



ANALYTICAL REPORT

PREPARED FOR

Attn: Brandi Andrews
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1004 N. Freya Street
Spokane, Washington 99202

Generated 4/10/2025 5:57:27 PM

JOB DESCRIPTION

Spokane County Water Q1 and Q3

JOB NUMBER

192-20305-1

Eurofins Arkansas

1

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Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing South Central, LLC Project Manager.

Authorization



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Authorized for release by
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Re: Acute Biomonitoring utilizing *Pimephales promelas* (Fathead minnow)
Sample ID: Manhole - Outfall
Job number: 192-20305
Permit No.: WA0093317

This report is the analytical results and supporting information for the samples submitted to Eurofins Arkansas. The following results are applicable only to the sample identified by the control number referenced above. Accurate assessment of the data requires access to the entire document. Each section of the report has been reviewed and approved by the Lab Manager or qualified designee.

Testing procedure and Quality Assurance were in accordance with "Methods for measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms" EPA-821-R-02-012, Fifth Edition, October 2002.

Test results are summarized below:

Acute *Pimephales promelas* (Fathead minnow) Survival test.
The permit requirement is NOEC not less than 6.4%.
The following were concluded from the test:

Survival:	NOEC	LOEC	LC50
	100	>100	>100

The sample therefore PASSED the Fathead minnow test.

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Pimephales promelas

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I. Introduction and Summary

96-hour renewal definitive toxicity test using *Pimephales promelas* was performed.

The *Pimephales promelas* test was conducted from April 01, 2025 at 1104 to April 05, 2025 at 1018.

The test was performed in accordance with EPA-821-R-02-012. Statistical analyses were performed on the observed data.

The test was conducted in temperature and light cycle controlled environmental chamber. The test temperature was 25 degrees C +/- 1 degree for the *Pimephales promelas*.

II. Control Acceptance Criteria

ORGANISM	CRITERIA	RESULTS	PASS/FAIL
<i>Pimephales promelas</i>	Control Survival > or = 90%	100	Pass
<i>Pimephales promelas</i>	Control Dilution CV <= 40	0.00	Pass
<i>Pimephales promelas</i>	Critical Dilution CV < or = 40 *	6.08	Pass

*EPA Region 6 Requirement consult permit

III. Outlined Report

A. Introduction

- Permit Number: WA0093317
- Test Requirements: 96-hour renewal definitive toxicity test using:
Pimephales promelas

B. Effluent Samples:

- Sampling Point: Manhole - Outfall
- Chemical Data:

Analysis	Sample 1
Dissolved oxygen (mg/l)	9.92
pH (standard units)	7.47
Alkalinity (mg/l as CaCO3)	120
Hardness (mg/l as CaCO3)	270
Conductivity (umhos/cm)	865
Residual Chlorine (mg/l)	<0.05
Ammonia as N (mg/l)	0.62

C. Dilution Water Samples: Synthetic Moderately Hard Chemical Data:

Analysis	192-20163-A-3
Dissolved oxygen (mg/l)	8.69
pH (standard units)	6.64
Alkalinity (mg/l as CaCO3)	63
Hardness (mg/l as CaCO3)	88
Conductivity (umhos/cm)	306
Residual Chlorine (mg/l)	<0.05
Ammonia as N (mg/l)	NA

D. Test Methods

Methods for measuring the Acute Toxicity of Effluents to Freshwater and Marine Organisms, (Fifth Ed.), EPA-821-R-02-012, 96-hour acute definitive test.

Endpoints:

Death; the criteria employed to establish death are:

No movement

No reaction to gentle prodding

Criteria	Pimephales promelas
Type and Volume of Test Chamber	500 ml disposable beaker
Volume of Sample	250 ml
Organism per chamber	10
Replicates per dilution	4
Test Temperature	25 deg. C
Test Initiated	April 01, 2025 at 1104
Test Terminated	April 05, 2025 at 1018
Feeding	At 48-hour
Age of Test Organisms	6 days

E. Test Organisms

Pimephales promelas

F. Quality Assurance - Toxicity Tests

Reference Toxicant: Sodium Chloride

Date of test:

Pimephales promelas: 24-Feb-25 (192-18837)

Synthetic moderately hard dilution water used

Organism	LC50	Warning Limits
Pimephales promelas	7.63	6.52 - 9.18

G. Organism History

Pimephales promelas (Fathead minnow)

Date: 1-Apr-25

Age: 6 days

Source: In-house culture

IV. Results Summary

Pimephales promelas are exposed in a static non-renewal system to different concentrations of effluent and dilution water. Effluent dilutions for this test were 6.4, 12.5, 25, 50 and 100%. The low-flow concentration was 6.4%. Test results are based on survival.

Pimephales promelas

The *Pimephales promelas* test was conducted from April 01, 2025 at 1104 to April 05, 2025 at 1018.

Concentration	24 hour % Survival	48 hour % Survival	72 hour % Survival	96 hour % Survival
Control	100	100	100	100
6.4%	100	100	95	95
12.5%	100	100	100	100
25%	97.5	97.5	97.5	97.5
50%	100	100	100	100
100%	100	100	100	100

Pimephales promelas
Survival Data

Number of organisms per chamber: 10
Volume of test chamber: 500 ml

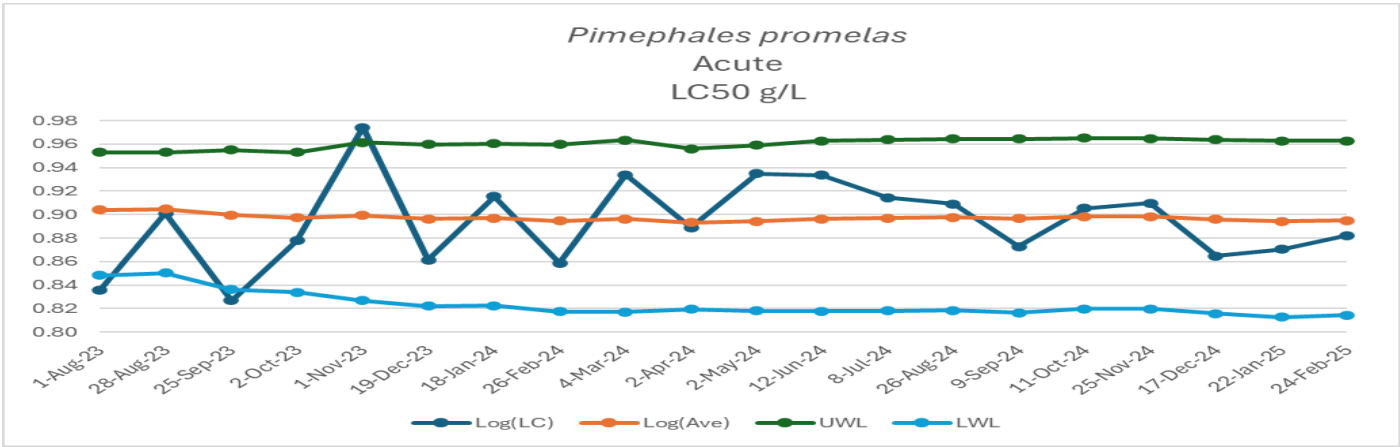
Age of organisms: 6 days
Volume of test solution: 250 ml

fluent Concentration		Number of survivors				% Survival	CV %
		24 hours	48 hours	72 hours	96 hours		
Control	rep. A	10	10	10	10	100	0.00
	rep. B	10	10	10	10		
	rep. C	10	10	10	10		
	rep. D	10	10	10	10		
6.4%	rep. A	10	10	10	10	95.0	6.08
	rep. B	10	10	10	10		
	rep. C	10	10	9	9		
	rep. D	10	10	9	9		
12.5%	rep. A	10	10	10	10	100	0.00
	rep. B	10	10	10	10		
	rep. C	10	10	10	10		
	rep. D	10	10	10	10		
25%	rep. A	9	9	9	9	97.5	5.13
	rep. B	10	10	10	10		
	rep. C	10	10	10	10		
	rep. D	10	10	10	10		
50%	rep. A	10	10	10	10	100	0.00
	rep. B	10	10	10	10		
	rep. C	10	10	10	10		
	rep. D	10	10	10	10		
100%	rep. A	10	10	10	10	100	0.00
	rep. B	10	10	10	10		
	rep. C	10	10	10	10		
	rep. D	10	10	10	10		

CV = Coefficient of variance = standard deviation X 100/mean

Appendix (Reference Toxicant)

Acute Reference Toxicant, *Pimephales promelas* (Fathead minnow)



Appendix (Water Chemistry)
Chemical Data for
Pimephales promelas

Day 1		Control	6.4	12.5	25	50	100
DO, mg/l	Initial	8.69	8.89	8.85	8.85	9.04	9.92
	Final 1	8.35	8.36	8.34	8.39	8.3	8.32
pH, su	Initial	6.64	7.28	7.46	7.51	7.53	7.47
	Final 1	7.75	7.74	7.76	6.83	7.93	8.07
Conductivity, umho/cm		306.00	341	374	445	584	865
Alkalinity, mg/l		63.00					120
Hardness, mg/l		88.00					270
Ammonia, mg/l		NA					0.62
Residual Chlorine, mg/l		<0.05					<0.05

Day 2		Control	6.4	12.5	25	50	100
DO, mg/l	Final 1	8.30	8.42	8.43	8.39	8.35	8.35
	Final 1	7.68	7.68	7.75	7.81	7.95	8.11

Day 3		Control	6.4	12.5	25	50	100
DO, mg/l	Initial	8.7	8.66	8.62	8.88	8.77	9.42
	Final 1	7.95	8.09	8.14	8.08	8.01	8.09
pH, su	Initial	7.4	7.36	7.38	7.36	7.42	7.34
	Final 1	7.17	7.36	7.5	7.68	7.83	7.99

Day 4		Control	6.4	12.5	25	50	100
DO, mg/l	Final 1	8.18	8.26	8.19	8.15	8.12	8.16
	Final 1	6.94	7.38	7.61	7.75	7.88	8.07

Analysts: YHC4, E5VU, B6YF, V6YL, GCX6, CT4D, HQN3

CETIS Summary Report

Report Date: 09 Apr-25 09:22 (p 1 of 1)
Test Code/ID: 20305_FH96R / 10-0974-8957

Fathead Minnow 96-h Acute Survival Test

Eurofins Arkansas

Batch ID:	18-3805-2093	Test Type:	Survival (96h)	Analyst:	
Start Date:	01 Apr-25 11:04	Protocol:	EPA/821/R-02-012 (2002)	Diluent:	Mod-Hard Synthetic Water
Ending Date:	05 Apr-25 10:18	Species:	Pimephales promelas	Brine:	
Test Length:	95h	Taxon:	Actinopterygii	Source:	In-House Culture
				Age:	6D

Sample ID:	04-1948-8083	Code:	20305	Project:	
Sample Date:	31 Mar-25 09:06	Material:	POTW Effluent	Source:	Jacobs Spokane County (WA0093317
Receipt Date:	01 Apr-25 08:55	CAS (PC):		Station:	BIO25033106
Sample Age:	26h	Client:			

Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	NOEL	LOEL	TOEL	PMSD	TU
20-8426-8372	96h Survival Rate	Steel Many-One Rank Sum Test	100	>100	---	5.9%	1

Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	Level	%	95% LCL	95% UCL	TU
07-1267-9433	96h Survival Rate	Linear Interpolation (ICPIN)	LC50	>100	---	---	<1

Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits		Overlap	Decision
				Lower	Upper		
07-1267-9433	96h Survival Rate	Control Resp	1	0.9	>>	Yes	Passes Criteria
20-8426-8372	96h Survival Rate	Control Resp	1	0.9	>>	Yes	Passes Criteria

96h Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	D	4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
6.4		4	0.9500	0.8581	1.0000	0.9000	1.0000	0.0289	0.0577	6.08%	5.00%
12.5		4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
25		4	0.9750	0.8954	1.0000	0.9000	1.0000	0.0250	0.0500	5.13%	2.50%
50		4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
100		4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%

96h Survival Rate Detail

MD5: 7720B8B75EF3522723EB1676C175C42A

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	1.0000	1.0000	1.0000	1.0000
6.4		1.0000	1.0000	0.9000	0.9000
12.5		1.0000	1.0000	1.0000	1.0000
25		0.9000	1.0000	1.0000	1.0000
50		1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000	1.0000

96h Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	10/10	10/10	10/10	10/10
6.4		10/10	10/10	9/10	9/10
12.5		10/10	10/10	10/10	10/10
25		9/10	10/10	10/10	10/10
50		10/10	10/10	10/10	10/10
100		10/10	10/10	10/10	10/10

CETIS Analytical Report

Report Date: 09 Apr-25 09:22 (p 1 of 2)
 Test Code/ID: 20305_FH96R / 10-0974-8957

Fathead Minnow 96-h Acute Survival Test

Eurofins Arkansas

Analysis ID: 20-8426-8372	Endpoint: 96h Survival Rate	CETIS Version: CETIS v2.1.6
Analyzed: 09 Apr-25 9:21	Analysis: Nonparametric-Control vs Treatments	Status Level: 1
Edit Date: 09 Apr-25 0:00	MD5 Hash: 7720B8B75EF3522723EB1676C175C42A	Editor ID: 005-847-680-2
Batch ID: 18-3805-2093	Test Type: Survival (96h)	Analyst:
Start Date: 01 Apr-25 11:04	Protocol: EPA/821/R-02-012 (2002)	Diluent: Mod-Hard Synthetic Water
Ending Date: 05 Apr-25 10:18	Species: Pimephales promelas	Brine:
Test Length: 95h	Taxon: Actinopterygii	Source: In-House Culture Age: 6D
Sample ID: 04-1948-8083	Code: 20305	Project:
Sample Date: 31 Mar-25 09:06	Material: POTW Effluent	Source: Jacobs Spokane County (WA0093317)
Receipt Date: 01 Apr-25 08:55	CAS (PC):	Station: BIO25033106
Sample Age: 26h	Client:	

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	Tox Units	MSDu	PMSD
Angular (Corrected)	C > T	100	>100	---	1	0.05896	5.90%

Steel Many-One Rank Sum Test

Control	vs	Conc-%	df	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)
Dilution Water		6.4	6	14	10	1	CDF	0.3451	Non-Significant Effect
		12.5	6	18	10	1	CDF	0.8333	Non-Significant Effect
		25	6	16	10	1	CDF	0.6105	Non-Significant Effect
		50	6	18	10	1	CDF	0.8333	Non-Significant Effect
		100	6	18	10	1	CDF	0.8333	Non-Significant Effect

Test Acceptability Criteria

Attribute	Test Stat	TAC Limits		Overlap	Decision
		Lower	Upper		
Control Resp	1	0.9	>>	Yes	Passes Criteria

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0232394	0.0046479	5	1.8	0.1637	Non-Significant Effect
Error	0.0464788	0.0025822	18			
Total	0.0697182		23			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Bartlett Equality of Variance Test				Indeterminate
Distribution	Shapiro-Wilk W Normality Test	0.7721	0.884	0.0001	Non-Normal Distribution

96h 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%
6.4		4	0.9500	0.8581	1.0000	0.9500	0.9000	1.0000	0.0289	6.08%	5.00%
12.5		4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
25		4	0.9750	0.8954	1.0000	1.0000	0.9000	1.0000	0.0250	5.13%	2.50%
50		4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
100		4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%

Angular (Corrected) Transformed Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	4	1.4120	1.4120	1.4120	1.4120	1.4120	1.4120	0.0000	0.00%	0.00%
6.4		4	1.3310	1.1810	1.4800	1.3310	1.2490	1.4120	0.0471	7.07%	5.77%
12.5		4	1.4120	1.4120	1.4120	1.4120	1.4120	1.4120	0.0000	0.00%	0.00%
25		4	1.3710	1.2420	1.5010	1.4120	1.2490	1.4120	0.0407	5.94%	2.89%
50		4	1.4120	1.4120	1.4120	1.4120	1.4120	1.4120	0.0000	0.00%	0.00%
100		4	1.4120	1.4120	1.4120	1.4120	1.4120	1.4120	0.0000	0.00%	0.00%

CETIS Analytical Report

Report Date: 09 Apr-25 09:22 (p 2 of 2)
Test Code/ID: 20305_FH96R / 10-0974-8957

Fathead Minnow 96-h Acute Survival Test

Eurofins Arkansas

Analysis ID: 20-8426-8372 Endpoint: 96h Survival Rate CETIS Version: CETIS v2.1.6
Analyzed: 09 Apr-25 9:21 Analysis: Nonparametric-Control vs Treatments Status Level: 1
Edit Date: 09 Apr-25 0:00 MD5 Hash: 7720B8B75EF3522723EB1676C175C42A Editor ID: 005-847-680-2

96h Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	1.0000	1.0000	1.0000	1.0000
6.4		1.0000	1.0000	0.9000	0.9000
12.5		1.0000	1.0000	1.0000	1.0000
25		0.9000	1.0000	1.0000	1.0000
50		1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000	1.0000

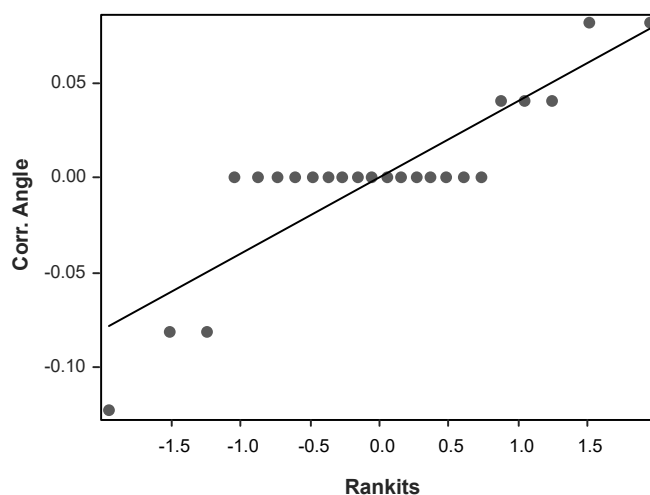
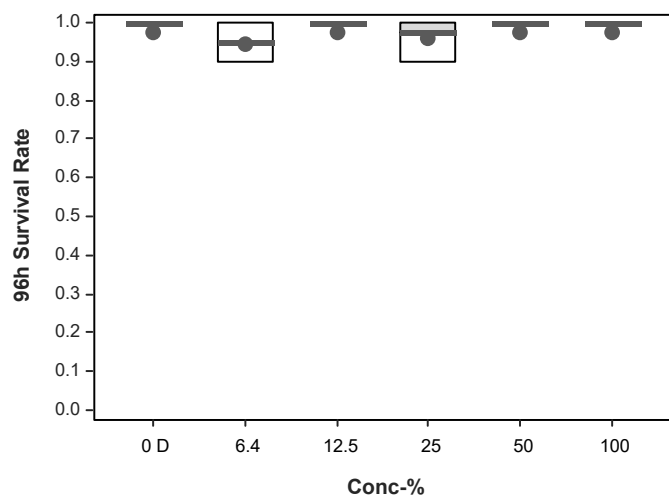
Angular (Corrected) Transformed Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	1.4120	1.4120	1.4120	1.4120
6.4		1.4120	1.4120	1.2490	1.2490
12.5		1.4120	1.4120	1.4120	1.4120
25		1.2490	1.4120	1.4120	1.4120
50		1.4120	1.4120	1.4120	1.4120
100		1.4120	1.4120	1.4120	1.4120

96h Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	10/10	10/10	10/10	10/10
6.4		10/10	10/10	9/10	9/10
12.5		10/10	10/10	10/10	10/10
25		9/10	10/10	10/10	10/10
50		10/10	10/10	10/10	10/10
100		10/10	10/10	10/10	10/10

Graphics



CETIS Analytical Report

Report Date: 09 Apr-25 09:22 (p 1 of 2)
 Test Code/ID: 20305_FH96R / 10-0974-8957

Fathead Minnow 96-h Acute Survival Test

Eurofins Arkansas

Analysis ID: 07-1267-9433	Endpoint: 96h Survival Rate	CETIS Version: CETIS v2.1.6
Analyzed: 09 Apr-25 9:21	Analysis: Linear Interpolation (ICPIN)	Status Level: 1
Edit Date: 09 Apr-25 0:00	MD5 Hash: 7720B8B75EF3522723EB1676C175C42A	Editor ID: 005-847-680-2
Batch ID: 18-3805-2093	Test Type: Survival (96h)	Analyst:
Start Date: 01 Apr-25 11:04	Protocol: EPA/821/R-02-012 (2002)	Diluent: Mod-Hard Synthetic Water
Ending Date: 05 Apr-25 10:18	Species: Pimephales promelas	Brine:
Test Length: 95h	Taxon: Actinopterygii	Source: In-House Culture Age: 6D
Sample ID: 04-1948-8083	Code: 20305	Project:
Sample Date: 31 Mar-25 09:06	Material: POTW Effluent	Source: Jacobs Spokane County (WA0093317)
Receipt Date: 01 Apr-25 08:55	CAS (PC):	Station: BIO25033106
Sample Age: 26h	Client:	

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	1111019	1000	Yes	Two-Point Interpolation

Test Acceptability Criteria

TAC Limits

Attribute	Test Stat	Lower	Upper	Overlap	Decision
Control Resp	1	0.9	>>	Yes	Passes Criteria

Point Estimates

Level	%	95% LCL	95% UCL	Tox Units	95% LCL	95% UCL
LC50	>100	---	---	<1	---	---

96h Survival Rate Summary

Calculated Variate(A/B)

Isotonic Variate

Conc.-%	Code	Count	Mean	Median	Min	Max	CV%	%Effect	ΣA/ΣB	Mean	%Effect
0	D	4	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	40/40	1.0000	0.00%
6.4		4	0.9500	0.9500	0.9000	1.0000	6.08%	5.00%	38/40	0.9850	1.50%
12.5		4	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	40/40	0.9850	1.50%
25		4	0.9750	1.0000	0.9000	1.0000	5.13%	2.50%	39/40	0.9850	1.50%
50		4	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	40/40	0.9850	1.50%
100		4	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	40/40	0.9850	1.50%

96h Survival Rate Detail

Conc.-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	1.0000	1.0000	1.0000	1.0000
6.4		1.0000	1.0000	0.9000	0.9000
12.5		1.0000	1.0000	1.0000	1.0000
25		0.9000	1.0000	1.0000	1.0000
50		1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000	1.0000

96h Survival Rate Binomials

Conc.-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	10/10	10/10	10/10	10/10
6.4		10/10	10/10	9/10	9/10
12.5		10/10	10/10	10/10	10/10
25		9/10	10/10	10/10	10/10
50		10/10	10/10	10/10	10/10
100		10/10	10/10	10/10	10/10

CETIS Analytical Report

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Eurofins Arkansas

Analysis ID:	07-1267-9433	Endpoint:	96h Survival Rate	CETIS Version:	CETIS v2.1.6
Analyzed:	09 Apr-25 9:21	Analysis:	Linear Interpolation (ICPIN)	Status Level:	1
Edit Date:	09 Apr-25 0:00	MD5 Hash:	7720B8B75EF3522723EB1676C175C42A	Editor ID:	005-847-680-2

Graphics

