



Ecotoxicology Research Facility



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October 11, 2017

Bruce Richart
Berryville Waste Water Treatment
1000 W. Cedarvale Road
Berryville, AR 72616

Dear Bruce,

Please find enclosed the results of the 7-day chronic tests using water collected from the Berryville wastewater treatment facilities during the week of October 2, 2017. No lethal or sublethal effects were measured in *Ceriodaphnia dubia* or *Pimephales promelas* exposed to the treated effluent dilutions. However, the *C. dubia* %CV was above the acceptable EPA limits of 40%, thus the *C. dubia* test is deemed invalid. We will need to repeat this test at no charge to you during this quarter.

All test conditions and acceptability criteria as suggested by our laboratory and the US EPA, with the exception of the %CV as mentioned above, were met during these tests.

If you have any questions regarding this particular test series, please feel free to call.

Sincerely,

Jennifer L. Bouldin, PhD
Director, Ecotoxicology Research Facility
PO Box 847
Arkansas State University
State University, AR 72467

Facility Director / Contact: Jennifer L. Bouldin, PhD
 Phone: (870) 972-2570

Client: Berryville Waste Water Treatment
 1000 W. Cedarvale Road
 Berryville, AR 72616

Contact: Bruce Richart
 (479) 443-3292
 (479) 443-5613

NPDES Permit #: AR0021792 AFIN#: 08-00034

Effluent Sampling Point/Type: 24hr Composite

Samples Collected:

Sample #	Sampling Times	Received	Arrival Temp
1	10/01/17 0600 hrs to 10/02/17 0600 hrs	10/03/17 0910 hrs	3.5°C
2	10/03/17 0600 hrs to 10/04/17 0600 hrs	10/05/17 0908 hrs	2.0°C
3	10/05/17 0600 hrs to 10/06/17 0600 hrs	10/06/17 1040 hrs	1.5°C

Test Methods:

7-Day Chronic Toxicity, Static renewal, Fathead minnow, EPA 821/R-02/013, Section 11
 7-Day Chronic Toxicity, Static renewal, Cladoceran, EPA 821/R-02/013, Section 13

Organisms: *P. promelas* <24hrs, *C. dubia* <24hrs

Culture Source: ASU ERF

Dilutions: 0%, 32%, 42%, 56%, 75%, 100%

Critical Dilution: 100%

Statistical Method: Toxcalc 5.0.25

<i>C. dubia</i>			<i>P. promelas</i>		
whole effluent toxicity			whole effluent toxicity		
	lethality	sublethality		lethality	sublethality
DMR Code	22414 10	22414 P0	DMR Code	22414 10	22414 P0
Result	100%	100%	Result	100%	100%
	lethality	sublethality		lethality	sublethality
DMR Code	TLP3B	TGP3B	DMR Code	TLP6C	TGP6C
Result	0	0	Result	0	0
	NOEC lethality	NOEC sublethal		NOEC lethality	NOEC sublethal
DMR Code	TOP3B	TPP3B	DMR Code	TOP6C	TPP6C
Result	100%	100%	Result	100%	100%
	CV%			CV%	
DMR Code	TQP3B		DMR Code	TQP6C	
Result	54.8%		Result	5.2%	
	control survival	control mean reproduction		control survival	control mean weight
	100%	16.6		100%	0.3365
	critical dil. survival	critical mean reproduction		critical dil. survival	critical mean weight
	100%	9.4		95%	0.3155
	MSDp			MSDp	
	0.4487			0.1494	

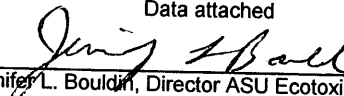
Results Summary:

No lethal or sublethal effects were measured in *C. dubia* or *P. promelas* exposed to effluent dilutions. However, the %CV in the *C. dubia* control was above acceptable limits, therefore the test is deemed invalid.

QA/Reference Testing:

Data attached

Reviewed By:


 Jennifer L. Bouldin, Director ASU Ecotoxicology Research Facility

Toxicity Test Performed: 7-day *Ceriodaphnia dubia* Survival and Reproduction
 Effluent Sampling Point: Berryville Waste Water Plant
 Date Test Started: 10/03/17 *C. dubia*
 Time Test Started: 1017 *C. dubia*
 Date Test Terminated: 10/10/17 *C. dubia*
 Time Test Terminated: 0918 *C. dubia*
 Laboratory Analyst: Hughes/Bouldin

Toxicity Test Performed: 7-day *Pimephales promelas* Survival and Growth
 Effluent Sampling Point: Berryville Waste Water Plant
 Date Test Started: 10/03/17 *P. promelas*
 Time Test Started: 1020 *P. promelas*
 Date Test Terminated: 10/10/17 *P. promelas*
 Time Test Terminated: 1030 *P. promelas*
 Laboratory Analyst: Gonzalez/Rosado-Berrios

I. Test Methods

A. Physical and Chemical Testing - APHA, Standard Methods for the Examination of Water and Wastewater; Vol. 21, 2005.

<u>Test</u>	<u>Method</u>
Alkalinity	2320B
Conductivity	2510B
Dissolved Oxygen (mg/L, DO)	4500-O-G
Hardness (mg/L CaCO ₃)	2340C
pH	4500-H ⁺ B
Temperature (°C)	2550B

B. Toxicity Testing – EPA 821/R-02/013: Short Term Methods for Estimating the Chronic Toxicity of Effluents to Freshwater Organisms

<u>Test</u>	<u>Method</u>
Fathead Minnow Survival and Growth	Section 11
Cladoceran Survival and Reproduction	Section 13

II. Test Organisms

- A. Name: *Pimephales promelas* (Fathead minnow)
 Source: Laboratory Culture
 Age: <24 hours
 Life Stage: Larval

- B. Name: *Ceriodaphnia dubia* (Cladoceran)
Source: Laboratory Culture
Age: <24 hours
Life Stage: Neonate

III. External Factors

A. Incubator

- Temperature (°C)
Average: 25.0
Range: 24.8-25.1
Light Cycle: 16 hours light/ 8 hours dark
Light Intensity: 100 footcandles
Control Water: Moderately Hard Synthetic Water (#MH 1000)

B. *Ceriodaphnia dubia*

- Test Chambers: 30 ml Solo cups
Volume per Chamber: 15-20 ml
Number of Organisms per Chamber: 1
Number of Replicates per Concentration: 10
Acclimation: Laboratory control water was added to cultures until >50% of the culture water consisted of control water.
Food: Cladocera were fed *Selenastrum* (#ABS-091317) and yeast/cereal/trout chow mix (#YCT-091817) one hour prior to test setup and once daily thereafter.

C. *Pimephales promelas*

- Test Chambers: 250 ml storage dishes
Volume per Chamber: 200 ml
Number of Organisms per Chamber: 8
Number of Replicates per Concentration: 5
Acclimation: Laboratory control water was added to cultures until >50% of the culture water consisted of control water.
Food: Larval fish were fed 0.15ml of laboratory-cultured *Artemia* brine shrimp one hour prior to test setup and then 3X daily thereafter.

IV. Quality Assurance

A. Standard Toxicant: Sodium Chloride

B. Organism: *Ceriodaphnia dubia*

Date and time of Reference Toxicant Test

Start: 10/02/17

Terminated: 10/10/17

Time of Reference Toxicant Test

Start: 1451

Terminated: 1439

Laboratory Analyst: Hughes

Dilution Water Used: Moderately Hard Synthetic Water #1000

Results: Survival and Reproduction within control limits

Survival

LOEC: 2.60 g/L NaCl

EC50: 2.17 g/L NaCl

Reproduction

LOEC: 1.82 g/L NaCl

IC25: 1.31 g/L NaCl

C. Organism: *Pimephales promelas*

Date of Reference Toxicant Test

Start: 10/02/17

Terminated: 10/09/17

Time of Reference Toxicant Test

Start: 1030

Terminated: 1130

Laboratory Analyst: Sanchez-Gonzalez

Dilution Water Used: Moderately Hard Synthetic Water #1000

Results: Survival and growth within control limits.

Survival

LOEC: 7.50 g/L NaCl

EC50: 6.55 g/L NaCl

Growth

LOEC: >7.50 g/L NaCl

IC25: >7.50 g/L NaCl

V. Physical and Chemical Data - See Attached

VI. Survival and Growth Data - See Attached

VII. Statistical Methods - See Attached

VIII. NPDES Permit Results - See Attached

SUMMARY REPORTING FORM
WET Testing
***Ceriodaphnia dubia* Survival and Reproduction**

Permittee: Berryville Waste Water Plant

NPDES No.: AR0021792

		<u>Time</u>	<u>Date</u>		<u>Time</u>	<u>Date</u>
Composite 1:	Collected from	0600	10/01/17	to	0600	10/02/17
Composite 2:	Collected from	0600	10/03/17	to	0600	10/04/17
Composite 3:	Collected from	0600	10/05/17	to	0600	10/06/17

Test Initiated: 1017

Date: 10/03/17

Time Terminated: 0918

Date: 10/10/17

Dilution H₂O: MH 1000

PERCENT SURVIVAL

Percent Effluent

<u>Time of Reading</u>	<u>Control</u>	<u>32%</u>	<u>42%</u>	<u>56%</u>	<u>75%</u>	<u>100%</u>
24h	100	100	100	100	100	100
48h	100	100	100	100	100	100
7 day	100	90	90	100	100	100

NUMBER OF YOUNG/FEMALE @ 7 DAYS

Percent Effluent

REP	<u>0%</u>	<u>32%</u>	<u>42%</u>	<u>56%</u>	<u>75%</u>	<u>100%</u>
A	17	19	18	24	9	13
B	6	21	17	13	9	12
C	25	X/0	18	10	9	7
D	31	33	20	19	25	3
E	10	33	21	18	7	20
F	8	23	X/8	18	11	9
G	12	30	35	13	24	7
H	28	34	8	33	23	6
I	14	27	32	19	14	13
J	15	31	18	16	14	4
Mean	16.6	27.9	20.8	18.3	14.5	9.4
CV%*	51.9	20.2	39.2	35.5	47.8	54.8

*Coefficient of Variation% = Standard Deviation x 100/Mean

***Ceriodaphnia dubia* Survival and Reproduction**

1. FISHER'S EXACT TEST:
Is the mean survival for the critical dilution (100%) at 7 days significantly different ($p=0.05$) than the control survival?
 Yes No

2. DUNNETT'S PROCEDURE OR STEEL'S MANY-ONE RANK TEST AS APPROPRIATE:
Is the mean number of young produced per female by the critical dilution (100%) significantly different ($p=0.05$) than the control's number of young per female?
 Yes No

3. If the NOEC for survival is less than the critical dilution, enter [1], otherwise enter [0] for parameter #TLP3B: 0

4. If the NOEC for reproduction is less than the critical dilution, enter [1], otherwise enter [0] for parameter #TGP3B: 0

5. Report the NOEC value for survival, Parameter #TOP3B:
NOEC survival 100 % effluent

6. Report the NOEC value for reproduction, Parameter #TPP3B:
NOEC reproduction 100 % effluent

7. Report the % coefficient of variation (largest of critical and control dilutions), Parameter #TQP3B:
CV % reproduction 54.8% (critical)

Whole Effluent Lethality Values for *Ceriodaphnia dubia*

1. Report the Whole Effluent Lethality values for the 30-Day average minimum, Parameter #22414:
Daily Average Minimum NOEC: 100%

2. Report the Whole Effluent Lethality values for the 7-day minimum, Parameter #22414:
7-Day Minimum NOEC: 100%

WET Testing Summary Form
***Ceriodaphnia dubia* (Cladoceran)**
Chemical Parameters Chart

Permittee: Berryville Wastewater Plant
 NPDES No.: AR0021792
 Contact: Bruce Richart
 Analyst: Hughes/Bouldin

Sample No. 1 Collected Ending Date: 10/10/17 Time: 0600
 Sample No. 2 Collected Ending Date: 10/12/17 Time: 0600
 Sample No. 3 Collected Ending Date: 10/14/17 Time: 0600
 Test Begin: Date: 10/03/17 Time: 1017 Test End: Date: 10/10/17 Time: 0918

Initial Water Chemistry for Chronic Tests								
Project: Berryville WWTP – <i>C. dubia</i>								
Test day		0	1	2	3	4	5	6
Date		10/3/2017	10/4/2017	10/5/2017	10/6/2017	10/7/2017	10/8/2017	10/9/2017
H ₂ O #		MH 1000	MH 1000	MH 1000	MH 1000	MH 1000	MH 1000	MH 1000
Temp (°C)	Control	22.4	21.6	22.0	22.0	22.0	22.0	21.8
	32%	22.9	21.5	21.5	22.7	22.0	22.1	22.1
	42%	22.8	21.5	21.9	22.0	22.1	22.0	22.3
	56%	22.7	21.7	21.8	22.7	22.0	22.0	22.6
	75%	22.8	21.7	21.7	22.9	22.0	22.1	22.9
	100%	24.3	21.5	21.4	22.6	22.0	22.1	23.4
pH (Standard Units)	Control	7.55	7.66	7.63	7.69	7.75	7.88	7.82
	32%	7.75	7.96	7.76	7.70	8.04	8.13	8.08
	42%	7.89	7.99	7.80	7.71	8.05	8.14	8.07
	56%	7.94	8.05	7.85	7.73	8.10	8.21	8.18
	75%	7.99	8.21	7.87	7.78	8.16	8.19	8.24
	100%	8.04	8.27	7.88	7.75	8.30	8.27	8.26
DO (mg/L)	Control	8.6	8.8	8.7	8.7	8.5	8.5	8.5
	32%	8.6	8.9	8.7	8.7	8.1	8.5	8.4
	42%	8.8	8.7	8.8	8.8	8.5	8.4	8.4
	56%	8.7	8.7	8.8	8.8	8.5	8.5	8.3
	75%	8.8	8.7	8.9	8.8	8.3	8.6	8.3
	100%	9.0	8.5	9.0	8.5	8.2	8.6	8.1
Cond (µS/cm)	Control	258	254	257	253	255	255	253
	32%	739	734	680	696	653	647	644
	42%	874	878	808	848	775	775	774
	56%	1069	1055	993	1069	960	953	953
	75%	1341	1372	1251	1318	1200	1193	1176
	100%	1886	1820	1665	1882	1608	1588	1520
Alk (mg/L)	Control	62		62		62		
	100%	226		254		268		
Hard (mg/L)	Control	100		100		100		
	100%	70		80		90		

WET Testing Summary Form
***Ceriodaphnia dubia* (Cladoceran)**
Chemical Parameters Chart

Permittee: Berryville Wastewater Plant
 NPDES No.: AR0021792
 Contact: Bruce Richart
 Analyst: Hughes/Bouldin

Sample No. 1 Collected Ending Date: 10/10/17 Time: 0600
 Sample No. 2 Collected Ending Date: 10/12/17 Time: 0600
 Sample No. 3 Collected Ending Date: 10/14/17 Time: 0600
 Test Begin: Date: 10/03/17 Time: 1017 Test End: Date: 10/10/17 Time: 0918

Final Water Chemistry for Chronic Tests								
Project: Berryville WWTP – <i>C. dubia</i>								
Test day		1	2	3	4	5	6	7
Date		10/4/2017	10/5/2017	10/6/2017	10/7/2017	10/8/2017	10/9/2017	10/10/2017
H ₂ O #		MH 1000	MH 1000	MH 1000	MH 1000	MH 1000	MH 1000	MH 1000
Temp (°C)	Control	22.0	22.1	22.5	23.0	22.8	22.4	23.7
	32%	22.1	22.0	22.4	23.0	22.9	22.4	23.1
	42%	22.0	22.0	22.0	23.0	22.8	22.3	23.5
	56%	21.8	22.0	22.2	23.0	22.8	22.3	23.6
	75%	22.0	22.0	22.5	23.0	22.8	22.4	23.2
	100%	22.0	22.0	22.3	23.0	22.8	22.4	23.5
pH (Standard Units)	Control	7.89	7.71	7.85	7.91	7.90	7.83	7.75
	32%	8.37	8.32	8.35	8.36	8.32	8.26	8.21
	42%	8.41	8.43	8.42	8.48	8.40	8.37	8.32
	56%	8.50	8.50	8.54	8.51	8.49	8.43	8.37
	75%	8.62	8.63	8.63	8.62	8.53	8.57	8.52
	100%	8.75	8.73	8.72	8.70	8.63	8.63	8.58
DO (mg/L)	Control	8.9	8.5	8.5	9.8	8.6	8.5	8.5
	32%	8.7	8.5	8.3	9.6	8.5	8.3	8.8
	42%	8.7	8.7	8.5	9.8	8.5	8.5	8.7
	56%	8.7	8.7	8.5	9.9	8.5	8.4	8.6
	75%	8.6	8.7	8.5	9.8	8.5	8.5	8.8
	100%	8.7	8.7	8.5	9.7	8.4	8.5	8.5

SUMMARY REPORTING FORM
WET Testing
Fathead Minnow Larvae (*Pimephales promelas*) Survival and Growth

Permittee: Berryville Waste Water Plant

NPDES No.: AR0021792

		<u>Time</u>	<u>Date</u>		<u>Time</u>	<u>Date</u>
Composite 1:	Collected from	0600	10/01/17	to	0600	10/02/17
Composite 2:	Collected from	0600	10/03/17	to	0600	10/04/17
Composite 3:	Collected from	0600	10/05/17	to	0600	10/06/17

Test Initiated: 1020

Date: 10/03/17

Time Terminated: 1030

Date: 10/10/17

Dilution H₂O: MH 1000

DATA TABLE FOR SURVIVAL

Effluent Conc. %	% Survival in Replicate Chambers					Mean % Survival			CV%
	A	B	C	D	E	24h	48h	7days	
Control	100	100	100	100	100	100	100	100	0.0
32	100	100	100	87.5	87.5	100	100	95	7.6
42	100	100	100	87.5	100	100	100	97.5	6.1
56	100	100	100	87.5	87.5	100	100	95	7.6
75	87.5	100	50	100	100	100	100	87.5	21.3
100	87.5	100	87.5	100	100	100	100	95	7.6

Coefficient of Variation = Standard Deviation x 100/Mean

DATA TABLE FOR GROWTH

Effluent Conc %	Average Dry Weight in Replicate Chambers (mg)					Mean Dry Weight (mg)	CV%
	A	B	C	D	E		
Control	0.3313	0.3350	0.3375	0.3562	0.3225	0.3365	3.7
32	0.2738	0.2663	0.3288	0.3171	0.3171	0.3006	9.5
42	0.2837	0.2763	0.2738	0.3257	0.2988	0.2916	7.3
56	0.2862	0.2788	0.2875	0.3471	0.2929	0.2985	9.3
75	0.3257	0.2487	0.4100	0.2538	0.2925	0.3061	21.5
100	0.3100	0.3063	0.3314	0.2963	0.3338	0.3155	5.2

Fathead Minnow Larvae (*Pimephales promelas*) Survival and Growth

1. FISHER'S EXACT TEST:

Is the mean survival for the critical dilution (100%) at 7 days significantly different (p=0.05) than the control survival?

____ Yes X No

2. DUNNETT'S PROCEDURE OR STEEL'S MANY-ONE RANK TEST AS APPROPRIATE:

Is the mean growth by *P. promelas* in the critical dilution (100%) significantly different (p=0.05) than the growth in control exposures?

____ Yes X No

3. If the NOEC for survival is less than the critical dilution, enter [1], otherwise enter [0] for parameter #TLP6C: 0

4. If the NOEC for growth is less than the critical dilution, enter [1], otherwise enter [0] for parameter #TGP6C: 0

5. Report the NOEC value for survival, Parameter #TOP6C:
NOEC survival 100 % effluent

6. Report the NOEC value for growth, Parameter #TPP6C:
NOEC growth 100 % effluent

7. Report the % coefficient of variation (largest of low flow and control dilutions), Parameter #TQP6C: CV % growth 5.2 % (critical)

Whole Effluent Lethality Values

1. Report the Whole Effluent Lethality values for the 30-Day average minimum, Parameter #22414:

Daily Average Minimum NOEC: 100%

2. Report the Whole Effluent Lethality values for the 7-day minimum, Parameter #22414:

7-Day Minimum NOEC: 100%

WET Testing Summary Form
Fathead Minnow Larvae (*Pimephales promelas*)

Chemical Parameters Chart

Permittee: Berryville Wastewater Plant Sample No. 1 Collected Ending Date: 10/10/17 Time: 0600
 NPDES No.: AR0021792 Sample No. 2 Collected Ending Date: 10/12/17 Time: 0600
 Contact: Bruce Richart Sample No. 3 Collected Ending Date: 10/14/17 Time: 0600
 Analyst: Gonzalez/Rosado-Berrios Test Begin: Date: 10/03/17 Time: 1020 Test End: Date: 10/10/17 Time: 1030

Initial Water Chemistry for Chronic Tests								
Project: Berryville WWTP – <i>P. promelas</i>								
Test day		0	1	2	3	4	5	6
Date		10/3/2017	10/4/2017	10/5/2017	10/6/2017	10/7/2017	10/8/2017	10/9/2017
H ₂ O #		MH 1000	MH 1000	MH 1000	MH 1000	MH 1000	MH 1000	MH 1000
Temp (°C)	Control	22.4	21.6	22.0	22.0	22.0	22.0	21.8
	32%	22.9	21.5	21.5	22.7	22.0	22.1	22.1
	42%	22.8	21.5	21.9	22.0	22.1	22.0	22.3
	56%	22.7	21.7	21.8	22.7	22.0	22.0	22.6
	75%	22.8	21.7	21.7	22.9	22.0	22.1	22.9
	100%	24.3	21.5	21.4	22.6	22.0	22.1	23.4
pH (Standard Units)	Control	7.55	7.66	7.63	7.69	7.75	7.88	7.82
	32%	7.75	7.96	7.76	7.70	8.04	8.13	8.08
	42%	7.89	7.99	7.80	7.71	8.05	8.14	8.07
	56%	7.94	8.05	7.85	7.73	8.10	8.21	8.18
	75%	7.99	8.21	7.87	7.78	8.16	8.19	8.24
	100%	8.04	8.27	7.88	7.75	8.30	8.27	8.26
DO (mg/L)	Control	8.6	8.8	8.7	8.7	8.5	8.5	8.5
	32%	8.6	8.9	8.7	8.7	8.1	8.5	8.4
	42%	8.8	8.7	8.8	8.8	8.5	8.4	8.4
	56%	8.7	8.7	8.8	8.8	8.5	8.5	8.3
	75%	8.8	8.7	8.9	8.8	8.3	8.6	8.3
	100%	9.0	8.5	9.0	8.5	8.2	8.6	8.1
Cond (µS/cm)	Control	258	254	257	253	255	255	253
	32%	739	734	680	696	653	647	644
	42%	874	878	808	848	775	775	774
	56%	1069	1055	993	1069	960	953	953
	75%	1341	1372	1251	1318	1200	1193	1176
	100%	1886	1820	1665	1882	1608	1588	1520
Alk (mg/L)	Control	62		62		62		
	100%	226		254		268		
Hard (mg/L)	Control	100		100		100		
	100%	70		80		90		

WET Testing Summary Form
Fathead Minnow Larvae (*Pimephales promelas*)
Chemical Parameters Chart

Permittee: Berryville Wastewater Plant

Sample No. 1 Collected Ending Date: 10/10/17 Time: 0600

NPDES No.: AR0021792

Sample No. 2 Collected Ending Date: 10/12/17 Time: 0600

Contact: Bruce Richart

Sample No. 3 Collected Ending Date: 10/14/17 Time: 0600

Analyst: Gonzalez/Rosado-Berrios Test Begin: Date: 10/03/17 Time: 1020 Test End: Date: 10/10/17 Time: 1030

Final Water Chemistry for Chronic Tests								
Project: Berryville WWTP- <i>P. promelas</i>								
Test day		1	2	3	4	5	6	7
Date		10/4/2017	10/5/2017	10/6/2017	10/7/2017	10/8/2017	10/9/2017	10/10/2017
H ₂ O #		MH 1000	MH 1000	MH 1000	MH 1000	MH 1000	MH 1000	MH 1000
Temp (°C)	Control	22.2	24.5	22.7	23.0	23.0	22.0	23.4
	32%	22.1	24.8	22.6	23.0	23.0	22.0	23.6
	42%	22.2	25.0	22.4	23.0	23.0	22.0	23.6
	56%	22.3	24.5	22.7	23.0	23.0	22.5	23.9
	75%	22.4	25.0	22.9	23.0	23.0	23.0	23.7
	100%	22.3	24.9	22.9	23.0	23.0	23.0	24.0
(Standard	Control	7.26	7.07	7.45	7.67	7.77	7.47	7.62
	32%	7.96	7.75	7.91	8.05	8.14	7.91	8.05
	42%	8.10	7.95	8.04	8.17	8.21	8.06	8.17
	56%	8.19	7.99	8.09	8.20	8.27	8.14	8.26
	75%	8.35	8.21	8.22	8.30	8.38	8.27	8.35
	100%	8.47	8.36	8.34	8.42	8.50	8.40	8.47
DO (mg/L)	Control	8.0	7.5	7.9	7.5	7.6	7.3	7.7
	32%	7.7	7.4	7.6	7.3	7.6	7.2	7.4
	42%	7.6	7.4	7.5	7.3	7.4	7.2	7.6
	56%	7.7	7.4	7.5	7.2	7.3	7.3	7.7
	75%	7.7	7.1	7.3	7.0	7.2	7.2	7.7
	100%	7.7	7.2	7.3	6.9	7.2	7.2	7.7

Ceriodaphnia Survival and Reproduction Test-7 Day Survival

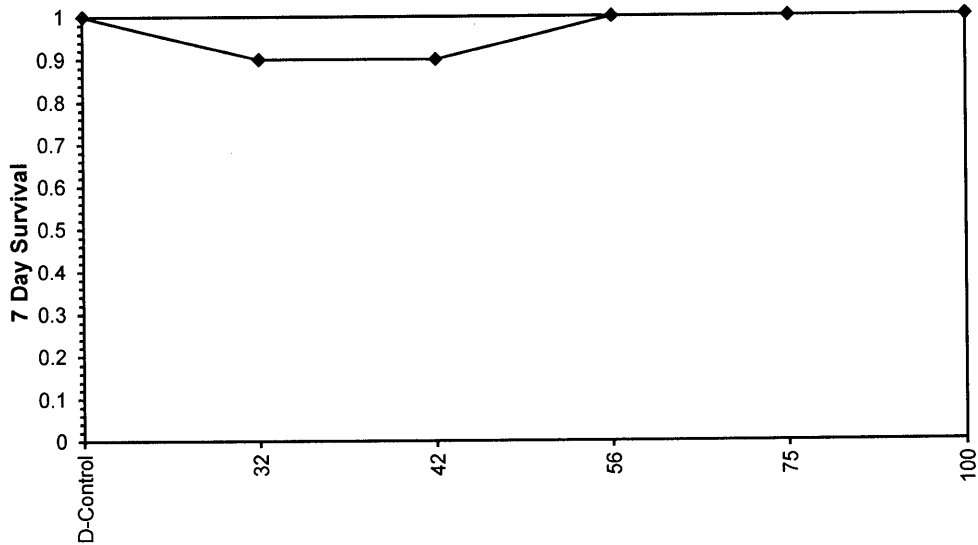
Start Date:	10/3/2017 10:17	Test ID:	Berryville	Sample ID:	AR0021792-NPDES Permit #
End Date:	10/10/2017 09:18	Lab ID:	ASU-ERF	Sample Type:	EFF1-POTW
Sample Date:	10/2/2017	Protocol:	EPAF 02-EPA Freshwater	Test Species:	CD-Ceriodaphnia dubia
Comments:	4th quarter WET				

Conc-%	1	2	3	4	5	6	7	8	9	10
D-Control	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	0.0000	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	0.0000	1.0000	1.0000	1.0000	1.0000
56	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
75	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
100	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

Conc-%	Mean	N-Mean	Resp	Not Resp	Total	N	Fisher's Exact P	1-Tailed Critical
D-Control	1.0000	1.0000	0	10	10	10		
32	0.9000	0.9000	1	9	10	10	0.5000	0.0500
42	0.9000	0.9000	1	9	10	10	0.5000	0.0500
56	1.0000	1.0000	0	10	10	10	1.0000	0.0500
75	1.0000	1.0000	0	10	10	10	1.0000	0.0500
100	1.0000	1.0000	0	10	10	10	1.0000	0.0500

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Fisher's Exact Test	100	>100		1

Dose-Response Plot



Ceriodaphnia Survival and Reproduction Test-Reproduction

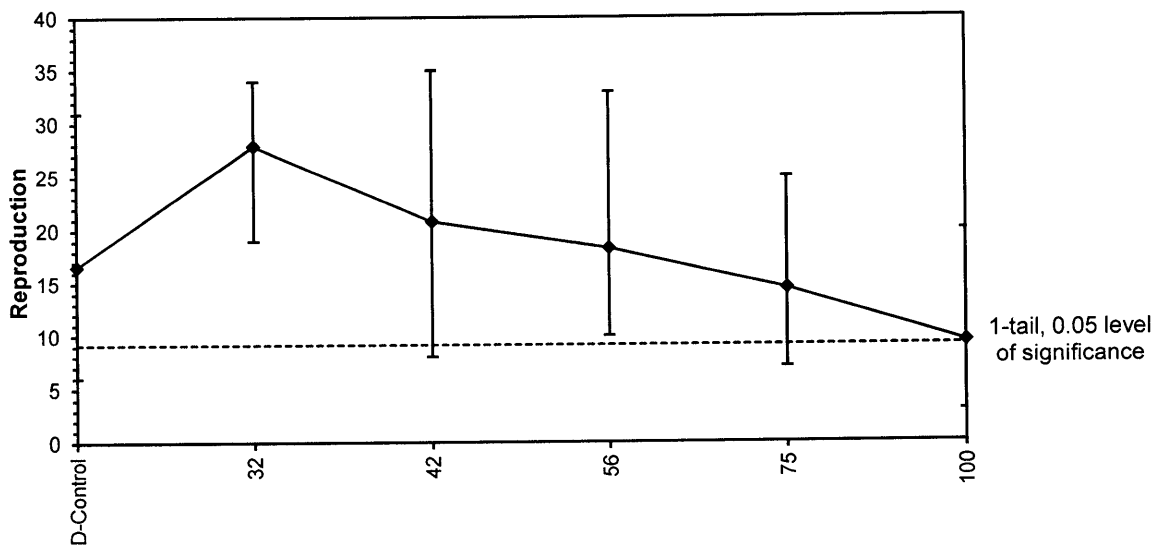
Start Date: 10/3/2017 10:17	Test ID: Berryville	Sample ID: AR0021792-NPDES Permit #
End Date: 10/10/2017 09:18	Lab ID: ASU-ERF	Sample Type: EFF1-POTW
Sample Date: 10/2/2017	Protocol: EPAF 02-EPA Freshwater	Test Species: CD-Ceriodaphnia dubia
Comments: 4th quarter WET		

Conc-%	1	2	3	4	5	6	7	8	9	10
D-Control	17.000	6.000	25.000	31.000	10.000	8.000	12.000	28.000	14.000	15.000
32	19.000	21.000	33.000	33.000	23.000	30.000	34.000	27.000	31.000	
42	18.000	17.000	18.000	20.000	21.000	35.000	8.000	32.000	18.000	
56	24.000	13.000	10.000	19.000	18.000	18.000	13.000	33.000	19.000	16.000
75	9.000	9.000	9.000	25.000	7.000	11.000	24.000	23.000	14.000	14.000
100	13.000	12.000	7.000	3.000	20.000	9.000	7.000	6.000	13.000	4.000

Conc-%	Mean	N-Mean	Transform: Untransformed					N	t-Stat	1-Tailed Critical	MSD
			Mean	Min	Max	CV%					
D-Control	16.600	1.0000	16.600	6.000	31.000	51.915	10				
32	27.889	1.6801	27.889	19.000	34.000	20.239	9	-3.541	2.400	7.653	
42	20.778	1.2517	20.778	8.000	35.000	39.157	9	-1.310	2.400	7.653	
56	18.300	1.1024	18.300	10.000	33.000	35.512	10	-0.548	2.400	7.449	
75	14.500	0.8735	14.500	7.000	25.000	47.808	10	0.677	2.400	7.449	
100	9.400	0.5663	9.400	3.000	20.000	54.753	10	2.320	2.400	7.449	

Auxiliary Tests	Statistic	Critical	Skew	Kurt						
Kolmogorov D Test indicates normal distribution (p > 0.01)	1.00602	1.035	0.57798	-0.31061						
Bartlett's Test indicates equal variances (p = 0.66)	3.28624	15.0863								
Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Bonferroni t Test	100	>100		1	7.4485	0.4487	365.314	48.1509	2.1E-05	5, 52

Dose-Response Plot



CHRONIC TEST DATA SHEET
Ceriodaphnia dubia

Project: Berryville Beginning Date: 100317 Time: 1017 Test Species: C. dubia
Dilution H₂O: ^{ml}1000 Ending Date: 100417 Time: 0918 Age: 24hr.

Test Type: (*)Static Renewal () Flowthrough Toxicant/Effluent: _____

Conc.	Rep	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Neonates
Control	1	0	0	0	3	6	7	1	17
	2	0	0	0	0	0	6	0	6
	3	0	0	0	2	4	8	11	25
	4	0	0	0	2	8	8	13	31
	5	0	0	0	2	0	8	0	10
	6	0	0	0	3	0	5	0	8
	7	0	0	0	3	3	5	1	12
	8	0	0	0	2	0	9	17	28
	9	0	0	0	2	4	8	6	14
	10	0	0	0	1	6	8	0	15
32%	1	0	0	0	4	6	9	0	19
	2	0	0	0	4	4	0	13	21
	3	0	0	0	0	0	0	0	10
	4	0	0	0	0	6	12	15	33
	5	0	0	0	4	4	10	15	33
	6	0	0	0	0	7	4	12	23
	7	0	0	0	6	8	9	7	30
	8	0	0	0	3	6	12	13	34
	9	0	0	0	0	7	9	11	27
	10	0	0	4	0	6	11	10	31
Date	100317	100417	100517	100617	100717	100817	100917	101017	
Initials	NB	NB	NB	NB	J	J	NB	NB	J

CHRONIC TEST DATA SHEET
Ceriodaphnia dubia

Project: Berryville Beginning Date: 100817 Time: 1017 Test Species: C. dubia
Dilution H₂O: 1000 Ending Date: 101017 Time: 0918 Age: <24hr

Test Type: (*)Static Renewal () Flowthrough Toxicant/Effluent

Conc.	Rep	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Neonates
42%	1	0	0	0	5	7	6	0	18
	2	0	0	0	3	5	9	0	17
	3	0	0	0	2	5	11	0	18
	4	0	0	3	1	8	3	5	20
	5	0	0	0	5	8	8	0	21
	6	0	0	0	3	5	0	X/6 -	X/8
	7	0	0	0	2	8	9	16	35
	8	0	0	0	2	6	0	0	8
	9	0	0	0	3	8	9	12	32
	10	0	0	0	4	7	7	0	18
56%	1	0	0	0	3	7	8	6	24
	2	0	0	0	0	6	7	0	13
	3	0	0	0	0	5	5	0	10
	4	0	0	0	2	3	7	7	19
	5	0	0	0	3	6	7	2	18
	6	0	0	0	3	7	8	0	18
	7	0	0	0	2	0	11	0	13
	8	0	0	0	0	6	12	15	33
	9	0	0	0	0	7	12	0	19
	10	0	0	0	4	4	8	6	16
Date	100317	100417	100517	100617	100717	100817	100917	101017	
Initials	NB	NB	NB	NB	J	J	NB	NB	J

CHRONIC TEST DATA SHEET
Ceriodaphnia dubia

Project: Berryville Beginning Date: 100317 Time: 1017 Test Species: C. dubia

Dilution H₂O: ^{mH}1000 Ending Date: 101017 Time: 0918 Age: < 24 hr.

Test Type: (*)Static Renewal () Flowthrough Toxicant/Effluent:

Conc.	Rep	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Neonates
75%	1	0	0	0	0	4	5	0	9
	2	0	0	0	4	0	5	0	9
	3	0	0	0	3	1	5	0	9
	4	0	0	0	0	7	9	9	25
	5	0	0	0	3	4	0	0	7
	6	0	0	0	0	7	4	0	11
	7	0	0	2	8 1	6	8	7	24
	8	0	0	0	4	0	8	11	23
	9	0	0	0	3	4	7	0	14
	10	0	0	0	0	6	8	0	14
100%	1	0	0	0	3	9	1	0	13
	2	0	0	0	4	8	0	0	12
	3	0	0	0	3	3	1	0	7
	4	0	0	0	3	0	0	0	3
	5	0	0	0	3	6	5	6	20
	6	0	0	0	0	4	5	0	9
	7	0	0	0	2	5	0	0	9
	8	0	0	0	2	2	2	0	6
	9	0	0	0	3	2	7	1	13
	10	0	0	0	2	0	2	0	4
Date	100317	100417	100417	100617	100717	100817	100917	101017	
Initials	NB	NB	NB	NB	J	J	NB	NB	J

Larval Fish Growth and Survival Test-7 Day Survival

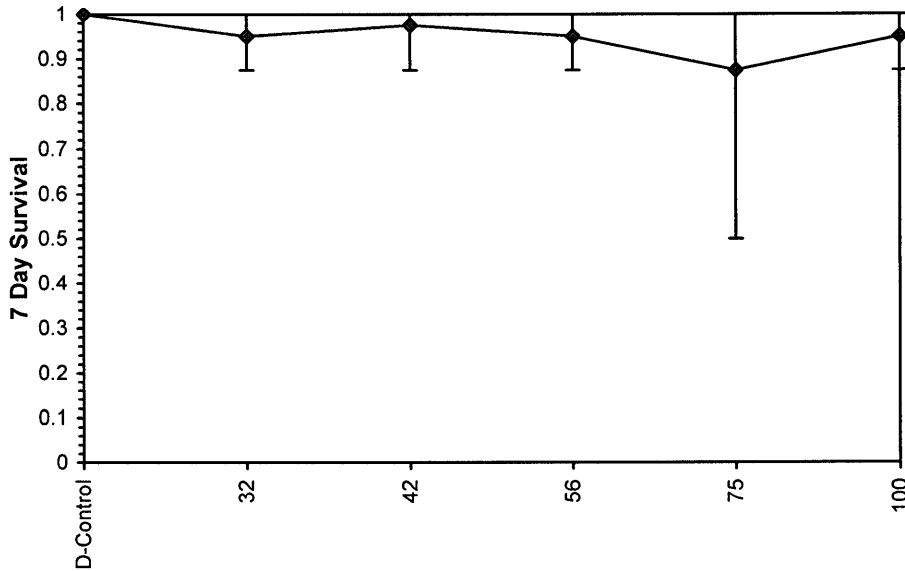
Start Date: 10/3/2017 10:20 Test ID: Berryville Sample ID: AR0021792-NPDES Permit #
 End Date: 10/10/2017 10:30 Lab ID: ASU-ERF Sample Type: EFF1-POTW
 Sample Date: 10/2/2017 Protocol: EPAF 02-EPA Freshwater Test Species: PP-Pimephales promelas
 Comments: 4th quarter WET

Conc-%	1	2	3	4	5
D-Control	1.0000	1.0000	1.0000	1.0000	1.0000
32	1.0000	1.0000	1.0000	0.8750	0.8750
42	1.0000	1.0000	1.0000	0.8750	1.0000
56	1.0000	1.0000	1.0000	0.8750	0.8750
75	0.8750	1.0000	0.5000	1.0000	1.0000
100	0.8750	1.0000	0.8750	1.0000	1.0000

Conc-%	Mean	N-Mean	Transform: Arcsin Square Root					N	Rank Sum	1-Tailed Critical
			Mean	Min	Max	CV%				
D-Control	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5			
32	0.9500	0.9500	1.3196	1.2094	1.3931	7.623	5	22.50	16.00	
42	0.9750	0.9750	1.3564	1.2094	1.3931	6.055	5	25.00	16.00	
56	0.9500	0.9500	1.3196	1.2094	1.3931	7.623	5	22.50	16.00	
75	0.8750	0.8750	1.2348	0.7854	1.3931	21.341	5	22.50	16.00	
100	0.9500	0.9500	1.3196	1.2094	1.3931	7.623	5	22.50	16.00	

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.01) Equality of variance cannot be confirmed	0.83098	0.9	-1.7903	5.36341
Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	100	>100		1

Dose-Response Plot



Larval Fish Growth and Survival Test-7 Day Growth

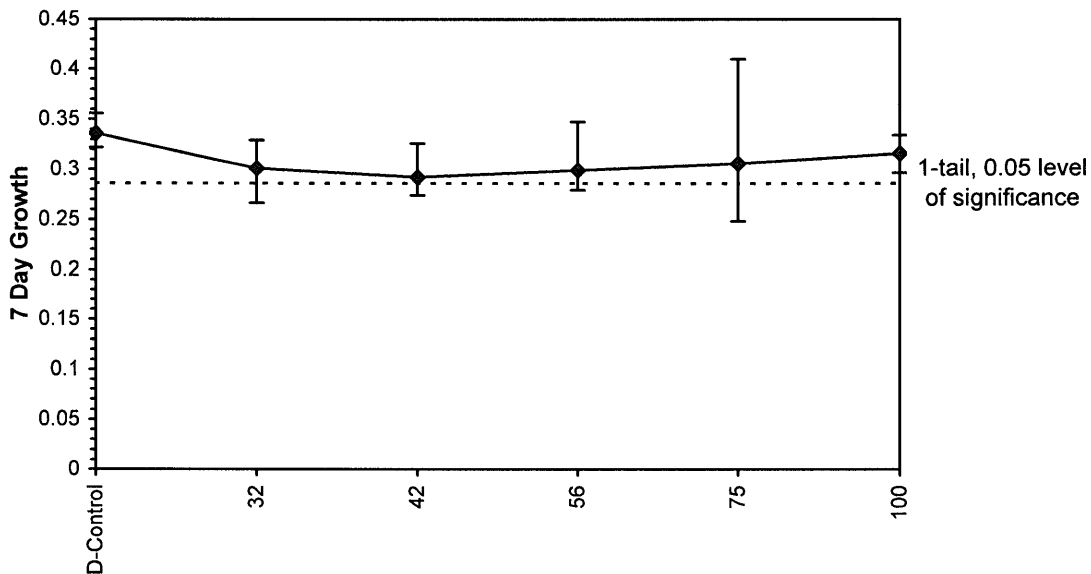
Start Date: 10/3/2017 10:20 Test ID: Berryville Sample ID: AR0021792-NPDES Permit #
 End Date: 10/10/2017 10:30 Lab ID: ASU-ERF Sample Type: EFF1-POTW
 Sample Date: 10/2/2017 Protocol: EPAF 02-EPA Freshwater Test Species: PP-Pimephales promelas
 Comments: 4th quarter WET

Conc-%	1	2	3	4	5
D-Control	0.3313	0.3350	0.3375	0.3562	0.3225
32	0.2738	0.2663	0.3288	0.3171	0.3171
42	0.2837	0.2763	0.2738	0.3257	0.2988
56	0.2862	0.2788	0.2875	0.3471	0.2929
75	0.3257	0.2487	0.4100	0.2538	0.2925
100	0.3100	0.3063	0.3314	0.2963	0.3338

Conc-%	Mean	N-Mean	Transform: Untransformed				N	1-Tailed		
			Mean	Min	Max	CV%		t-Stat	Critical	MSD
D-Control	0.3365	1.0000	0.3365	0.3225	0.3562	3.690	5			
32	0.3006	0.8933	0.3006	0.2663	0.3288	9.469	5	1.685	2.360	0.0503
42	0.2916	0.8667	0.2916	0.2738	0.3257	7.336	5	2.106	2.360	0.0503
56	0.2985	0.8871	0.2985	0.2788	0.3471	9.265	5	1.784	2.360	0.0503
75	0.3061	0.9098	0.3061	0.2487	0.4100	21.540	5	1.425	2.360	0.0503
100	0.3155	0.9377	0.3155	0.2963	0.3338	5.191	5	0.984	2.360	0.0503

Auxiliary Tests	Statistic	Critical	Skew	Kurt						
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.91677	0.9	1.16247	3.66683						
Bartlett's Test indicates equal variances (p = 0.02)	13.5971	15.0863								
Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	100	>100		1	0.05026	0.14937	0.00128	0.00113	0.37004	5, 24

Dose-Response Plot



CHRONIC TEST DATA SHEET
Pimephales promelas

Project: Berryville Beginning Date: 10/03/17 Time: 1020 Test Species: *P. promelas*
Dilution H₂O: M41000 Ending Date: 10/10/17 Time: 1030 Age: < 24h

Test Type: (*)Static Renewal () Flowthrough Toxicant/Effluent: _____

Conc.	Rep	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Pan #
Control	1	8/0	8/0	8/0	8/0	8/0	8/0	8/0	1
	2	8/0	8/0	8/0	8/0	8/0	8/0	8/0	2
	3	8/0	8/0	8/0	8/0	8/0	8/0	8/0	3
	4	8/0	8/0	8/0	8/0	8/0	8/0	8/0	4
	5	8/0	8/0	8/0	8/0	8/0	8/0	8/0	5
32%	1	8/0	8/0	8/0	8/0	8/0	8/0	8/0	6
	2	8/0	8/0	8/0	8/0	8/0	8/0	8/0	7
	3	8/0	8/0	8/0	8/0	8/0	8/0	8/0	8
	4	8/1	7/0	7/0	7/0	7/0	7/0	7/0	9
	5	8/0	8/0	8/0	8/1	7/0	7/0	7/0	10
42%	1	8/0	8/0	8/0	8/0	8/0	8/0	8/0	11
	2	8/0	8/0	8/0	8/0	8/0	8/0	8/0	12
	3	8/0	8/0	8/0	8/0	8/0	8/0	8/0	13
	4	8/0	8/0	8/0	8/0	8/1	7/0	7/0	14
	5	8/0	8/0	8/0	8/0	8/0	8/0	8/0	15
56%	1	8/0	8/0	8/0	8/0	8/0	8/0	8/0	16
	2	8/0	8/0	8/0	8/0	8/0	8/0	8/0	17
	3	8/0	8/0	8/0	8/0	8/0	8/0	8/0	18
	4	8/0	8/0	8/0	8/0	8/1	7/0	7/0	19
	5	8/0	8/1	7/0	7/0	7/0	7/0	7/0	20
Date		1009/17	1005/17	1006/17	1007/17	1008/17	1009/17	1010/17	
Initials		ISL	ISL	ISL	ISL	ISL	mm	ISL	

CHRONIC TEST DATA SHEET
Pimephales promelas

Project: Berryville Beginning Date: 10/03/17 Time: 1020 Test Species: *P. promelas*
Dilution H₂O: M4/1000 Ending Date: 10/10/17 Time: 1030 Age: 224h

Test Type: (*)Static Renewal () Flowthrough Toxicant/Effluent: _____

Conc.	Rep	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Pan #
75%	1	8/0	8/0	8/1	7/0	7/0	7/0	7/0	21
	2	8/0	8/0	8/0	8/0 8/0	8/0	8/0	8/0	22
	3	8/0	8/0	8/0	8/34	4/0	4/0	4/0	23
	4	8/0	8/0	8/0	8/0	8/0	8/0	8/0	24
	5	8/0	8/0	8/0	8/0	8/0	8/0	8/0	25
100%	1	8/0	8/0	8/0	8/0	8/0	8/0	8/0	26
	2	8/0	8/0	8/0	8/0	8/0	8/0	8/0	27
	3	8/0	8/0	8/0	8/0	8/0	8/0	8/0	28
	4	8/0	8/0	8/0	8/0	8/0	8/0	8/0	29
	5	8/0	8/0	8/0	8/0	8/0	8/0	8/0	30
Date		100417	100517	100617	100717	100817	100917	101017	
Initials		ISL	aur/aw	ISL	WAP	WAP	mm	ISL	

Initial Water Chemistry for Chronic Tests
Project: Berryville - C. dubia / P. promelas

Test Day		0	1	2	3	4	5	6
Date								
H.O. Batch #								
Temp. (°C)	Control	22.4	21.6	22.0	22.0	22.0	22.0	21.8
	32%	22.9	21.5	21.5	22.7	22.0	22.1	22.1
	42%	22.8	21.5	21.9	22.0	22.1	22.0	22.3
	56%	22.7	21.7	21.8	22.7	22.0	22.0	22.6
	75%	22.8	21.7	21.7	22.9	22.0	22.1	22.9
	100%	24.3	21.5	21.4	22.6	22.0	22.1	23.4
pH	Control	7.55	7.66	7.63	7.69	7.75	7.88	7.82
	32%	7.75	7.96	7.76	7.70	8.04	8.13	8.08
	42%	7.89	7.99	7.80	7.71	8.05	8.14	8.07
	56%	7.94	8.05	7.85	7.73	8.10	8.21	8.18
	75%	7.99	8.21	7.87	7.78	8.16	8.19	8.24
	100%	8.04	8.27	7.88	7.75	8.30	8.27	8.26
DO (mg/L)	Control	8.6	8.8	8.7	8.7	8.5	8.5	8.5
	32%	8.6	8.9	8.7	8.7	8.4	8.5	8.4
	42%	8.8	8.7	8.8	8.8	8.5	8.4	8.4
	56%	8.7	8.7	8.8	8.8	8.5	8.5	8.3
	75%	8.8	8.7	8.9	8.8	8.3	8.6	8.3
	100%	9.0	8.5	9.0	8.5	8.2	8.6	8.1
Cond. (µS/cm)	Control	258	254	257	253	255	255	253
	32%	739	734	680	696	653	647	644
	42%	874	878	808	848	775	775	774
	56%	1069	1055	993	1069	960	953	953
	75%	1341	1372	1251	1318	1200	1193	1176
	100%	1886	1820	1665	1882	1608	1588	1520
Alk. (mg/L)	Control	62		62		62		
	100%	226		254		268		
Hard. (mg/L)	Control	100		100		100		
	100%	70		80		90		
Initials		EM, NB	NB	AA, NB	NB	J (NB)	J	NB

Final Water Chemistry for Chronic Tests
Project: Berryville - C. dubia

Test Day:		1	2	3	4	5	6	7
Date:		1004F	1005F	1006F	100717	100817	100917	1010F
H ₂ O Batch #:		MH1000	MH1000	MH1000	MH1000	MH1000	MH1000	MH1000
Temp. (°C)	Control	22.0	22.1	22.5	23.0	22.8	22.4	23.7
	32%	22.1	22.0	22.4	23.0	22.9	22.4	23.1
	42%	22.0	22.0	22.0	23.0	22.8	22.3	23.5
	56%	21.8	22.0	22.2	23.0	22.8	22.3	23.6
	75%	22.0	22.0	22.5	23.0	22.8	22.4	23.2
	100%	22.0	22.0	22.3	23.0	22.8	22.4	23.5
pH	Control	7.89	7.71	7.85	7.91	7.90	7.83	7.75
	32%	8.37	8.32	8.35	8.36	8.32	8.26	8.21
	42%	8.41	8.43	8.42	8.48	8.40	8.37	8.32
	56%	8.50	8.50	8.54	8.51	8.49	8.43	8.37
	75%	8.62	8.63	8.63	8.62	8.53	8.57	8.52
	100%	8.75	8.73	8.72	8.70	8.63	8.63	8.58
DO (mg/L)	Control	8.9	8.5	8.5	9.8	8.6	8.5	8.5
	32%	8.7	8.5	8.3	9.6	8.5	8.3	8.8
	42%	8.7	8.7	8.5	9.8	8.5	8.5	8.7
	56%	8.7	8.7	8.5	9.9	8.5	8.4	8.6
	75%	8.6	8.7	8.5	9.8	8.5	8.5	8.8
	100%	8.7	8.7	8.5	9.7	8.4	8.5	8.5
Initials		NB	NB	NB	JS	JS	NB	SA

Final Water Chemistry for Chronic Tests
Project: Berryville - *P. promelas*

Test Day:		1	2	3	4	5	6	7
Date:		100417	100517	100617	100717	100817	100917	101017
H ₂ O Batch #:		MH1000	MH1000	MH1000	MH1000	MH1000	MH1000	MH1000
Temp. (°C)	Control	22.2	24.5	22.7	23.0	23.0	22.0	23.4
	32%	22.1	24.8	22.6	23.0	23.0	22.0	23.6
	42%	22.2	25.0	22.4	23.0	23.0	22.0	23.6
	56%	22.3	24.5	22.7	23.0	23.0	22.5	23.9
	75%	22.4	25.0	22.9	23.0	23.0	23.0	23.7
	100%	22.3	24.9	22.9	23.0	23.0	23.0	24.0
pH	Control	7.26	7.07	7.45	7.67	7.77	7.47	7.62
	32%	7.96	7.75	7.91	8.05	8.14	7.91	8.05
	42%	8.10	7.95	8.04	8.17	8.21	8.00	8.11
	56%	8.19	7.99	8.09	8.20	8.27	8.14	8.26
	75%	8.35	8.21	8.22	8.30	8.38	8.27	8.35
	100%	8.47	8.36	8.34	8.42	8.50	8.40	8.47
DO (mg/L)	Control	8.0	7.5	7.9	7.5	7.6	7.3	7.7
	32%	7.7	7.4	7.6	7.3	7.6	7.2	7.4
	42%	7.6	7.4	7.5	7.3	7.4	7.2	7.5
	56%	7.7	7.4	7.5	7.2	7.3	7.3	7.7
	75%	7.7	7.1	7.3	7.0	7.2	7.2	7.7
	100%	7.7	7.2	7.3	6.9	7.2	7.2	7.7
Initials		AMR/AS/ACR/EM	LS	J	J	mm	LS	



SAMPLE CHECK IN

Sample ID Number: # 1

Fill out this information with each effluent or river water sample coming in for testing. Keep completed sheets with test data and file with the lab QA/QC officer.

Date: 100317 Sampling Date: 100217 Arrival Time: 0910

Field Identification Number: _____ Description: _____

Shipped by: Federal Express UPS _____ Hand delivered by: _____

Drop-Off Location: ASU-ERF

Storage While Shipped: _____

Analysis Requested: Chronic p-promelas, chronic C-duga

Initial Water Chemistry Analysis:

Sample Received by: Irene Sanchez

Temperature (°C): 3.5 Ice Present upon delivery: YES NO

Date: 100317

Quality Assurance	Initial	Date	Yes	No
Chain of Custody	156	100317	<input checked="" type="checkbox"/>	
Refrigerated at 4°C	156	100317	<input checked="" type="checkbox"/>	
Field Record Received	156	100317		<input checked="" type="checkbox"/>
Sample Label Affixed Properly	156	100317		<input checked="" type="checkbox"/>
Project Leader Informed	156	100317	<input checked="" type="checkbox"/>	

Comments: _____



Ecotoxicology Research Facility

SAMPLE CHECK IN

Sample ID Number: Berryville #2

Fill out this information with each effluent or river water sample coming in for testing. Keep completed sheets with test data and file with the lab QA/QC officer.

Date: 100517 Sampling Date: ¹⁰⁰³¹⁷100417 Arrival Time: 0903

Field Identification Number: MBC07 Description: _____

Shipped by: Federal Express UPS _____ Hand delivered by: _____

Drop-Off Location: _____ ASU-ERF _____

Storage While Shipped: _____

Analysis Requested: Chronic C. dubia , chronic P. promelas

Initial Water Chemistry Analysis: _____

Sample Received by: Amber Ruby

Temperature (°C): 2.0°

Ice Present upon delivery: YES NO

Date: 100517

Quality Assurance	Initial	Date	Yes	No
Chain of Custody	<u>AR</u>	<u>100517</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Refrigerated at 4°C	<u>AR</u>	<u>100517</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Field Record Received	<u>AR</u>	<u>100517</u>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Sample Label Affixed Properly	<u>AR</u>	<u>100517</u>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Project Leader Informed	<u>AR</u>	<u>100517</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Comments: _____



Ecotoxicology Research Facility

SAMPLE CHECK IN

Sample ID Number: #3

Fill out this information with each effluent or river water sample coming in for testing. Keep completed sheets with test data and file with the lab QA/QC officer.

Date: 100717 Sampling Date: 10/05 - 10/06/17 Arrival Time: 1040

Field Identification Number: Berryville/MB 001 Description: Camp

Shipped by: Federal Express X UPS Hand delivered by:

Drop-Off Location: ASU-ERF

Storage While Shipped: Cooler with ice

Analysis Requested: Chronic C.dubia + Chronic P.promelas

Initial Water Chemistry Analysis:

Sample Received by: VAB

Temperature (°C): 1.5

Ice Present upon delivery: YES NO

Date: 100717

Quality Assurance	Initial	Date	Yes	No
Chain of Custody	<u> VAB </u>	<u> 100717 </u>	<u> ✓ </u>	
Refrigerated at 4°C	<u> VAB </u>	<u> 100717 </u>	<u> ✓ </u>	
Field Record Received	<u> VAB </u>	<u> 100717 </u>		<u> ✓ </u>
Sample Label Affixed Properly	<u> VAB </u>	<u> 100717 </u>	<u> ✓ </u>	
Project Leader Informed	<u> VAB </u>	<u> 100717 </u>	<u> ✓ </u>	

Comments:



Ecotoxicology Research Facility
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 501 Iroquois
 State University, AR 72467
 (870) 972-2570 Fax (870) 972-2577

CHAIN OF CUSTODY RECORD



Client Name		Phone: 479-443-3292					Analyses (List Below)					
Berryville WWTP		Fax: 479-443-5613										
Project # / Outfall #		PO #: CREDIT CARD										
BERRYVILLE / MB-001		Remarks: CL2 = < 0.10										
Sampler(s)ign <i>Michael Hayward</i>		Contact: Bruce Richart										
Cont.#	Sample ID Number	Location	Sample Date	Sample Time	Sample Type			Matrix				
					Comp	Grab	Aqueous		Soil	Other		
	MB 001		10-1-17	0600	X		X		Chronic <i>C. dubia</i>	Chronic <i>P. promelas</i>		
			10-2-17	0600								
Ice present at delivery: <u>X</u> yes <u>no</u>		Initials LSG										
Temp: 3.5 °C												
Initials LS												
1. Relinquished By (sign) <i>Michael Hayward</i>		Date	10/03/17	Time	11:15	1. Received By (sign)			Date	10/03/17	Time	0910
2. Relinquished By (sign)		Date		Time		2. Received By (sign)			Date		Time	



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CHAIN OF CUSTODY RECORD



Client Name Berryville WWTP		Phone: 479-443-3292												
Project # / Outfall # BERRYVILLE / MB001		Fax: 479-443-5613												
Sampler (sign) <i>Michael Maynard</i>		PO #: CREDIT CARD												
Remarks: Contact: Bruce Richart		CL ₂ = < 0.10												
Cont.#	Sample ID Number	Location	Sample Date	Sample Time	Sample Type			Matrix			Analyses (List Below)			
					Comp	Grab	Aqueous	Soil	Other	Chronic C. dubia	Chronic P. promelas			
	MB 001		11/17/17	0600-0600	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
Ice present at delivery: <input checked="" type="checkbox"/> yes <input type="checkbox"/> no MBD Initials														
Temp: 1.5 °C														
Initials MBD														
1. Relinquished By (sign) <i>Michael Maynard</i>			Date 11/16/17	Time 11:45	1. Received By (sign) <i>Carlo M... ..</i>			Date 10/07/17	Time 1040					
2. Relinquished By (sign)			Date	Time	2. Received By (sign)			Date	Time					