

**Toxicity Tests
For
Western Virginia Water Authority
Report # 3176**

Submitted To: S. Scott Shirley
Chief Operating Officer- Water Quality
Western Virginia Water Authority

Submitted By: Biological Monitoring, Inc.
1800 Kraft Drive, Suite 104
Blacksburg, VA 24060

Phone: 540-953-2821
Fax: 540-951-1481

Report Date: May 23, 2023



Biological Monitoring, Inc. is accredited by The NELAC Institute (TNI 2016, ID:460015). The test results reported herein meet all requirements of TNI. The procedures are deemed compliant with the methods and acceptable for reporting.



Quality Manager

A handwritten signature in black ink, appearing to read "Wendy R. Boyle", is written over a horizontal line.

Page 1 of 4



BIOLOGICAL MONITORING, INC

1800 KRAFT DRIVE SUITE 104 BLACKSBURG VIRGINIA 24060

PH:540-953-2821 EMAIL: BMI@BIOMON.COM WWW.BIOMON.COM



TNI ACCREDITED LAB# 460015

Toxicity Testing Data Summary

Client Western Virginia Water Authority **Permit #** 4AROA198.08 **Sample** Explore Park

Test ID WVA050223-1 **Result** NOEC = 12.5, IC25 > 100 **Pass/Fail** NA **Next Step** NA

Test ID WVA050223-2 **Result** NOEC = 100, IC25 > 100 **Pass/Fail** NA **Next Step** NA



BIOLOGICAL MONITORING, INC

1800 KRAFT DRIVE SUITE 104 BLACKSBURG VIRGINIA 24060

PH:540-953-2821 EMAIL:BMI@BIOMON.COM WWW.BIOMON.COM



TNI ACCREDITED LAB# 460015

Certificate of Analysis

Client Western Virginia Water Authority

Report # 3176

BMI Project # 4268

Report Date May 23, 2023

Permit # 4AROA198.08

Sample ID #s WVA050223-1

Sample Explore Park

Test ID # WVA050223-1

Test Type Short Term Chronic

Organism Pimephales promelas

Test Start Date May 2, 2023

Test Start Time 1300

EPA Method # 1000

Test End Date May 9, 2023

Test End Time 1230

Photoperiod 16h L/8h D

Endpoint Survival

Method Dunnett's Test

Result NOEC = 12.5

Endpoint Survival

Method Graphical

Result 48h LC50 > 100

Endpoint Growth

Method Dunnett's Test

Result NOEC = 100

Endpoint Growth

Method Linear Interpolation

Result IC25 > 100

Endpoint Growth

Method PMSD

Result 19.31%

Final Result NOEC = 12.5, IC25 > 100, TUc = 1

Pass/Fail NA



BIOLOGICAL MONITORING, INC

1800 KRAFT DRIVE SUITE 104 BLACKSBURG VIRGINIA 24060

PH:540-953-2821 EMAIL:BMI@BIOMON.COM WWW.BIOMON.COM



TNI ACCREDITED LAB# 460015

Certificate of Analysis

Client Western Virginia Water Authority

Report # 3176

BMI Project # 4268

Report Date May 23, 2023

Permit # 4AROA198.08

Sample ID #s WVA050223-1

Sample Explore Park

Test ID # WVA050223-2

Test Type Short Term Chronic

Organism Ceriodaphnia dubia

Test Start Date May 2, 2023

Test Start Time 1300

EPA Method # 1002

Test End Date May 8, 2023

Test End Time 1230

Photoperiod 16h L/8h D

Endpoint Survival

Method Fisher's Exact Test

Result NOEC = 100

Endpoint Survival

Method Graphical

Result 48h LC50 > 100

Endpoint Reproduction

Method Wilcoxon Rank Sum Test

Result NOEC = 100

Endpoint Reproduction

Method Linear Interpolation

Result IC25 > 100

Endpoint Reproduction

Method PMSD

Result 26.36%

Final Result NOEC = 100, IC25 > 100, TUC = 1

Pass/Fail NA

Chronic Toxicity Test
(*Pimephales promelas*)

Page 1 of 4

Experiment I.D.# WMA050223-1
 Biologist(s): JR PR VF MH WB RG
 Permit # 41A204198,08
 Client: WVWA
 Effluent toxicant: Explore Park
 Sample Type: Grab Composite
 Sample Chlorine: LO-07
 Dilution Water Used MHRW
 Feeding Schedule: 0.15 ml Artemia 2x Daily
 Aeration: N/A
 Template #: LY6 even

Start of Test Date: 05/02/23 Time: 1300
 End of Test Date: 05/08/23 Time: 1230
 Test Duration: 7 days
 Test Temperature: 25 +/- 1 deg C
 Test Volume: 350 ml
 Test Containers Used: 500 ml PE
 Renewal Frequency: Daily
 Test Organism Age: 24-48
 Organism Batch #: ABS050223-1
 Organisms per concentration: 40
 Waterbath/Shelf #: 7

SAMPLE COLLECTION							
Date(s)		Time(s)		TEST RENEWAL			
From:	To:	From:	To:	Date(s)	Time(s)	Test Day	Diluent Batch #:
05/01/23	05/01/23	0930	—	05/02/23	1300	0	8457
05/02/23	05/02/23	0935	—	05/03/23	1200	1	8457
				05/04/23	1300	2	8460
				05/05/23	1230	3	8460
05/05/23	05/05/23	1020	—	05/06/23	1100	4	8462
				05/07/23	1130	5	8462
				05/08/23	1230	6	8462

Meters: Instrument Id#: Temp.: 089 pH: 06.1

DO: 06.1 Conductivity/Salinity: 041

Condition of Organisms at End of Test: Normal

Average weight per control fish: ^① 100 0.926 mg Control Survival (%): 100

Comments: ① 05/09/23 Bdr ② WMA 5/23/23

Experiment ID: WVA050223-1

Conc: Units	Day	Number of Live Organisms				DO (mg/L)		pH		Alkalinity mg/L as CaCO ₃	Hardness mg/L as CaCO ₃	Cond./ Salinity umho/ 0/00	Temp. (C)		Feeding 1	Feeding 2	Comments	Initials
		A	B	C	D	Before	After	Before	After				Before	After				
0	0	10	10	10	10		8.44		8.20	60	82	368		25	✓			MH
	1	10	10	10	10	8.20	8.52	8.08	8.22			331	25	25	✓			Bd
	2	10	10	10	10	7.48	8.38	8.01	8.16	64	88	322	25	25	✓			Bd
	3	10	10	10	10	7.47	8.07	8.08	8.21			320	25	25	✓			Bd
	4	10	10	10	10	7.49	8.46	8.39	8.29	60	92	331	25	25	✓			MH
	5	10	10	10	10	6.80	8.05	8.02	8.24			328	25	25	✓			Bd
	6	10	10	10	10	7.82	8.07	8.01	8.15			340	25	25	✓			Bd
	7	10	10	10	10	6.94		8.03					25		No Food			Bd
6.25	0	10	10	10	10		8.31		8.19			321		25	✓			MH
	1	10	10	10	10	8.16	8.57	8.07	8.16			312	25	25	✓			Bd
	2	10	10	10	10	7.88	7.85	8.03	8.10			319	25	25	✓			Bd
	3	10	10	10	10	7.22	7.88	8.02	8.16			318	25	25	✓			Bd
	4	10	10	10	10	7.87	8.51	8.24	8.25			326	25	25	✓			MH
	5	10	10	10	10	6.89	8.01	8.03	8.09			333	25	25	✓			Bd
	6	10	10	9	10	7.63	8.23	7.98	8.13			339	25	25	✓			Bd
	7	10	10	9	10	6.70		7.99					25		No Food			Bd
12.5	0	10	10	10	10		8.22		8.15			308		25	✓			MH
	1	10	10	10	10	8.04	8.58	8.07	8.16			303	25	25	✓			Bd
	2	10	10	10	10	7.48	7.86	8.06	8.11			317	25	25	✓			Bd
	3	10	10	10	10	7.28	7.86	8.01	8.17			327	25	25	✓			Bd
	4	10	10	9	10	8.00	8.48	8.21	8.25			335	25	25	✓			MH
	5	10	10	9	10	7.12	8.04	8.08	8.15			332	25	25	✓			Bd
	6	10	10	9	10	7.47	8.25	8.00	8.14			330	25	25	✓			Bd
	7	10	10	9	10	6.82		7.99					25		No Food			Bd

Experiment ID: 100105050723-1

Conc: Units	Day	Number of Live Organisms				DO (mg/L)		pH		Alkalinity mg/L as CaCO ₃	Hardness mg/L as CaCO ₃	Cond./ Salinity umho/ 0/00	Temp. (C)		Feeding 1	Feeding 2	Comments	Initials
		A	B	C	D	Before	After	Before	After				Before	After				
25	0	10	10	10	10		7.98		8.13			307		25		✓		MA
	1	10	10	10	10	8.19	8.63	8.11	8.16			298	75	25	✓	✓		Bd
	2	10	10	9	9	7.27	7.78	8.09	8.15			311	25	25	✓	✓		Bd
	3	9	8	8	7	7.31	7.93	8.08	8.19			315	75	25	✓	✓		Bd
	4	9	8	8	7	7.91	8.34	8.22	8.27			332	25	25	✓	✓		MA
	5	9	8	8	7	7.50	8.06	8.12	8.21			345	25	25	✓	✓		Bd
	6	9	8	8	7	7.65	8.18	8.08	8.23			338	25	25	✓	✓		Bd
	7	9	8	8	7	6.73		8.01					25		No Food			Bd
50	0	10	10	10	10		7.91		8.18			288		25		✓		MA
	1	10	10	10	10	8.23	8.65	8.15	8.17			293	25	25	✓	✓		Bd
	2	10	10	10	10	7.18	7.88	8.14	8.18			304	25	25	✓	✓		Bd
	3	10	10	10	10	7.36	8.08	8.20	8.20			307	25	25	✓	✓		Bd
	4	10	10	10	10	7.90	8.49	8.26	8.29			341	25	25	✓	✓		MA
	5	10	10	9	10	7.31	8.10	8.17	8.22			339	25	25	✓	✓		Bd
	6	10	10	9	10	7.62	8.52	8.20	8.26			340	25	25	✓	✓		Bd
	7	10	10	9	10	6.64		8.68					25		No Food			Bd
100	0	10	10	10	10		7.94		8.21	100	124	268		25		✓		MA
	1	10	10	10	10	8.06	8.76	8.28	8.19	112	134	283	25	25	✓	✓		Bd
	2	10	10	10	10	7.21	7.98	8.33	8.19			296	25	25	✓	✓		Bd
	3	10	10	8	10	7.21	8.43	8.27	8.18			291	25	25	✓	✓		Bd
	4	9	10	8	10	7.95	8.56	8.40	8.28	140	172	362	25	25	✓	✓		MA
	5	9	8	8	10	7.21	8.26	8.32	8.23			353	25	25	✓	✓		Bd
	6	9	7	8	10	7.59	8.56	8.35	8.24			351	25	25	✓	✓		Bd
	7	9	7	8	10	6.58		8.25					25		No Food			Bd

pH = 8.20

03/05/08/23

Weight Data Sheet

Experiment ID: WVA050223-1

Treatment ID	Initial Weight (mg)	Final Weight (mg)	# Larvae	Comments	Initials
0 A	16.88	27.51	10		MH
0 B	16.28	25.14	10		MH
0 C	16.52	24.84	10		MH
0 D	16.42	25.63	10		MH
6.25 A	16.35	25.04	10		MH
6.25 B	16.82	27.44	10		MH
6.25 C	17.36	26.79	10		MH
6.25 D	17.53	25.28	10		MH
12.5 A	16.58	26.02	10		MH
12.5 B	16.94	25.95	10		MH
12.5 C	16.99	25.87	10		MH
12.5 D	17.00	26.43	10		MH
25 A	17.24	24.60	10		MH
25 B	17.48	26.39	10		MH
25 C	17.31	26.34	10		MH
25 D	17.91	24.63	10		MH
50 A	17.64	25.89	10		MH
50 B	17.46	27.57	10		MH
50 C	17.21	26.35	10		MH
50 D	17.76	27.47	10		MH
100 A	17.60	26.00	10		MH
100 B	17.50	23.84	10		MH
100 C	17.52	26.57	10		MH
100 D	16.70	26.37	10		MH

CETIS Analytical Report

Report Date: 23 May-23 12:41 (p 3 of 6)
 Test Code/ID: WVA050223-1 / 05-8064-6122

Fathead Minnow 7-d Larval Survival and Growth Test Biological Monitoring, Inc.

Analysis ID: 05-0453-0468	Endpoint: 7d Survival Rate	CETIS Version: CETISv1.9.4
Analyzed: 23 May-23 12:41	Analysis: Parametric-Control vs Treatments	Status Level: 1
Batch ID: 10-2262-9553	Test Type: Growth-Survival (7d)	Analyst: Lab Tech
Start Date: 02 May-23 13:00	Protocol: EPA/821/R-02-013 (2002)	Diluent: Mod-Hard Synthetic Water
Ending Date: 09 May-23 12:30	Species: Pimephales promelas	Brine:
Test Length: 7d	Taxon: Actinopterygii	Source: Aquatic Biosystems, CO Age: 48
Sample ID: 03-3571-9131	Code: WVA050223-1	Project: Special Studies
Sample Date: 01 May-23 09:30	Material: Riverine Monitoring Sample	Source: 4AROA198.08 (4AROA198.0)
Receipt Date: 02 May-23 09:00	CAS (PC):	Station: Explore Park
Sample Age: 27h	Client: Western Va Water Authority	

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)	C > T	12.5	25	17.68	8	10.79%

Dunnett Multiple Comparison Test

Control	vs	Conc-%	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Dilution Water		6.25	0.5574	2.407	0.176	6	CDF	0.6223	Non-Significant Effect
		12.5	0.5574	2.407	0.176	6	CDF	0.6223	Non-Significant Effect
		25*	4.082	2.407	0.176	6	CDF	0.0015	Significant Effect
		50	0.5574	2.407	0.176	6	CDF	0.6223	Non-Significant Effect
		100*	3.039	2.407	0.176	6	CDF	0.0142	Significant Effect

Test Acceptability Criteria

Attribute	Test Stat	Lower	Upper	Overlap	Decision
Control Resp	1	0.8	>>	Yes	Passes Criteria

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.298059	0.0596118	5	5.578	0.0028	Significant Effect
Error	0.19236	0.0106867	18			
Total	0.490419		23			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Levene Equality of Variance Test	2.88	4.248	0.0441	Equal Variances
Variances	Mod Levene Equality of Variance Test	1.638	4.248	0.2007	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.8996	0.884	0.0211	Normal Distribution

7d Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
6.25		4	0.9750	0.8954	1.0000	1.0000	0.9000	1.0000	0.0250	5.13%	2.50%
12.5		4	0.9750	0.8954	1.0000	1.0000	0.9000	1.0000	0.0250	5.13%	2.50%
25		4	0.8000	0.6701	0.9299	0.8000	0.7000	0.9000	0.0408	10.21%	20.00%
50		4	0.9750	0.8954	1.0000	1.0000	0.9000	1.0000	0.0250	5.13%	2.50%
100		4	0.8500	0.6446	1.0000	0.8500	0.7000	1.0000	0.0646	15.19%	15.00%

Angular (Corrected) Transformed Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	4	1.412	1.412	1.412	1.412	1.412	1.412	0	0.00%	0.00%
6.25		4	1.371	1.242	1.501	1.412	1.249	1.412	0.04074	5.94%	2.89%
12.5		4	1.371	1.242	1.501	1.412	1.249	1.412	0.04074	5.94%	2.89%
25		4	1.114	0.9457	1.282	1.107	0.9912	1.249	0.05277	9.48%	21.13%
50		4	1.371	1.242	1.501	1.412	1.249	1.412	0.04074	5.94%	2.89%
100		4	1.19	0.9005	1.479	1.178	0.9912	1.412	0.09091	15.28%	15.73%

CETIS Analytical Report

Report Date: 23 May-23 12:41 (p 4 of 6)
Test Code/ID: WVA050223-1 / 05-8064-6122

Fathead Minnow 7-d Larval Survival and Growth Test

Biological Monitoring, Inc.

Analysis ID: 05-0453-0468 Endpoint: 7d Survival Rate
Analyzed: 23 May-23 12:41 Analysis: Parametric-Control vs Treatments

CETIS Version: CETISv1.9.4
Status Level: 1

7d Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	1.0000	1.0000	1.0000	1.0000
6.25		1.0000	1.0000	0.9000	1.0000
12.5		1.0000	1.0000	0.9000	1.0000
25		0.9000	0.8000	0.8000	0.7000
50		1.0000	1.0000	0.9000	1.0000
100		0.9000	0.7000	0.8000	1.0000

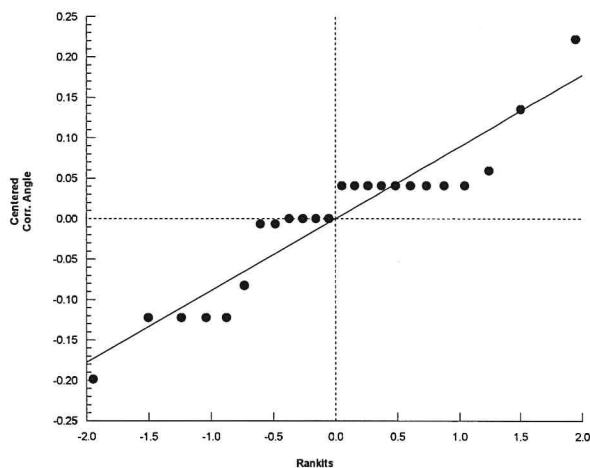
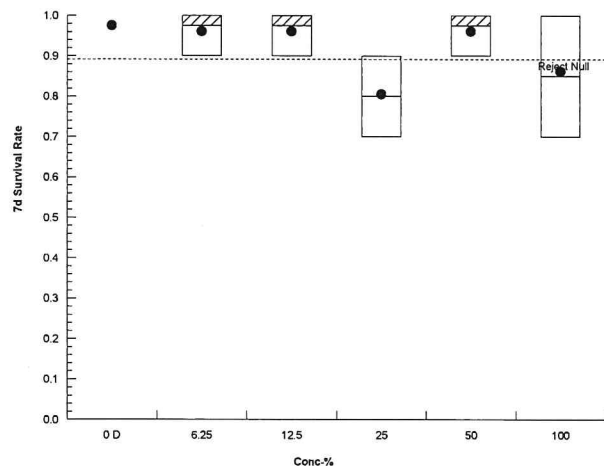
Angular (Corrected) Transformed Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	1.412	1.412	1.412	1.412
6.25		1.412	1.412	1.249	1.412
12.5		1.412	1.412	1.249	1.412
25		1.249	1.107	1.107	0.9912
50		1.412	1.412	1.249	1.412
100		1.249	0.9912	1.107	1.412

7d Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	10/10	10/10	10/10	10/10
6.25		10/10	10/10	9/10	10/10
12.5		10/10	10/10	9/10	10/10
25		9/10	8/10	8/10	7/10
50		10/10	10/10	9/10	10/10
100		9/10	7/10	8/10	10/10

Graphics



CETIS Analytical Report

Report Date: 23 May-23 12:41 (p 5 of 6)
Test Code/ID: WVA050223-1 / 05-8064-6122

Fathead Minnow 7-d Larval Survival and Growth Test

Biological Monitoring, Inc.

Analysis ID: 18-2793-2904	Endpoint: Mean Dry Biomass-mg	CETIS Version: CETISv1.9.4
Analyzed: 23 May-23 12:41	Analysis: Parametric-Control vs Treatments	Status Level: 1
Batch ID: 10-2262-9553	Test Type: Growth-Survival (7d)	Analyst: Lab Tech
Start Date: 02 May-23 13:00	Protocol: EPA/821/R-02-013 (2002)	Diluent: Mod-Hard Synthetic Water
Ending Date: 09 May-23 12:30	Species: Pimephales promelas	Brine:
Test Length: 7d	Taxon: Actinopterygii	Source: Aquatic Biosystems, CO Age: 48
Sample ID: 03-3571-9131	Code: WVA050223-1	Project: Special Studies
Sample Date: 01 May-23 09:30	Material: Riverine Monitoring Sample	Source: 4AROA198.08 (4AROA198.0)
Receipt Date: 02 May-23 09:00	CAS (PC):	Station: Explore Park
Sample Age: 27h	Client: Western Va Water Authority	

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	C > T	100	>100	n/a	1	19.31%

Dunnett Multiple Comparison Test

Control	vs	Conc-%	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Dilution Water		6.25	0.1785	2.407	0.179	6	CDF	0.7754	Non-Significant Effect
		12.5	0.08755	2.407	0.179	6	CDF	0.8062	Non-Significant Effect
		25	1.684	2.407	0.179	6	CDF	0.1741	Non-Significant Effect
		50	-0.08419	2.407	0.179	6	CDF	0.8569	Non-Significant Effect
		100	1.199	2.407	0.179	6	CDF	0.3376	Non-Significant Effect

Test Acceptability Criteria

Attribute	Test Stat	Lower	Upper	Overlap	Decision
Control Resp	0.9255	0.25	>>	Yes	Passes Criteria

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0607073	0.0121415	5	1.101	0.3938	Non-Significant Effect
Error	0.198423	0.0110235	18			
Total	0.25913		23			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	5.542	15.09	0.3534	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9785	0.884	0.8658	Normal Distribution

Mean Dry Biomass-mg Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	4	0.9255	0.7684	1.083	0.9035	0.832	1.063	0.04935	10.67%	0.00%
6.25		4	0.9123	0.7194	1.105	0.906	0.775	1.062	0.06061	13.29%	1.43%
12.5		4	0.919	0.8732	0.9648	0.922	0.888	0.944	0.01439	3.13%	0.70%
25		4	0.8005	0.6182	0.9828	0.8135	0.672	0.903	0.05728	14.31%	13.51%
50		4	0.9317	0.8002	1.063	0.9425	0.825	1.017	0.04135	8.88%	-0.68%
100		4	0.8365	0.6064	1.067	0.8725	0.634	0.967	0.07231	17.29%	9.62%

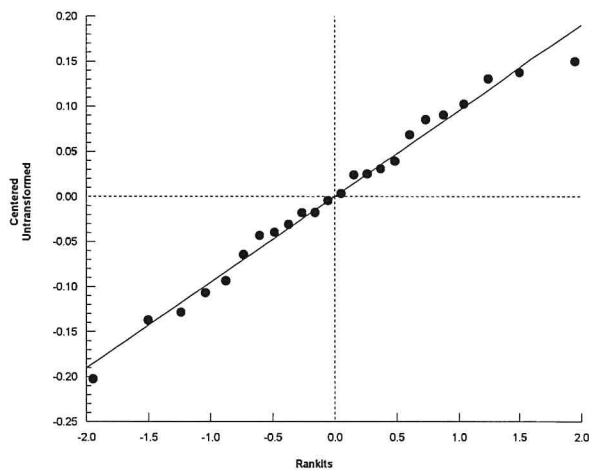
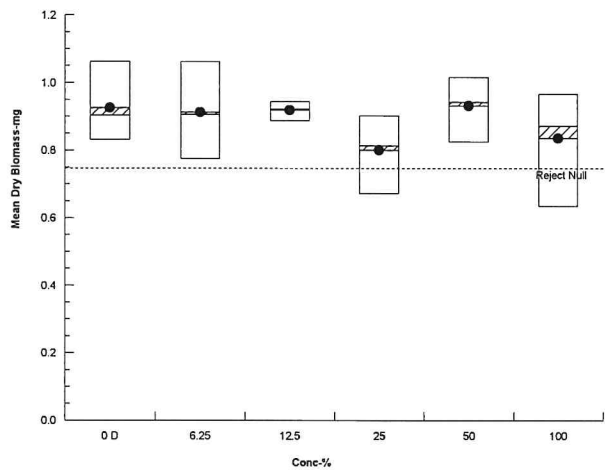
Mean Dry Biomass-mg Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	1.063	0.886	0.832	0.921
6.25		0.869	1.062	0.943	0.775
12.5		0.944	0.901	0.888	0.943
25		0.736	0.891	0.903	0.672
50		0.825	1.017	0.914	0.971
100		0.84	0.634	0.905	0.967

Fathead Minnow 7-d Larval Survival and Growth Test Biological Monitoring, Inc.

Analysis ID: 18-2793-2904	Endpoint: Mean Dry Biomass-mg	CETIS Version: CETISv1.9.4	
Analyzed: 23 May-23 12:41	Analysis: Parametric-Control vs Treatments	Status Level: 1	

Graphics



CETIS Analytical Report

Report Date: 23 May-23 12:41 (p 1 of 2)
Test Code/ID: WVA050223-1 / 05-8064-6122

Fathead Minnow 7-d Larval Survival and Growth Test

Biological Monitoring, Inc.

Analysis ID: 20-7137-7914	Endpoint: Mean Dry Biomass-mg	CETIS Version: CETISv1.9.4
Analyzed: 23 May-23 12:41	Analysis: Linear Interpolation (ICPIN)	Status Level: 1
Batch ID: 10-2262-9553	Test Type: Growth-Survival (7d)	Analyst: Lab Tech
Start Date: 02 May-23 13:00	Protocol: EPA/821/R-02-013 (2002)	Diluent: Mod-Hard Synthetic Water
Ending Date: 09 May-23 12:30	Species: Pimephales promelas	Brine:
Test Length: 7d	Taxon: Actinopterygii	Source: Aquatic Biosystems, CO Age: 48
Sample ID: 03-3571-9131	Code: WVA050223-1	Project: Special Studies
Sample Date: 01 May-23 09:30	Material: Riverine Monitoring Sample	Source: 4AROA198.08 (4AROA198.0)
Receipt Date: 02 May-23 09:00	CAS (PC):	Station: Explore Park
Sample Age: 27h	Client: Western Va Water Authority	

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	290079	1000	Yes	Two-Point Interpolation

Test Acceptability Criteria

		TAC Limits		Overlap	Decision
Attribute	Test Stat	Lower	Upper		
Control Resp	0.9255	0.25	>>	Yes	Passes Criteria

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	21.69	n/a	n/a	4.61	n/a	n/a
IC10	>100	n/a	n/a	<1	n/a	n/a
IC15	>100	n/a	n/a	<1	n/a	n/a
IC20	>100	n/a	n/a	<1	n/a	n/a
IC25	>100	n/a	n/a	<1	n/a	n/a
IC40	>100	n/a	n/a	<1	n/a	n/a
IC50	>100	n/a	n/a	<1	n/a	n/a

Mean Dry Biomass-mg Summary

			Calculated Variate						Isotonic Variate	
Conc-%	Code	Count	Mean	Min	Max	Std Dev	CV%	%Effect	Mean	%Effect
0	D	4	0.9255	0.832	1.063	0.09871	10.67%	0.0%	0.9255	0.0%
6.25		4	0.9123	0.775	1.062	0.1212	13.29%	1.43%	0.9156	1.07%
12.5		4	0.919	0.888	0.944	0.02879	3.13%	0.7%	0.9156	1.07%
25		4	0.8005	0.672	0.903	0.1146	14.31%	13.51%	0.8661	6.42%
50		4	0.9317	0.825	1.017	0.0827	8.88%	-0.68%	0.8661	6.42%
100		4	0.8365	0.634	0.967	0.1446	17.29%	9.62%	0.8365	9.62%

Mean Dry Biomass-mg Detail

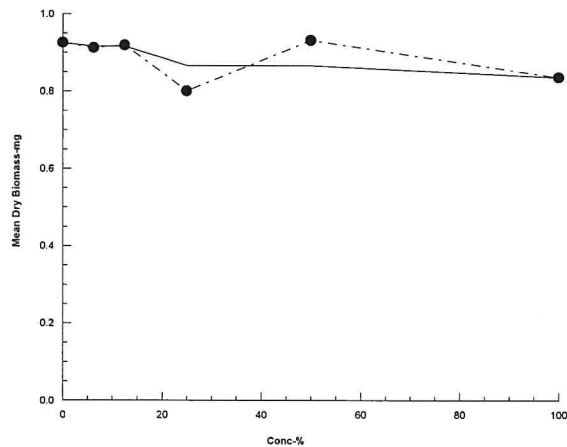
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	1.063	0.886	0.832	0.921
6.25		0.869	1.062	0.943	0.775
12.5		0.944	0.901	0.888	0.943
25		0.736	0.891	0.903	0.672
50		0.825	1.017	0.914	0.971
100		0.84	0.634	0.905	0.967

CETIS Analytical Report

Report Date: 23 May-23 12:41 (p 2 of 2)
Test Code/ID: WVA050223-1 / 05-8064-6122

Fathead Minnow 7-d Larval Survival and Growth Test			Biological Monitoring, Inc.
Analysis ID: 20-7137-7914	Endpoint: Mean Dry Biomass-mg	CETIS Version: CETISv1.9.4	
Analyzed: 23 May-23 12:41	Analysis: Linear Interpolation (ICPIN)	Status Level: 1	

Graphics



Chronic Toxicity Test
(Ceriodaphnia dubia)

Page 1 of 5

Experiment I.D.# WVAC050223-2
Biologist(s): JR PR WB VF MH RG
Permit # 4 A20198,08
Client: WVWA
Effluent toxicant: Expire Paril
Sample Type: Grab Composite
Sample Chlorine: LO.02
Dilution Water Used MHRW
Feeding Schedule: 0.1 ml YCT and Rs Daily
Aeration: W/A
Template #: 12

Start of Test Date: 05/02/23 Time: 1300
End of Test Date: 5/8/23 Time: 1230
Test Duration: 3 Broods
Test Temperature: 25 +/- 1 deg C
Test Volume: 15 ml
Test Containers Used: 30 ml PS
Renewal Frequency: Daily
Test Organism Age: 15-21 h
Organism Batch #: 042523 (1600-2200)
Organisms per concentration: 10
Waterbath/Shelf #: 9

SAMPLE COLLECTION							
Date(s)		Time(s)		TEST RENEWAL			
From:	To:	From:	To:	Date(s)	Time(s)	Test Day	Diluent Batch #:
05/01/23	05/01/23	0930	—	05/02/23	1300	0	8457
05/02/23	05/02/23	0935	—	05/03/23	1230	1	8457
				05/04/23	1100	2	8460
				05/05/23	1300	3	8460
05/05/23	05/05/23	1020	—	05/06/23	1330	4	8462
				5/7/23	1330	5	8462
						6	8462

Food Batch/Days Used: YCT 032123 0-3 Algae 042523 0-5
YCT 040423 4-6⁰ Algae —

Meters: Instrument Id#: Temp.: 089 pH: 06.1
DO: 06.1 Conductivity/Salinity: 041

Condition of Organisms at End of Test: Normal
Control Survival (%): 90 Average # Young/Female: 31.5
Percent control female with 3 broods (%): 90
Comments: OVF 5/9/23

Experiment ID: WVA050223-Z

Conc: Units	Day	A	B	C	D	E	F	G	H	I	J	# Young	# Adults	# Males	Init.
%	1	0	0	0	0	0	0	0	0	0	0	0	10		VF
	2	0	0	0	0	0	0	0	0	0	0	0	10		VF
	3	5	6	3	6	7	5	5	6	4	6	53	10	0	VF
	4	0	0	0	0	1↑	0	0	0	0	0	1	10	0	VF
	5	12	10	16	13	14x	15	14	15	13	16	138	9	0	VF
	6	17	15	12	14	↓	9	8	17	12	19	123	9	0	VF
	7														
6.25	Total	34	31	31	33	22	29	27	38	29	41	315	9	0	WMD
	1	0	0	0	0	0	0	0	0	0	0	0	10		VF
	2	0	0	0	0	0	0	0	0	0	0	0	10		VF
	3	6	5	6	8	7	6	5	6	7	0	56	10	0	VF
	4	0	0	0	0	0	0	0	0	0	0	0	10	0	VF
	5	16	13	9	14	16	17	9	11	9	10	124	10	0	VF
	6	17	15	12	16	15	12	9	12	15	3	126	10	0	VF
12.5	7														
	Total	39	33	27	38	38	35	23	29	31	13	306	10	0	WMD
	1	0	0	0	0	0	0	0	0	0	0	0	10		VF
	2	0	0	0	0	0	0	0	0	0	0	0	10		VF
	3	7	6	6	5	6	3	4	5	6	3	51	10	0	VF
	4	0	0	0	0	0	1↑	0	0	0	0	1	10	0	VF
	5	0	10	11	12	11	14	12	7	8	9	94	10	0	VF
	6	9	13	21	16	22	15	19	17	16	14	162	10	0	VF
	7														
	Total	16	29	38	33	39	33	35	29	30	26	308	10	0	WMD

Experiment ID: WVVA050223-2

Conc: Units	Day	A	B	C	D	E	F	G	H	I	J	# Young	# Adults	# Males	Init.
25	1	0	0	0	0	0	0	0	0	0	0	0	10		VF
	2	0	0	0	0	0	0	0	0	0	0	0	10		VF
	3	5	4	4	6	7	8	0	0	3	5	42	10	0	VF
	4	0	0	0	0	0	0	0	3	0	0	3	10	0	VF
	5	8	6X	10	13	10	12	15	10	8	9	95	9	0	VF
	6	13	↓	14	16	9	13	10	5	17	11	108	9	0	VF
	7														
50	Total	26	4	28	35	46	33	25	18	28	25	248	9	0	WVD
	1	0	0	0	0	0	0	0	0	0	0	0	10		VF
	2	0	0	0	0	0	0	0	0	0	0	0	10		VF
	3	5	6	4	7	6	5	0	0	2	5	46	10	0	VF
	4	0	0	0	0	0	0	0	0	0	0	0	10	0	VF
	5	10	13	8	12	10	9	8X	7	11	12	100	9	0	VF
	6	11	12	9	10	15	10	↓	10	12	15	104	9	0	VF
100	7														
	Total	26	31	21	29	31	24	14	17	25	32	250	9	0	WVD
	1	0	0	0	0	0	0	0	0	0	0	0	10		VF
	2	0	0	0	0	0	0	0	0	0	0	0	10		VF
	3	6	0	3	6	5	0	0	7	6	8	41	10		VF
	4	0	7	0X	0	0	0	4	0	0	0	11	9		VF
	5	11	5	↓	8	11	0	9	11	8	9	72	9		VF
100	6	15	10	↓	12	11	0	20	13	9	18	108	9	1	VF
	7														
	Total	32	22	3	26	27	0	33	31	23	35	232	9	1	WVD

① WVD 5/22/23

Experiment ID: WVA050223-2

Conc: Units	Day	Temperature (C)		Dissolved Oxygen (mg/L)		pH		Cond. (umhos)	Alkalinity (mg/L CaCO ₃)	Hardness (mg/L CaCO ₃)	Food	Init.
		Before	After	Before	After	Before	After					
%	0		75		8.44		8.20	368	60	82	✓	Bd
	1	25	25	7.83	8.52	8.27	8.22	331			✓	Bd
	2	25	25	7.20	8.38	8.35	8.16	322	64	88	✓	Bd
	3	25	25	8.15	8.07	8.28	8.21	320			✓	Bd
	4	25	25	7.71	8.46	8.29	8.29	331	60	92	✓	MH
	5	25	25	7.85	8.05	8.29	8.24	328			✓	VF
	6	25		7.92		8.27						Pa
	7											
6.25	0		25		8.3		8.19	321			✓	Bd
	1	25	25	7.77	8.57	8.23	8.16	312			✓	Bd
	2	25	25	8.11	7.85	8.38	8.10	319			✓	Bd
	3	25	25	8.08	7.88	8.34	8.16	318			✓	Bd
	4	25	25	8.01	8.51	8.32	8.25	326			✓	MH
	5	25	25	7.61	8.01	8.26	8.09	333			✓	VF
	6	25		7.93		8.31						Pa
	7											
12.5	0		25		8.22		8.15	308			✓	Bd
	1	25	25	7.87	8.58	8.18	8.14	303			✓	Bd
	2	25	25	7.43	7.80	8.30	8.11	317			✓	Bd
	3	25	25	8.03	7.86	8.40	8.17	327			✓	Bd
	4	25	25	8.09	8.48	8.39	8.25	335			✓	MH
	5	25	25	7.70	8.04	8.32	8.15	332			✓	VF
	6	25		7.88		8.34						Pa
	7											

Experiment ID: WVA050223-2

Conc: Units	Day	Temperature (C)		Dissolved Oxygen (mg/L)		pH		Cond. (umhos)	Alkalinity (mg/L CaCO ₃)	Hardness (mg/L CaCO ₃)	Food	Init.
		Before	After	Before	After	Before	After					
25	0		25		7.98		8.13	303			✓	Bd
	1	25	25	7.84	8.63	8.22	8.16	298			✓	Bd
	2	25	25	7.61	7.78	8.37	8.15	311			✓	Bd
	3	25	25	7.98	7.93	8.41	8.19	315			✓	Bd
	4	25	25	8.12	8.34	8.42	8.27	332			✓	MH
	5	25	25	7.91	8.00	8.38	8.21	345			✓	VF
	6	25		7.83		8.39						Ad
	7											
50	0		25		7.91		8.18	288			✓	Bd
	1	25	25	8.11	8.65	8.26	8.17	293			✓	Bd
	2	25	25	7.70	7.88	8.41	8.18	304			✓	Bd
	3	25	25	8.01	8.08	8.42	8.20	307			✓	Bd
	4	25	25	8.08	8.56	8.44	8.29	341			✓	MH
	5	25	25	7.88	8.10	8.45	8.22	339			✓	VF
	6	25		7.84		8.42						Ad
	7											
100	0		25		7.94		8.21	268	100	124	✓	Bd
	1	25	25	8.16	8.76	8.39	8.19	283	112	134	✓	Bd
	2	25	25	7.75	7.98	8.51	8.19	296			✓	Bd
	3	25	25	8.06	8.43	8.47	8.18	291			✓	Bd
	4	25	25	8.20	8.56	8.56	8.28	362	140	172	✓	MH
	5	25	25	7.84	8.20	8.58	8.23	353			✓	VF
	6	25		8.02		8.51						Ad
	7											

CETIS Analytical Report

Report Date: 23 May-23 12:55 (p 1 of 2)
Test Code/ID: WVA050223-2 / 06-1394-9931

Ceriodaphnia 7-d Survival and Reproduction Test

Biological Monitoring, Inc.

Analysis ID: 20-4103-7310	Endpoint: 6d Survival Rate	CETIS Version: CETISv1.9.4
Analyzed: 23 May-23 12:49	Analysis: STP 2xK Contingency Tables	Status Level: 1
Batch ID: 12-4464-9664	Test Type: Reproduction-Survival (7d)	Analyst: Lab Tech
Start Date: 02 May-23 13:00	Protocol: EPA/821/R-02-013 (2002)	Diluent: Mod-Hard Synthetic Water
Ending Date: 08 May-23 12:30	Species: Ceriodaphnia dubia	Brine:
Test Length: 6d	Taxon: Branchiopoda	Source: In-House Culture Age: 24
Sample ID: 06-8167-1511	Code: WVA050223-1	Project: Special Studies
Sample Date: 01 May-23 09:30	Material: Riverine Monitoring Sample	Source: 4AROA198.08 (4AROA198.0)
Receipt Date: 02 May-23 09:00	CAS (PC):	Station: Explore Park
Sample Age: 27h	Client: Western Va Water Authority	

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU
Untransformed	C > T	100	>100	n/a	1

Fisher Exact/Bonferroni-Holm Test

Control	vs	Group	Test Stat	P-Type	P-Value	Decision(α:5%)
Dilution Water		6.25	1.0000	Exact	1.0000	Non-Significant Effect
		12.5	1.0000	Exact	1.0000	Non-Significant Effect
		25	0.7632	Exact	1.0000	Non-Significant Effect
		50	0.7632	Exact	1.0000	Non-Significant Effect
		100	0.7632	Exact	1.0000	Non-Significant Effect

Data Summary

Conc-%	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
0	D	9	1	10	0.9	0.1	0.0%
6.25		10	0	10	1	0	-11.11%
12.5		10	0	10	1	0	-11.11%
25		9	1	10	0.9	0.1	0.0%
50		9	1	10	0.9	0.1	0.0%
100		9	1	10	0.9	0.1	0.0%

6d Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	D	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000
6.25		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
12.5		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
25		1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
50		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

6d Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	D	1/1	1/1	1/1	1/1	0/1	1/1	1/1	1/1	1/1	1/1
6.25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
12.5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
25		1/1	0/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
50		1/1	1/1	1/1	1/1	1/1	1/1	0/1	1/1	1/1	1/1
100		1/1	1/1	0/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1

CETIS Analytical Report

Report Date: 23 May-23 12:55 (p 2 of 2)

Test Code/ID: WVA050223-2 / 06-1394-9931

Ceriodaphnia 7-d Survival and Reproduction Test

Biological Monitoring, Inc.

Analysis ID: 20-4103-7310

Endpoint: 6d Survival Rate

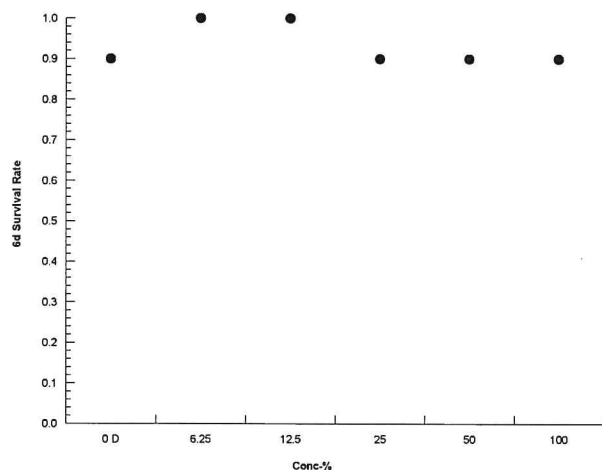
CETIS Version: CETISv1.9.4

Analyzed: 23 May-23 12:49

Analysis: STP 2xK Contingency Tables

Status Level: 1

Graphics



CETIS Analytical Report

Report Date: 23 May-23 12:55 (p 1 of 2)
Test Code/ID: WVA050223-2 / 06-1394-9931

Ceriodaphnia 7-d Survival and Reproduction Test					Biological Monitoring, Inc.	
Analysis ID:	20-2844-1693	Endpoint:	Reproduction	CETIS Version:	CETISv1.9.4	
Analyzed:	23 May-23 12:55	Analysis:	Nonparametric-Multiple Comparison	Status Level:	1	
Batch ID:	12-4464-9664	Test Type:	Reproduction-Survival (7d)	Analyst:	Lab Tech	
Start Date:	02 May-23 13:00	Protocol:	EPA/821/R-02-013 (2002)	Diluent:	Mod-Hard Synthetic Water	
Ending Date:	08 May-23 12:30	Species:	Ceriodaphnia dubia	Brine:		
Test Length:	6d	Taxon:	Branchiopoda	Source:	In-House Culture	
					Age: 24	
Sample ID:	06-8167-1511	Code:	WVA050223-1	Project:	Special Studies	
Sample Date:	01 May-23 09:30	Material:	Riverine Monitoring Sample	Source:	4AROA198.08 (4AROA198.0)	
Receipt Date:	02 May-23 09:00	CAS (PC):		Station:	Explore Park	
Sample Age:	27h	Client:	Western Va Water Authority			

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	C > T	100	>100	n/a	1	26.36%

Wilcoxon/Bonferroni Adj Test

Control	vs	Conc-%	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Dilution Water		6.25	106	n/a	5	18	Exact	1.0000	Non-Significant Effect
		12.5	104.5	n/a	3	18	Exact	1.0000	Non-Significant Effect
		25	77.5	n/a	1	18	Exact	0.0915	Non-Significant Effect
		50	77	n/a	2	18	Exact	0.0812	Non-Significant Effect
		100	74.5	n/a	4	17	Exact	0.5442	Non-Significant Effect

Test Acceptability Criteria

		TAC Limits					
Attribute	Test Stat	Lower	Upper	Overlap	Decision		
Control Resp	31.5	15	>>	Yes	Passes Criteria		

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	504.514	100.903	5	1.778	0.1333	Non-Significant Effect
Error	3007.66	56.7482	53			
Total	3512.17		58			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	3.974	15.09	0.5531	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9075	0.9451	2.8E-04	Non-Normal Distribution

Reproduction Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	10	31.5	27.62	35.38	31	22	41	1.714	17.21%	0.00%
6.25		10	30.6	24.82	36.38	32	13	39	2.557	26.42%	2.86%
12.5		10	30.8	26.06	35.54	31.5	16	39	2.097	21.53%	2.22%
25		10	24.8	18.61	30.99	26	4	35	2.736	34.88%	21.27%
50		10	25	20.6	29.4	25.5	14	32	1.944	24.59%	20.63%
100		9	25.78	18.36	33.2	27	3	35	3.218	37.45%	18.17%

Reproduction Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	D	34	31	31	33	22	29	27	38	29	41
6.25		39	33	27	38	38	35	23	29	31	13
12.5		16	29	38	33	39	33	35	29	30	26
25		26	4	28	35	26	33	25	18	28	25
50		26	31	21	29	31	24	14	17	25	32
100		32	22	3	26	27	33	31	23	35	

CETIS Analytical Report

Report Date: 23 May-23 12:55 (p 2 of 2)
Test Code/ID: WVA050223-2 / 06-1394-9931

Ceriodaphnia 7-d Survival and Reproduction Test

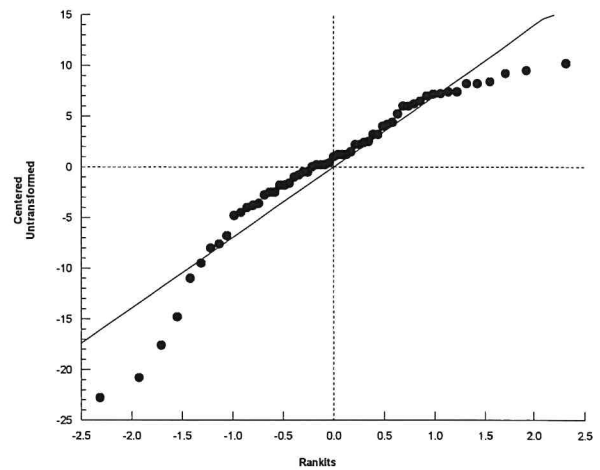
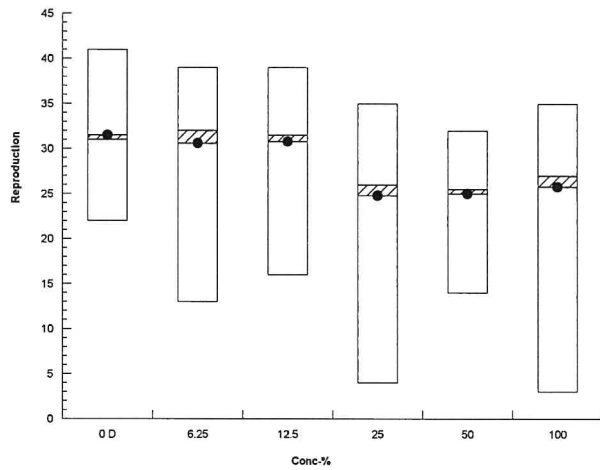
Biological Monitoring, Inc.

Analysis ID: 20-2844-1693
Analyzed: 23 May-23 12:55

Endpoint: Reproduction
Analysis: Nonparametric-Multiple Comparison

CETIS Version: CETISv1.9.4
Status Level: 1

Graphics



CETIS Analytical Report

Report Date: 23 May-23 12:55 (p 1 of 2)

Test Code/ID: WVA050223-2 / 06-1394-9931

Ceriodaphnia 7-d Survival and Reproduction Test

Biological Monitoring, Inc.

Analysis ID: 13-8135-4129	Endpoint: Reproduction	CETIS Version: CETISv1.9.4
Analyzed: 23 May-23 12:55	Analysis: Linear Interpolation (ICPIN)	Status Level: 1
Batch ID: 12-4464-9664	Test Type: Reproduction-Survival (7d)	Analyst: Lab Tech
Start Date: 02 May-23 13:00	Protocol: EPA/821/R-02-013 (2002)	Diluent: Mod-Hard Synthetic Water
Ending Date: 08 May-23 12:30	Species: Ceriodaphnia dubia	Brine:
Test Length: 6d	Taxon: Branchiopoda	Source: In-House Culture Age: 24
Sample ID: 06-8167-1511	Code: WVA050223-1	Project: Special Studies
Sample Date: 01 May-23 09:30	Material: Riverine Monitoring Sample	Source: 4AROA198.08 (4AROA198.0)
Receipt Date: 02 May-23 09:00	CAS (PC):	Station: Explore Park
Sample Age: 27h	Client: Western Va Water Authority	

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	2082340	1000	Yes	Two-Point Interpolation

Test Acceptability Criteria

Attribute	Test Stat	TAC Limits		Overlap	Decision
		Lower	Upper		
Control Resp	31.5	15	>>	Yes	Passes Criteria

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	14.26	1.938	20.82	7.013	4.804	51.61
IC10	17.83	3.875	43.15	5.607	2.318	25.81
IC15	21.41	5.812	n/a	4.671	n/a	17.2
IC20	24.98	15.95	n/a	4.003	n/a	6.271
IC25	>100	n/a	n/a	<1	n/a	n/a
IC40	>100	n/a	n/a	<1	n/a	n/a
IC50	>100	n/a	n/a	<1	n/a	n/a

Reproduction Summary

Conc-%	Code	Count	Calculated Variate						Isotonic Variate	
			Mean	Min	Max	Std Dev	CV%	%Effect	Mean	%Effect
0	D	10	31.5	22	41	5.421	17.21%	0.0%	31.5	0.0%
6.25		10	30.6	13	39	8.086	26.42%	2.86%	30.7	2.54%
12.5		10	30.8	16	39	6.63	21.53%	2.22%	30.7	2.54%
25		10	24.8	4	35	8.651	34.88%	21.27%	25.19	20.02%
50		10	25	14	32	6.146	24.59%	20.63%	25.19	20.02%
100		9	25.78	3	35	9.654	37.45%	18.17%	25.19	20.02%

Reproduction Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	D	34	31	31	33	22	29	27	38	29	41
6.25		39	33	27	38	38	35	23	29	31	13
12.5		16	29	38	33	39	33	35	29	30	26
25		26	4	28	35	26	33	25	18	28	25
50		26	31	21	29	31	24	14	17	25	32
100		32	22	3	26	27	33	31	23	35	

CETIS Analytical Report

Report Date: 23 May-23 12:55 (p 2 of 2)
Test Code/ID: WVA050223-2 / 06-1394-9931

Ceriodaphnia 7-d Survival and Reproduction Test

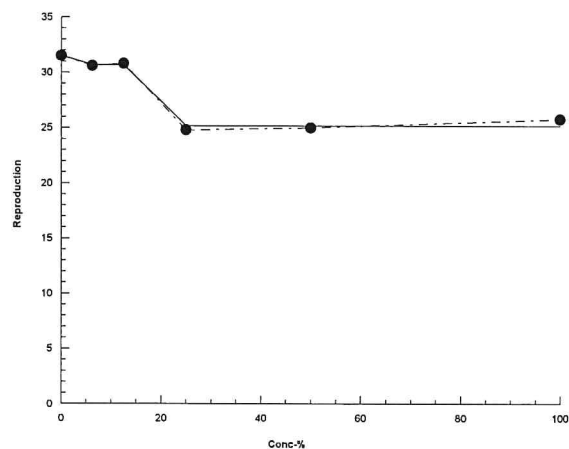
Biological Monitoring, Inc.

Analysis ID: 13-8135-4129
Analyzed: 23 May-23 12:55

Endpoint: Reproduction
Analysis: Linear Interpolation (ICPIN)

CETIS Version: CETISv1.9.4
Status Level: 1

Graphics





NELAC ACCREDITED LAB # 460015

Sample Collection – Chain of Custody FormLab Sample ID
(Lab Use Only)

W V A O S O 2 2 3 - 1

General InformationClient WVWA Contact Name/Phone # (540) 266-2835NPDES Permit # HAROA198.08 Outfall Name/# Explore ParkSample Chlorinated? _____ Dechlorinated? _____
Should BMI Dechlorinate Sample? _____**Sampling Information**Grab Sample _____ Date 5/1/23 Time 0930 Volume 3 gal

Composite Sample Type _____ Time _____ Flow _____

Composite Start Date _____ Composite Start Time _____

Composite End Date _____ Composite End Time _____

Sub-samples _____ Frequency _____ Volume _____

Field Measurements

Temp at Collection Point	Temp In Collection Device	pH	Chlorine	Date/Time	Initials

Custody Information

Relinquished By	Date	Time	Received By	Date	Time
<u>Daniel Beckman</u>	<u>5.1.23</u>	<u>1100</u>	<u>WVWA</u>	<u>5/1/23</u>	<u>1100</u>

Daniel Beckman / WVWA

Printed Name/Affiliation

Daniel Beckman

Signature

5.1.23

Date

Sample Check In (Lab Use Only)Temperature 2.4 pH 8.11 Chlorine 40.02 DO 9.02 Conductivity/Salinity 274On Ice? ☒ Custody Seal? N/A Alkalinity 100 Hardness 124Visual Description clear Odor noneAmmonia (NH₃-N) 0.00 Initials VF Date/Time 05-02-23/0900



NELAC ACCREDITED LAB # 460015

Sample Collection – Chain of Custody FormLab Sample ID
(Lab Use Only)

W	V	A	0	5	0	23	2	3	-	1
---	---	---	---	---	---	----	---	---	---	---

General InformationClient WVWA Contact Name/Phone # (540)266-2835NPDES Permit # 4AR0A198.08 Outfall Name/# Explofe ParkSample Chlorinated? _____ Dechlorinated? _____
Should BMI Dechlorinate Sample? _____**Sampling Information**Grab Sample _____ Date 5-2-23 Time 0935 Volume 3gal

Composite Sample Type _____ Time _____ Flow _____

Composite Start Date _____ Composite Start Time _____

Composite End Date _____ Composite End Time _____

Sub-samples _____ Frequency _____ Volume _____

Field Measurements

Temp at Collection Point	Temp In Collection Device	pH	Chlorine	Date/Time	Initials

Custody Information

Relinquished By	Date	Time	Received By	Date	Time
<u>Eric Pank</u>	<u>5/2/23</u>	<u>1100</u>	<u>WVWA (Bef)</u>	<u>5/2/23</u>	<u>1100</u>

Eric Pank

Printed Name/Affiliation

Eric Pank

Signature

5/2/23

Date

Sample Check In (Lab Use Only)Temperature 3.1 pH 8.20 Chlorine 0.02 DO 8.70 Conductivity/Salinity 292On Ice? ✓ Custody Seal? N/A Alkalinity 112 Hardness 134Visual Description Slight yellow tint Odor noneAmmonia (NH₃-N) 0.00 Initials Bef Date/Time 05/03/23 0900

BMI BIOLOGICAL MONITORING, INC.

1800 KRAFT DRIVE SUITE 104 BLACKSBURG VIRGINIA 24060
PH: 540-953-2821 FAX: 540-951-1481 WWW.BIOMON.COM



NELAC ACCREDITED LAB # 460015

Sample Collection – Chain of Custody Form

Lab Sample ID
(Lab Use Only)

W V A O S O 6 2 3 - i

General Information

Client WVWA Contact Name/Phone # (540) 266-2835

NPDES Permit # 4AR0A198.08 Outfall Name/# Explore Park

Sample Chlorinated? _____ Dechlorinated? _____
Should BMI Dechlorinate Sample? _____

Sampling Information



Grab Sample _____ Date 5-5-23 Time 1020 Volume 5 gal



Composite Sample Type _____ Time _____ Flow _____

Composite Start Date _____ Composite Start Time _____

Composite End Date _____ Composite End Time _____

Sub-samples _____ Frequency _____ Volume _____

Field Measurements

Temp at Collection Point	Temp In Collection Device	pH	Chlorine	Date/Time	Initials

Custody Information

Relinquished By	Date	Time	Received By	Date	Time
<u>Eric Powers</u>	<u>5/5/23</u>		<u>Wendy Bege</u>	<u>5/5/23</u>	<u>1205</u>

Eric Powers

Printed Name/Affiliation

Eric Powers

Signature

5/5/23

Date

Sample Check In (Lab Use Only)

Temperature 2.5 pH 8.10 Chlorine 0.02 DO 8.98 Conductivity/Salinity 349

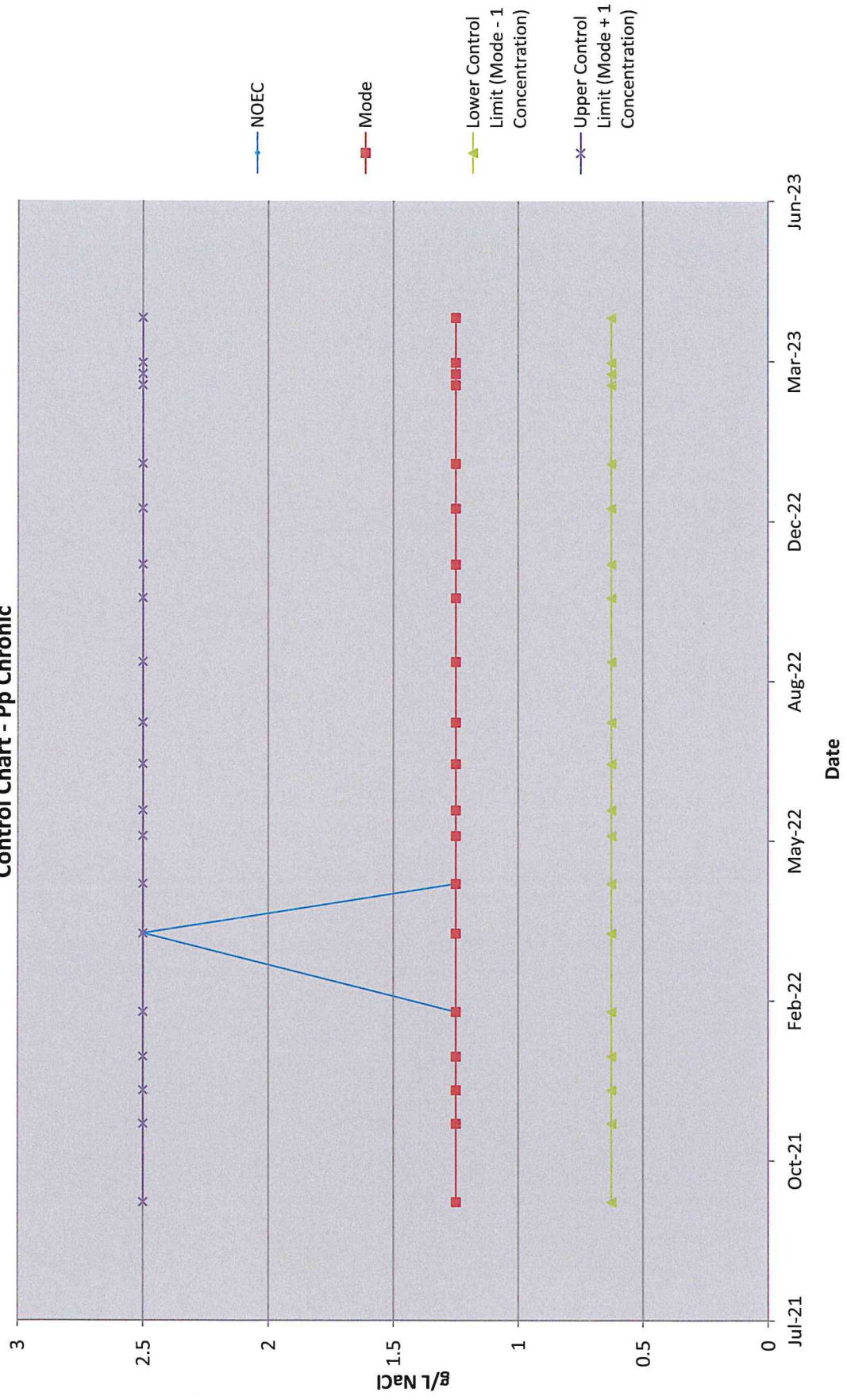
On Ice? ✓ Custody Seal? N/A Alkalinity 140 Hardness 172

Visual Description clear Odor none

Ammonia (NH₃-N) 0.19 Initials VF Date/Time 5-6-23/0930

Biological Monitoring, Inc.

Control Chart - Pp Chronic



Biological Monitoring, Inc.

Control Chart - Cd Chronic

