

July 2, 2025

Jared Buck Linkan Engineering 400 Corporate Circle Suite H Golden, CO 80401

Dear Jared:

Enclosed is the report for chronic biomonitoring tests performed for Linkan Engineering on effluent from the Schwartzwalder Mine 001A outfall. There was no statistically significant toxicity to either test species at any effluent concentration. The effluent passes WET (Whole Effluent Toxicity) testing requirements for this sampling period.

If you have any questions or concerns, please do not hesitate to contact me at (303) 661-9324.

Best regards,

7 fm

Ethan White Aquatic Toxicologist II

REPORT OF CHRONIC BIOMONITORING TESTS CONDUCTED FOR LINKAN ENGINEERING ON EFFLUENT FROM THE SCHWARTZWALDER MINE 001A OUTFALL

Prepared for:

Jared Buck Linkan Engineering 400 Corporate Circle Suite H Golden, CO 80401

Prepared by:

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July 2, 2025

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Chronic Toxicity Test Summary

	7-day static renewal using Ceriodaphnia dubia
Test:	7-day static renewal using fathead minnow (<i>Pimephales promelas</i>)
Client:	Linkan Engineering
Test Procedure	<i>Ceriodaphnia dubia</i> : EPA/821/R-02-013. Method 1002.0 (2002)
Followed:	fathead minnow: EPA/821/R-02-013. Method 1000.0 (2002)
Sample Number:	525317.B
Dilution Water:	moderately hard laboratory reconstituted water
Test Organism Source:	SeaCrest Group
Reference Toxicant:	Sodium Chloride

Sample	Time of Collection	Date of Collection	Time of Receipt	Date of Receipt
Effluent 1	1330	06-23-2025	1600	06-23-2025
Effluent 2	1400	06-24-2025	1530	06-24-2025
Effluent 3	1400	06-25-2025	1620	06-25-2025

	Ceriodaphnia dubia	
Test Initiation Time	1145	1620
Test Initiation Date	06-24-2025	06-23-2025
Test Completion Time	1205	1520
Test Completion Date	06-30-2025	06-30-2025

Abstract with Results					
Test Concentrations: Control (0%), 20%, 40%, 60%, 80%, 100%					
10 for Ceriodaphnia dubiaNumber of Organisms/Concentration:40 for fathead minnow					
Replicates at each Concentration:10 for Ceriodaphnia dubia4 for fathead minnow					

	Ceriodaphnia dubia	fathead minnow
Test vessel size/Exposure volume	30ml/15ml	500ml/200ml
Lethal LOEL/LC25	>100%/>100%	>100%/>100%
Pass/Fail Status	PASS	PASS
Temperature Range (°C)	24.1 - 25.9	24.1 - 25.9
Dissolved Oxygen Range (mg/L)	6.4 - 8.0	3.8 - 8.1
pH Range	7.7 - 8.6	7.6 - 8.2
	Control (<i>Cerio</i> /FHM)	Effluent Sample

	(Certo/FHM)	Entuent Sample
Hardness (mg/L as CaCO ₃)	96/100	0/0/2
Alkalinity (mg/L as CaCO ₃)	62/63	75/79/85
Total residual chlorine (mg/L)	< 0.01	<0.01/<0.01/0.02
Total ammonia (mg/L as NH ₃)	< 0.03	0.03/<0.03/<0.03

INTRODUCTION

Biomonitoring provides an effective means by which the toxicity of discharges from municipal, industrial, and mining operations can be tested. Among the advantages of biomonitoring is the ability to test complex effluents containing a broad range of contaminants. Biomonitoring, when used in conjunction with chemical analyses, can generate data capable of identifying a much wider range of contaminants.

The Colorado Water Quality Control Division requires certain NPDES permittees to perform acute and/or chronic biomonitoring tests. The chronic test measures significant differences in lethality and in reproduction (*Ceriodaphnia dubia*) or growth (fathead minnow – *Pimephales promelas*) between control and effluent-exposed organisms.

The present report discusses the results of chronic biomonitoring tests conducted on effluent from the Linkan Engineering Schwartzwalder Mine 001A discharge. These tests were conducted in accordance with EPA and State of Colorado procedures in June 2025.

MATERIALS AND METHODS

Sample Collection

Two gallons of the effluent were collected on three separate dates as specified in Permit CO-0001244. Samples were delivered chilled to the SeaCrest lab where they were held at $0-6^{\circ}$ C. Chain of custody forms showing sample collection and laboratory arrival times are included (Appendix 1).

Dilution Water

Laboratory reconstituted water was used as both the dilution water source and the control for the tests. Reconstituted water for the *Ceriodaphnia dubia* test was produced by adding sodium bicarbonate, calcium sulfate, magnesium sulfate, potassium chloride, and sodium selenate to deionized water. Reconstituted water for the fathead minnow test was produced by adding sodium bicarbonate, calcium sulfate, magnesium sulfate, and potassium chloride to deionized water.

Test Organisms

The biomonitoring test used *Ceriodaphnia dubia*, cultured in the SeaCrest laboratory. The organisms are cultured in brood culture boards from which individual females are monitored for survival and reproduction for periods of up to two weeks. Neonates less than 24-hours old, released from third or subsequent broods of eight or more within an 8-hour period, are collected from the brood chambers and used in tests. The animals are fed daily with a mixture of Yeast, Cereal Leaves, and Trout Chow (YCT), produced in-house. This is supplemented with cultured green algae (*Selenastrum capricornutum*) provided by Aquatic Biosystems.

Less than one-day-old fathead minnow, cultured in the laboratory, were also used in the test. Adult fish are maintained in 10-gallon aquaria where females deposit their eggs on the under-surface of split PVC pipe sections. The eggs are collected daily and transferred to aerated containers where they hatch after three to four days. The larval fish are fed newly hatched brine shrimp (*Artemia* sp.) at least twice per day.

In-house organisms are tested monthly in a reference toxicant test using sodium chloride to monitor overall health and test reproducibility. (Appendix 4).

Test Procedures

Upon receipt at the lab, samples were analyzed for alkalinity, ammonia, chlorine, conductivity, dissolved oxygen, hardness, and pH.

Methods used in chemical analysis

Alkalinity	EPA 310.2	Hach 8203	I-2030-85.2
Ammonia	SM4500-NH ₃ , C-E1997	ASTM D1426-08	
Chlorine	SM4500-Cl D	Hach 10026	
Conductivity	SM2510		
Dissolved Oxygen	SM4500-O	Electrode: G-2001	Winkler (QC): B-F-2001
Hardness	SM2340 B or C	Hach 8213	
pH	SM4500-H+ B-2000		

The test followed procedures in EPA³ and CDPHE⁴ guidelines. Exposure concentrations included control (0%), 20%, 40%, 60%, 80%, and 100% mixtures, diluted with moderately hard laboratory reconstituted water.

Individual *Ceriodaphnia dubia* were placed in 30ml plastic containers containing approximately 15ml of exposure medium. Ten replicates at each concentration were used. The animals were fed daily with the YCT mixture and an equal volume of the green algae *(Selenastrum capricornutum)*. The exposure medium was changed daily in each container and the number of young released overnight were counted and recorded. Young were removed from the containers daily and discarded. Routine measurements were made each day of temperature, dissolved oxygen, and pH before and after the water changes.

Fathead minnow were exposed in 500ml plastic cups to which 250ml of media was replaced daily. Four replicates were used at each concentration. Ten fish, less than 24-hours old, were placed in each cup. The fish were monitored daily for survival and fed live brine shrimp at least twice per day. After seven days, the fish were removed from the cups, euthanized with isopropyl alcohol, and then placed in aluminum pans and dried in an oven for a minimum of six hours at 100°C. The pans were then weighed on a five-place analytical balance to determine the average dry weight of the fish from each replicate.

Data Analysis

Data from the tests were analyzed on a personal computer using the CETIS program (developed by Tidepool Scientific Software). Statistical tests used in the analyses are shown in Table 1. Test acceptability was determined using control survival and reproduction/growth criteria, concentration-response relationships, and percent minimum significant differences (USEPA ^{5,6}).

Va	ariance	Ι	Distribution	
Bartlett Equali	ty of Variance Test	Shapiro-Wilk W Normality Test		
Statistical Difference				
Species Survival		Growth	Reproduction	IC ₂₅
Ceriodaphnia dubia	bhnia dubia Fisher Exact/Bonferroni- Holm Test		Steel Many-One Rank Sum Test	ICp
fathead minnow	fathead minnow Steel Many-One Rank Sum Test		N/A	ІСр

Table 1. Statistical methods used in testing for significant differences in test parameters.

RESULTS

Ceriodaphnia dubia Test Results

Test results for the *Ceriodaphnia dubia* are summarized in Table 2 and provided on the data sheets located in Appendix 2. Survival was 0% in the 100% effluent and ranged from 90-100% in the remaining effluent concentrations. Control survival was 100%. Statistically significant lethality was measured in the 100% effluent concentration when compared to the control. The LOEL (Lowest Observed Effect Level) for lethality was >100% and the LC₂₅ (Lethal Concentration 25) for lethality was 84.5%.

Average number of neonates was 0.4 in the 100% effluent concentration and ranged from 24.9 - 28.5 in the remaining effluent concentrations. Average number of neonates in the control was 25.3 for statistical analyses and test acceptability criteria. Statistically significant differences in the number of neonates were found between the control and the 100% effluent concentration. The LOEL for reproduction was >100% and the IC₂₅ (Inhibition Concentration 25) for reproduction was 84.2%.

	Domoord	Moor			Significant Difference	
Concentration	Percent Survival	Mean Neonates	Min.	Max.	Lethality	Reprod.
Control (0%)	100	25.3	16	34		
20%	100	28.5	23	32		
40%	90	24.9	0	39		
60%	100	25.3	16	35		
80%	100	26.3	20	31		
100%	0	0.4	0	3	*	*

Table 2. Summary of *Ceriodaphnia dubia* test results. An asterisk (*) denotes a statistically significant difference from the control.

Fathead Minnow Test Results

Fathead minnow results are summarized in Table 3 and are provided on data sheets in Appendix 3. Survival was 72.5% in the 100% effluent concentration and ranged from 95% - 97.5% in the remaining effluent concentrations. Control survival was 97.5%. No statistically significant lethality was measured in any effluent concentration when compared to the control. The LOEL (Lowest Observed Effect Level) for lethality was >100% and the LC₂₅ (Lethal Concentration 25) for lethality was 99.5%.

Average weight in the 100% effluent concentration was 0.233mg and ranged from 0.553mg - 0.586mg per individual in the remaining effluent concentrations. Average weight for the control fish was 0.587mg for statistical analyses and test acceptability criteria. Statistically significant differences for growth were measured in the 100% effluent concentration when compared to the control. The LOEL for growth was 100% and the IC₂₅ for growth was 87%.

 Table 3. Summary of fathead minnow test results. An asterisk (*) denotes a statistically significant difference from the control.

	Percent	Average			Significant Difference	
Concentration	Survival	Weight (mg)	Min.	Max.	Lethality	Growth
Control (0%)	98	0.587	0.544	0.644		
20%	95	0.586	0.564	0.614		
40%	98	0.565	0.442	0.675		
60%	98	0.562	0.522	0.610		
80%	98	0.553	0.501	0.601		
100%	73	0.233	0.151	0.308		*

Test Acceptability

Acceptable control survival (80%) was achieved in both tests. Similarly, *Ceriodaphnia dubia* reproduction (average 15 neonates/organism) and fathead minnow growth (average 0.250mg/test container) in control organisms met required levels. PMSD was within the required limits for an acceptable test (Table 4).

Table 4. PMSD for chronic test parameters.

	fathead min	now growth	C. dubia rep	production
	Lower bound	Upper bound	Lower bound	Upper bound
PMSD	12	30	13	47
(% Minimum significant difference)	16	i.5	23.	3

DISCUSSION

A failed test for this discharge occurs when there is a statistical difference and LC_{25} less than the IWC (Instream Waste Concentration) of 100%. The LOEL represents the lowest effluent concentration at which a statistically significant effect is observed. The LC_{25} represents an estimate of the effluent concentration that would cause a 25 percent reduction in survival. Since there was no statistically significant differences meeting this criterion, the effluent passes WET (Whole Effluent Toxicity) testing for this sampling period.

REFERENCES

- 1. Hach Chemical Company. 2008. *Hach's Water Analysis Handbook*. Fifth Edition. Hach Chemical Company, Loveland, Colorado. Digital Medium.
- 2. **APHA/AWWA/WEF.** 1998. *Standard Methods for the Examination of Water and Wastewater.* 20th Edition. American Public Health Association, Washington, D.C.
- 3. **USEPA.** 2002. Short Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms. EPA-821-R-02-013. 335 pp.
- 4. **CDPHE (Colorado Department of Public Health and Environment).** 1998. *Laboratory Guidelines for Conducting Whole Effluent Toxicity Tests.* Water Quality Control Division.
- 5. USEPA. 2000. Method of Guidance and Recommendations for Whole Effluent Toxicity (WET) Testing (40 CFR Part 136). EPA/821/B-00/004.
- 6. **USEPA**. 2000. Understanding and Accounting for Method Variability in Whole Effluent Toxicity Applications under the National Pollutant Discharge Elimination System Program. EPA/833/R-00/003.

Appendix 1 – Chain of Custody with Sample Receipt Forms

ENVIRONMENTAL SERVICES LABORATORY	SORATORY											(303) 661	(303) 661.9324 - FAX (303) 661.9325	AX (303) 661.	932
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7. pH adjustment necessary			Y	D	
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Receiving: $\mathbb{N}/\mathbb{A}_{\mathcal{T}}$ Presence of native species:			Y	$\widehat{\mathbf{D}}$	
Lab # Temp D.O. pH 31구.6#3 10.7 7.8 7.8	Cond 151				
Custody Seals: 1. Present on Outer Package 2. Unbroken on Outer Package 3. Present on Sample 4. Unbroken on Sample	Y Y Y Y	R Z Z Z Z	NA		

Custody Documentation (Chain of Custody):

1. Present Upon Receipt of Sample

N

Ø

Appendix 2 – Data Sheets for the *Ceriodaphnia dubia* Test

WET TEST REPORT FORM – CHRONIC

CO-0001244

Permittee: Permit No.:	Linkan Engine CO-0001244	eering-Schwartzwa	alder Mine
Outfall:	001A – IWC:	100%	
Test Type:	Routine 🖂	Accelerated 🗌	Screen
Test Species:	Ceriodaphnia	dubia	

Test Start Time	Test Start Date	Test End Time	Test End Date
1145	06-24-2025	1205	06-30-2025

Test Results	Lethality/TCP3B	Reproduction/TKP3B
S code: LOEL	100%	100%
	PASS	N/A
P code: LC ₂₅ /IC ₂₅	84.5%	84.2%
	PASS	N/A
T code:	100%	100%

Test Summary

Measurements	Control (0%)	20%	40%	60%	80%	100%
Exposed organisms	10	10	10	10	10	10
Survival for day 1	10	10	10	10	10	10
Survival for day 2	10	10	10	10	10	6
Survival for day 3	10	10	9	10	10	2
Survival for day 4	10	10	9	10	10	0
Survival for day 5	10	10	9	10	10	0
Survival for day 6	10	10	9	10	10	0
Mean 3 Brood Total	25.3	28.5	24.9	25.3	26.3	0.4

Hardness (mg/L) – Receiving Water: N/A Alkalinity (mg/L) – Receiving Water: N/A Chlorine (mg/L) – Effluent: <0.01/<0.01/0.02 Total Ammonia as NH₃ (mg/L) - Effluent: 0.03/- Effluent: 0/0/2 Effluent: 75/79/85 Recon Water: 96 Recon Water: 62

Were all Test Conditions in Conformance with Division Guidelines? YES \boxtimes NO \square

If <u>NO</u>, list deviations from test specifications: N/A

Laboratory: SeaCrest Group

Comments:

Analyst's Name: Haley West, Cat Cash, Hannah Tiede, and Katie Maranowski

Signature

Date July 2, 2025

SeaCrest Group

SeaCres Louisvill	st Group le, CO		C	eriodaphnia	a Chronic Bo	enchsheet			Form #: 1 : March 2	
ermittee	Lir	ikan Er	Iginee	ring	Lab #: 52	5317.B	Site:	A100		
NC %:	100		plate #: 5	Dilution	Water: MH	25-014	Sample Date:	06232	5	
ge & So	urce:	1197 (062425			125 1149		063096		5
est Cond		11-11			<u>dovi</u>	10.5 11	2	Dr. Dur	21000	_
est con	-				-	-			1	5
()	0	1	2	3	4	5	6	7	Total	4
C)	0	0	0	12	0	13	13		32	4
	0	0	0	6	0	112	HA-		E	1
	0	0	0	6	0	112	10		34	1
	0	0	0	l ŭ	0	B	8		125	1
5	0	0	0	5	Ō	9	12		20	1
0	0	0	0	9	0	10	10		24	1
	0	0	0	D	4	(0			21	1
	0	0	0	1	0	5	12		24	
00	0	0	0	4	y	8	0		16	
DO	712	1,5,6,8	10.8 6.9	12.9 10.8	7.0 4.9	7369	hur			I
Temp pH	A418	85.825.5	8.0 8.1	8.2 1.9	25.8 24.1	859369	255265		75.3	
Cond	31-1	310	201	318	327	314	83		0.0	1
1)	0	0	0	8	0	9	12		20	1
	0	0	0	Ŭ	0	a	12		28	1
	0	0	0	3	0	6	IL		23	1
	0	0	0	5	0	12	12		29	1
	0	0	0	9	0	10	10		24	1
h	0	0	0	1	0	10	15		32	1
90	0	0	0	1	0		IL		32]
	0	0	0	413	ß	10	14		31	1
	0	0	0	4	0	0	3		27	1
DO		7.5 6,8	6.817.2	10.9 16.8	7.07.1	711/0.0	- lle		30	4
Temp	24,8	25835B	153114	259:257	25.824.1	7,40,9	2552			
pH	7.8	8,217,9	8.0.81	8.2 1.9		8,17,8			28.5	
Cond	281	288	298	291	298	281	310		00.0	
2)	0	0	0	0	Le	U	15		29	3
	0	0	0	1	0	14	18		39	1
	0	0	0	4	0	10	14		28	1
	0	0	0	le	0	9	11		26	
	0	0	0	5	0	10	13		28	
10	0	0	0	Q D.	~		10		0	D
10	0	0	0	- S	0	4	13		29	
ł	0	0	0	4	0	ă	14		25	
	0	0	0	3	й	Ĭ	K		15	
DO	7,0		10717.4	69112-8	7.1 17.3	7511	7,7			
[emp	24.8	25,8,25,5	25.3 24.9	25.9:25.7	25-8 24.1	259259	255		2110	
pH		0.3718	8.1.18.1	8.3 8.0	8.0 7.8		8.4		24.9	
	259	259	270	270	268	256	275		0	
)	0	0	0	-1-	0	10	9		26	
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ł	0	0	0	4	0	<u>A</u>	14		30	
ŀ	0	0	0	Ч	0	1	15		20	
n	0	0	0	4	0	- 52	3		44	
00	0	0	0	ů.	0	14	12		37	
	0	0	0	3	0	11	10		5-1	
1	0	0	0	Ŭ	0	4	17		22	
	0	0	0	. 3	7	313	0	No.	16	
DO	11	77109	4.47.4	4.9 49	7.17.5	110115	7,91	and a second sec		
			11110	7/11/0/ 0	0	act is the	221			
emp	34.8	25.8055 8.37,8	8280		25.824.1 8.1 7.8	a59 269	25,5 8.4		753	

CC

SeaCrest Group

Form #: 101a

Effective: March 2023 Louisville, CO 0 1 2 3 4 5 6 7 Total (4) 0 0 9 2 25 0 U 0 18 10 0 0 0 50 0 0 0 0 20 0 0 0 0 4 0 C IJ V 0 0 0 0 80 Z 04 2 0 0 0 0 0 0 0 0 0 30 0 0 D C 防 0 0 0 0 0 0 0 Ŏ 51 3 7.8:6960 578 3333 780 190 9 0.9 7.27.77 59 257 25.824 18 58.0 8.2 7.86 190 185 DO 71 24.8 599359 Temp 3 Ul. pН 8 6,0 Cond (5) Ō 0 0 ١ PA -3 0 0 3 D 0 0 0 0 0 D D 0 ōБ 0 000000 0 0 0 p 0 0 0 001 0 0 DBD 4 0 0 0 Ó 0 0 0 0 0 0 0 0 0 D 8 0 0 0 7,8 7,9 0,9 24,8 259 255 7,8,855 7,8 U \$.0 325.5 3 8.0 154 DO 911 0 ٦. 0 Temp 59128 518 156 25.8 3 0.4 7,8 8.3 7 pН 3 7,9 Cond 1549 Algae YCT H₂O ABS 412504 ABS 2504 ABS ABS ABS ABS asoy 2504 SOL 2 KM KM CC th Initials HT KM KN Fff #1 Eff #2 Eff #3 Recon 96 Hardness Alkalinity 19 102 0.01 20.01 20.01 Chlorine 20.01 0.02 20.03 Ammonia 10.0 Exposure Chamber: Feeding Schedule: Units: Total Capacity: 30mL Total Solution Volume: 15mL Fed daily Food used: YCT, Algae DO: mg/L Temp: °C Hardness: mg/L Alkalinity: mg/L pH: N/A Chlorine: mg/L Cond: µS/cm3 Ammonia: mg/L Comments:

CO-0001244

Ceriodaphnia Chronic Benchsheet

							x:y:z = boa	rd #:row:co	lumn
1	2	3	4	5	6	7	8	9	10
AI	A3	AY	A5	AQ	A8	Aq	CS	CQ	C7

CC

CETIS Ana	lyti	cal Repo	ort							eport est Co	Date: de/ID:			Jun-25 15:5 25317cd / 11	
Ceriodaphnia	7-d	Survival and	d Repro	oduc	tion Test						50.00			SeaC	rest Group
Analysis ID: Analyzed: Edit Date:	30 .	7225-8130 Jun-25 15:54 Jun-25 0:00		Anal	ysis: ST	Survival Rat P 2xK Contir D148ECA29	ngency Tabl		2A4		S Version s Level: r ID:	1	CETIS v:		
Batch ID:	19-1	490-5435		Test	Type: Re	production-S	urvival (7d)			Analy	st:			17	
Start Date:	24	lun-25		Proto	col: EP	A/821/R-02-	013 (2002)			Dilue	nt: M	od-Ha	rd Syntl	netic Water	
Ending Date:	30 .	lun-25		Spec	ies: Ce	riodaphnia d	ubia			Brine	: N	ot App	licable		
Test Length:	6d	Oh	5	Тахо	n: Bra	inchiopoda				Sour	ce: In	-Hous	e Cultur	е	Age:
Data Transfor	m		Alt H	ур				NOEL	LOE	L	TOEL	Т	ox Units	3	
Untransformed	ł		C > T					80	100		89.44	1.	2		
Fisher Exact/	Bonf	erroni-Holm	Test	-20											
Control	vs	Conc-%			Test Stat	P-Type	P-Value	Decision	(α:5%)						
Dilution Water		20			1.0000	Exact	1.0000	Non-Signi	ficant	Effect					
		40			0.5000	Exact	1.0000	Non-Signi	ficant	Effect					
		60			1.0000	Exact	1.0000	Non-Signi	ficant	Effect					
		80			1.0000	Exact	1.0000	Non-Signi	ficant	Effect					
		100*			0.0000	Exact	2.7E-05	Significan							
Test Acceptal	bility	Criteria	т	C Li	mite	_									
Attribute		Test Stat			Upper	Overlap	Decision								
Control Resp		1	0.8		>>	Yes	Passes C	riteria							
7d Survival R	ate F	requencies	6					11 - S.							
Conc-%		Code	NR		R	NR + R	Prop NR	Prop R	%Ef	fect					
0		D	10		0	10	1.0000	0.0000	0.00	%					
20			10		0	10	1.0000	0.0000	0.00	%					
40			9		1	10	0.9000	0.1000	10.0	0%					
60			10		0	10	1.0000	0.0000	0.00	%					
80			10		0	10	1.0000	0.0000	0.00	%					
100			0		10	10	0.0000	1.0000	100.	00%					
7d Survival R	ate S	Summary													
Conc-%		Code	Coun	t	Mean	95% LCL	95% UCL	Median	Min		Max	S	td Err	CV%	%Effect
0		D	10		1.0000	1.0000	1.0000	1.0000	1.00	00	1.0000	0.	0000	0.00%	0.00%
20			10		1.0000	1.0000	1.0000	1.0000	1.00	00	1.0000	0.	0000	0.00%	0.00%
40			10		0.9000	0.6738	1.0000	1.0000	0.00		1.0000	0.	1000	35.14%	10.00%
60			10		1.0000	1.0000	1.0000	1.0000	1.00		1.0000		0000	0.00%	0.00%
80			10		1.0000	1.0000	1.0000	1.0000	1.00		1.0000		0000	0.00%	0.00%
															100.00%
100			10		0.0000	0.0000	0.0000	0.0000	0.00	00	0.0000	0.	0000		100.

Analyst: EW QA:

CETIS	S Ana	lytical Repo	ort						Report Test Co) Jun-25 15:5 525317cd / 11	u ,
Ceriod	aphnia	7-d Survival and	d Reproduc	tion Test								SeaCr	est Group
Analys Analyz Edit Da	ed:	00-9292-1898 30 Jun-25 15:54 30 Jun-25 0:00	Ana	lysis: Line	Survival Rate ear Interpola 0148ECA297	tion (ICPIN)		D92E2A4	Statu	IS Version us Level: or ID:	n: CETIS 1 000-346		Ϋ́,
Batch I Start D	ate:	19-1490-5435 24 Jun-25	Prot	ocol: EP/	oroduction-S A/821/R-02-0	013 (2002)			Anal Dilue	ent: Me		thetic Water	
Ending Test Le		30 Jun-25 6d Oh	Spectra		iodaphnia du nchiopoda	ubia			Brine Sour		ot Applicable House Cult		Age:
Linear	Interpo	lation Options											1.15.11
X Trans	sform	Y Transform	See	d	Resamples	Exp 95%	CL	Method					
Linear		Linear	2140)199	1000	Yes		Two-Poin	t Interp	olation			
Test Ad	cceptal	oility Criteria	TAC L	imits									
Attribu	te	Test Stat		Upper	Overlap	Decision							
Control	Resp	1	0.8	>>	Yes	Passes Cr	riteria						
Point E	Estimat	es											
Level	%	95% LCL	95% UCL	Tox Units	95% LCL	95% UCL							
LC15	82.41	81.11	83	1.2	1.2	1.2							
LC20	83.45	82.22	84	1.2	1.2	1.2							
LC25	84.48	83.33	85	1.2	1.2	1.2							
LC40	87.59	86.67	88	1.1	1.1	1.2							
LC50	89.66	88.89	90	1.1	1.1	1.1							
7d Sur	vival R	ate Summary				Calculated	I Varia	te(A/B)				Isoton	ic Variate
Conc-%	6	Code	Count	Mean	Median	Min	Max	C	1%	%Effect	ΣΑ/ΣΒ	Mean	%Effect
0		D	10	1.0000	1.0000	1.0000	1.00	00 0.0	00%	0.00%	10/10	1.0000	0.00%
20			10	1.0000	1.0000	1.0000	1.00	0.0 0.0	00%	0.00%	10/10	1.0000	0.00%
40			10	0.9000	1.0000	0.0000	1.00	00 35	.14%	10.00%	9/10	0.9667	3.33%
60			10	1.0000	1.0000	1.0000	1.00	00 0.0	00%	0.00%	10/10	0.9667	3.33%
80			10	1.0000	1.0000	1.0000	1.00	00 0.0	00%	0.00%	10/10	0.9667	3.33%
100			10	0.0000	0.0000	0.0000	0.00	00		100.00%	6 0/10	0.0000	100.00%

	uyu	carnepo	n					Report Test Co		52	5317cd / 11	5 (p 1 of -5089-238
Ceriodaphnia	yzed: 30 Jun-25 15 Date: 30 Jun-25 0: h ID: 19-1490-543 Date: 24 Jun-25 ng Date: 30 Jun-25 0: ng Date: 24 Jun-25 ng Date: 30 Jun-25 Length: 6d 0h Transform	Survival and	l Reprodu	ction Test							SeaCr	est Grou
Analysis ID:	21-0	21-0611-3581 30 Jun-25 15:54 30 Jun-25 0:00 19-1490-5435 24 Jun-25 30 Jun-25 3d Oh n e Rank Sum Tes vs Conc-% 20 40 60 80 100* ility Criteria Test Stat 25.3 0.2326 Sum Squar 5572.08 1784.1 7356.18 ptions Tests Test Bartlett Equ Shapiro-Wil Summary Code D	Enc	Ipoint: Rep	oroduction			CETI	S Version:	CETIS v2	.1.6	
Analyzed:	sis ID: 21-0611-358 zed: 30 Jun-25 15 late: 30 Jun-25 15 late: 30 Jun-25 0 ID: 19-1490-543 Date: 24 Jun-25 g Date: 24 Jun-25 g Date: 30 Jun-25 .ength: 6d 0h Iransform Many-One Rank Surr ol vs Conc-1 m Water 20 40 60 80 100° Acceptability Criteria ute Test S ol Resp 25.3 0 0.2326 /A Table se Sum S sen 5572.0 1784.1 7356.1 /A Assumptions Test ute Test nce Bartlet puton Shapir oduction Summary -% Code	un-25 15:54	Ana	lysis: Nor	parametric-	Control vs T	reatments	Statu	is Level:	1		
Edit Date:		un-25 0:00	MD	5 Hash: 01E	F43253810	70C52D741	67D967455	C4 Edito	or ID:	000-346-4	192-2	
Batch ID:		490-5435	Tes	t Type: Rep	oroduction-S	urvival (7d)		Analy	yst:			
Start Date:		un-25	Pro	tocol: EP/	V821/R-02-	013 (2002)		Dilue		d-Hard Synth	etic Water	
Ending Date:	30 J	un-25	Spe	cies: Cer	iodaphnia d	ubia		Brine		Applicable		
Test Length:	6d (Dh	Тах	on: Bra	nchiopoda			Sour	ce: In-H	louse Culture	9	Age:
Data Transfo	rm		Alt Hyp				NOEL	LOEL	TOEL	Tox Units	MSDu	PMSD
Untransformed	d		C > T				80	100	89.44	1.2	5.885	23.26%
Steel Many-O	ne R	ank Sum Te	st									
Control	vs	Conc-%	df	Test Stat	Critical	Ties	P-Type	P-Value	Decision			
Dilution Water		20	18	3 119	75	2	CDF	0.9875	-	ificant Effect		
		40	18	3 111.5	75	4	CDF	0.9403	•	ificant Effect		
		60	18	3 108	75	3	CDF	0.8923	-	ificant Effect		
		80	18	3 113	75	1	CDF	0.9548		ificant Effect		
-		100*	18	3 55	75	0	CDF	0.0004	Significar	nt Effect	1	
Test Accepta	bility	Criteria	TAC L	.imits								
Attribute		Test Stat	Lower	Upper	Overlap	Decision						
Control Resp		25.3	15	>>	Yes	Passes Cr	riteria					
PMSD		0.2326	0.13	0.47	Yes	Passes Cr	riteria					
ANOVA Table	•											
Source		Sum Squa	ires	Mean Squ	lare	DF	F Stat	P-Value	Decision	(α:5%)		
Between		5572.08		1114.42		5	33.73	<1.0E-05	Significar	nt Effect		
Error		1784.1		33.0389		54	_					
Total		7356.18				59						
ANOVA Assu	mpti	ons Tests										
Attribute		Test				Test Stat		P-Value	Decision			
Variance						39.62	15.09	<1.0E-05		Variances		
Distribution		Shapiro-W	ilk W Norn	nality Test		0.8851	0.9459	3.9E-05	Non-Norr	nal Distributio	on	
Reproduction	n Sur	nmary										
Conc-%			Count	Mean	95% LCL			Min	Max	Std Err	CV%	%Effect
D		D	10	25.3	20.69	29.91	24.5	16	34	2.039	25.48%	0.00%
20			10	28.5	26.28	30.72	29	23	32	0.9804	10.88%	-12.65%
			10	24.9	17.53	32.27	27	0	39	3.257	41.37%	1.58%
40						00 4	00	40	35	4 00	04 000/	0.00%
			10	25.3	21.5	29.1	26	16	35	1.68	21.00%	
40 60 80			10 10	25.3 26.3	21.5 23.84	29.1 28.76	26 27	20	31	1.086	13.06%	-3.95%

CETIS	S Ana	lytical Repo	rt					Report D Test Cod		30 Jun-25 15:5 525317cd / 1	
Ceriod	aphnia	7-d Survival and	d Reproduc	tion Test						SeaC	rest Group
Analys	is ID:	18-8463-6412	End	point: Re	eproduction			CETIS	Version:	CETIS v2.1.6	
Analyz	ed:	30 Jun-25 15:54	Ana	lysis: Lir	near Interpolat	tion (ICPIN)		Status	s Level:	1	
Edit Da	ate:	30 Jun-25 0:00	MD5	Hash: 01	EF432538107	70C52D74167E	967455C4	Editor	r ID:	000-346-492-2	
Batch I	ID:	19-1490-5435	Test	Type: Re	eproduction-S	urvival (7d)		Analy	st:		
Start D	ate:	24 Jun-25	Prot	ocol: EF	PA/821/R-02-0	013 (2002)		Diluer	nt: Mod-	Hard Synthetic Water	
Ending	Date:	30 Jun-25	Spe	cies: Ce	eriodaphnia du	ubia		Brine	Not A	pplicable	
Test Le	ength:	6d 0h	Тахо	on: Br	anchiopoda			Sourc	e: In-Ho	ouse Culture	Age:
Linear	Interpo	olation Options									
X Tran	sform	Y Transform	See	d	Resamples	Exp 95% CL	Method				
Linear		Linear	1115	5090	1000	Yes	Two-Po	int Interpo	lation		
Test A	cceptat	bility Criteria	TAC L	imits							
Attribu	ite	Test Stat	Lower	Upper	Overlap	Decision					
Control	Resp	25.3	15	>>	Yes	Passes Criter	ia				
Point E	Estimat	es									
Level	%	95% LCL	95% UCL	Tox Unit	s 95% LCL	95% UCL					
IC15	82.1	38.35	83.07	1.2	1.2	2.6					
IC20	83.17	7 80.62	84.09	1.2	1.2	1.2					
IC25	84.24	81.86	85.12	1.2	1.2	1.2					
IC40	87.46	85.58	88.19	1.1	1.1	1.2					
IC50	89.6	88.07	90.24	1.1	1.1	1.1					
Reproc	duction	n Summary				Calculated	Variate			Isotor	ic Variate
Conc-9	%	Code	Count	Mean	Median	Min M	ax C	V%	%Effect	Mean	%Effect
0		D	10	25.3	24.5	16 34		5.48%	0.00%	26.9	0.00%
20			10	28.5	29	23 32	2 1	0.88%	-12.65%	26.9	0.00%
40			10	24.9	27	0 39	4	1.37%	1.58%	25.5	5.20%
60			10	25.3	26	16 35	5 2	1.00%	0.00%	25.5	5.20%
80			10	26.3	27	20 31	1	3.06%	-3.95%	25.5	5.20%
100			10	0.4	0	0 3	2	41.52%	98.42%	0.4	98.51%

Appendix 3 – Data Sheets for the Fathead Minnow Test

	WET TEST REPORT FORM – CHRONIC
Permittee:	Linkan Engineering-Schwartzwalder Mine
Permit No.:	CO-0001244
Outfall:	001A – IWC: 100%
Test Type:	Routine \square Accelerated \square Screen \square
Test Species:	fathead minnow

Test Start Time	Test Start Date	Test End Time	Test End Date
1620	06-23-2025	1520	06-30-2025

Test Results	Lethality/TCP6C	Growth/TKP6C
S code: LOEL	>100%	100%
	PASS	N/A
P code: LC_{25}/IC_{25}	99.5%	87%
	PASS	N/A
T code:	>100%	100%

Test Summary

Measurements	Control (0%)	12.5%	25%	50%	75%	100%
Exposed organisms	40	40	40	40	40	40
Survival for day 1	40	40	40	40	40	40
Survival for day 2	40	40	40	40	40	40
Survival for day 3	40	40	40	40	40	39
Survival for day 4	40	39	40	39	39	38
Survival for day 5	40	38	40	39	39	33
Survival for day 6	40	38	39	39	39	30
Survival for day 7	39	38	39	39	39	29
Mean Dry Wt. (mg)	0.587	0.586	0.565	0.562	0.553	0.233

Hardness (mg/L) – Receiving Water: N/A

Effluent: 0/0/2

Recon Water: 100

Alkalinity (mg/L) – Receiving Water: N/A

Effluent: 75/79/85

Recon Water: 63

pH (initial/final) – Control: 8.1/7.6 100%: 7.9/7.8

Chlorine (mg/L) – Effluent: <0.01/<0.01/0.02

Total Ammonia as NH₃ (mg/L) -Effluent: 0.03/<0.03/<0.03

Were all Test Conditions in Conformance with Division Guidelines? YES 🖂 NO 🗌

If <u>NO</u>, list deviations from test specifications: N/A

Laboratory: SeaCrest Group

Comments:

Analyst's Name: Cat Cash, Ethan White, and Hannah Tiede

Signature

Date July 2, 2025

SeaCrest Group

.

-	Louisville	Louisville, CO						Ш	athead	Fathead Minnow Chronic Benchsheet	ow Ch	ronic	Ben	chsh	eet							Effectiv	Form #: 103a Effective: March 2024
Test Start: //	TH LO	Client: UN LON LANN PRINC	Sint	CUIN Test End:	Nez	Site:	ADIA SZ20	Lab#	Lab #: 5253 (D.1 Species Info: (14/2/2	O.U.S	F	Sample Date: <u>00</u> 2	Date: OU	1325 EHM		IWC: 100 Test Conditions	Ó itions:	1	Dilution H ₂ O: MH25 - 043	o: MI	425	5h0-	
Conc Read	tead 0			2		m	4	_	5	9	2	0	1	2		5	9	# 2	Fish & Tare		Tare Fi	Fish Wt mg	Ave wt
ð	N 1	24,4 6.9	6.9	4.9 6.	6	4,4 6.8	4.3 6.	34.2	6.8	P. 1	4.8S.	0 10	10	101	0101	02	0	0 #1	1.05292	-	07648 (phon.(<
ř C	Temp 24	U. 129.5 24.1	24.1	24.924.1	124	6 24.1	125.0 24	828	1 24.5	25.12	H 32(-HZ	10	10	101	010	0101	-	10 #2	19620-1	-	013910	210	£
E		17.6	7.63.0	3.8 B	+	6 8.1	8 t.t	.42.	1.89	1.6 8.	1	10	101	0	010	-	-	£	1.08373		0HSLL0*	580	5
Ŭ	5	3 320	0	316	C.	314	306		311	314		10	10	10	10 10	0	001	#	8518011		071a340	HhS.	ò
ă	DO 7	34:3	o.t	4.87.	04.6	0 t h	4,4 7	04.	1.4	P. 4 6.9	10	10	10	101	0 0	0	0	10 #5	1,07247	1-	, 06/05/0	1651	Ĺ
A Te	Temp 24	1 24.5 24.3	24.3	24.9 29	29.424.6	6 24.1	25.0 24.7	7 25.1	24.7	26.1 2	0	10	0	1	50	0	+-	9	1.09019		040480	Ulo !!	3
Ha C		31	80	7.88	0.40	6 8.0	8 t.t.	9.51	8.0	7.60 8.1		19	+	1	010	10	- 0	10 #1	1.07869	-	07294D	S S	3
ŭ	Cond 200		9	292		88	67.	2	85	292			-	-	010	0	+		1.0754		001010	Pars.	Ċ
ă	1.7 Da		1.5	tH. P	TO 4	6.F >	4.6 F	P.4 Z.	5.4	0.12. H	04.0	10	0	101	010	10	101	6# (0)	1.078:4		099170	63	1
/// Te	Temp [24].	1 24.5 24.4	24.4	25.024.8	1.8 24	6 24.1	12.0.24	675.	2.74.8	26.12	24.8 25	4 10	01	10 11	010	01		10 #10		341.07	75510	353	0
PH)	1 8.	P.F. 0.FU	b.t.	t 8.4	tb	7 8.0	578	5 4 0	14		-	10	1-	10	010	10		(0 #11	1-		019400	558	3
ŭ	Cond 24	0 240	0	270		38	233	2	29	242	+		C	10 11	010	10	-	9 #12	-		074860	2hh.	ò
DO	0 7.5	54.07.	S.t	たけち	145	5.4.6	4.5 7.4	1 4	9.t. 0	10 h	.14.	2 10	2	0	010	19	0	10 #13			005800	1010	C
I ON Te	Temp///	1245245	245	25.0.25	25.294	7124.1		575.7	1950	2.5.1 25.2	K322.8		+-	10	210	61			-	-	079120	Solo	2
E	1.1	たたし	5 1	1	5	9.11	T 8 F	tb	544	N S. L	11	1	100	10	0	+	-	#15		1-	0101031	122	5
ŭ	Cond 213	3 214	-	216	2	06	206	0				10	-	101	0	2		1 1 #16	-	-	Diologua	1580	0
ă). C 00	3.9.9	1 +' t	£19.7	1.9.1.	5 7-8	べたちか	64.6	8.E	-	1.24.	10	2	11 01	6	10	0			-	0(E00)	1001	<
XN Te	Temp 24.	124.5124.625	24.6	25.1.25	.0	1.42 4.40	15.0 24.4	425.	1.528	25.12	25 4 2E	H 10	-	10 11	01 0	-		0 #18	-	-	070550	501	2
됩	5.1.	4.4	4.4	50	ŵ	7.8.7.8	7.8.7.8	8.4.8	4.4	1.8 8.1	ŕ	8 10	[O	10 10	00	6	9 9	#19	1.09821	-	08230	DSUL	50
ŭ	-		-0	187	-	++	18	-	32	199	100	10	101	0 1	010	10	10 10	10 #20	849t.0'1	-	070810	UNS:	Ż
	00 7 6	03.87.5	4. Z	17	24	24.58.0	Ť	5		1	1.44.	10	101	0	010	S	S	S #21			.072401	1229	<u> </u>
	D 0	242	24.8	5.12	26.	シャーマー	12.0.57	3 25	i	25.12	26.9 25H	H 10	10	0 16	0 0	g	9	\$ #22	_	1.071871.07034	1034	1.51	2
	0.1	F F. F. F. F. F	1	8	20	8.4.8.	+8.4	8 7.8	t.	7.93	H	8 10	01	0 16	10	-	0	D #23	1.07501	-	·07193C	202	20
ŭ	Cond 150		1	2	1	49	151	-	20	163		10	07	10 9	5	5	9	\$ #24	1.01875	-	, 0101032	5.4%	Ż
8			1		+						_	9		-				#					_
Le	Temp				+				_		_	10		-			-	#					
E	_		1		+						_	10		-			_	#		_			
ŭ	Cond				-			_			1	10		_				#					
Initials	s CC	EW	2	EN	-	EW	EW	ELL)	EW	H	Ŧ						pretest	t #	1,054	054251.0543	5431		1
vvater #	t			Ĩ			ņ	-		2													
		E# 3	Kecon K	S	Kcv 2 Kcv 3	3 MR		· ·	Exposure Chamber			3		Units:			Com	Comments:					
All All	1C	10	31	+	+		Total Capacity:	ity:		1	500 mL		DO: mg/L		Hard: mg/L	- T/Bu							
Chlor /0	10/101	2011 201 10 10 10 10 10 10 10 10 10 10 10 10 1	000	+	+		Test Solution Surface Area	Surface	Area.	"	20.0 mL	_ `	DH: N/A		Chlor moll	g/L							
NH ₃ 0.(03400	3 60.03	<0.03				Water Depth (constant):	(constan	t):	Ί	6.5 cm	- S	Cond: uS/cm ³		NH ₃ : mg/L	g/L							
Feeding	0	Н	2	3,4	4, 5	9	7		Feeding Schedule			\vdash											
AM	+		5	> >	>		/ Fed:			2x p	2x per day												
Initials	+	3	3	EV EV	N E	Ŧ	Food	Food Used:		<24hr	<24hr artemia												
ML.	>;	>	>	>	>																		

	0.50	al Repo							Test C	ode/ID:	5253	317fhm / 14	4-7334-15			
Fathead Minn	iow 7-	d Larval S	urviva	l and	Growth T	est						1 000-346-492-2 ard Synthetic Water plicable water see Culture ox Units MSDu 0.1507 0.1507 5%) 0.1507 5%) 0.1507 5%) 0.1507 5%) 0.1507 5%)				
Analysis ID: Analyzed: Edit Date:	01 Ju	36-1892 I-25 12:34 I-25 0:00		Anal	ysis: No	Survival Rat onparametric- 78D78A35C	Control vs T		Stat	TIS Versitus Leve tor ID:	H: 1	525317fhm / 1 SeaC CETIS v2.1.6 1 Out of the sead				
Batch ID: Start Date: Ending Date: Test Length:	23 Ju 30 Ju	n-25	4		ocol: Ef	owth-Surviva PA/821/R-02- mephales pro tinopterygii	013 (2002)		Dilu Brir	ne:	Mod-Hard Synth Not Applicable In-House Culture		Age:			
Data Transfor	m		Alt H	lyp				NOEL	LOEL	TOEL	. Tox Units	PMSD				
Angular (Corre	ected)		C > 1					100	>100		1	15.46%				
Steel Many-O	ne Ra	nk Sum Te	est	-												
Control	vs	Conc-%		df	Test Sta	Critical	Ties	P-Type	P-Value	Decis	sion(a:5%)					
Dilution Water		20		6	16	10	2	CDF	0.6105	Non-S	Significant Effect					
		40		6	18	10	2	CDF	0.8333	Non-S	Significant Effect					
		60		6	18	10	2	CDF	0.8333		Significant Effect					
		80		6	18	10	2	CDF	0.8333	Non-S	Significant Effect					
		100		6	12.5	10	1	CDF	0.1834	Non-S	Significant Effect					
Test Acceptal	bility (Criteria	Т	AC Li	mits											
Attribute		Test Stat	Lowe	ər	Upper	Overlap	Decision									
Control Resp		0.975	0.8		>>	Yes	Passes Cr	iteria								
ANOVA Table	e										Decision(α:5%) Significant Effect					
Source		Sum Squa	ares		Mean So	uare	DF	F Stat	P-Value	Decis						
Between		0.337039			0.067407	8	5	3.596	0.0198	Signif	icant Effect					
Error		0.337422			0.018745	57	18	_								
Total		0.674461					23				Significant Effect					
ANOVA Assu	mptio	ns Tests														
Attribute		Test					Test Stat	Critical	P-Value	Decis	Decision(a:1%)					
Variance		Bartlett Eq	uality of	of Var	iance Test		9.263	15.09	0.0990	Equal	Decision(α:1%) Equal Variances					
Distribution		Shapiro-W	/ilk W I	Norma	ality Test		0.8289	0.884	0.0009	Non-N						
7d Survival R	ate Su	immary														
Conc-%		Code	Cour	nt	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect			
0		D	4		0.9750	0.8954	1.0000	1.0000	0.9000	1.000	0 0.0250	5.13%	0.00%			
20			4		0.9500	0.8581	1.0000	0.9500	0.9000	1.000		6.08%	2.56%			
40			4		0.9750	0.8954	1.0000	1.0000	0.9000	1.000	0 0.0250	5.13%	0.00%			
60			4		0.9750	0.8954	1.0000	1.0000	0.9000	1.000	0 0.0250	5.13%	0.00%			
80			4		0.9750	0.8954	1.0000	1.0000	0.9000	1.000	0 0.0250	5.13%	0.00%			
100			4		0.7250	0.3722	1.0000	0.7000	0.5000	1.000	0 0.1109	30.58%	25.64%			
Annulas (Com	ected) Transform			ary											
Angular (Corr		Code	Cour	nt	Mean	95% LCL	95% UCL	Median	Min	Max			%Effect			
Conc-%						1.2420	1.5010	1.4120	1.2490	1.412	0 0.0407	5.94%	0.00%			
Conc-%		D	4		1.3710											
Conc-% 0 20		D	4		1.3310	1.1810	1.4800	1.3310	1.2490	1.412			2.97%			
Conc-% 0 20 40		D	4 4		1.3310 1.3710	1.1810 1.2420	1.5010	1.4120	1.2490	1.412	0 0.0407	5.94%	0.00%			
Conc-% 0 20 40 60		D	4 4 4		1.3310 1.3710 1.3710	1.1810 1.2420 1.2420	1.5010 1.5010	1.4120 1.4120	1.2490 1.2490	1.412 1.412	0 0.0407 0 0.0407	5.94% 5.94%	0.00% 0.00%			
Conc-% 0 20 40		D	4 4		1.3310 1.3710	1.1810 1.2420	1.5010	1.4120	1.2490	1.412	0 0.0407 0 0.0407 0 0.0407	5.94% 5.94% 5.94%	0.00%			

CETISTM v2.1.6.2 x64 (000-346-492-2)

Analyst:___EW ___CC

CETIS	S Ana	lytical	Repo	rt						port Date: st Code/ID			Jul-25 12:3 5317fhm / 14	
Fathea	d Minn	ow 7-d L	arval Su	rvival and	Growth Te	st							SeaCi	est Group
Analysi	is ID:	06-6049	-6880	End	point: 7d	Survival Rate	•			CETIS Vers	sion:	CETIS v	2.1.6	
Analyze	ed:	01 Jul-2	5 12:34	Anal	ysis: Line	ear Interpolat	tion (ICPIN)			Status Lev	el:	1		
Edit Da	ate:	01 Jul-2	5 0:00	MD5	Hash: 517	8D78A35C7	34333017828	BCC17BE	66C	Editor ID:		000-346	-492-2	
Batch I	D:	01-7884	-4059	Test	Type: Gro	wth-Survival	(7d)			Analyst:				
Start D	ate:	23 Jun-2	25	Prote	ocol: EP/	A/821/R-02-0	13 (2002)		1	Diluent:	Mod-	Hard Synt	hetic Water	
Ending	Date:	30 Jun-2	.5	Spec	cies: Pirr	ephales pro	melas		1	Brine:	Not A	Applicable		
Test Le	ength:	7d Oh		Taxo	on: Act	inopterygii			1	Source:	In-Ho	ouse Cultu	re	Age:
Linear	Interpo	lation O	ptions											
X Trans	sform	Y Tra	Insform	Seed	ł	Resamples	Exp 95% C	L Meth	od					
Linear		Linea	ar	5792	20	1000	Yes	Two-	Point Ir	nterpolation				
Test Ac	cceptat	oility Crit	eria	TAC LI	mits									
Attribu	te	Те	st Stat	Lower	Upper	Overlap	Decision							
Control	Resp	0.9	975	0.8	>>	Yes	Passes Crite	eria						
Point E	Estimat	es												
Level	%	95	% LCL	95% UCL	Tox Units	95% LCL	95% UCL							
LC15	91.49	82	.25		1.1		1.2							
LC20	95.49	84	.13		1		1.2							
LC25	99.49	85	.7		1		1.2							
LC40	>100				<1									
LC50	>100				<1									
7d Sur	vival R	ate Sum	mary				Calculated V	ariate(A/	B)				Isoton	ic Variate
Conc-%	6	Co	ode	Count	Mean	Median	Min	Max	CV%	%Ef	fect	ΣΑ/ΣΒ	Mean	%Effect
0		D		4	0.9750	1.0000	0.9000	1.0000	5.13	% 0.00	%	39/40	0.9750	0.00%
20				4	0.9500	0.9500	0.9000	1.0000	6.089	% 2.56	%	38/40	0.9688	0.64%
40				4	0.9750	1.0000	0.9000	1.0000	5.139	% 0.00	%	39/40	0.9688	0.64%
60				4	0.9750	1.0000	0.9000	1.0000	5.139	% 0.00	%	39/40	0.9688	0.64%
				4	0.9750	1.0000	0.9000	1.0000	5.139	% 0.00	%	39/40	0.9688	0.64%
80								1.00000	0.10	0.00	10			

CETISTM v2.1.6.2 x64 (000-346-492-2)

Fath and Minu														See.C.	
Fathead Minn	wo	/-d Larval S	urvival a	na	Growth Te	st								Seach	rest Grou
Analysis ID:		5089-0904				an Dry Biom	-				S Versio		CETIS v2	.1.6	
Analyzed:		Jul-25 12:34				ametric-Cor					s Level:		1		
Edit Date:	01.	Jul-25 0:00	M	ID5	Hash: C2	529A1E8077	70A100269D	EC1F3601	14B	Edito	or ID:		000-346-4	92-2	
Batch ID:	01-	7884-4059	Т	est '	Type: Gro	wth-Surviva	l (7d)			Analy	/st:				
Start Date:		Jun-25				A/821/R-02-				Dilue		/lod-h	Hard Synthe	etic Water	
Ending Date:	30.	Jun-25		pec		nephales pro				Brine			pplicable		
Test Length:				axo		inopterygii				Sour	ce: li	n-Ho	use Culture	•	Age:
Data Transfor	m		Alt Hy	p				NOEL	LOE	L	TOEL		Tox Units	MSDu	PMSD
Untransformed	i		C > T					80	100	1	89.44		1.2	0.09674	16.49%
Dunnett Multi	ple	Comparison	Test		1										
Control	vs	Conc-%		df	Test Stat	Critical	MSD	P-Type	P-Va	lue	Decisi	on(α	:5%)		
Dilution Water	2	20		6	0.01876	2.407	0.09674	CDF	0.82	78	Non-Si	gnific	cant Effect		
		40		6	0.5537	2.407	0.09674	CDF	0.62	40	Non-Si	gnific	cant Effect		
		60		6	0.6221	2.407	0.09674	CDF	0.59	34	Non-Si	gnific	cant Effect		
		80		6	0.8524	2.407	0.09674	CDF	0.48		Non-Si	gnific	cant Effect		
		100*		6	8.809	2.407	0.09674	CDF	2.7E	-05	Signific	cant E	Effect		
Test Acceptal	oility	Criteria	TAC	Lir	nits										
Attribute		Test Stat	Lower		Upper	Overlap	Decision				_				
Control Resp		0.5868	0.25		>>	Yes	Passes Cr	iteria							
PMSD		0.1649	0.12		0.3	Yes	Passes Cr	iteria							
ANOVA Table	0													14	
Source		Sum Squa	ares		Mean Squ	lare	DF	F Stat	P-Va	lue	Decisi	on(α	:5%)		
Between		0.383565			0.076713		5	23.75	<1.0	E-05	Signific	ant E	Effect		
Error		0.0581447			0.0032303	3	18	_							
Total		0.44171					23								
ANOVA Assu	npti														
Attribute		Test					Test Stat	Critical	P-Va		Decisi				
Variance		Bartlett Eq					6.105	15.09	0.29		Equal				
Distribution		Shapiro-W	ilk W No	rma	lity Test		0.986	0.884	0.97	66	Norma	Dist	tribution		
Mean Dry Bio	mas														
Conc-%		Code	Count	_	Mean	95% LCL	95% UCL	Median	Min		Max	_	Std Err	CV%	%Effect
0		D	4		0.5868	0.5193	0.6542	0.5795	0.54		0.644		0.0212	7.22%	0.00%
20			4		0.586	0.5515	0.6205	0.583	0.56		0.614		0.01085	3.70%	0.13%
40			4		0.5645	0.4119	0.7171	0.5705	0.44		0.675		0.04796	16.99%	3.79%
60			4		0.5617	0.491	0.6325	0.5575	0.52		0.61		0.02223	7.91%	4.26%
80			4		0.5525	0.4853	0.6197	0.554	0.50		0.601		0.02111	7.64%	5.84%
100			4		0.2327	0.1302	0.3353	0.236	0.15	1	0.308	_	0.03223	27.69%	60.33%
Mean Dry Bio	mas														
Conc-%		Code	Rep 1	_	Rep 2	Rep 3	Rep 4								
0		D	0.644		0.57	0.589	0.544								
20			0.591		0.614	0.575	0.564								
40			0.675		0.583	0.558	0.442								
60 80			0.61		0.526	0.522	0.589								
80			0.601		0.501	0.541	0.567								
100			0.229		0.151	0.308	0.243								

Analyst: EW QA:

CETIS	S Ana	lyti	cal Repo	rt						Report Fest Co		01 Jul-25 12: 525317fhm / 1	
Fathea	d Minn	ow 7	'-d Larval Su	rvival and	Growth Te	st							rest Group
Analysi Analyzo Edit Da	ed:	01 J	9556-5134 Jul-25 12:34 Jul-25 0:00	Anal	ysis: Line	an Dry Bioma ear Interpolat 29A1E8077	tion (ICPIN)		F360114B		S Version: us Level: or ID:	: CETIS v2.1.6 1 000-346-492-2	
Batch I Start D Ending Test Le	ate: Date:	23 J 30 J			col: EPA	wth-Survival A/821/R-02-0 ephales pro nopterygii	13 (2002)			Analy Dilue Brine Sour	ent: Mo e: Not	d-Hard Synthetic Water Applicable House Culture	Age:
Linear	Interpo	atic	on Options										
X Trans	sform	١	Transform	Seed	i i	Resamples	Exp 95%	CL	Method				
Linear		L	inear	1401	857	1000	Yes		Two-Point	t Interpo	olation		
Test Ac	ceptat	oility	Criteria	TAC LI	mits								
Attribu	te		Test Stat	Lower	Upper	Overlap	Decision						
Control	Resp		0.5868	0.25	>>	Yes	Passes Ci	riteria					
Point E	stimat	es											
Level	%		95% LCL	95% UCL	Tox Units	95% LCL	95% UCL						
IC15	83.36	5	78.61	85.75	1.2	1.2	1.3						
IC20	85.2		80.8	87.67	1.2	1.1	1.2						
IC25	87.03	1000	82.8	89.66	1.1	1.1	1.2						
IC40	92.54		88.4	96.62	1.1	1	1.1						
IC50	96.21		91.75	101.7	1	1	1.1						
Mean D	ory Bio	mas	s-mg Summ	ary			Calculat	ted V	ariate			Isoto	nic Variate
Conc-%	6		Code	Count	Mean	Median	Min	Ma	x CV	%	%Effect	Mean	%Effect
0			D	4	0.5868	0.5795	0.544	0.64	44 7.2	2%	0.00%	0.5868	0.00%
20				4	0.586	0.583	0.564	0.6	14 3.7	'0%	0.13%	0.586	0.13%
40				4	0.5645	0.5705	0.442	0.6		.99%	3.79%	0.5645	3.79%
60				4	0.5617	0.5575	0.522	0.6		1%	4.26%	0.5617	4.26%
80				4	0.5525	0.554	0.501	0.6		4%	5.84%	0.5525	5.84%
100				4	0.2327	0.236	0.151	0.3	08 27.	.69%	60.33%	0.2327	60.33%
		mas	s-mg Detail										
Conc-%	6		Code	Rep 1	Rep 2	Rep 3	Rep 4						
0			D	0.644	0.57	0.589	0.544						
20				0.591	0.614	0.575	0.564						
40				0.675	0.583	0.558	0.442						
60				0.61	0.526	0.522	0.589						
80				0.601	0.501	0.541	0.567						
100				0.229	0.151	0.308	0.243						

Analyst EW QA:

Appendix 4 – QA/QC and Reference Toxicant Test Chart

Quality Assurance Check List – Chronic Whole Effluent Toxicity Test

Client:	Linkan Engineering-Schwartzwalder Mine
SeaCrest Sample No:	525317.B
Species Tested:	Ceriodaphnia dubia and fathead minnow

Sample Dates	Start Date of Test (<i>Ceriodaphnia dubia</i>)	Start Date of Test (fathead minnow)
06-23-2025		
06-24-2025		
06-25-2025	06-24-2025	06-23-2025

Sample received in lab properly preserved (0-6°C)?	N *
Sample received at laboratory within 36 hours of collection?	Y
Sample delivered on ice or equivalent?	Y
Test initiated within 36-hours of collection?	Y
Test protocol conforms to CDPHE guidelines (Ceriodaphnia dubia)?	Y
Test protocol conforms to CDPHE guidelines (fathead minnow)?	Y
Average test temp. ±1°C (Ceriodaphnia dubia)?	Y
Average test temp. ±1°C (fathead minnow)?	Y
DO level ≥4.0mg/L; no super-saturation (<i>Ceriodaphnia dubia</i>)?	Y
DO level ≥4.0mg/L; no super-saturation (fathead minnow)?	Y
Survival in control ≥80% (<i>Ceriodaphnia dubia</i>)?	Y
Survival in control ≥80% (fathead minnow)?	Y
Ceriodaphnia dubia neonates <24-hours old?	Y
Fathead minnow larvae <24-hours old?	Y
Appropriate reference toxicity test conducted?	Y
Reference toxicity test results within the confidence limits for the lab?	Y

* The samples were received at 8.7°C, 10.5°C and 10.8°C on the same day as sampling.

<u>Author</u>

Position: Aquatic Toxicologist II

Date July 2, 2025

at Cash-Quality Control

Date July 2, 2025

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QC LIMITS	± 5.00% + 5.00%	± 5.00%	± 5.00%	± 10.00%	± 10.00%	± 10.00%	± 10.00%	± 5.00, ± 20.00%	± 5.00%	± 5.00%	± 5.00%	± 5.00%	QC Limits	± 5.00%	± 5.00%	± 5.00%	± 5.00%	QC Limits	± 15%	± 15%	Catladh June 2, 2025
%RPD	-0.74% 2.79%	0.84%	-1.92%	1.01%	0.80%	-2.26%	-2.17%	0.00%	-2.32%	4.72%	-1.83%	-1.12%	%REC M2	98.57%	98.55%	98.55%	96.00%	%RPD	0.00%	0.00%	Signature: Date:
%REC	100.19% 100.97%	101.03%	101.97%	99.77%	95.17%	95.80%	97.84%	100.00%	102.97%	103.00%	103.00%	98.14%	%REC M1	100.00%	95.77%	95.77%	98.68%	%REC MR S	108.11%	114.50%	
LCS (rec)	104.80% 104.80%	104.00%	103.60%	96.60%	96.00%	104.00%	95.00%	97.48%	96.49%	96.50%	95.00%	103.51%	LCS (rec)	N/A	N/A	N/A	N/A	Blank	100.00%	100.00%	
Date	5/8/2025 5/14/2025	5/22/2025	5/28/2025	5/7/2025	5/14/2025	5/23/2025	5/27/2025	5/29/2025	5/9/2025	5/16/2025	5/23/2025	5/29/2025		5/8/2025	5/16/2025	5/24/2025	5/30/2025		5/26/2025	5/26/2025	2 Et
Analyte	Alkalinity - Total Alkalinity - Total	Alkalinity - Total	Alkalinity - Total	Ammonia	Ammonia	Ammonia	Ammonia	Chlorine	Hardness - Total	Hardness - Total	Hardness - Total	Hardness - Total		DO - Winkler	DO - Winkler	DO - Winkler	DO - Winkler		Suspended Solids (TTL)	Dissolved Solids (TTL)	Halley We
Method	2320 B 2320 B	2320 B	2320 B	4500 NH3 D	4500 NH3 D	4500 NH3 D	4500 NH3 D	4500 CI D	2340 B	2340 B	2340 B	2340 B		4500 O	4500 O	4500 O	4500 O		2540 D	2540 C	Signature: _ Date:

CO-0001244

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SeaCrest Group 500 S Arthur Ave. Suite 450 Louisville, CO 80027 (303) 661.9324 FAX (303) 661.9325

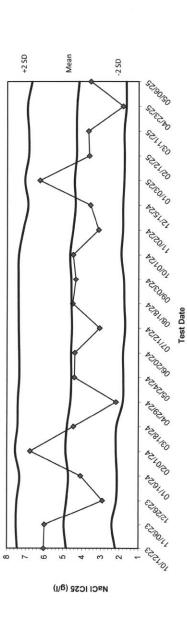
METHOD QC

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DAPHNIA SURVIVAL LC25 NaCI REFTOX	States and	2 SD 1.2784 1.2784 1.2767 1.2767 1.2774 1.2774 1.2774 1.2774 1.2774 1.2774 1.2774 1.2774 1.2774 1.2774 1.2774 1.2774 1.2774 1.2774 1.2774 1.2774 1.2774 1.2774 1.2774 1.2774 1.2774 1.2774 1.2774 1.2774 1.2774 1.2774 1.2774 1.2776 1.2776 1.2776 1.2776 1.2776 1.2776 1.2776 1.2776 1.2776 1.2776 1.2776 1.2776 1.2776 1.2776 1.2776 1.2776 1.2776 1.2776 1.2776 1.2776 1.2776 1.2776 1.2776 1.2776 1.2776 1.2776 1.2776 1.2776 1.2776 1.2776 1.2776 1.2776 1.2776 1.2776 1.2776 1.2776 1.2776 1.2766 1.4883 1.4865 1.4865 1.4866 1.4669 1.4273 1.4210 1.4210 1.4210 1.4210 1.4213 1.4210 1.4210 1.4213 1.4210 1.4213 1.4210 1.4213 1.4210 1.4210 1.4213 1.4210 1.4213 1.4210 1.4213 1.4213 1.4213 1.4213 1.4213 1.4213 1.4213 1.4213 1.4197 1.5383
SURVIVAL LC	RUIP OF CHARTER TO THE TOTAL	Mean Mean 20158 20158 20158 20158 20158 20578 20578 20578 21471 20055 21471 21474 21489 21130 211368 21130 21130 21658 21658 21658 22055 22055 22055
	School and anian anian anian	LC25 1425 25000 25000 25000 25000 25000 25000 25000 25000 25000 21250 23330 21250 21250 21250 21250 23330 23330 23330 23330 23330
CERIO	John Barton Contract (art)	Date Date 10/16/23 11/12/23 01/12/24 02/01/24 02/13/24 03/11/24 03/11/24 03/11/24 03/11/24 01/22/24 01/22/24 01/12/24 11/12/24 11/12/24 03/12/25 02/02/25 03/12/25 02/02/25 02/02/25

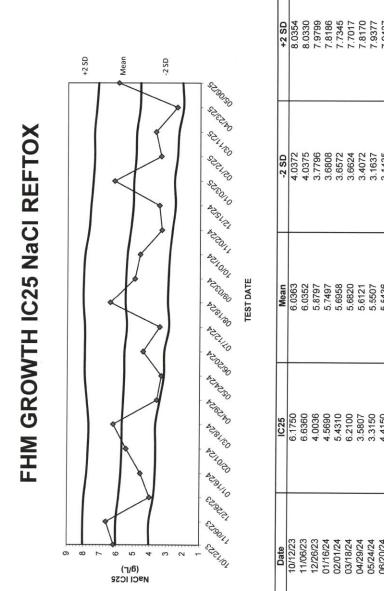
хо	+2 SD -2 SD	+2 SD	1.0878	1.082583628	1.0658	1.0560	1.0040	0.9962	1.0265	1.0252	1.0202	1.0545	1.0458	1.0478	1.0972	1.1309	1.1362	1.1295	1.1297	1.1256	1,1321
C25 NaCI REFT	63450 14040 93860 67090 67090	-2 SD	0.5450	0.547401472	0.5440	0.5477	0.5736	0.5/34	0.5204	0.5315	0.5279	0.5160	0.5161	0.5324	0.5208	0.5311	0.5133	0.4866	0.4860	0.5094	0.4950
CERIODAPHNIA REPRODUCTION IC25 NaCI REFTOX	01400 04050 04050 04050 10010 10160 04050 04050 10405 TESTDATE	Mean	0.8164	0.81499255	0.8049	0.8019	0.7888	0.7848	1225 J.D	0.7784	0.7741	0.7853	0.7810	0.7901	0.8090	0.8310	0.8248	0.8080	0.8078	0.8175	0.8135
ODAPHNIA RE	16890 014850 49160 49160 49160 49160	IC25	0.8875	0.9757	0.7500	0.9119	0.8302	0.7944	0.5070	0.6995	0.7430	1.0180	0.8050	0.8281	1.0932	1.0770	0.6303	0.6042	0.6646	0.8031	0.5799
CERI	0.947 0 0.947	Date	10/16/23	11/20/2023	12/11/23	01/02/24	02/01/24	03/11/24	04/10/24	06/21/24	07/12/24	08/25/24	09/13/24	10/18/24	11/02/24	12/13/24	01/02/25	02/06/25	03/12/25	04/25/25	05/09/25

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+2 SD	7.4487	7.5142	7.4725	7.3289	7.5596	7.4374	7.4222	7.3461	7.3510	7.3739	7.3867	7.3926	7.3779	7.1450	6.8841	7.0552	6.8545	6.8534	6.9172	6.6748
-2 SD	2.2221	2.4111	2.1721	2.1284	2.1868	2.1625	1.8268	1.8037	1.8168	1.7090	1.7560	1.7805	1.9181	1.8336	1.8292	1.7718	1.7493	1.7635	1.6502	1.6533
Mean	4.8354	4.9627	4.8223	4.7287	4.8732	4.7999	4.6245	4.5749	4.5839	4.5415	4.5714	4.5865	4.6480	4.4893	4.3567	4.4135	4.3019	4.3085	4.2837	4.1641
IC25	6.0360	6.0000	2.9120	4.0800	6.7670	4.4550	2.1900	4.4090	4.3800	3.0670	4.5000	4.3333	4.4760	3.1230	3.5620	6.2500	3.6250	3.6670	1.8150	3.5380
Date	10/12/23	11/06/23	12/26/23	01/16/24	02/01/24	03/18/24	04/29/24	05/24/24	06/20/24	07/12/24	08/18/24	09/03/24	10/01/24	11/02/24	12/15/24	01/03/25	02/12/25	03/11/25	04/23/25	05/06/25



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+2 SD	8.0354	8.0330	7.9799	7.8186	7.7345	7.7017	7.8170	7.9377	7.9437	7.9433	8.0376	8.0194	7.9423	7.7066	7.5935	7.4674	7.3809	7.3927	7.2567	7 1455
-2 SD	4.0372	4.0375	3.7796	3.6808	3.6572	3.6624	3.4072	3.1637	3.1435	2.8641	2.9474	2.9061	2.8281	2.6657	2.4899	2.5449	2.3681	2.2844	2.0116	2 0618
Mean	6.0363	6.0352	5.8797	5.7497	5.6958	5.6820	5.6121	5.5507	5.5436	5.4037	5.4925	5.4628	5.3852	5.1862	5.0417	5.0062	4.8745	4.8385	4.6342	4 6037
IC25	6.1750	6.6360	4.0036	4.5690	5.4310	6.2100	3.5807	3.3150	4.4150	3.4180	6.4180	4.9290	4.6060	3.3070	3.4660	6.1720	3.3550	3.6790	2.3840	5.9270
Date	10/12/23	11/06/23	12/26/23	01/16/24	02/01/24	03/18/24	04/29/24	05/24/24	06/20/24	07/12/24	08/18/24	09/03/24	10/01/24	11/02/24	12/15/24	01/03/25	02/12/25	03/11/25	04/23/25	05/06/25



SWO Q2 WET Test results

1 message

Chris Prosper <chris.prosper@linkan.com> To: "Hays - DNR, Peter" <peter.hays@state.co.us> Cc: Adam Billin <Adam.Billin@linkan.com>, Alex Schwiebert <alex.schwiebert@linkan.com> Mon, Jul 7, 2025 at 7:31 AM

Hello Peter,

I hope you had a great 4th of July. Attached is the WET test report from our Q2 WET test.

Let me know if you have any questions,

Thank you,

Chris Prosper

Engineer



Office: 775-777-8003

Cell: 719-247-0564

400 Corporate Circle • Suite H

Golden, Colorado 80401

An Employee-Owned Company

linkan.com • chris.prosper@linkan.com

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