Arkansas Analytical, Inc.

Toxicity Test Results
City of DeQueen
NPDES PERMIT NUMBER: AR0021733
First Quarter 2017
AFIN # 67-00023

Fathead Minnow, *Pimephales promelas,* Larval Survival and Growth Test
Test 1000.0

Ceriodaphnia dubia, Survival and Reproduction Test
Test 1002.0

Prepared for: **Mr. Mike Sims**
City of DeQueen
P.O. Box 730
DeQueen, Arkansas 71832

Prepared by: Arkansas Analytical, Inc.
8100 National Drive
Little Rock, Arkansas 72209
Lab Number K1702003

Wednesday, February 22, 2017

Plant location

City of DeQueen. 1/8 mile south from intersection of Coulter Ave. and south of 9th Street on Philip Cox Blvd, in Section 36, Township 8 South, Range 32 West in Sevier County, Arkansas.

Test Methods

EPA Method 1000.0 *Pimephales promelas*, Larval survival and growth test

- Test chambers: 500 mL plastic cups
- Test solution volume: 250 mL
- Number of test organisms per chamber: 10
- Number of replicates per concentration: 5
- Test temperature 25°C ± 1°C
- Test concentrations: 0%, 32%, 42%, 56%, 75%, 100%
- Dilution water: Moderately hard synthetic
- No deviation from method

EPA Method 1002.0 *Ceriodaphnia dubia*, Survival and reproduction test

- Test chambers: 30 mL plastic cups
- Test solution volume: 15 mL
- Number of test organisms per chamber: 1
- Number of replicates per concentration: 10
- Test temperature 25°C ± 1°C
- Test concentrations: 0%, 32%, 42%, 56%, 75%, 100%
- Dilution water: Moderately hard synthetic
- No deviation from method

Reference Toxicant Data

REFERENCE TOXICANT (Potassium Chloride)

Ceriodaphnia dubia 1/5/17-1/12/17		*Pimephales promelas 1/5/17-1/12/17*	
NOEC Survival:	250 ppm KCl	NOEC Survival:	500 ppm KCl
LOEC Survival:	500 ppm KCl	LOEC Survival:	1000 ppm KCl
NOEC Reproduction:	250 ppm KCl	NOEC Growth:	500 ppm KCl
LOEC Reproduction:	500 ppm KCl	LOEC Growth:	1000 ppm KCl

Summary of Results

City of DeQueen

Ceriodaphnia dubia		*Pimephales promelas*	
NOEC Survival Parameter: **TOP3B**	100%	NOEC Survival Parameter: **TOP6C**	100%
Pass/Fail Survival Parameter: **TLP3B**	Pass	Pass/Fail Survival Parameter: **TLP6C**	Pass
NOEC Reproduction Parameter: **TPP3B**	100%	NOEC Growth Parameter: **TPP6C**	100%
Pass/Fail Reproduction Parameter: **TGP3B**	Pass	Pass/Fail Growth Parameter: **TGP6C**	Pass
%CV Reproduction Parameter: **TQP3B**	13.9%	%CV Growth Parameter: **TQP6C**	13.9%
PMSD Reproduction	14.5%	PMSD Growth	15.7%

Conclusion

Pimephales promelas, (Method 1000.0): The permit issued to the City of DeQueen, specifies that the **critical dilution is 100% effluent**. The effluent samples **did not** exhibit lethal or sublethal effects at the critical dilution, and, as such, **passed** both portions of the test.

Ceriodaphnia dubia, (Method 1002.0): The permit issued to the City of DeQueen, specifies that the **critical dilution is 100% effluent**. The effluent samples **did not** exhibit lethal or sublethal effects at the critical dilution, and, as such, **passed** both portions of the test.

Biomonitoring Analysts: Tracy Bounds, Shelby Chappell, Trinidy Allen, Hallie Freyaldenhoven

Reviewed by:

Tracy Bounds

Tracy Bounds, lab manager

Appendices

Arkansas Analytical Inc.

8100 National Dr.
Little Rock, AR 72209
PHONE: 501-455-3233
FAX: 501-455-6118

CHAIN OF CUSTODY RECORD

CLIENT INFORMATION	BILLING	Project Description	Turnaround Time	Preservation Codes:
City of DeQueen Wastewater Plant	City of DeQueen Wastewater Plant	Chronic Toxicity	1 Day (100%)	1. Cool, 4 Degrees Centigrade; 4. Thiosulfate for Dechlorination
514 South 9th	P.O. Box 730		2 Day (50%)	2. Sulfuric Acid (H_2SO_4), pH < 2; 5. Hydrochloric Acid(HCl)
DeQueen, AR 71832	DeQueen, AR 71832	Reporting Information	3 Day (25%)	3. Nitric Acid (HNO_3), pH < 2; 6. Sodium Hydroxide (NaOH), pH > 12
		Telephone: 870-642-5231	Routine	TEST PARAMETERS
Attn: Mike Sims		Fax: 870-642-3117	Preservative Code:	1
		Email: msims@cityofdequeen.com	Bottle Type:	P

Bottle Type Code: G = Glass; P = Plastic; V = Septum; A = Amber

Sampler(s) Signature: [signature]

Sampler(s) Printed: Michael Sims

Chronic Biomonitoring

Arkansas Analytical Work Order Number: K1702003

Field Number	SAMPLE COLLECTION Date/s	Time/s	Grab	Comp	Number of Bottles	Sample Matrix	SAMPLE IDENTIFICATION/ DESCRIPTION	Chronic Biomonitoring	Bottle Type Code
	2-5-6-17	8:00am-8:00am		X	4	Water	Final Discharge Outfall	X	A

1. Relinquished by: (Signature)	Date/Time	2. Received by: (Signature)	SAMPLE CONDITION UPON RECEIPT IN LAB	REMARKS / SAMPLE COMMENTS
[signature]	2-6-17 12:10pm	[signature]	1. CUSTODY SEALS: ✓ Yes ___ No	PO# 13130
			2. CONTAINERS CORRECT: ___ Yes ___ No	
			3. COC/LABELS AGREE: ___ Yes ___ No	
3. Relinquished by: (Signature)	Date/Time	4. Received by lab: (Signature)	4. RECEIVED ON ICE: ___ Yes ___ No	
[signature]	1658 2-6-17	Danny Riddle	5. TEMPERATURE ON RECEIPT: 1 °C	
			6. TEMPERATURE GUN ID: HHT# 2	
			FOR COMPLETION BY LAB ONLY	

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CLIENT INFORMATION	BILLING	Project Description	Turnaround Time
City of DeQueen Wastewater Plant	City of DeQueen Wastewater Plant	Chronic Toxicity	1 Day (100%)
514 South 9th	P.O. Box 730		2 Day (50%)
DeQueen, AR 71832	DeQueen, AR 71832	Reporting Information	3 Day (25%)
		Telephone: 870-642-5231	Routine
Attn: Mike Sims		Fax: 870-642-3117	Preservative Code: 1
		Email: msims@cityofdequeen.com	Bottle Type: P

Preservation Codes:
1. Cool, 4 Degrees Centigrade
2. Sulfuric Acid (H_2SO_4), pH < 2
3. Nitric Acid (HNO_3), pH < 2
4. Thiosulfate for Dechlorination
5. Hydrochloric Acid(HCl)
6. Sodium Hydroxide (NaOH), pH > 12

Sampler(s) Signature: Michael Sims

Sampler(s) Printed: Michael Sims

Field Number	SAMPLE COLLECTION Date/s	Time/s	Grab	Comp	Number of Bottles	Sample Matrix	SAMPLE IDENTIFICATION/ DESCRIPTION	Chronic Biomonitoring	TEST PARAMETERS	Bottle Type Code
	2-6-7-17	8:00-8:00		X	4	Water	Final Discharge Outfall	X		B

Bottle Type Code: G = Glass; P = Plastic; V = Septum; A = Amber

Arkansas Analytical Work Order Number: K1702003

1. Relinquished by: (Signature)	Date/Time	2. Received by: (Signature)
	2-7-17 12:30 pm	2-7-17 12:36
3. Relinquished by: (Signature)	Date/Time	4. Received by lab: (Signature)
	16:48 2-7-17	Tammy Riddle

SAMPLE CONDITION UPON RECEIPT IN LAB

1. CUSTODY SEALS:	✓ Yes	No
2. CONTAINERS CORRECT:	Yes	No
3. COC/LABELS AGREE:	Yes	No
4. RECEIVED ON ICE:	Yes	No
5. TEMPERATURE ON RECEIPT:	1 °C	
6. TEMPERATURE GUN ID:	HHT# 2	

FOR COMPLETION BY LAB ONLY

REMARKS / SAMPLE COMMENTS: PO# 73730

Revision 3
1/4/16

Arkansas Analytical Inc.
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CHAIN OF CUSTODY RECORD

CLIENT INFORMATION	BILLING	Project Description	Turnaround Time	Preservation Codes:
City of DeQueen Wastewater Plant	City of DeQueen Wastewater Plant	Chronic Toxicity	1 Day (100%)	1. Cool, 4 Degrees Centigrade / 4. Thiosulfate for Dechlorination
514 South 9th	P.O. Box 730		2 Day (50%)	2. Sulfuric Acid (H_2SO_4), pH < 2 / 5. Hydrochloric Acid(HCl)
DeQueen, AR 71832	DeQueen, AR 71832	Reporting Information	3 Day (25%)	3. Nitric Acid (HNO_3), pH < 2 / 6. Sodium Hydroxide (NaOH), pH > 12
		Telephone: 870-642-5231	Routine	TEST PARAMETERS
Attn: Mike Sims		Fax: 870-642-3117	Preservative Code:	1
		Email: msims@cityofdequeen.com	Bottle Type:	P

Bottle Type Code: G = Glass; P = Plastic; V = Septum; A = Amber

Sampler(s) Signature: Michael Sims

Sampler(s) Printed: Michael Sims

Field Number	SAMPLE COLLECTION Date/s	Time/s	Grab	Comp	Number of Bottles	Sample Matrix	SAMPLE IDENTIFICATION/ DESCRIPTION	Chronic Biomonitoring	Arkansas Analytical Work Order Number:
	2-7-8-17	8:00-8:00		X	4	Water	Final Discharge Outfall	X	K1702003 C

1. Relinquished by: (Signature)	Date/Time	2. Received by: (Signature)
Michael Sims	2-8-17 1130 AP ~~12:30 pm~~ 2-8-17	Allen Parker
3. Relinquished by: (Signature)	Date/Time	4. Received by lab: (Signature)
Allen Parker	1558 2-8-17	Sammy Riddle

SAMPLE CONDITION UPON RECEIPT IN LAB

1. CUSTODY SEALS:	√ Yes	___ No
2. CONTAINERS CORRECT:	√ Yes	___ No
3. COC/LABELS AGREE:	√ Yes	___ No
4. RECEIVED ON ICE:	√ Yes	___ No
5. TEMPERATURE ON RECEIPT:	2 °C	
6. TEMPERATURE GUN ID:	HHT# 2	

FOR COMPLETION BY LAB ONLY

REMARKS / SAMPLE COMMENTS: PO# 73730

CETIS Summary Report

Fathead Minnow 7-d Larval Survival and Growth Test — **Arkansas Analytical, Inc.**

Batch ID:	16-3586-4134	**Test Type:**	Growth-Survival (7d)	**Analyst:**	Shelby Chappell
Start Date:	07 Feb-17 15:10	**Protocol:**	EPA/821/R-02-013 (2002)	**Diluent:**	Mod-Hard Synthetic Water
Ending Date:	14 Feb-17 15:00	**Species:**	Pimephales promelas	**Brine:**	Not Applicable
Duration:	7d	**Source:**	Aquatox, AR	**Age:**	<24
Sample ID:	17-7609-5203	**Code:**	69DD0FE3	**Client:**	City of DeQueen
Sample Date:	06 Feb-17 08:00	**Material:**	POTW Effluent	**Project:**	WET Quarterly Compliance Test (1Q)
Receipt Date:	06 Feb-17 16:58	**Source:**	City of DeQueen (AR0021733)		
Sample Age:	31h (1 °C)	**Station:**	Final Discharge		

Sample Renewals

Renewal	Sample Code	Sample Date	Receive Date	Renewal Date	Temp °C
1	K1702003B	07 Feb-17 08:00	07 Feb-17 16:48	09 Feb-17 00:00	1
2	K1702003C	08 Feb-17 08:00	08 Feb-17 15:58	10 Feb-17 00:00	2

Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	NOEL	LOEL	TOEL	TU	PMSD ✓
20-9586-2234	7d Survival Rate	Steel Many-One Rank Sum Test	100	> 100	n/a	1	9.94%
07-9134-2317	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	100	> 100	n/a	1	15.7%

Test Acceptability

				TAC Limits			
Analysis ID	**Endpoint**	**Attribute**	**Test Stat**	**Lower**	**Upper**	**Overlap**	**Decision**
20-9586-2234	7d Survival Rate	Control Resp	0.96	0.8	>>	Yes	Passes Criteria

7d Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	D	5	0.9600	0.8489	1.0000	0.8000	1.0000	0.0400	0.0894	9.32%	0.00%
32		5	0.9800	0.9245	1.0000	0.9000	1.0000	0.0200	0.0447	4.56%	-2.08%
42		5	0.9600	0.8920	1.0000	0.9000	1.0000	0.0245	0.0548	5.71%	0.00%
56		5	0.9600	0.8920	1.0000	0.9000	1.0000	0.0245	0.0548	5.71%	0.00%
75		5	0.9600	0.8489	1.0000	0.8000	1.0000	0.0400	0.0894	9.32%	0.00%
100		5	0.9600	0.8920	1.0000	0.9000	1.0000	0.0245	0.0548	5.71%	0.00%

Mean Dry Weight-mg Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	D	5	0.4576	0.3789	0.5363	0.388	0.526	0.02836	0.06341	13.86%	0.00%
32		5	0.4242	0.3791	0.4693	0.374	0.463	0.01623	0.0363	8.56%	7.30%
42		5	0.4572	0.377	0.5374	0.4	0.539	0.02888	0.06458	14.13%	0.09%
56		5	0.4064	0.3744	0.4384	0.364	0.428	0.01153	0.02577	6.34%	11.19%
75		5	0.3982	0.3304	0.466	0.311	0.454	0.02441	0.05458	13.71%	12.98%
100		5	0.416	0.3808	0.4512	0.37	0.444	0.01268	0.02835	6.81%	9.09%

Fathead Minnow 7-d Larval Survival and Growth Test
Arkansas Analytical, Inc.

7d Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	D	1.0000	1.0000	1.0000	0.8000	1.0000
32		1.0000	1.0000	1.0000	0.9000	1.0000
42		1.0000	1.0000	0.9000	0.9000	1.0000
56		1.0000	0.9000	1.0000	0.9000	1.0000
75		0.8000	1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	0.9000	0.9000	1.0000

Mean Dry Weight-mg Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	D	0.436	0.526	0.415	0.388	0.523
32		0.374	0.403	0.429	0.452	0.463
42		0.539	0.514	0.4	0.426	0.407
56		0.364	0.405	0.409	0.426	0.428
75		0.311	0.454	0.427	0.386	0.413
100		0.444	0.431	0.424	0.411	0.37

7d Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	D	10/10	10/10	10/10	8/10	10/10
32		10/10	10/10	10/10	9/10	10/10
42		10/10	10/10	9/10	9/10	10/10
56		10/10	9/10	10/10	9/10	10/10
75		8/10	10/10	10/10	10/10	10/10
100		10/10	10/10	9/10	9/10	10/10

CETIS Summary Report

Ceriodaphnia 7-d Survival and Reproduction Test — **Arkansas Analytical, Inc.**

Batch ID:	07-6893-3805	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Tracy Bounds
Start Date:	07 Feb-17 14:15	**Protocol:**	EPA/821/R-02-013 (2002)	**Diluent:**	Mod-Hard Synthetic Water
Ending Date:	14 Feb-17 14:50	**Species:**	Ceriodaphnia dubia	**Brine:**	Not Applicable
Duration:	7d 1h	**Source:**	In-House Culture	**Age:**	<24
Sample ID:	13-1317-7660	**Code:**	4E45803C	**Client:**	City of DeQueen
Sample Date:	06 Feb-17 08:00	**Material:**	POTW Effluent	**Project:**	WET Quarterly Compliance Test (1Q)
Receipt Date:	06 Feb-17 16:58	**Source:**	City of DeQueen (AR0021733)		
Sample Age:	30h (1 °C)	**Station:**	Final Discharge		

Sample Renewals

Renewal	Sample Code	Sample Date	Receive Date	Renewal Date	Temp °C
1	K1702003B	07 Feb-17 08:00	07 Feb-17 16:48	09 Feb-17 00:00	1
2	K1702003C	08 Feb-17 08:00	08 Feb-17 15:58	10 Feb-17 00:00	2

Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	NOEL	LOEL	TOEL	TU	PMSD ✓
02-9865-7288	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	100	> 100	n/a	1	n/a
09-4556-7292	Reproduction	Dunnett Multiple Comparison Test	100	> 100	n/a	1	14.5%

Test Acceptability

				TAC Limits			
Analysis ID	Endpoint	Attribute	Test Stat	Lower	Upper	Overlap	Decision
02-9865-7288	7d Survival Rate	Control Resp	1	0.8	>>	Yes	Passes Criteria
09-4556-7292	Reproduction	Control Resp	19.8	15	>>	Yes	Passes Criteria

7d Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	D	10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
32		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
42		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
56		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
75		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
100		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%

Reproduction Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	D	10	19.8	18.86	20.74	18	22	0.4163	1.317	6.65%	0.00%
32		10	22.7	21.12	24.28	20	27	0.7	2.214	9.75%	-14.65%
42		10	24.7	22.88	26.52	20	28	0.8035	2.541	10.29%	-24.75%
56		10	25.4	23.74	27.06	23	30	0.7333	2.319	9.13%	-28.28%
75		10	26.7	24.2	29.2	22	32	1.106	3.498	13.10%	-34.85%
100		10	29	26.12	31.88	21	34	1.274	4.028	13.89%	-46.46%

Ceriodaphnia 7-d Survival and Reproduction Test

Arkansas Analytical, Inc.

7d Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	D	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
32		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
42		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
56		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
75		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

Reproduction Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	D	21	18	22	20	18	20	19	21	19	20
32		24	21	20	24	21	20	24	27	23	23
42		23	26	24	25	28	20	26	28	22	25
56		23	23	26	23	30	26	28	26	24	25
75		29	32	28	22	32	24	26	23	25	26
100		29	33	28	31	32	24	30	28	21	34

7d Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	D	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
32		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
42		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
56		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
75		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
100		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1

CHEMICAL DATA SHEET FOR CHRONIC TOXICITY TESTING									Fathead Minnow
Lab # / Sample ID K17020C3				Test Start (Date/Time) 2-7-17, 1510					
Client: DeQueen				Test End (Date/Time) 2-14-17, 1500					
		Day of Test							
		1	2	3	4	5	6	7	notes
Control	MHS 849	2-7	2-8	2-9	2-10	2-11	2-12	2-13	
D.O. (mg/L)	INITIAL	8.6	8.4	8.9	8.8	9.5	8.5	8.6	
	FINAL	7.8	7.9	8.3	8.4	7.7	7.7	8.2	
pH (s.u.)	INITIAL	8.0	7.8	7.9	7.9	7.5	7.4	7.9	
	FINAL	7.8	7.7	7.9	7.5	7.8	7.8	7.9	
temp (C)	INITIAL	22	23	20	21	21	24	22	
	FINAL	25	25	25	25	25	25	25	
ALKALINITY (mg/L)		80	→	→	→	→	→	→	
HARDNESS (mg/L)		82	→	→	→	→	→	→	
CONDUCTIVITY (umhc		309	→	→	→	→	→	→	
CHLORINE (mg/L)		<0.05	→	→	→	→	→	→	
CONC: 32%									
D.O. (mg/L)	INITIAL	8.7	8.7	8.9	9.1	8.9	9.0	8.8	
	FINAL	7.6	8.1	8.3	8.1	7.8	7.4	8.2	
pH (s.u)	INITIAL	7.9	7.8	7.7	7.6	7.8	7.6	7.7	
	FINAL	7.9	7.9	7.9	7.6	7.8	7.7	7.9	
temp (C)	INITIAL	21	25	21	22	21	24	23	
	FINAL	25	25	25	25	25	25	25	
CONC: 42%									
D.O. (mg/L)	INITIAL	8.8	9.0	9.1	9.1	9.0	9.1	9.0	
	FINAL	7.8	7.9	8.2	8.0	7.5	7.1	7.9	
pH (mg/L)	INITIAL	7.9	7.8	7.7	7.5	7.7	7.6	7.6	
	FINAL	7.9	7.9	7.8	7.7	7.6	7.7	7.8	
temp (C)	INITIAL	21	25	21	23	21	24	23	
	FINAL	25	25	25	25	25	25	25	
CONC: 56%									
D.O. (mg/L)	INITIAL	9.0	9.0	9.1	9.2	9.1	9.1	9.2	
	FINAL	7.8	7.9	8.3	8.0	7.1	7.4	7.8	
pH (s.u.)	INITIAL	7.9	7.8	7.6	7.5	7.7	7.5	7.6	
	FINAL	7.9	7.9	7.9	7.7	7.7	7.8	7.8	
temp (C)	INITIAL	21	26	22	25	21	24	24	
	FINAL	25	25	25	25	25	25	25	
CONC: 75%									
D.O. (mg/L)	INITIAL	9.1	9.0	9.1	9.3	9.1	9.2	9.2	
	FINAL	7.7	7.8	8.2	7.9	7.5	7.5	7.9	
pH (s.u.)	INITIAL	7.9	7.8	7.6	7.4	7.7	7.4	7.5	
	FINAL	7.9	7.9	7.8	7.8	7.8	7.9	7.8	
temp (C)	INITIAL	21	26	22	26	21.6	25	25	
	FINAL	25	25	25	25	25	25	25	
CONC: 100%									
D.O. (mg/L)	INITIAL	9.5	7.7	9.1	9.6	9.3	8.1	9.2	
	FINAL	7.8	7.9	8.3	7.9		7.5	7.9	
pH (s.u.)	INITIAL	7.8	7.7	7.5	7.3	7.6	7.5	7.5	
	FINAL	8.0	8.0	8.0	7.8		7.8	7.9	
temp (C)	INITIAL	21	27	23	26	22	26	25	
	FINAL	25	25	25	25		25	25	
CONC: 100 %		A	A	B	C	D	C	C	
ALKALINITY (mg/L)		94	→	78	86	78	86	→	
HARDNESS (mg/L)		64	→	48	62	48	62	→	
CONDUCTIVITY (umhc		952	→	879	964	879	964	→	
CHLORINE (mg/L)		<0.05	→	<0.05	<0.05	<0.05	<0.05	→	

CHEMICAL DATA SHEET FOR CHRONIC TOXICITY TESTING									Ceriodaphnia Dubia
Lab # / Sample ID K1702003					Test Start (Date/Time) 2-7-2017 / 1415				
Client: DeQueen					Test End (Date/Time) 2-14-2017 / 1450				
		Day of Test							
		1	2	3	4	5	6	7	notes
Control	MHS 849	2-7	2-8	2-9	2-10	2-11	2-12	2-13	
D.O. (mg/L)	INITIAL	8.6	*8.84	8.9	8.8	8.8	8.5	8.6	
	FINAL	8.6	9.0	8.6	9.0	8.8	8.8	9.6	
pH (s.u.)	INITIAL	8.0	7.8	7.9	7.9	7.8	7.4	7.9	
	FINAL	8.4	8.2	8.0	8.0	8.0	8.1	8.6	
temp (C)	INITIAL	22	*24.3	20	21	21	24	22	
	FINAL	25	25	25	25	25	25	25	
ALKALINITY (mg/L)		50	→	→	→	→	→	→	
HARDNESS (mg/L)		82	→	→	→	→	→	→	
CONDUCTIVITY (umho		309	→	→	→	→	→	→	
CHLORINE (mg/L)		<0.05	→	→	→	→	→	→	
CONC: 32%									
D.O. (mg/L)	INITIAL	8.7	8.7	8.9	9.1	8.9	9.0	8.8	
	FINAL	8.7	9.0	8.6	9.0	9.0	8.8	9.7	
pH (s.u)	INITIAL	7.9	7.8	7.7	7.6	7.8	7.6	7.7	
	FINAL	8.3	8.2	8.1	8.0	8.1	8.2	8.6	
temp (C)	INITIAL	21	25	21	22	21	24	23	
	FINAL	25	25	25	25	25	25	25	
CONC: 42%									
D.O. (mg/L)	INITIAL	8.8	9.0	9.1	9.1	9.0	9.1	9.6	
	FINAL	8.7	9.1	8.6	9.0	9.0	8.8	9.5	
pH (mg/L)	INITIAL	7.9	7.8	7.7	7.5	7.7	7.6	7.6	
	FINAL	8.4	8.2	8.1	8.0	8.1	8.2	8.5	
temp (C)	INITIAL	21	25	21	23	21	24	23	
	FINAL	25	25	25	25	25	25	25	
CONC: 56%									
D.O. (mg/L)	INITIAL	9.0	9.0	9.1	9.2	9.1	9.1	9.2	
	FINAL	8.9	9.1	8.6	9.0	9.0	8.8	9.4	
pH (s.u.)	INITIAL	7.9	7.8	7.6	7.5	7.7	7.5	7.6	
	FINAL	8.4	8.2	8.0	8.1	8.1	8.3	8.4	
temp (C)	INITIAL	21	26	22	25	21	24	24	
	FINAL	25	25	25	25	25	25	25	
CONC: 75%									
D.O. (mg/L)	INITIAL	9.1	9.0	9.1	9.3	9.1	9.2	9.2	
	FINAL	8.9	9.1	8.6	9.0	9.0	8.8	9.3	
pH (s.u.)	INITIAL	7.9	7.8	7.6	7.4	7.7	7.4	7.5	
	FINAL	8.4	8.3	8.1	8.1	8.2	8.3	8.4	
temp (C)	INITIAL	21	26	22	26	21	25	25	
	FINAL	25	25	25	25	25	25	25	
CONC: 100%									
D.O. (mg/L)	INITIAL	9.5	7.7	9.1	9.6	9.3	8.1	9.2	
	FINAL	8.9	9.1	8.6	9.0	9.0	8.8	9.3	
pH (s.u.)	INITIAL	7.8	7.7	7.5	7.3	7.6	7.5	7.5	
	FINAL	8.4	8.3	8.0	8.1	8.2	8.3	8.3	
temp (C)	INITIAL	21	27	23	26	22	26	25	
	FINAL	25	25	25	25	25	25	25	
CONC: 100 %		A	A	B	*~~B~~C	B	C	C	
ALKALINITY (mg/L)		94	→	78	86	78	86	→	
HARDNESS (mg/L)		64	→	48	62	48	62	→	
CONDUCTIVITY (umho		952	→	879	964	879	964	→	
CHLORINE (mg/L)		<0.05	→	<0.05	<0.05	<0.05	<0.05	→	

* SC 2-16-17

* SC 2-8-17

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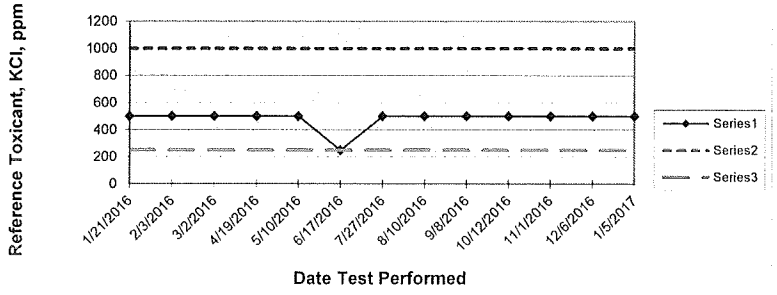
FATHEAD MINNOW SURVIVAL 7 Day
QUALITY ASSURANCE



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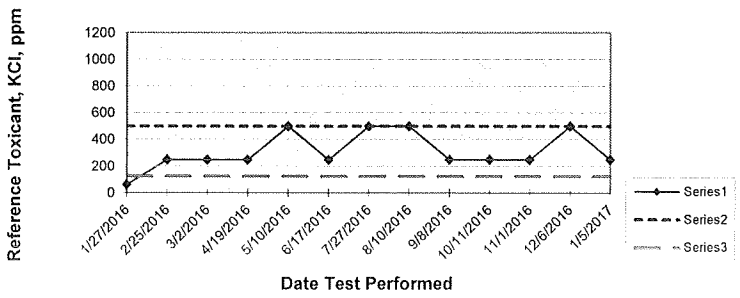
CERIODAPHNIA DUBIA SURVIVAL
QUALITY ASSURANCE



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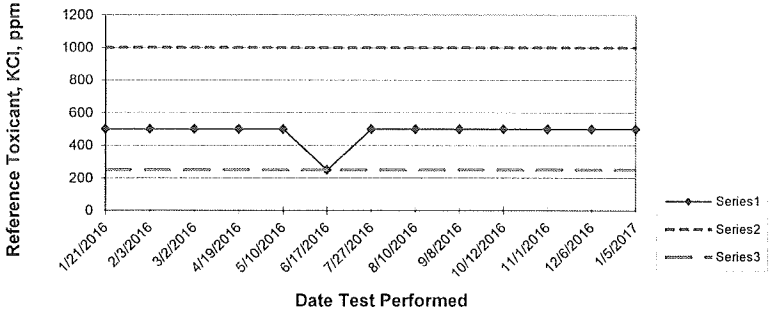
FATHEAD MINNOW GROWTH 7 Day
QUALITY ASSURANCE



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