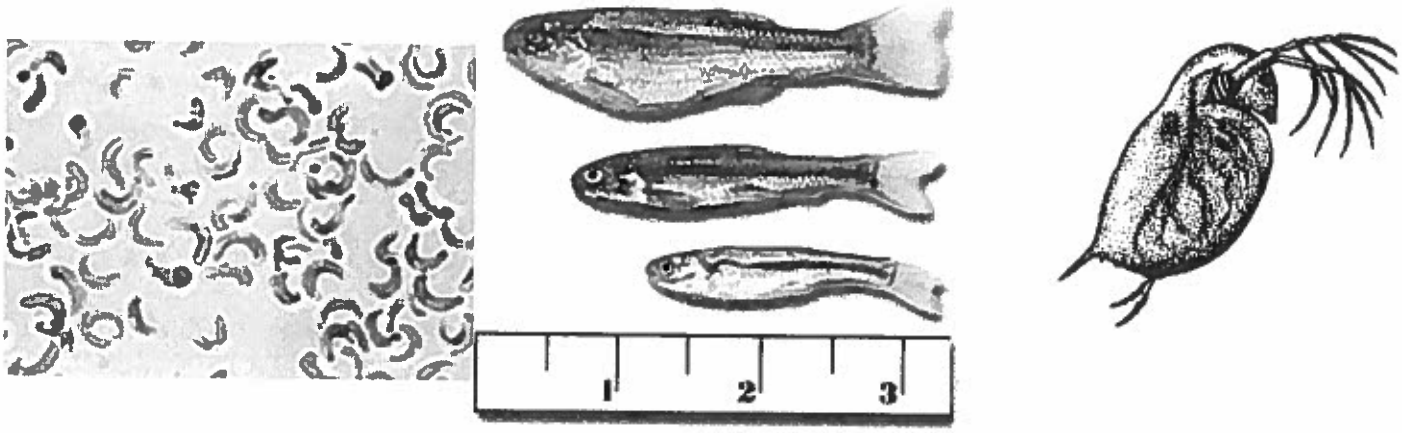
BIOMONITORING REPORT

FOR

CITY OF CALDWELL WWTP

LAB #1814025
PERMIT # ID0021504



APRIL 2018

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SUMMARY OF ANALYSES

CITY OF CALDWELL WWTP

APRIL 2018

PERMIT # ID0021504

The results for the *Ceriodaphnia dubia* reproduction study:

NOEC:	100%
LOEC:	>100%
IC25:	>100%
TUc:	1

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 April 3, April 5, and April 6, 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 April 3, 2018 and completed on April 10, 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, Ceriodaphnia dubia neonates were produced in house from brood organisms that produce 8 or more young in their 3rd or subsequent broods. Brood animals are fed daily and transferred to new culture media at a minimum of 3 times a week. Survival and reproduction records are maintained to ensure healthy test organisms. Original mass cultures of organisms were started from brood organisms obtained from Aquatic Biosystems in Fort Collins, Colorado. Neonates less than 24 hours old were selected randomly from a known parentage, inspected, and arranged in six sample dilutions and a control with ten replicates to each. Analyses at a static renewal were performed over the next 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 – April 3, 2018

   Collection #2 – Renewal Day 3 and 4 – April 5, 2018

   Collection #3 – Renewal Day 5 and 6 – April 6, 2018

   Day 7 – Final counts and statistical review

2. Temperature - 23.5 +/- 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%, 81%, 62%, 31%, 15.5% 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

		NOEC	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 and survival test were declared valid.

Test Quality Control

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

1. Effluent sampling and handling. Sampling containers prepared as per section 7 of Methods for Measuring and Chronic Toxicity of Effluent to Freshwater and Marine Organisms were provided to client. Insulated transportation containers with cooling packs to chill samples were provided.
2. 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.
3. 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.
4. 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.
6. 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

CITY OF CALDWELL WWTP
LAB ID #1814025
APRIL 2018

METHOD 1002.0

Concentration	Initial Count	48-hour Count	96-hour Count	Final Count	Percent Survival	Average Remaining Young/Female
Control	10	10	9	9	90%	32.2
15.5%	10	10	9	9	90%	32.2
31%	10	10	10	10	100%	34.5
62%	10	10	10	10	100%	37.6
81%	10	10	10	10	100%	39.4
100%	10	10	10	10	100%	38.8

Table I: *Ceriodaphnia dubia* Survival And Reproduction Summary

Concentration	Control		9.75%		19.5%		39%		69.5%		100%	
Day	DO	pH	DO	pH	DO	pH	DO	pH	DO	pH	DO	pH
1	7.7	8.2	7.7	8.3	7.7	8.3	7.6	8.4	7.5	8.4	7.6	8.5
2	7.7	8.2	7.7	8.3	7.7	8.4	7.6	8.4	7.6	8.4	7.5	8.5
3	7.7	8.3	7.6	8.4	7.6	8.4	7.5	8.4	7.5	8.4	7.5	8.5
4	7.7	8.4	7.6	8.4	7.5	8.5	7.5	8.5	7.4	8.6	7.5	8.6
5	7.8	8.1	7.9	8.4	7.9	8.5	8.0	8.6	8.0	8.6	8.0	8.6
6	7.7	7.9	7.8	8.1	7.8	8.2	7.8	8.3	7.7	8.4	7.7	8.4
7	7.3	8.2	7.3	8.2	7.3	8.3	7.3	8.4	7.4	8.4	7.8	8.5

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

Concentration	CHLORINE RESIDUAL	ALKALINITY	CONDUCTIVITY	HARDNESS	AMMONIA	pH
	(mg/L)	(mg/L)	(umhos)	(mg/L)	(mg/L)	S.U.
4/3/2018	<0.10	174	752	150	<0.04	7.6
4/5/2018	<0.10	184	718	149	<0.04	7.8
4/6/2018	<0.10	179	769	155	<0.04	7.6

Table III: Dilution Chemistries Summary

Definition of Terms

1. Safe Concentration. The highest concentrations of toxicant that will permit normal propagation of fish and other aquatic life in receiving waters, biologically defined rather than statistically.

2. 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. TUc (chronic toxicity units) –100/IC25

5. IC25 (Inhibition concentration - 25%) – Concentration where at least 25% of the organisms have some statistically significant effect.
   Taken from: 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.

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

LAB ID# 1814025 Analyst: GP/Bore Final Report Review: _____

Discharged: Effluent Test Start Date/Time: 4/3/18, 1600

Description: City of Caldwell WWTP Test Stop Date/Time: 4/10/18, 1430

Temp Received: Day 1: 6.9°c Day 2: 4.6°c Day 3: 3.7°c

Renewal Lab Numbers: **Day 0 & 1:** 14025 **Day 2 & 3:** 14565 **Day 4, 5 & 6:** 14815

Conc Control

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-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		7.6	8.1			23.2
1-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		7.2	8.1	7.7	8.2	22.8
2-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		7.2	8.0	7.7	8.2	23.8
3-	✓	✓	✓	✓	1/8	1/7	✓	✓	✓	✓	15	7.2	8.0	7.7	8.3	23.6
4-	1/8	1/6	D	1/8	✓	✓	1/8	1/4	1/8	1/8	50	7.3	8.1	7.7	8.4	23.3
5-	2/13	2/8	↓	2/12	2/13	2/12	2/2	✓	2/10	2/13	83	7.6	8.0	7.8	8.1	21.9
6-	3/18	3/14	↓	✓	3/20	3/21	✓	2/3	✓	✓	76	8.0	8.1	7.7	7.9	23.1
7-	✓	✓	↓	3/20	✓	✓	3/21	3/18	3/17	3/22	98			7.3	8.2	
Total	39	28	0	40	41	40	31	25	35	43	322					
M/F	F	→								→						

Conc 15.5%

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-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		7.8	7.9			23.1
1-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		7.6	8.0	7.7	8.3	23.0
2-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		7.4	7.9	7.7	8.3	24.1
3-	✓	✓	✓	✓	1/7	1/6	✓	✓	✓	✓	13	7.5	8.0	7.6	8.4	23.5
4-	1/7	1/8	1/7	1/6	✓	✓	1/8	1/6	D	1/8	50	7.7	8.1	7.6	8.4	23.2
5-	2/7	2/9	2/13	2/7	2/14	2/14	2/2	2/4	↓	2/16	86	7.8	8.1	7.9	8.4	21.8
6-	3/19	3/14	✓	✓	3/17	3/18	✓	✓	↓	✓	68	8.1	8.0	7.8	8.1	23.2
7-	✓	✓	3/18	3/16	✓	✓	3/24	3/24	↓	3/23	105			7.3	8.2	
Total	33	31	38	29	38	38	34	34	0	47	322					
M/F	F	→								→						

Conc 31%

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-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		8.1	7.9			23.0
1-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		7.9	7.9	7.7	8.3	23.0
2-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		7.7	7.8	7.7	8.4	24.0
3-	✓	✓	✓	✓	1/7	1/7	✓	✓	✓	✓	14	7.8	7.9	7.6	8.4	23.4
4-	1/6	1/8	1/8	1/7	✓	✓	1/8	1/7	1/6	1/6	56	8.0	8.0	7.5	8.5	23.0
5-	2/7	2/9	2/8	2/7	2/14	2/14	2/7	2/2	2/8	2/11	87	8.1	8.0	7.9	8.5	24.8
6-	✓	3/13	✓	✓	3/21	3/18	✓	✓	✓	✓	52	8.4	7.9	7.8	8.2	23.4
7-	3/20	✓	3/17	3/19	✓	✓	3/22	3/17	3/24	3/17	136			7.3	8.3	
Total	33	30	33	33	42	39	37	26	38	34	345					
M/F	F	→								→						

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

LAB ID# 1814025 Analyst: EP / Bone Final Report Review: _____

Discharged: Effluent Test Start Date/Time: 4/3/18, 1600

Description: City of Caldwell WWTP Test Stop Date/Time: 4/10/18, 1430

Temp Received: Day 1: 6.9°c Day 2: 4.6°c Day 3: 3.7°c

Renewal Lab Numbers: **Day 0 & 1:** 14025 **Day 2 & 3:** 14565 **Day 4, 5 & 6:** 14815

Conc 62%

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			22.8
1-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		8.5	7.7	7.6	8.4	23.0
2-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		8.2	7.7	7.6	8.4	24.1
3-	✓	✓	✓	✓	1/7	1/7	✓	✓	✓	✓	14	8.2	7.8	7.5	8.4	23.3
4-	1/6	1/7	1/6	1/6	✓	✓	1/5	1/7	1/7	1/8	52	8.7	7.8	7.5	8.5	23.0
5-	2/11	2/14	2/8	1/1	2/13	2/11	2/6	2/5	2/10	2/10	89	8.7	7.9	8.0	8.6	21.7
6-	✓	✓	✓	2/13	3/15	3/17	✓	✓	✓	✓	45	8.7	7.7	7.8	8.3	23.1
7-	3/21	3/20	3/24	3/20	✓	✓	3/24	3/20	3/22	3/25	176			7.3	8.4	
Total	38	41	38	40	35	35	35	32	39	43	376					
M/F	F	→	→	→	→	→	→	→	→	F						

Conc 81%

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-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		8.8	7.7			22.7
1-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		8.8	7.6	7.5	8.4	22.9
2-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		8.5	7.6	7.6	8.4	24.3
3-	✓	✓	✓	✓	1/8	✓	✓	✓	✓	✓	8	8.6	7.7	7.5	8.4	23.4
4-	1/7	1/6	1/8	1/7	✓	1/8	1/7	1/6	1/6	1/8	63	9.0	7.7	7.4	8.6	22.7
5-	2/9	2/10	2/11	✓	2/12	2/12	2/9	✓	2/9	2/13	85	8.8	7.9	8.0	8.6	21.5
6-	✓	✓	✓	2/14	3/19	3/20	✓	2/8	✓	✓	61	8.9	7.6	7.7	8.4	23.3
7-	3/21	3/22	3/23	3/22	✓	✓	3/25	3/19	3/20	3/25	177			7.4	8.4	
Total	37	38	42	43	39	40	41	33	35	46	394					
M/F	F	→	→	→	→	→	→	→	→	→						

Conc 100%

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-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		9.2	7.6			22.4
1-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		9.0	7.6	7.6	8.5	23.0
2-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		9.0	7.6	7.5	8.5	23.5
3-	✓	✓	✓	✓	1/7	1/5	✓	✓	✓	✓	12	8.8	7.6	7.5	8.5	23.3
4-	1/8	1/7	✓	1/8	✓	✓	1/7	1/7	1/6	1/8	51	9.2	7.6	7.5	8.6	22.7
5-	2/16	2/11	1/9	✓	2/11	2/13	2/3	✓	2/11	2/11	85	9.8	7.9	8.0	8.6	21.5
6-	✓	✓	✓	2/14	3/20	3/16	✓	2/7	✓	✓	57	9.1	7.6	7.7	8.4	23.3
7-	3/26	3/22	2/25	3/24	✓	✓	3/23	3/16	3/23	3/24	183			7.8	8.5	
Total	50	40	34	46	38	34	33	30	40	43	388					
M/F	F	→	→	→	→	→	→	→	→	→						

Summary Sheet

Facility	Analytical Laboratories	**Analyst**	Chris Pate
Test ID	#1814025 City of Caldwell WWTP	**Species**	Ceriodaphnia dubia (water flea)
Date	4/25/2018	**Test Type**	Reproduction
IWC Conc.			

Input

	Concentrations					
Replicate	0	15.5	31	62	81	100
1	39	33	33	38	37	50
2	28	31	30	41	38	40
3	0	38	33	38	42	34
4	40	29	33	40	43	46
5	41	38	42	35	39	38
6	40	38	39	35	40	34
7	31	34	37	35	41	33
8	25	34	26	32	33	30
9	35	0	38	39	35	40
10	43	47	34	43	46	43
Mean	32.200	32.200	34.500	37.600	39.400	38.800
Stdev	12.813	12.363	4.649	3.340	3.864	6.286

Output

Statistical Data	Conc.	Mean	Stdev	CV	Steel test
	0	32.200	12.813	0.398	
	15.5	32.200	12.363	0.384	NS
	31	34.500	4.649	0.135	NS
	62	37.600	3.340	0.089	NS
	81	39.400	3.864	0.098	NS
	100	38.800	6.286	0.162	NS

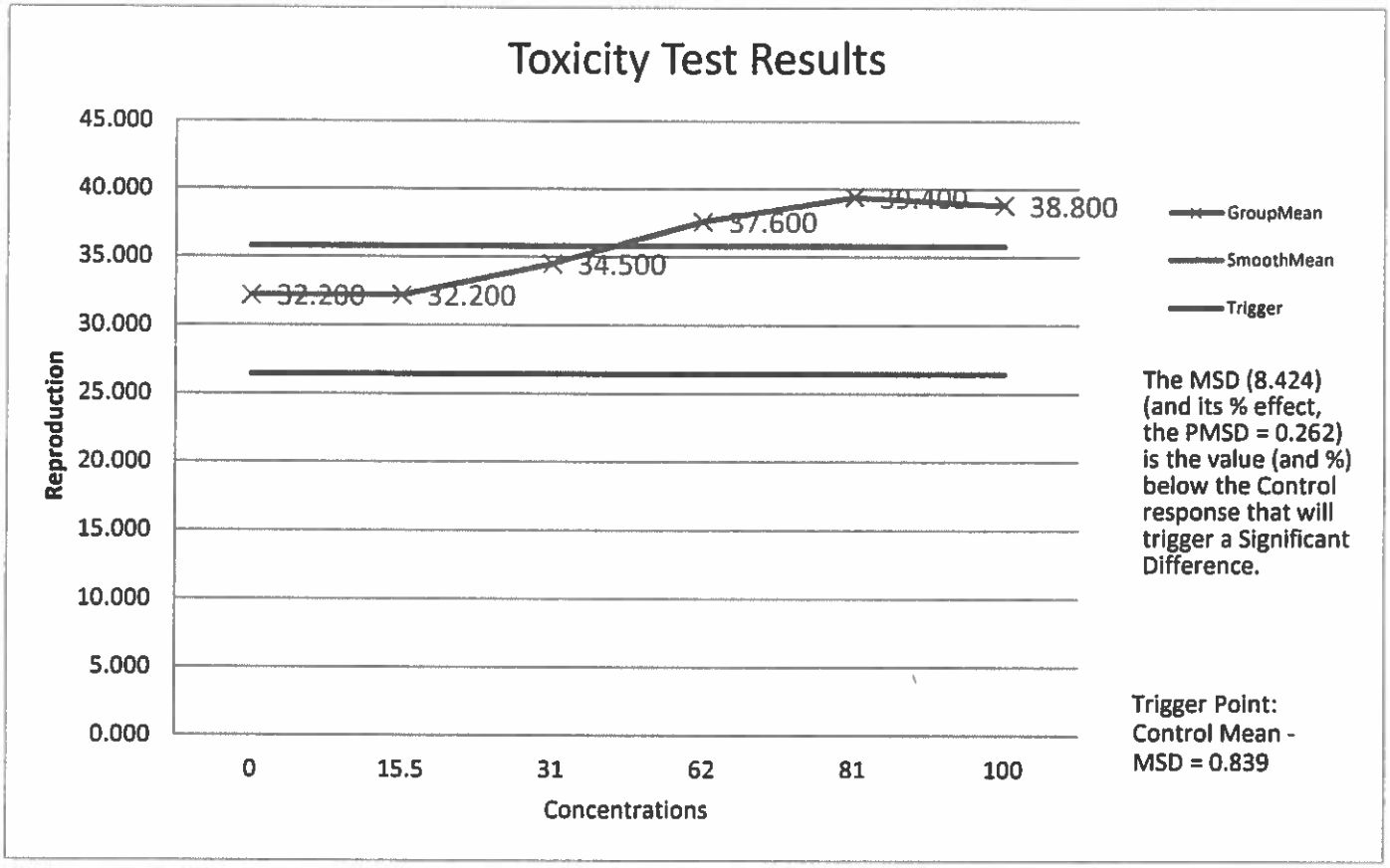
NOEC	LOEC	IC25	95% Confidence Intervals	
100	>100	>100	N/A	N/A

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

MSD	PMSD
8.424	26.2%

Summary Sheet

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.

Summary Sheet

Facility	Analytical Laboratories	**Analyst**	Chris Pate
Test ID	#1814025 City of Caldwell WWTP	**Species**	Ceriodaphnia dubia (water flea)
Date	4/25/2018	**Test Type**	Chronic Survival
IWC Conc.			

Input

Number of Organisms Exposed or Counted

	Concentrations					
Replicate	0	15.5	31	62	81	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	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

	Concentrations					
Replicate	0	15.5	31	62	81	100
1	1	1	1	1	1	1
2	1	1	1	1	1	1
3	0	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	0	1	1	1	1
10	1	1	1	1	1	1

Total Organisms	10	10	10	10	10	10
Total Responding	9	9	10	10	10	10
% Responding	90.0%	90.0%	100.0%	100.0%	100.0%	100.0%

Output

Summary Sheet

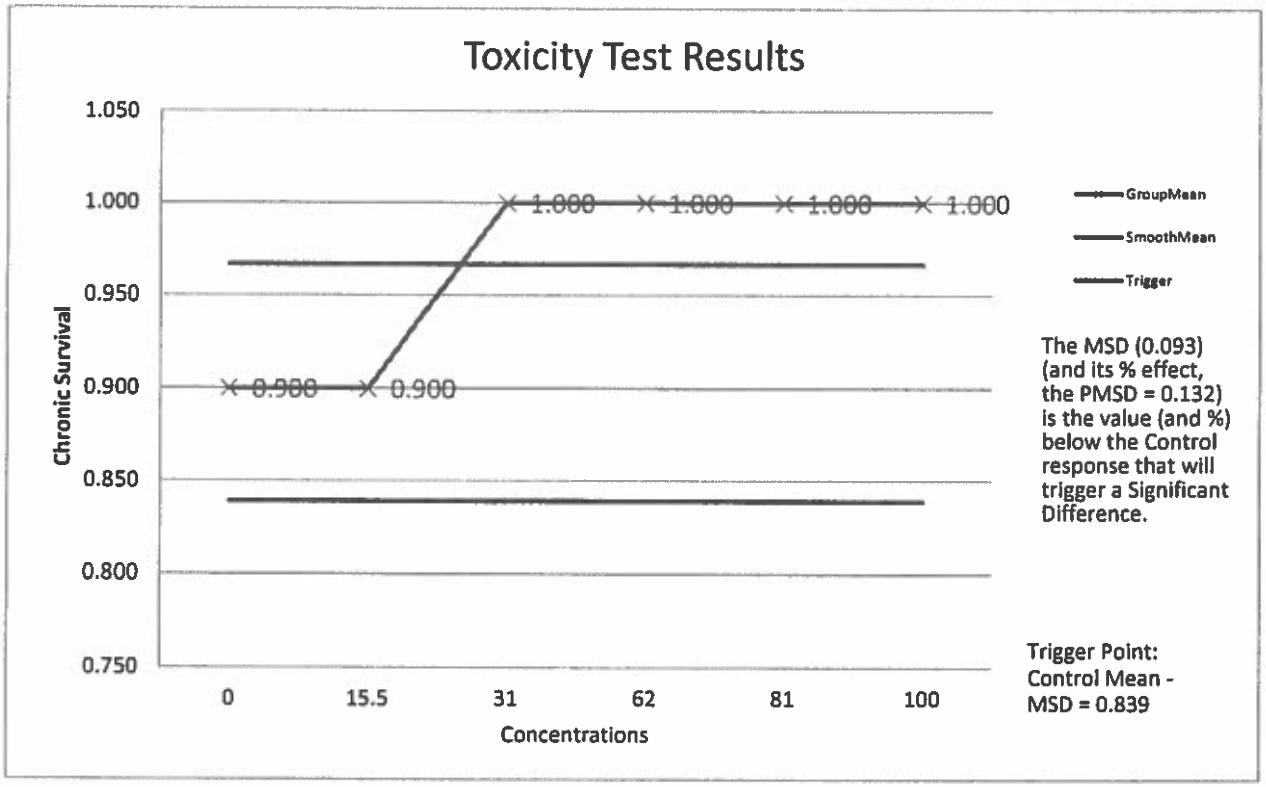
Statistical Data	Conc.	Mean	Stdev	CV	Steel test
	0	0.995	0.166	0.166	
Statistics are based on the transformed data used for endpoint calculations	15.5	0.995	0.166	0.166	NS
	31	1.047	0.000	0.000	NS
	62	1.047	0.000	0.000	NS
	81	1.047	0.000	0.000	NS
	100	1.047	0.000	0.000	NS

NOEC	LOEC	IC25	95% Confidence Intervals	
100	>100	>100	N/A	N/A

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

MSD	PMSD
0.093	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

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.

CLIENT CODE= CALDWW

CHAIN OF CUSTODY RECORD

* SPC

CLIENT INFORMATION:	PROJECT INFORMATION:
Project Manager: SALVADOR ARREOLA	Project Name:
Company: CALDWW	PWS Number:
Address: 208 JOHNSON LN	Purchase Order Number:
CALDWELL ID 83605	Required Due Date:
Phone: 455-3027 Fax:	E-mail Address:
Sampled by: *(Please print)*	Transported by: *(Please print)* B. Miller

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

Lab ID	Date Sampled	Time Sampled	Sample Description (Source)	Sample Matrix	BOD TSS	BOD Low	TSS	TPO4 Low NH3	WET	E Coli w				Remarks:
14023	4-3-18	0800	INF-C	WATER	✓									PH temp. 10.5°C
14024	"	0824	FE-C (6 BOTTLES)	"		✓	✓	✓	✓					
14025	"	0825	FE-C 15.6°C	"					✓	✓				
14026			FE-C B=0 Day 1						X	Cenodaphnia				

Invoice to: *(If different than above address)*

Special Instructions:

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Note: Samples are discarded 21 days after results are reported. Hazardous samples will be returned to client or disposed of at client expense.

	Print Name:	Company:	Date:	Time:
Relinquished By: *(Signature)* Rodger Hawken	Rodger Hawken	CALDWW	4-3-18	0850
Received By: *(Signature)* B. Miller	B. Miller	ALI	4/3/18	0930
Relinquished By: *(Signature)* B. Miller	B. Miller	ALI	4/3/18	1050
Received By: *(Signature)*		ALI	4/3/18	1050

SAMPLE RECEIPT Total # of Containers: 8 Chains of Custody Seals Y / N / (NA) Intact: Y / N / (NA) Temperature Received: 6.9°C Condition: Good

Ryan

REV. 2/19/12 WHITE: STAYS WITH SAMPLE(S) YELLOW: LAB PINK: SAMPLER

Analytical Laboratories, Inc.

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

Date Report Printed: 4/17/2018 12:27:05 PM
http://www.analyticallaboratories.com
These test results relate only to the items tested.

Laboratory Analysis Report

Sample Number: 1814026

Attn: SALVADOR ARREOLA
CALDWELL WASTEWATER
PO BOX 1179
CALDWELL, ID 83607

Collected By:
Submitted By: B. MILLER

Source of Sample:
FE-C BIO-MONITORING DAY 1

Time of Collection: 8:24
Date of Collection: 4/3/2018
Date Received: 4/3/2018
Report Date: 4/17/2018

Field pH:
Lab pH:
Field Temp:
Temp Rcvd in Lab: 6.9 °C

PWS#:
PWS Name:

Test Requested	MCL	Analysis Result	Units	MDL	Method	Date Completed	Analyst
Ceriodaphnia dubia		*			EPA 1002.0	4/17/2018	CP
Ammonia Direct (as N)		<0.04	mg/L	0.04	EPA 350.1	4/9/2018	SMC
Alkalinity		174	mg/L		EPA 310.1	4/10/2018	SMC
Chlorine Residual, Cl2		<0.10	mg/L	0.10	EPA 330.5	4/3/2018	JMS
Conductivity		752	umhos	2	EPA 120.1	4/3/2018	JMS
Hardness		150	mg/L	5.0	SM 2340	4/9/2018	SMC
pH		7.6	S.U.		SM 4500-H B	4/3/2018	NC

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= CALDWW

CHAIN OF CUSTODY RECORD

*SPC

CLIENT INFORMATION:	PROJECT INFORMATION:
Project Manager: SAL ARREDLA	Project Name:
Company: CALDWW	PWS Number:
Address: 208 Johnson Ln. Caldwell, ID 83605	Purchase Order Number:
	Required Due Date:
Phone: 208 455 3027 Fax:	E-mail Address:
Sampled by: (Please print) RODGER HAWKER	Transported by: (Please print) B. Miller

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(208) 342-5515 • Fax: (208) 342-5591 • 1-800-574-5773
Website: www.analyticallaboratories.com
E-mail: ali@analyticallaboratories.com

TESTS REQUESTED

Lab ID	Date Sampled	Time Sampled	Sample Description (Source)	Sample Matrix	Turbidity	BOD TSS	BOD Low TSS	NH3 TPO4 Low	WET	EColi				Remarks:
14562	4-4-18	1205	BRY-UP	WATER	X									Pt temp. 7.5
14563	4-5-18	0748	INF-C	WATER		✓								
14564	"	0758	FE-C	"			✓	✓	✓	X	07			
14566	"	0800	FE-C 16.6°C	"							✓			
14565			FE-C Bio dup 2							X				

Invoice to: *(If different than above address)*

Special Instructions:

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	Print Name:	Company:	Date:	Time:
Relinquished By: (Signature) Rodger Hawker	Rodger Hawker	CALDWW	4-5-18	0830
Received By: (Signature) B Miller	B. Miller	ALI	4/5/18	0950
Relinquished By: (Signature) B Miller	B. Miller	ALI	4/5/18	11:30
Received By: (Signature)	Print Name:	Company: ALI	4/5/18	1130

SAMPLE RECEIPT Total # of Containers: 9 Chains of Custody Seals Y / N (NA) Intact: Y / N / (NA) Temperature Received: 4.6 Condition: Good

REV. 2/19/12 WHITE: STAYS WITH SAMPLE (S) YELLOW: LAB PINK: SAMPLER

TWO

Analytical Laboratories, Inc.

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

Date Report Printed: 4/25/2018 3:44:03 PM
http://www.analyticallaboratories.com
These test results relate only to the items tested.

Laboratory Analysis Report

Sample Number: 1814565

Attn: SALVADOR ARREOLA
CALDWELL WASTEWATER
PO BOX 1179
CALDWELL, ID 83607

Collected By: R. HAWKER
Submitted By: B. MILLER

Source of Sample:
FE-C BIO-MONITORING DAY 2

Time of Collection: 7:58
Date of Collection: 4/5/2018
Date Received: 4/5/2018
Report Date: 4/11/2018

Field pH:
Field Temp:
Lab pH:
Temp Rcvd in Lab: 4.6 °C

PWS#:
PWS Name:

Test Requested	MCL	Analysis Result	Units	MDL	Method	Date Completed	Analyst
Ammonia Direct (as N)		<0.04	mg/L	0.04	EPA 350.1	4/9/2018	SMC
Alkalinity		184	mg/L		EPA 310.1	4/10/2018	SMC
Chlorine Residual, Cl2		<0.10	mg/L	0.10	EPA 330.5	4/5/2018	RME
Conductivity		718	umhos	2	EPA 120.1	4/5/2018	RME
Hardness		149	mg/L	5.0	SM 2340	4/9/2018	SMC
pH		7.8	S.U.		SM 4500-H B	4/5/2018	RME

Email: sarreola@ci.caldwell.id.us

c/o: JH
4-27-18

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

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

CLIENT CODE= CALDWW

*SPC

CHAIN OF CUSTODY RECORD

CLIENT INFORMATION:	PROJECT INFORMATION:
Project Manager: Sal Arreola	Project Name:
Company: CALDWW	PWS Number:
Address: 208 Johnson Ln.	Purchase Order Number:
Caldwell, ID 83605	Required Due Date:
Phone: (208)455-3027 Fax:	E-mail Address:
Sampled by: (Please print) Kaitlin Chattin	Transported by: (Please print) C. Pate

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

Lab ID	Date Sampled	Time Sampled	Sample Description (Source)	Sample Matrix	WETT	Remarks:
14815	4-6-18	747	FE-C Bro Dry 3	WATER	X	FT: 4.2°C

Invoice to: *(If different than above address)*

Special Instructions:

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.

Note: Samples are discarded 21 days after results are reported. Hazardous samples will be returned to client or disposed of at client expense.

	Print Name:	Company:	Date:	Time:
Relinquished By: *(Signature)*				
Received By: *(Signature)* C P	Chris Pate	ALI	4-6-18	1000
Relinquished By: *(Signature)* C P	Chris Pate	ALI	4-6-18	1040
Received By: *(Signature)*	Tom Taylor	ALI	4/6/18	1040

SAMPLE RECEIPT Total # of Containers: 4 | Chains of Custody Seals Y / N / (NA) | Intact: Y / N / (NA) | Temperature Received: 3.7°C | Condition: Good

REV. 2/19/12 WHITE: STAYS WITH SAMPLE(S) YELLOW: LAB PINK: SAMPLER

VNS

Analytical Laboratories, Inc.

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

Date Report Printed: 4/17/2018 12:27:05 PM
http://www.analyticallaboratories.com
These test results relate only to the items tested.

Laboratory Analysis Report

Sample Number: 1814815

Attn: SALVADOR ARREOLA
CALDWELL WASTEWATER
PO BOX 1179
CALDWELL, ID 83607

Collected By: K. CHATTIN
Submitted By: C. PATE

Source of Sample:
FE-C BIO-MONITORING DAY 3

Time of Collection: 7:47
Date of Collection: 4/6/2018
Date Received: 4/6/2018
Report Date: 4/17/2018

Field pH:
Lab pH:
Field Temp: 4.2 °C
Temp Rcvd in Lab: 3.7 °C

PWS#:
PWS Name:

Test Requested	MCL	Analysis Result	Units	MDL	Method	Date Completed	Analyst
Ammonia Direct (as N)		<0.04	mg/L	0.04	EPA 350.1	4/9/2018	SMC
Alkalinity		179	mg/L		EPA 310.1	4/10/2018	SMC
Chlorine Residual, Cl2		<0.10	mg/L	0.10	EPA 330.5	4/6/2018	JH
Conductivity		769	umhos	2	EPA 120.1	4/6/2018	JH
Hardness		155	mg/L	5.0	SM 2340	4/15/2018	SMC
pH		7.6	S.U.		SM 4500-H B	4/6/2018	JH

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

Table 3: Total Phosphorus Interim Effluent Limits and Compliance Schedule Dates		
6	January 31, 2024	Complete Bidding Deliverable: The permittee will provide DEQ and EPA with written notice that the Bid has been awarded.
7	April 30, 2024	Start Construction 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: 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. 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.

(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 TU_c (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) IC_{25} means "25% inhibition concentration." The IC_{25} 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

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*

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) A description of the investigation and evaluation techniques that would be used to identify potential causes/sources of toxicity, effluent variability, treatment system efficiency;

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.

(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 12-week 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:

PAGE 1 OF 2

SURVIVAL/REPRODUCTION TEST. EPA Method 1002.0

Analyst: cp/dpw Final Report Review: cp

Test Start Date/Time: 3/27/18, 1600

Test Stop Date/Time: 4/3/18, 1500

3.0°c Day 3: 0.6°c

Day 2 & 3: 13449 **Day 4, 5 & 6:** 13743

Conc Control

	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-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		7.7	7.4			23.6
	1-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		7.6	8.0	8.0	8.5	22.9
	2-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		7.6	8.0	7.9	8.3	23.5
	3-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		7.5	8.0	8.1	8.4	23.8
	4-	1/4	1/7	1/7	1/5	1/7	✓	1/5	D	1/8	1/6	49	7.5	8.1	8.0	8.5	23.6
	5-	2/10	2/11	2/9	2/7	2/9	1/5	2/10	↓	2/10	2/11	77	7.5	7.9	8.6	8.5	23.8
	6-	✓	✓	✓	✓	✓	2/7	✓		✓	✓	0	7.3	7.6	8.0	8.0	22.4
*	7-	3/19	3/18	3/17	3/15	3/17	D	3/17	↓	3/20	3/21	144			8.0	8.5	
	Total	33	36	33	27	33	0	32	0	38	38	270					
	M/F	F	—	—	—	—	—	—	—	—	→						

* 3rd brood neonates were used to set up test Lab ID # 1814025

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: 3/26/2018

SPECIES: *Raphidocelis subcapitata**

INOCULATION DATE: 3/6/2018

HARVEST DATE: 3/12/2018

CONCENTRATION DATE: 3/14/2018

CELL COUNT (/ml): 3.0×10^7 cells/ml

Comments:

* Formerly known as *Pseudokirschneriella 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
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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: 3/14/2018: Best if used by 6/30/2018
Average Total Solids: 1800 mg/l

Ingredient Lot Numbers

Pines International® Wheat Grass: COCDW12S50; Zeigler Finfish Starter #1 (Lot 12/4/2017); Fleischmanns Yeast: G-3

Analyzed Metals	Report Limits	Results (mg/L)
Aluminum	0.03	0.20
Arsenic	0.001	0.004
Cadmium	0.001	U
Chromium	0.005	U
Copper	0.005	0.075
Iron	0.02	0.61
Lead	0.001	U
Mercury	0.001	U
Nickel	0.005	U
Silver	0.001	U
Zinc	0.01	0.29

EPA Required Toxic Metals and Pesticide Analyses*

Compounds	Report Limits	Results (ug/L)
Aldrin	0.5	U
alpha-BHC	0.5	U
beta-BHC	0.5	U
delta-BHC	0.5	U
gamma-BHC (Lindane)	0.5	U
alpha-Chlordane	0.5	U
gamma-Chlordane	0.5	U
4,4' – DDD	0.5	U
4,4' – DDE	0.5	U
4,4' –DDT	0.5	U
Dieldrin	0.5	U
Endosulfan I	0.5	U
Endosulfan II	0.5	U
Endosulfan sulfate	0.5	U
Endrin	0.5	U
Endrin aldehyde	0.5	U
Endrin ketone	0.5	U
Heptachlor	0.5	U
Heptachlor epoxide	0.5	U
Methoxychlor	0.5	U
Chlordane (technical)	5.0	U
Toxaphene	25	U
Aroclor-1016	5.0	U
Aroclor-1221	5.0	U
Aroclor-1232	5.0	U
Aroclor-1242	5.0	U
Aroclor-1248	5.0	U
Aroclor-1254	5.0	U
Aroclor-1260	5.0	U
Aroclor-1262	5.0	U
Aroclor-1268	5.0	U

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

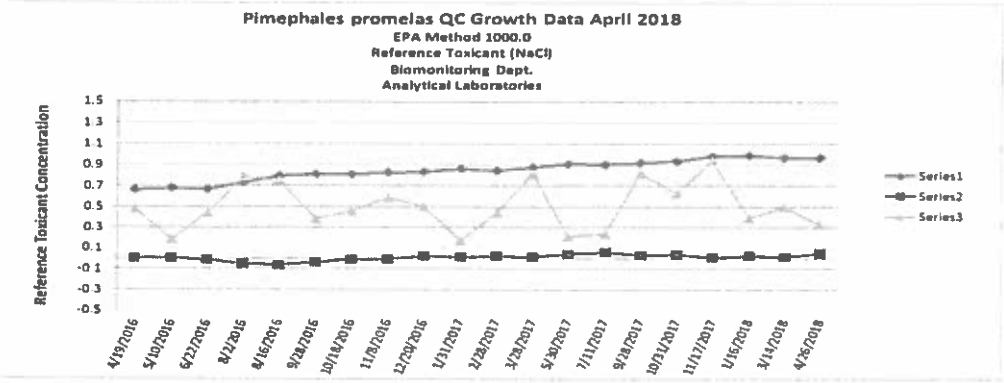
Literature Cited

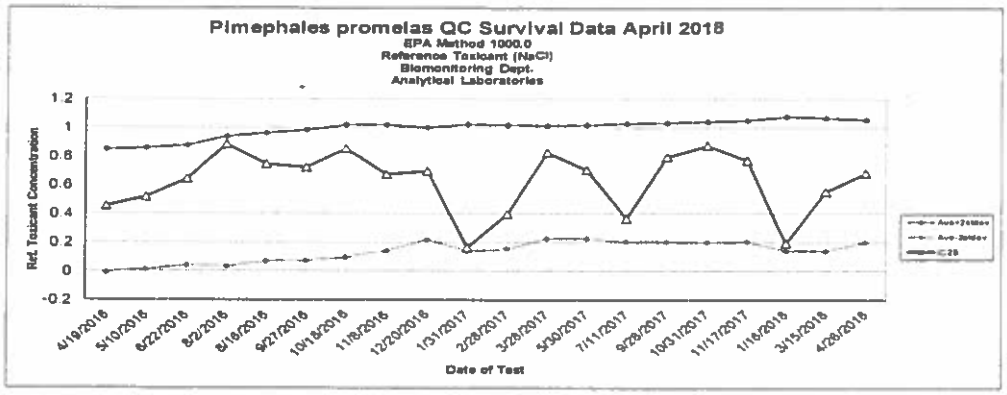
1. Short-Term methods for Estimating the Chronic Toxicity of Effluents and receiving Waters to Freshwater Organisms, Fourth Edition. October 2002. EPA-821-R-02-013.

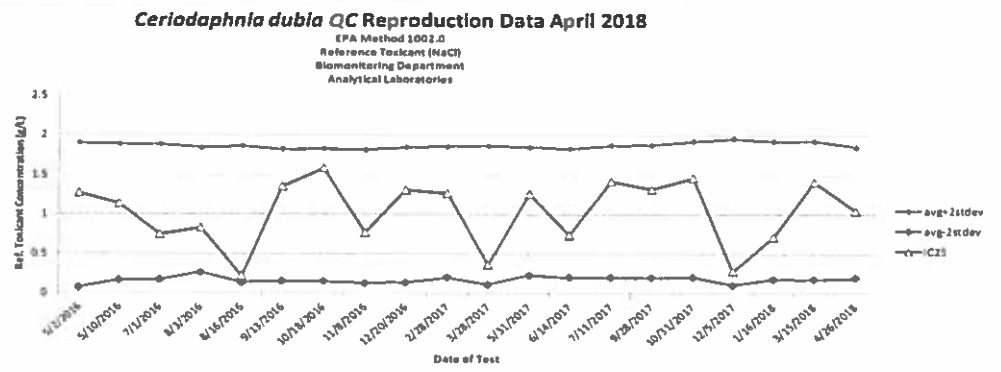
2. Methods for Measuring the Chronic Toxicity of Effluents to Freshwater and Marine Organisms, EPA/600/4-85/013, US EPA.

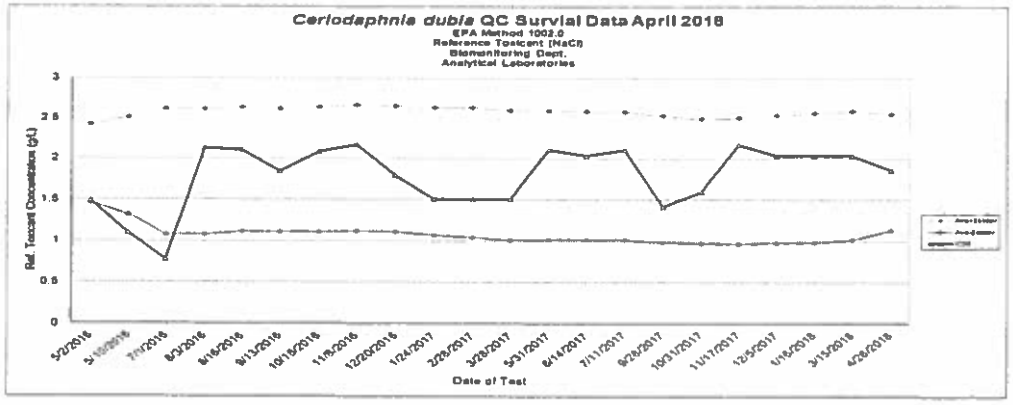
3. Standard Methods for the Examination of Water and Wastewater, 19 Edition, 1995, APHA, AWWA, WPCF.

4. Handbook for Analytical Quality Control in Water and Wastewater Laboratories, Environmental Monitoring and Support Laboratory, Cincinnati, EPA/600/4-79/019, US EPA

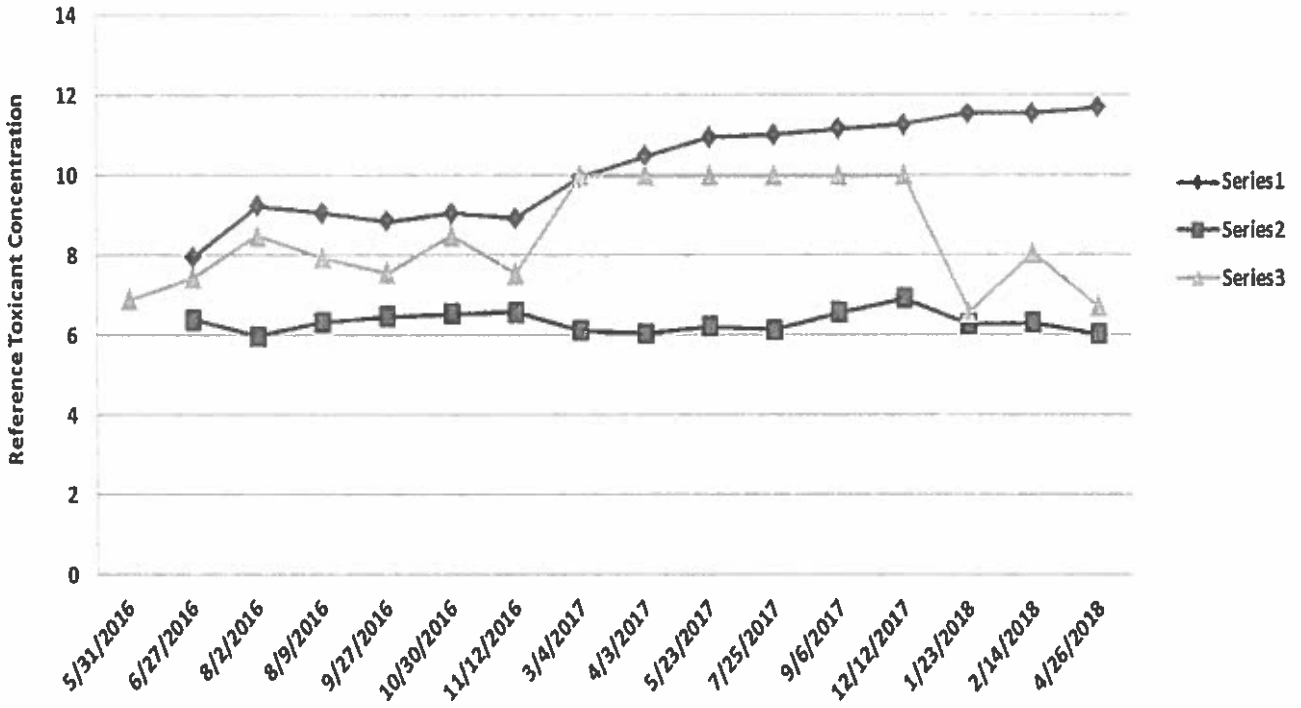

Pimephales promelas QC Growth Data April 2018
EPA Method 1000.0
Reference Toxicant (NaCl)
Biomonitoring Dept.
Analytical Laboratories
Reference Toxicant Concentration
Series1
Series2
Series3


Pimephales promelas QC Survival Data April 2018
EPA Method 1000.0
Reference Toxicant (NaCl)
Biomonitoring Dept.
Analytical Laboratories
Ref. Toxicant Concentration
Date of Test


Ceriodaphnia dubia QC Reproduction Data April 2018
EPA Method 1002.0
Reference Toxicant (NaCl)
Biomonitoring Department
Analytical Laboratories
Ref. Toxicant Concentration (g/L)
avg+2stdev
avg-2stdev
IC25
Date of Test


Ceriodaphnia dubia QC Survial Data April 2018
EPA Method 1002.0
Reference Toxicant (NaCl)
Biomonitoring Dept.
Analytical Laboratories
Ref. Toxicant Concentration (g/L)
Date of Test

Selenastrum Capricornutum QC Data Prior to April 2018
EPA Method 1003.0
Reference Toxicant (NaCl)
Biomonitoring Department
Analytical Laboratories



BENCH SHEET FOR QC CERIODAPHNIA SURVIVAL/REPRODUCTION TEST.

TEST MONTH April 2018 Analyst: CP / Bom

Test Start Date/Time: 4/17/18, 1615 Test Stop Date/Time: 4/24/18, 1315

Conc. CONTROL

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	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	XXX	7.7	7.8	XXX	XXX	23.0
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	XXX	7.9	7.9	8.2	8.3	23.2
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	XXX	7.6	7.7	8.1	7.9	22.7
3	✓	✓	✓	✓	1/5	✓	✓	✓	✓	✓	5	7.5	8.0	7.9	8.2	23.1
4	1/5	1/7	1/8	1/8	✓	1/5	1/6	1/4	1/5	1/5	53	7.7	7.8	7.8	8.3	22.9
5	2/13	2/6	✓	2/14	2/4	2/4	✓	2/15	2/16	2/10	82	7.4	7.9	7.3	8.0	22.4
6	✓	✓	2/16	✓	✓	✓	✓	✓	✓	✓	16	7.5	8.0	7.8	7.9	23.2
7	3/23	3/18	3/25	3/20	✓	3/11	✓	3/17	3/13	3/17	144			8.0	8.4	
Total	41	31	49	42	9	20	6	36	34	32	300					

Conc. 0.50 g/L

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	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	XXX	7.5	7.9	XXX	XXX	23.1
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	XXX	7.9	8.0	8.1	8.4	22.9
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	XXX	7.4	7.8	7.8	8.0	22.8
3	1/8	✓	✓	✓	✓	✓	✓	✓	✓	✓	8	7.4	8.0	7.8	8.2	23.1
4	✓	1/7	1/5	1/6	1/5	1/6	1/6	1/8	1/6	1/7	56	7.4	8.0	7.8	8.3	22.7
5	2/16	2/14	✓	2/13	2/5	✓	✓	2/11	2/12	2/9	80	7.4	8.1	7.3	8.1	22.2
6	✓	✓	2/14	✓	✓	✓	✓	✓	✓	✓	14	7.6	8.0	7.8	8.1	23.1
7	3/23	3/14	3/17	3/20	✓	✓	✓	3/19	3/18	3/20	131			7.7	8.3	
Total	47	35	36	39	10	6	6	38	36	36	289					

Conc. 1.25 g/L

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	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	XXX	7.6	7.9	XXX	XXX	23.1
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	XXX	7.8	8.0	8.0	8.3	22.8
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	XXX	7.5	7.9	7.7	8.1	22.8
3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	XXX	7.5	8.0	7.7	8.2	23.3
4	1/6	1/5	✓	1/6	1/5	1/4	1/5	1/6	1/4	1/6	47	7.3	8.0	7.6	8.3	22.9
5	2/13	2/11	✓	2/7	✓	✓	✓	2/10	✓	2/3	44	7.4	8.1	7.4	8.2	21.7
6	2/1	✓	✓	✓	✓	✓	✓	✓	2/11	2/11	23	7.6	8.0	7.8	8.1	23.1
7	3/19	3/14	1/12	3/15	✓	✓	✓	3/15	✓	3/15	90			7.7	8.2	
Total	39	30	12	28	5	4	5	31	15	35	204					

BENCH SHEET QC CERIODAPHNIA SURVIVAL/REPRODUCTION TEST.

TEST MONTH April 2018 Analyst: CP / BOM

Test Start Date/Time: 4/17/18, 1615 Test Stop Date/Time: 4/24/18, 1315

Conc. 2.00 g/L

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	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	XXX	XXX	XXX	XXX	XXX	XXX
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		7.5	7.9	XXX	XXX	23.0
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		7.8	7.9	8.0	8.3	22.5
3	✓	✓	✓	✓	✓	✓	✓	✓	D	✓		7.5	7.9	7.8	8.2	22.7
4	1/2	1/1	D	1/1	✓	1/1	✓	✓	↓	✓	5	7.5	8.0	7.7	8.2	27.4
5	2/10	2/11	↓	✓	✓	✓	✓	✓	↓	✓	21	7.4	8.0	7.6	8.3	22.9
6	✓	✓	↓	2/8	0	✓	✓	1/2	↓	1/3	13	7.4	8.1	7.5	8.2	21.7
7	3/11	3/15	↓	3/7	↓	✓	1/1	✓	↓	2/9	43	7.5	8.0	7.8	8.2	23.2
Total	23	27	0	16	0	1	1	2	0	12	82			7.7	8.2	

Conc. 2.75 g/L

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	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	XXX	XXX	XXX	XXX	XXX	XXX
1	✓	D	✓	✓	✓	D	D	D	D	✓		7.5	7.9	XXX	XXX	23.1
2	D	↓	D	D	D	↓	↓	↓	↓	D		7.7	7.9	8.1	8.3	22.4
3	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		7.5	7.9	7.8	8.2	22.9
4	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓						
5	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓						
6	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓						
7	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓						
Total	0	0	0	0	0	0	0	0	0	0						

Conc. 3.50 g/L

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	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	XXX	XXX	XXX	XXX	XXX	XXX
1	D	D	D	D	D	D	D	D	D	D		7.6	7.9	XXX	XXX	23.0
2	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		7.7	7.9	8.2	8.3	22.5
3	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓						
4	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓						
5	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓						
6	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓						
7	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓						
Total	0	0	0	0	0	0	0	0	0	0						

Summary Sheet

Facility	Analytical Laboratories	**Analyst**	Chris Pate
Test ID	QC April 2018	**Species**	Ceriodaphnia dubia (water flea)
Date	4/26/2018	**Test Type**	Reproduction
IWC Conc.			

Input

	Concentrations					
Replicate	0	0.5	1.25	2	2.75	3.5
1	41	47	39	23	0	0
2	31	35	30	27	0	0
3	49	36	12	0	0	0
4	42	39	28	16	0	0
5	9	10	5	0	0	0
6	20	6	4	1	0	0
7	6	6	5	1	0	0
8	36	38	31	2	0	0
9	34	36	15	0	0	0
10	32	36	35	12	0	0
Mean	30.000	28.900	20.400	8.200	0.000	0.000
Stdev	14.142	15.300	13.599	10.497	0.000	0.000

Output

Statistical Data	Conc.	Mean	Stdev	CV	Steel test
	0	30.000	14.142	0.471	
	0.5	28.900	15.300	0.529	NS
	1.25	20.400	13.599	0.667	NS
	2	8.200	10.497	1.280	Y
	2.75	0.000			Y
	3.5	0.000			Y

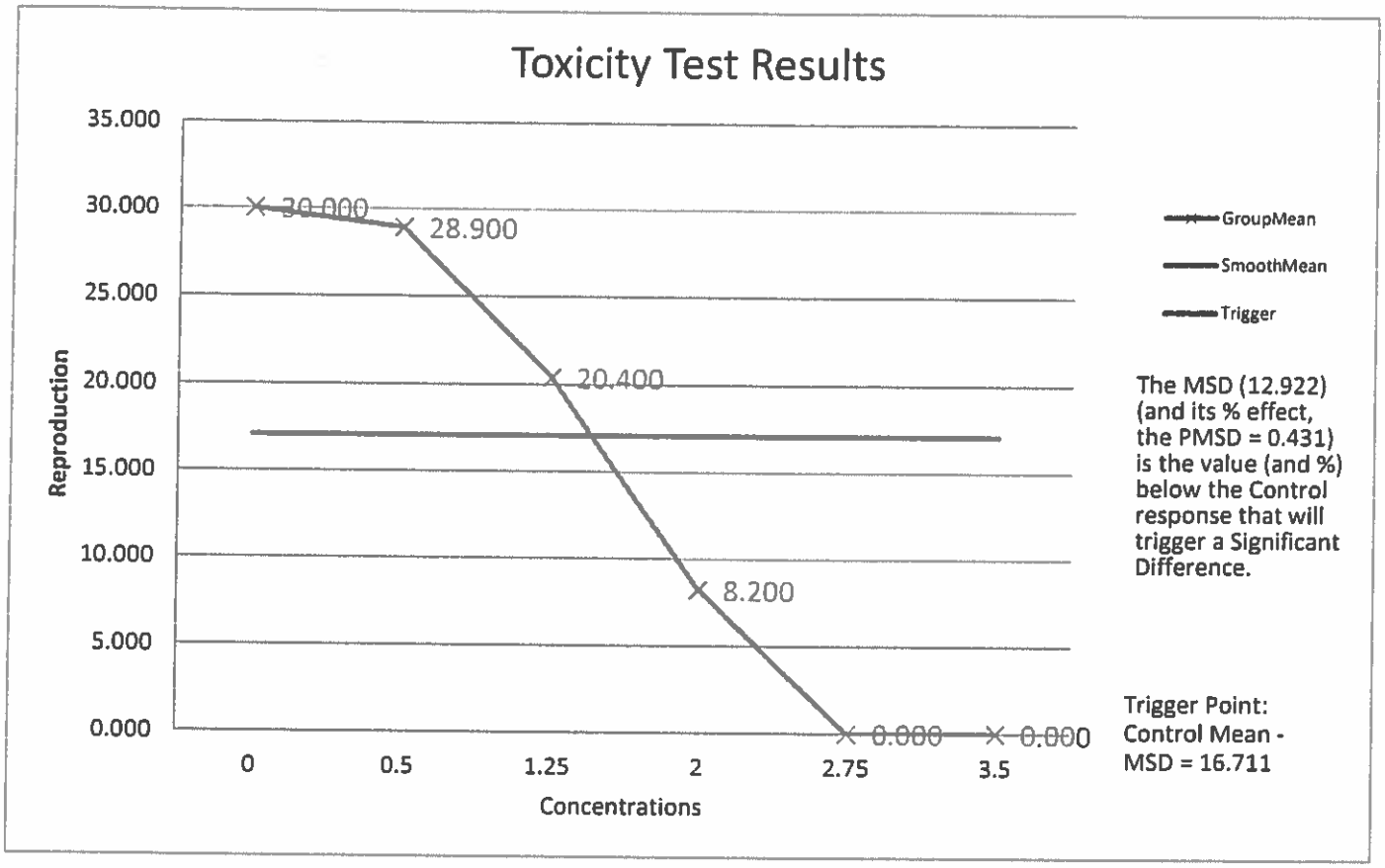
NOEC	LOEC	IC25	95% Confidence Intervals	
1.25	2	1.04	0.31	1.47

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

MSD	PMSD
12.922	43.1%

Summary Sheet

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.



Summary Sheet

Facility	Analytical Laboratories	**Analyst**	Chris Pate
Test ID	QC April 2018	**Species**	Ceriodaphnia dubia (water flea)
Date	4/26/2018	**Test Type**	Chronic Survival
IWC Conc.			

Input

Number of Organisms Exposed or Counted

	Concentrations					
Replicate	0	0.5	1.25	2	2.75	3.5
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

	Concentrations					
Replicate	0	0.5	1.25	2	2.75	3.5
1	1	1	1	1	0	0
2	1	1	1	1	0	0
3	1	1	1	0	0	0
4	1	1	1	1	0	0
5	1	1	1	0	0	0
6	1	1	1	1	0	0
7	1	1	1	1	0	0
8	1	1	1	1	0	0
9	1	1	1	0	0	0
10	1	1	1	1	0	0

Total Organisms	10	10	10	10	10	10
Total Responding	10	10	10	7	0	0
% Responding	100.0%	100.0%	100.0%	70.0%	0.0%	0.0%

Output

Summary Sheet

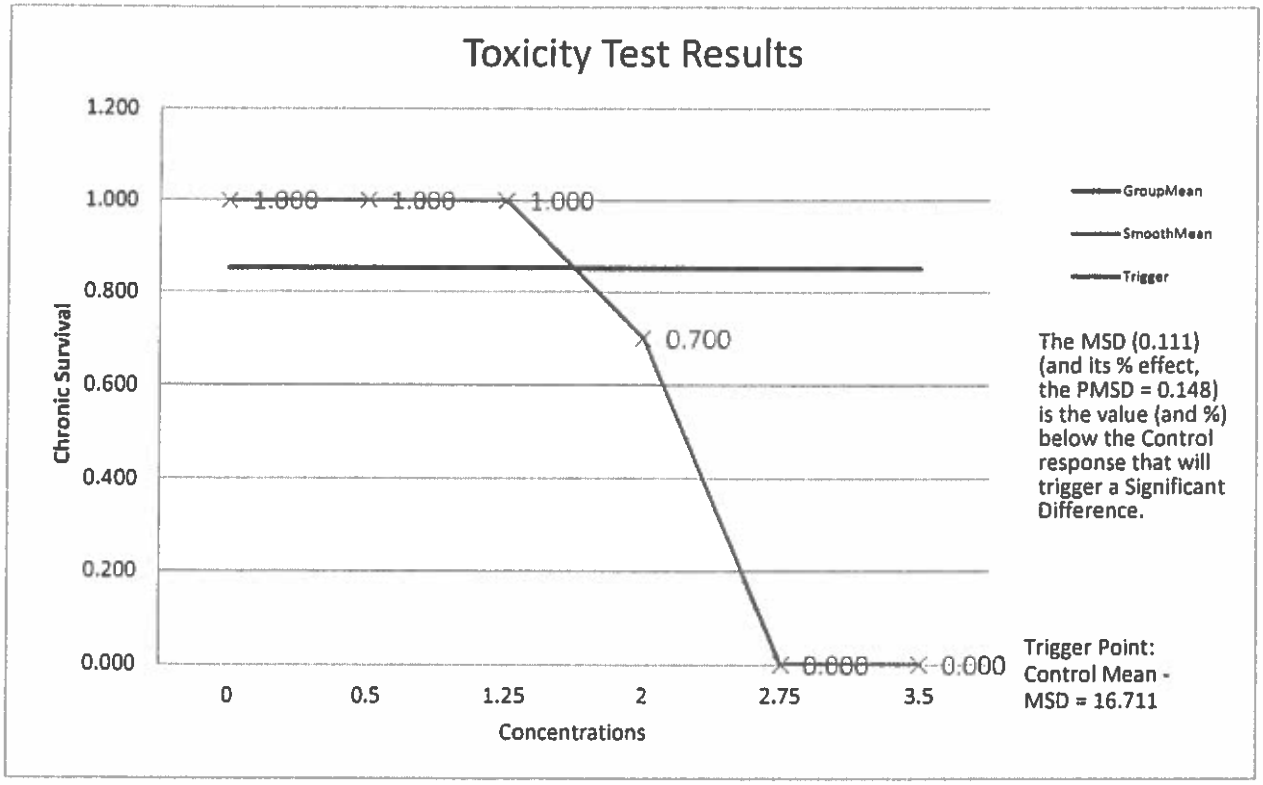
Statistical Data	Conc.	Mean	Stdev	CV	Steel test
	0	1.047	0.000	0.000	
Statistics are based on the transformed data used for endpoint calculations	0.5	1.047	0.000	0.000	NS
	1.25	1.047	0.000	0.000	NS
	2	0.890	0.253	0.284	NS
	2.75				Y
	3.5				Y

NOEC	LOEC	IC25	95% Confidence Intervals	
2	2.75	1.86	1.54	2.16

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

MSD	PMSD
0.111	14.8%

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

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.

Bench Sheet For Fathead Minnow QC Survival Test Method 1000.0

Test Month/Year: April 2018 Analyst: CP BDM

Test Start Date/Time: 4/10/18, 1600 Test Stop Date/Time: 4/17/18, 1100

Reference Toxicant Used: Sodium Chloride										
Day		0	1	2	3	4	5	6	7	Remarks
Conc:	Beaker#									
Control	1	10	10	10	10	10	10	10	10	
	2	10	10	10	10	10	10	10	10	98%
	3	10	10	10	10	10	10	10	10	
	4	10	10	10	9	9	9	9	9	
New DO	XXX	7.7	7.7	7.5	7.8	7.7	7.5	7.8	XXX	
New pH	XXX	7.9	8.0	7.9	7.9	8.0	8.2	7.9	XXX	
Temp	XXX	22.3	23.5	22.0	23.2	23.4	23.7	22.6	XXX	23.5 Day 5 temp BDM
Old DO	XXX	XXX	6.0	5.9	5.6	5.8	5.8	5.7	6.4	
Old pH	XXX	XXX	7.9	7.9	7.6	7.9	7.9	7.6	7.9	
Conc: 0.25g/L	1	10	10	10	10	10	10	9	9	
	2	10	10	10	10	10	9	9	9	
	3	10	10	10	10	10	10	9	8	85%
	4	10	10	10	10	10	10	9	8	
New DO	XXX	7.6	7.7	7.5	7.8	7.7	7.6	7.6	XXX	
New pH	XXX	7.9	8.0	8.1	7.9	8.0	8.1	8.0	XXX	
Temp	XXX	22.4	23.2	22.5	23.2	22.8	22.8	22.6	XXX	
Old DO	XXX	XXX	5.8	5.9	5.7	5.6	5.9	6.2	6.3	
Old pH	XXX	XXX	7.9	7.8	7.7	7.9	8.3	7.8	7.8	
Conc: 1.5g/L	1	10	10	10	10	10	10	7	4	
	2	10	10	10	10	10	9	8	8	
	3	10	10	10	10	10	9	8	8	58%
	4	10	10	10	10	10	9	4	3	
New DO	XXX	7.6	7.6	7.5	7.8	7.7	7.6	7.7	XXX	
New pH	XXX	8.0	8.1	8.1	8.0	8.1	8.1	8.0	XXX	
Temp	XXX	22.4	23.6	22.2	23.3	23.2	22.8	22.6	XXX	
Old DO	XXX	XXX	5.9	6.1	6.0	5.9	6.2	6.6	6.6	
Old pH	XXX	XXX	7.8	7.8	7.7	7.8	8.0	7.6	7.8	
Conc: 2.5g/L	1	10	10	10	10	10	9	6	5	
	2	10	10	10	10	10	9	5	4	
	3	10	10	10	10	10	10	4	3	40%
	4	10	10	10	10	9	8	4	4	
New DO	XXX	7.6	7.6	7.4	7.8	7.6	7.6	7.7	XXX	
New pH	XXX	8.0	8.1	8.1	8.1	8.1	8.2	8.0	XXX	
Temp	XXX	22.4	23.3	22.2	23.1	22.7	23.1	22.5	XXX	
Old DO	XXX	XXX	6.0	6.1	6.0	6.0	6.2	6.5	6.7	
Old pH	XXX	XXX	7.8	7.8	7.7	7.8	7.9	7.9	7.9	
Conc:	1	10	10	10	10	10	9	5	4	
Conc: 3.5g/L	2	10	10	10	10	10	9	6	4	
	3	10	10	10	10	10	10	7	5	40%
	4	10	10	10	10	10	9	5	3	
New DO	XXX	7.6	7.6	7.4	7.8	7.6	7.5	7.7	XXX	
New pH	XXX	8.0	8.0	8.1	8.0	8.1	8.1	8.1	XXX	
Temp	XXX	22.4	23.5	22.7	23.4	23.6	23.2	22.5	XXX	
Old DO	XXX	XXX	6.2	6.4	5.9	6.0	6.3	6.6	6.6	
Old pH	XXX	XXX	7.8	7.8	7.7	7.8	7.9	7.9	7.8	
Conc: 8.5g/L	1	10	7	0	0	0				
	2	10	8	2	0	0				
	3	10	8	2	0	0				0%
	4	10	8	2	~~0~~ SC	0				
New DO	XXX	7.6	7.6	7.4	7.8	7.6			XXX	
New pH	XXX	7.9	8.0	8.0	8.0	8.0			XXX	
Temp	XXX	22.3	23.7	22.6	23.1	23.0			XXX	
Old DO	XXX	XXX	6.3	6.8	6.7	6.4				
Old pH	XXX	XXX	7.7	7.7	7.7	7.8				
Feeding	A.M.	XXX	CP	CP	CP	CP	RDM	RDM	XXX	
	P.M.	CP	CP	CP	CP	CP	RDM	SC	XXX	

BENCH SHEET FOR FATHEAD MINNOW INITIAL WEIGHT DATA EPA METHOD 1000.0

LAB ID#: April QC Test Start Date: 4/10/18 Drying Temp: 100°C

Weighing Date: 4/11/17 Test End Date: 4/17/18 Drying Time: 20 hrs

Location/Client: ALI

	Rep No.	Weight of Boat (g)	Boat and Dry Larvae (g)	Dry Weight of Larvae (g)	No. of Larvae	Mean Dry Weight of Larvae (mg)	Average
Initial	I1	1.2846	1.2858	0.0012	10	0.12	0.12 mg
	I2	1.2893	1.2903	0.0010	10	0.10	
	I3	1.2883	1.2895	0.0012	10	0.12	
	I4	1.2886	1.2899	0.0013	10	0.13	

Reviewed By: GP

Fathead Minnow QC Weight Data

Analyst: CP Test Month/Year: April 2018 Drying Temp: 100°c

Weighing Date: 4/18/18 Drying Time: 21 hrs

Conc.	Rep No.	Weight of Boat (g)	Boat and Dry Larvae (g)	Dry Weight of Larvae (g)	No. of Larvae	Mean Dry Weight of Larvae (mg)	Avg.-Init.= Avg. Wt. Gain (mg)
CONTROL	1	1.2792	1.2841	0.0049	10	0.49	
	2	1.2760	1.2823	0.0063		0.63	0.53mg - 0.12mg = 0.41mg
	3	1.2741	1.2789	0.0048		0.48	
	4	1.2686	1.2737	0.0051		0.51	
0.25g/L	X5	1.2944	1.2984	0.0040		0.40	
	X6	1.2636	1.2686	0.0050		0.50	0.41mg - 0.12mg = 0.29mg
	X7	1.2964	1.3004	0.0040		0.40	
	X8	1.2884	1.2919	0.0035		0.35	
1.5g/L	X9	1.2904	1.2922	0.0018		0.18	
	X10	1.2955	1.2987	0.0032		0.32	0.23mg - 0.12mg = 0.11mg
	X11	1.2982	1.3009	0.0027		0.27	
	X12	1.2862	1.2876	0.0014		0.14	
2.5g/L	X13	1.2941	1.2966	0.0025		0.25	
	X14	1.2970	1.2988	0.0018		0.18	0.22mg - 0.12mg = 0.10mg
	X15	1.2905	1.2924	0.0019		0.19	
	X16	1.2860	1.2886	0.0026		0.26	
3.5g/L	X17	1.2919	1.2941	0.0022		0.22	
	X18	1.2974	1.2997	0.0023		0.23	0.21mg - 0.12mg = 0.09mg
	X19	1.2930	1.2949	0.0019		0.19	
	X20	1.2884	1.2904	0.0020		0.20	
8.5g/L	X21	—	—	—		—	
	X22	—	—	—		—	
	X23	—	—	—		—	
	X24	—	—	—	↓	—	

Reviewed By: CP

Summary Sheet

Facility	Analytical Laboratories	**Analyst**	Chris Pate
Test ID	QC April 2018	**Species**	Pimephales promelas (fathead minnow)
Date	4/26/2018	**Test Type**	Growth
IWC Conc.			

Input

	Concentrations					
Replicate	0	0.25	1.5	2.5	3.5	8.5
1	0.49	0.4	0.18	0.25	0.22	0
2	0.63	0.5	0.32	0.18	0.23	0
3	0.48	0.4	0.27	0.19	0.19	0
4	0.51	0.35	0.14	0.26	0.2	0
Mean	0.528	0.413	0.228	0.220	0.210	0.000
Stdev	0.069	0.063	0.082	0.041	0.018	0.000

Output

Statistical Data	Conc.	Mean	Stdev	CV	Dunnett test
	0	0.528	0.069	0.132	
	0.25	0.413	0.063	0.153	Y
	1.5	0.228	0.082	0.361	Y
	2.5	0.220	0.041	0.186	Y
	3.5	0.210	0.018	0.087	Y
	8.5	0.000			Y

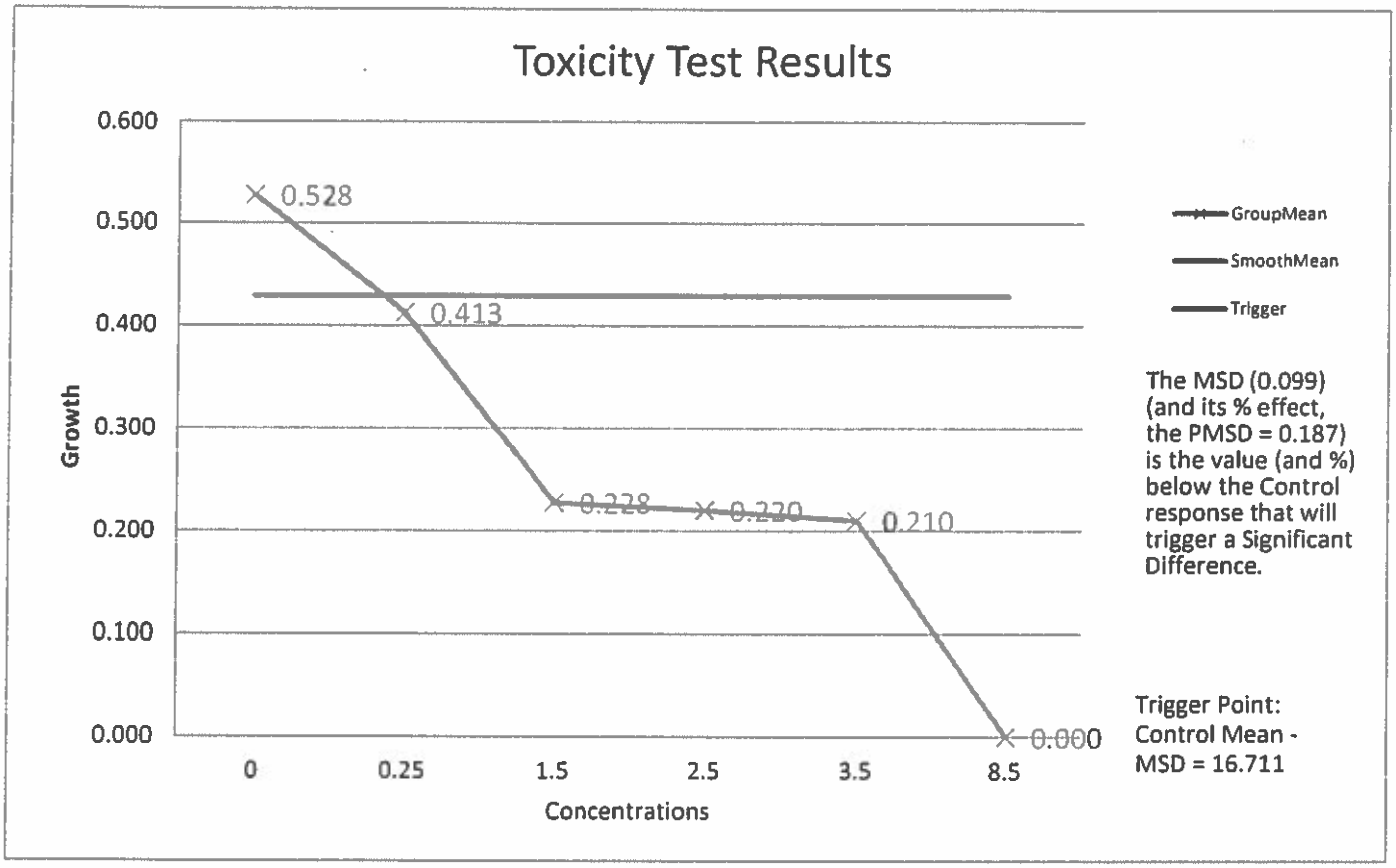
NOEC	LOEC	IC25	95% Confidence Intervals	
<0.25	0.25	0.33	0.18	0.59

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

MSD	PMSD
0.099	18.7%

Summary Sheet

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.



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Summary Sheet

Facility	Analytical Laboratories	**Analyst**	Chris Pate
Test ID	QC April 2018	**Species**	Pimephales promelas (fathead minnow)
Date	4/26/2018	**Test Type**	Chronic Survival
IWC Conc.			

Input

Number of Organisms Exposed or Counted

	Concentrations					
Replicate	0	0.25	1.5	2.5	3.5	8.5
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

	Concentrations					
Replicate	0	0.25	1.5	2.5	3.5	8.5
1	10	9	4	5	4	0
2	10	9	8	4	4	0
3	10	8	8	3	5	0
4	9	8	3	4	3	0

Total Organisms	40	40	40	40	40	40
Total Responding	39	34	23	16	16	0
% Responding	97.5%	85.0%	57.5%	40.0%	40.0%	0.0%

Output

Summary Sheet

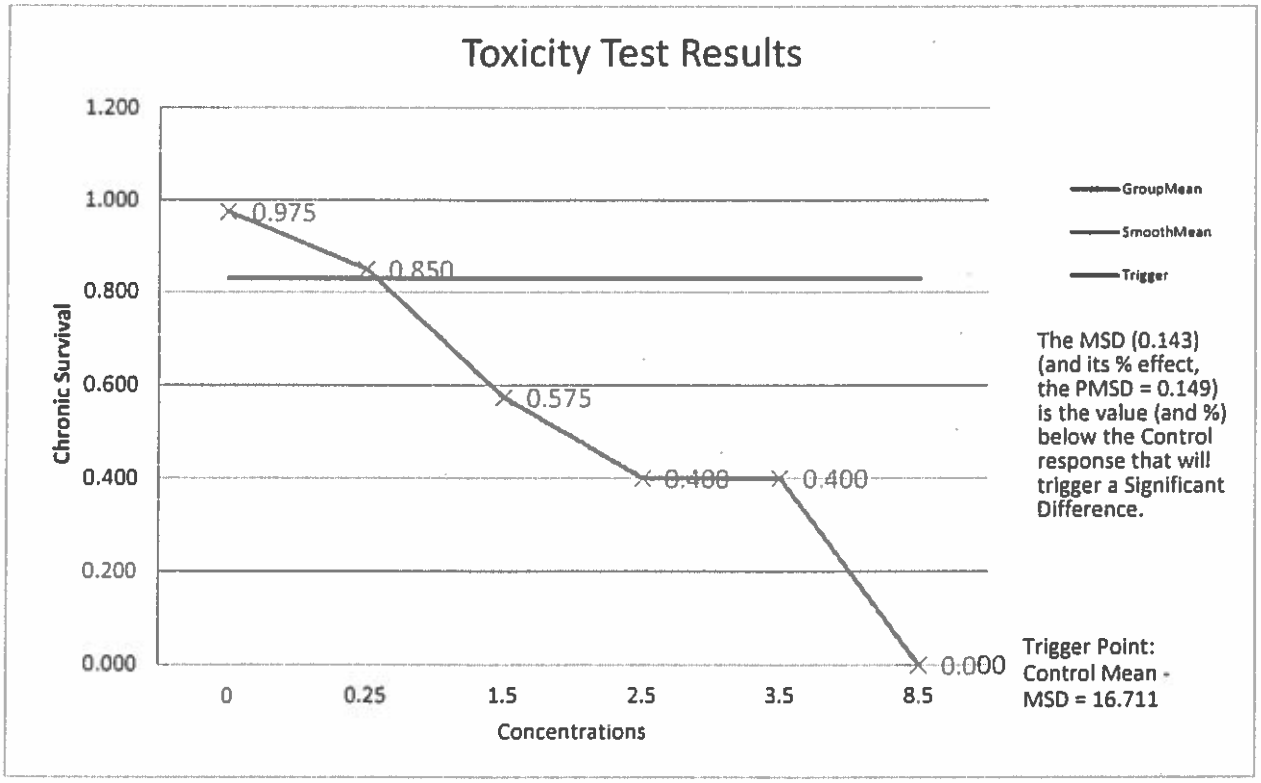
Statistical Data	Conc.	Mean	Stdev	CV	Dunnett test
	0	1.371	0.081	0.059	
Statistics are based on the transformed data used for endpoint calculations	0.25	1.178	0.082	0.070	NS
	1.5	0.870	0.278	0.319	Y
	2.5	0.684	0.084	0.123	Y
	3.5	0.684	0.084	0.123	Y
	8.5				Y

NOEC	LOEC	IC25	95% Confidence Intervals	
0.25	1.5	0.69	0.45	1.66

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

MSD	PMSD
0.143	14.9%

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.



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

TEST MONTH/YEAR# April 2018 ANALYST: GP FINAL REPORT REVIEW: GP
TEST START DATE/TIME: 4/21/18, 1605
TEST END DATE/TIME: 4/25/18, 1600

Initial Algae Count (cells/mL)

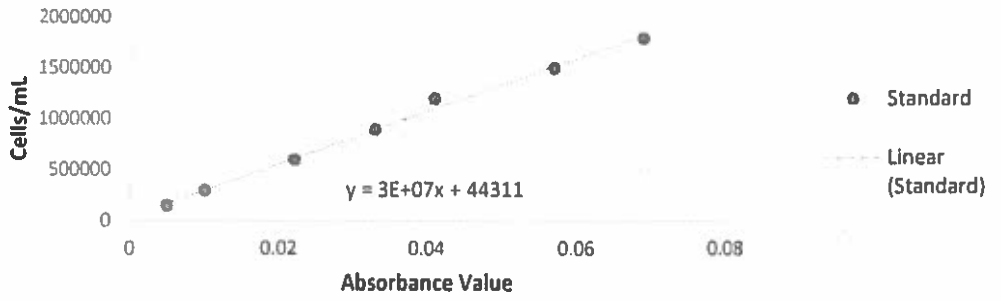
	Random Sample #1	Random Sample #2	Random Sample #3	Random Sample #4	Initial Average
	Absorbance Value: 0.010 0.34	Absorbance Value: 0.010 0.34	Absorbance Value: 0.009 0.31	Absorbance Value: 0.010 0.34	Absorbance Value: 0.010 Cells/mL: 0.34

Final Algae Count (cells/mL)

CONCENTRATION	Rep. 1	Rep. 2	Rep. 3	Rep. 4	Average
CONTROL	Absorbance Value: 0.062 1.90	Absorbance Value: 0.052 1.60	Absorbance Value: 0.054 1.66	Absorbance Value: 0.054 1.66	Absorbance Value: 0.056 Cells/mL: 1.71
0.5	Absorbance Value: 0.072 2.20	Absorbance Value: 0.070 2.14	Absorbance Value: 0.071 2.17	Absorbance Value: 0.069 2.11	Absorbance Value: 0.071 Cells/mL: 2.16
1.5	Absorbance Value: 0.078 2.38	Absorbance Value: 0.080 2.44	Absorbance Value: 0.079 2.41	Absorbance Value: 0.082 2.50	Absorbance Value: 0.080 Cells/mL: 2.44
5.5	Absorbance Value: 0.055 1.69	Absorbance Value: 0.061 1.87	Absorbance Value: 0.063 1.93	Absorbance Value: 0.058 1.78	Absorbance Value: 0.059 Cells/mL: 1.82
8.5	Absorbance Value: 0.037 1.15	Absorbance Value: 0.040 1.24	Absorbance Value: 0.040 1.24	Absorbance Value: 0.040 0.040 1.24	Absorbance Value: 0.039 Cells/mL: 1.22
10	Absorbance Value: 0.043 1.33	Absorbance Value: 0.044 1.36	Absorbance Value: 0.045 1.39	Absorbance Value: 0.043 1.33	Absorbance Value: 0.044 Cells/mL: 1.36

***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**



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

Test Month/Year April 2018 Analyst: cp Bmm Final Report Review: cp
Test Start Date/Time: 4/21/18, 1605
Test Stop Date/Time: 4/25/18, 1600

Daily pH and Temp.

CONCENTRATION	Day 0		Day 1		Day 2		Day 3		Day 4		Comments
	pH	Temp	pH	Temp	pH	Temp	pH	Temp	pH	Temp	
Control	7.9	25.2	9.5	24.1	10.3	24.1	10.7	23.6	10.8	24.0	
0.50 g/L	8.1	26.6	9.6	24.9	10.4	24.2	10.7	24.0	10.8	23.8	
1.5 g/L	8.2	26.2	9.5	23.8	10.5	24.1	10.7	24.1	10.7	23.9	
5.5 g/L	8.2	26.4	9.4	24.8	9.9	24.2	10.3	24.0	10.2	24.1	
8.5 g/L	8.2	26.0	9.2	24.0	9.8	23.4	9.9	24.1	9.9	24.1	
10 g/L	8.2	26.1	~~7~~ 9.1	24.7	9.8	23.8	10.0	24.0	10.0	24.0	

Summary Sheet

Facility	Analytical Laboratories	**Analyst**	Chris Pate
Test ID	QC April 2018	**Species**	Selenastrum capricornutum (green algae)
Date	4/26/2018	**Test Type**	Growth
IWC Conc.			

Input

	Concentrations					
Replicate	0	0.5	1.5	5.5	8.5	10
1	1.9	2.2	2.38	1.69	1.15	1.33
2	1.6	2.14	2.44	1.87	1.24	1.36
3	1.66	2.17	2.41	1.93	1.24	1.39
4	1.66	2.11	2.5	1.78	1.24	1.33
Mean	1.705	2.155	2.433	1.818	1.218	1.353
Stdev	0.133	0.039	0.051	0.105	0.045	0.029

Output

Statistical Data	Conc.	Mean	Stdev	CV	Dunnett test
	0	1.705	0.133	0.078	
	0.5	2.155	0.039	0.018	NS
	1.5	2.433	0.051	0.021	NS
	5.5	1.818	0.105	0.058	NS
	8.5	1.218	0.045	0.037	Y
	10	1.353	0.029	0.021	Y

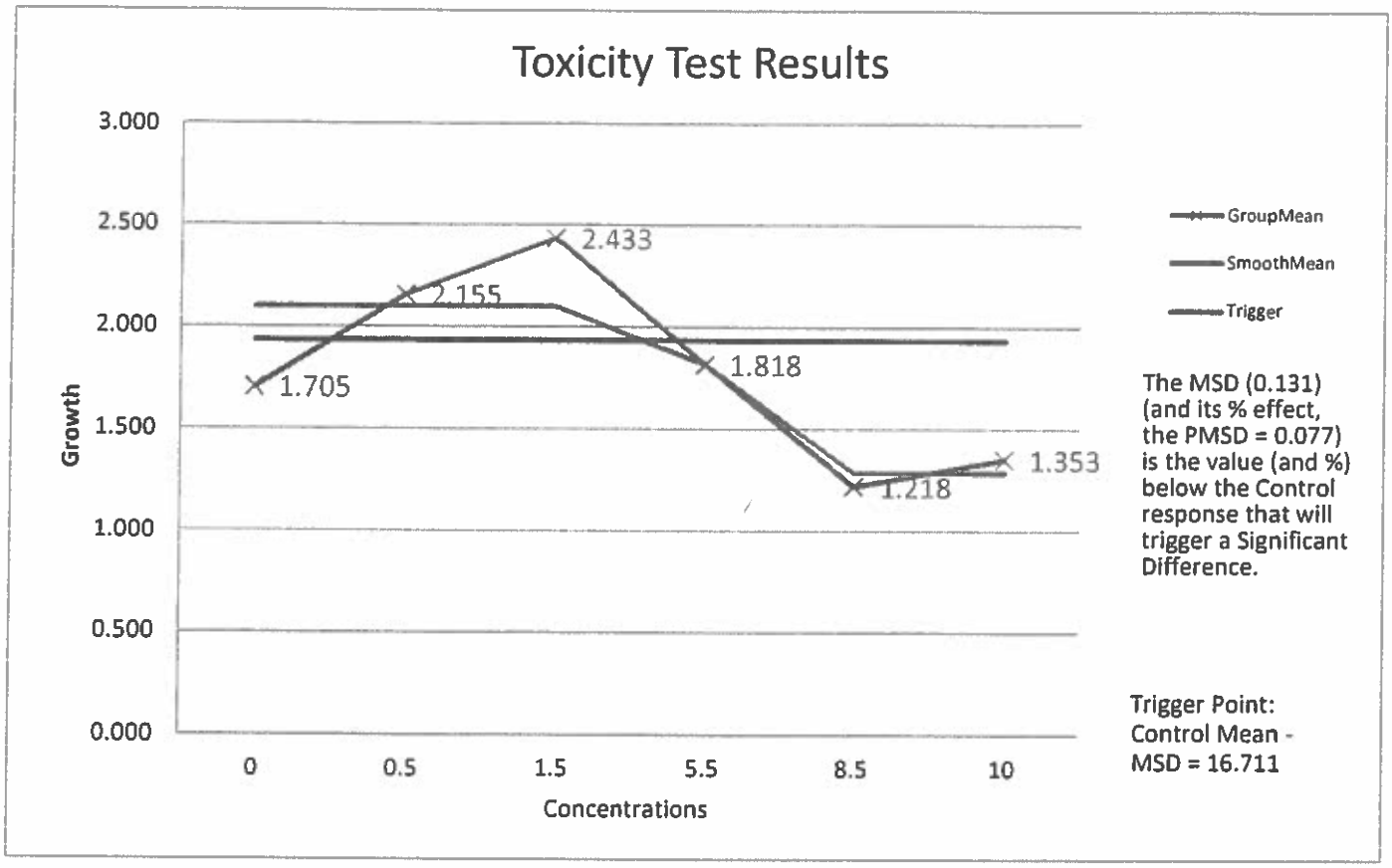
NOEC	LOEC	IC25	95% Confidence Intervals	
5.5	8.5	6.74	6.35	6.96

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

MSD	PMSD
0.131	7.7%

Summary Sheet

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.



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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: 4/9/2018

SPECIES: *Pimephales promelas*

AGE: N/A

LIFE STAGE: Embryo

HATCH DATE: 4/9/2018

BEGAN FEEDING: N/A

FOOD: N/A

Water Chemistry Record:	Current	Range
TEMPERATURE:	25°C	--
SALINITY/CONDUCTIVITY:	--	--
TOTAL HARDNESS (as $CaCO_3$):	120 mg/l	--
TOTAL ALKALINITY (as $CaCO_3$):	90 mg/l	--
pH:	7.98	--

Comments:

Facility Supervisor

PAGE 1 OF 2

VAL/REPRODUCTION TEST. EPA Method 1002.0

Analyst: CP BOYNE Final Report Review: _____

Test Start Date/Time: 4/10/18, 1510

Test Stop Date/Time: 4/17/18, 1450

Day 3: 7.3°C

& 3: 15506 Day 4, 5 & 6: 16070

Conc Control

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-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		7.7	7.9			23.2
1-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		7.7	8.0	7.8	8.5	~~23.7~~ 22.5
2-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		7.5	7.9	8.0	8.4	22.9
3-	✓	✓	✓	✓	✓	✓	✓	1/7	✓	✓	7	7.8	7.9	7.8	8.3	22.7
4-	1/7	1/7	✓	✓	1/6	1/8	1/7	✓	1/6	1/8	49	7.7	8.0	7.8	8.5	23.5
5-	2/11	2/11	✓	✓	2/6	2/5	2/8	2/5	2/11	2/8	67	7.5	8.2	7.7	8.5	22.9
6-	2/1	✓	1/9	✓	✓	✓	3/15	3/16	✓	✓	41	7.8	7.9	7.6	8.1	22.4
7-	3/15	3/20	2/18	✓	3/20	3/17	✓	✓	3/15	3/11	116			8.0	8.4	
Total	34	38	27	0	32	32	30	28	32	27	280					
M/F	F	→	→	M	F	→	→	→	→	→						

* 3rd brood neonates were used to set up April QC for EPA Method 1002.0

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: 4/9/2018

SPECIES: *Raphidocelis subcapitata**

INOCULATION DATE: 3/26/2018

HARVEST DATE: 4/1/2018

CONCENTRATION DATE: 4/3/2018

CELL COUNT (/ml): 3.0×10^7 cells/ml

Comments:

* Formerly known as *Pseudokirschneriella 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: 3/21/2018: Best if used by 6/30/2018
Average Total Solids: 1860 mg/l

Ingredient Lot Numbers

Pines International® Wheat Grass: COCDW12S50; Zeigler Finfish Starter #1 (Lot 12 4 2017), Fleischmanns Yeast: G-3

Analyzed Metals	Report Limits	Results (mg/L)
Aluminum	0.03	0.20
Arsenic	0.001	0.004
Cadmium	0.001	U
Chromium	0.005	U
Copper	0.005	0.075
Iron	0.02	0.61
Lead	0.001	U
Mercury	0.001	U
Nickel	0.005	U
Silver	0.001	U
Zinc	0.01	0.29

EPA Required Toxic Metals and Pesticide Analyses*

Compounds	Report Limits	Results (ug/L)
Aldrin	0.5	U
alpha-BHC	0.5	U
beta-BHC	0.5	U
delta-BHC	0.5	U
gamma-BHC (Lindane)	0.5	U
alpha-Chlordane	0.5	U
gamma-Chlordane	0.5	U
4,4' – DDD	0.5	U
4,4' – DDE	0.5	U
4,4' –DDT	0.5	U
Dieldrin	0.5	U
Endosulfan I	0.5	U
Endosulfan II	0.5	U
Endosulfan sulfate	0.5	U
Endrin	0.5	U
Endrin aldehyde	0.5	U
Endrin ketone	0.5	U
Heptachlor	0.5	U
Heptachlor epoxide	0.5	U
Methoxychlor	0.5	U
Chlordane (technical)	5.0	U
Toxaphene	25	U
Aroclor-1016	5.0	U
Aroclor-1221	5.0	U
Aroclor-1232	5.0	U
Aroclor-1242	5.0	U
Aroclor-1248	5.0	U
Aroclor-1254	5.0	U
Aroclor-1260	5.0	U
Aroclor-1262	5.0	U
Aroclor-1268	5.0	U

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