Arkansas Analytical, Inc.

Toxicity Test Results
City of DeQueen
NPDES PERMIT NUMBER: AR0021733
Third Quarter 2016
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 K1609006

Tuesday, October 4, 2016

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 8/10/16-8/17/16		*Pimephales promelas 8/10/16-8/17/16*	
NOEC Survival:	250 ppm KCl	NOEC Survival:	500 ppm KCl
LOEC Survival:	500 ppm KCl	LOEC Survival:	1000ppm KCl
NOEC Reproduction:	250 ppm KCl	NOEC Growth:	500ppm 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 Reproduction Parameter: **TPP6C**	100%
Pass/Fail Reproduction Parameter: **TGP3B**	Pass	Pass/Fail Growth Parameter: **TGP6C**	Pass
%CV Reproduction Parameter: **TQP3B**	14.5%	%CV Growth Parameter: **TQP6C**	6.81%
PMSD Reproduction	15.7%	PMSD Growth	17.8%

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: Chris Turney, Tracy Bounds, Shelby Chappell

Reviewed by:

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
City of DeQueen Wastewater Plant	City of DeQueen Wastewater Plant
514 South 9th	P.O. Box 730
DeQueen, AR 71832	DeQueen, AR 71832
Attn: Mike Sims	

Project Description: Chronic Toxicity

Reporting Information
Telephone: 870-642-5231
Fax: 870-642-3117
Email: msims@cityofdequeen.com

Turnaround Time: 1 Day (100%) / 2 Day (50%) / 3 Day (25%) / Routine

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: MS

Sampler(s) Printed: MS

Field Number	SAMPLE COLLECTION Date/s	Time/s	Grab	Comp	Number of Bottles	Sample Matrix	SAMPLE IDENTIFICATION/ DESCRIPTION	Chronic Biomonitoring	Bottle Type Code
	~~9-10-16~~ 9/11-12/16	11:45a-9:00a		X	4	Water	Final Discharge Outfall	X	A

TEST PARAMETERS — Preservative Code: 1 | Bottle Type: P

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

Arkansas Analytical Work Order Number: K1609006

1. Relinquished by: (Signature)	Date/Time	2. Received by: (Signature)
	9-11-16 11:30 a m	~~UPS~~ FEDEX
3. Relinquished by: (Signature) FEDEX	Date/Time 9-13-16 11:30	4. Received by lab: (Signature) 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:	0 °C	
6. TEMPERATURE GUN ID:	HHT# 2	

FOR COMPLETION BY LAB ONLY

REMARKS / SAMPLE COMMENTS

Po# 73047

*Date collected changed per Mike Sims - 10/6/16 - (8)

Revision 3
1/4/16

Arkansas Analytical Inc.

8100 National Dr.
Little Rock, AR 72209
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CHAIN OF CUSTODY RECORD

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City of DeQueen Wastewater Plant	City of DeQueen Wastewater Plant
514 South 9th	P.O. Box 730
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Attn: Mike Sims	

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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: MS

Sampler(s) Printed: MS

Field Number	SAMPLE COLLECTION Date/s	Time/s	Grab	Comp	Number of Bottles	Sample Matrix	SAMPLE IDENTIFICATION/ DESCRIPTION	TEST PARAMETERS: Chronic Biomonitoring	Bottle Type Code
	9-12-13-16	11:00-9:00		X	4	Water	Final Discharge Outfall	X	B

TEST PARAMETERS: Preservative Code: 1; Bottle Type: P

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

Arkansas Analytical Work Order Number: K1609006

1. Relinquished by: (Signature)	Date/Time	2. Received by: (Signature)
MS	9-13-16 11:45am	FEDEX
3. Relinquished by: (Signature)	Date/Time	4. Received by lab: (Signature)
FEDEX	9-14-16 1155	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:	4 °C	
6. TEMPERATURE GUN ID:	HHT# 2	

FOR COMPLETION BY LAB ONLY

REMARKS / SAMPLE COMMENTS

PO# 73047

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

Sampler(s) Signature: Craig Grubbs

Sampler(s) Printed: Craig Grubbs

Field Number	SAMPLE COLLECTION Date/s	Time/s	Grab	Comp	Number of Bottles	Sample Matrix	SAMPLE IDENTIFICATION/ DESCRIPTION	Chronic Biomonitoring	Bottle Type Code	Arkansas Analytical Work Order Number:
Bio	9/13/14/16	11Am to 9AM		X	4	Water	Final Discharge Outfall	X	C	K1609006

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

1. Relinquished by: (Signature)	Date/Time	2. Received by: (Signature)
Craig Grubbs	9/13/14/16	Craig Grubbs
3. Relinquished by: (Signature)	Date/Time	4. Received by lab: (Signature)
FEDEX	9-15-16 1216	Danny Riddle

SAMPLE CONDITION UPON RECEIPT IN LAB

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

FOR COMPLETION BY LAB ONLY

REMARKS / SAMPLE COMMENTS

CETIS Summary Report

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

Batch ID:	07-0134-4829	**Test Type:**	Growth-Survival (7d)	**Analyst:**	Tracy Bounds
Start Date:	13 Sep-16 14:00	**Protocol:**	EPA/821/R-02-013 (2002)	**Diluent:**	Mod-Hard Synthetic Water
Ending Date:	20 Sep-16 15:00	**Species:**	Pimephales promelas	**Brine:**	Not Applicable
Duration:	7d 1h	**Source:**	Aquatox, AR	**Age:**	<24
Sample ID:	08-5900-9097	**Code:**	33337049	**Client:**	City of DeQueen
Sample Date:	12 Sep-16 09:00	**Material:**	POTW Effluent	**Project:**	WET Quarterly Compliance Test (3Q)
Receipt Date:	13 Sep-16 11:30	**Source:**	City of DeQueen (AR0021733)		
Sample Age:	29h (0 °C)	**Station:**	001		

Sample Renewals

Renewal	Sample Code	Sample Date	Receive Date	Renewal Date	Temp °C
1	K1609006B	13 Sep-16 09:00	14 Sep-16 11:55	15 Sep-16 00:00	4
2	K1609006	14 Sep-16 09:00	15 Sep-16 12:16	17 Sep-16 00:00	2

Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	NOEL	LOEL	TOEL	TU	PMSD ✓
16-1848-3768	7d Survival Rate	Steel Many-One Rank Sum Test	100	> 100	n/a	1	7.25%
17-6058-1140	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	100	> 100	n/a	1	17.8%

Test Acceptability

				TAC Limits			
Analysis ID	Endpoint	Attribute	Test Stat	Lower	Upper	Overlap	Decision
16-1848-3768	7d Survival Rate	Control Resp	1	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	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
32		5	0.9600	0.8920	1.0000	0.9000	1.0000	0.0245	0.0548	5.71%	4.00%
42		5	0.9600	0.8920	1.0000	0.9000	1.0000	0.0245	0.0548	5.71%	4.00%
56		5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
75		5	0.9400	0.8289	1.0000	0.8000	1.0000	0.0400	0.0894	9.52%	6.00%
100		5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	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	0.4304	0.394	0.4668	0.391	0.463	0.0131	0.0293	6.81%	0.00%
32		5	0.4302	0.3709	0.4895	0.369	0.482	0.02136	0.04776	11.10%	0.05%
42		5	0.5044	0.4138	0.595	0.428	0.621	0.03262	0.07295	14.46%	-17.19%
56		5	0.5066	0.4264	0.5868	0.404	0.563	0.02888	0.06457	12.75%	-17.70%
75		5	0.5294	0.4723	0.5865	0.459	0.572	0.02057	0.04599	8.69%	-23.00%
100		5	0.545	0.5062	0.5838	0.507	0.579	0.01398	0.03127	5.74%	-26.63%

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	1.0000	1.0000
32		1.0000	0.9000	1.0000	0.9000	1.0000
42		0.9000	1.0000	0.9000	1.0000	1.0000
56		1.0000	1.0000	1.0000	1.0000	1.0000
75		1.0000	0.9000	1.0000	1.0000	0.8000
100		1.0000	1.0000	1.0000	1.0000	1.0000

Mean Dry Weight-mg Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	D	0.44	0.463	0.41	0.448	0.391
32		0.397	0.369	0.482	0.433	0.47
42		0.428	0.621	0.515	0.494	0.464
56		0.519	0.557	0.404	0.563	0.49
75		0.563	0.543	0.572	0.51	0.459
100		0.507	0.548	0.52	0.579	0.571

7d Survival Rate Binomials

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

CETIS Summary Report

Test Code: K1609006 CD | 07-2511-2624

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

Batch ID:	05-3365-7739	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Tracy Bounds
Start Date:	13 Sep-16 13:10	**Protocol:**	EPA/821/R-02-013 (2002)	**Diluent:**	Mod-Hard Synthetic Water
Ending Date:	19 Sep-16 15:20	**Species:**	Ceriodaphnia dubia	**Brine:**	Not Applicable
Duration:	6d 2h	**Source:**	In-House Culture	**Age:**	<24
Sample ID:	01-3909-4693	**Code:**	84A6AA5	**Client:**	City of DeQueen
Sample Date:	12 Sep-16 09:00	**Material:**	POTW Effluent	**Project:**	WET Quarterly Compliance Test (3Q)
Receipt Date:	13 Sep-16 11:30	**Source:**	City of DeQueen (AR0021733)		
Sample Age:	28h (0 °C)	**Station:**	001		

Sample Renewals

Renewal	Sample Code	Sample Date	Receive Date	Renewal Date	Temp °C
1	K1609006B	13 Sep-16 09:00	14 Sep-16 11:55	15 Sep-16 00:00	4
2	K1609006C	14 Sep-16 09:00	15 Sep-16 12:16	17 Sep-16 00:00	2

Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	NOEL	LOEL	TOEL	TU	PMSD ✓
17-4028-6291	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	100	> 100	n/a	1	n/a
20-1671-1523	Reproduction	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
20-1671-1523	Reproduction	Control Resp	32.3	15	>>	Yes	Passes Criteria

6d 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	0.9000	0.6738	1.0000	0.0000	1.0000	0.1000	0.3162	35.14%	10.00%
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	32.3	28.94	35.66	24	39	1.484	4.692	14.53%	0.00%
32		10	34.2	32.86	35.54	32	38	0.5925	1.874	5.48%	-5.88%
42		10	32.5	28.3	36.7	21	41	1.857	5.874	18.07%	-0.62%
56		10	30.5	25.54	35.46	14	40	2.192	6.932	22.73%	5.57%
75		10	32.8	29.48	36.12	26	41	1.467	4.638	14.14%	-1.55%
100		10	32.1	29.09	35.11	25	41	1.329	4.202	13.09%	0.62%

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

6d 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	0.0000	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	34	34	30	33	34	25	24	34	39	36
32		34	33	38	33	34	33	34	34	32	37
42		36	26	32	33	21	33	34	30	39	41
56		40	34	32	14	28	32	26	31	35	33
75		38	32	33	27	30	33	32	36	26	41
100		35	31	31	32	28	33	41	25	33	32

6d 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	0/1	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 K16090006						Test Start (Date/Time) 9-13-16, 1400			
Client: DeQueen						Test End (Date/Time) 9-20-16, 1500			
		Day of Test							
		1	2	3	4	5	6	7	notes
Control	MHS 835	9-13	9-14	9-15	9-16	9-17	9-18 *	9-19	MHS 836
D.O. (mg/L)	INITIAL	8.2	8.3	8.3	8.3	8.0	8.2	8.4	
	FINAL	8.3	6.3	7.6	7.7	7.9	7.3	7.4	
pH (s.u.)	INITIAL	7.5	7.8	7.9	8.0	7.7	7.7	7.9	
	FINAL	7.5	7.4	7.6	7.4	7.2	7.6	7.6	
temp (C)	INITIAL	24	23	24	24	24	25	23	
	FINAL	25	25	25	25	25	25	25	
ALKALINITY (mg/L)		30	→	→	→	→	44	→	
HARDNESS (mg/L)		100	→	→	→	→	62	→	
CONDUCTIVITY (umho		312	→	→	→	→	282	→	
CHLORINE (mg/L)		<0.05	→	→	→	→	<0.05	→	
CONC: 32%									
D.O. (mg/L)	INITIAL	8.8	8.6	8.6	8.5	8.0	8.3	8.3	
	FINAL	8.3	6.5	7.6	7.7	7.9	7.6	7.8	
pH (s.u)	INITIAL	7.7	7.7	7.7	7.8	7.6	7.2	7.7	
	FINAL	7.7	7.4	7.7	7.6	7.5	7.8	7.8	
temp (C)	INITIAL	24	24	24	25	25	24.1	24	
	FINAL	25	25	25	25	25	25	25	
CONC:									
D.O. (mg/L)	INITIAL	8.9	8.7	8.7	8.7	8.1	8.2	8.5	
	FINAL	8.0	6.6	7.5	7.8	7.9	7.5	7.6	
pH (mg/L)	INITIAL	7.8	7.7	7.7	7.7	7.6	7.5	7.7	
	FINAL	7.8	7.5	7.7	7.6	7.6	7.7	7.7	
temp (C)	INITIAL	24	24	24	25	25.7	25	24	
	FINAL	25	25	25	25	25	25	25	
CONC:									
D.O. (mg/L)	INITIAL	9.1	8.9	8.7	8.7	8.1	8.2	8.6	
	FINAL	7.89	6.9	7.2	7.3	7.7	7.5	7.6	
pH (s.u.)	INITIAL	7.8	7.7	7.7	7.7	7.6	7.5	7.6	
	FINAL	7.8	7.6	7.6	7.6	7.6	7.7	7.7	
temp (C)	INITIAL	25	24	25	25	26.4	25	25	
	FINAL	25	25	25	25	25	25	25	
CONC:									
D.O. (mg/L)	INITIAL	8.6	9.0	8.8	8.6	8.1	8.2	8.7	
	FINAL	7.8	6.6	7.2	7.3	7.7	7.1	7.4	
pH (s.u.)	INITIAL	7.8	7.7	7.6	7.6	7.5	7.5	7.6	
	FINAL	7.8	7.6	7.7	7.7	7.7 SS	7.6	7.7	
temp (C)	INITIAL	25	24	26	26	27.1	26	25	
	FINAL	25	25	25	25	25	25	25	
CONC:									
D.O. (mg/L)	INITIAL	8.3	9.2	9.1	9.4	8.2	8.5	8.9	
	FINAL	7.8	6.7	7.4	7.7	7.7	7.4	7.4	
pH (s.u.)	INITIAL	7.9	7.7	7.6	7.6	7.5	7.4	7.6	
	FINAL	7.9	7.7	7.8	7.7	7.8	7.8	7.8	
temp (C)	INITIAL	25	24	26	26	27.4	26	25	
	FINAL	25	25	25	25	25	25	25	
CONC: 100 %		A	A	B	B	C	C	C	
ALKALINITY (mg/L)		72	→	62	→	54	→	→	
HARDNESS (mg/L)		14	→	16	→	12	→	→	
CONDUCTIVITY (umho		1041	→	950	→	1025	→	→	
CHLORINE (mg/L)		<0.05	→	<0.05	→	<0.05	→	→	

CHEMICAL DATA SHEET FOR CHRONIC TOXICITY TESTING — Ceriodaphnia Dubia

Lab # / Sample ID K1609006 — Test Start (Date/Time) 9-13-16, 1310

Client: DeQueen — Test End (Date/Time) 9-20-16, 1520

Day of Test — 9 Db 10-6-16

		1	2	3	4	5	6	7	notes
Control	MHS	9-13	9-14	~~9-15~~ 9-16	9-16	9-17	9-18	9-19	MHS
D.O. (mg/L)	INITIAL	8.2	8.3	8.3	8.3	8.0	8.2	8.4	8.3c
	FINAL	8.1	8.3	8.6	8.4	8.5	7.8		
pH (s.u.)	INITIAL	7.5	7.8	7.9	8.0	7.7	7.7	7.9	
	FINAL	7.9	8.1	8.1	7.8	7.8	7.8		
temp (C)	INITIAL	24	23	24	24	24	25	23	
	FINAL	25	25	25	25	25	25		
ALKALINITY (mg/L)		30	→	→	→	→	44	→	
HARDNESS (mg/L)		100	→	→	→	→	62	→	
CONDUCTIVITY (umhc		312	→	→	→	→	282	→	
CHLORINE (mg/L)		<0.05	→	→	→	→	<0.05	→	
CONC: 32%									
D.O. (mg/L)	INITIAL	8.8	8.6	8.6	8.5	8.6	8.3	8.3	
	FINAL	8.1	8.4	8.7	8.6	8.5	8.0		
pH (s.u)	INITIAL	7.7	7.7	7.7	7.8	7.6	7.2	7.7	
	FINAL	7.9	8.1	8.2	7.9	7.8	8.0		
temp (C)	INITIAL	24	24	24	25	25	24	24	
	FINAL	25	25	25	25	25	25		
CONC: 42%									
D.O. (mg/L)	INITIAL	8.9	8.7	8.7	8.7	8.1	8.2	8.5	
	FINAL	8.1	8.4	8.6	8.6	8.6	8.0		
pH (mg/L)	INITIAL	7.8	7.7	7.7	7.7	7.6	7.5	7.7	
	FINAL	8.0	8.2	8.2	7.9	7.9	7.9		
temp (C)	INITIAL	24	24	24	25	26	25	24	
	FINAL	~~24~~ 25	25	25	25	25	25		
CONC: 56%									
D.O. (mg/L)	INITIAL	9.1	8.9	8.7	8.7	8.1	8.2	8.6	
	FINAL	8.1	8.5	8.6	8.6	8.6	8.0		
pH (s.u.)	INITIAL	7.8	7.7	7.7	7.7	7.6	7.5	7.6	
	FINAL	8.0	8.3	8.2	8.0	7.9	8.0		
temp (C)	INITIAL	25	24	25	25	26	25	25	
	FINAL	25	25	25	25	25	25		
CONC: 75%									
D.O. (mg/L)	INITIAL	8.6	9.0	8.8	8.6	8.1	8.2	8.7	
	FINAL	8.1	8.5	8.6	8.5	8.6	8.0		
pH (s.u.)	INITIAL	7.8	7.7	7.6	7.6	7.5	7.5	7.6	
	FINAL	8.1	8.4	8.3	8.0	7.9	8.0		
temp (C)	INITIAL	25	24	26	26	27	26	25	
	FINAL	25	25	25	25	25	25		
CONC: 100%									
D.O. (mg/L)	INITIAL	8.3	9.2	9.1	9.4	8.2	8.5	8.9	
	FINAL	8.1	8.5	8.5	8.5	8.6	7.9		
pH (s.u.)	INITIAL	7.9	7.7	7.6	7.6	7.5	7.4	7.6	
	FINAL	8.1	8.2	8.3	8.0	7.9	8.0		
temp (C)	INITIAL	25	24	26	26	27	26	25	
	FINAL	25	25	25	25	25	25		
CONC: 100 %		A	A	B	B	C	C	C	
ALKALINITY (mg/L)		72	→	102	→	54	→	→	
HARDNESS (mg/L)		14	→	116	→	12	→	→	
CONDUCTIVITY (umhc		1041	→	950	→	1025	→	→	
CHLORINE (mg/L)		<0.05	→	<0.05	→	<0.05	→	→	

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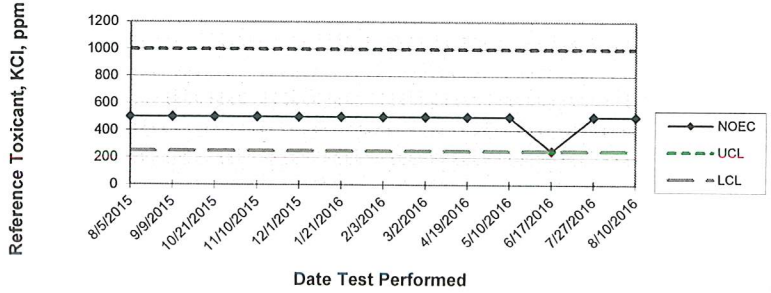
FATHEAD MINNOW SURVIVAL 7 Day
QUALITY ASSURANCE



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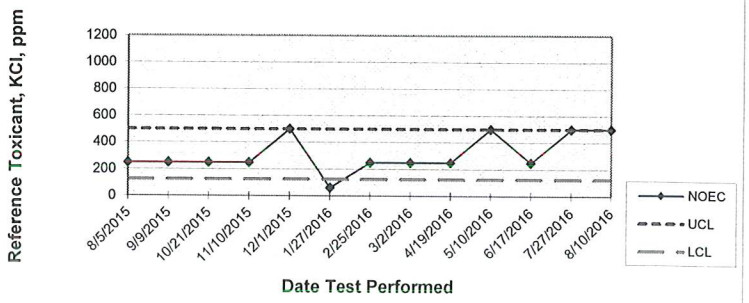
CERIODAPHNIA DUBIA SURVIVAL
QUALITY ASSURANCE



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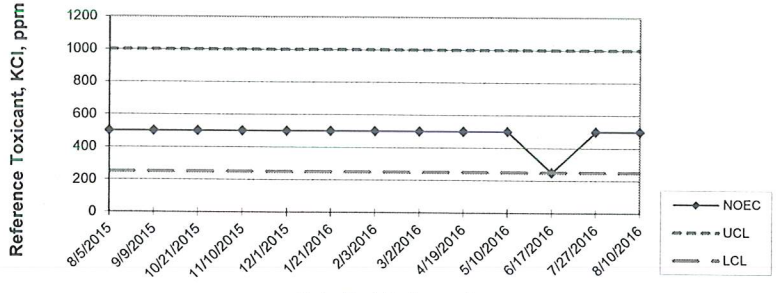
FATHEAD MINNOW GROWTH 7 Day
QUALITY ASSURANCE



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