McCLELLAND CONSULTING ENGINEERS, INC.
DESIGNED TO SERVE

7302 Kanis Road
P.O. Box 34087
Little Rock, AR 72204/72203
501-371-0272 • FAX 501-371-9932
www.mce.us.com

February 6, 2020

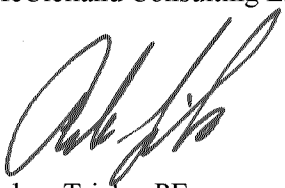
Gavin Gray, Enforcement Analyst
Arkansas Department of Environmental Quality
Office of Water Quality, Enforcement Branch
5301 Northshore Drive
North Little Rock, AR 72118

RE: City of Dumas
NPDES AR0033987 / AFIN 21-00045
Permit Compliance Section B

Dear Mr. Gray:

The City of Dumas has complied with the final limits for C. dubia toxicity limits per the permit, please see attached biomonitoring reports. If you have any questions do not hesitate to contact me.

Sincerely,
McClelland Consulting Engineers, Inc.



Adam Triche, PE
Principal/ Asst. Water & Wastewater Dept. Manager

cc: Patrick Fitzgerald

Arkansas Analytical, Inc.

Toxicity Test Results

CITY OF DUMAS
NPDES PERMIT NUMBER: AR0033987
First Quarter 2019
AFIN # 21-00045

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

Ceriodaphnia dubia, Survival and Reproduction Test
Test 1002.0

Prepared for: **Pat Fitzgerald**
City of Dumas
155 E. Waterman
Dumas, Arkansas, 71639

Prepared by: Arkansas Analytical,
8100 National Drive
Little Rock, Arkansas 72209
Lab Number K1903002

Tuesday, March 26, 2019

Plant Location

City of Dumas. The plant is located in Dumas, Arkansas, Highway 165 North in Section 25, Township 9 South, Range 4 West in Desha 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%, 16%, 22%, 29%, 39%, 52%
- 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%, 16%, 22%, 29%, 39%, 52%
- Dilution water: Moderately hard synthetic
- No deviation from method

Reference Toxicant Data

REFERENCE TOXICANT (Potassium Chloride)

Ceriodaphnia dubia 2/20/19-2/27/19		*Pimephales promelas* 2/20/19-2/27/19	
NOEC Survival:	250 ppm KCl	NOEC Survival:	250 ppm KCl
LOEC Survival:	500 ppm KCl	LOEC Survival:	500ppm KCl
NOEC Reproduction:	250 ppm KCl	NOEC Growth:	250ppm KCl
LOEC Reproduction:	500 ppm KCl	LOEC Growth:	500 ppm KCl

Summary of Results

City of Dumas

Ceriodaphnia dubia		*Pimephales promelas*	
NOEC Survival Parameter: **TOP3B**	52%	NOEC Survival Parameter: **TOP6C**	39%
Pass/Fail Survival Parameter: **TLP3B**	Pass	Pass/Fail Survival Parameter: **TLP6C**	Pass
NOEC Reproduction Parameter: **TPP3B**	52%	NOEC Growth Parameter: **TPP6C**	39%
Pass/Fail Reproduction Parameter: **TGP3B**	Pass	Pass/Fail Growth Parameter: **TGP6C**	Pass
%CV Reproduction Parameter: **TQP3B**	25.4%	%CV Growth Parameter: **TQP6C**	9.20%
PMSD Reproduction	38.6%	PMSD Growth	20.5%

Conclusion

Pimephales promelas, (Method 1000.0): The permit issued to the City of Dumas, specifies that the **critical dilution is 39% 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 Dumas, specifies that the **critical dilution is 39% 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: Melissa Bird, Emily Nichols, Clint Wood

Reviewed by:

Melissa Bird

Melissa Bird

Appendices

Appendix A.....Chains of custody

Appendix B.....Fathead minnow data & statistics

Appendix C.....*Ceriodaphnia dubia* data & statistics

Appendix D.....Water chemistry data

Appendix E.....Reference toxicant control charts

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 INFORMATION	Project Description	Turnaround Time
McClelland Consulting Engineers	McClelland Consulting Engineers	Chronic Toxicity	1 Day (100%)
1311 W 2nd St.	P.O. Box 34087	City of Dumas	2 Day (50%)
Little Rock, AR 72201	Little Rock, AR 72203-4087	**Reporting Information**	3 Day (25%)
		Telephone: 501-378-7808	Routine
Attn: Matt Bienvenu		Fax: 501-376-4677	Preservative Code: 1
		Email: mbienvenu@mcclelland-engrs.com	Bottle Type: P

Preservation Codes:

1. Cool, 6 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: Matt Bienvenu

Sampler(s) Printed: Jesse James

Field Number	SAMPLE COLLECTION Date/s	Time/s	Grab	Comp	Number of Bottles	Sample Matrix	SAMPLE IDENTIFICATION/ DESCRIPTION	TEST PARAMETERS: Chronic Toxicity	Bottle Type Code
	3/4-3/5	8A-8A		X	4	Water	Final Discharge	X	A

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

Arkansas Analytical Work Order Number: K1903002

1. Relinquished by: (Signature)	Date/Time	2. Received by: (Signature)
Matt Bienvenu	3/5/19 1456	
3. Relinquished by: (Signature)	Date/Time	4. Received by lab: (Signature)
		Danny 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

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 INFORMATION
McClelland Consulting Engineers	McClelland Consulting Engineers
1311 W 2nd St.	P.O. Box 34087
Little Rock, AR 72201	Little Rock, AR 72203-4087
Attn: Matt Bienvenu	

Project Description
Chronic Toxicity
City of Dumas

Reporting Information
Telephone: 501-378-7808
Fax: 501-376-4677
Email: mbienvenu@mcclelland-engrs.com

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

Preservation Codes:
1. Cool, 6 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

Preservative Code: 1
Bottle Type: P

Sampler(s) Signature: Jesse James
Sampler(s) Printed: Jesse James

Field Number	SAMPLE COLLECTION Date/s	Time/s	Grab	Comp	Number of Bottles	Sample Matrix	SAMPLE IDENTIFICATION/ DESCRIPTION	TEST PARAMETERS: Chronic Toxicity	Bottle Type Code
	3/5-3/6	9A-9A		X	4	Water	Final Discharge	X	B

Arkansas Analytical Work Order Number: K1903002

1. Relinquished by: (Signature)	Date/Time	2. Received by: (Signature)
	3/6/19 1505	
3. Relinquished by: (Signature)	Date/Time	4. Received by lab: (Signature)

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

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 INFORMATION	Project Description	Turnaround Time
McClelland Consulting Engineers	McClelland Consulting Engineers	Chronic Toxicity	1 Day (100%)
1311 W 2nd St.	P.O. Box 34087	City of Dumas	2 Day (50%)
Little Rock, AR 72201	Little Rock, AR 72203-4087	**Reporting Information**	3 Day (25%)
		Telephone: 501-378-7808	Routine
Attn: Matt Bienvenu		Fax: 501-376-4677	Preservative Code: 1
		Email: mbienvenu@mcclelland-engrs.com	Bottle Type: P

Preservation Codes:

1. Cool, 6 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

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

Sampler(s) Signature: Jesse James

Sampler(s) Printed: Jesse James

Arkansas Analytical Work Order Number: K1903002

Field Number	SAMPLE COLLECTION Date/s	Time/s	Grab	Comp	Number of Bottles	Sample Matrix	SAMPLE IDENTIFICATION/ DESCRIPTION	TEST PARAMETERS: Chronic Toxicity	Bottle Type Code
	3/6-3/7	10A-10A		X	4	Water	Final Discharge	X	C

1. Relinquished by: (Signature)	Date/Time	2. Received by: (Signature)
	3/7/19 1500	
3. Relinquished by: (Signature)	Date/Time	4. Received by lab: (Signature)
		Danny 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

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

Batch ID:	06-9576-9958	Test Type:	Growth-Survival (7d)	Analyst:	Melissa Bird
Start Date:	06 Mar-19 14:05	Protocol:	EPA/821/R-02-013 (2002)	Diluent:	Mod-Hard Synthetic Water
Ending Date:	13 Mar-19 13:28	Species:	Pimephales promelas	Brine:	Not Applicable
Duration:	6d 23h	Source:	Aquatox, AR	Age:	<24
Sample ID:	20-6432-0781	Code:	K1903002FH	Client:	City of Dumas
Sample Date:	05 Mar-19 08:00	Material:	POTW Effluent	Project:	WET Quarterly Compliance Test (1Q)
Receipt Date:	05 Mar-19 14:56	Source:	City of Dumas (AR0033987)		
Sample Age:	30h (1 °C)	Station:	Final Discharge		

Sample Renewals

Renewal	Sample Code	Sample Date	Receive Date	Renewal Date	Temp °C
1	K1903002B	06 Mar-19 09:00	06 Mar-19 15:05	08 Mar-19 00:00	2
2	K1903002C	07 Mar-19 10:00	07 Mar-19 15:00	10 Mar-19 00:00	2

Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	NOEL	LOEL	TOEL	TU	PMSD ✓
00-9061-7637	7d Survival Rate	Dunnett Multiple Comparison Test	39	52	45.03	2.564	11.0%
13-9776-2493	Mean Dry Biomass-mg	Dunnett Multiple Comparison Test	52	> 52	n/a	1.923	20.5%

Test Acceptability

				TAC Limits			
Analysis ID	Endpoint	Attribute	Test Stat	Lower	Upper	Overlap	Decision
00-9061-7637	7d Survival Rate	Control Resp	0.98	0.8	>>	Yes	Passes Criteria
13-9776-2493	Mean Dry Biomass-mg	Control Resp	0.5436	0.25	>>	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	0.9800	0.9245	1.0000	0.9000	1.0000	0.0200	0.0447	4.56%	0.00%
16		5	0.9200	0.8645	0.9755	0.9000	1.0000	0.0200	0.0447	4.86%	6.12%
22		5	0.9400	0.8720	1.0000	0.9000	1.0000	0.0245	0.0548	5.83%	4.08%
29		5	0.9000	0.7244	1.0000	0.7000	1.0000	0.0633	0.1414	15.71%	8.16%
39		5	0.8800	0.7761	0.9839	0.8000	1.0000	0.0374	0.0837	9.51%	10.20%
52		5	0.8600	0.7920	0.9280	0.8000	0.9000	0.0245	0.0548	6.37%	12.24%

Mean Dry Biomass-mg Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	D	5	0.5436	0.4922	0.595	0.494	0.603	0.01851	0.04139	7.61%	0.00%
16		5	0.4684	0.4122	0.5246	0.426	0.533	0.02024	0.04525	9.66%	13.83%
22		5	0.5318	0.4288	0.6348	0.402	0.599	0.03711	0.08297	15.60%	2.17%
29		5	0.5432	0.5002	0.5862	0.502	0.594	0.0155	0.03465	6.38%	0.07%
39		5	0.5136	0.4549	0.5723	0.471	0.59	0.02113	0.04724	9.20%	5.52%
52		5	0.4906	0.422	0.5592	0.415	0.541	0.02471	0.05525	11.26%	9.75%

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	0.9000
16		1.0000	0.9000	0.9000	0.9000	0.9000
22		1.0000	0.9000	0.9000	1.0000	0.9000
29		1.0000	1.0000	0.8000	1.0000	0.7000
39		1.0000	0.9000	0.8000	0.9000	0.8000
52		0.9000	0.9000	0.8000	0.9000	0.8000

Mean Dry Biomass-mg Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	D	0.603	0.518	0.545	0.558	0.494
16		0.43	0.533	0.459	0.426	0.494
22		0.497	0.402	0.599	0.57	0.591
29		0.502	0.594	0.554	0.543	0.523
39		0.471	0.59	0.522	0.505	0.48
52		0.535	0.511	0.415	0.451	0.541

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	9/10
16		10/10	9/10	9/10	9/10	9/10
22		10/10	9/10	9/10	10/10	9/10
29		10/10	10/10	8/10	10/10	7/10
39		10/10	9/10	8/10	9/10	8/10
52		9/10	9/10	8/10	9/10	8/10

CETIS Summary Report

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

Batch ID:	18-1932-9210	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Melissa Bird
Start Date:	06 Mar-19 11:20	**Protocol:**	EPA/600/4-91/002 (1994)	**Diluent:**	Mod-Hard Synthetic Water
Ending Date:	12 Mar-19 10:44	**Species:**	Ceriodaphnia dubia	**Brine:**	Not Applicable
Duration:	5d 23h	**Source:**	In-House Culture	**Age:**	<24
Sample ID:	21-1938-3630	**Code:**	K1903002CD	**Client:**	City of Dumas
Sample Date:	05 Mar-19 08:00	**Material:**	POTW Effluent	**Project:**	WET Quarterly Compliance Test (1Q)
Receipt Date:	05 Mar-19 14:56	**Source:**	City of Dumas (AR0033987)		
Sample Age:	27h (1 °C)	**Station:**	Final Discharge		

Sample Renewals

Renewal	Sample Code	Sample Date	Receive Date	Renewal Date	Temp °C
1	K1903002B	06 Mar-19 09:00	06 Mar-19 15:05	08 Mar-19 00:00	2
2	K1903002C	07 Mar-19 10:00	07 Mar-19 15:00	10 Mar-19 00:00	2

Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	NOEL	LOEL	TOEL	TU	PMSD ✓
17-1901-9558	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	52	> 52	n/a	1.923	n/a
15-1084-8484	Reproduction	Steel Many-One Rank Sum Test	52	> 52	n/a	1.923	38.6%

Test Acceptability

				TAC Limits			
Analysis ID	**Endpoint**	**Attribute**	**Test Stat**	**Lower**	**Upper**	**Overlap**	**Decision**
17-1901-9558	7d Survival Rate	Control Resp	0.9	0.8	>>	Yes	Passes Criteria
15-1084-8484	Reproduction	Control Resp	19.9	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	0.9000	0.6738	1.0000	0.0000	1.0000	0.1000	0.3162	35.14%	0.00%
16		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	-11.11%
22		10	0.9000	0.6738	1.0000	0.0000	1.0000	0.1000	0.3162	35.14%	0.00%
29		10	0.9000	0.6738	1.0000	0.0000	1.0000	0.1000	0.3162	35.14%	0.00%
39		10	0.9000	0.6738	1.0000	0.0000	1.0000	0.1000	0.3162	35.14%	0.00%
52		10	0.9000	0.6738	1.0000	0.0000	1.0000	0.1000	0.3162	35.14%	0.00%

Reproduction Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	D	10	~~19.9~~	15.02	24.78	7	26	2.157	6.822	~~34.28%~~	0.00%
16		10	27.6	24.43	30.77	22	36	1.4	4.427	16.04%	-38.69%
22		10	23.9	16.99	30.81	5	33	3.057	9.666	40.44%	-20.10%
29		10	22.3	16.97	27.63	9	32	2.357	7.454	33.43%	-12.06%
39		10	~~25.2~~	19.57	30.83	11	33	2.489	7.871	~~31.23%~~	-26.63%
52		10	23.7	18.1	29.3	5	33	2.477	7.832	33.05%	-19.10%

~~5~~ 0% CV + $\bar{x}$ reproduction of surviving females:

@ 0%
%CV = 25.4%
$\bar{x}$ = 21.3

@ 39%
%CV = 24.1%
$\bar{x}$ = 26.8

Cladoceran 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	0.0000	1.0000	1.0000	1.0000
16		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
22		1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
29		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000
39		1.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
52		1.0000	1.0000	0.0000	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	24	11	25	23	26	13	7	23	24	23
16		34	28	36	26	24	29	27	26	24	22
22		31	5	22	33	12	17	30	32	31	26
29		14	27	16	32	26	22	25	9	31	21
39		32	29	11	28	23	12	33	26	32	26
52		26	25	5	24	30	17	33	28	26	23

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	0/1	1/1	1/1	1/1
16		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
22		1/1	0/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
29		1/1	1/1	1/1	1/1	1/1	1/1	1/1	0/1	1/1	1/1
39		1/1	1/1	0/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
52		1/1	1/1	0/1	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: L19030C2				Test Start (Date/Time): 3-6-19 / 1405					
Client: Dumas				Test End (Date/Time): 3-13-19 / 1328					
		Day of Test							
		1	2	3	4	5	6	7	notes
Control	MHS010	3/6	3/7	3/8	3/9	3/10	3/11	3/12	MHS011 used 3/9
D.O. (mg/L)	INITIAL	4.1	8.7	8.6	9.2	8.6	8.7	8.7	
	FINAL	8.1	7.4	7.4	7.9	7.3	7.4	8.1	
pH (s.u.)	INITIAL	8.0	8.0	8.1	7.4	8.0	8.8	8.0	
	FINAL	7.4	7.7	7.6	7.7	7.9	7.8	8.0	
temp (C)	INITIAL	20	21	22	26	22	22	22	
	FINAL	25	25	23	25	25	25	25	
ALKALINITY (mg/L)		56			74				
HARDNESS (mg/L)		110			112				
CONDUCTIVITY (umhc		316.2			352				
CHLORINE (mg/L)		<0.05			<0.05				
CONC: 100%									
D.O. (mg/L)	INITIAL	9.0	8.7	8.6	8.6	8.7	8.6	8.6	
	FINAL	6.9	7.3	7.4	7.8	7.1	6.7	7.2	
pH (s.u)	INITIAL	8.0	7.8	8.1	7.4	8.1	8.1	8.2	
	FINAL	7.5	7.7	7.6	8.2	7.9	7.8	7.9	
temp (C)	INITIAL	20	22	21	23	23	23	22	
	FINAL	25	25	23	22	25	25	25	
CONC: 22%									
D.O. (mg/L)	INITIAL	9.0	8.6	8.7	8.6	8.7	8.6	8.6	
	FINAL	8.2	8.2	7.4	8.0	7.1	6.6	7.7	
pH (mg/L)	INITIAL	7.9	7.8	8.0	7.7	7.9	7.9	8.1	
	FINAL	7.6	7.7	7.6	7.9	7.7	7.7	7.9	
temp (C)	INITIAL	20	22	22	23	23	23	22	
	FINAL	25	25	23	22	25	25	25	
CONC: 12%									
D.O. (mg/L)	INITIAL	9.0	8.6	8.7	8.7	8.8	8.5	8.6	
	FINAL	6.8	7.1	6.7	7.2	6.7	6.7	7.5	
pH (s.u.)	INITIAL	7.9	7.7	7.9	7.4	7.7	7.9	8.1	
	FINAL	7.7	7.6	7.6	7.5	7.8	7.6	7.9	
temp (C)	INITIAL	20	23	22	24	23	23	22	
	FINAL	25	25	23	22	25	25	25	
CONC: 6%									
D.O. (mg/L)	INITIAL	9.0	8.5	8.7	8.7	9.0	8.5	8.6	
	FINAL	6.4	7.1	7.1	7.1	6.6	6.8	7.4	
pH (s.u.)	INITIAL	7.9	7.7	7.8	7.6	7.6	7.8	8.0	
	FINAL	7.6	7.6	7.5	7.5	7.6	7.6	7.9	
temp (C)	INITIAL	20	23	22	24	24	24	22	
	FINAL	25	25	23	22	25	25	25	
CONC: 3%									
D.O. (mg/L)	INITIAL	8.9	8.4	8.7	8.7	8.8	8.4	8.5	
	FINAL	7.9	6.8	7.0	7.5	6.8	6.8	7.6	
pH (s.u.)	INITIAL	7.8	7.6	7.7	7.6	7.6	7.9	8.0	
	FINAL	7.6	7.6	7.7	7.8	7.7	7.6	7.8	
temp (C)	INITIAL	20	23	22	25	24	24	22	
	FINAL	25	25	23	22	25	25	25	
CONC: 0%		A	A	B	B	C	C	C	
ALKALINITY (mg/L)		54		40		58			
HARDNESS (mg/L)		24		28		26			
CONDUCTIVITY (umhc		230		231		227			
CHLORINE (mg/L)		<0.05		<0.05		<0.05			

CHEMICAL DATA SHEET FOR CHRONIC TOXICITY TESTING — Ceriodaphnia Dubia

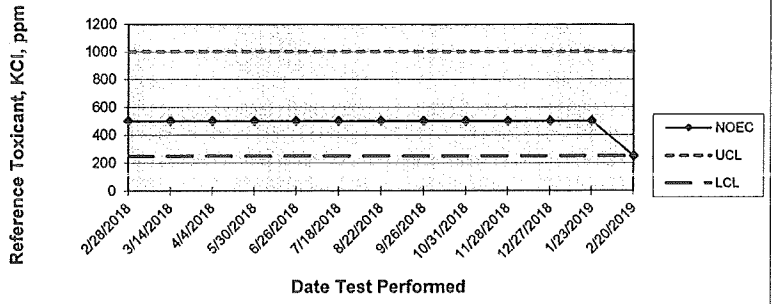
Lab # / Sample ID: K1903C02 — Test Start (Date/Time): 3-6-19 / 1120

Client: Dumas — Test End (Date/Time): 3-12-19 / 1049

		Day of Test							
		1	2	3	4	5	6	7	notes/remarks
Control	MHS 010	3/6	3/7	3/8	3/9	3/10	3/11	3/12	MHS 011
D.O. (mg/L)	INITIAL	9.1	8.7	8.6	9.2	8.6	8.7	8.7	used 3/9
	FINAL	8.5	8.6	8.6	8.6	8.5	8.2		
pH (s.u.)	INITIAL	8.0	8.0	8.1	7.4	8.0	8.8	8.0	
	FINAL	8.3	7.8	7.9	8.3	8.0	8.2		
temp (C)	INITIAL	20	21	22	26	22	22	22	
	FINAL	25	25	25	25	25	25		
ALKALINITY (mg/L)		56	—	—	74	—	—	—	
HARDNESS (mg/L)		110	—	—	112	—	—	—	
CONDUCTIVITY (umhos/cm)		362	—	—	352	—	—	—	
CHLORINE (mg/L)		<0.05	—	—	<0.05	—	—	—	
CONC:	11%								
D.O. (mg/L)	INITIAL	9.0	8.7	8.6	8.6	8.7	8.6	8.6	
	FINAL	8.5	8.8	8.9	8.5	8.5	8.1		
pH (s.u)	INITIAL	8.0	7.8	8.1	7.4	8.1	8.1	8.2	
	FINAL	8.3	8.1	8.2	8.3	8.1	8.2		
temp (C)	INITIAL	20	22	21	23	23	23	22	
	FINAL	25	25	25	25	25	25		
CONC:	22%								
D.O. (mg/L)	INITIAL	9.0	8.6	8.7	8.6	8.7	8.6	8.6	
	FINAL	8.5	8.8	9.0	8.5	8.4	8.2		
pH (mg/L)	INITIAL	7.9	7.8	8.0	7.7	7.9	7.9	8.1	
	FINAL	8.3	8.1	8.4	8.3	8.1	8.2		
temp (C)	INITIAL	20	22	22	23	23	23	22	
	FINAL	25	25	25	25	25	25		
CONC:	29%								
D.O. (mg/L)	INITIAL	9.0	8.6	8.7	8.7	8.8	8.5	8.6	
	FINAL	8.5	8.8	9.0	8.5	8.5	8.2		
pH (s.u.)	INITIAL	7.9	7.7	7.9	7.4	7.7	7.9	8.1	
	FINAL	8.2	8.2	8.3	8.3	8.2	8.2		
temp (C)	INITIAL	20	23	22	24	23	23	22	
	FINAL	25	25	25	25	25	25		
CONC:	39%								
D.O. (mg/L)	INITIAL	9.0	8.5	8.7	8.7	9.0	8.5	8.6	
	FINAL	8.5	8.9	8.9	8.5	8.4	8.2		
pH (s.u.)	INITIAL	7.9	7.7	7.8	7.6	7.6	7.8	8.0	
	FINAL	8.3	8.3	8.3	8.2	8.1	8.1		
temp (C)	INITIAL	20	23	22	24	24	24	22	
	FINAL	25	25	25	25	25	25		
CONC:	52%								
D.O. (mg/L)	INITIAL	8.9	8.4	8.7	8.7	8.8	8.4	8.5	
	FINAL	8.5	8.8	8.7	8.5	8.4	8.2		
pH (s.u.)	INITIAL	7.8	7.6	7.7	7.6	7.6	7.9	8.0	
	FINAL	8.2	8.3	8.1	8.2	8.1	8.1		
temp (C)	INITIAL	20	23	22	25	24	24	22	
	FINAL	25	25	25	25	25	25		
CONC:	100%	A	A	B	B	C	C	C	
ALKALINITY (mg/L)		54	—	40	—	58	—	—	
HARDNESS (mg/L)		24	—	28	—	26	—	—	
CONDUCTIVITY (umhos/cm)		230	—	231	—	227	—	—	
CHLORINE (mg/L)		<0.05	—	<0.05	—	<0.05	—	—	

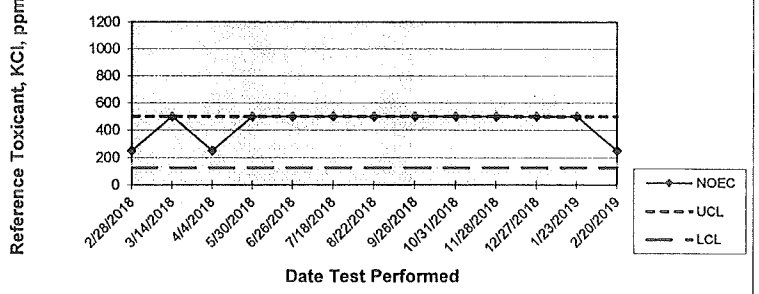
ARKANSAS ANALYTICAL, INC.

FATHEAD MINNOW SURVIVAL 7 Day
QUALITY ASSURANCE



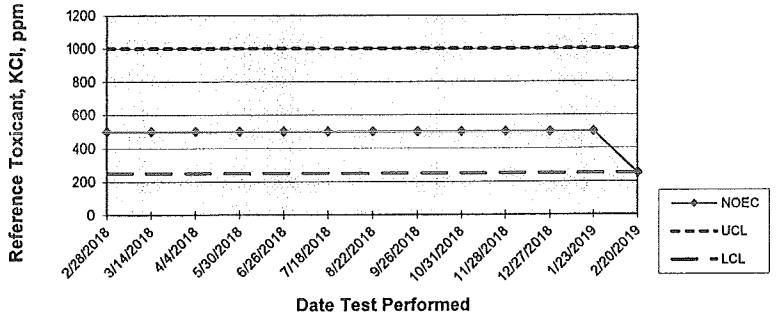
ARKANSAS ANALYTICAL, INC.

CERIODAPHNIA DUBIA SURVIVAL
QUALITY ASSURANCE



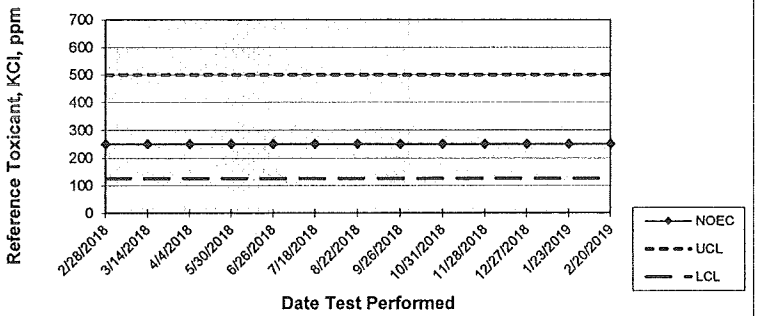
ARKANSAS ANALYTICAL, INC.

FATHEAD MINNOW GROWTH 7 Day
QUALITY ASSURANCE



ARKANSAS ANALYTICAL, INC.

CERIODAPHNIA DUBIA REPRODUCTION
QUALITY ASSURANCE



Arkansas Analytical, Inc.

Toxicity Test Results

CITY OF DUMAS
NPDES PERMIT NUMBER: AR0033987
Second Quarter 2019
AFIN # 21-00045

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

Ceriodaphnia dubia, Survival and Reproduction Test
Test 1002.0

Prepared for: **Pat Fitzgerald**
City of Dumas
155 E. Waterman
Dumas, Arkansas, 71639

Prepared by: Arkansas Analytical,
8100 National Drive
Little Rock, Arkansas 72209
Lab Number K1905006

Thursday, June 06, 2019

Plant Location

City of Dumas. The plant is located in Dumas, Arkansas, Highway 165 North in Section 25, Township 9 South, Range 4 West in Desha 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%, 16%, 22%, 29%, 39%, 52%
- 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%, 16%, 22%, 29%, 39%, 52%
- Dilution water: Moderately hard synthetic
- No deviation from method

Reference Toxicant Data

REFERENCE TOXICANT (Potassium Chloride)

Ceriodaphnia dubia 4/3/19-4/10/19		*Pimephales promelas* 4/3/19-4/10/19	
NOEC Survival:	500 ppm KCl	NOEC Survival:	500 ppm KCl
LOEC Survival:	1000 ppm KCl	LOEC Survival:	1000ppm KCl
NOEC Reproduction:	500 ppm KCl	NOEC Growth:	500ppm KCl
LOEC Reproduction:	1000 ppm KCl	LOEC Growth:	1000 ppm KCl

Summary of Results

City of Dumas

Ceriodaphnia dubia		*Pimephales promelas*	
NOEC Survival Parameter: **TOP3B**	52%	NOEC Survival Parameter: **TOP6C**	52%
Pass/Fail Survival Parameter: **TLP3B**	Pass	Pass/Fail Survival Parameter: **TLP6C**	Pass
NOEC Reproduction Parameter: **TPP3B**	52%	NOEC Growth Parameter: **TPP6C**	52%
Pass/Fail Reproduction Parameter: **TGP3B**	Pass	Pass/Fail Growth Parameter: **TGP6C**	Pass
%CV Reproduction Parameter: **TQP3B**	27.5%	%CV Growth Parameter: **TQP6C**	11.7%
PMSD Reproduction	21.2%	PMSD Growth	20.9%

Conclusion

Pimephales promelas, (Method 1000.0): The permit issued to the City of Dumas, specifies that the **critical dilution is 39% 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 Dumas, specifies that the **critical dilution is 39% 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: Melissa Bird, Emily Nichols, Emma Elnabarawy, Hallie Freyaldenhoven

Reviewed by:

Melissa Bird

Appendices

Appendix A.....Chains of custody

Appendix B.....Fathead minnow data & statistics

Appendix C.....*Ceriodaphnia dubia* data & statistics

Appendix D.....Water chemistry data

Appendix E.....Reference toxicant control charts

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 INFORMATION	Project Description	Turnaround Time
McClelland Consulting Engineers	McClelland Consulting Engineers	Chronic Toxicity	1 Day (100%)
1311 W 2nd St.	P.O. Box 34087	City of Dumas	2 Day (50%)
Little Rock, AR 72201	Little Rock, AR 72203-4087	**Reporting Information**	3 Day (25%)
		Telephone: 501-378-7808	Routine
Attn: Matt Bienvenu		Fax: 501-376-4677	Preservative Code: 1
		Email: mbienvenu@mcclelland-engrs.com	Bottle Type: P

Preservation Codes:
1. Cool, 6 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

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

Sampler(s) Signature

Sampler(s) Printed: S Jesse James

Field Number	SAMPLE COLLECTION Date/s	Time/s	Grab	Comp	Number of Bottles	Sample Matrix	SAMPLE IDENTIFICATION/ DESCRIPTION	Chronic Toxicity	Arkansas Analytical Work Order Number:
	5/13/19-5/14/19	9A-9A		X	4	Water	Final Discharge	X	K1905006
									A

1. Relinquished by: (Signature)	Date/Time	2. Received by: (Signature)
	5/14/19 1502	
3. Relinquished by: (Signature)	Date/Time	4. Received by lab: (Signature)

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

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 INFORMATION
McClelland Consulting Engineers	McClelland Consulting Engineers
1311 W 2nd St.	P.O. Box 34087
Little Rock, AR 72201	Little Rock, AR 72203-4087
Attn: Matt Bienvenu	

Project Description: Chronic Toxicity; City of Dumas

Reporting Information:
Telephone: 501-378-7808
Fax: 501-376-4677
Email: mbienvenu@mcclelland-engrs.com

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

Preservative Code: 1
Bottle Type: P

Preservation Codes:
1. Cool, 6 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

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

Sampler(s) Signature: Jesse James
Sampler(s) Printed: Jesse James

Arkansas Analytical Work Order Number: K1505006

Field Number	SAMPLE COLLECTION Date/s	Time/s	Grab	Comp	Number of Bottles	Sample Matrix	SAMPLE IDENTIFICATION/ DESCRIPTION	TEST PARAMETERS: Chronic Toxicity	Bottle Type Code
	5/14-5/15	1044-1045		X	4	Water	Final Discharge	X	B

1. Relinquished by: (Signature) — Date/Time: 5/15/15 1454
2. Received by: (Signature)
3. Relinquished by: (Signature) — Date/Time:
4. Received by lab: (Signature) Amanda Forbush

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

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 INFORMATION	Project Description	Turnaround Time
McClelland Consulting Engineers	McClelland Consulting Engineers	Chronic Toxicity	1 Day (100%)
1311 W 2nd St.	P.O. Box 34087	City of Dumas	2 Day (50%)
Little Rock, AR 72201	Little Rock, AR 72203-4087	**Reporting Information**	3 Day (25%)
		Telephone: 501-378-7808	Routine
Attn: Matt Bienvenu		Fax: 501-376-4677	Preservative Code: 1
		Email: mbienvenu@mcclelland-engrs.com	Bottle Type: P

Preservation Codes:

1. Cool, 6 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: Jesse James

Sampler(s) Printed: Jesse James

Field Number	SAMPLE COLLECTION Date/s	Time/s	Grab	Comp	Number of Bottles	Sample Matrix	SAMPLE IDENTIFICATION/ DESCRIPTION	Chronic Toxicity	Bottle Type Code
	5/15-5/16	11A-11A		X	4	Water	Final Discharge	X	C

TEST PARAMETERS

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

Arkansas Analytical Work Order Number: K1605006

1. Relinquished by: (Signature)	Date/Time	2. Received by: (Signature)
	5/16/17 1527	
3. Relinquished by: (Signature)	Date/Time	4. Received by lab: (Signature)
		Amanda Forbish

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:		°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:	09-7360-6332	**Test Type:**	Growth-Survival (7d)	**Analyst:**	Melissa Bird
Start Date:	15 May-19 13:45	**Protocol:**	EPA/821/R-02-013 (2002)	**Diluent:**	Mod-Hard Synthetic Water
Ending Date:	22 May-19 13:12	**Species:**	Pimephales promelas	**Brine:**	Not Applicable
Duration:	6d 23h	**Source:**	Aquatox, AR	**Age:**	<24
Sample ID:	16-6809-6823	**Code:**	K1905006FH	**Client:**	City of Dumas
Sample Date:	14 May-19 09:00	**Material:**	POTW Effluent	**Project:**	WET Quarterly Compliance Test (2Q)
Receipt Date:	14 May-19 15:02	**Source:**	City of Dumas (AR0033987)		
Sample Age:	29h (2 °C)	**Station:**	Final Discharge		

Sample Renewals

Renewal	Sample Code	Sample Date	Receive Date	Renewal Date	Temp °C
1	K1905006B	15 May-19 10:00	15 May-19 14:54	17 May-19 00:00	2
2	K1905006C	16 May-19 11:00	16 May-19 15:27	19 May-19 00:00	1

Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	NOEL	LOEL	TOEL	TU	PMSD ✓
11-6615-2082	7d Survival Rate	Steel Many-One Rank Sum Test	52	> 52	n/a	1.923	7.7%
09-5520-7106	Mean Dry Biomass-mg	Dunnett Multiple Comparison Test	52	> 52	n/a	1.923	20.9%

Test Acceptability

				TAC Limits			
Analysis ID	**Endpoint**	**Attribute**	**Test Stat**	**Lower**	**Upper**	**Overlap**	**Decision**
11-6615-2082	7d Survival Rate	Control Resp	0.98	0.8	>>	Yes	Passes Criteria
09-5520-7106	Mean Dry Biomass-mg	Control Resp	0.4726	0.25	>>	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	0.9800	0.9245	1.0000	0.9000	1.0000	0.0200	0.0447	4.56%	0.00%
16		5	0.9200	0.8161	1.0000	0.8000	1.0000	0.0374	0.0837	9.09%	6.12%
22		5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	-2.04%
29		5	0.9600	0.8920	1.0000	0.9000	1.0000	0.0245	0.0548	5.71%	2.04%
39		5	0.9800	0.9245	1.0000	0.9000	1.0000	0.0200	0.0447	4.56%	0.00%
52		5	0.9800	0.9245	1.0000	0.9000	1.0000	0.0200	0.0447	4.56%	0.00%

Mean Dry Biomass-mg Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	D	5	0.4726	0.4042	0.541	0.406	0.551	0.02465	0.05512	11.66%	0.00%
16		5	0.4232	0.3498	0.4966	0.334	0.498	0.02643	0.0591	13.97%	10.45%
22		5	0.4904	0.3611	0.6197	0.401	0.653	0.04658	0.1042	21.24%	-3.77%
29		5	0.5258	0.4512	0.6004	0.432	0.588	0.02685	0.06005	11.42%	-11.26%
39		5	0.48	0.4213	0.5388	0.425	0.525	0.02116	0.04732	9.86%	-1.57%
52		5	0.5074	0.4399	0.5749	0.458	0.59	0.0243	0.05434	10.71%	-7.36%

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	0.9000	1.0000	1.0000	1.0000	1.0000
16		1.0000	0.9000	0.8000	1.0000	0.9000
22		1.0000	1.0000	1.0000	1.0000	1.0000
29		0.9000	1.0000	1.0000	1.0000	0.9000
39		0.9000	1.0000	1.0000	1.0000	1.0000
52		1.0000	1.0000	0.9000	1.0000	1.0000

Mean Dry Biomass-mg Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	D	0.448	0.406	0.5	0.458	0.551
16		0.498	0.423	0.334	0.418	0.443
22		0.653	0.531	0.401	0.413	0.454
29		0.556	0.506	0.547	0.588	0.432
39		0.491	0.436	0.525	0.425	0.523
52		0.533	0.458	0.469	0.487	0.59

7d Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	D	9/10	10/10	10/10	10/10	10/10
16		10/10	9/10	8/10	10/10	9/10
22		10/10	10/10	10/10	10/10	10/10
29		9/10	10/10	10/10	10/10	9/10
39		9/10	10/10	10/10	10/10	10/10
52		10/10	10/10	9/10	10/10	10/10

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

Batch ID:	08-0426-2272	Test Type:	Reproduction-Survival (7d)	Analyst:	Melissa Bird
Start Date:	15 May-19 11:19	Protocol:	EPA/600/4-91/002 (1994)	Diluent:	Mod-Hard Synthetic Water
Ending Date:	21 May-19 10:09	Species:	Ceriodaphnia dubia	Brine:	Not Applicable
Duration:	5d 23h	Source:	In-House Culture	Age:	<24
Sample ID:	16-0156-4467	Code:	K1905006CD	Client:	City of Dumas
Sample Date:	14 May-19 09:00	Material:	POTW Effluent	Project:	WET Quarterly Compliance Test (2Q)
Receipt Date:	14 May-19 15:02	Source:	City of Dumas (AR0033987)		
Sample Age:	26h (2 °C)	Station:	Final Discharge		

Sample Renewals

Renewal	Sample Code	Sample Date	Receive Date	Renewal Date	Temp °C
1	K1905006B	15 May-19 10:00	15 May-19 14:54	17 May-19 00:00	2
2	K1905006C	16 May-19 11:00	17 May-19 15:27	19 May-19 00:00	1

Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	NOEL	LOEL	TOEL	TU	PMSD ✓
05-9265-6162	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	52	> 52	n/a	1.923	n/a
11-5471-2341	Reproduction	Steel Many-One Rank Sum Test	52	> 52	n/a	1.923	21.2%

Test Acceptability

				TAC Limits			
Analysis ID	Endpoint	Attribute	Test Stat	Lower	Upper	Overlap	Decision
05-9265-6162	7d Survival Rate	Control Resp	1	0.8	>>	Yes	Passes Criteria
11-5471-2341	Reproduction	Control Resp	30.2	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%
16		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
22		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
29		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
39		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
52		10	0.9000	0.6738	1.0000	0.0000	1.0000	0.1000	0.3162	35.14%	10.00%

Reproduction Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	D	10	30.2	26.06	34.34	17	39	1.831	5.789	19.17%	0.00%
16		10	28.2	24.36	32.04	17	36	1.698	5.371	19.05%	6.62%
22		10	33.4	30.4	36.4	25	38	1.327	4.195	12.56%	-10.60%
29		10	32.6	28.29	36.91	18	39	1.904	6.022	18.47%	-7.95%
39		10	29.7	23.86	35.54	13	39	2.582	8.166	27.49%	1.66%
52		10	28.9	23.8	34	16	36	2.253	7.125	24.65%	4.30%

Cladoceran 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
16		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
22		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
29		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
39		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
52		1.0000	1.0000	1.0000	1.0000	0.0000	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	29	39	34	31	26	17	30	30	33	33
16		24	30	28	36	28	25	17	29	31	34
22		37	29	32	33	37	31	25	36	36	38
29		30	36	38	39	32	18	30	36	35	32
39		39	36	13	31	34	27	28	38	31	20
52		31	33	33	28	16	36	33	33	30	16

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
16		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
22		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
29		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
39		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
52		1/1	1/1	1/1	1/1	0/1	1/1	1/1	1/1	1/1	1/1

CHEMICAL DATA SHEET FOR CHRONIC TOXICITY TESTING									Fathead Minnow
Lab # / Sample ID		K1905006			Test Start (Date/Time)		5-15-19 / 1345		
Client:		Dumas			Test End (Date/Time)		5-22-19 / 1312		
		Day of Test							
		1	2	3	4	5	6	7	notes
Control	MH5020	5/15	5/16	5/17	5/18	5/19	5/20	5/21	
D.O. (mg/L)	INITIAL	8.5	8.2	7.9	8.1	8.7	8.2	8.2	
	FINAL	7.2	7.8	7.2	8.7 7.9	7.5	7.7	7.5	
pH (s.u.)	INITIAL	7.5	7.6	7.8	7.6	8.1	8.3	8.1	
	FINAL	7.9	7.9	7.7	8.1	7.1	7.3	8.3	
temp (C)	INITIAL	22	24	24	24	24	24	24	
	FINAL	25	25	25	25	25	25	25	
ALKALINITY (mg/L)		68							
HARDNESS (mg/L)		118							
CONDUCTIVITY (umho		379							
CHLORINE (mg/L)		<0.05							
CONC:	16%								
D.O. (mg/L)	INITIAL	8.5	8.2	7.9	7.5	8.3	8.4	8.2	
	FINAL	7.2	7.9	7.6	7.7	7.8	7.8	8.2	
pH (s.u)	INITIAL	8.1	7.8	8.0	7.8	8.0	8.1	8.1	
	FINAL	7.9	7.6	7.9	8.0	7.5	7.4	8.1	
temp (C)	INITIAL	22	23	24	24	24	23	24	
	FINAL	25	25	25	25	25	25	24	
CONC:	22%								
D.O. (mg/L)	INITIAL	8.5	8.3	8.1	8.0	8.3	8.4	8.2	
	FINAL	7.2	7.4	7.4	7.6	7.5	7.5	6.9	
pH (mg/L)	INITIAL	8.1	7.8	8.0	7.8	8.0	8.1	8.1	
	FINAL	7.9	7.9	7.9	8.0	7.5	7.5	7.9	
temp (C)	INITIAL	22	23	24	24	24	23	25	
	FINAL	25	25	25	25	25	25	25	
CONC:	29%								
D.O. (mg/L)	INITIAL	8.5	8.4	8.2	8.2	8.3	8.4	8.2	
	FINAL	7.2	7.8	7.4	7.6	7.5	7.3	6.8	
pH (s.u.)	INITIAL	8.0	7.9	8.0	7.7	8.0	8.1	8.1	
	FINAL	7.9	7.2	8.0	8.0	7.6	7.5	7.9	
temp (C)	INITIAL	23	23	24	24	24	23	25	
	FINAL	25	25	25	25	25	25	25	
CONC:	39%								
D.O. (mg/L)	INITIAL	8.4	8.4	8.2	8.3	8.3	8.4	8.2	
	FINAL	6.5	7.2	7.6	7.5	7.5	7.2	6.8	
pH (s.u.)	INITIAL	8.0	7.9	7.9	7.7	8.0	8.1	8.0	
	FINAL	7.9	7.9	8.0	8.0	7.7	7.6	7.7	
temp (C)	INITIAL	23	23	24	24	24	24	25	
	FINAL	25	25	25	25	25	25	25	
CONC:	52%								
D.O. (mg/L)	INITIAL	8.4	8.5	8.2	8.4	8.4	8.5	8.1	
	FINAL	6.5	7.2	7.7	7.3	7.4	7.0	6.8	
pH (s.u.)	INITIAL	8.0	7.8	7.9	7.7	8.0	8.0	8.0	
	FINAL	7.9	7.9	8.0	8.0	7.7	7.6	7.6	
temp (C)	INITIAL	23	23	24	25	24	24	26	
	FINAL	25	25	25	25	25	25	25	
CONC:	100%	A	A	B	B	C	C	C	
ALKALINITY (mg/L)		66		54		64			
HARDNESS (mg/L)		88		44		52			
CONDUCTIVITY (umho		214		217		219			
CHLORINE (mg/L)		<0.05		<0.05		<0.05			

*HF
5-19-19

CHEMICAL DATA SHEET FOR CHRONIC TOXICITY TESTING — Ceriodaphnia Dubia

Lab # / Sample ID K1905006 — Test Start (Date/Time) 5-15-19/1119

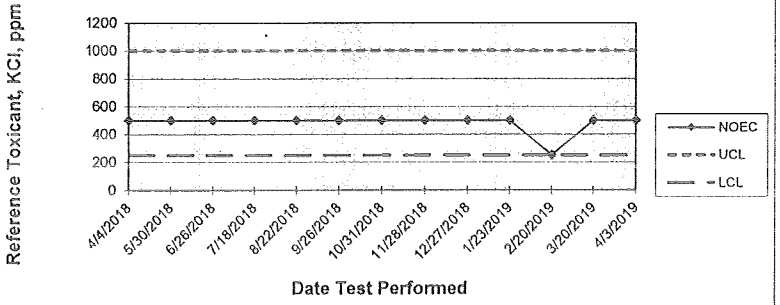
Client: Dinnar — Test End (Date/Time) 5-21-19/1009

		Day of Test							
		1	2	3	4	5	6	7	notes/remarks
Control	MHS 020	5/15	5/16	5/17	5/18	5/19	5/20	5/21	
D.O. (mg/L)	INITIAL	8.5	8.2	7.9	8.1	8.3	8.2	8.2	
	FINAL	8.4	8.5	8.6	8.8	7.9	7.8		
pH (s.u.)	INITIAL	7.5	7.6	7.8	7.6	8.1	8.3	8.1	
	FINAL	8.2	7.8	8.4	8.4	8.2	8.1		
temp (C)	INITIAL	22	24	24	24	24	24	24	
	FINAL	25	25	25	25	25	25		
ALKALINITY (mg/L)		68	—	—	—	—	—	—	
HARDNESS (mg/L)		118	—	—	—	—	—	—	
CONDUCTIVITY (umhos/cm)		379	—	—	—	—	—	—	
CHLORINE (mg/L)		<0.05	—	—	—	—	—	—	
CONC:	16%								
D.O. (mg/L)	INITIAL	8.5	8.2	7.9	7.5	8.3	8.4	8.2	
	FINAL	8.5	8.6	8.6	8.6	8.1	7.7		
pH (s.u)	INITIAL	8.1	7.8	8.0	7.8	8.0	8.1	8.1	
	FINAL	8.3	8.0	8.4	8.5	8.2	8.0		
temp (C)	INITIAL	22	23	24	24	24	23	24	
	FINAL	25	25	25	25	25	25		
CONC:	22%								
D.O. (mg/L)	INITIAL	8.5	8.3	8.1	8.0	8.3	8.4	8.2	
	FINAL	8.5	8.8	8.7	8.5	8.1	7.7		
pH (mg/L)	INITIAL	8.1	7.8	8.0	7.8	8.0	8.1	8.1	
	FINAL	8.3	8.2	8.5	8.4	8.3	8.0		
temp (C)	INITIAL	22	23	24	24	24	23	25	
	FINAL	25	25	25	25	25	25		
CONC:	29%								
D.O. (mg/L)	INITIAL	8.5	8.4	8.2	8.2	8.3	8.4	8.2	
	FINAL	8.5	8.8	8.6	8.5	8.1	7.6		
pH (s.u.)	INITIAL	8.0	7.9	8.0	7.7	8.0	8.1	8.1	
	FINAL	8.4	8.3	8.5	8.4	8.3	7.9		
temp (C)	INITIAL	23	23	24	24	24	23	25	
	FINAL	25	25	25	25	25	25		
CONC:	39%								
D.O. (mg/L)	INITIAL	8.4	8.4	8.2	8.3	8.3	8.4	8.2	
	FINAL	8.5	8.8	8.6	8.4	8.1	7.4		
pH (s.u.)	INITIAL	8.0	7.9	7.9	7.7	8.0	8.1	8.0	
	FINAL	8.3	8.3	8.5	8.4	8.3	7.9		
temp (C)	INITIAL	23	23~~24~~	24	24	24	24	25	
	FINAL	25	25	25	25	25	25		
CONC:	52%								
D.O. (mg/L)	INITIAL	8.4	8.5	8.2	8.4	8.4	8.5	8.1	
	FINAL	8.5	8.9	8.6	8.3	8.1	7.5		
pH (s.u.)	INITIAL	8.0	7.8	7.9	7.7	8.0	8.0	8.0	
	FINAL	8.3	8.4	8.4	8.3	8.3	7.9		
temp (C)	INITIAL	23	23	24	25	24	24	26	
	FINAL	25	25	25	25	25	25		
CONC:	100%	A	A	B	B	C	C	C	
ALKALINITY (mg/L)		166	—	54	—	64	—	—	
HARDNESS (mg/L)		38	—	44	—	52	—	—	
CONDUCTIVITY (umhos/cm)		214	—	217	—	219	—	—	
CHLORINE (mg/L)		<0.05	—	<0.05	—	<0.05	—	—	

er 5-16-19

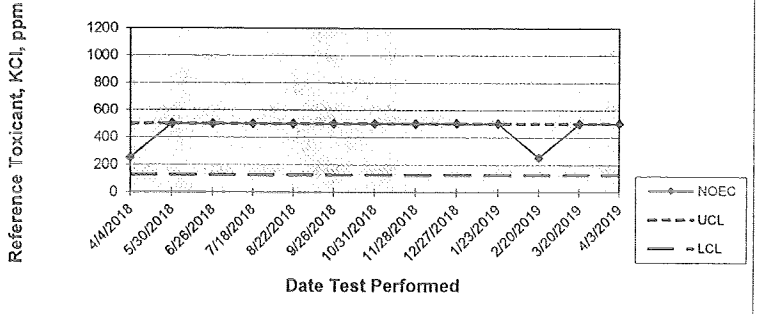
ARKANSAS ANALYTICAL, INC.

FATHEAD MINNOW SURVIVAL 7 Day
QUALITY ASSURANCE



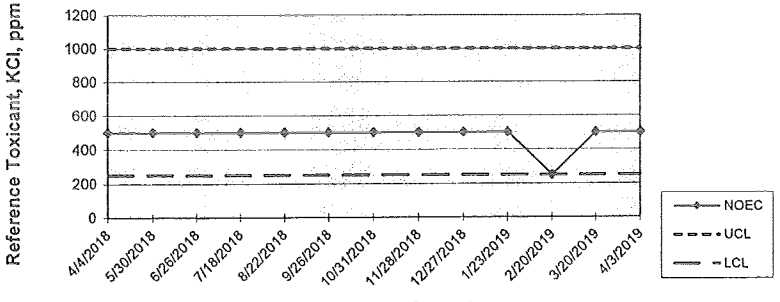
ARKANSAS ANALYTICAL, INC.

CERIODAPHNIA DUBIA SURVIVAL
QUALITY ASSURANCE



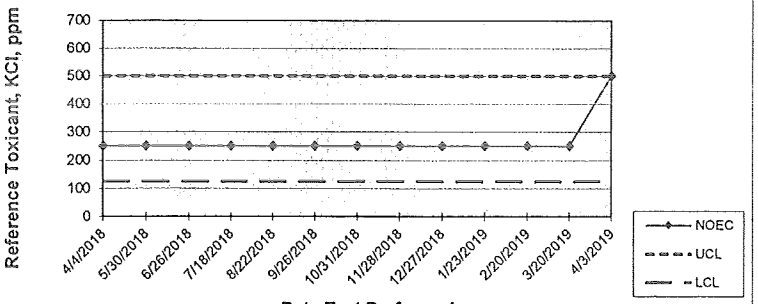
ARKANSAS ANALYTICAL, INC.

FATHEAD MINNOW GROWTH 7 Day
QUALITY ASSURANCE



ARKANSAS ANALYTICAL, INC.

CERIODAPHNIA DUBIA REPRODUCTION
QUALITY ASSURANCE



Arkansas Analytical, Inc.

Toxicity Test Results

CITY OF DUMAS
NPDES PERMIT NUMBER: AR0033987
Third Quarter 2019
AFIN # 21-00045

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

Ceriodaphnia dubia, Survival and Reproduction Test
Test 1002.0

Prepared for: **Pat Fitzgerald**
City of Dumas
155 E. Waterman
Dumas, Arkansas, 71639

Prepared by: Arkansas Analytical, Inc.
8100 National Drive
Little Rock, Arkansas 72209
Lab Number K1909008

Monday, October 07, 2019

Plant Location

City of Dumas. The plant is located in Dumas, Arkansas, Highway 165 North in Section 25, Township 9 South, Range 4 West in Desha 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%, 16%, 22%, 29%, 39%, 52%
- 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%, 16%, 22%, 29%, 39%, 52%
- Dilution water: Moderately hard synthetic
- No deviation from method

Reference Toxicant Data

REFERENCE TOXICANT (Potassium Chloride)

Ceriodaphnia dubia 8/7/19-8/13/19		*Pimephales promelas* 8/7/19-8/14/19	
NOEC Survival:	500 ppm KCl	NOEC Survival:	500 ppm KCl
LOEC Survival:	1000 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 Dumas

Ceriodaphnia dubia		*Pimephales promelas*	
NOEC Survival Parameter: **TOP3B**	52%	NOEC Survival Parameter: **TOP6C**	52%
Pass/Fail Survival Parameter: **TLP3B**	Pass	Pass/Fail Survival Parameter: **TLP6C**	Pass
NOEC Reproduction Parameter: **TPP3B**	52%	NOEC Growth Parameter: **TPP6C**	52%
Pass/Fail Reproduction Parameter: **TGP3B**	Pass	Pass/Fail Growth Parameter: **TGP6C**	Pass
%CV Reproduction Parameter: **TQP3B**	12.0%	%CV Growth Parameter: **TQP6C**	11.9%
PMSD Reproduction	15.1%	PMSD Growth	17.8%

Conclusion

Pimephales promelas, (Method 1000.0): The permit issued to the City of Dumas, specifies that the **critical dilution is 39% 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 Dumas, specifies that the **critical dilution is 39% 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: Melissa Bird, Emily Nichols, Jettie Parnell, Hallie Freyaldenhoven

Reviewed by:

Melissa Bird

Melissa Bird

Appendices

Appendix A.....Chains of custody

Appendix B.....Fathead minnow data & statistics

Appendix C.....*Ceriodaphnia dubia* data & statistics

Appendix D.....Water chemistry data

Appendix E.....Reference toxicant control charts

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 INFORMATION
McClelland Consulting Engineers	McClelland Consulting Engineers
1311 W 2nd St.	P.O. Box 34087
Little Rock, AR 72201	Little Rock, AR 72203-4087
Attn: Matt Bienvenu	

Project Description: Chronic Toxicity; City of Dumas

Reporting Information
Telephone: 501-378-7808
Fax: 501-376-4677
Email: mbienvenu@mcclelland-engrs.com

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

Preservation Codes:
1. Cool, 6 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

Preservative Code: 1
Bottle Type: P

Sampler(s) Signature: Jesse James
Sampler(s) Printed: Jesse James

Field Number	SAMPLE COLLECTION Date/s	Time/s	Grab	Comp	Number of Bottles	Sample Matrix	SAMPLE IDENTIFICATION/ DESCRIPTION	TEST PARAMETERS: Chronic Toxicity	Bottle Type Code
	9/16-9/17	7A-7A		X	4	Water	Final Discharge	X	A

Arkansas Analytical Work Order Number: 19090058

1. Relinquished by: (Signature)	Date/Time	2. Received by: (Signature)
Jesse James	9/17/19 1436	
3. Relinquished by: (Signature)	Date/Time	4. Received by lab: (Signature)
		Sydney James

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:		°C
6. TEMPERATURE GUN ID:	HHT# 2	

FOR COMPLETION BY LAB ONLY

REMARKS / SAMPLE COMMENTS

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 INFORMATION
McClelland Consulting Engineers	McClelland Consulting Engineers
1311 W 2nd St.	P.O. Box 34087
Little Rock, AR 72201	Little Rock, AR 72203-4087
Attn: Matt Bienvenu	

Project Description: Chronic Toxicity; City of Dumas

Reporting Information
Telephone: 501-378-7808
Fax: 501-376-4677
Email: mbienvenu@mcclelland-engrs.com

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

Preservative Code: 1
Bottle Type: P

Preservation Codes:
1. Cool, 6 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: Jesse James
Sampler(s) Printed: Jesse James

Field Number	SAMPLE COLLECTION Date/s	Time/s	Grab	Comp	Number of Bottles	Sample Matrix	SAMPLE IDENTIFICATION/ DESCRIPTION	Chronic Toxicity	TEST PARAMETERS	Bottle Type Code
	9/17-9/18	8A-8A		X	4	Water	Final Discharge	X		B

Arkansas Analytical Work Order Number: K1909008

1. Relinquished by: (Signature)	Date/Time	2. Received by: (Signature)
Jesse James	9/18/19 1423	
3. Relinquished by: (Signature)	Date/Time	4. Received by lab: (Signature)
		Amanda Johnson

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

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 INFORMATION
McClelland Consulting Engineers	McClelland Consulting Engineers
1311 W 2nd St.	P.O. Box 34087
Little Rock, AR 72201	Little Rock, AR 72203-4087
Attn: Matt Bienvenu	

Project Description: Chronic Toxicity; City of Dumas

Reporting Information
Telephone: 501-378-7808
Fax: 501-376-4677
Email: mbienvenu@mcclelland-engrs.com

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

Preservative Code: 1
Bottle Type: P

Preservation Codes:
1. Cool, 6 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: [signature]
Sampler(s) Printed: Jesse James

Field Number	SAMPLE COLLECTION Date/s	Time/s	Grab	Comp	Number of Bottles	Sample Matrix	SAMPLE IDENTIFICATION/ DESCRIPTION	TEST PARAMETERS: Chronic Toxicity	Bottle Type Code
	9/18-9/19	9A-9P		X	4	Water	Final Discharge	X	C

Arkansas Analytical Work Order Number: K1909008

1. Relinquished by: (Signature)	Date/Time	2. Received by: (Signature)
[signature]	9/19/19 1420	
3. Relinquished by: (Signature)	Date/Time	4. Received by lab: (Signature)
		Sydney James

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

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

Batch ID:	16-5076-1681	**Test Type:**	Growth-Survival (7d)	**Analyst:**	Melissa Bird
Start Date:	18 Sep-19 12:40	**Protocol:**	EPA/821/R-02-013 (2002)	**Diluent:**	Mod-Hard Synthetic Water
Ending Date:	25 Sep-19 12:05	**Species:**	Pimephales promelas	**Brine:**	Not Applicable
Duration:	6d 23h	**Source:**	Aquatox, AR	**Age:**	<24
Sample ID:	16-2751-8652	**Code:**	K1909008FH	**Client:**	City of Dumas
Sample Date:	17 Sep-19 07:00	**Material:**	POTW Effluent	**Project:**	WET Quarterly Compliance Test (3Q)
Receipt Date:	17 Sep-19 14:36	**Source:**	City of Dumas (AR0033987)		
Sample Age:	30h (1 °C)	**Station:**	Final Discharge		

Sample Renewals

Renewal	Sample Code	Sample Date	Receive Date	Renewal Date	Temp °C
1	K1909008B	18 Sep-19 08:00	18 Sep-19 14:23	20 Sep-19 00:00	1
2	K1909008C	19 Sep-19 09:00	19 Sep-19 14:20	21 Sep-19 00:00	1

Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	NOEL	LOEL	TOEL	TU	PMSD ✓
13-2956-8641	7d Survival Rate	Steel Many-One Rank Sum Test	52	> 52	n/a	1.923	6.01%
19-4672-9475	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	52	> 52	n/a	1.923	17.8%

Test Acceptability

				TAC Limits			
Analysis ID	Endpoint	Attribute	Test Stat	Lower	Upper	Overlap	Decision
13-2956-8641	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%
16		5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
22		5	0.9600	0.8920	1.0000	0.9000	1.0000	0.0245	0.0548	5.71%	4.00%
29		5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
39		5	0.9600	0.8920	1.0000	0.9000	1.0000	0.0245	0.0548	5.71%	4.00%
52		5	0.9800	0.9245	1.0000	0.9000	1.0000	0.0200	0.0447	4.56%	2.00%

Mean Dry Weight-mg Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	D	5	0.4358	0.3715	0.5001	0.381	0.494	0.02315	0.05176	11.88%	0.00%
16		5	0.4918	0.3926	0.591	0.4	0.582	0.03574	0.07991	16.25%	-12.85%
22		5	0.4516	0.398	0.5052	0.389	0.504	0.01929	0.04314	9.55%	-3.63%
29		5	0.4234	0.3798	0.467	0.38	0.474	0.01571	0.03513	8.30%	2.85%
39		5	0.3924	0.3488	0.436	0.345	0.433	0.01571	0.03514	8.96%	9.96%
52		5	0.3728	0.3063	0.4393	0.309	0.445	0.02396	0.05357	14.37%	14.46%

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
16		1.0000	1.0000	1.0000	1.0000	1.0000
22		0.9000	0.9000	1.0000	1.0000	1.0000
29		1.0000	1.0000	1.0000	1.0000	1.0000
39		0.9000	1.0000	0.9000	1.0000	1.0000
52		1.0000	1.0000	1.0000	0.9000	1.0000

Mean Dry Weight-mg Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	D	0.381	0.47	0.494	0.382	0.452
16		0.533	0.415	0.582	0.4	0.529
22		0.389	0.434	0.504	0.459	0.472
29		0.404	0.38	0.425	0.434	0.474
39		0.433	0.345	0.369	0.403	0.412
52		0.309	0.349	0.353	0.408	0.445

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
16		10/10	10/10	10/10	10/10	10/10
22		9/10	9/10	10/10	10/10	10/10
29		10/10	10/10	10/10	10/10	10/10
39		9/10	10/10	9/10	10/10	10/10
52		10/10	10/10	10/10	9/10	10/10

CETIS Summary Report

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

Batch ID:	14-7308-6681	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Melissa Bird
Start Date:	18 Sep-19 10:06	**Protocol:**	EPA/600/4-91/002 (1994)	**Diluent:**	Mod-Hard Synthetic Water
Ending Date:	24 Sep-19 10:00	**Species:**	Ceriodaphnia dubia	**Brine:**	Not Applicable
Duration:	6d	**Source:**	In-House Culture	**Age:**	<24
Sample ID:	13-2178-5787	**Code:**	K1909008CD	**Client:**	City of Dumas
Sample Date:	17 Sep-19 07:00	**Material:**	POTW Effluent	**Project:**	WET Quarterly Compliance Test (3Q)
Receipt Date:	17 Sep-19 14:36	**Source:**	City of Dumas (AR0033987)		
Sample Age:	27h (1 °C)	**Station:**	Final Discharge		

Sample Renewals

Renewal	Sample Code	Sample Date	Receive Date	Renewal Date	Temp °C
1	K1909008B	18 Sep-19 08:00	18 Sep-19 14:23	20 Sep-19 00:00	1
2	K1909008C	19 Sep-19 09:00	19 Sep-19 14:20	21 Sep-19 00:00	1

Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	NOEL	LOEL	TOEL	TU	PMSD ✓
11-5328-6055	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	52	> 52	n/a	1.923	n/a
01-1060-5666	Reproduction	Dunnett Multiple Comparison Test	52	> 52	n/a	1.923	15.1%

Test Acceptability

				TAC Limits			
Analysis ID	Endpoint	Attribute	Test Stat	Lower	Upper	Overlap	Decision
11-5328-6055	7d Survival Rate	Control Resp	1	0.8	>>	Yes	Passes Criteria
01-1060-5666	Reproduction	Control Resp	29.4	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%
16		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
22		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
29		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
39		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
52		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	29.4	26.89	31.91	24	35	1.108	3.502	11.91%	0.00%
16		10	25.7	22.21	29.19	18	33	1.542	4.877	18.98%	12.59%
22		10	25.8	21.67	29.93	13	32	1.825	5.77	22.36%	12.24%
29		10	24.4	20.8	28	17	33	1.593	5.038	20.65%	17.01%
39		10	24.2	22.13	26.27	20	28	0.9165	2.898	11.98%	17.69%
52		10	25.9	23.65	28.15	22	31	0.9939	3.143	12.13%	11.90%

Cladoceran 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
16		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
22		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
29		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
39		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
52		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	28	29	27	34	27	31	27	24	32	35
16		26	27	30	20	24	18	33	30	28	21
22		31	26	20	24	25	13	29	32	30	28
29		26	28	19	21	33	17	25	26	29	20
39		21	22	26	22	28	26	20	27	27	23
52		28	22	23	27	30	26	23	31	26	23

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
16		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
22		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
29		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
39		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
52		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		K1909008			Test Start (Date/Time)		9-18-19/1240		
Client:		Dumas			Test End (Date/Time)		9-25-19/1205		
		Day of Test							
		1	2	3	4	5	6	7	notes
Control	MH5038	9/18	9/19	9/20	9/21	9/22	9/23	9/24	MH5039 used 9/20
D.O. (mg/L)	INITIAL	8.5	8.0	8.3	8.7	6.2	8.3	8.5	
	FINAL	7.6	7.6	8.4	7.9	7.6	7.8	7.7	
pH (s.u.)	INITIAL	8.7	8.5	8.1	8.2	8.3	7.7	7.6	
	FINAL	6.8	6.6	8.2	8.2	7.1	7.7	7.5	
temp (C)	INITIAL	21	22	20	22	22	~~26~~ 23	21	@ 9/23
	FINAL	25	25	25	25	25	25	25	
ALKALINITY (mg/L)		64	—	68	—			—	
HARDNESS (mg/L)		88	—	84	—			—	
CONDUCTIVITY (umho		294	—	317	—			—	
CHLORINE (mg/L)		<0.05	—	<0.05	—			—	
CONC:	6%								
D.O. (mg/L)	INITIAL	8.6	8.3	8.5	8.4	8.5	8.5	8.5	
	FINAL	7.6	7.5	8.4	7.7	7.6	7.8	7.7	
pH (s.u)	INITIAL	8.7	8.2	8.1	8.3	8.5	7.8	7.7	
	FINAL	6.9	7.0	8.3	8.2	7.3	7.6	7.4	
temp (C)	INITIAL	22	21	20	23	22	21	21	
	FINAL	25	25	25	25	25	25	25	
CONC:	22%								
D.O. (mg/L)	INITIAL	8.6	8.4	8.4	8.5	8.6	8.4	8.4	
	FINAL	7.6	7.4	8.4	6.7	7.7	7.8	7.7	
pH (mg/L)	INITIAL	8.6	8.2	8.1	8.3	8.4	7.9	7.8	
	FINAL	8.0	7.2	8.4	8.2	7.4	7.7	7.5	
temp (C)	INITIAL	22	22	20	23	22	22	21	
	FINAL	25	25	25	25	25	25	25	
CONC:	29%								
D.O. (mg/L)	INITIAL	8.6	8.4	8.5	8.5	8.6	8.4	8.4	
	FINAL	7.6	7.6	8.4	7.4	7.8	8.0	7.8	
pH (s.u.)	INITIAL	8.6	8.2	8.2	8.3	8.4	7.9	7.9	
	FINAL	8.0	7.4	8.3	8.3	7.5	7.8	7.6	
temp (C)	INITIAL	22	22	20	23	22	22	20	
	FINAL	25	25	25	25	25	25	25	
CONC:	39%								
D.O. (mg/L)	INITIAL	8.6	8.4	8.5	8.4	8.6	8.5	8.4	
	FINAL	7.6	7.5	8.3	7.4	7.8	7.8	7.8	
pH (s.u.)	INITIAL	8.5	8.2	8.2	8.2	8.4	8.0	8.0	
	FINAL	8.2	7.5	8.3	8.4	7.6	8.0	7.6	
temp (C)	INITIAL	22	22	20	23	23	22	20	
	FINAL	25	25	25	25	25	25	25	
CONC:	52%								
D.O. (mg/L)	INITIAL	8.5	8.3	8.9	8.4	8.6	8.5	8.4	
	FINAL	7.5	7.5	8.3	7.6	7.8	7.9	7.9	
pH (s.u.)	INITIAL	8.5	8.4	8.2	8.2	8.4	8.1	8.1	
	FINAL	8.3	7.6	8.4	8.4	7.7	8.1	7.7	
temp (C)	INITIAL	22	22	20	23	23	22	20	
	FINAL	25	25	25	25	25	25	25	
CONC:	100%	A	A	B	C	C	B	C	
ALKALINITY (mg/L)		120	—	132	134	—	132	134	
HARDNESS (mg/L)		32	—	30	50	—	30	50	
CONDUCTIVITY (umho		345	—	343	346	—	343	346	
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 K1909008 — Test Start (Date/Time) 9-18-19 /1006

Client: Dumas — Test End (Date/Time) 9-24-19 /1000

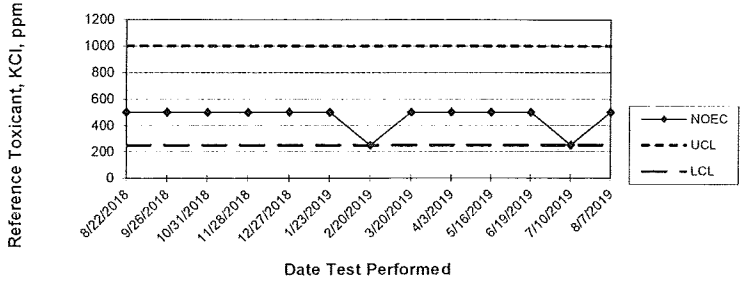
		Day of Test							
		1	2	3	4	5	6	7	notes/remarks
Control	MHS 038	9/18	9/19	9/20	9/21	9/22	9/23	9/24	MHS 039 used 9/20
D.O. (mg/L)	INITIAL	8.5	8.0	8.3	8.7	8.2	8.3	8.5	
	FINAL	8.3	8.9	7.9	8.2	8.3	7.9		
pH (s.u.)	INITIAL	8.7	8.5	8.1	8.2	8.3	7.7	7.6	
	FINAL	8.4	8.7	8.4	8.3	8.3	8.3		
temp (C)	INITIAL	21	22	20	22	22	23	21	
	FINAL	25	25	25	25	25	25		
ALKALINITY (mg/L)		64	—	68	—	—	—	—	
HARDNESS (mg/L)		88	—	84	—	—	—	—	
CONDUCTIVITY (umhos/cm)		294	—	317	—	—	—	—	
CHLORINE (mg/L)		<0.05	—	<0.05	—	—	—	—	
CONC: 16%									
D.O. (mg/L)	INITIAL	8.6	8.3	8.5	8.4	8.5	8.5	8.5	
	FINAL	8.3	8.8	8.0	8.1	8.2	7.9		
pH (s.u)	INITIAL	8.7	8.2	8.1	8.3	8.5	7.8	7.7	
	FINAL	8.5	8.7	8.4	8.5	8.3	8.3		
temp (C)	INITIAL	22	21	20	23	22	21	21	
	FINAL	25	25	25	25	25	25		
CONC: 22%									
D.O. (mg/L)	INITIAL	8.6	8.4	8.4	8.5	8.6	8.4	8.4	
	FINAL	8.3	8.8	7.8	8.1	8.2	8.0		
pH (mg/L)	INITIAL	8.6	8.2	8.1	8.3	8.2	7.9	7.8	
	FINAL	8.5	8.7	8.4	8.4	8.3	8.4		
temp (C)	INITIAL	22	22	20	23	22	22	21	
	FINAL	25	25	25	25	25	25		
CONC: 29%									
D.O. (mg/L)	INITIAL	8.6	8.4	8.5	8.5	8.6	8.4	8.4	
	FINAL	8.3	8.8	7.7	8.1	8.2	8.0		
pH (s.u.)	INITIAL	8.6	8.2	8.2	8.3	8.4	7.9	7.9	
	FINAL	8.5	8.7	8.4	8.5	8.3	8.4		
temp (C)	INITIAL	22	22	20	23	22	22	20	
	FINAL	25	25	25	25	25	25		
CONC: 39%									
D.O. (mg/L)	INITIAL	8.6	8.4	8.5	8.4	8.6	8.5	8.4	
	FINAL	8.4	8.8	7.6	8.1	8.2	8.0		
pH (s.u.)	INITIAL	8.5	8.2	8.2	8.2	8.4	8.0	8.0	
	FINAL	8.6	8.7	8.4	8.5	8.3	8.4		
temp (C)	INITIAL	22	22	20	23	23	22	20	
	FINAL	25	25	25	25	25	25		
CONC: 52%									
D.O. (mg/L)	INITIAL	8.5	8.3	8.5	8.4	8.6	8.5	8.4	
	FINAL	8.4	8.7	7.6	8.1	8.2	8.0		
pH (s.u.)	INITIAL	8.5	8.4	8.2	8.2	8.4	8.1	8.1	
	FINAL	8.5	8.7	8.4	8.5	8.3	8.4		
temp (C)	INITIAL	22	22	20	23	23	22	20	
	FINAL	25	25	25	25	25	25		
CONC: 100%		A	A	~~B~~ B	C	C	B	C	
ALKALINITY (mg/L)		120	—	132	134	—	132	134	
HARDNESS (mg/L)		32	—	30	50	—	30	50	
CONDUCTIVITY (umhos/cm)		345	—	343	346	—	343	346	
CHLORINE (mg/L)		<0.05	—	<0.05	<0.05	—	<0.05	<0.05	

*HF 9-24-19

Revision 1

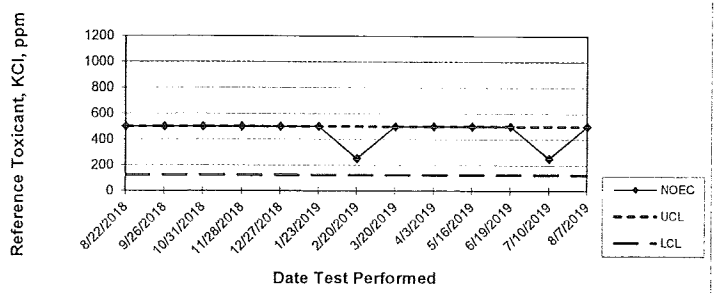
ARKANSAS ANALYTICAL, INC.

FATHEAD MINNOW SURVIVAL 7 Day
QUALITY ASSURANCE



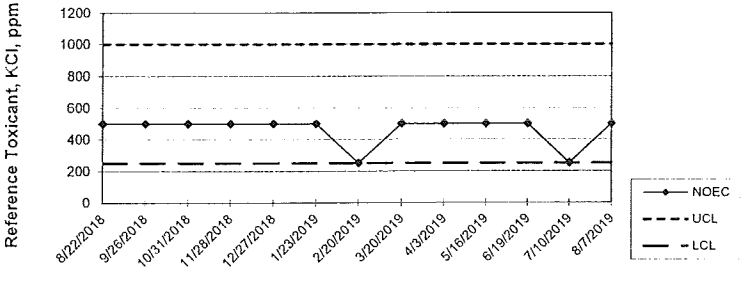
ARKANSAS ANALYTICAL, INC.

CERIODAPHNIA DUBIA SURVIVAL
QUALITY ASSURANCE



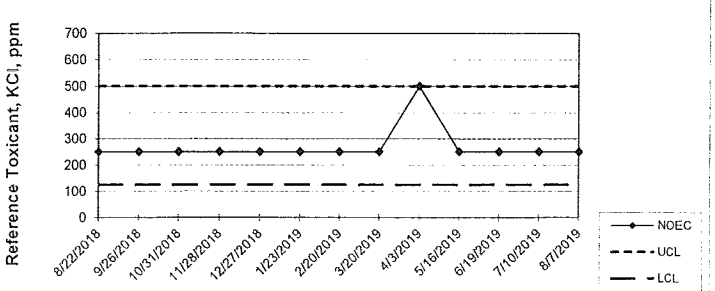
ARKANSAS ANALYTICAL, INC.

FATHEAD MINNOW GROWTH 7 Day
QUALITY ASSURANCE



ARKANSAS ANALYTICAL, INC.

CERIODAPHNIA DUBIA REPRODUCTION
QUALITY ASSURANCE



Arkansas Analytical, Inc.

Toxicity Test Results

CITY OF DUMAS
NPDES PERMIT NUMBER: AR0033987
Fourth Quarter 2019
AFIN # 21-00045

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

Ceriodaphnia dubia, Survival and Reproduction Test
Test 1002.0

Prepared for: **Pat Fitzgerald**
City of Dumas
155 E. Waterman
Dumas, Arkansas, 71639

Prepared by: Arkansas Analytical, Inc.
8100 National Drive
Little Rock, Arkansas 72209
Lab Number K1912004

Monday, December 30, 2019

Plant Location

City of Dumas. The plant is located in Dumas, Arkansas, Highway 165 North in Section 25, Township 9 South, Range 4 West in Desha 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%, 16%, 22%, 29%, 39%, 52%
- 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%, 16%, 22%, 29%, 39%, 52%
- Dilution water: Moderately hard synthetic
- No deviation from method

Reference Toxicant Data

REFERENCE TOXICANT (Potassium Chloride)

Ceriodaphnia dubia 11/20/19-11/27/19		*Pimephales promelas* 11/20/19-11/27/19	
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 Dumas

Ceriodaphnia dubia		*Pimephales promelas*	
NOEC Survival Parameter: **TOP3B**	52%	NOEC Survival Parameter: **TOP6C**	52%
Pass/Fail Survival Parameter: **TLP3B**	Pass	Pass/Fail Survival Parameter: **TLP6C**	Pass
NOEC Reproduction Parameter: **TPP3B**	52%	NOEC Growth Parameter: **TPP6C**	52%
Pass/Fail Reproduction Parameter: **TGP3B**	Pass	Pass/Fail Growth Parameter: **TGP6C**	Pass
%CV Reproduction Parameter: **TQP3B**	35.4%	%CV Growth Parameter: **TQP6C**	15.4%
PMSD Reproduction	32.0%	PMSD Growth	15.2%

Conclusion

Pimephales promelas, (Method 1000.0): The permit issued to the City of Dumas, specifies that the **critical dilution is 39% 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 Dumas, specifies that the **critical dilution is 39% 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: Melissa Bird, Emily Nichols, Jettie Parnell, Sean Stokes, Sam Petty

Reviewed by:

Melissa Bird

Melissa Bird

Appendices

Appendix A.....Chains of custody

Appendix B.....Fathead minnow data & statistics

Appendix C.....*Ceriodaphnia dubia* data & statistics

Appendix D.....Water chemistry data

Appendix E.....Reference toxicant control charts

Arkansas Analytical Inc.

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

CHAIN OF CUSTODY RECORD

CLIENT INFORMATION	Project Description	Turnaround Time
McClelland Consulting Engineers	Chronic Toxicity	1 Day (100%)
7302 Kanis Rd.	City of Dumas	2 Day (50%)
Little Rock, AR 72204	**Reporting Information**	3 Day (25%)
	Telephone: 501-378-7808	Routine
Attn: Matt Bienvenu	Fax: 501-376-4677	Preservative Code:
	Email: mbienvenu@mcclelland-engrs.com	Bottle Type:

Preservation Codes:

1. Cool, 6 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: [signature]

Sampler(s) Printed: Jesse James

Field Number	SAMPLE COLLECTION Date/s	Time/s	Grab	Comp	Number of Bottles	Sample Matrix	SAMPLE IDENTIFICATION/ DESCRIPTION	TEST PARAMETERS: Chronic Toxicity	Bottle Type Code
	12/9-12/10	9A-9A		X	4	Water	Final Discharge	X	A

TEST PARAMETERS

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

Arkansas Analytical Work Order Number: K1912004

1. Relinquished by: (Signature)	Date/Time	2. Received by: (Signature)
[signature]	12/10/19 1424	
3. Relinquished by: (Signature)	Date/Time	4. Received by lab: (Signature)
		Jeremy 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

Arkansas Analytical Inc.

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

CHAIN OF CUSTODY RECORD

CLIENT INFORMATION	Project Description	Turnaround Time
McClelland Consulting Engineers	Chronic Toxicity	1 Day (100%)
7302 Kanis Rd.	City of Dumas	2 Day (50%)
Little Rock, AR 72204	**Reporting Information**	3 Day (25%)
	Telephone: 501-378-7808	Routine
Attn: Matt Bienvenu	Fax: 501-376-4677	Preservative Code: 1
	Email: mbienvenu@mcclelland-engrs.com	Bottle Type: P

Preservation Codes:

1. Cool, 6 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: Jesse James

Sampler(s) Printed: Jesse James

Field Number	SAMPLE COLLECTION Date/s	Time/s	Grab	Comp	Number of Bottles	Sample Matrix	SAMPLE IDENTIFICATION/ DESCRIPTION	TEST PARAMETERS: Chronic Toxicity	Bottle Type Code
	12/10-12/11	10A-10P		X	4	Water	Final Discharge	X	604 B

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

Arkansas Analytical Work Order Number: K1912-

1. Relinquished by: (Signature)	Date/Time	2. Received by: (Signature)
	12/11/19 1534	
3. Relinquished by: (Signature)	Date/Time	4. Received by lab: (Signature)
		Sydney James

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

Arkansas Analytical Inc.

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

CHAIN OF CUSTODY RECORD

CLIENT INFORMATION	Project Description	Turnaround Time	Preservation Codes:
McClelland Consulting Engineers	Chronic Toxicity	1 Day (100%)	1. Cool, 6 Degrees Centigrade / 4. Thiosulfate for Dechlorination
7302 Kanis Rd.	City of Dumas	2 Day (50%)	2. Sulfuric Acid (H_2SO_4), pH < 2 / 5. Hydrochloric Acid(HCl)
Little Rock, AR 72204	**Reporting Information**	3 Day (25%)	3. Nitric Acid (HNO_3), pH < 2 / 6. Sodium Hydroxide (NaOH), pH > 12
	Telephone: 501-378-7808	Routine	
Attn: Matt Bienvenu	Fax: 501-376-4677	Preservative Code:	
	Email: mbienvenu@mcclelland-engrs.com	Bottle Type:	

Sampler(s) Signature: Jesse James

Sampler(s) Printed: Jesse James

Field Number	SAMPLE COLLECTION Date/s	Time/s	Grab	Comp	Number of Bottles	Sample Matrix	SAMPLE IDENTIFICATION/ DESCRIPTION	Chronic Toxicity	TEST PARAMETERS	Bottle Type Code
	12/11-12/12	11A-11P		X	4	Water	Final Discharge	X		C

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

Arkansas Analytical Work Order Number: K1912004

1. Relinquished by: (Signature)	Date/Time	2. Received by: (Signature)
	12/12/19 1430	
3. Relinquished by: (Signature)	Date/Time	4. Received by lab: (Signature)
		Darrin 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

CETIS Summary Report

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

Batch ID:	02-8642-1075	**Test Type:**	Growth-Survival (7d)	**Analyst:**	Emily Nichols		
Start Date:	11 Dec-19 13:11	**Protocol:**	EPA/821/R-02-013 (2002)	**Diluent:**	Mod-Hard Synthetic Water		
Ending Date:	18 Dec-19 12:40	**Species:**	Pimephales promelas	**Brine:**	Not Applicable		
Test Length:	6d 23h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR	**Age:**	<24
Sample ID:	09-4234-3473	**Code:**	K1912004FH	**Project:**	WET Quarterly Compliance Test (4Q)		
Sample Date:	10 Dec-19 09:00	**Material:**	Industrial Effluent	**Source:**	Dumas (AR0033987)		
Receipt Date:	10 Dec-19 14:24	**CAS (PC):**		**Station:**			
Sample Age:	28h (1 °C)	**Client:**	Dumas				

Sample Renewals

Renewal	Sample Code	Sample Date	Receive Date	Renewal Date	Temp °C
1	K1912004B	11 Dec-19 10:00	11 Dec-19 15:34	13 Dec-19 00:00	2
2	K1912004C	12 Dec-19 11:00	12 Dec-19 14:30	15 Dec-19 00:00	1

Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	✓	NOEL	LOEL	TOEL	TU	PMSD	S
06-9763-6217	7d Survival Rate	Steel Many-One Rank Sum Test		52	>52	n/a	1.923	4.07%	1
17-3123-3647	Mean Dry Biomass-mg	Dunnett Multiple Comparison Test		52	>52	n/a	1.923	15.2%	1

Test Acceptability

				TAC Limits			
Analysis ID	Endpoint	Attribute	Test Stat	Lower	Upper	Overlap	Decision
06-9763-6217	7d Survival Rate	Control Resp	1	0.8	>>	Yes	Passes Criteria
17-3123-3647	Mean Dry Biomass-mg	Control Resp	0.5744	0.25	>>	Yes	Passes Criteria
17-3123-3647	Mean Dry Biomass-mg	PMSD	0.1524	0.12	0.3	Yes	Passes Criteria

7d Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	L	5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
16		5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
22		5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
29		5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
39		5	0.9800	0.9245	1.0000	0.9000	1.0000	0.0200	0.0447	4.56%	2.00%
52		5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%

Mean Dry Biomass-mg Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	L	5	0.5744	0.4647	0.6841	0.518	0.725	0.03951	0.08835	15.38%	0.00%
16		5	0.5244	0.4815	0.5673	0.483	0.576	0.01546	0.03456	6.59%	8.70%
22		5	0.556	0.5127	0.5993	0.511	0.608	0.01561	0.03491	6.28%	3.20%
29		5	0.5244	0.4495	0.5993	0.444	0.599	0.02699	0.06036	11.51%	8.71%
39		5	0.5224	0.4505	0.5943	0.442	0.596	0.02591	0.05793	11.09%	9.05%
52		5	0.511	0.4386	0.5834	0.444	0.579	0.02607	0.0583	11.41%	11.04%

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

7d Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	L	1.0000	1.0000	1.0000	1.0000	1.0000
16		1.0000	1.0000	1.0000	1.0000	1.0000
22		1.0000	1.0000	1.0000	1.0000	1.0000
29		1.0000	1.0000	1.0000	1.0000	1.0000
39		0.9000	1.0000	1.0000	1.0000	1.0000
52		1.0000	1.0000	1.0000	1.0000	1.0000

Mean Dry Biomass-mg Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	L	0.524	0.725	0.583	0.522	0.518
16		0.483	0.576	0.522	0.534	0.507
22		0.511	0.555	0.608	0.545	0.561
29		0.519	0.599	0.565	0.444	0.495
39		0.493	0.596	0.537	0.442	0.544
52		0.521	0.444	0.459	0.552	0.579

7d Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	L	10/10	10/10	10/10	10/10	10/10
16		10/10	10/10	10/10	10/10	10/10
22		10/10	10/10	10/10	10/10	10/10
29		10/10	10/10	10/10	10/10	10/10
39		9/10	10/10	10/10	10/10	10/10
52		10/10	10/10	10/10	10/10	10/10

CETIS Summary Report

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

Batch ID:	17-0591-9368	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Emily Nichols
Start Date:	11 Dec-19 09:30	**Protocol:**	EPA/821/R-02-013 (2002)	**Diluent:**	Mod-Hard Synthetic Water
Ending Date:	18 Dec-19 09:45	**Species:**	Ceriodaphnia dubia	**Brine:**	Not Applicable
Test Length:	7d 0h	**Taxon:**	Branchiopoda	**Source:**	In-House Culture **Age:** <24
Sample ID:	15-3478-2678	**Code:**	K1912004CD	**Project:**	WET Quarterly Compliance Test (4Q)
Sample Date:	10 Dec-19 09:00	**Material:**	Industrial Effluent	**Source:**	Dumas (AR0033987)
Receipt Date:	10 Dec-19 14:24	**CAS (PC):**		**Station:**	
Sample Age:	25h (1 °C)	**Client:**	Dumas		

Sample Renewals

Renewal	Sample Code	Sample Date	Receive Date	Renewal Date	Temp °C
1	K1912004B	11 Dec-19 10:00	11 Dec-19 15:34	13 Dec-19 00:00	2
2	K1912004C	12 Dec-19 11:00	12 Dec-19 14:30	15 Dec-19 00:00	1

Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	✓	NOEL	LOEL	TOEL	TU	PMSD	S
03-1382-6846	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test		52	>52	n/a	1.923	n/a	1
20-9234-3614	Reproduction	Dunnett Multiple Comparison Test		52	>52	n/a	1.923	32.0%	1

Test Acceptability

				TAC Limits			
Analysis ID	Endpoint	Attribute	Test Stat	Lower	Upper	Overlap	Decision
03-1382-6846	7d Survival Rate	Control Resp	1	0.8	>>	Yes	Passes Criteria
20-9234-3614	Reproduction	Control Resp	23.3	15	>>	Yes	Passes Criteria
20-9234-3614	Reproduction	PMSD	0.3204	0.13	0.47	Yes	Passes Criteria

7d Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	L	10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
16		10	0.8000	0.4984	1.0000	0.0000	1.0000	0.1333	0.4216	52.70%	20.00%
22		10	0.7000	0.3544	1.0000	0.0000	1.0000	0.1528	0.4830	69.01%	30.00%
29		10	0.9000	0.6738	1.0000	0.0000	1.0000	0.1000	0.3162	35.14%	10.00%
39		10	0.8000	0.4984	1.0000	0.0000	1.0000	0.1333	0.4216	52.70%	20.00%
52		10	0.7000	0.3544	1.0000	0.0000	1.0000	0.1528	0.4830	69.01%	30.00%

Reproduction Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	L	10	23.3	18.35	28.25	13	34	2.186	6.913	29.67%	0.00%
16		10	16.2	10.64	21.76	0	27	2.458	7.772	47.97%	30.47%
22		10	19.8	15.22	24.38	9	29	2.026	6.408	32.37%	15.02%
29		10	20.7	17.7	23.7	14	26	1.325	4.191	20.25%	11.16%
39		10	~~21.2~~	14.43	27.97	6	36	2.992	9.461	~~44.63%~~	9.01%
52		10	18	12.34	23.66	2	33	2.503	7.916	43.98%	22.75%

Avg. neonates per surviving female in the 39%

$\bar{x}$=23.8 CV=35.4%

EM
12-30-19

Ceriodaphnia 7-d Survival and Reproduction Test — Arkansas Analytical

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	L	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
16		1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	1.0000	1.0000	1.0000	1.0000
22		0.0000	0.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
29		0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
39		1.0000	1.0000	1.0000	0.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000
52		0.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000

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	L	13	30	30	24	20	28	19	17	18	34
16		26	27	14	21	16	0	14	12	19	13
22		16	9	14	15	21	29	22	21	29	22
29		16	26	26	24	19	24	21	14	19	18
39		32	17	21	6	16	36	15	32	15	22
52		2	16	33	24	17	22	20	15	15	16

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	L	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
16		1/1	1/1	1/1	1/1	0/1	0/1	1/1	1/1	1/1	1/1
22		0/1	0/1	1/1	0/1	1/1	1/1	1/1	1/1	1/1	1/1
29		0/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
39		1/1	1/1	1/1	0/1	0/1	1/1	1/1	1/1	1/1	1/1
52		0/1	0/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	0/1

CHEMICAL DATA SHEET FOR CHRONIC TOXICITY TESTING									Fathead Minnow
Lab # / Sample ID: K1912004					Test Start (Date/Time): 12-11-19 / 1311				
Client: Dumas					Test End (Date/Time): 12-18-19 / 1240				
		Day of Test							
	MHS 047	1	2	3	4	5	6	7	notes
Control		12/11	12-12	12/13	12-14	12-15	12-16	12/17	MHS 048
D.O. (mg/L)	INITIAL	8.9	9.0	8.3	8.4	8.2	8.5	8.7	used 12/12
	FINAL	8.2	7.4	7.6	7.7	7.8	7.72	8.2	
pH (s.u.)	INITIAL	8.8	8.2	9.0	8.0	8.2	8.8	8.4	MHS 049
	FINAL	7.8	8.8	7.8	8.1	9.0	9.23	9.5	used 12/13
temp (C)	INITIAL	21	20	22	23	23	22	22	
	FINAL	25	25	25	25	25	25	25	MHS 050
ALKALINITY (mg/L)		64	68	70				102	used 12/17
HARDNESS (mg/L)		100	80	82				84	
CONDUCTIVITY (umho		357	311	286				307	
CHLORINE (mg/L)		<0.05	<0.05	<0.05				<0.05	
CONC: 16%									
D.O. (mg/L)	INITIAL	9.0	8.6	8.2	8.9	8.6	8.5	8.7	
	FINAL	8.1	7.4	7.5	7.8	7.9	7.75	8.1	
pH (s.u)	INITIAL	8.8	7.9	9.1	8.2	8.0	8.7	8.7	
	FINAL	7.8	8.8	7.9	8.1	9.0	9.06	9.4	
temp (C)	INITIAL	21	20	22	22	23	21	22	
	FINAL	25	25	25	25	25	25	25	
CONC: 22%									
D.O. (mg/L)	INITIAL	8.9	8.7	8.3	8.5	8.7	8.6	8.7	
	FINAL	8.8	7.4	7.4	7.7	7.8	7.62	8.0	
pH (mg/L)	INITIAL	8.8	7.9	9.0	8.1	8.0	8.8	8.8	
	FINAL	7.9	8.8	7.9	8.0	9.0	9.01	9.3	
temp (C)	INITIAL	21	20	22	22	22	21	22	
	FINAL	25	25	25	25	25	25	25	
CONC: 29%									
D.O. (mg/L)	INITIAL	9.0	8.8	8.4	8.8	8.8	8.7	8.8	
	FINAL	8.1	7.4	7.3	7.5	7.6	7.66	7.9	
pH (s.u.)	INITIAL	8.8	7.9	9.0	8.1	8.0	8.9	8.9	
	FINAL	7.9	8.9	7.9	8.0	9.0	8.96	9.3	
temp (C)	INITIAL	21	20	22	22	22	21	22	
	FINAL	25	25	25	25	25	25	25	
CONC: 36%									
D.O. (mg/L)	INITIAL	8.9	8.9	8.6	8.9	9.0	8.9	8.8	
	FINAL	8.0	7.3	7.3	7.4	7.6	7.59	8.0	
pH (s.u.)	INITIAL	8.8	7.9	9.0	8.0	8.0	8.9	8.9	
	FINAL	7.9	8.9	7.9	8.0	9.0	8.85	9.3	
temp (C)	INITIAL	22	20	22	22	22	21	22	
	FINAL	25	25	25	25	25	25	25	
CONC: 52%									
D.O. (mg/L)	INITIAL	9.0	8.9	8.7	9.1	9.2	8.9	8.8	
	FINAL	8.0	7.3	7.4	7.4	7.6	7.33	8.1	
pH (s.u.)	INITIAL	8.8	7.9	9.0	8.0	8.0	8.9	9.0	
	FINAL	7.9	8.9	8.0	8.0	9.0	8.78	9.3	
temp (C)	INITIAL	21	21	22	21	22	21	22	
	FINAL	25	25	25	25	25	25	25	
CONC: 100%		A	A	B	B	C	C	C	
ALKALINITY (mg/L)		114		108		90			
HARDNESS (mg/L)		32		32		30			
CONDUCTIVITY (umho		318		314		314			
CHLORINE (mg/L)		<0.05		<0.05		<0.05			

CHEMICAL DATA SHEET FOR CHRONIC TOXICITY TESTING — Ceriodaphnia Dubia

Lab # / Sample ID: K1912004 — Test Start (Date/Time): 12-11-19/0930

Client: DUMAS — Test End (Date/Time): 12-18-19/0945

		Day of Test							
		1	2	3	4	5	6	7	notes/remarks
Control	MHS 047	12/11	12-12	12/13	12-14	12-15	12-16	12/17	MHS 048 used 12/12 MHS 049 used 12/13 MHS 050 used 12/17
D.O. (mg/L)	INITIAL	8.9	9.0	8.3	8.4	8.2	8.5	8.7	
	FINAL	7.9	8.4	8.3	8.4	8.5	8.5	8.3	
pH (s.u.)	INITIAL	8.8	8.2	9.0	8.0	8.2	8.8	8.4	
	FINAL	7.6	9.1	9.6	9.4	9.0	9.1	8.8	
temp (C)	INITIAL	21	20	22	23	23	22	22	
	FINAL	25	25	25	25	25	25	25	
ALKALINITY (mg/L)		104	108	70				102	
HARDNESS (mg/L)		100	80	82				84	
CONDUCTIVITY (umhos/cm)		357	311	286				307	
CHLORINE (mg/L)		<0.05	<0.05	<0.05				<0.05	
CONC: 16%									
D.O. (mg/L)	INITIAL	9.0	8.6	8.2	8.9	8.6	8.5	8.7	
	FINAL	7.9	8.4	8.2	8.4	8.5	8.6	8.4	
pH (s.u)	INITIAL	8.8	7.9	9.1	8.2	8.0	8.8	8.7	
	FINAL	7.7	9.0	9.5	9.4	9.0	9.1	8.8	
temp (C)	INITIAL	21	20	22	22	23	21	22	
	FINAL	25	25	25	25	25	25	25	
CONC: 22%									
D.O. (mg/L)	INITIAL	8.9	8.7	8.3	8.8	8.7	8.6	8.7	
	FINAL	7.9	8.3	8.3	8.4	8.6		8.4	
pH (mg/L)	INITIAL	8.8	7.9	9.0	8.1	8.0	8.8	8.8	
	FINAL	7.8	9.1	9.5	9.4	9.0		8.8	
temp (C)	INITIAL	21	20	22	22	22	21	22	
	FINAL	25	25	25	25	25	25	25	
CONC: 29%									
D.O. (mg/L)	INITIAL	9.0	8.8	8.4	8.8	8.9	8.7	8.8	
	FINAL	7.7	8.3	8.4	8.3	8.6	8.6	8.4	
pH (s.u.)	INITIAL	8.8	7.9	9.0	8.1	8.0	8.9	8.9	
	FINAL	7.8	9.1	9.4	9.3	9.0	9.1	8.9	
temp (C)	INITIAL	21	20	22	22	22	21	22	
	FINAL	25	25	25	25	25	25	25	
CONC: 59%									
D.O. (mg/L)	INITIAL	8.9	8.9	8.6	8.9	9.0	8.9	8.8	
	FINAL	7.7	8.2	8.4	8.3	8.6	8.6	8.4	
pH (s.u.)	INITIAL	8.8	7.9	9.0	8.0	8.0	8.9	8.9	
	FINAL	7.8	9.1	9.4	9.3	9.0	9.1	8.9	
temp (C)	INITIAL	22	20	22	22	22	21	22	
	FINAL	25	25	25	25	25	25	25	
CONC: 52%									
D.O. (mg/L)	INITIAL	9.0	8.9	8.7	9.1	9.2	8.9	8.8	
	FINAL	7.8	8.2	8.4	8.4	8.6	8.5	8.3	
pH (s.u.)	INITIAL	8.8	7.9	9.0	8.0	8.0	8.9	9.0	
	FINAL	7.8	9.2	9.4	9.3	9.0	9.1	8.9	
temp (C)	INITIAL	21	21	22	21	22	21	22	
	FINAL	25	25	25	25	25	25	25	
CONC: 100%		A	A	B	B	C	C	C	
ALKALINITY (mg/L)		114		108		90			
HARDNESS (mg/L)		32		32		30			
CONDUCTIVITY (umhos/cm)		318		314		314			
CHLORINE (mg/L)		<0.05		<0.05		<0.05			

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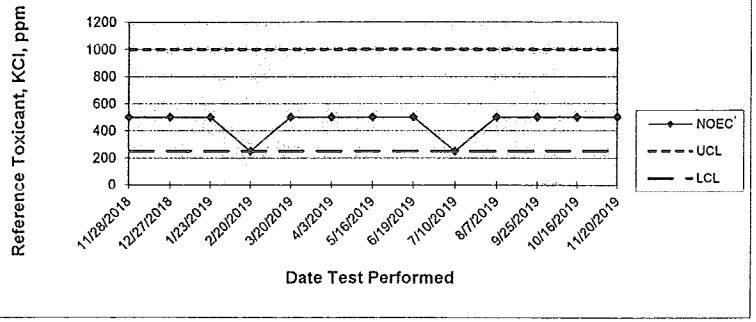
FATHEAD MINNOW SURVIVAL 7 Day
QUALITY ASSURANCE



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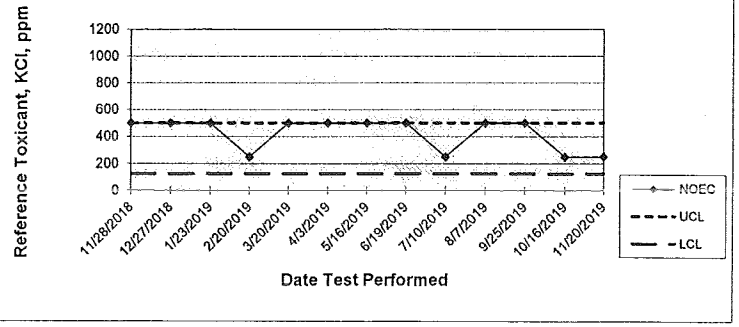
CERIODAPHNIA DUBIA SURVIVAL
QUALITY ASSURANCE



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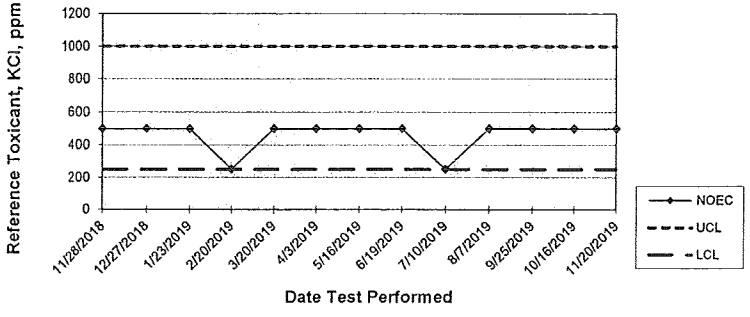
FATHEAD MINNOW GROWTH 7 Day
QUALITY ASSURANCE



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