480	0.4910	0.4666	6.58

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

City of Springdale WWTF

Lab ID# 19909

Test Date: July 31, 2012

WET CHEMISTRY MEASUREMENTS

Date	Time	Temp	Samp. No.	pH of Solution						Analysis
				CON	31%	41%	55%	73%	97%	
07/31/12	Start	25.0	1	8.44	8.38	8.29	8.23	8.16	8.06	STC
08/01/12	24 Hr.	26.0	1	7.78	7.93	7.84	7.77	7.72	7.71	MJ
08/01/12	Renew	25.1	1	8.02	7.99	7.93	7.89	7.87	7.86	MJ
08/02/12	48 Hr.	25.7	1	8.07	8.10	8.03	8.13	8.04	8.00	SK
08/02/12	Renew	25.0	2	8.14	7.94	7.87	7.81	7.64	7.46	SK
08/03/12	72 Hr.	25.8	2	8.11	8.06	8.01	7.99	7.97	7.85	SK
08/03/12	Renew	25.4	2	8.30	8.16	8.10	8.03	7.95	7.84	SK
08/04/12	96 Hr.	25.9	2	8.06	8.03	8.01	7.97	7.95	7.92	SK
08/04/12	Renew	25.0	3	8.29	8.23	8.17	8.14	8.01	7.84	SK
08/05/12	120 Hr.	25.9	3	8.01	8.04	8.00	7.99	7.98	7.92	SK
08/05/12	Renew	25.4	3	8.21	8.10	8.03	7.96	7.87	7.74	SK
08/06/12	144 Hr.	25.9	3	8.14	8.15	8.12	8.05	8.06	7.96	SK
08/06/12	Renew	25.5	3	8.39	8.32	8.43	8.24	8.14	8.17	SK
08/07/12	168 Hr.	25.9	3	8.04	7.99	7.95	7.92	7.95	7.95	STC

Date	Time	Temp	Samp. No.	DO (mg/L) of Solution						Analysis
				CON	31%	41%	55%	73%	97%	
07/31/12	Start	25.0	1	8.55	8.48	8.99	8.89	8.86	8.44	STC
08/01/12	24 Hr.	26.0	1	8.51	8.63	8.48	8.46	8.51	8.54	MJ
08/01/12	Renew	25.1	1	8.49	8.70	8.76	8.74	8.79	8.75	MJ
08/02/12	48 Hr.	25.7	1	7.84	7.87	7.88	8.46	8.06	7.80	SK
08/02/12	Renew	25.0	2	7.73	7.90	7.93	7.98	8.38	8.49	SK
08/03/12	72 Hr.	25.8	2	8.21	8.33	8.36	8.36	8.52	8.45	SK
08/03/12	Renew	25.4	2	7.98	8.08	8.27	8.31	8.39	8.39	SK
08/04/12	96 Hr.	25.9	2	7.79	7.79	7.81	7.83	7.86	7.87	SK
08/04/12	Renew	25.0	3	7.66	7.73	7.83	7.69	7.76	7.77	SK
08/05/12	120 Hr.	25.9	3	7.88	7.90	7.91	7.87	7.91	7.92	SK
08/05/12	Renew	25.4	3	8.31	8.23	8.28	8.23	8.32	8.33	SK
08/06/12	144 Hr.	25.9	3	7.87	7.91	7.88	7.85	7.82	7.61	SK
08/06/12	Renew	25.5	3	7.85	7.93	8.09	8.02	7.96	8.13	SK
08/07/12	168 Hr.	25.9	3	8.15	8.16	8.14	8.13	8.16	8.28	STC

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

City of Springdale WWTF

Lab ID# 19909

Test Date: July 31, 2012

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
07/31/12	1	7.52	8.94	80	80	682	<0.01	N/A	TN
08/02/12	2	7.22	8.42	80	76	679	<0.01	N/A	TN
08/04/12	3	7.39	8.21	84	82	670	<0.01	N/A	TN
07/31/12	Con	8.44	8.55	164	110	590	-	-	TN

¹Measurements 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	0.425	0.497	0.466
2	31% Effluent	5	0.447	0.502	0.474
3	41% Effluent	5	0.416	0.504	0.468
4	55% Effluent	5	0.426	0.504	0.474
5	73% Effluent	5	0.419	0.502	0.463
6	97% Effluent	5	0.427	0.502	0.467

Summary Statistics on Transformed Data Table 2 of 2

Grp	Identification	Variance	Sd	Sem	C.V.%
1	Control	0.001	0.037	0.016	7.84
2	31% Effluent	0.001	0.025	0.011	5.35
3	41% Effluent	0.001	0.036	0.016	7.71
4	55% Effluent	0.001	0.030	0.013	6.30
5	73% Effluent	0.001	0.035	0.016	7.57
6	97% Effluent	0.001	0.031	0.014	6.58

Shapiro - Wilk's Test For Normality

D = 0.025

W = 0.906

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 = 0.70

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	0.000	0.000	0.094
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 Calculated In Original Units	T Stat	Sig
1	Control	0.466	0.466		
2	31% Effluent	0.474	0.474	-0.379	
3	41% Effluent	0.468	0.468	-0.097	
4	55% Effluent	0.474	0.474	-0.389	
5	73% Effluent	0.463	0.463	0.146	
6	97% Effluent	0.467	0.467	-0.019	

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	31% Effluent	5	0.049	10.4	-0.008
3	41% Effluent	5	0.049	10.4	-0.002
4	55% Effluent	5	0.049	10.4	-0.008
5	73% Effluent	5	0.049	10.4	0.003
6	97% Effluent	5	0.049	10.4	-0.000

**APPENDIX A
RAW DATA**

7-DAY CERIODAPH Nia DUBIA SURVIVAL & REPRODUCTION

DAILY RAW DATA TABLE

PAGE 1 OF 2

CLIENT Springdale
 OUTFALL 001
 LAB ID # 19909

START DATE/TIME 7-31-12 KD 1615
 END DATE/TIME 8-7-12 KD 1615

Con

Date	Rep1	Rep2	Rep3	Rep4	Rep5	Rep6	Rep7	Rep8	Rep9	Rep10	Analyst	Time
8/1	A	A	A	A	A	A	A	A	A	A	MJ	1615
8/2	A	A	A	A	A	A	A	A	A	A	MJ	1400
8/3	A	A	A	A	A	A	A	A	A	A	MH	1000
8/4	A	2	2	A	3	2	3	3	A	A	MJ	1420
8/5	3	A	A	4	A	A	A	4	3		KD	1100
8/6	8	10	9	8	8	9	10	8	9	9	MH	1535
8/7	13	12	12	13	12	11	13	12	13	14	KD	1615
	24	21	23	25	23	22	26	27	26	26		

\bar{x} # Young w/o Dead = 24.2 CV% = 6.10

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

\bar{x} % Survival = 100.0 CV% = 0.00

31

Date	Rep1	Rep2	Rep3	Rep4	Rep5	Rep6	Rep7	Rep8	Rep9	Rep10	Analyst	Time
8/1	A	A	A	A	A	A	A	A	A	A	MJ	1615
8/2	A	A	A	A	A	A	A	A	A	A	MJ	1400
8/3	A	A	A	A	A	A	A	A	A	A	MH	1000
8/4	2	3	2	3	A	2	4	3	3	3	MJ	1420
8/5	A	A	A	A	4	A	A	A	A	A	KD	1100
8/6	9	8	8	8	9	10	8	7	8	7	MH	1535
8/7	13	12	14	13	14	14	15	13	14	15	KD	1615
	24	23	24	24	27	26	27	23	25	25		

\bar{x} # Young w/o Dead = 24.8 CV% = 5.95

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

\bar{x} % Survival = 100.0 CV% = 0.00

41

Date	Rep1	Rep2	Rep3	Rep4	Rep5	Rep6	Rep7	Rep8	Rep9	Rep10	Analyst	Time
8/1	A	A	A	A	A	A	A	A	A	A	MJ	1615
8/2	A	A	A	A	A	A	A	A	A	A	MJ	1400
8/3	A	A	A	A	A	A	A	A	A	A	MH	1000
8/4	2	3	3	2	4	A	4	3	3	2	MJ	1420
8/5	A	A	A	A	4	A	A	A	A	A	KD	1100
8/6	7	7	10	8	8	9	8	7	8		MH	1535
8/7	13	12	14	13	14	13	12	13	14	13	KD	1615
	24	22	24	25	26	25	25	24	24	23		

\bar{x} # Young w/o Dead = 24.2 CV% = 4.69

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

\bar{x} % Survival = 100.0 CV% = 0.00

55

Date	Rep1	Rep2	Rep3	Rep4	Rep5	Rep6	Rep7	Rep8	Rep9	Rep10	Analyst	Time
8/1	A	A	A	A	A	A	A	A	A	A	MJ	1615
8/2	A	A	A	A	A	A	A	A	A	A	MJ	1400
8/3	A	A	A	A	A	A	A	A	A	A	MH	1000
8/4	2	A	3	2	4	A	A	2	3	2	MJ	1420
8/5	A	3	A	A	A	4	3	A	A	A	KD	1100
8/6	10	7	8	7	9	8	8	9	9	9	MH	1535
8/7	12	13	13	14	14	13	13	14	15	13	KD	1615
	24	23	24	23	27	25	24	25	27	24		

\bar{x} # Young w/o Dead = 24.6 CV% = 5.81

\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 Springdale
 OUTFALL 001
 LAB ID # 19909

START DATE/TIME 7-31-12 KD 1615
 END DATE/TIME 8-7-12 KD 1615

73

Date	Rep1	Rep2	Rep3	Rep4	Rep5	Rep6	Rep7	Rep8	Rep9	Rep10	Analyst	Time
8/1	A	A	A	A	A	A	A	A	A	A	TJ2	1615
8/2	A	A	A	A	A	A	A	A	A	A	TJ2	1400
8/3	A	A	A	A	A	A	A	A	A	A	MH	1000
8/4	3	A	2	A	4	3	4	3	3	4	TJ2	1420
8/5	A	2	A	4	A	A	A	A	A	A	KD	1100
8/6	8	10	7	8	7	9	8	9	7	8	MH	1535
8/7	13	12	14	13	12	13	13	12	14		KD	1615
	24	24	23	25	23	25	25	22	26			

\bar{x} # Young w/o Dead = 24.2 CV% = 5.08

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

\bar{x} % Survival = 100.0 CV% = 0.00

97

Date	Rep1	Rep2	Rep3	Rep4	Rep5	Rep6	Rep7	Rep8	Rep9	Rep10	Analyst	Time
8/1	A	A	A	A	A	A	A	A	A	A	TJ2	1615
8/2	A	A	A	A	A	A	A	A	A	A	TJ2	1400
8/3	A	A	A	A	A	A	A	A	A	A	MH	1000
8/4	2	2	A	3	4	A	2	3	A	A	TJ2	1420
8/5	A	A	4	A	A	4	A	A	A	4	KD	1100
8/6	7	8	7	6	8	8	7	8	8	7	MH	1535
8/7	13	13	12	12	12	13	14	12	13	12	KD	1615
	22	23	23	21	24	25	23	23	23	23		

\bar{x} # Young w/o Dead = 23.0 CV% = 4.58

\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% =

Chronic Toxicity Summary Form

Permittee: Springdale
 Or fall: 001
 ID No.: 19909
 Start Time/Date: 7-31-12 1615

Ceriodaphnia dubia
Chemical Parameters Chart

End Date/Time: 8-7-12 1615

Date	Time	Temp.	Samp. No.	pH of Solution						Analyst
				CON	31	41	55	73	97	
7/31	Start	25.0	1	8.44	8.38	8.29	8.23	8.16	8.06	SK
8/1	24 Hr.	25.1	1	8.11	8.08	8.04	8.04	8.02	8.00	SK
8/1	Renew	25.1	1	8.02	7.99	7.93	7.89	7.87	7.86	SK
8/2	48 Hr.	24.8	1	8.51	8.46	8.38	8.33	8.30	8.28	SK
8/2	Renew	25.0	2	8.14	7.94	7.87	7.81	7.64	7.46	SK
8/3	72 Hr.	25.4	2	8.44	8.54	8.47	8.34	8.28	8.19	SK
8/3	Renew	25.4	2	8.30	8.16	8.10	8.03	7.95	7.84	SK
8/4	96 Hr.	24.9	2	8.23	8.19	8.23	8.16	8.11	8.06	SK
8/4	Renew	25.0	3	8.29	8.23	8.17	8.14	8.01	7.84	SK
8/5	120 Hr.	24.8	3	8.18	8.18	8.15	8.15	8.12	8.03	SK
8/5	Renew	25.4	3	8.21	8.10	8.03	7.96	7.87	7.74	SK
8/6	144 Hr.	25.1	3	8.40	8.46	8.61	8.46	8.39	8.43	SK
8/6	Renew	25.5	3	8.39	8.32	8.43	8.24	8.14	8.17	SK
8/7	168 Hr.	25.1	3	8.24	8.22	8.22	8.19	8.15	8.13	SK

Date	Time	Temp.	Samp. No.	DO(mg/L) of Solution						Analyst
				CON	31	41	55	73	97	
7/31	Start	25.0	1	8.55	8.48	8.99	8.89	8.86	8.44	SK
8/1	24 Hr.	25.1	1	8.30	8.39	8.24	8.16	8.11	8.07	SK
8/1	Renew	25.1	1	8.49	8.70	8.76	8.74	8.79	8.75	SK
8/2	48 Hr.	24.8	1	7.73	7.74	7.58	7.69	7.69	7.68	SK
8/2	Renew	25.0	2	7.73	7.90	7.93	7.98	8.38	8.49	SK
8/3	72 Hr.	25.4	2	8.51	8.58	8.69	8.80	8.81	8.84	SK
8/3	Renew	25.4	2	7.98	8.08	8.27	8.31	8.39	8.39	SK
8/4	96 Hr.	24.9	2	8.09	8.41	8.49	8.40	8.33	8.30	SK
8/4	Renew	25.0	3	7.66	7.73	7.83	7.69	7.76	7.77	SK
8/5	120 Hr.	24.8	3	8.43	8.29	8.30	8.32	8.26	8.29	SK
8/5	Renew	25.4	3	8.31	8.23	8.28	8.23	8.32	8.33	SK
8/6	144 Hr.	25.1	3	7.99	8.05	8.26	8.11	8.10	8.17	SK
8/6	Renew	25.5	3	7.85	7.93	8.09	8.02	7.96	8.13	SK
8/7	168 Hr.	25.1	3	8.16	7.91	7.77	7.68	7.65	7.64	SK

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

CLIENT/FACILITY Springdale
 OUTFALL # 001 PROJECT # 19909
 ORGANISM ID# PPB-1L-212

DATE/TIME STARTED 7-31-12 AL 1640
 DATE/TIME ENDED 8-7-12 MH 1640

Conc.	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
31	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
41	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
55	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
73	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
97	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>8-1-12 AL 1640</u>					<u>8-2-12 MH 0915</u>					<u>8-3-12 AL 0940</u>					<u>8-4-12 MH 0920</u>					<u>8-5-12 MH 0940</u>				

Conc.	A	B	C	D	E	A	B	C	D	E	Mean Survival	CV%
Con	8	8	8	8	8	8	8	8	8	8	100.0	0.00
31	8	8	8	8	8	8	8	8	8	8	100.0	0.00
41	8	8	8	8	8	8	8	8	8	8	100.0	0.00
55	8	8	8	8	8	8	8	8	8	8	100.0	0.00
73	8	8	8	8	8	8	8	8	8	8	100.0	0.00
97	8	8	8	8	8	8	8	8	8	8	100.0	0.00
Initials Date/Time	<u>8-6-12 AL 0920</u>					<u>8-7-12 MH 1640</u>						

Chronic Toxicity Summary Form

Permittee: Springdale
 Outfall: 001
 ID No.: 19909
 Begin Time/Date: 7-31-12 1640

Pimephales promelas
Chemical Parameters Chart

End Date/Time: 8-7-12 1640

Date	Time	Temp.	Samp. No.	pH of Solution						Analyst
				CON	31	41	55	73	97	
7/31	Start	25.0	1	8.44	8.38	8.29	8.23	8.16	8.06	SK
8/1	24 Hr.	26.0	1	7.78	7.93	7.84	7.77	7.72	7.71	
8/1	Renew	25.1	1	8.02	7.99	7.93	7.89	7.87	7.86	SK
8/2	48 Hr.	25.7	1	8.07	8.10	8.03	8.13	8.04	8.00	
8/2	Renew	25.0	2	8.14	7.94	7.87	7.81	7.64	7.46	SK
8/3	72 Hr.	25.8	2	8.11	8.06	8.01	7.99	7.97	7.85	
8/3	Renew	25.4	2	8.30	8.16	8.10	8.03	7.95	7.84	SK
8/4	96 Hr.	25.9	2	8.66	8.03	8.01	7.97	7.95	7.92	
8/4	Renew	25.0	3	8.29	8.23	8.17	8.14	8.01	7.84	SK
8/5	120 Hr.	25.9	3	8.01	8.04	8.00	7.99	7.98	7.92	
8/5	Renew	25.4	3	8.21	8.10	8.03	7.96	7.87	7.74	SK
8/6	144 Hr.	25.9	3	8.14	8.15	8.12	8.05	8.06	7.96	
8/6	Renew	25.5	3	8.39	8.32	8.43	8.24	8.14	8.17	SK
8/7	168 Hr.	25.9	3	8.04	7.99	7.95	7.92	7.95	7.93	

Date	Time	Temp.	Samp. No.	DO(mg/L) of Solution						Analyst
				CON	31	41	55	73	97	
7/31	Start	25.0	1	8.55	8.48	8.99	8.89	8.86	8.44	SK
8/1	24 Hr.	26.0	1	8.51	8.63	8.48	8.46	8.51	8.54	
8/1	Renew	25.1	1	8.49	8.70	8.76	8.74	8.79	8.75	SK
8/2	48 Hr.	25.7	1	7.84	7.87	7.88	8.46	8.06	7.80	
8/2	Renew	25.0	2	7.73	7.90	7.93	7.98	8.38	8.49	SK
8/3	72 Hr.	25.8	2	8.21	8.33	8.36	8.36	8.52	8.45	
8/3	Renew	25.4	2	7.98	8.08	8.27	8.31	8.39	8.39	SK
8/4	96 Hr.	25.9	2	7.79	7.79	7.81	7.83	7.86	7.87	
8/4	Renew	25.0	3	7.66	7.73	7.83	7.69	7.76	7.77	SK
8/5	120 Hr.	25.9	3	7.88	7.90	7.91	7.87	7.91	7.92	
8/5	Renew	25.4	3	8.31	8.23	8.28	8.23	8.32	8.33	SK
8/6	144 Hr.	25.9	3	7.87	7.91	7.88	7.85	7.82	7.61	
8/6	Renew	25.5	3	7.85	7.93	8.09	8.02	7.98	8.13	SK
8/7	168 Hr.	25.9	3	8.05	8.16	8.41	8.13	8.16	8.28	

Client / Facility Springdale
 Lab ID Number 19909
 Outfall Number 001
 Test Date 7-31-12

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
7/31	1	7.52	8.94	80	80	682	0.01	Na	TN
8/2	2	7.22	8.42	80	76	679	S	S	S
8/4	3	7.39	8.21	84	82	670	S	S	S
7/31	CON	8.44	8.55	164	110	590	-	-	S

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

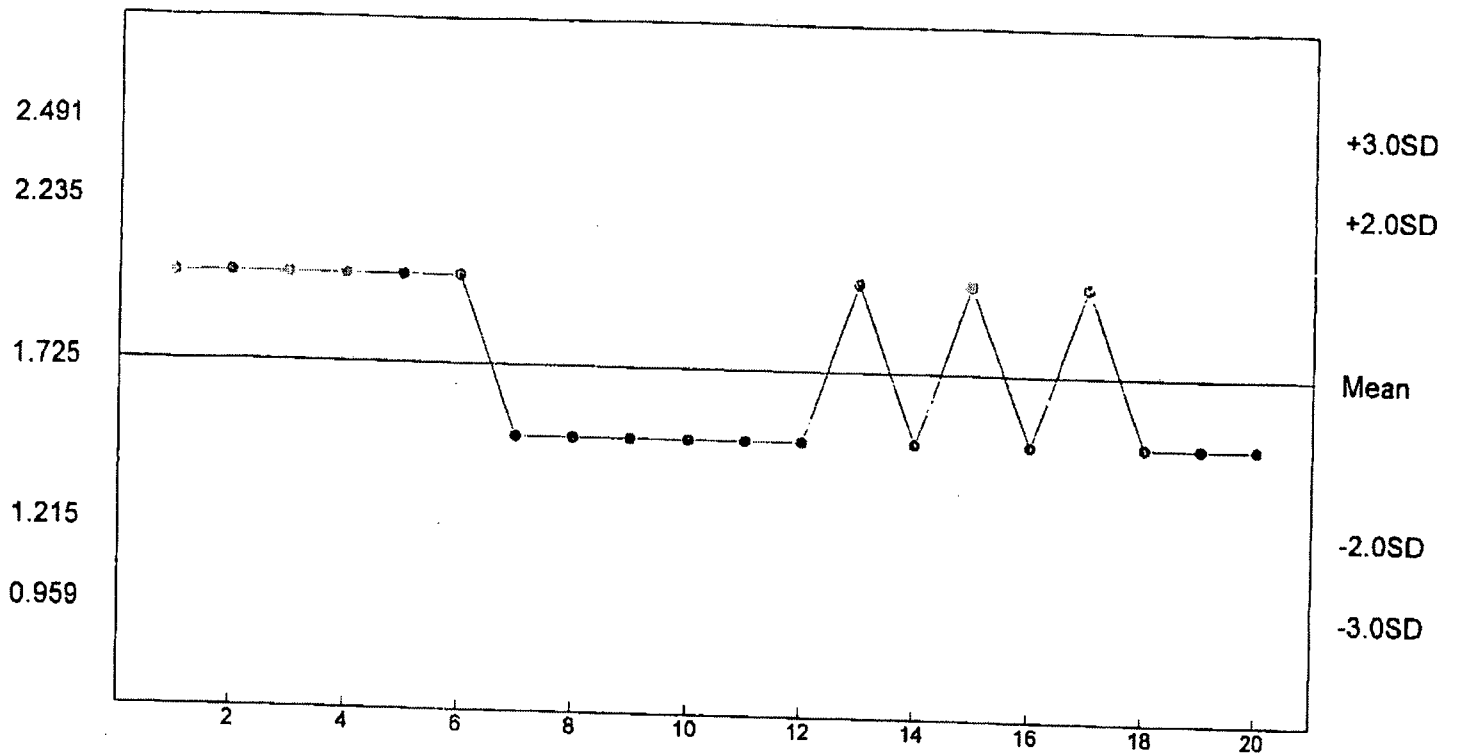
SPECIES: *Ceriodaphnia dubia*
 CHEMICAL: Sodium Chloride
 DURATION: 7-Days
 TEST NUMBER: 7
 TEST DATE/TIME: 07/02/12 - 07/09/12
 1415 Hrs - 1415 Hrs
 STATISTICAL METHOD: Fishers, Dunnetts/Steels

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

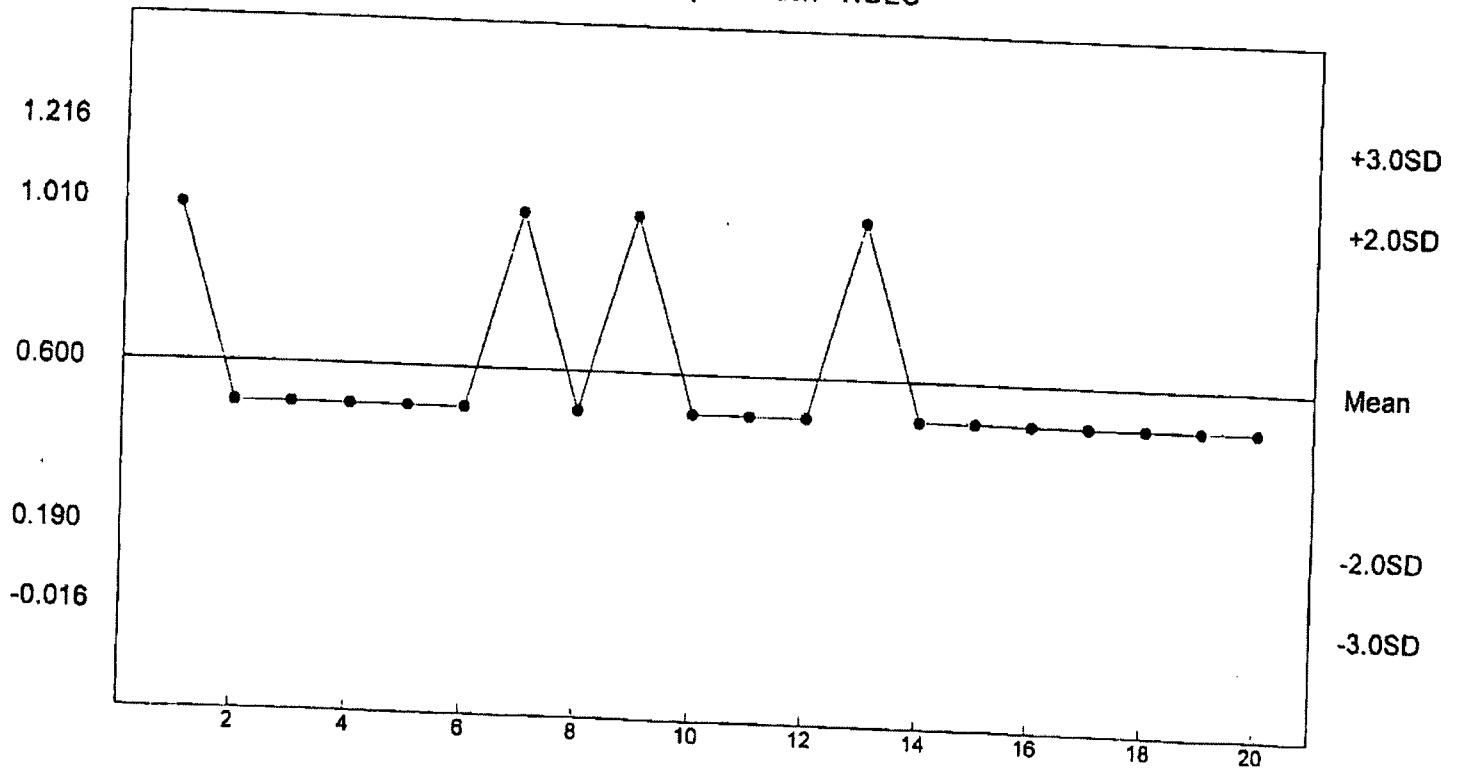
C. dubia Survival - NOEC



n= 20 Mean= 1.725 SD= 0.255 CV= 14.79% Min= 1.500 Max= 2.000

Reference Tox Sodium Chloride g/L

C. dubia Reproduction - NOEC



n= 20 Mean= 0.600 SD= 0.205 CV= 34.20% Min= 0.500 Max= 1.000

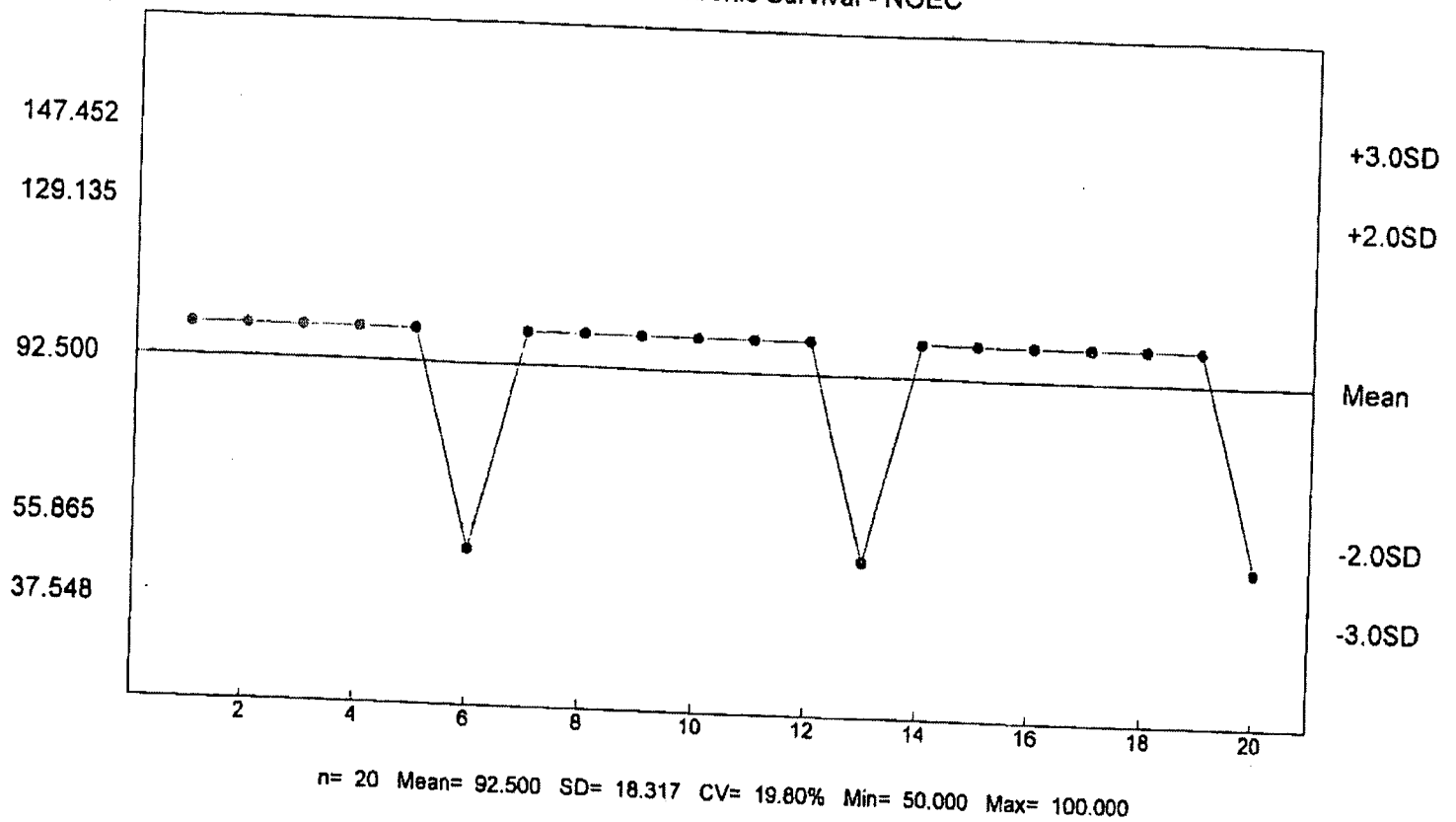
CHRONIC REFERENCE TOXICANT TEST RESULTS

SPECIES: *Pimephales promelas*
 CHEMICAL: Copper Nitrate
 DURATION: 7-Days
 TEST NUMBER: 7
 TEST DATE/TIME: 07/02/12 - 07/09/12
 1400 Hrs - 1400 Hrs
 STATISTICAL METHOD: Dunnetts/Steels

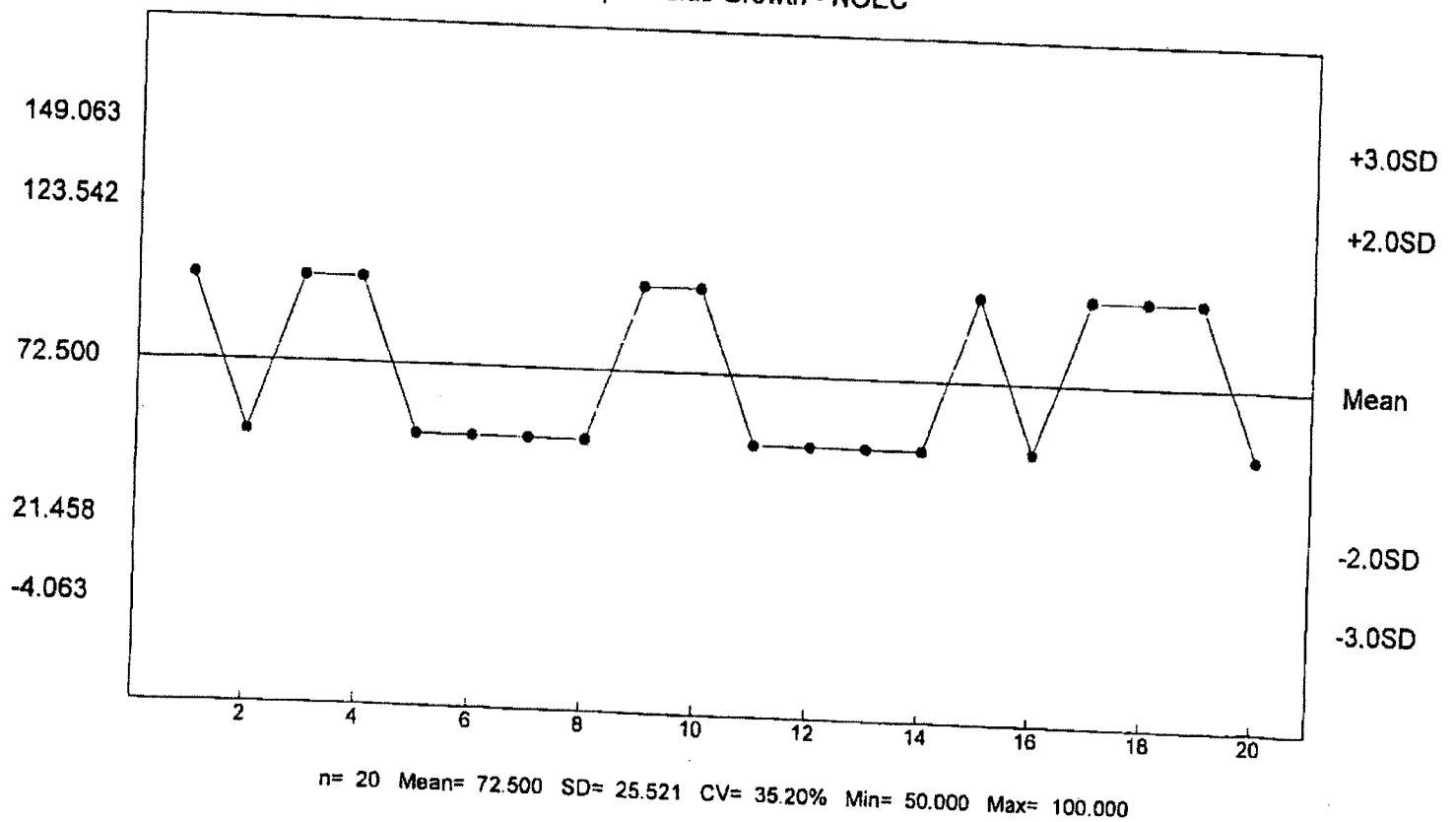
CONCENTRATION (ug/L)	NUMBER EXPOSED	NUMBER DEAD
12.5	40	0
25	40	3
50	40	2
100	40	9
200	40	26
400	40	37
800	40	40

LOEC FOR SURVIVAL	NOEC FOR SURVIVAL	LOEC FOR GROWTH	NOEC FOR GROWTH
100 ug/L	50 ug/L	100 ug/L	50 ug/L

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



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



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 # 19909 PROJECT NAME Springdale PERMIT # NPDES A20022063

OUTFALL SAMPLES

24-Hr Flow Weighted Composite _____ Other 24 HR TIME/GRABS COMP.

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	OPERATIONAL STAFF	0800 07/29/12	0900 07/30/12	12		✓		(01)

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 7day C/F
 NAME OF RECEIVING WATER Spring Creek
 DILUTION WATER USED FOR THIS TEST LAB

RELINQUISHED BY: Josh Warner DATE: 07/30/12 TIME: 0900 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 X Pick Up _____ Client Delivered _____ Other _____

RECEIVED: Matt Warner DATE: 7-31-12 TIME: 1540 SAMPLE TEMP. @ RECEIPT. 4.2

CHAIN OF CUSTODY RECORD

PROJECT # 19909 PROJECT NAME Springdale PERMIT # NPDES #R0022003

OUTFALL SAMPLES

24-Hr Flow Weighted Composite _____ Other 24^{hr} FLOW PROP.

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	operations Staff	07/31/12 0000	07/31/12 2400	240	✓			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 2day C/F
NAME OF RECEIVING WATER Spring Creek
DILUTION WATER USED FOR THIS TEST LAB

RELINQUISHED BY: Rachel F. DATE: 08/01/12 TIME: 1106 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: Matasha Felix DATE: 8-2-12 TIME: 09:50 SAMPLE TEMP. @ RECEIPT. 6.0°

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

CHAIN OF CUSTODY RECORD

PROJECT # 19909 PROJECT NAME Springdale PERMIT # NPDES AR 00220007

OUTFALL SAMPLES

24-Hr Flow Weighted Composite _____ Other 24HR FLOW COMP.

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	OPERATIONS STAFF	0000 08/02/12	2400 08/02/12	217	✓			(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
RECEIVING WATER SAMPLES				

TYPE OF TEST 7day C/E
 NAME OF RECEIVING WATER Spring Creek
 DILUTION WATER USED FOR THIS TEST LAB

RELINQUISHED BY: Julie Warner DATE: 08/03/12 TIME: 0830 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: Natalia Zeler DATE: 8-4-12 TIME: 0950 SAMPLE TEMP. @ RECEIPT: 6.0°

**CITY OF SPRINGDALE WWTF
 NPDES PERMIT NO. AR0022063
 AFIN NO. 72-00003
 BIOMONITORING REPORTING
 TEST DATE: 07/31/12**

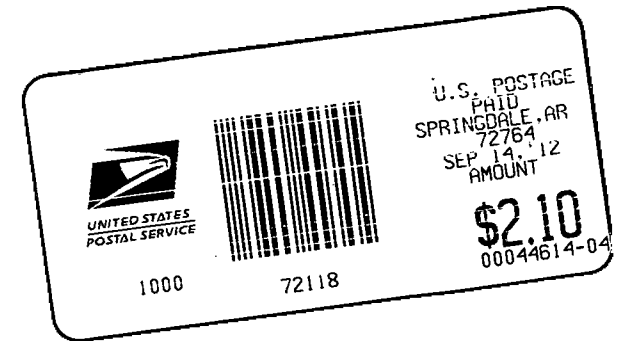
I. *Ceriodaphnia dubia*

	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) Report the NOEC value for survival, Parameter No. TOP3B.	97%
(C) Report the NOEC value for reproduction, Parameter No. TPP3B.	97%
(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 (critical dilution or control) Coefficient of Variation, Parameter No. TQP3B.	6.10%

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) Report the NOEC value for survival, Parameter No. TOP6C.	97%
(C) Report the NOEC value for growth, Parameter No. TPP6C.	97%
(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 (critical dilution or control) Coefficient of Variation, Parameter No. TQP6C.	7.84%
22415 Retest Number 1	Leave Blank
22416 Retest Number 2	Leave Blank

Springdale Water Utilities
Wastewater Treatment Plant
P.O. Box 769
Springdale, Arkansas 72765-0769



Mary Barnett
Arkansas Department of Environmental
Quality
4301 Northshore Drive
North Little Rock, AR 72118-5317

