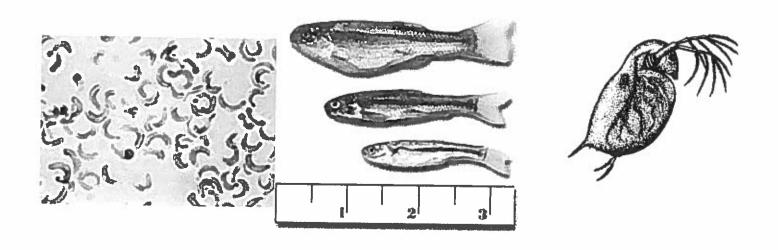
BIOMONITORING REPORT

FOR

CITY OF CALDWELL WWTP

LAB #1802032 PERMIT # ID0021504



January 2018

PREPARED BY:

ANALYTICAL LABORATORIES, INC. 1802 N. 33RD STREET BOISE, ID 83703 (208)342-5515

SUMMARY OF ANALYSES

CITY OF CALDWELL WWTP **JANUARY 2018**

PERMIT # ID0021504

The results for the Ceriodaphnia dubia reproduction study:

NOEC:

100%

LOEC:

>100%

IC25:

>100%

TUc:

The results for the Ceriodaphnia dubia survival study:

NOEC:

100%

LOEC:

>100%

IC25:

>100%

TUc: 1

Statistical analyses of survival and reproduction data for test method 1002.0 demonstrated that all concentrations tested were not significantly different from the controls and displayed no chronic toxicity.

Introduction

Toxicity analysis consisting of chronic bioassay EPA Test Method 1002.0 was conducted on effluent samples collected by the City of Caldwell WWTP. Samples were collected January 16, January 18, and January 19, 2018, as 24-hour effluent composites. Once collected, samples were sent immediately to Analytical Laboratories, Inc. for analyses. Effluent composites were collected in one-gallon jugs for solution renewal water and in one liter cubitainers for water chemistries testing. Samples were chilled during transport by the addition of cold packs to the coolers. Method 1002.0, utilizing the freshwater flea *Ceriodaphnia dubia*, was conducted on January 16, 2018 and completed on January 23, 2018. Testing was conducted according to Short-Term Methods for Estimating the Chronic Toxicity of Effluents and receiving Waters to Freshwater Organisms, Fourth Edition October 2002 EPA-821-R-02-013 and Standard Methods for the Examination of Water and Wastewater, 19th Edition.

Methods and Materials

Test methods are designed to estimate and measure chronic toxicity of whole and partial effluents to the model freshwater aquatic organisms, freshwater flea *Ceriodaphnia dubia* in a 7-day static renewal test. Test water was collected as 24-hour effluent composites using mechanical sampling equipment. Samples were then transported to the laboratory for analyses. Effluent was used; whole or combined, with artificially prepared dilution water to prepare dilution series. Dilution water was prepared (20% v/v Perrier Mineral Water in deionized water) to produce a moderately hard dilution of control water. Water was prepared in bulk 24 hours prior to analyses and was aerated continuously to increase dissolved oxygen.

For Test Method 1002.0, less than 24hr neonate Ceriodaphnia dubia were sent from Aquatic Biosystems Inc., Fort Collins, Colorado. Neonates were selected from a composite pool, inspected, and arranged in five dilutions and a control. Analyses at a static renewal were performed over seven consecutive days. Data obtained was used to determine NOEC, LOEC, IC25 and TUc for survival and reproduction (see Appendix I - Definition of Terms).

Test Design/Standard Conditions Method 1002.0

1. Test Type - static renewal (daily)

Collection #1 - Renewal Day 1 and 2 - January 16, 2018

Collection #2 - Renewal Day 3 and 4 - January 18, 2018

Collection #3 - Renewal Day 5 and 6 - January 19, 2018

Day 7 - Final counts and statistical review

2. Temperature - 25 +/- 1 degree Celsius.

3. Light Quality - Environmental Chamber Fisher/11-67966

4. Light Intensity - Incubation chamber (as above)

5. Photoperiod - 16 hours light; 8 hours dark

6. Test Chamber - 30 ml Comet Heavyweight Plastic Portion Cups

7. Renewal - All dilutions daily

8. Age - Neonates/less than 24 hours

9. Organisms per chamber - One

10. Replicates - Ten chambers/control and each dilution

11. Feeding - 0.1 ml YTC; 0.1 ml Selenastrum capricornutum

suspension - once daily

12. Dilution water - 20% v/v Perrier Mineral Water in deionized water

13. Concentrations used - 100%, 69.5%, 39%, 19.5%, 9.75 % and Control

14. Duration - Seven days

15. Endpoint - Survival/reproduction

16. Acceptability - 80% or greater of control survival / 60% of control produce

3rd brood / Average of 15 young/surviving female

17. Source of organisms - Aquatic Biosystems, Inc., Fort Collins, Colorado

Interpretation - Statistical Review

Statistical endpoints of data from Method 1002.0 were determined by the use of WET Analysis Spreadsheet v1.6.1. The EPA uses this spreadsheet to analyze valid WET test data to obtain acute and chronic test endpoints identified in EPA's WET test methods under the NPDES program. The test analyses performed by this statistical software compare the raw data of test and control concentrations and determine if there are any statistically significant differences. The software infers normality and variance from the raw data, and chooses the appropriate analytical methodology. This minimizes the effect that extraneous circumstances may have on the NOEC, LOEC, and IC25. TUc (Chronic Toxicity Units) values are calculated by the following formulas:

For survival endpoints: 100/NOEC
For all other test endpoints: 100/IC25

Results - Method 1002.0

During EPA Method 1002.0, survival and reproduction test using Ceriodaphnia dubia, survival and reproduction values from specific dilutions of collected effluent are measured and compared to values obtained from control individuals.

Statistical analyses of survival data for test method 1002.0 demonstrated that all concentrations tested were not significantly different from the controls and displayed no chronic toxicity.

Endpoints Determined - Method 1002.0

		<u>NOEC</u>	LOEC	IC25
Ceriodaphnia dubia	Survival	100%	>100%	>100%
	Reproduction	100%	>100%	>100%

The mortality was less than twenty percent (<20%) in controls. An average of at least 15 young per surviving female within three broods was established. Reproduction test was declared valid.

Test Quality Control

Quality control practices for effluent toxicity tests include certain precautions at each of the following steps:

- Effluent sampling and handling. Sampling containers prepared as per section 7 of
 <u>Methods for Measuring and Chronic Toxicity of Effluent to Freshwater and Marine
 Organisms</u> were provided to client. Insulated transportation containers with cooling
 packs to chill samples were provided.
- Condition of test organisms. Test organisms for Method 1002.0 are purchased from Aquatic Biosystems, Inc. in Fort Collins, Colorado, a state and federally approved aquatic test organism supplier.
- Conditions of test equipment. All test equipment used is maintained according to
 manufacturer's specifications. Equipment such as balances, thermometers, etc. is
 calibrated annually by outside sources and certificates are maintained. All equipment
 maintenance and calibrations are recorded and archived.
- Test conditions. Only test methods directly from EPA references or methodologies provided are used. Any deviations or alterations from these procedures are documented and approved prior to use.
- 5. Reference toxicants. Reference toxicants are used for both Methods 1000.0 and 1002.0. Sodium chloride is made up in dilution control water at prescribed concentrations and is used to determine toxicity for each method. Reference toxicants are run once per month to ensure consistency in test methodology. Quality control data is provided and a graphical representation over time is attached.
- Record Keeping. All raw data, data evaluation, and statistical analysis are included in report to client. Original hardcopies along with all test records are maintained at laboratory for client or future reference.

LIST OF TABLES AND APPENDICES

Table I - Ceriodaphnia dubia Survival and Reproduction Summary

Method 1002.0

Table II - Ceriodaphnia dubia Water Renewal Chemistries - Old pH

and Dissolved Oxygen

Table III - Effluent Water Composites - Chemistries Summary

Appendix I - Definition of Terms

Appendix II - Ceriodaphnia dubia Raw Data

Appendix III - Effluent Samples Chain of Custodies & Chemistries

Reports

Appendix IV - NPDES WETT Permit Requirements

Appendix V - Organisms - Transfer Sheets

Appendix VI - Literature Cited

Appendix VII - Reference Toxicants Data and Graphs

CITY OF CALDWELL WWTP LAB ID #1802032 JANUARY 2018

METHOD 1002.0

Concentration	Initial Count	48-hour Count	96-hour Count	Final Count	Percent Survival	Average Remaining Young/Female
Control	10	10	10	10	100%	25.1
9.75%	10	10	10	10	100%	22.4
19.5%	10	10	10	10	100%	23.5
39%	10	10	10	10	100%	23.0
69.5%	10	10	10	8	80%	22.0
100%	10	10	10	9	90%	20.4

Table I: Ceriodaphnia dubia Survival And Reproduction Summary

Concentration	Cor	itrol	9.75%		19.	19.5%		%	69.5%		100%	
Day	DO	pН	DO	pН	DO	pН	DO	pН	DO	pН	DO	_ pH
1	7.7	8.1	7.8	8.2	7.7	8.3	7.5	8.3	7.6	8.4	7.8	8.5
2	7.5	8.2	7.4	8.2	7.2	8.2	6.8	8.3	7.5	8.3	7.0	8.4
3	7.6	8.3	7.3	8.3	7.3	8.3	7.3	8.3	7.3	8.4	7.3	8.4
4	7.7	8.4	7.4	8.4	7.4	8.4	7.5	8.4	7.6	8.5	7.7	8.5
5	7.9	8.1	7.8	8.3	7.7	8.3	7.8	8.4	7.9	8.5	7.9	8.5
6	8.2	8.0	8.2	8.2	8.2	8.3	8.3	8.3	8.3	8.4	8.4	8.5
7	7.6	8.0	7.3	8.2	7.4	8.1	7.3	8.2	7.7	8.3	7.7	8.4

Table II: Water Chemistries, Daily Renewals - Old Water pH & Dissolved Oxygen Values

Concentration	CHLORINE RESIDUAL	ALKALINITY	CONDUCTIVITY	HARDNESS	AMMONIA	рН
	(mg/L)	(mg/L)	(umhos)	(mg/L)	(mg/L)	S.U.
1/16/2018	< 0.10	194	780	153	0.05	7.2
1/18/2018	< 0.10	187	756	153	< 0.04	7.0
1/19/2018	<0.10	190	773	152	<0.04	7.4

Table III: Dilution Chemistries Summary

Definition of Terms

- 1. <u>Safe Concentration</u>. The highest concentrations of toxicant that will permit normal propagation of fish and other aquatic life in receiving waters, biologically defined rather than statistically.
- NOEC (No-Observed Effect Concentration) The highest concentration of toxicant in which the values for the observed parameters (survival, growth, reproduction) in which there is no statistically significant difference from controls and no observable effect on organism behavior or health.
- 3. LOEC (Lowest-Observed Effect Concentration) The lowest concentration of toxicant in which the values for the observed parameters (survival, growth, reproduction) do have a statistical significant difference from controls. At this concentration there is evidence of toxicity.
- 4. <u>TUc</u> (chronic toxicity units) –100/IC25
- IC25 (Inhibition concentration 25%) Concentration where at least 25% of the organisms have some statistically significant effect.

Taken from: <u>Short-Term methods for Estimating the Chronic Toxicity of Effluents</u> and receiving Waters to Freshwater Organisms, Fourth Edition. October 2002. <u>EPA-821-R-02-013</u>.

PAGE / OF T

BENCH SHEET FOR CERIODAPHNIA SURVIVAL/REPRODUCTION TEST. EPA Method 1002.0

LAB ID# 1802031

Analyst: Co Brown

Final Report Review: 5c

Discharged: Effluent

Test Start Date/Time: 1/16/18 / 16/30
Test Stop Date/Time: 1/23/18 , 14/36

Description: City of Caldust wwife
Temp Received: Day 1: 7.3°C Day 2: 5.5°C Day 3: 3.9°C

Description: City of Caldust wwife

Test Stop Dates

Test Stop Dates

Renewal Lab Numbers: Day 0 & 1: 2032 Day 2 & 3: 2540 Day 4, 5 & 6: 2819

Conc	Control	
	-011101	

Day-Lab #	1	2	3	4	5	6	7	8	9	10	# Young	New D.O.	New pH	Old D.O.	Old pH	Daily Temp
0-	/	/		/	/	/	/	1	/	1		7.7	80]	•	24.3
1-	/		~	/	/	/	_/	/	/	/		7.8	7.9	7.7	8.1	23.4
2- Vc	1/1/10	1/1		/	/	/	/	/	/	1		7.4	8.0	7.5	8.2	24.1
3- 45	1/44	1/4	1/5	1/2	1/4	<u>/</u>	/	/	/	1	20	7.4	8.2	7.6	8.3	23.5
4-	2/	2/	V	1	2/	1/4	1/4	74	1/3	1/4	19	7.7	8.2	7.7	8.4	23.2
5-	2/10	2/7	<i>7</i> /g	2/2	2/7	2/7	2/5	2/7	V	V	57	7.8	7.9	7,9	8.1	23.4
7-	3/14	3/11	3/12	3/7	3/13		V	V		2/9	72	8.0	8-1	8.2	8.0	23.0
	V	/	/	/	/	3/19	3/16	3/14	3/16	3/18	83		-	7.6	8.0	
Total	29	22	25	15	24	30	25	25	25	31	251		,			•
M/F	F									>						

Conc 9.75%

Day-Lab #	1	2	3	4	5	6	7	8	9	10	# Young	New D.O.	New pH	Old D.O.	Old pH	Daily Temp
0-	/	/		/		/	/	/	/	/		0.8	7.9]		23.6
1-		/	/		/	/	/	/	1	1		7.9	7.9	7.8	8.2	23.4
2-		/	/	V	1	/	/	/	/	/		7.6	8.0	7.4	8,2	24.2
3-	/		/	/	/	/	/	1/4	/	/	4	7.5	8.1	7.3	8.3	23.5
4-	1/3	1/4	1/4	1/4	1/3	74	/	/	1/4	1/4	30	7.9	8.1	7.4	8.4	23,2
5-		3/5	V	V	V	V	/	3/6	3/4	3/6	21	7.9	8.1	7.8	8,3	23.6
6-	/		3/4	3/7	7/10	2/4		3/7	V	1	37	8,1	8.0	8.2	8.2	23.6
7-	2/14	3/12	3/17	3/13	3/13	3/12	V	1	3/15	3/14				7.3	8.2	
Total	17	21	25	24	26	25	0	17	23	24	202		١	·		I
M/F	F-						M	6			~~ Ø					

Conc /9.5%

Day-Lab#	1	2	3	4	5	6	7	8	9	10	# Young	New D.O.	New pH	Old D.O.	Old pH	Daily Temp
0-	/	/	/	1	1	/	/	1	1	1		8.2	7.8]	.	23.7
1-		/	/	/	/	/	/	/	1	/		8.0	7.9	7.7	8.3	23.4
2-	/		/			/	/	/	/			7.7	7.9	7.2	8.2	24.1
3-	/	1/4	1/4	1/4	/	/	/	V	/	/	12	7.6	7.9	7.3	8.3	23.4
<u>4-</u>	1/4	V	2/4	/	1/3	1/2	1/3	1/4	1/3	1/3	26	8.0	8.0	7.4	8.4	23.0
5-	V	2/6	3/5	3/7	V	V	V	2/6	2/5	V	29	8.1	8.0	7.7	8.3	23.5
6-	3/11	3/4	V _C p	3/4	3/9	2/9	2/7	/			<i>१५4 H</i>		8.0	8.2		23.4
7-	3/12	/	\$/17	/	3/11	3/9	3/14	3/10	3/13	3/18	48710	4		7.4	8.1	
Total	27	19	30	20	23	20	24	20	21	31	235		,			
M/E	6															

PAGE 2 OF 2

BENCH SHEET FOR CERIODAPHNIA SURVIVAL/REPRODUCTION TEST. EPA Method 1002.0

LAB ID# 1802032 Discharged: Ettluent

Analyst: co row Final Report Review: 5C

Test Start Date/Time: 1/16/18, 1630

Description: City of Calduell WWP

Test Stop Date/Time: 1/23/18, 1430

Temp Received: Day 1: 7.3°c Day 2: 5.5°c Day 3: 3.9°c

Renewal Lab Numbers: Day 0 & 1: 2031 Day 2 & 3: 2540 Day 4, 5 & 6: 2819

Conc	39	1	7.

Day-Lab #	1	2	3	4	5	6	7	8	9	10	# Young	New D.O.	New pH	Old D.O.	Old pH	Daily Temp
0-	/	-/	/-	/	/	/	/	/	/	/		8.5	7.7]		23.5
1-	/	/	/	/	/	/	/			/		8.3	7.8	7.5	8.3	23,2
2-	/	/	/	/		/	/	/	1	/		8.0	7.7	6.8	8.3	24.1
3-	1/1	/	1		/		1	/	/	1	1	7.8	7.8	7.3	8.3	23.3
4-	V	1/3	1/2	1/4	74	1/5	1/3	1/3	1/4	74	32	8.4	7.8	7.5	8.4	23,0
5	3/5	3/4	V	3/5	/	/	3/5		2/6	V	25	7.9	8.0	7.8	8.4	23.5
6-	3/6	V	2/8	_/	2/5	2/8	/	34	V	2/8	39	8.9	7.9	8.3	8.3	23.3
7-	/	3/16	3/14	3/17	3/19	3/14	3/15	3/15	3/13	3/10	133			7.3	8.2	
Total	12	23	24	26	28	27	23	22	23	22	230					•
M/F	F-											1				

Conc 69.5%

Day-Lab #	1	2	3	4	5	6	7	8	9	10	# Young	New D.O.	New pH	Old D.O.	Old pH	Daily Temp
0-	/	/	/	/	/	1	/	/	/	/		9.0	7.6]		235
1-	1	/		/	/	/	/	/	/	/		8.6	7.7	7.6	8.4	1-
2-	/	/		/	/	/	/	/	/			8.6	7.6	7.5	8.3	24.0
3-	'/	/	/	/	/	/	/	/	1	1	1	8.2	7.6	7.3	8.4	23,3
4-	/	1/1	1/1	1/4	1/2	1/3	1/3	1/4	74	1/2	42420	8.9	7.6	7.6	8.5	23.0
5	2/3	3/4	3/3	V	Ŋ	/		V	3/4	2/5	14	g.g	7.8	7.9	8.5	23,3
6-	2/3	/	√	2/6		3/11	3/9	2/5	2/1	۵	35	9.5	7.9	83	_	23.3
7-	/	3/14	3/17	3/15	V	3/15	3/12	3/19	3/14	1	106			7.7	8.3	
Total	7	19	21	25	0	29	24	28	23	0	176				,	1
A 4 /57					-							ı				

Conc / 00%

Day-Lab #	1	2	3	4	5	6	7	8	9	10	# Young	New D.O.	New pH	Old D.O.	Old pH	Daily Temp
0-	/	/	/	1	/	/	1	/	/	/		8.8	7.7]		23.4
1-	/	1	/	1	/			/	/			8.5	7.7	7.8	8.5	23.1
2-		/	/	1		/	1	/	/	1		8.4	7.6	7.0	8.4	24.1
3-	1/2	/	/	1/2	/		/	/	/	/	4	8.1	7.6	7.3	8.4	23.3
4-	/	1/3	1/3	/	1/3	/	72	1/4	1/4	14	19	9.2	7.8	7.7	8.5	22.9
5-	26	2/2	3%	2/5	3/2	1/2	3/6	V	V	2/4	37	8.2	7.7	7.9	8.5	23.3
6-	3/11	/	<u> </u>	3/7	3/2	2/3	LV	3/6	D	V	34	10.0	78	Q.4	8.5	23.2
7-	1	3/14	3/15	/	3/13	/	3/14	3/14	V	3/15	85			7.7	8.4	
Total	19	23	24	14	20	15	22	24	0	23	184					,

Facility

Analytical Laboratories

Test ID Date

IWC Conc.

1802032 City of Caldwell WWTP

1/24/2018

Analyst

Chris Pate

Species Ceriodaphnia dubia (water flea)

Test Type Reproduction

Input

		<u></u>	Concen	trations			
Replicate	<u>0</u>	<u>9.75</u>	<u> 19.5</u>	<u>39</u>	<u>69.5</u>	100	
1	29	17	27	12	7	19	
2	22	21	19	23	19	23	
3	25	25	30	24	21	24	
4	15	24	20	26	25	14	
5	24	26	23	28	29	20	
6	30	25	20	27	24	15	
7	25	17	24	23	28	22	
8	25	23	20	22	23	24	
9	25	24	21	23		23	
10	31		31	22			

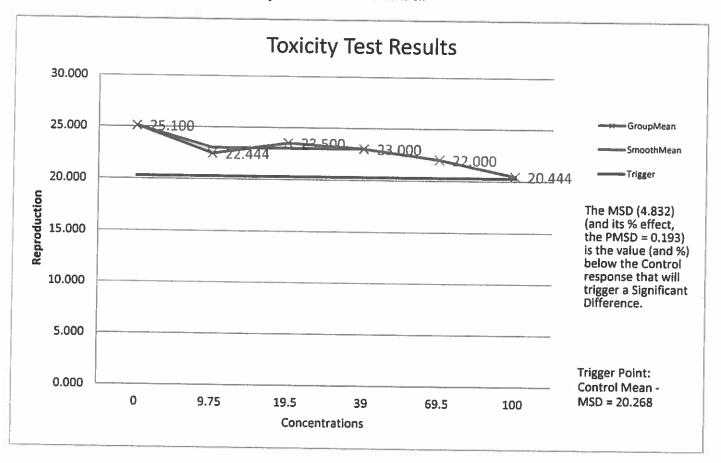
Stdev	4.557	3.395	4.403	4.397	6.908	3.779
Output						
Statistical Data	Conc.	Mean	Stdev	CV	 .	T-test
	0	25.100	4.557	0.182		
	9.75	22.444	3.395	0.151		NS
	19.5	23.500	4.403	0.187		NS
	39	23.000	4.397	0.191		NS
	69.5	22.000	6.908	0.314		NS
	100	20.444	3.779	0.185		NS
NOEC	LOEC		IC25	95% Confi	idence Interv	als
100	>100	·	>100	N/A	N/A	
тѕт	Calculated t	-value	Table t-val	iue	Relative %	Effect at IWC

MSD

4.832

PMSD 19.3%

Note - For statistical tests, "NS" indicates that the concentration is not statistically different from the control, while "Y" indicates that the concentration is statistically different from the control.



NOTICE

The United States Environmental Protection Agency (EPA), through its Office of Wastewater Management, funded and managed the development of the whole effluent toxicity (WET) Tool described here. This is a tool that calculates WET test endpoints for the EPA-approved WET test methods and is used by EPA internally for analyzing valid WET test data. Neither the EPA nor any of their employees, assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information or process disclosed. Furthermore, the WET Tool is supplied "as-is" without guarantee or warranty, expressed or implied, including without limitation, any warranty of merchantability or fitness for a specific purpose.

Facility

Analytical Laboratories

Test ID Date

1802032 City of Caldwell WWTP

1/24/2018

Analyst

Species Ceriodaphnia dubia (water flea)

Test Type Chronic Survival

Chris Pate

IWC Conc.

Input

	ipat .							
N	umber of Organis	sms Expose	d or Counted					
				Concen	trations			
	Replicate	Q	<u>9.75</u>	<u>19.5</u>	<u>39</u>	<u>69.5</u>	<u>100</u>	
	1	1	1	1	1	1	1	
	2	1	1	1	1	1	1	
	3	1	1	1	1	1	1	
	4	1	1	1	1	1	1	
	5	1	1	1	1	1	1	
	6	1	1	1	1	1	1	
	7	1	1	1	1	1	1	
	8	1	1	1	1	1	1	
	9	1	1	1	1	1	1	
	10	1	1	1	1	1	4	

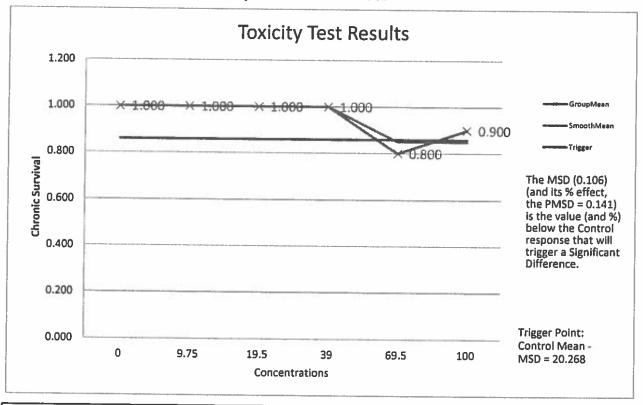
Number of Organisms Surviving or Responding

			Concen	trations		
Replicate	<u>0</u>	<u>9.75</u>	<u>19.5</u>	<u>39</u>	<u>69.5</u>	100
1	1	1	1	1	1	1
2	1	1	1	1	1	1
3	1	1	1	1	1	1
4	1	1	1	1	1	1
5	1	1	1	1	0	1
6	1	1	1	1	1	1
7	1	1	1	1	1	1
8	1	1	1	1	1	1
9	1	1	1	1	1	0
10	1	1	1	1	n	1

Total Organisms Total Responding	10 10	10 10	10 10	10 10	10 8	10 9
% Responding	100.0%	100.0%	100.0%	100.0%	80.0%	90.0%
Output						

Statistical Data	Conc.	Mean	Stdev	CV	Steel test
	0	1.047	0.000	0.000	3.537.1031
Statistics are based on	9.75	1.047	0.000	0.000	NS
the transformed data	19.5	1.047	0.000	0.000	NS
used for endpoint	39	1.047	0.000	0.000	NS
calculations	69.5	0.942	0.221	0.234	NS
	100	0.995	0.166	0.166	NS
NOEC	LOEC		IC25	95% Conf	fidence Intervals
100	>100	-	>100	N/A	N/A
тѕт	Calculated t	-value	Table t-va	lue	Relative % Effect at IWC
MSD	PMSD				

Note - For statistical tests, "NS" indicates that the concentration is not statistically different from the control, while "Y" indicates that the concentration is statistically different from the control.



NOTICE

The United States Environmental Protection Agency (EPA), through its Office of Wastewater Management, funded and managed the development of the whole effluent toxicity (WET) Tool described here. This is a tool that calculates WET test endpoints for the EPA-approved WET test methods and is used by EPA internally for analyzing valid WET test data. Neither the EPA nor any of their employees, assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information or process disclosed. Furthermore, the WET Tool is supplied "as-is" without guarantee or warranty, expressed or implied, including without limitation, any warranty of merchantability or fitness for a specific purpose.

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Analytical Laboratories, Inc.

1804 N. 33rd Street Boise, Idaho 83703 Phone (208) 342-5515

Date Report Printed:

1/25/2018 7:08:10 AM

http://www.analyticallaboratories.com

These test results relate only to the items tested.

Laboratory Analysis Report

Sample Number: 1802032

Collected By: R. HAWKER

Attn: SALVADOR ARREOLA **CALDWELL WASTEWATER**

PO BOX 1179

Submitted By: B. MILLER

CALDWELL, ID 83607

Source of Sample:

FE-C BIO-MONITORING DAY 1

Time of Collection:

8:13

Date of Collection:

1/16/2018

Date Received:

1/16/2018

Report Date:

1/25/2018

Field pH:

Lab pH:

PWS#:

Field Temp:

Temp Revd in Lab: 7.3 °C

PWS Name:

Test Requested	MCL	Analysis Result	Units	MDL	Method	Date Completed	Analyst
Ceriodaphnia dubia		*			EPA 1002.0	1/24/2018	СР
Ammonia Direct (as N)		0.05	mg/L	0.04	EPA 350.1	1/22/2018	SMC
Alkalinity		194	mg/L		EPA 310.1	1/23/2018	SMC
Chlorine Residual, C12		< 0.10	mg/L	0.10	EPA 330.5	1/16/2018	JD
Conductivity		780	umhos	2	EPA 120.1	1/16/2018	JMS
Hardness		153	mg/L	5.0	SM 2340	1/23/2018	SMC
рН		7.2	S.U.		SM 4500-H B	1/16/2018	JMS

Email: sarreola@ci.caldwell.id.us

MCL = Maximum Contamination Level MDL = Method/Minimum Detection Limit

UR = Unregulated

Thank you for choosing Analytical Laboratories for your testing needs.

If you have any questions about this report, or any future analytical needs, please contact your client manager;

James Hibbs

CLIENT CODE - C.A. L.) W. I.V.

CHAIN OF CUSTODY RECORD

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Analytical Laboratories, Inc.

1804 N. 33rd Street Boise, Idaho 83703 Phone (208) 342-5515

Attn: SALVADOR ARREOLA

CALDWELL WASTEWATER

Date Report Printed:

1/25/2018 7:14:34 AM

http://www.analyticallaboratories.com

These test results relate only to the items tested,

Laboratory Analysis Report

Sample Number: 1802540

Collected By:

R. HAWKER

Submitted By: B. MILLER

PO BOX 1179

CALDWELL, ID 83607

Source of Sample:

FE-C BIO-MONITORING DAY 2

Time of Collection:

7:32

Date of Collection:

1/18/2018

Date Received:

1/18/2018

Report Date:

1/25/2018

Field pH: Field Temp: Lab pH:

Temp Revd in Lab: 5.5 °C

PWS#:

PWS Name:

Test Requested	MCL	Analysis	Units	MDL	Method	Date	Analyst
rest Requested	Wich	Result	Cinto	ME	17101100	Completed	
Ammonia Direct (as N)		<0.04	mg/L	0.04	EPA 350.1	1/22/2018	SMC
Alkalinity		187	mg/L		EPA 310.1	1/23/2018	SMC
Chlorine Residual, Cl2		<0.10	mg/L	0.10	EPA 330.5	1/18/2018	RME
Conductivity		756	umhos	2	EPA 120.1	1/18/2018	RME
Hardness		153	mg/L	5.0	SM 2340	1/23/2018	SMC
рН		7.0	S.U.		SM 4500-H B	1/18/2018	RME

Email: sarreola@ci.caldwell.id.us

MCL = Maximum Contamination Level

MDL = Method/Minimum Detection Limit

UR = Unregulated

RECOL CUSTAS C.O. JAMES HEBBS

Thank you for choosing Analytical Laboratories for your testing needs,

If you have any questions about this report, or any future analytical needs, please contact your client manager;

James Hibbs

CHAIN OF CUSTODY RECORD

ORD	ANALYTICAL LABS, INC. 1804 N. 33rd Street Boise, ID 83703	(208) 342-5515 • Fax: (208) 342-5591 • 1-800-574-5773 Website: www.analyticallaboratories.com	E-mail: ali@analyticallaboratories.com TESTS REQUESTED				ACTA OS CONTOCA Remarks:	X X X X X X X X X X X X X X X X X X X	X							ALLOCATIONS OF RISK: Analytical Laboratories, Inc. will perform preparation and testing services, obtain findings and prepare reports in accordance with Good Laboratory Practices (GLP). If, for any reason, Analytical Laboratories, Inc. errors in the conduct of a test or procedure, their liability shall be limited to the cost of the test or procedure completed in error. Under no circumstances will Analytical Laboratories, Inc. be liable for any other cost associated with obtaining a sample or use of data.		Date: Time: 1-19-15 05:10	Date: Time: 1-19-18 1010	Date: 1-19-18 1145	71/19/18, Time:	NA) Temperature Received: 3.9°C Condition: Gasol
IN OF CUSTODY RECORD	PROJECT INFORMATION: me:		Number:	ite:		int) C. Pate		WATER X	WATER						Special instructions:	testing services, obtain findings and prepare rey shall be limited to the cost of the test or proce	amples will be returned to client or di	CALDA/	Pate Company:	of the Company: ALT	Tula Company: A	YELLOW: LAB Intact: Y I N I (NA YELLOW: LAB
CHAIN	PROJE Project Name:	PWS Number:	Purchase Order Number:	Required Due Date:	E-mail Address:	Transported by: (Please print)	Sample Description (Source)	-up	ی	BAV-UP Halow	L' & Black	:				Inc. will perform preparation and test if a test or procedure, their liability sh ig a sample or use of data.	ssuits are reported. Hazardous s	Print Name:	ו א	Print Name:	Print Mame:	BITS: ACP Chains of Custody S WHITE: STAYS WITH SAMPLE (S)
CLIENT CODE=	Project Manager: Sol Averso	3	000	Colower In 82 feed	Fax:	by: (Please print)	Lab ID Date Time Sampled		2819 1-19-18 1747 FE-C	NO 0111 81/8/11 2/82	@ @ 8182				Invoice to: (If different than above address)	ALLOCATIONS OF RISK: Analytical Laboratories, Inc. will perform preparation and Analytical Laboratories, Inc. errors in the conduct of a test or procedure, their liability be liable for any other cost associated with obtaining a sample or use of data.	Note: Samples are discarded 21 days after results are reported. Hazardous samples will be returned to client or disposed of at client expense.	Relinguished By: (SignaRire)	Received By: (Signature)	Relinquished By: (Signapare)	Received By: (Signature)	SAMPLE RECEIPT Total # of Containers: REV. 219112 WHI

Analytical Laboratories, Inc.

1804 N. 33rd Street Boise, Idaho 83703 Phone (208) 342-5515

Date Report Printed:

1/30/2018 8:06:40 AM

http://www.analyticallaboratories.com

These test results relate only to the items tested.

Laboratory Analysis Report

Sample Number: 1802819

Attn: SALVADOR ARREOLA

CALDWELL WASTEWATER PO BOX 1179

CALDWELL, ID 83607

Collected By: R. HAWKER

Submitted By: C. PATE

Source of Sample:

FE-C BIO MONITORING DAY 3

Time of Collection:

7:47

Date of Collection:

1/19/2018

Date Received:

1/19/2018

Report Date:

1/30/2018

Field pH:

Lab pH:

PWS#:

Field Temp:

Temp Revd in Lab: 3.9 °C

PWS Name:

Test Requested	MCL	Analysis Result	Units	MDL	Method	Date Completed	Analys
Ammonia Direct (as N)		<0.04	mg/L	0.04	EPA 350.1	1/29/2018	SMC
Alkalinity		190	mg/L		EPA 310.1	1/23/2018	SMC
Chlorine Residual, Cl2		< 0.10	mg/L	0.10	EPA 330.5	1/19/2018	JН
Conductivity		773	umhos	2	EPA 120.1	1/19/2018	JH
Hardness		152	mg/L	5.0	SM 2340	1/23/2018	SMC
pН		7.4	S.U.		SM 4500-H B	1/19/2018	JH

Email: sarreola@ci.caldwell,id,us

MCL = Maximum Contamination Level

PEXEL CUTES C.O. JAMES HIBBS

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Permit No.: ID0021504

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T	able 3: Total Phosphor	us Interim Effluent Limits and Compliance Schedule Dates
		Complete Bidding
6	January 31, 2024	Deliverable: The permittee will provide DEQ and EPA with written notice that the Bid has been awarded.
		Start Construction
7	April 30, 2024	Deliverable: The permittee will provide DEQ and EPA with a copy of the Notice to Proceed with construction.
8	April 30, 2026	Complete Construction Deliverable: The permittee will provide DEQ and EPA with written notice that the construction is completed.
9	September 30, 2026	Process Optimization and Achieve Final Effluent Limitation Deliverable: The permittee must achieve compliance with the final effluent limitations and provide DEQ and EPA with written notice of compliance with final effluent limitations.

Notes

2. The annual average total phosphorus concentration and load must be reported on the December DMR.

D. Whole Effluent Toxicity Testing Requirements

The permittee must conduct chronic toxicity tests on effluent samples from outfall 001. Testing must be conducted in accordance with subsections 1 through 7, below.

1. Toxicity testing must be conducted on 24-hour composite samples of effluent. In addition, a split of each sample collected must be analyzed for the chemical and physical parameters required in Part I.B, above, with a required effluent sampling frequency of once per month or more frequently, using the sample type required in Part I.B. For parameters for which grab samples are required in Part I.B, grab samples must be taken during the same 24-hour period as the 24-hour composite sample used for the toxicity tests. When the timing of sample collection coincides with that of the sampling required in Part I.B, analysis of the split sample will fulfill the requirements of Part I.B as well.

2. Chronic Test Species and Methods

- a) For outfall 001, chronic tests must be conducted once per quarter. Quarters are defined as January – March, April through June, July – September, and October – December.
- b) The permittee must conduct short-term tests with the water flea, Ceriodaphnia dubia (survival and reproduction test), the fathead minnow, Pimephales promelas (larval survival and growth test), and a green alga, Selenastrum capricornutum (growth test) for the first three suites of tests. After this screening period, monitoring must be conducted using the most sensitive species, which is defined below.

^{1.} The annual average total phosphorus concentration and load must be calculated as the sum of all daily discharges measured for total phosphorus during a calendar year, divided by the number of daily discharges measured for total phosphorus during that year.

Permit No.: ID0021504 Page 12 of 51

- (i) The most sensitive species is the species which, during the screening period, produces the greatest maximum toxicity result in chronic toxic units (TU_c), which is defined in Part I.D.2.d, below.
- (ii) If all three species produce the identical maximum toxicity result (including no toxicity in 100% effluent) the permittee must use Ceriodaphnia dubia for subsequent tests.
- (iii) If two species produce the identical maximum toxicity result, which is greater than 1.0 TU_c and also greater than the maximum toxicity result of the third species, the permittee may use either of the two species producing the greater maximum toxicity result for subsequent tests.
- c) The presence of chronic toxicity must be determined as specified in Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, Fourth Edition, EPA/821-R-02-013, October 2002.
- d) Results must be reported in TUc (chronic toxic units), which is defined as follows:
 - (i) For survival endpoints, $TU_c = 100/NOEC$.
 - (ii) For all other test endpoints, $TU_c = 100/IC_{25}$.
 - (iii) IC₂₅ means "25% inhibition concentration." The IC₂₅ is a point estimate of the toxicant concentration, expressed in percent effluent, that causes a 25% reduction in a non-quantal biological measurement (e.g., reproduction or growth) calculated from a continuous model (e.g., Interpolation Method).
 - (iv) NOEC means "no observed effect concentration." The NOEC is the highest concentration of toxicant, expressed in percent effluent, to which organisms are exposed in a chronic toxicity test [full life-cycle or partial life-cycle (short term) test], that causes no observable adverse effects on the test organisms (i.e., the highest concentration of effluent in which the values for the observed responses are not statistically significantly different from the controls).

3. Quality Assurance

- a) The toxicity testing on each organism must include a series of five test dilutions and a control. The dilution series must include the receiving water concentration (RWC), which is the dilution associated with the average monthly whole effluent toxicity limits, two dilutions above the RWC, and two dilutions below the RWC. The RWCs are:
 - (i) 62% effluent for April June
 - (ii) 39% effluent for July March Control, 9.75%, 19.5%, 39%, 69.5%, 100%
- b) All quality assurance criteria and statistical analyses used for chronic tests and reference toxicant tests must be in accordance with Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to

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Freshwater Organisms, Fourth Edition, EPA/821-R-02-013, October 2002, and individual test protocols.

- c) In addition to those quality assurance measures specified in the methodology, the following quality assurance procedures must be followed:
 - (i) If organisms are not cultured in-house, concurrent testing with reference toxicants must be conducted. If organisms are cultured in-house, monthly reference toxicant testing is sufficient. Reference toxicant tests must be conducted using the same test conditions as the effluent toxicity tests.
 - (ii) If either of the reference toxicant tests or the effluent tests do not meet all test acceptability criteria as specified in the test methods manual, the permittee must re-sample and re-test within 14 days of receipt of the test results.
 - (iii) Control and dilution water must be receiving water or lab water, as appropriate, as described in the manual. If the dilution water used is different from the culture water, a second control, using culture water must also be used. Receiving water may be used as control and dilution water upon notification of EPA and IDEQ. In no case shall water that has not met test acceptability criteria be used for either dilution or control.

4. Reporting

- a) The permittee must submit the results of the toxicity tests with the discharge monitoring reports (DMRs). Results must be reported on the DMRs for the last month of the quarter in which the samples were taken.
- b) The report of toxicity test results must include all relevant information outlined in Section 10, Report Preparation, of Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, Fourth Edition, EPA/821-R-02-013, October 2002. In addition to toxicity test results, the permittee must report: dates of sample collection and initiation of each test; flow rate at the time of sample collection; and the results of the monitoring required in Part I.B of this permit, for parameters with a required monitoring frequency of once per month or more frequently.
- 5. Preparation of initial investigation toxicity reduction evaluation (TRE) workplan: By January 31, 2017, the permittee must submit to EPA a copy of the permittee's initial investigation TRE workplan. This plan shall describe the steps the permittee intends to follow in the event that chronic toxicity is detected above the applicable effluent limits in Table 1 of this permit, and must include at a minimum:
 - A description of the investigation and evaluation techniques that would be used to identify potential causes/sources of toxicity, effluent variability, treatment system efficiency;

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b) A description of the facility's method of maximizing in-house treatment efficiency, good housekeeping practices, and a list of all chemicals used in operation of the facility; and

- c) If a toxicity identification evaluation (TIE) is necessary, who will conduct it (i.e., in-house or other).
- d) The initial investigation TRE workplan must be sent to the following address:

US EPA Region 10 Attn: NPDES WET Coordinator 1200 Sixth Avenue Suite 900 OWW-191 Seattle, WA 98101-3140

- 6. Accelerated testing: If chronic toxicity is detected above the applicable average monthly limit for whole effluent toxicity in Part I.B or I.C of this permit, the permittee must comply with the following:
 - a) The permittee must conduct six more bi-weekly (every two weeks) chronic toxicity tests, over a 12-week period. This accelerated testing shall be initiated within 10 calendar days of receipt of the test results indicating the initial exceedance.
 - b) The permittee must notify EPA of the exceedance in writing at the address in Part I.C.5.d, above, within 5 calendar days of receipt of the test results indicating the exceedance. The notification must include the following information:
 - (i) A status report on any actions required by the permit, with a schedule for actions not yet completed.
 - (ii) A description of any additional actions the permittee has taken or will take to investigate and correct the cause(s) of the toxicity.
 - (iii) Where no actions have been taken, a discussion of the reasons for not taking action.
 - c) If none of the six accelerated chronic toxicity tests required under Part I.C.6.a are above the applicable average monthly limit in Part I.B or I.C of this permit, the permittee may return to the regular chronic toxicity testing cycle specified in Part I.D.2.a.
 - d) If any of the six accelerated chronic toxicity tests required under Part I.C.6.a are above the applicable average monthly limit in Part I.B or I.C of this permit, then the permittee must implement the initial investigation TRE workplan as described in Part I.D.7.
- 7. Implementation of Initial Investigation TRE Workplan
 - a) The permittee must implement the initial investigation TRE workplan within 48 hours of the permittee's receipt of the accelerated toxicity test result demonstrating an exceedance of the applicable average monthly limit in Part I.B or I.C of this permit.

Permit No.: ID0021504 Page 15 of 51

(i) If implementation of the initial investigation workplan clearly identifies the source of toxicity to the satisfaction of EPA (e.g., a temporary plant upset), the permittee may return to the regular chronic toxicity testing cycle specified in Part I.D.2.a.

(ii) If implementation of the initial investigation workplan does not clearly identify the source of toxicity to the satisfaction of EPA, then the permittee must begin implementation of further toxicity reduction evaluation (TRE) requirements in part I.D.8 below.

8. Detailed TRE/TIE

- a) If implementation of the initial investigation workplan does not clearly identify the source of toxicity to the satisfaction of EPA, then, in accordance with the permittee's initial investigation workplan and EPA manual EPA 833-B-99-002 (Toxicity Reduction Evaluation Guidance for Municipal Wastewater Treatment Plants), the permittee must develop as expeditiously as possible a more detailed TRE workplan, which includes:
 - (i) Further actions to investigate and identify the cause of toxicity;
 - (ii) Actions the permittee will take to mitigate the impact of the discharge and to prevent the recurrence of toxicity; and
 - (iii) A schedule for these actions.
- b) The permittee may initiate a TIE as part of the overall TRE process described in the EPA acute and chronic TIE manuals EPA/600/6-91/005F (Phase I), EPA/600/R-92/080 (Phase II), and EPA-600/R-92/081 (Phase III).
- c) If the detailed TRE/TIE clearly identifies the source of toxicity to the satisfaction of EPA, the permittee may return to the regular chronic toxicity testing cycle specified in Part I.D.2.a.

9. Inconclusive TRE/TIE

- a) If the detailed TRE described in Part I.D.8 is inconclusive, the permittee must conduct six bi-weekly (every two weeks) chronic toxicity tests, over a 12week period. This accelerated testing shall be initiated within 10 calendar days of completing the detailed TRE/TIE.
- b) If none of the six accelerated chronic toxicity tests required under Part I.D.9.a exceed the applicable average monthly limit in Part I.B or I.C of this permit, the permittee may return to the regular chronic toxicity testing cycle specified in Part I.D.2.a.
- c) If any of the six accelerated chronic toxicity tests required under Part I.D.9.a exceed the applicable chronic toxicity trigger in Part I.D.6 of this permit, then the permittee must repeat the TRE/TIE process described in Part I.D.8.

E. Surface Water Monitoring

The permittee must conduct surface water monitoring. The program must meet the following requirements:

1300 Blue Spruce Drive, Suite C Fort Collins, Colorado 80524



Toll Free: 800/331-5916 Tel: 970/484-5091 Fax:970/484-2514

ORGANISM HISTORY

DATE: _	1	/15/2018	- Marian - Marian - Marian - Addingson - Addingson op sales
SPECIES:AGE:	_ <:	eriodaphnia dubia 24 hour eonate	
HATCH DATE:	1/	15/2018	
BEGAN FEEDING:	lm	mediately-	
F00D:	Yï	TC, Raphidocelis subcapitata*	and the second of the second o
_*			
Water Chemistry Record:		Current	Range
TEMPERA	TURE:	22°C	= 4
SALINITY/CONDUCTI	VITY:		e 10
TOTAL HARDNESS (as Ca	aCO3); ,	100 mg/l	
TOTAL ALKALINITY (as Ca	iCO ₃):	80 mg/l	
	рН:	8.20	
Comments: * Formerly known as	Psuedokii	rschneriella subcapitata and Sc Jaje Lie Facility Supervisor	elenastrum capricornutum

1300 Blue Spruce Drive, Suite C Fort Collins, Colorado 80524



Toll Free: 800/331-5916 Tel: 970/484-5091 Fax:970/484-2514

Algae Preparation History

DATE:	1/15/2018
SPECIES:	
INOCULATION DATE:	1/2/2018
HARVEST DATE:	1/8/2018
CONCENTRATION DATE:	1/10/2018
CELL COUNT (/ml);	3.0×10^7 cells/ml

Comments:

- * Formerly known as Psuedokirschneriella subcapitata and Selenastrum capricornutum
- ** All concentrated algae diluted to proper cell count with reconstituted moderately hard DI water.

Supervisor

1300 Blue Spruce Drive, Suite C Fort Collins, Colorado 80524



Toll Free: 800/331-5916 Tel:970/484-5091 Fax:970/484-2514

YTC TOTAL SOLIDS MEASUREMENT

(Method from EPA/505/8-89-002a)

YTC Process Date:

1/10/2018: Best if used by 4/30/2018

Average Total Solids:

1810 mg/L

Ingredient Lot Numbers

Pines International® Wheat Grass: COCDW12S50; Zeigler Finfish Starter #1 (Lot 07/17/2017); Fleischmanns Yeast: G-3

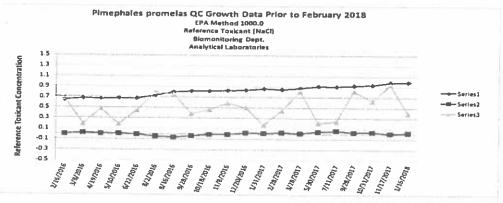
Analyzed Metals Report Limits Results (mg/L) Aluminum 0.03 0.12 Arsenic 0.001 0.002 Cadmium 0.001 [I Chromium 0.005 .006 Copper 0.0050.047 Iron 0.02 0.32Lead 0.001 U Mereury 100.0 U Nickel 0.0050.005Silver 0.001 U Zine 0.01 0.18

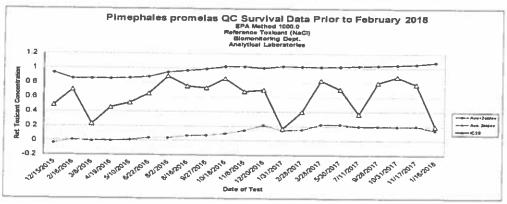
Compounds	Report Limits	Results (ug/L)
Aldrin	0.5	Ţ.fi
alpha-BHC	0.5	- II
heta-BHC	0.5	U
delta-BHC	0.5	UA.
gamma-BHC (Lindane)	0.5	(1)
alpha-Chlordane	0.5	U
gamma-Chlordane	0.5	LI!
4,4' - DDD	0.5	Lf:
4.4' – DDE	0.5	U
4,4' -DDT	0.5	U
Dieldrin	0.5	U
Endosulfan I	0.5	U
Endosuffan II	0.5	[]
Endosulfan sulfate	0.5	ŢĮ.
Endrin	0.5	U
Endrin aldehyde	0.5	U
Endrin ketone	0.5	U
leptachlor	0.5	U
leptachfor epovide	0.5	U
Methozychlor	0.5	Ü
Chlordane (technical)	5.0	U
Toxaphene	25	Į!
Aroclor-1016	5.0	U
Aruelor-1221	5.0	U
roclor-1232	5.0	U
roclor-1242	5.0	U
roclor-1248	5.0	U.
roclor-1254	5.0	U
roclor-1260	5.0	11
roelor-1262	5.0	U
roclor-1268	5.0	U

U – Indicates compound was analyzed for but not detected. *Testing performed by Energy Labs, Billings, Montana

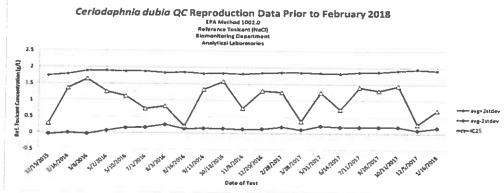
Literature Cited

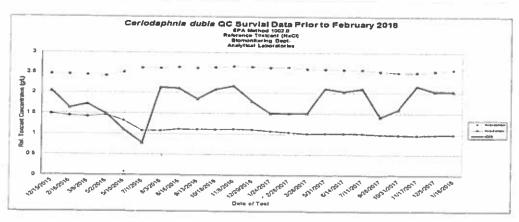
- Short-Term methods for Estimating the Chronic Toxicity of Effluents and receiving Waters to Freshwater Organisms, Fourth Edition. October 2002. EPA-821-R-02-013.
- 2. <u>Methods for Measuring the Chronic Toxicity of Effluents to Freshwater and Marine Organisms</u>, EPA/600/4-85/013, US EPA.
- 3. Standard Methods for the Examination of Water and Wastewater, 19 Edition, 1995, APHA, AWWA, WPCF.
- 4. <u>Handbook for Analytical Quality Control in Water and Wastewater Laboratories</u>, Environmental Monitoring and Support Laboratory, Cincinnati, EPA/600/4-79/019, US EPA











---Series2 →-Series1 --- Series 3 Crodels Reference Toxicant (NaCl) Biomonitoring Department Analytical Laboratories 9102/12/6 Stock 18 0 60 12 10 14 Reference Toxicant Concentration

Selenastrum Capricornutum QC Data Prior to February 2018

EPA Method 1003.0

Bench Sheet For Fathead Minnow QC Survival Test Method 1000.0

Sanuary 2018
Analyst: CP | Bnc
Test Stop Date/Time: 1/16/18 / 1600

Test Month/Year: Test Start Date/Time:

Day			7		ant Used: So	i e		_	7	Domestic
Day Conc.	Dogt-o-#	0	1	2	3	4	5	6	- '-	Remarks
	Beaker#	1.5	1.5	1.0	1 -	10		10	1.0	
Control	1	10	10	10	10	10	10	10	10_	-
	2		10	10	10	10	10	10	10	
	3		10	10	10	10	10	10	10	
	4	10	10	10	10	10	10	10	10	
New DO	XXX	8.1	7.6	7.7	7.6	7.7	8.0	8.0	XXX	
New pH	XXX	7.9	8.2	8.2	8.2	8.2	7.9	7.8	XXX	
Temp	XXX	24.3	24.4	23.8	24.8	23.6	23.4	22.7	XXX	
Old DO	XXX	XXX	5.8	6.4	5.8	5.7	6.6	6.8	6.6	<u> </u>
Old pH	XXX	XXX	7.8	7.8	7.8	7.8	7.5	7.5	8.0	l
Conc: 0.25g/L	1	10	10	10	10	10	10	6	5	
	2	10	10	10	10	10	10	8	6	
	3	10	10	10	10	10	10	4	9	Ş
	4	10	10	10	10	10	10	8	8	
New DQ	XXX	8.1	7.7	7.7	7.6	7.7	1.2	7.9	XXX	
New pH	XXX	8.0	8-1	8.0	8.1	8.1	8.2	7.9	XXX	
Temp	XXX	24.0	24.5	24.1	24.9	24.2	22.3	22.5	XXX	
Old DO	XXX	XXX			5.8	5.9	6.4		6.4	
Old pH	XXX	XXX	5.8 7.9	6.0 7.8	7.9	7.9		7.7	7.9	
			· ·		•		7.4			
Conc: 1.5g/L	1	10	10	10	9	9	8	6	6_	_
	2	10	10	10	10	9	7	6	6	
	3	10	10	10	10	9_	4	4	4	
	4	10	10	10	8	8	Ь	5	4	ļ
New DO	XXX	8.1	7.7	7.7	7.6	7.7	8.2	7,9	XXX	
New pH	XXX	7.9	8.0	7.9	8.1	8.1	8.1	7.4	XXX	
Гетр	XXX	23.9	24.5	24.0	25.0	24.2	22.4	22.7	XXX	
Old DO	XXX	XXX	6.0	6.3	6.0	6.0	6.9	6.8	6-6	
Old pH	XXX	XXX	7.8	7.8	7.8	7.8	7,8	7.7	7.9	
Conc: 2.5g/L	1	10	10	10	10	9	フ	6	3	
	2	10	10	10	10	10	9	5	2	
	3	10	10	10	9	8	8	7	6	
i	4	10	10	10	10	10	8	7	6	
New DO	XXX	8-1	7.7	7.7	7.6	7.7	ช .ล	8.0	XXX	
New pH	XXX	7.9	8.0	79	8.0	8.1	8.1	7.9	XXX	
				24.4	24,9	24.1	22.3	22.8	XXX	
Temp	XXX	23.8	24.5			6.0			6.4	
Old DO	XXX	XXX	6.2	6.4	6.1	7.9	6.6	-		-
Old pH	XXX	XXX	7.8	7.8	7.9		7.8	7.8	7.7	
Conc:	1	10	/a	10	9	9	5	5	5	
Conc: 3.5g/L	2	10	10	10	10	10	9	ઇ	_5	
	3	10	10	10_	10	10	9	_7	5	
	4	10	10	10	10	10	8	6	6	
New DO	XXX	8.7	7.7	7.7	7.6	7.8	8.2	8-0	XXX	ļ
New pH	XXX	7.9	8.0	7.9	8,0	8.1	8-1	7-8	XXX	
Гетр	XXX	27.9	247	23.8	25.2	24.1	22.5	22.8	XXX	
Old DO	ххх	XXX	6.1	6.2	6.0	6.1	6.6	6.4	6.5	
Old pH	XXX	XXX	7.8	7.8	7.7	7.7	7-8	7.8	7.8	
Conc: 8.5g/L	1	10	9	4	2	2	Ð			
	2	10	8	1	٥	Ô	0			
	3	10	7		1	ī	0			1
	3	10	7		0	0				-
	4			0			0		- 700	
New DO	XXX	8.2	7.7	7.7	7.6	7.8	MA		XXX	1
New pH	XXX	7.9	7.9	7.8	7.9	8.0	NA		XXX	-
Temp	XXX	23.8	24.6	24.2	25.0	23.9	NA		XXX	
Old DO	XXX	XXX	6.2	6.6	6.7	6.8	7.3			
Old pH	XXX	XXX	7.6	7.7	7.7	7.8	7.8			
	A.M.	XXX	QP	cp	CP	GP .	12762	Em	XXX	
	r +4 F 0 Fs		Q ^o	क			Box	Bne	XXX	+

BENCH SHEET FOR FATHEAD MINNOW INITIAL WEIGHT DATA EPA METHOD 1000.0

LAB ID#: January QC 2018 Test Start Date: 1/9/18
Drying Temp: 100°C

Weighing Date: 1/10/18
Test End Date: 1/16/18
Drying Time: 20 krs

Location/Client: ALT QC Jen. 2018

	Rep No.	Weight of Boat (g)	Boat and Dry Larvae (g)	Dry Weight of Larvae (g)		Mean Dry Weight of Larvae (mg)	Average
	I/	1.2854	1.2862	0.0008	10	0.08	
Initial	I2	1.2897	1.2908	0.0011	10	0.1	0.09 mg
, iiiiiai	<i>I</i> 3	1. 2889		0.0009	10	0,09	U. J. mg
L	I4	1.2893	1.2902	0.0009	10	0.09	ĺ

Reviewed By: 5C

Fathead Minnow QC Weight Data

Analyst: 40

Test Month/Year: January 2018 Drying Temp: 100°C
Weighing Date: 1/17/18 Drying Time: 18 hours

Rep Weight of Larvae Dry Weight of Larvae Mean Dry Mean			,					
CONTROL 1		'	_	Dry Larvae	Weight of		Weight of Larvae	Ava Init - Ava Wt Gain (ma)
CONTROL 2	Conc.						1	AvgIIII. – Avg. Wt. Gain (IIIg)
3 1.2742 1.2787 0.0045 0.45 0.47 4 1.2690 1.2737 0.0047 0.47 X		<u> </u>			0.0046	10_	0.46	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	CONTROL				0.0053		0.53	0.48 mg - 0.09 mg = 0.39 mg
0.25g/L $\begin{array}{c ccccccccccccccccccccccccccccccccccc$					0.0045		0.45	
0.25g/L $\frac{\times 6}{\times 7}$ /.2637 /.2668 0.0031 0.31 0.38mg - 0.09mg = 0.29mg = 0.29mg = 0.29mg = 0.29mg = 0.13mg \lambda \chi \chi \chi \chi \chi \chi \chi \chi		4	1.2690	1. 2737	0.0047		0.47	
0.25g/L $\times 7$ /, 2963 /, 3010 0,0047 0.47 0.46 $\times 9$ /, 2881 /, 2927 0.0046 0.46 $\times 9$ /, 2904 /, 2987 0.0026 0.26 0.22mg -0.09 mg = 0.13 mg = 0.18 $\times 11$ /, 2982 /, 2997 0.0018 0.16 $\times 11$ /, 2982 0.0010 0.10 0.20mg -0.09 mg = 0.11 mg $\times 16$ /, 2905 /, 2933 0.0018 0.18 $\times 14$ /, 2972 /, 2982 0.0010 0.10 0.20mg -0.09 mg = 0.11 mg $\times 16$ /, 2864 /, 2887 0.0023 0.23 $\times 16$ /, 2864 /, 2887 0.0024 0.24 0.24 $\times 17$ /, 2921 /, 2945 0.0024 0.24 0.24 $\times 17$ /, 2921 /, 2945 0.0024 0.24 0.24 $\times 17$ /, 2929 /, 2953 0.0024 0.25 0.25 $\times 17$ /, 2929 0.0025 0.25		×S	1. 2944	1.2973	0.0029		0.29	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	0.25a/l	x6	1.2637	1.2668	0.0031		0.31	0.38mg - 0.09mg = 0.29mg
1.5g/L $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	J.Logic	X7	1.2963	1,3010	0.0047		0,47	
1.5g/L $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		78×	1.2881	1.2927	ე. აა46		0.46	
1.5g/L $\times 11$ /.2982 /.2997 0.0015 0.15 0.15 $\times 1\lambda$ /.2864 /.2883 0.0019 0.19 0.19 0.18 $\times 14$ /.2972 /.2982 0.0010 0.10 0.20m3 - 0.09m3 = 0.11 m $\times 15$ /.2905 /.2933 0.0028 0.23 $\times 16$ /.2864 /.2887 0.0024 0.24 $\times 15$ /.2921 /.2945 0.0024 0.24 $\times 15$ /.2929 /.2953 0.0024 0.24 0.24 $\times 15$ /.2929 /.2953 0.0024 0.24 0.24 $\times 15$ /.2929 /.2953 0.0024 0.25 $\times 15$ $\times 15$ /.2929 /.2953 0.0024 0.25 $\times 15$ $\times 15$ /.2929 /.2953 0.0024 0.25 0.25 $\times 15$ $\times 15$ /.2929 /.2953 0.0025 0.25		х٩	1.2904			10	0.29	
1.3g/L \times 11	4 5 0 //	XIO	1.2961	1,2987	0.0026		0.26	0.22mc - 0.09mc = 0.13mg
2.5g/L $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	1.agrL	XII	1.2982	1. 2997	0.0015		0.15	
2.5g/L $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	w 3	XIX	1.2864	1.2883	0.0019		0.19	
2.5g/L $\begin{array}{ c c c c c c c c c c c c c c c c c c c$		X13					0.18	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	2 50/1	X14	1.2972	1.2982	0.0010		0.10	0.20 mg - 0.09 mg = 0.11 mg
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	2.5g/L						0.28_	
3.5g/L $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$							0.23	
3.5g/L $\begin{array}{ c c c c c c c c c c c c c c c c c c c$		X17					0.24	
X19 1.2929 1.2953 0.0024 0.24 X20 1.2885 1.2910 0.0025 0.25 X21 — X22 —	2.5~!!	XI8	1.2975				0.24	0.24m - 0.09 mg = 0.15mg
X20	3.5g/L	X19	1.2929	1. 2953	0.0024		0,24	
8.5g/L ×22 —							0.25	
8.5g/L ×22 —								
5.5g/L X23 —	0.5-1		_					
	o.og/L	X23	_	Ü				
X24 - V		X 24	-			V		

Reviewed By: 5C

Facility

IWC Conc.

Analytical Laboratories

0.478

22.4%

Mean

0.383

Test ID

Analytical Labs January QC 2018

1/18/2018

Analyst

Chris Pate

Pimephales promelas (fathead minnow) **Species** Test Type Growth

Input

Date

աւ							
			Concen	trations			
Replicate	<u>0</u>	0.25	<u>1.5</u>	<u>2.5</u>	<u>3.5</u>	<u>8.5</u>	
1	0.46	0.29	0.29	0.18	0.24	0	
2	0.53	0.31	0.26	0.1	0.24	0	
3	0.45	0.47	0.15	0.28	0.24	0	
4	0.47	0.46	0.19	0.23	0.25	0	

	0.25 1.5 2.5 3.5	0.383 0.223 0.198 0.243	0.096 0.064 0.077 0.005	0.250 0.287 0.389 0.021	NS Y Y Y	
	8.5	0.000	0.000	0.021	Ý	
NOEC	LOEC		IC25		idence Intervals	
0.25	1.5		0.39	0.17	0.82	
TST	Calculated t-value		Table t-value		Relative % Effect at IWC	

0.223

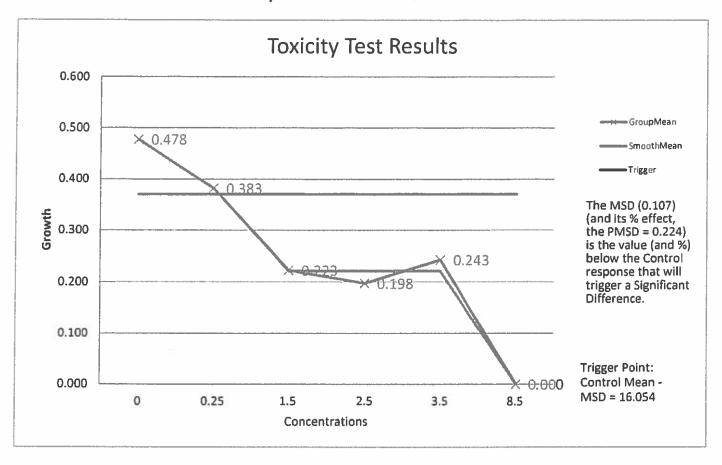
0.198

0.243

0.000

0.107

Note - For statistical tests, "NS" indicates that the concentration is not statistically different from the control, while "Y" indicates that the concentration is statistically different from the control.



NOTICE

Facility Test ID

Analytical Laboratories

Analytical Labs January QC 2018

1/18/2018

Analyst Chris Pate

Species Pimephales promelas (fathead minnow)

Test Type Chronic Survival

IWC Conc.

Date

put							
umber of Organis	sms Expose	d or Counted					-
			Concer	itrations			
Replicate	<u>o</u>	<u>0.25</u>	<u>1.5</u>	<u>2.5</u>	<u>3.5</u>	<u>8.5</u>	
1	10	10	10	10	10	10	
2	10	10	10	10	10	10	
3	10	10	10	10	10	10	
4	10	10	10	10	10	10	

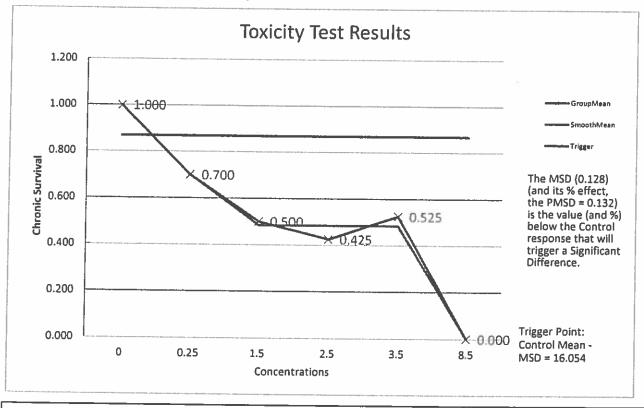
Number of Organisms Surviving or Responding

			Concer	ntrations		
Replicate	<u>0</u>	<u>0.25</u>	<u>1.5</u>	<u>2.5</u>	<u>3.5</u>	<u>8.5</u>
1	10	5	6	3	5	0
2	10	6	6	2	5	0
3	10	9	4	6	5	0
4	10	8	4	6	6	0

Total Organisms	40	40	40	40	40	40	
Total Responding % Responding	40 100.0%	28 70.0%	20 50.0%	17 42.5%	21 52.5%	0.0%	
Output	100.070	70.070	50.078	42.578	J2.J70	0.078	

Statistical Data	Conc.	Mean	Stdev	CV	Dunnett test
	0	1.412	0.000	0.000	
Statistics are based or	0.25	1.007	0.210	0.209	Y
the transformed data	1.5	0.785	0.116	0.148	Y
used for endpoint calculations	2.5	0.704	0.216	0.306	Y
calculations	3.5	0.811	0.050	0.062	Υ
	8.5				Υ
NOEC	LOEC		IC25	95% Conf	idence Intervals
<0.25	0.25		0.20	0.13	0.65
TST	Calculated t	-value	Table t-va	lue	Relative % Effect at IWC
MSD	PMSD				
0.128	13.2%				

Note - For statistical tests, "NS" indicates that the concentration is not statistically different from the control, while "Y" indicates that the concentration is statistically different from the control.



NOTICE

PAGE / OF 2

BENCH SHEET FOR OC CERIODAPHNIA SURVIVAL/REPRODUCTION TEST.

TEST MONTH January 2018
Test Start Date/Time: 1/9/18, 1420

Analyst: co Bre

Test Stop Date/Time: 1/16/18, 1626

New D.O. Young

Old New рΗ D.O.

Daily Old pH Temp

Conc. CONTROL XXX XXX XXX XXX 10 XXX XXX 7 8 9 5 6 Day-Lab # 1 2 3 128 7.9 8.1 XXX 1 XXX / \checkmark / / 0 8.1 8.1 23,8 8.2 7.6 / 1 23.6 8.0 8.4 7.7 8.2 2 24.8 8.0 8.5 8.2 18 7.6 1/2 1/3 1/2 1/2 1/2 1// 1/2 U/ 1/2 3 8.1 23.7 8.2 8.5 7.7 2/9 2/8 2/5 26 2/4 4 2/7 54 8.6 23.9 7.9 8.3 2/9 2/9 2/7 3/7 8.0 3/7 5 8-054 g. / 22.8 3/12 3/9 95 3/11 3/10 3/11 8.0 7.8 3/10 V 3/9 6 8.3 8.4 4/10 4/15 4/12 4/10 0 4/10 V V 7 22 16 20 193 23 20 23 21 18 13 17 Total

> Daily Old New New Temp D.O. Old pH Young D.O, pН

Conc.	0.50	g/L					711							 _		
Day-Lab #	1	2	3	4	5	6	7	8	9	10	XXX	XXX	XXX	XXX	XXX	XXX
0	1	1	/	1	/	/	1	1				8.1	7.9	XXX	XXX	23.1
1		/		/	1	/	/	1	/	1		7.7	8.0	8.1	8.3	23.6
2			1/2		1		1				2	7.7	7.9	7.9	8.4	23.6
3	11.2	112	1	1/2	1/2	1/		1//	1/2	1	14	7.6	8.0	8.0	8.4	24.5
1	2/8	1/3	2/4	113	2/3	1/4	11)	1	./	1	21	7.8	8.2	8.1	8.5	23.6
5	-/8	2/3	3/6_	2/2	1/	2/8	24	2/	2/3	1/1	48	7.8	8-0	8.4	8.5	23.5
6	3 /	/3	76	3/6	3/	1.6	79_	3/4	13	3/8	45	7.9	7.9	8.4	8.2	23,2
0	710	2/	U/		1/2	3/	2/0	1	3/9	.0	40			8.3	8.3	
/	V		4/10	76	1-7	7/1/	3/9	11/		14	-	 	 			
Total	21	17	12	16	17	23	20	16	14	17	170		<u> </u>	<u> </u>		

Daily Old New New Temp D.O. Old pH Young D.O. pН

Conc.	1.25	_g/L_														
Day-Lab #	1	2	3	4	5	6	7	8	9	10	XXX	XXX	XXX	XXX	XXX	XXX
n	1	1	1	/		1	/	1	/	/		8.1	7,9	XXX	XXX	23,0
1	-	1	1	1	/	/	/			/		7.7	8.0	7.9	8.3	23.5
2	/	/	/	1	1	1				/		7.7	7.9	7.9	8.3	23.6
3	./		/	1/	~	1/	di	1/2	1/1	1/3	7	7.6	8.1	8.2	8.3	24.5
4	1	1/2	1	1	1	1/3		2/3	1	2/4	12	7.8	8.2	NA	NA	23.5
5	1/	2/	1/2	1/1	1/2	3/1	2/2	1	2/5	1	17	7.9	8.1	8.4	8.5	23.4
6	/1	2/2	1	7	1/2	1	3/2	3/4	3/2	3/2	28	8.0	7.9	8.5	8,2	23.0
7	2/6	3/5	2/6	2/2	16	3/9	1/	17	~	1	29			8.4	8.3	
/ Total	8	10	3	4	8	13	11	9	13	9	93					

BENCH SHEET OC CERIODAPHNIA SURVIVAL/REPRODUCTION TEST.

TEST MONTH January 2018
Test Start Date/Time: 1/9/18 1420

Analyst: CP Gove

Test Stop Date/Time: 1/16/18, 1626

New Young D.O. New рΗ

Old

D.O.

Old pH Temp

Daily

Conc.	2.00	g/L
Сопс.	2.00	g/L

Day-Lab #	1	2	3	4	5	6	7	8	9	10	XXX	XXX	XXX	XXX	XXX	XXX
0	/	1	1	1	/	/	1	/	1	/		8.1	7.9	XXX	XXX	22.9
1	1	/	/	/	/	/	/	1	/	/		7.7	8.0	8.0	8.3	23,4
2			/	1	1	1	/	1	/			7.8	8.0	7.9	8.3	23.5
3	1	V	/	V	V	~	V	D	~	0		7.7_	8.0	8.1_	8.3	24.7
4	/	1	1		/	/	/		/			7.8	8.1	8.1	8.4	23.5
5	V	1/1	/	V	V	V	/	\Box	V		_1_	7.9	8.0	8.4	8-5	23.6
6	1/1		1/1	1/6	/	V	1/1				4	8-0	7-9	8.6	8.3	23,8
7	/	~	V	V	1/2	1/1_		V	1/2	4	5			8.3	8.2	
Total	1	1	1		2	1	l_	0	2	٥	10					

New New Old Daily D.O. Old pH Temp Young D.O, pН

Conc.	2.75	g/L														· -
Day-Lab #	1	2	3	4	5	6	7	8	9	10	XXX	XXX	XXX	XXX	XXX	XXX
0	/	/	1	/	/	/	1	/	/	/		8.1	7.9	XXX	XXX	22.8
1	1	/	1	1	/	/	/	/	~	1		7.7	8.0	7.9	8.2	23. 3
2	D	D	D	D	D	/	/	0	D	D		7.7	7.9	8.1	8.2	23.5
3	1	ı	1	1		Ø	10	I	1	١		7.7	8.0	8.3	8.4	24.6
4				\sqcap		1	1	П								
5																
6																
7	V	4	V	V	V	4	+	V	V	V						
Total	0	D	0	٥	0	0	O	0	٥	0		12-				

Daily Old New New D.O. Old pH Temp Young D.O, pН

Conc.	3.50	g/L										<u>.</u>				,
Day-Lab #	_ 1	2	3	4	5	6	7	8	9	10	XXX	XXX	XXX	XXX	XXX	XXX
0	1	/	1	V	1	/	/	/	1	~	[8.0	7.9	XXX	XXX	23.0
1	80		D	/	1	D	D	D	0	D		7.7	8.0	8.0	8.2	23.1
2	1	D	l	D	D	- 1	1	1				7.7	7.9	8.0	8.2	23.3
3				1												
4																
5																<u></u>
6																ļ
7	V	V	\downarrow	V	V	V	V	V	1	V						
Total	0	0	0	0	0	0	δ	٥	0	0			<u> </u>	<u></u>		<u> </u>

Facility Test ID

Analytical Laboratories

Analytical Labs January 2018 QC

Date **IWC Conc.**

1/18/2018

Analyst Chris Pate

Ceriodaphnia dubia (water flea) Species

Test Type Chronic Survival

Input

Number of Organi	sms Expose	d or Counted	1				
			Concent	trations			
Replicate	<u>0</u>	<u>0.5</u>	1.25	<u>2</u>	<u>2.75</u>	<u>3.5</u>	
1	1	1	1	1	1	1	
2	1	1	1	1	1	1	
3	1	1	1	1	1	1	
4	1	1	1	1	1	1	
5	1	1	1	1	1	1	
6	1	1	1	1	1	1	
7	1	1	1	1	1	1	
* 8	1	1	1	1	1	1	
9	1	1	1	1	1	1	
10	1	1	1	1	1	1	

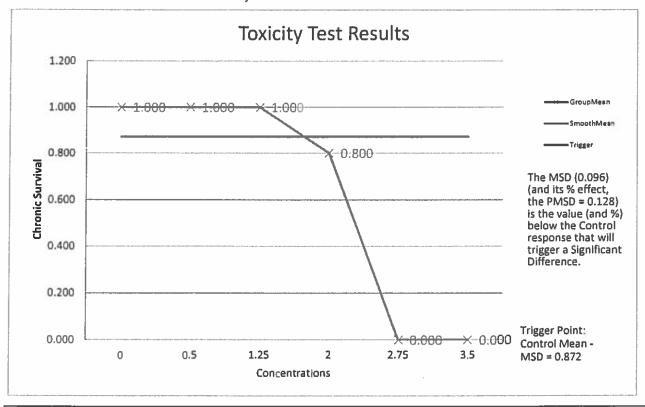
Number of Organisms Surviving or Responding

			Concent	trations		
Replicate	<u>o</u>	<u>0.5</u>	<u>1.25</u>	<u>2</u>	<u>2.75</u>	<u>3.5</u>
1	1	1	1	1	0	0
2	1	1	1	1	0	0
3	1	1	1	1	0	0
4	1	1	1	1	0	0
5	1	1	1	1	0	0
6	1	1	1	1	0	0
7	1	1	1	1	0	0
8	1	1	1	0	0	0
9	1	1	1	1	0	0
10	1	W 1	1	0	0	0

Total Organisms Total Responding % Responding	10 10 100.0%	10 10 100.0%	10 10 100.0%	10 8 80.0%	10 0 0.0%	10 0 0.0%	
Output							_

Statistical Data	Conc.	Mean	Stdev	CV	Steel test
	0	1.047	0.000	0.000	
Statistics are based on	0.5	1.047	0.000	0.000	NS
the transformed data	1.25	1.047	0.000	0.000	NS
used for endpoint	2	0.942	0.221	0.234	NS
calculations	2.75				Υ
	3.5				Y
NOEC	LOEC		IC25	95% Conf	fidence Intervals
2	2.75		2.04	1.69	2.17
TST	Calculated t	-value	Table t-va	lue	Relative % Effect at IWC
MSD	PMSD				
0.096	12.8%				

Note - For statistical tests, "NS" indicates that the concentration is not statistically different from the control, while "Y" indicates that the concentration is statistically different from the control.



NOTICE

Facility

Analytical Laboratories

Test ID Date

IWC Conc.

Analytical Labs January 2018 QC

1/18/2018

Analyst Chris Pate

Species

Ceriodaphnia dubia (water flea)

Test Type Reproduction

Input

	Concentrations								
Replicate	<u>o</u>	<u>0.5</u>	<u>1.25</u>	<u>2</u>	<u>2.75</u>	<u>3.5</u>			
1	21	21	8	1	0	0			
2	18	17	10	1	0	0			
3	13	12	8	1	0	0			
4	17	16	4	1	0	0			
5	23	17	8	2	0	0			
6	23	23	13	1	0	0			
7	20	20	11	1	0	0			
8	22	16	9	0	0	0			
9	16	14	13	2	0	0			
10	20	14	9	0	0	0			

Mean Stdev	19.300 3.268	17.000 3.432	9.300 2.669	1.000 0.667	0.000 0.000	0.000 0.000	
Output							
Statistical Data	Conc.	Mean	Stdev	CV		Steel test	
	0	19.300	3.268	0.169			
	0.5	17.000	3.432	0.202		NS	
	1.25	9.300	2.669	0.287		Υ	
	2	1.000	0.667	0.667		Υ	
	2.75	0.000				Υ	
	3.5	0.000				Υ	
NOEC	LOEC		IC25	95% Conf	idence Interv	rals	
0.5	1.25		0.71	0.47	0.89		

MSD	PMSD
2.622	13.6%

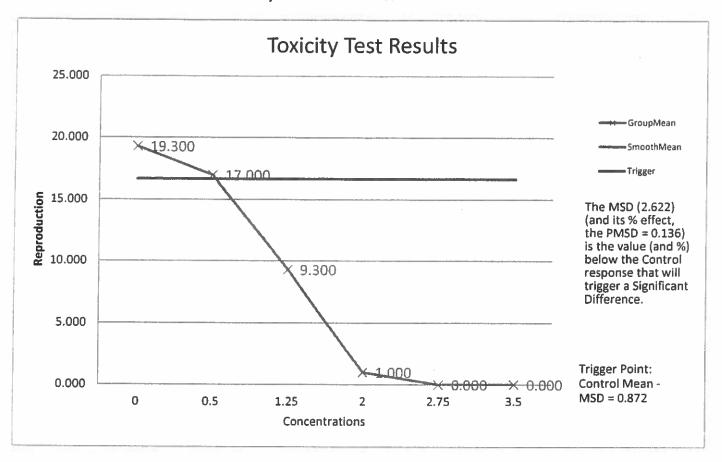
Table t-value

Relative % Effect at IWC

TST

Calculated t-value

Note - For statistical tests, "NS" indicates that the concentration is not statistically different from the control, while "Y" indicates that the concentration is statistically different from the control.



NOTICE

BENCH SHEET FOR S. capicornutum ALGAL QC GROWTH TEST. **EPA METHOD 1003.0**

Test Month/Year Jan. 2018 Analyst: 40, 2018 Final Report Review: 50

Test Start Date/Time: 1/17/18, 1430

Test Stop Date/Time: 1/21/18, 1430

Daily pH and Temp.

CONCENTRATION	ם	Day 0		Day 1		Day 2		Day 3		Day 4	
	рН	Temp	рН	Temp	pН	Temp	рН	Temp	pН	Temp	
Control	8.2	24.8	9.7	24.7	10.5	24.9	10.8	23.8	10.7	23.9	
0.50 g/L	8.(24.4	9.6	24.4	10.5	24.5	10.7	24-7	10.8	23.1	
1.5 g/L	8.1	24.2	9.6	24.2	10.5	24.2	10.7	24.2	10.7	24.7	
5.5 g/L	8.0	24:1	9.4	25.0	9.9	23.7	1.01	24.2	10.2	24.2	
8.5 g/L	8.0	24.2	9.2	24.9	9.8	23.9	9.9	24.0	9.8	24-(
10 g/L	8.0	24.3	9.(24.6	9.7	23.8	9.9	23.8	10.0	24.5	

BENCH SHEET FOR S. capicornutum ALGAL QC GROWTH TEST

EPA TEST METHOD 1003.0

TEST MONTH/YEAR# Jan, 2018 ANALYST: 8711 FINAL REPORT REVIEW: 40 TEST START DATE/TIME: 1/17/18 1400
TEST END DATE/TIME: 1/21/18 1430

Initial Algae Count (cells/mL)

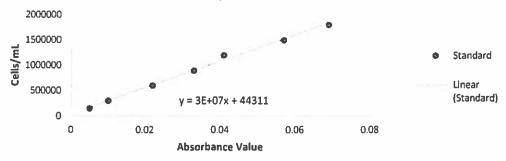
Random Sample #1	Random Sample #2	Random Sample #3	Random Sample #4	Initial Average					
Absorbance Value: 0.01(Absorbance Value: •.010	Absorbance Value: 0.010	Absorbance Value: 0.009	Absorbance Value: 0.010 Cells/mL: 0.344					
0.37	0.34	0.34	0.31	0.3 • 1					

Final Algae Count (cells/mL)

			oount (oons	,	
CONCENTRATION	Rep. 1	Rep. 2	Rep. 3	Rep. 4	Average
CONTROL	Absorbance Value: 0.084	Absorbance Value: ひょの分	ı		
	2,56	2.56	2.23	3.33	2.40
0.5	Absorbance Value: 0.091	Absorbance Value: 0-076	Absorbance Value: 0-072	Absorbance Value:0.072	Absorbance Value 0,093 Cells/mL:
0.0	2.77	2.72	2.50	2.80	2.83
1,5	Absorbance Value: 0-099	Absorbance Value:0-079	Absorbance Value: 0. 100	Absorbance Value: 0.097	Absorbance Value <i>০ ত</i> াণু Cells/mL:
	3.01	3.01	3.04	2.95	3.01
5.5	Absorbance Value: ひ, 07 3	Absorbance Value: つでん	Absorbance Value: 0-077	Absorbance Value: 0.072	Absorbance Value:0.074 Cells/mL:
	5.53	2.20	2.35	2.20	a. 25
8.5	Absorbance Value:0.054	-		Absorbance Value: 0.057	
	1.66	1.81	1.72	1.75	1.74
10	Absorbance Value:0,057	Absorbance Value:0-062	Absorbance Value:0.06	Absorbance Value: <i>০.০5</i> ণ	Absorbance Value: 0.060 Cells/mL:
	1-75	1,90	1.87	1.81	1.84

^{*}Absorbance values (AV) obtained from Spectronic 601 spectrophotometer are used to determine cells/mL based on a standardized linear relationship ((3x10^7)(AV) + 44311).

Selenastrum capricornutum Conversion Chart



Facility

Analytical Laboratories

Test ID Date

IWC Conc.

Analytical Labs January 2018 QC

1/23/2018

Analyst

Chris Pate

Species

Selenastrum capricornutum (green algae)

Test Type Growth

Input

· [
Concentrations								
Replicate	<u>0</u>	<u>0.5</u>	<u>1.5</u>	<u>5.5</u>	<u>8.5</u>	<u>10</u>		
1	2.56	2.77	3.01	2.23	1.66	1.75		
2	2.56	2.92	3.01	2.2	1.81	1.9		
3	2.23	2.8	3.04	2.35	1.72	1.87		
4	2.23	2.8	2.95	2.2	1.75	1.81		

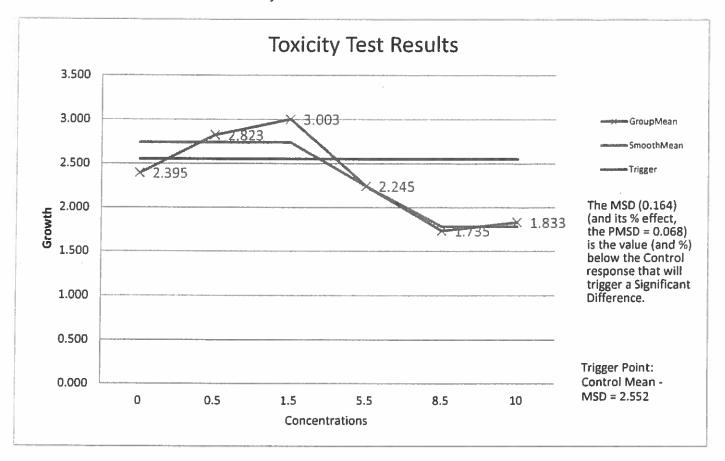
Mean	2.395	2.823	3.003	2.245	1.735	1.833	
Stdev	0.191	0.067	0.038	0.071	0.062	0.067	
Output	ric.						
Statistical Data	Conc.	Mean	Stdev	CV		Dunnett test	
	0	2.395	0.191	0.080			
	0.5	2.823	0.067	0.024		NS	
	1.5	3.003	0.038	0.013		NS	
	5.5	2.245	0.071	0.032		NS	
	8.5	1.735	0.062	0.036		Υ	
	10	1.833	0.067	0.036		Υ	

NOEC	LOEC	IC25	95% Confid	dence Intervals
5.5	8.5	6.60	6.22	6.93

TST	Calculated t-value	Table t-value	Relative % Effect at IWC	

MSD	PMSD
0.164	6.8%

Note - For statistical tests, "NS" indicates that the concentration is not statistically different from the control, while "Y" indicates that the concentration is statistically different from the control.



NOTICE





Toll Free: 800/331-5916 Tel: 970/484-5091 Fax:970/484-2514

ORGANISM HISTORY

DATE:	1/8	72018			
SPECIES:	Ceriodaphnia dubia				
AGE:	< 24 hour				
LIFE STAGE:	Neonate		darushur kiliku sulakukiki kelikur 1980-1985 — 1985-1985 — 1985-1987-1987-1987		
HATCH DATE:	1/8/2018				
BEĞAN FEEDING:	Immediately				
FOOD:	YTC, Raphidocelis subcapitata*				
Water Chemistry Record:		Current	Range		
TI MPERATURE:		2290			
SALINITY/CONDUCTIVITY:		13 3	-		
TOTAL HARDNESS (as CaCO3):		110 mg/l	# #		
TOTAL ALKALINITY (as CaCO ₃):		90 mg/l			
	pH:	8.12	ph dis		
Comments: * Formerly known as Psuedokirschneriella subcapitata and Selenastrum capricornutum					
		Sittle	<u> </u>		
		Facility Supervisor			





Toll Free: 800/331-5916 Tel: 970/484-5091 Fax:970/484-2514

ORGANISM HISTORY

DATE:	1/8/2018	
SPECIES:	Pimephales promelas	**************************************
AGE:	N/A	
LIFE STAGE:	Embryo	
HATCH DATE:	1/8/2018 between 10:30 am - 11:30 am MST	
BEGAN FEEDING:	N/A	
FOOD:	N/A	
Water Chemistry Record:	Current	Range
TEMPERATURE:	2.4°C	40.44
SALINITY/CONDUCTIVITY:		m =
TOTAL HARDNESS (as CaCO ₃):	120 mg/l	At all
TOTAL ALKALINITY (as CaCO ₃):	105 mg/l	
pH:	7.96	₩ w
Comments:		
Comments,		
	-(11)	1
	Sitalle	
	Facility Supervisor	

1300 Blue Spruce Drive, Suite C Fort Collins, Colorado 80524



Toll Free: 800/331-5916 Tel: 970/484-5091 Fax:970/484-2514

Algae Preparation History

DATE:	1/8/2018
SPECIES:	Raphidocelis subcapitata*
INOCULATION DATE:	12/26/2017
HARVEST DATE:	1/2/2018
CONCENTRATION DATE:	1/4/2018
CELL COUNT (/ml):	3.0×10^7 cells/ml

Comments:

- * Formerly known as Psuedokirschneriella subcapitata and Selenastrum capricormitum
- ** All concentrated algae diluted to proper cell count with reconstituted moderately hard DI water.

Supervisor





Toll Free: 800/331-5916 Tel:970/484-5091 Fax:970/484-2514

STOCK SOLUTIONS FOR MEDIUM PREPARATION OF

Raphidocelis subcapitata*

Formerly known as Psuedokirschneriella subcapitata and Selenastrum capricornutum

	*	Amount Dissolved in
		4L Deionized H ₂ O
Solution #1		TE INCINIBIOUS READY
NO THE COME IT I	MgCl ₂ • 6H ₂ 0	48.64g
	CaCl ₂ • 2H ₂ O	17.60g
	H ₃ BO ₃	0.7424g
	MnCl ₂ • 4H ₂ O	1.6640g
	ZnCl ₂	0.01312g
	FeCl ₃ • 6H ₂ 0	0.6392g
	CoCl ₂ • 6H ₂ 0	0.005712g
	Na ₂ MoO ₄ • 2H ₂ O	0.02904g
	CuCl ₂ • 2H ₂ O	0.000048g OR 0.06g in 1L H ₂ O Dilute 1 ml of this to 10 mls and take 8ml of this into 4L.
	NaEDTA • 2H ₂ O	1.20g
	Na ₂ SeO ₄	0.01g
		,
Solution #2		
	NaNO ₃	102.0g
Solution #3		
	MgSO ₄ • 7H ₂ O	58.80g
	***	44
Solution #4		
	K ₂ HPO ₄	4.1760g
		tor
Solution #5		
	NaHCO ₃	60.0g
	-	-

Preparation Date: 11/28/2017

^{*} Adapted from USEPA/600/4-90/027 September, 1991 page 143 for Selenastrum capricornutum

^{**}Purchased from Sigma-Aldrich Chemical, St.Louis, MO