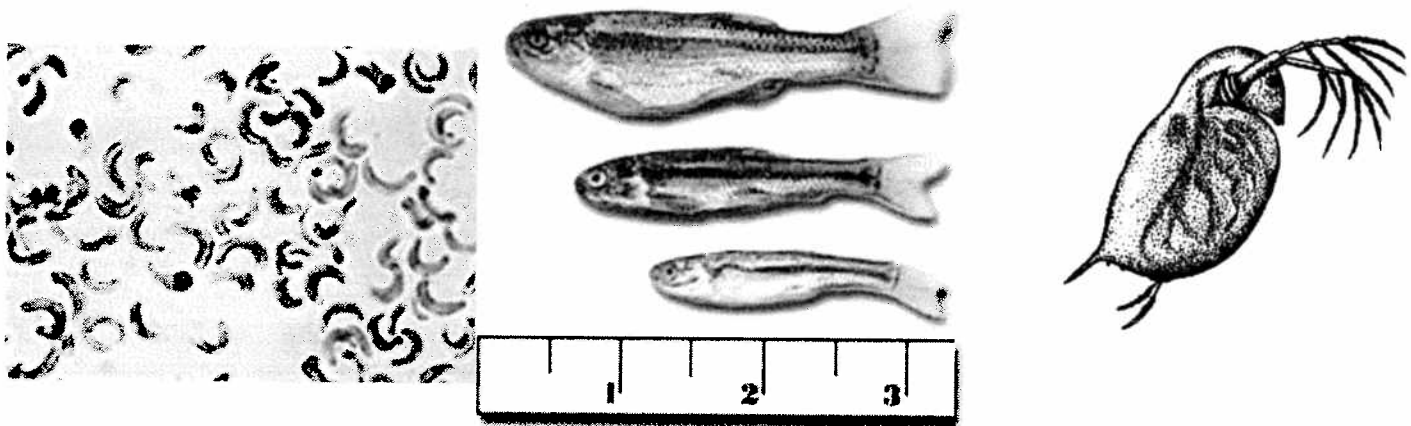


BIOMONITORING REPORT
FOR
CITY OF CALDWELL WWTP

LAB #1714385

PERMIT # ID0021504



APRIL 2017

PREPARED BY:

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SUMMARY OF ANALYSES
CITY OF CALDWELL WWTP
APRIL 2017

The results for the Fathead Minnow survival study:

NOEC:	100%
LOEC:	>100%
IC25:	>100%
TU _c :	1

The results for the Fathead Minnow growth study:

NOEC:	100%
LOEC:	>100%
IC25:	>100%
TU _c :	1

The results for the *Ceriodaphnia dubia* reproduction study:

NOEC:	100%
LOEC:	>100%
IC25:	>100%
TU _c :	1

The results for the *Ceriodaphnia dubia* survival study:

NOEC:	100%
LOEC:	>100%
IC25:	>100%
TU _c :	1

The results for the algae, *Selenastrum capricornutum* growth study:

NOEC:	100%
LOEC:	>100%
IC25:	>100%
TU _c :	1

Interpretation

EPA Method 1000.0- *Pimephales promelas*

Statistical analyses of survival and growth data for test method 1000.0 demonstrated that all concentrations tested were not significantly different from the controls and displayed no chronic toxicity.

EPA Method 1002.0- *Ceriodaphnia dubia*

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.

EPA Method 1003.0 – *Selenastrum capricornutum*

Statistical analyses of growth inhibition data for test method 1003.0 demonstrated that all concentrations tested displayed no chronic toxicity. However, significantly greater growth in increased test concentrations may indicate a bio stimulatory effect caused by the effluent sample.

Introduction

Toxicity analyses, consisting of two chronic bioassays, EPA Test Method 1000.0, EPA Test Method 1002.0 and EPA Test Method 1003.0 were conducted on effluent samples collected by the City of Caldwell WWTP. Samples were collected April 11, April 13, and April 14, 2017, 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 1000.0, using the freshwater fathead minnow *Pimephales promelas*, was conducted on April 11, 2017 and completed on April 18, 2017. Method 1002.0, utilizing the freshwater flea *Ceriodaphnia dubia*, was conducted on April 11, 2017 and completed on April 18, 2017. Method 1003.0 utilizing the green algae *Selenastrum capricornutum* was initiated April 13, 2017 and completed on April 17, 2017. 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 effluents to the cladoceran *Ceriodaphnia dubia* and the fathead minnow *Pimephales promelas* in a 7-day static renewal test. The green algae *Selenastrum capricornutum* was exposed in a static system to a series of concentrations of effluent for 96 hours to estimate chronic toxicity. 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 Millipore Milli-Q deionized water) to produce a moderately hard dilution and control water. Water was prepared in bulk 24 hours prior to analyses and was aerated for 24 hours prior to starting the test in order to produce sufficient dissolved oxygen in the control water. All test method design and overviews are provided below.

For Method 1000.0, utilizing the fathead minnow *Pimephales promelas*, larvae (less than 24 hours) were sent from Aquatic Biosystems, Inc. in Fort Collins, Colorado. Organisms were sent by UPS in oxygen saturated water contained in plastic bags in an insulated container. Once received, larvae were steadily acclimated to laboratory control water prior to transfer to test dilutions. Healthy larvae were transferred to test cells using wide-bore pipettes. Larvae were offered freshly hatched, freshwater-rinsed brine shrimp *Artemia nauplii*. Larvae were fed twice daily and water renewed daily using fresh test solution for seven consecutive days. Data obtained was used to determine NOEC, LOEC, IC25 and TUC for survival and growth (dry weight gain).

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 composite pool, inspected, and arranged in five sample dilutions and a control with ten replicates. Analyses at a static renewal were performed over the next seven consecutive days. Data obtained was used to determine NOEC, LOEC, and IC25 for survival and reproduction (see Appendix I - Definition of Terms).

For Test Method 1003.0, utilizing the green algae *Selenastrum capricornutum*, starter cultures are purchased from Aquatic Biosystems with an initial concentration of 3.0×10^7 cells/mL. This stock solution is diluted with algal medium to produce an initial concentration of >10,000 algae cells/mL in each replicate. A spectrophotometer is used at the beginning and after completion of the test to determine the cell density in each replicate prior to the start, and at the end of the test period. For the duration of the test, vessels are shaken twice daily to avoid sedimentation of algal cells for prolonged periods of time. Data obtained was used to determine NOEC, LOEC, IC25 and TUC (see Appendix I - Definition of Terms) for specific growth rate (increase in cell density).

Test Designed/Standard Conditions/Method 1000.0:

Test design and standard conditions for Method 1000.0 are as follows:

1. Test Type - static renewal (daily)
Collection #1 – Renewal Day 1 and 2 – April 11, 2017
Collection #2 – Renewal Day 3 and 4 – April 13, 2017
Collection #3 – Renewal Day 5 and 6 – April 14, 2017
Day 7 – Final counts and statistical review
2. Temperature - 25 +/- 1 degrees 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 - 500 mL tall form beakers
7. Test Solution Volume - 250 ml / replicate
8. Renewal static - All dilutions daily
9. Age of Test Organisms - Larvae; less than 24 hours old
10. Individual/Chamber - 10 per chamber
11. Chamber Replicates - 4 replicates of each dilution and control
12. Feeding - 0.1 ml newly hatched brine shrimp twice daily; 8 hour intervals
13. Dilution Water - 20% v/v Perrier Mineral Water in deionized water
14. Dilution Concentrations - 100%, 81%, 62%, 31%, 15.5% and Control
15. Test Duration - 7 days
16. Endpoints - Survival and growth (individual dry weight gain)
17. Acceptability - 80% survival in controls. Average net dry weight gain of surviving controls equals or exceeds 0.25 mg/individual
18. Sample Volume Taken - 1 gallon for test solution renewal and 1 liter for daily composite water chemistries
19. Source of organisms - Aquatic Biosystems, Inc., Fort Collins, Colorado

Test Design/Standard Conditions Method 1002.0

1. Test Type - static renewal (daily)
Collection #1 – Renewal Day 1 and 2 – April 11, 2017
Collection #2 – Renewal Day 3 and 4 – April 13, 2017
Collection #3 – Renewal Day 5 and 6 – April 14, 2017
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 anchor-hocking
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 - In house

Test Designed/Standard Conditions/Method 1003.0

1. Test Type: Static system
Collection – April 13, 2017
 2. Temperature: 25 degrees C. +/- 1 degree C.
 3. Light Quality: Incubator chamber (Percival Scientific Model AL30L2C8)
 4. Light Intensity: Incubation chamber (as above)
 5. Photoperiod: 24 hours light
 6. Test Chamber: 250 mL borosilicate glass bottles
 7. Test Solution Volume: 100 ml / replicate
 8. Age of Test Organisms: 4 day culture
 9. Individual/Vessel: 7.34×10^5 cells per mL initially
 10. Vessel Replicates: 4 replicates of control and each dilution
 11. Feeding: Initial addition of Algal culture medium (prepared by Aquatic Biosystems) at equal portion in each dilution.
 12. Dilution Water: 20% diluted Perrier mineral water
 13. Dilution Concentrations: 100%, 81%, 62%, 31%, 15.5% and Control
 14. Test Duration: 96 hours
 15. Endpoint: Growth – Absorbance values obtained from Spectronic 601 are used to determine cells/mL based on a standardized linear relationship
 16. Acceptability: Mean cell density of at least 1.0×10^6 cells/mL in the controls; and variability (CV%) among control replicates less than or equal to 20%
- Source of Algae: Aquatic Biosystems, Fort Collins, Colorado

Interpretation - Statistical Review

Results - Method 1000.0

During Method 1000.0, larval survival and growth test using the fathead minnow *Pimephales promelas*, survival and growth from specific dilutions of collected wastewater were measured and compared to values obtained from controls prepared in 20% diluted mineral water.

Statistical analyses of survival and growth data for test method 1000.0 demonstrated that all concentrations tested were not significantly different from the controls and displayed no chronic toxicity.

Endpoints Determined - Method 1000.0

		<u>NOEC</u>	<u>LOEC</u>	<u>IC25</u>
<i>Pimephales promelas</i>	Survival	100%	>100%	>100%
	Growth	100%	>100%	>100%

Survival of controls exceeded eighty-percent (80%) and net dry weight gain of surviving individuals did exceed 0.25 mg/individuals in controls. Test was declared valid.

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 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.

Endpoints Determined - Method 1002.0

		<u>NOEC</u>	<u>LOEC</u>	<u>IC25</u>
<i>Ceriodaphnia dubia</i>	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.

Results - Method 1003.0

During EPA Method 1003.0, algal growth response test using the green algae *Selenastrum capricornutum*, growth from specific dilutions of collected effluent were measured and compared to values obtained from controls prepared in 20% diluted Perrier mineral water.

Statistical analyses of growth inhibition data for test method 1003.0 demonstrated that all concentrations tested were not significantly different from the controls and displayed no chronic toxicity.

Endpoints Determined - Method 1003.0

		<u>NOEC</u>	<u>LOEC</u>	<u>IC25</u>
<i>Selenastrum capricornutum</i>	Growth	100%	>100%	>100%

Final mean cell counts of control exceeded 1.0×10^6 cell/mL cell density and less than 20% variation in controls was established. Test was 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 1000.0 and 1002.0, 1003.0 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.

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CITY OF CALDWELL WWTP

LAB ID # 1714385

APRIL 2017

METHOD 1000.0

Concentration	Initial Count	48-hour Count	96-hour Count	Final Count	Percent Survival
Control	40	39	37	37	93%
15.5%	40	38	37	37	95%
31%	40	39	39	39	98%
62%	40	40	40	40	100%
81%	40	40	40	40	100%
100%	40	40	40	39	98%

Table I: Fathead Minnow Larvae Survival Summary

Concentration	APPROXIMATE AVERAGE INITIAL WEIGHT (mg)*	ENDING AVERAGE WEIGHT (mg)	ENDING AVERAGE WEIGHT GAIN (mg)
Control	0.12	0.46	0.34
15.5%	0.12	0.44	0.32
31%	0.12	0.49	0.37
62%	0.12	0.48	0.36
81%	0.12	0.49	0.37
100%	0.12	0.46	0.34

* Initial weight obtained by taking 40 individuals at beginning of procedure (weight is dry weight/mg, 100° C. for 24 hours.)

Table II: Fathead Minnow Larvae Growth Summary

Concentration	Day	1	2	3	4	5	6	7
Control	DO	6.7	6.7	6.4	6.3	6.2	6.6	6.7
	pH	7.7	7.7	7.7	7.7	7.7	7.8	7.6
15.5%	DO	5.7	7.0	5.3	6.3	6.3	6.4	6.5
	pH	7.7	7.9	7.6	7.7	7.8	7.8	7.7
31%	DO	5.8	6.7	5.1	6.2	6.3	6.2	5.9
	pH	7.7	7.9	7.6	7.8	7.8	7.9	7.8
62%	DO	5.6	6.7	5.3	6.2	6.6	6.4	6.1
	pH	7.9	8.0	7.8	7.9	8.0	8.1	8.1
81%	DO	6.3	6.7	5.2	6.1	6.4	6.5	6.2
	pH	8.1	8.1	7.9	8.0	8.1	8.1	8.2
100%	DO	6.7	6.8	5.0	6.3	6.5	6.6	6.2
	pH	8.2	8.2	7.9	8.1	8.1	8.2	8.1

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

CITY OF CALDWELL WWTP
 LAB ID #1714385
 APRIL 2017

METHOD 1002.0

Concentration	Initial Count	48-hour Count	96-hour Count	Final Count	Percent Survival	Average Remaining Young/Female
Control	10	10	10	9	90%	32.8
15.5%	10	10	10	10	100%	41.9
31%	10	10	10	10	100%	38.6
62%	10	10	10	10	100%	37.3
81%	10	10	10	10	100%	36.9
100%	10	10	10	10	100%	36.0

Table IV: *Ceriodaphnia dubia* Survival and Reproduction Summary

Concentration Day	Control		15.5%		31%		62%		81%		100%	
	DO	pH	DO	pH	DO	pH	DO	pH	DO	pH	DO	pH
1	7.8	8.2	7.8	8.2	7.8	8.1	7.8	8.2	7.8	8.3	7.9	8.4
2	8.3	7.9	8.3	8.1	8.2	8.2	8.2	8.3	8.4	8.4	8.4	8.4
3	7.7	8.0	7.9	8.2	7.8	8.2	7.8	8.3	7.8	8.3	7.8	8.4
4	7.5	8.2	7.8	8.2	7.9	8.3	7.6	8.3	7.9	8.4	7.5	8.5
5	7.8	8.4	7.7	8.3	7.7	8.3	7.7	8.4	7.8	8.4	7.9	8.4
6	8.0	8.4	7.8	8.3	7.9	8.3	7.8	8.4	7.9	8.5	8.1	8.5
7	8.1	8.3	8.2	8.3	8.2	8.2	8.3	8.2	8.5	8.3	8.5	8.4

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

CITY OF CALDWELL WWTP
LAB ID #1714385
APRIL 2017

METHOD 1003.0

Conc	Day 0		Day 1		Day 2		Day 3		Day 4	
	pH	Temp	pH	Temp	pH	Temp	pH	Temp	pH	Temp
Control	8.1	25.0	9.5	24.0	10.4	24.5	10.5	23.7	10.6	24.5
15.5%	8.1	25.2	9.6	24.4	10.4	24.4	10.7	23.9	10.7	24.4
31%	8.0	25.4	9.5	23.9	10.5	24.1	10.7	23.9	10.7	23.9
62%	7.9	25.4	9.4	24.5	10.4	24.2	10.7	24.5	10.7	24.3
81%	7.8	25.2	9.2	24.4	10.4	24.0	10.7	24.5	10.8	24.5
100%	7.8	25.1	9.2	24.2	10.4	24.5	10.7	23.2	10.8	24.4

Table VI: *Selenastrum capricornutum* Water pH & Temperature

Concentration	Initial Cell Density	Final Cell Density Replicate 1	Final Cell Density Replicate 2	Final Cell Density Replicate 3	Final Cell Density Replicate 4	Final Cell Density Average
Control	0.419	1.84	1.54	2.02	1.99	1.85
15.5%	0.419	2.71	2.89	2.74	2.80	2.79
31%	0.419	3.28	3.34	3.34	3.31	3.32
62%	0.419	4.24	4.39	4.33	4.54	4.38
81%	0.419	5.92	5.68	5.95	5.23	5.70
100%	0.419	7.39	7.39	6.58	7.69	7.27

*Millions of cells per mL

Table VII: *Selenastrum capricornutum* Growth Response Summary

CITY OF CALDWELL WWTP
LAB ID # 1714385
APRIL 2017

Sample Date	CHLORINE RESIDUAL (mg/L)	ALKALINITY (mg/L)	CONDUCTIVITY (umhos)	HARDNESS (mg/L)	AMMONIA (mg/L)	pH S.U.
4/11/2017	<0.10	207	755	183	0.07	7.3
4/13/2017	<0.10	201	790	185	0.58	7.6
4/14/2017	<0.10	197	800	191	0.70	7.5

Table VIII: Effluent Chemistries Summary for EPA Method 1000.0, 1002.0 and 1003.0

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. TU_c (chronic toxicity units) – 100/NOEC for Survival; 100/IC25 for all other endpoints
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 Fathead Minnow Survival Test EPA METHOD 1000.0

LAB ID#: 1714385
 Discharged: Effluent
 Location: City of Caldwell WWTP
 Renewal Lab ID# Day 0,1: 14385

Analyst: CP/WR/X Final Report Review: SC
 Test Start Date: 4-11-17
 Test Stop Date: 4-18-17
 Day 2,3: 14849 Day 4,5,6: 15009

Lab ID/Day:		0	1	2	3	4	5	6	7	Remarks
Control	Beaker#									
	1	10	10	10	10	10	10	10	10	93%
	2	10	10	10	10	10	10	10	10	
	3	10	10	9	9	8	8	8	8	
	4	10	10	10	9	9	9	9	9	
New DO		7.7	7.9	8.0	7.7	7.6	7.8	7.5	xxx	
New pH		7.5	7.7	7.0	7.6	7.6	7.9	8.0	xxx	
Temp		22.9	22.9	22.5	22.8	23.1	23.0	24.5	xxx	
Old DO		xxx	6.7	6.7	6.4	6.3	6.2	6.6	6.7	
Old pH		xxx	7.7	7.4	7.7	7.7	7.7	7.8	7.6	
Conc:	1	10	10	10	10	10	10	10	10	93%
	2	10	10	9	9	9	9	9	9	
	3	10	10	9	9	9	9	9	9	
	4	10	10	10	10	9	9	9	9	
New DO		8.1	7.9	8.0	8.0	7.9	7.9	7.8	xxx	
New pH		7.7	7.9	7.7	7.6	7.6	8.0	7.8	xxx	
Temp		22.8	23.2	23.3	22.8	23.5	23.5	24.7	xxx	
Old DO		xxx	5.7	7.0	5.3	6.3	6.3	6.4	6.5	
Old pH		xxx	7.7	7.9	7.6	7.7	7.8	7.8	7.7	
Conc:	1	10	10	10	10	10	10	10	10	98%
	2	10	10	9	9	9	9	9	9	
	3	10	10	10	10	10	10	10	10	
	4	10	10	10	10	10	10	10	10	
New DO		8.3	8.3	8.2	8.1	8.1	8.1	8.2	xxx	
New pH		7.6	7.6	7.5	7.6	7.5	7.7	7.6	xxx	
Temp		22.8	23.1	23.2	23.0	23.4	23.6	24.3	xxx	
Old DO		xxx	5.8	6.7	5.1	6.2	6.3	6.2	5.9	
Old pH		xxx	7.7	7.9	7.6	7.8	7.8	7.9	7.8	
Conc:	1	10	10	10	10	10	10	10	10	100%
	2	10	10	10	10	10	10	10	10	
	3	10	10	10	10	10	10	10	10	
	4	10	10	10	10	10	10	10	10	
New DO		8.7	8.8	8.6	8.5	8.5	8.5	8.8	xxx	
New pH		7.6	7.5	7.4	7.5	7.4	7.5	7.5	xxx	
Temp		22.9	23.3	22.7	23.3	24.0	23.6	24.2	xxx	
Old DO		xxx	5.6	6.7	5.3	6.2	6.6	6.4	6.1	
Old pH		xxx	7.9	8.0	7.8	7.9	8.0	8.1	8.1	
Conc:	1	10	10	10	10	10	10	10	10	100%
	2	10	10	10	10	10	10	10	10	
	3	10	10	10	10	10	10	10	10	
	4	10	10	10	10	10	10	10	10	
New DO		9.1	9.1	8.9	8.7	8.9	8.8	9.2	xxx	
New pH		7.5	7.5	7.4	7.4	7.4	7.4	7.3	xxx	
Temp		22.7	23.5	22.5	23.8	23.7	23.5	24.1	xxx	
Old DO		xxx	6.3	6.7	5.2	6.1	6.4	6.5	6.2	
Old pH		xxx	8.1	8.1	7.9	8.0	8.1	8.1	8.2	
Conc:	1	10	10	10	10	10	10	10	10	98%
	2	10	10	10	10	10	10	10	10	
	3	10	10	10	10	10	10	10	10	
	4	10	10	10	10	10	10	10	10	
New DO		9.4	9.6	9.3	8.8	9.0	9.0	9.6	xxx	
New pH		7.5	7.6	7.4	7.4	7.3	7.4	7.3	xxx	
Temp		22.7	23.6	22.5	23.8	23.7	23.7	24.0	xxx	
Old DO		xxx	6.1	6.8	5.0	6.3	6.5	6.6	6.2	
Old pH		xxx	8.2	8.2	7.9	8.1	8.1	8.2	8.1	
Feeding	A.M.	xxx	CP	WR	CP	CP	WR	WR	xxx	
	P.M.	CP	SC	WR	SC	CP	WR	WR	xxx	

Summary Sheet

Facility	Analytical Laboratories	Analyst	Chris Pate
Test ID	1714385 City of Caldwell WWTP	Species	Pimephales promelas (fathead minnow)
Date	5/3/2017	Test Type	Chronic Survival
IWC Conc.			

Input

Number of Organisms Exposed or Counted

Replicate	Concentrations					
	<u>0</u>	<u>15.5</u>	<u>31</u>	<u>62</u>	<u>81</u>	<u>100</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

Replicate	Concentrations					
	<u>0</u>	<u>15.5</u>	<u>31</u>	<u>62</u>	<u>81</u>	<u>100</u>
1	10	10	10	10	10	10
2	10	9	9	10	10	10
3	8	9	10	10	10	10
4	9	9	10	10	10	9

Total Organisms	40	40	40	40	40	40
Total Responding	37	37	39	40	40	39
% Responding	92.5%	92.5%	97.5%	100.0%	100.0%	97.5%

Output

Summary Sheet

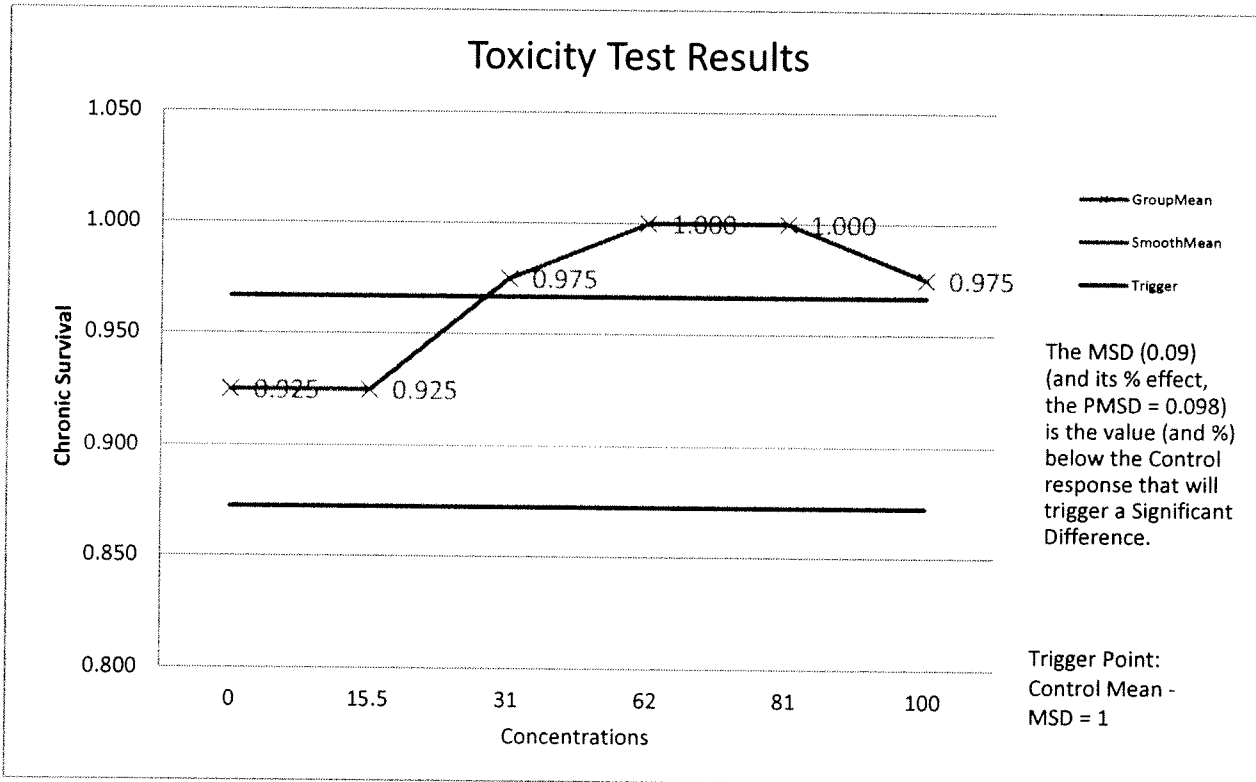
Statistical Data	Conc.	Mean	Stdev	CV	Dunnett test
	0	1.295	0.147	0.113	
Statistics are based on the transformed data used for endpoint calculations	15.5	1.290	0.081	0.063	NS
	31	1.371	0.081	0.059	NS
	62	1.412	0.000	0.000	NS
	81	1.412	0.000	0.000	NS
	100	1.371	0.081	0.059	NS

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
0.090	9.8%

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

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BENCH SHEET FOR FATHEAD MINNOW INITIAL WEIGHT DATA EPA METHOD 1000.0

LAB ID#: 1714385 Test Start Date: 4-11-17 Drying Temp: 100°C

Weighing Date: 4-12-17 Test End Date: 4-18-17 Drying Time: 24 hrs

Location/Client: Caldwell WWTP

	Rep No.	Weight of Boat (g)	Boat and	Dry	No. of Larvae	Mean Dry	Average
			Dry Larvae (g)	Weight of Larvae (g)		Weight of Larvae (mg)	
Initial	I1	1.2865	1.2876	0.0011	10	0.11	0.12mg
	I2	1.2915	1.2925	0.0010	↓	0.10	
	I3	1.2895	1.2909	0.0014		0.14	
	I4	1.2905	1.2917	0.0012		0.12	

Reviewed By: bc

Fathead Minnow Weight Data EPA METHOD 1000.0

LAB ID#: 1714385

Test Start Date: 4-11-17

Drying Temp: 100°C

Weighing Date: 4-19-17

Test End Date: 4-18-17

Drying Time: 24 hrs

Location/Client: Caldwell WWTP

Conc.	Weight of ID No.	Weight of Boat (g)	Weight of Boat and Dry Larvae (g)	Dry Weight of Larvae (g)	Original No. of Larvae	Mean Dry Weight of Larvae (mg)	Avg - Initial = Net Weight Gain
CONTROL	1	1.2803	1.2847	0.0044	10	0.44	0.46mg - 0.12mg = 0.34mg
	2	1.2774	1.2814	0.0040		0.40	
	3	1.2751	1.2795	0.0044		0.44	
	4	1.2698	1.2755	0.0057		0.57	
15.5%	x5	1.2949	1.2990	0.0041		0.41	0.44mg - 0.12mg = 0.32mg
	x6	1.2644	1.2688	0.0044		0.44	
	x7	1.2974	1.3016	0.0042		0.42	
	x8	1.2886	1.2936	0.0050		0.50	
31%	x9	1.2911	1.2961	0.0050		0.50	0.49mg - 0.12mg = 0.37mg
	x10	1.2960	1.2999	0.0039		0.39	
	x11	1.2975	1.3033	0.0058		0.58	
	x12	1.2867	1.2915	0.0048		0.48	
62%	x13	1.2951	1.3002	0.0051		0.51	0.48mg - 0.12mg = 0.36mg
	x14	1.2978	1.3023	0.0045		0.45	
	x15	1.2914	1.2960	0.0046		0.46	
	x16	1.2866	1.2914	0.0048		0.48	
81%	x17	1.2926	1.2980	0.0054		0.54	0.49mg - 0.12mg = 0.37mg
	x18	1.2985	1.3034	0.0049		0.49	
	x19	1.2938	1.2986	0.0048		0.48	
	x20	1.2891	1.2934	0.0043		0.43	
100%	x21	1.2913	1.2969	0.0056		0.56	0.46mg - 0.12mg = 0.34mg
	x22	1.2947	1.2990	0.0043		0.43	
	x23	1.2989	1.3031	0.0042		0.42	
	x24	1.2978	1.3022	0.0044	↓	0.44	

Reviewed By: SC

Summary Sheet

Facility	Analytical Laboratories	Analyst	Chris Pate
Test ID	1714385 City of Caldwell WWTP	Species	Pimephales promelas (fathead minnow)
Date	5/3/2017	Test Type	Growth
IWC Conc.			

Input

Replicate	Concentrations					
	<u>0</u>	<u>15.5</u>	<u>31</u>	<u>62</u>	<u>81</u>	<u>100</u>
1	0.44	0.41	0.5	0.51	0.54	0.56
2	0.4	0.44	0.39	0.45	0.49	0.43
3	0.44	0.42	0.58	0.46	0.48	0.42
4	0.57	0.5	0.48	0.48	0.43	0.44

Mean	0.463	0.443	0.488	0.475	0.485	0.463
Stdev	0.074	0.040	0.078	0.026	0.045	0.066

Output

Statistical Data	Conc.	Mean	Stdev	CV	Dunnett test
	0	0.463	0.074	0.160	
	15.5	0.443	0.040	0.091	NS
	31	0.488	0.078	0.160	NS
	62	0.475	0.026	0.056	NS
	81	0.485	0.045	0.093	NS
	100	0.463	0.066	0.142	NS

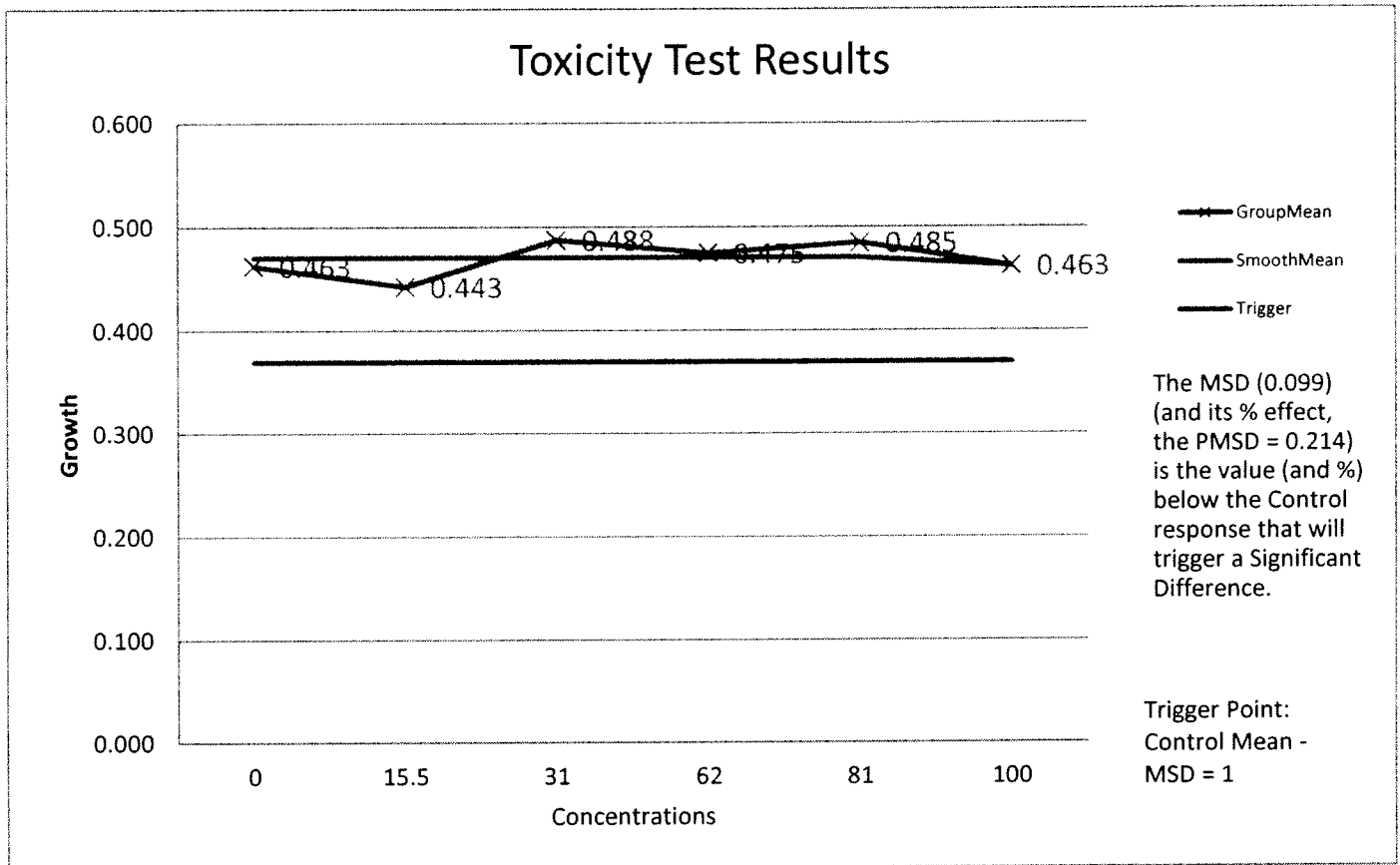
NOEC	LOEC	IC25	95% Confidence Intervals	
100	>100	>100	N/A	N/A

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

MSD	PMSD
0.099	21.4%

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

LAB ID# 1714385

Analyst: CP/WR/SL Final Report Review: SC

Discharged: Effluent

Test Start Date/Time: 4-1-17, 1600

Description: Coldwell WWTP

Test Stop Date/Time: 4-18-17, 1600

Temp Received: Day 1: 5.0°C Day 2: 6.6°C Day 3: 5.1°C

Renewal Lab Numbers: Day 0 & 1: 14385 Day 2 & 3: 14848 Day 4, 5 & 6: 15009

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-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		8.7	7.6			23.3
1-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		8.8	7.5	7.8	8.2	23.4
2-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		8.6	7.4	8.2	8.3	22.9
3-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		8.5	7.5	7.8	8.3	23.1
4-	1/3	1/5	1/1	1/8	1/6	1/6	1/7	1/7	1/6	1/7	56	8.5	7.4	7.6	8.3	24.4
5-	✓	✓	✓	✓	2/9	2/9	2/12	2/13	2/14	2/14	57	8.5	7.5	7.7	8.4	24.2
6-	2/9	2/13	2/13	2/13	✓	✓	✓	✓	2/14	✓	62	8.8	7.5	7.8	8.4	23.6
7-	3/12	3/23	3/16	3/23	3/19	3/22	3/19	3/22	3/20	3/22	198			8.3	8.2	
Total	24	41	30	44	34	37	38	42	40	43	373					
M/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-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		9.1	7.5			23.5
1-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		9.1	7.5	7.8	8.3	23.3
2-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		8.9	7.4	8.4	8.4	23.1
3-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		8.7	7.4	7.8	8.3	23.6
4-	1/6	1/6	1/6	1/3	1/7	1/5	1/6	1/5	1/7	1/9	60	8.9	7.4	7.9	8.4	25.0
5-	✓	✓	✓	✓	2/13	2/9	2/12	2/11	✓	2/6	51	8.8	7.4	7.8	8.4	24.2
6-	2/14	2/10	2/11	2/12	✓	✓	✓	✓	2/12	✓	59	9.2	7.5	7.9	8.5	23.7
7-	3/22	3/17	3/21	3/23	3/22	3/21	3/15	3/18	3/20	3/20	199			8.5	8.3	
Total	42	33	38	38	42	35	33	34	39	35	369					
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-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		9.4	7.5			23.5
1-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		9.6	7.6	7.9	8.4	23.3
2-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		9.3	7.4	8.4	8.4	23.2
3-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		8.8	7.4	7.8	8.4	23.4
4-	1/6	1/5	1/7	1/7	1/6	1/6	1/7	1/6	1/6	1/4	60	9.0	7.3	7.8	8.5	24.6
5-	✓	✓	✓	✓	2/12	2/12	2/11	2/12	2/7	2/13	67	9.0	7.4	7.9	8.4	24.3
6-	2/14	2/12	2/15	2/14	✓	✓	✓	✓	✓	✓	55	9.6	7.3	8.1	8.5	23.7
7-	3/22	3/20	3/21	3/19	3/20	3/22	3/10	3/16	3/13	3/15	178			8.5	8.4	
Total	42	37	43	38	38	40	28	34	26	32	360					
M/F	F									→						

Summary Sheet

Facility Analytical Laboratories **Analyst** Chris Pate
Test ID 1714385 City of Caldwell WWTP **Species** Ceriodaphnia dubia (water flea)
Date 5/3/2017 **Test Type** Chronic Survival
IWC Conc.

Input

Number of Organisms Exposed or Counted

Replicate	Concentrations					
	<u>0</u>	<u>15.5</u>	<u>31</u>	<u>62</u>	<u>81</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	1

Number of Organisms Surviving or Responding

Replicate	Concentrations					
	<u>0</u>	<u>15.5</u>	<u>31</u>	<u>62</u>	<u>81</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	0	1	1	1	1	1
10	1	1	1	1	1	1

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

Output

Summary Sheet

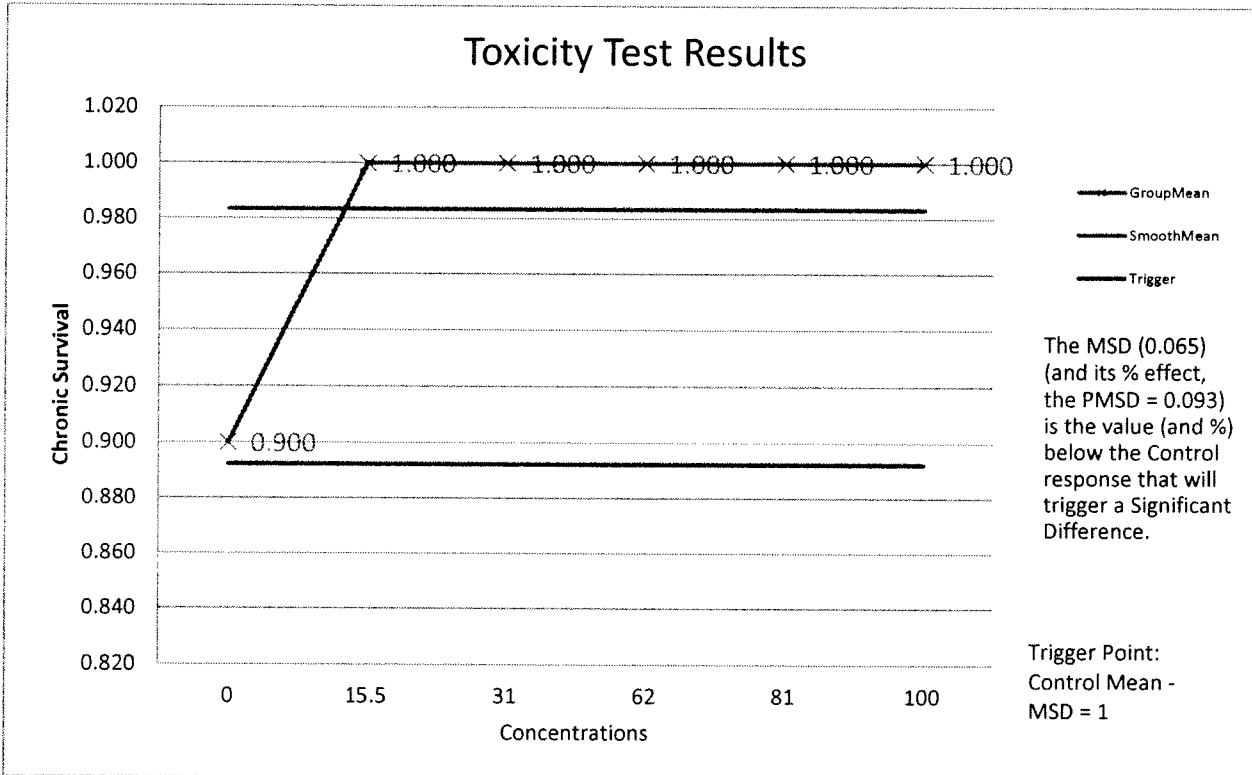
Statistical Data	Conc.	Mean	Stdev	CV	Steel test
	0	0.995	0.166	0.166	
Statistics are based on the transformed data used for endpoint calculations	15.5	1.047	0.000	0.000	NS
	31	1.047	0.000	0.000	NS
	62	1.047	0.000	0.000	NS
	81	1.047	0.000	0.000	NS
	100	1.047	0.000	0.000	NS

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
0.065	9.3%

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.



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Summary Sheet

Facility	Analytical Laboratories	Analyst	Chris Pate
Test ID	1714385 City of Caldwell WWTP	Species	Ceriodaphnia dubia (water flea)
Date	5/3/2017	Test Type	Reproduction
IWC Conc.			

Input

Replicate	Concentrations					
	0	15.5	31	62	81	100
1	23	41	37	24	42	42
2	44	34	37	41	33	37
3	38	39	39	30	38	43
4	27	42	34	44	38	40
5	26	41	41	34	42	38
6	39	46	41	37	35	40
7	42	44	38	38	33	28
8	45	44	41	42	34	34
9	0	45	40	40	39	26
10	44	43	38	43	35	32

Mean	32.800	41.900	38.600	37.300	36.900	36.000
Stdev	14.148	3.479	2.271	6.343	3.414	5.831

Output

Statistical Data	Conc.	Mean	Stdev	CV	Steel test
	0	32.800	14.148	0.431	
	15.5	41.900	3.479	0.083	NS
	31	38.600	2.271	0.059	NS
	62	37.300	6.343	0.170	NS
	81	36.900	3.414	0.093	NS
	100	36.000	5.831	0.162	NS

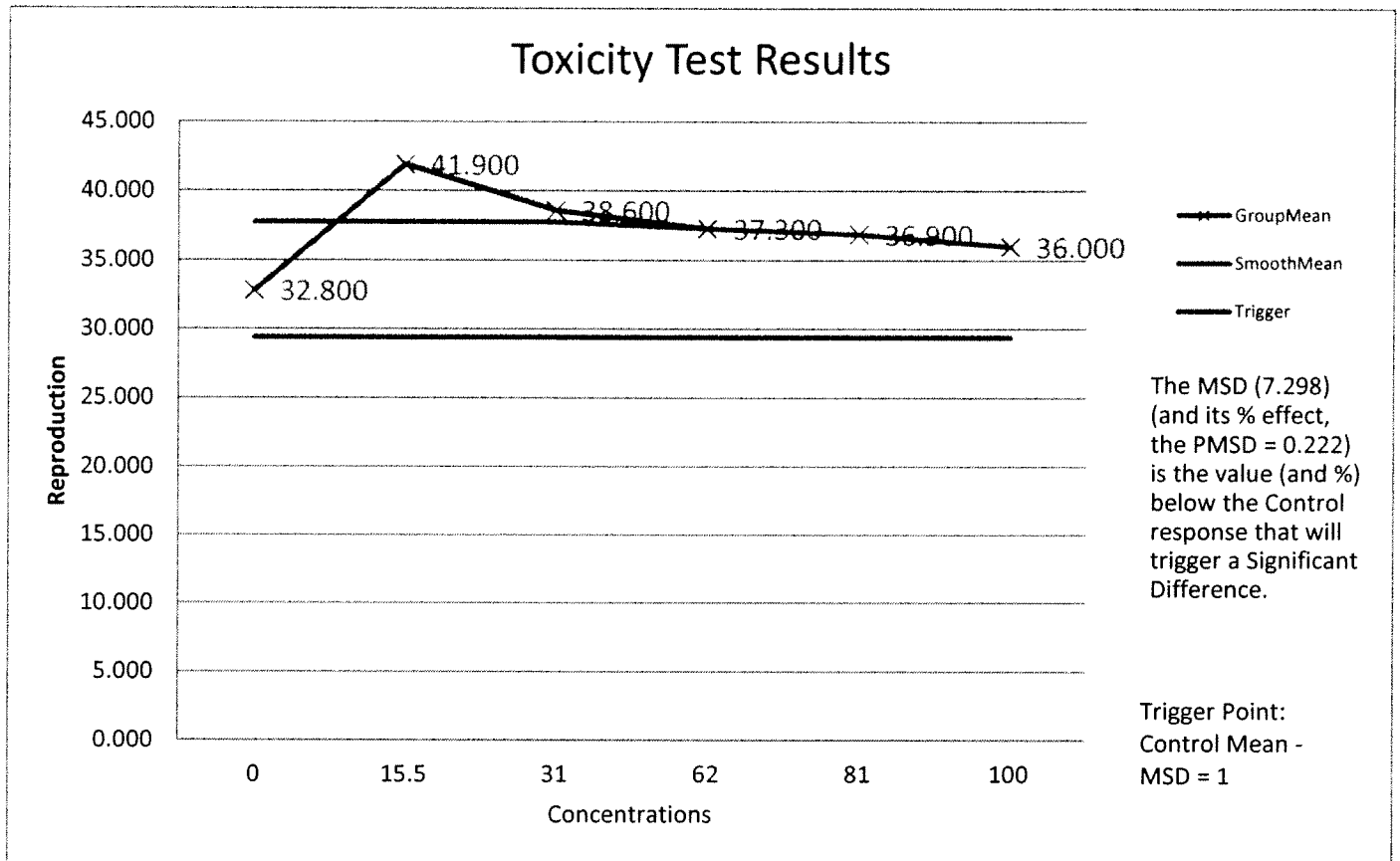
NOEC	LOEC	IC25	95% Confidence Intervals	
100	>100	>100	N/A	N/A

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

MSD	PMSD
7.298	22.2%

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.



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

LAB ID# 1714385 Analyst: cp/sc/wr

Final Report Review: sc

Discharged: Effluent

Test Start Date/Time: 4-13-17, 1330

Description: Caldwell WWTP

Test Stop Date/Time: 4-17-17, 1430

Lab Id # used to make dilutions: 14848

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	8.1	25.0	9.5	24.0	10.4 10.7	24.5 24.7	10.5	23.7	10.6	24.5	
15.5%	8.8 8.1	25.2	9.6	24.4	10.4	24.4	10.7	23.9	10.7	24.4	
31%	8.0	25.4	9.5	23.9	10.5	24.1	10.7	23.9	10.7	23.9	
62%	7.9	25.4	9.4	24.5	10.4	24.2	10.7	24.5	10.7	24.3	
81%	7.8	25.2	9.2	24.4	10.4	24.0	10.7	24.5	10.8	24.5	
100%	7.8	25.1	9.2	24.2	10.4	24.5	10.7	23.2	10.8	24.4	

BENCH SHEET FOR *S. capricornutum* ALGAL GROWTH TEST

EPA TEST

METHOD 1003.0

LAB ID# 1714385 ANALYST: cp/sc FINAL REPORT REVIEW: SL
 DISCHARGED: Effluent TEST START DATE/TIME: 4-13-17, 1330
 DESCRIPTION: Caldwell WWTP TEST END DATE/TIME: 4-17-17, 1430
 Lab ID# used to make Dilutions: 14848

Initial Algae Count (cells/mL)

	Random Sample #1	Random Sample #2	Random Sample #3	Random Sample #4	Initial Average
	Absorbance Value: .012 Cells/mL: .40	Absorbance Value: .012 Cells/mL: .40	Absorbance Value: .013 Cells/mL: .43	Absorbance Value: .013 Cells/mL: .43	Absorbance Value: .0125 Cells/mL: .419

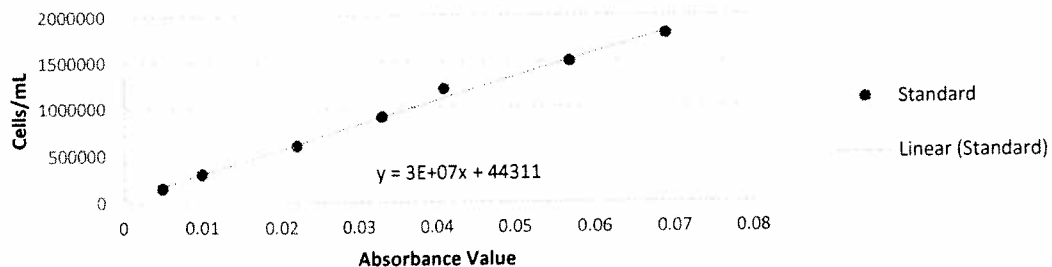
Final Algae Count (cells/mL)

CONCENTRATION	Rep. 1	Rep. 2	Rep. 3	Rep. 4	Average
CONTROL	Absorbance Value: 0.060 Cells/mL: 1.84	Absorbance Value: 0.050 Cells/mL: 1.54	Absorbance Value: 0.066 Cells/mL: 2.02	Absorbance Value: 0.065 Cells/mL: 1.99	Absorbance Value: .060 Cells/mL: 1.85
15.5%	Absorbance Value: 0.089 Cells/mL: 2.71	Absorbance Value: 0.095 Cells/mL: 2.89	Absorbance Value: 0.090 Cells/mL: 2.74	Absorbance Value: 0.092 Cells/mL: 2.80	Absorbance Value: .092 Cells/mL: 2.79
31%	Absorbance Value: 0.108 Cells/mL: 3.28	Absorbance Value: 0.110 Cells/mL: 3.34	Absorbance Value: 0.110 Cells/mL: 3.34	Absorbance Value: 0.109 Cells/mL: 3.31	Absorbance Value: .109 Cells/mL: 3.32
62%	Absorbance Value: 0.140 Cells/mL: 4.24	Absorbance Value: 0.145 Cells/mL: 4.39	Absorbance Value: 0.143 Cells/mL: 4.33	Absorbance Value: 0.150 Cells/mL: 4.54	Absorbance Value: .145 Cells/mL: 4.38
81%	Absorbance Value: 0.196 Cells/mL: 5.92	Absorbance Value: 0.188 Cells/mL: 5.68	Absorbance Value: 0.197 Cells/mL: 5.95	Absorbance Value: 0.173 Cells/mL: 5.23	Absorbance Value: .189 Cells/mL: 5.70
100%	Absorbance Value: 0.245 Cells/mL: 7.39	Absorbance Value: 0.245 Cells/mL: 7.39	Absorbance Value: 0.218 Cells/mL: 6.58	Absorbance Value: 0.255 Cells/mL: 7.69	Absorbance Value: .241 Cells/mL: 7.27

*Cells/mL are shown in millions

*Absorbance values (AV) obtained from Spectronic 601 spectrophotometer are used to determine cells/mL based on a standardized linear relationship $((3 \times 10^7)(AV) + 44311)$.

***Selenastrum capricornutum* Conversion Chart**



Summary Sheet

Facility Analytical Laboratories **Analyst** Chris Pate
Test ID 1714385 City of Caldwell WWTP **Species** Selenastrum capricornutum (green algae)
Date 5/3/2017 **Test Type** Growth
IWC Conc.

Input

Replicate	Concentrations					
	<u>0</u>	<u>15.5</u>	<u>31</u>	<u>62</u>	<u>81</u>	<u>100</u>
1	1.84	2.71	3.28	4.24	5.92	7.39
2	1.54	2.89	3.34	4.39	5.68	7.39
3	2.02	2.74	3.34	4.33	5.95	6.58
4	1.99	2.8	3.31	4.54	5.23	7.69

Mean	1.848	2.785	3.318	4.375	5.695	7.263
Stdev	0.220	0.079	0.029	0.126	0.333	0.476

Output

Statistical Data	Conc.	Mean	Stdev	CV	Steel test
	0	1.848	0.220	0.119	
	15.5	2.785	0.079	0.029	NS
	31	3.318	0.029	0.009	NS
	62	4.375	0.126	0.029	NS
	81	5.695	0.333	0.058	NS
	100	7.263	0.476	0.066	NS

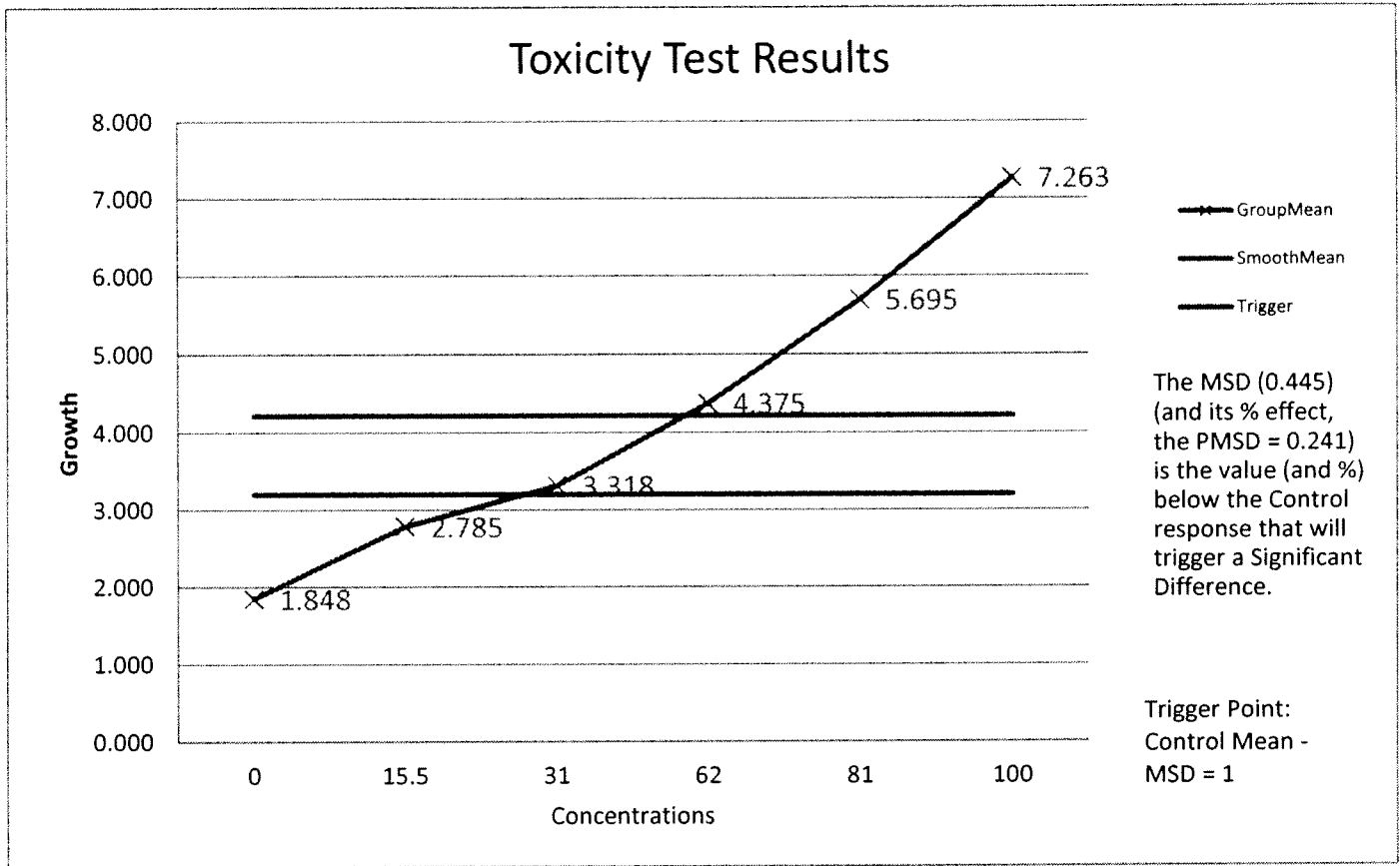
NOEC	LOEC	IC25	95% Confidence Intervals	
100	>100	>100	N/A	N/A

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

MSD	PMSD
0.445	24.1%

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.



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.



Analytical Laboratories, Inc.

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

Date Report Printed: 5/3/2017 3:21:51 PM
<http://www.analyticallaboratories.com>
These test results relate only to the items tested.

Laboratory Analysis Report

Sample Number: 1714385

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

Collected By: K. CHATTIN
Submitted By: S. CURTIS

Source of Sample:
FE-C BIO MONITORING DAY 1

Time of Collection: 7:40
Date of Collection: 4/11/2017
Date Received: 4/11/2017
Report Date: 4/21/2017

PWS#:

Field Temp: Temp Rcvd in Lab: 5.0 °C

PWS Name:

Test Requested	MCL	Analysis Result	Units	MDL	Method	Date Completed	Analyst
Ceriodaphnia dubia		*			EPA 1002.0	4/21/2017	SC
Pimephales promela		*			EPA 1000.0	4/21/2017	SC
Selenastrum		*			EPA 1003.0	4/21/2017	SC
Ammonia Direct (as N)		0.07	mg/L	0.04	EPA 350.1	4/14/2017	CJS
Alkalinity		207	mg/L		EPA 310.1	4/12/2017	CJS
Chlorine Residual, Cl2		<0.10	mg/L	0.10	EPA 330.5	4/11/2017	JMS
Conductivity		755	umhos	2	EPA 120.1	4/11/2017	JMS
Hardness		183	mg/L	5.0	SM 2340	4/12/2017	CJS
pH		7.3	S.U.		SM 4500-H B	4/11/2017	JMS

S. Curtis CO: JAMES HIBBS

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



Analytical Laboratories, Inc.

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

Date Report Printed: 5/3/2017 3:59:16 PM
<http://www.analyticallaboratories.com>
These test results relate only to the items tested.

Laboratory Analysis Report

Sample Number: 1714848

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

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

Source of Sample:
FE-C BIOMONITORING DAY 2

Time of Collection: 7:43
Date of Collection: 4/13/2017
Date Received: 4/13/2017
Report Date: 4/26/2017

PWS#:

Field Temp:

Temp Rcvd in Lab:

PWS Name:

Test Requested	MCL	Analysis Result	Units	MDL	Method	Date Completed	Analyst
Ammonia Direct (as N)		0.58	mg/L	0.04	EPA 350.1	4/14/2017	CJS
Alkalinity		201	mg/L		EPA 310.1	4/25/2017	CJS
Chlorine Residual, Cl2		<0.10	mg/L	0.10	EPA 330.5	4/13/2017	JMS
Conductivity		790	umhos	2	EPA 120.1	4/13/2017	JMS
Hardness		185	mg/L	5.0	SM 2340	4/25/2017	CJS
pH		7.6	S.U.		SM 4500-H B	4/13/2017	RME

ANALYTICAL LABORATORIES CO: JAMES HIBBS

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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



Analytical Laboratories, Inc.

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

Date Report Printed: 4/26/2017 11:55:04 AM
<http://www.analyticallaboratories.com>
These test results relate only to the items tested.

Laboratory Analysis Report

Sample Number: 1715009

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

Collected By: D. CROSS
Submitted By: S. CURTIS

Source of Sample:
FE-C BIO MONITORING DAY 3

Time of Collection: 7:42
Date of Collection: 4/14/2017
Date Received: 4/14/2017
Report Date: 4/26/2017

PWS#:

Field Temp: 5.4 °C Temp Recd in Lab: 5.1 °C

PWS Name:

Test Requested	MCL	Analysis Result	Units	MDL	Method	Date Completed	Analyst
Ammonia Direct (as N)		0.70	mg/L	0.04	EPA 350.1	4/14/2017	CJS
Alkalinity		197	mg/L		EPA 310.1	4/25/2017	CJS
Chlorine Residual, Cl2		<0.10	mg/L	0.10	EPA 330.5	4/14/2017	JH
Conductivity		800	umhos	2	EPA 120.1	4/14/2017	JH
Hardness		191	mg/L	5.0	SM 2340	4/25/2017	CJS
pH		7.5	S.U.		SM 4500-H B	4/14/2017	JH

S. Curtis CO: 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

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

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:

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

LAB ID# 173228

Analyst: cp/wr Final Report Review: sc

Discharged: Effluent

Test Start Date/Time: 4/4/17, 1430

Description: C. ~~fluminea~~ WWA

Test Stop Date/Time: 4/11/17, 1230

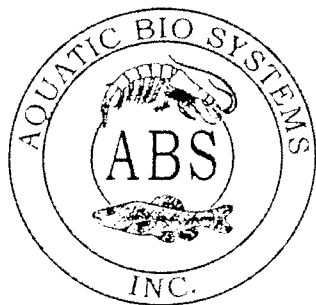
Temp Received: Day 1: 2.5°C Day 2: 6.7°C Day 3: 5.5°C

Renewal Lab Numbers: Day 0 & 1: 13228 Day 2 & 3: 13724 Day 4, 5 & 6: 14108

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	7.5			22.4
1-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		7.5	7.7	8.1	8.0	23.7
2-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		7.5	7.7	8.3	8.4	24.9
3-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		7.4	7.5	8.3	8.4	23.7
4-	1/1	1/6	1/4	✓	1/5	1/4	✓	✓	✓	1/4	24	7.5	7.8	9.0	8.3	23.4
5-	✓	✓	2/13	1/3	2/11	✓	1/5	1/6	1/5	2/12	5755	7.4	7.8	8.0	8.3	23.2
6-	2/12	2/12	✓	2/13	✓	2/10	2/14	2/13	2/14	✓	988	8.1	7.8	7.9	8.3	23.0
7-	3/19	3/18	3/21	3/19	3/13	3/17	3/18	✓	3/19	3/18	162			8.7	8.4	
Total	32	36	38	35	29	31	87	19	38	34	329					
M/F	F									→						

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: 4/10/2017

SPECIES: *Pimephales promelas*

AGE: N/A

LIFE STAGE: Embryo

HATCH DATE: 4/10/2017

BEGAN FEEDING: N/A

FOOD: N/A

Water Chemistry Record:

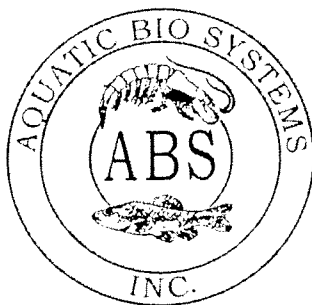
	Current	Range
TEMPERATURE:	<u>24°C</u>	<u>--</u>
SALINITY/CONDUCTIVITY:	<u>--</u>	<u>--</u>
TOTAL HARDNESS (as CaCO ₃):	<u>120 mg/l</u>	<u>--</u>
TOTAL ALKALINITY (as CaCO ₃):	<u>100 mg/l</u>	<u>--</u>
pH:	<u>8.06</u>	<u>--</u>

Comments:



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: 4/10/2017

SPECIES: *Raphidocelis subcapitata**

INOCULATION DATE: 3/21/2017

HARVEST DATE: 3/27/2017

CONCENTRATION DATE: 3/29/2017

CELL COUNT (/ml): 3.0×10^7 cells/ml

Comments:

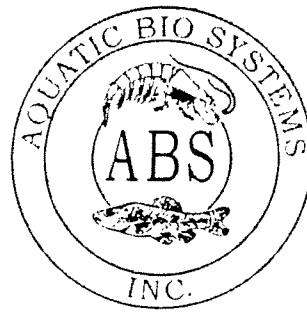
* Formerly known as *Pseudokirchneriella subcapitata* and *Selenastrum capricornutum*

** 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: 3/22/2017; Best if used by 6/30/2017
Average Total Solids: 1850 mg/l

Ingredient Lot Numbers

Pines International® Wheat Grass: COCDW12S50; Zeigler Finfish Starter #1 (Lot 10/19/2016); Fleischmanns Yeast: G-3

EPA Required Toxic Metals and Pesticide Analyses*

Analyzed Metals	Report Limits	Results (mg/L)
Aluminum	0.03	0.08
Arsenic	0.001	U
Cadmium	0.001	U
Chromium	0.005	U
Copper	0.05	0.033
Iron	0.02	0.24
Lead	0.001	U
Mercury	0.001	U
Nickel	0.005	U
Silver	0.001	U
Zinc	0.01	0.14

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	0.8	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.

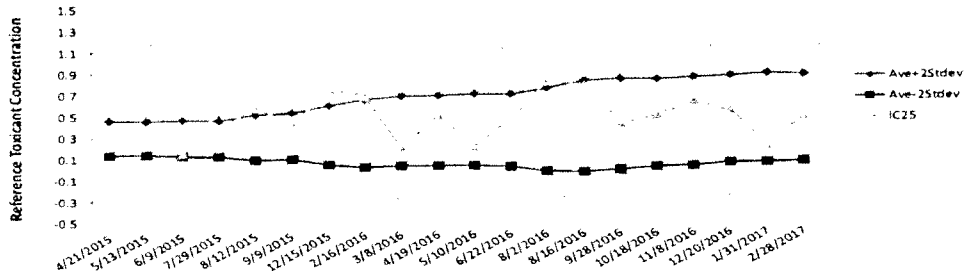
*Testing performed by Energy Labs, Billings, Montana

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

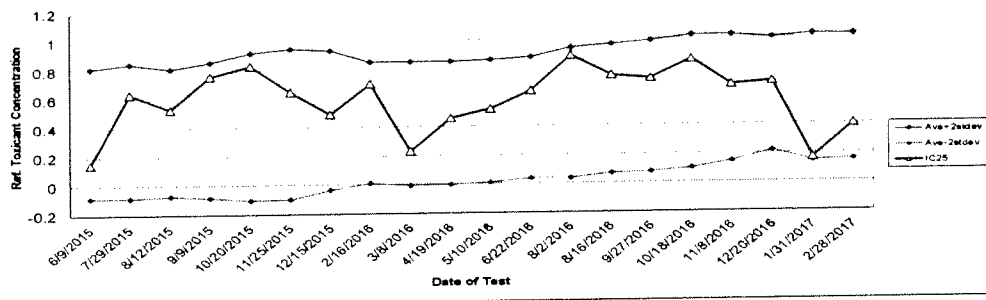
Pimephales promelas QC Growth Data Prior to March 2017

EPA Method 1000.0
Reference Toxicant (NaCl)
Biomonitoring Dept.
Analytical Laboratories



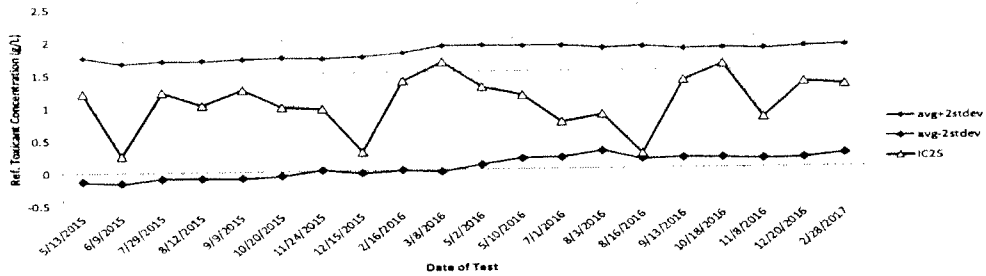
Pimephales promelas QC Survival Data Prior to March 2017

EPA Method 1000.0
Reference Toxicant (NaCl)
Biomonitoring Dept.
Analytical Laboratories



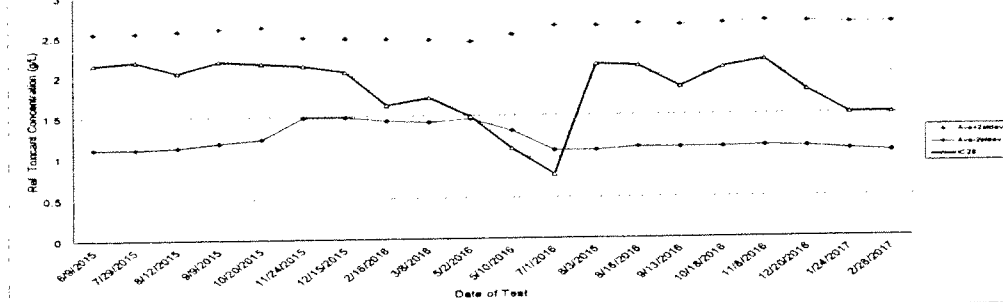
Ceriodaphnia dubia QC Reproduction Data Prior to March 2017

EPA Method 1002.0
Reference Toxicant (NaCl)
Biomonitoring Department
Analytical Laboratories



Ceriodaphnia dubia QC Survival Data Prior to March 2017

EPA Method 1002.0
Reference Toxicant (NaCl)
Biomonitoring Dept.
Analytical Laboratories



BENCH SHEET FOR QC CERIODAPHNIA SURVIVAL/REPRODUCTION TEST.

TEST MONTH MAR. 2017

Analyst: 9/54/wr

Test Start Date/Time: 2/28/17, 1530

Test Stop Date/Time: 3/7/17, 1300

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

Conc. **CONTROL**

Day-Lab #	1	2	3	4	5	6	7	8	9	10	XXX	XXX	XXX	XXX	XXX	XXX
0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		7.3	7.2	XXX	XXX	24.2
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		7.5	7.9	8.0	8.2	23.3
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		7.3	7.8	8.2	8.2	24.1
3	✓	✓	✓	✓	✓	✓	1/1	✓	✓	1/2	3	7.3	7.8	8.1	8.3	22.7
4	1/3	1/4	1/3	1/4	1/4	1/2	✓	1/5	1/6	✓	31	7.3	7.8	8.0	8.3	23.7
5	✓	2/10	✓	✓	2/8	2/9	2/6	2/9	2/6	2/7	55	7.5	7.7	8.3	8.2	22.9
6	2/10	✓	2/8	2/9	✓	✓	3/10	3/11	✓	3/14	62	7.6	7.8	8.0	7.7	23.7
7	3/15	3/14	3/15	3/13	3/15	3/12	✓	4/17	3/16	✓	100			8.1	8.0	
Total	28	28	26	26	27	23	17	25	28	23	251					

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

Conc. **0.50 g/L**

Day-Lab #	1	2	3	4	5	6	7	8	9	10	XXX	XXX	XXX	XXX	XXX	XXX
0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		7.3	7.4	XXX	XXX	24.3
1	✓	✓	✓	✓	✓	✓	✓	✓	0	✓		7.4	7.9	8.0	8.3	23.7
2	✓	✓	✓	✓	✓	✓	✓	✓		✓		7.4	7.9	8.2	8.3	24.2
3	✓	✓	✓	✓	1/3	✓	✓	✓		✓	3	7.3	7.9	8.2	8.4	22.9
4	1/6	1/2	1/3	1/4	✓	1/5	1/3	1/4		1/3	30	7.2	7.9	8.0	8.4	24.1
5	✓	✓	✓	2/7	2/9	✓	2/7	✓		2/8	31	7.5	7.7	8.2	8.4	22.9
6	2/11	2/8	2/9	✓	3/11	2/11	✓	2/8		✓	58	7.6	7.9	8.0	8.2	23.8
7	3/14	3/15	3/6	✓	4/10	✓	3/17	3/6	✓	3/11	69			8.1	8.1	
Total	31	25	18	11	23	16	27	18	0	22	191					

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

Conc. **1.25 g/L**

Day-Lab #	1	2	3	4	5	6	7	8	9	10	XXX	XXX	XXX	XXX	XXX	XXX
0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		7.2	7.6	XXX	XXX	24.5
1	✓	✓	✓	✓	✓	✓	✓	✓	0	✓		7.4	7.9	8.1	8.3	23.9
2	✓	✓	✓	✓	✓	✓	✓	✓		✓		7.5	7.8	8.2	8.3	24.2
3	✓	✓	✓	✓	✓	✓	✓	✓		✓		7.3	7.9	8.2	8.4	23.1
4	1/2	✓	1/3	1/3	1/2	1/3	1/4	1/3		✓	20	7.3	8.0	8.0	8.3	24.3
5	2/7	1/8	✓	2/7	2/6	2/11	✓	2/8		1/7	54	7.5	7.8	8.0	8.4	22.6
6	✓	2/9	2/8	3/10	✓	✓	✓	✓		2/8	55	7.6	7.9	7.9	8.2	22.8
7	3/12	3/17	3/14	4/13	3/12	3/15	2/12	✓	✓	3/13	85			8.1	8.2	
Total	21	34	25	20	20	19	16	11	0	28	194					

BENCH SHEET QC CERIODAPHNIA SURVIVAL/REPRODUCTION TEST.

TEST MONTH MAR. 2017

Analyst: CP/SC/WP

Test Start Date/Time: 2/23/17, 1530

Test Stop Date/Time: 3/7/17, 1300

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

Conc. **2.00 g/L**

Day-Lab #	1	2	3	4	5	6	7	8	9	10	XXX	XXX	XXX	XXX	XXX	XXX
0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		7.2	7.6	XXX	XXX	24.6
1	0	✓	✓	✓	✓	✓	✓	✓	0	✓		7.4	7.9	8.3	8.4	23.8
2	↓	✓	✓	✓	0	✓	✓	✓	✓	✓		7.3	7.8	8.2	8.3	24.2
3	↓	✓	✓	✓	↓	✓	✓	✓	↓	✓		7.3	7.9	8.3	8.3	23.2
4	↓	✓	✓	0	↓	✓	1/1	1/2	↓	0	3	7.3	8.0	7.9	8.4	24.3
5	↓	✓	✓	↓	↓	1/1	✓	✓	↓	↓	1	7.7	8.0	8.3	8.2	22.9
6	↓	✓	1/4	↓	↓	✓	✓	✓	↓	↓	4	7.6	7.9	7.9	7.9	23.6
7	↓	✓	2/7	↓	↓	2/7	2/9	2/9	↓	↓	32			8.1	8.1	
Total	0	0	11	0	0	8	10	11	0	0	40					

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

Conc. **2.75 g/L**

Day-Lab #	1	2	3	4	5	6	7	8	9	10	XXX	XXX	XXX	XXX	XXX	XXX
0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		7.1	7.6	XXX	XXX	24.7
1	✓	✓	✓	✓	0	✓	✓	✓	0	✓		7.4	7.8	8.2	8.4	24.0
2	✓	0	0	✓	↓	0	0	0	↓	0		7.4	7.8	8.3	8.3	24.3
3	0	↓	↓	0	↓	↓	↓	↓	↓	↓		7.3	7.8	-	8.4	23.3
4	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓						
5	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓						
6	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓						
7	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓						
Total	0	0	0	0	0	0	0	0	0	0	0					

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

Conc. **3.50 g/L**

Day-Lab #	1	2	3	4	5	6	7	8	9	10	XXX	XXX	XXX	XXX	XXX	XXX
0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		7.1	7.6	XXX	XXX	24.6
1	0	0	0	0	0	0	0	0	0	0		7.4	7.8	8.5	8.5	24.0
2	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓						
3	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓						
4	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓						
5	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓						
6	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓						
7	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓						
Total	0	0	0	0	0	0	0	0	0	0	0					

Summary Sheet

Facility Analytical Laboratories
Test ID QC February 2017
Date 3/8/2017
IWC Conc. 20%

Analyst Will Reynolds
Species Ceriodaphnia dubia (water flea)
Test Type Chronic Survival

Input

Number of Organisms Exposed or Counted

Replicate	Concentrations					
	<u>0</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	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

Replicate	Concentrations					
	<u>0</u>	<u>0.5</u>	<u>1.25</u>	<u>2</u>	<u>2.75</u>	<u>3.5</u>
1	1	1	1	0	0	0
2	1	1	1	1	0	0
3	1	1	1	1	0	0
4	1	1	1	0	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	0	0	0	0	0
10	1	1	1	0	0	0

Total Organisms	10	10	10	10	10	10
Total Responding	10	9	9	5	0	0
% Responding	100.0%	90.0%	90.0%	50.0%	0.0%	0.0%

Output

Summary Sheet

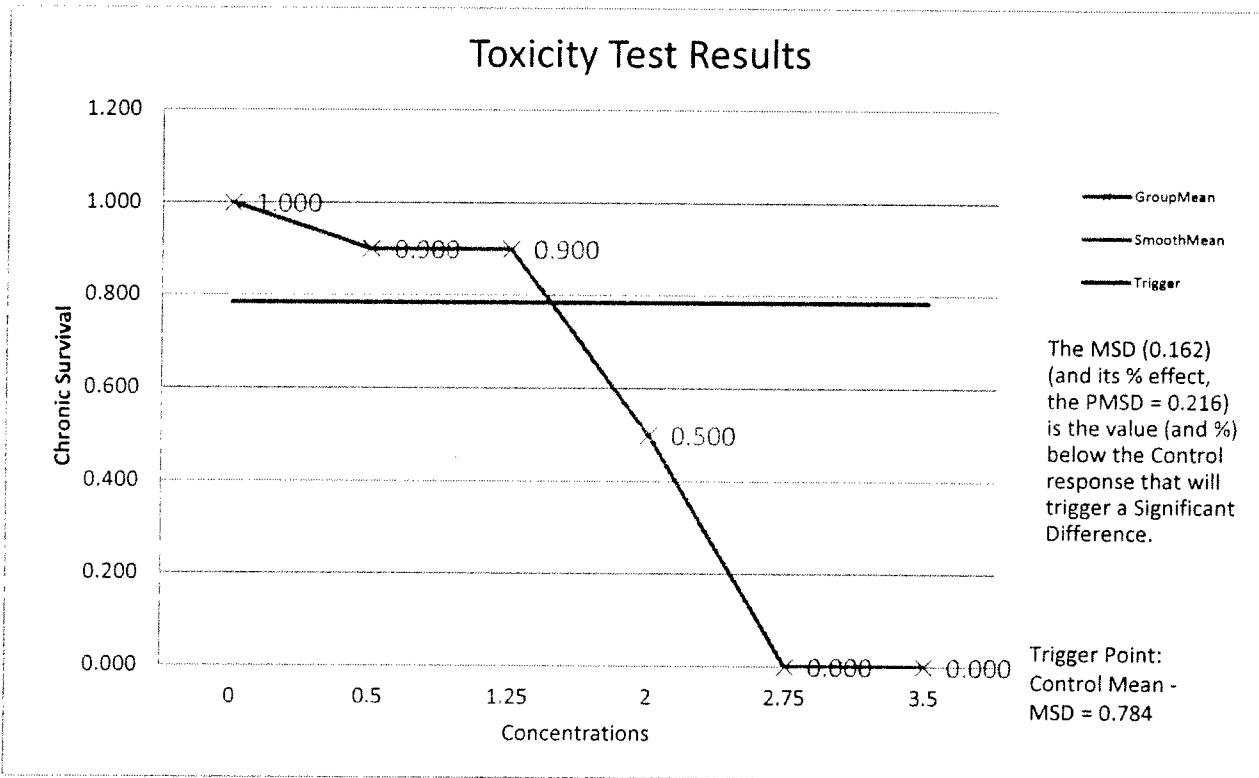
Statistical Data	Conc.	Mean	Stdev	CV	Steel test
	0	1.047	0.000	0.000	
Statistics are based on the transformed data used for endpoint calculations	0.5	0.995	0.166	0.166	NS
	1.25	0.995	0.166	0.166	NS
	2	0.785	0.276	0.351	NS
	2.75				Y
	3.5				Y

NOEC	LOEC	IC25	95% Confidence Intervals	
2	2.75	1.51	0.73	2.04

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

MSD	PMSD
0.162	21.6%

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

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Summary Sheet

Facility Analytical Laboratories
 Test ID QC February 2017
 Date ~~1/31/2017~~
 IWC Conc. 2/28

Analyst Will Reynolds
 Species Ceriodaphnia dubia (water flea)
 Test Type Reproduction

Input

Replicate	Concentrations					
	0	0.5	1.25	2	2.75	3.5
1	28	31	21	0	0	0
2	28	25	34	0	0	0
3	26	18	25	11	0	0
4	26	11	20	0	0	0
5	27	23	20	0	0	0
6	23	16	19	8	0	0
7	17	27	16	10	0	0
8	25	18	11	11	0	0
9	28	0	0	0	0	0
10	23	22	28	0	0	0

Mean	25.100	19.100	19.400	4.000	0.000	0.000
Stdev	3.414	8.850	9.312	5.228	0.000	0.000

Output

Statistical Data	Conc.	Mean	Stdev	CV	Steel test
	0	25.100	3.414	0.136	
	0.5	19.100	8.850	0.463	NS
	1.25	19.400	9.312	0.480	NS
	2	4.000	5.228	1.307	Y
	2.75	0.000			Y
	3.5	0.000			Y

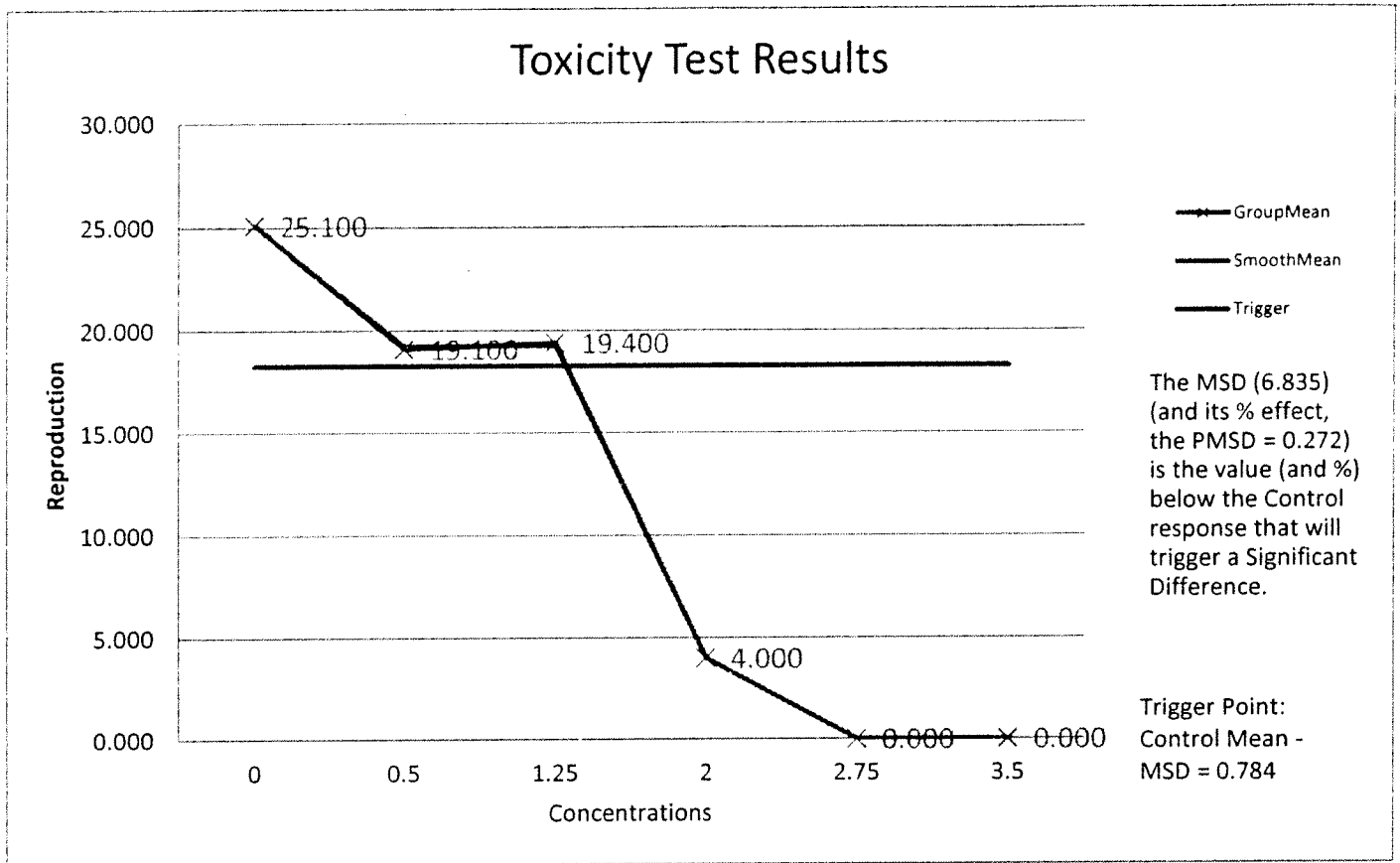
NOEC	LOEC	IC25	95% Confidence Intervals	
1.25	2	1.27	0.30	1.44

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

MSD	PMSD
6.835	27.2%

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.



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Bench Sheet For Fathead Minnow QC Survival Test Method 1000.0

Test Month/Year: Feb. 2017
 Test Start Date/Time: 2-21-17, 1400

Analyst: CP/WR
 Test Stop Date/Time: 2/28/17, 1300

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	
	3	10	10	10	10	10	10	10	10	
	4	10	10	10	10	10	10	10	10	
New DO	XXX	7.6	7.4	7.6	7.8	7.9	7.8	7.8	7.8	XXX
New pH	XXX	7.8	7.8	7.9	7.8	7.8	7.8	7.6	7.6	XXX
Temp	XXX	22.8	23.1	22.4	22.5	22.0	22.9	23.0	23.0	XXX
Old DO	XXX	XXX	6.4	6.3	6.9	6.5	6.4	6.0	5.9	
Old pH	XXX	XXX	7.7	7.4	7.7	7.6	7.4	7.6	7.5	
Conc: 0.25g/L										
	1	10	10	10	10	10	10	9	8	
	2	10	10	10	10	10	10	10	8	
	3	10	10	10	10	10	10	9	8	
	4	10	10	10	10	10	10	9	8	
New DO	XXX	7.5	7.6	7.7	7.7	7.7	7.8	7.8	XXX	
New pH	XXX	7.9	7.8	7.9	7.8	7.9	8.0	8.0	XXX	
Temp	XXX	23.4	23.2	22.4	22.3	23.4	22.3	22.9	22.9	XXX
Old DO	XXX	XXX	6.4	6.4	6.6	6.2	6.1	6.1	6.1	
Old pH	XXX	XXX	7.7	7.5	7.6	7.7	7.4	7.4	7.3	
Conc: 1.5g/L										
	1	10	10	10	9	9	9	5	4	
	2	10	10	10	10	10	10	4	4	
	3	10	10	10	10	10	10	9	4	
	4	10	10	10	10	10	10	8	7	
New DO	XXX	7.5	7.6	7.9	7.6	7.7	7.8	7.8	XXX	
New pH	XXX	7.9	7.8	7.9	7.9	7.9	8.0	7.9	XXX	
Temp	XXX	23.3	23.5	22.8	23.0	22.9	22.3	22.9	22.9	XXX
Old DO	XXX	XXX	6.6	6.4	6.7	6.3	6.1	5.9	6.0	
Old pH	XXX	XXX	7.7	7.5	7.7	7.7	7.5	7.4	7.4	
Conc: 2.5g/L										
	1	10	10	10	10	10	10	7	7	
	2	10	10	10	10	10	10	7	6	
	3	10	10	10	10	10	9	8	7	
	4	10	10	10	10	10	10	8	6	
New DO	XXX	7.5	7.6	8.0	7.6	7.7	7.9	7.8	XXX	
New pH	XXX	7.9	7.8	8.0	7.8	7.8	8.0	7.9	XXX	
Temp	XXX	23.3	23.6	23.1	23.0	22.9	22.2	23.0	23.0	XXX
Old DO	XXX	XXX	6.6	6.6	6.8	6.3	6.5	6.0	6.1	
Old pH	XXX	XXX	7.7	7.6	7.7	7.7	7.6	7.5	7.4	
Conc:										
Conc: 3.5g/L	1	10	10	10	10	10	10	8	0	
	2	10	10	10	10	10	10	8	2	
	3	10	10	10	10	10	10	9	7	
	4	10	10	10	10	10	10	7	1	
New DO	XXX	7.5	7.6	8.0	7.6	7.7	7.9	7.9	XXX	
New pH	XXX	7.9	7.8	8.0	7.8	7.8	8.0	7.9	XXX	
Temp	XXX	23.3	23.8	22.5	23.3	23.4	22.3	22.8	22.8	XXX
Old DO	XXX	XXX	6.5	6.5	6.9	6.2	6.7	6.6	6.4	
Old pH	XXX	XXX	7.7	7.6	7.7	7.6	7.6	7.3	7.5	
Conc: 8.5g/L										
	1	10	7	0	0	0	0	0	0	
	2	10	7	0	0	0	0	0	0	
	3	10	7	2	1	1	0	0	0	
	4	10	7	2	1	0	0	0	0	
New DO	XXX	7.6	7.6	8.1	7.8	7.7	-	-	XXX	
New pH	XXX	7.9	7.7	7.9	7.8	7.8	-	-	XXX	
Temp	XXX	23.3	23.5	22.3	23.5	22.5	-	-	XXX	
Old DO	XXX	XXX	6.7	7.2	7.1	6.8	6.9	-	-	
Old pH	XXX	XXX	7.6	7.6	7.7	7.7	7.7	-	-	
Feeding	A.M.	XXX	WR	CP	CP	CP	WR	WR	XXX	
	P.M.	WR	WR	CP	CP	CP	WR	WR	XXX	

Summary Sheet

Facility	Analytical Laboratories	Analyst	Will Reynolds
Test ID	QC February 2017	Species	Pimephales promelas (fathead minnow)
Date	2/28/2017	Test Type	Chronic Survival
IWC Conc.			

Input

Number of Organisms Exposed or Counted

Replicate	Concentrations					
	<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	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

Replicate	Concentrations					
	<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	8	4	2	0	0
2	10	8	4	6	2	0
3	10	8	4	7	7	0
4	10	8	7	6	1	0

Total Organisms	40	40	40	40	40	40
Total Responding	40	32	19	21	10	0
% Responding	100.0%	80.0%	47.5%	52.5%	25.0%	0.0%

Output

Summary Sheet

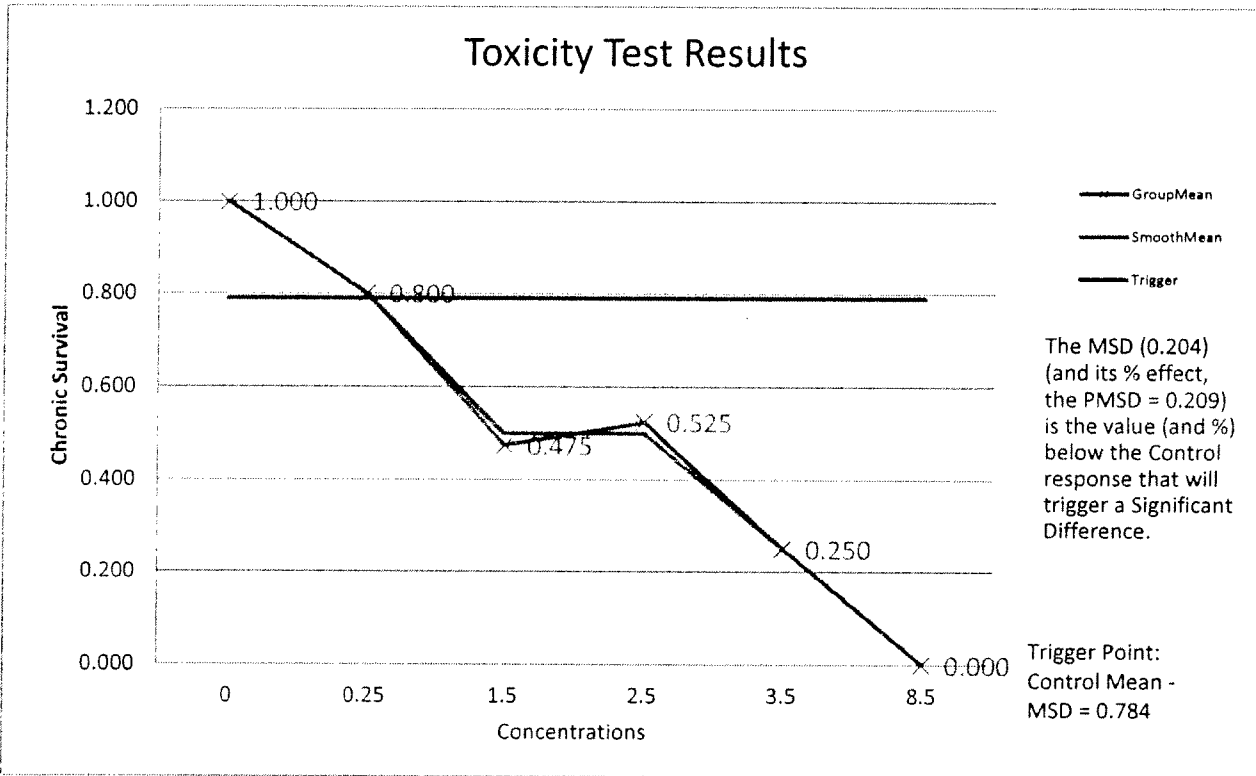
Statistical Data	Conc.	Mean	Stdev	CV	Dunnett test
	0	1.412	0.000	0.000	
Statistics are based on the transformed data used for endpoint calculations	0.25	1.107	0.000	0.000	NS
	1.5	0.761	0.153	0.201	Y
	2.5	0.807	0.234	0.290	Y
	3.5	0.484	0.360	0.745	Y
	8.5				Y

NOEC	LOEC	IC25	95% Confidence Intervals	
0.25	1.5	0.40	0.37	0.52

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

MSD	PMSD
0.204	20.9%

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 FATHEAD MINNOW INITIAL WEIGHT DATA EPA METHOD 1000.0

LAB ID#: Feb 2017 Test Start Date: 2-21-17 Drying Temp: 100°C
 Weighing Date: 2-22-17 Test End Date: 2-23-17 Drying Time: 20 hrs
 Location/Client: QC

	Rep No.	Weight of Boat (g)	Boat and Dry Larvae		No. of Larvae	Mean Dry Weight of Larvae (mg)	Average
			Weight of Larvae (g)	Dry Weight of Larvae (g)			
Initial	I1	1.2870	1.2883	.0013	10	.13	0.11 mg
	I2	1.2918	1.2928	.0010	10	.10	
	I3	1.2905	1.2918	.0013	10	.13	
	I4	1.2916	1.2925	.0009	10	.09	

Reviewed By: SL

Fathead Minnow QC Weight Data

Analyst: CP/WR Test Month/Year: Feb 2017 Drying Temp: 100°C
 Weighing Date: 3/1/17 Drying Time: 24hrs

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	1.2807	1.2850	.0043	10	.43	
	2	1.2773	1.2824	.0051		.51	0.44mg - 0.11mg = 0.33mg
	3	1.2758	1.2801	.0043		.43	
	4	1.2698	1.2738	.0040		.40	
0.25g/L	x 5	1.2947	1.2972	.0025		.25	
	x 6	1.2649	1.2685	.0036		.36	0.36mg - 0.11mg = 0.25mg
	x 7	1.2765	1.2808	.0043		.43	
	x 8	1.2887	1.2927	.0040		.40	
1.5g/L	x 9	1.2910	1.2924	.0014		.14	
	x 10	1.2963	1.2980	.0017		.17	0.21mg - 0.11mg = 0.10mg
	x 11	1.2975	1.2995	.0020		.20	
	x 12	1.2866	1.2898	.0032		.32	
2.5g/L	x 13	1.2946	1.2957	.0011		.11	
	x 14	1.2978	1.2982 1.3009	.0031		.31	0.24mg - 0.11mg = 0.13mg
	x 15	1.2908	1.2937	.0029		.29	
	x 16	1.2865	1.2890	.0025		.25	
3.5g/L	x 17	1.2925	1.2925	.0000		.00	
	x 18	1.2983	1.2994	.0011		.11	0.12mg - 0.11mg = 0.01mg
	x 19	1.2935	1.2968	.0033		.33	
	x 20	1.2897	1.2906	.0009		.09	
8.5g/L	x 21	-	-	.0000		.00	
	x 22	-	-	.0000		.00	
	x 23	-	-	.0000		.00	
	x 24	-	-	.0000		.00	

Reviewed By: AL

Summary Sheet

Facility	Analytical Laboratories	Analyst	Will Reynolds
Test ID	QC February 2017	Species	Pimephales promelas (fathead minnow)
Date	2/28/2017	Test Type	Growth
IWC Conc.			

Input

Replicate	Concentrations					
	0	0.25	1.5	2.5	3.5	8.5
1	0.43	0.25	0.14	0.11	0	0
2	0.51	0.36	0.17	0.31	0.11	0
3	0.43	0.43	0.2	0.29	0.33	0
4	0.4	0.4	0.32	0.25	0.03	0

Mean	0.443	0.360	0.208	0.240	0.118	0.000
Stdev	0.047	0.079	0.079	0.090	0.149	0.000

Output

Statistical Data	Conc.	Mean	Stdev	CV	Dunnett test
	0	0.443	0.047	0.107	
	0.25	0.360	0.079	0.219	NS
	1.5	0.208	0.079	0.380	Y
	2.5	0.240	0.090	0.376	Y
	3.5	0.118	0.149	1.269	Y
	8.5	0.000			Y

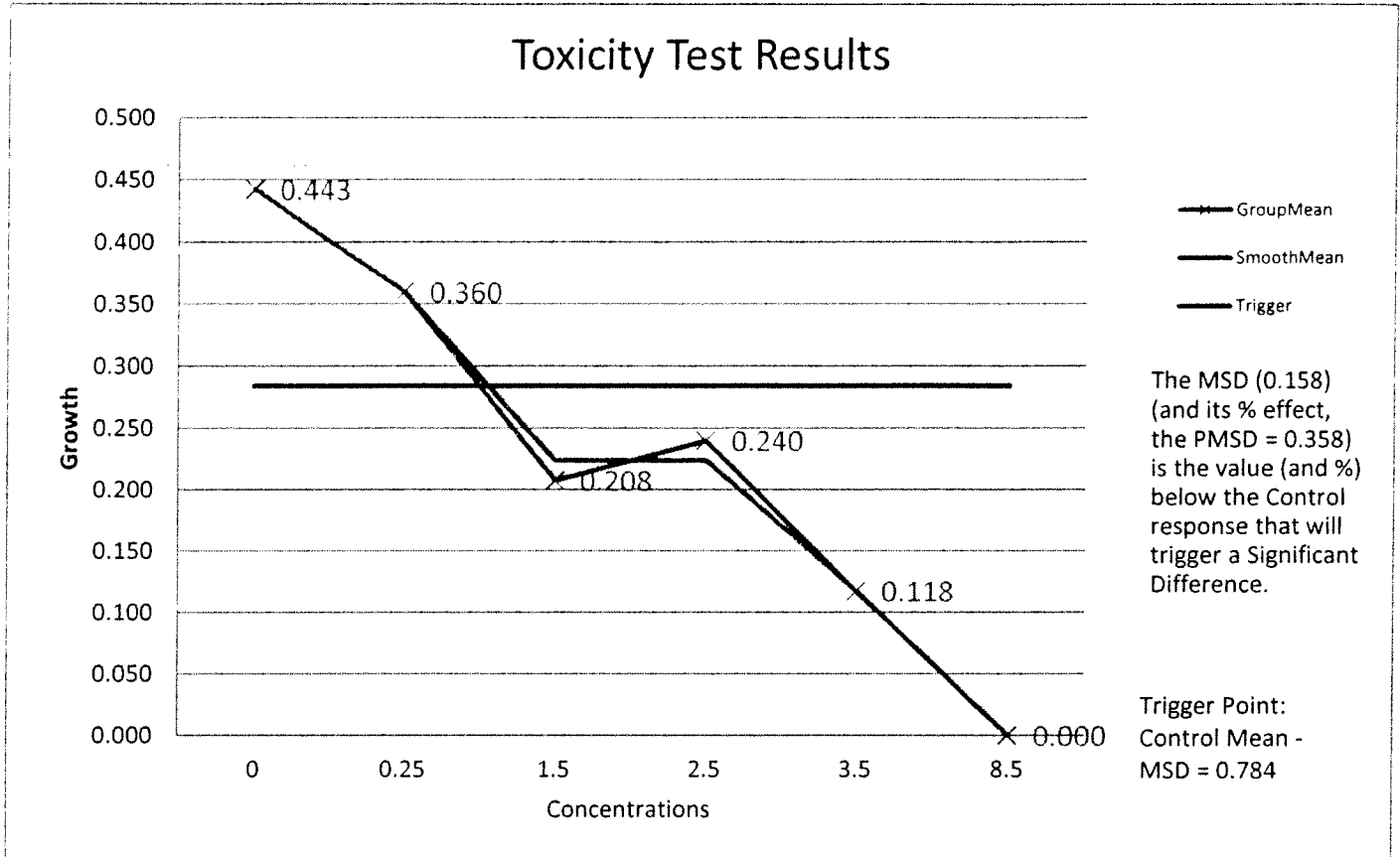
NOEC	LOEC	IC25	95% Confidence Intervals	
0.25	1.5	0.44	0.17	0.83

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

MSD	PMSD
0.158	35.8%

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.

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

Test Month/Year Feb, 2017 Analyst: cp/wr Final Report Review: SC
 Test Start Date/Time: 2/23/17, 1300
 Test Stop Date/Time: 3/4/17, 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	8.1	23.7	9.8	24.4	10.1	23.5	10.7	24.5	10.3	24.9	
0.50 g/L	8.3	24.5	9.9	24.1	10.4	24.6	10.6	24.2	10.6	25.5	
1.5 g/L	8.3	24.1	9.8	24.7	10.4	24.9	10.6	25.3	10.6	25.2	
5.5 g/L	8.2	24.0	9.5	24.2	9.9	24.8	10.2	25.0	10.1	25.8	
8.5 g/L	8.1	24.4	9.6	24.2	9.7	25.2	9.8	24.2	9.7	24.9	
10 g/L	8.0	24.7	9.5	24.1	9.7	25.1	9.9	24.2	9.8	25.9	

BENCH SHEET FOR *S. capicornutum* ALGAL QC GROWTH TEST

EPA TEST METHOD 1003.0

TEST MONTH/YEAR# Feb, 2017 ANALYST: uk/cp FINAL REPORT REVIEW: sc

TEST START DATE/TIME: 2/28/17 1300

TEST END DATE/TIME: 3/4/17 1600

Initial Algae Count (cells/mL)

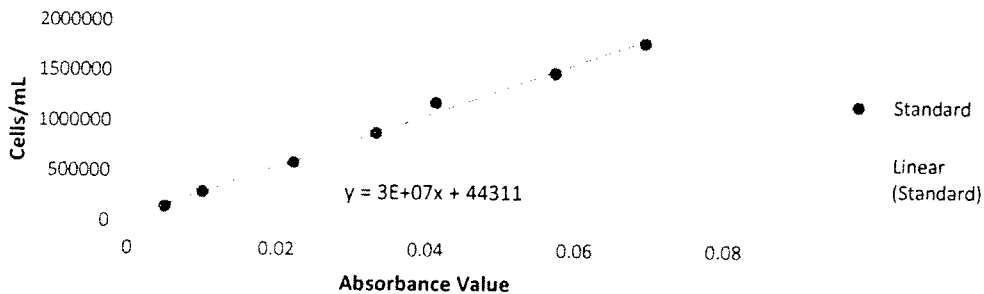
	Random Sample #1	Random Sample #2	Random Sample #3	Random Sample #4	Initial Average
	Absorbance Value: .015	Absorbance Value: .015	Absorbance Value: .014	Absorbance Value: .015	Absorbance Value: Cells/mL: .015 <u>0.487</u>

Final Algae Count (cells/mL)

CONCENTRATION	Rep. 1	Rep. 2	Rep. 3	Rep. 4	Average
CONTROL	Absorbance Value: .054 <u>1.81</u>	Absorbance Value: .062 <u>1.90</u>	Absorbance Value: .056 <u>1.72</u>	Absorbance Value: .059 <u>1.81</u>	Absorbance Value: .059 Cells/mL: <u>1.81</u>
0.5	Absorbance Value: .067 <u>2.05</u>	Absorbance Value: .053 <u>1.63</u>	Absorbance Value: .058 <u>1.78</u>	Absorbance Value: .053 <u>1.63</u>	Absorbance Value: .058 Cells/mL: <u>1.78</u>
1.5	Absorbance Value: .055 <u>1.69</u>	Absorbance Value: .066 <u>2.00</u>	Absorbance Value: .057 <u>1.75</u>	Absorbance Value: .058 <u>1.78</u>	Absorbance Value: .059 Cells/mL: <u>1.81</u>
5.5	Absorbance Value: .067 <u>2.05</u>	Absorbance Value: .059 <u>1.81</u>	Absorbance Value: .057 <u>1.75</u>	Absorbance Value: .054 <u>1.66</u>	Absorbance Value: .059 Cells/mL: <u>1.82</u>
8.5	Absorbance Value: .045 <u>1.39</u>	Absorbance Value: .044 <u>1.36</u>	Absorbance Value: .040 <u>1.24</u>	Absorbance Value: .043 <u>1.33</u>	Absorbance Value: .043 Cells/mL: <u>1.33</u>
10	Absorbance Value: .048 <u>1.48</u>	Absorbance Value: .047 <u>1.45</u>	Absorbance Value: .046 <u>1.42</u>	Absorbance Value: .044 <u>1.36</u>	Absorbance Value: .046 Cells/mL: <u>1.43</u>

*Absorbance values (AV) obtained from Spectronic 601 spectrophotometer are used to determine cells/mL based on a standardized linear relationship ((3x10⁷)(AV) + 44311).

Selenastrum capicornutum Conversion Chart



Summary Sheet

Facility Analytical Laboratories
Test ID QC February 2017
Date 1/31/2017
IWC Conc. 2/28

Analyst Will Reynolds
Species Selenastrum capricornutum (green algae)
Test Type Growth

Input

Replicate	Concentrations					
	0	0.5	1.5	5.5	8.5	10
1	1.81	2.05	1.69	2.05	1.39	1.48
2	1.9	1.63	2.02	1.81	1.36	1.45
3	1.72	1.78	1.75	1.75	1.24	1.42
4	1.81	1.63	1.78	1.66	1.33	1.36

Mean	1.810	1.773	1.810	1.818	1.330	1.428
Stdev	0.073	0.198	0.145	0.167	0.065	0.051

Output

Statistical Data	Conc.	Mean	Stdev	CV	Steel test
	0	1.810	0.073	0.041	
	0.5	1.773	0.198	0.112	NS
	1.5	1.810	0.145	0.080	NS
	5.5	1.818	0.167	0.092	NS
	8.5	1.330	0.065	0.049	Y
	10	1.428	0.051	0.036	Y

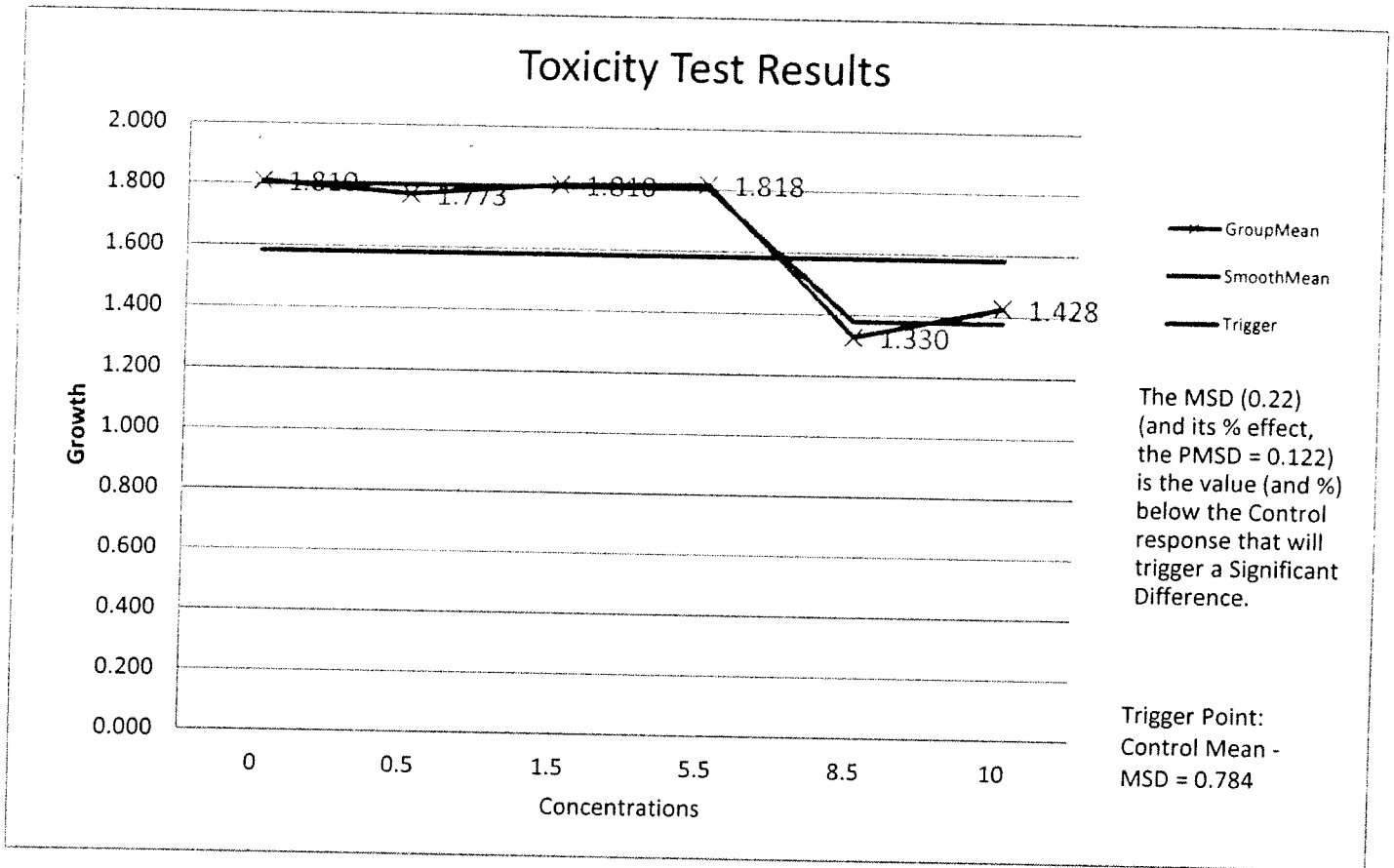
NOEC	LOEC	IC25	95% Confidence Intervals	
5.5	8.5	>10	N/A	N/A

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

MSD	PMSD
0.220	12.2%

Summary Sheet

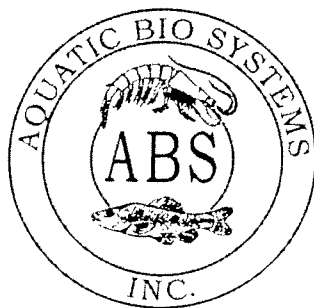
Note - For statistical tests, "NS" indicates that the concentration is not statistically different from the control, while "Y" indicates that the concentration is statistically different from the control.



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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: 2/20/2017

SPECIES: *Pimephales promelas*

AGE: N/A

LIFE STAGE: Embryo

HATCH DATE: 2/20/2017


BEGAN FEEDING: N/A

FOOD: N/A

Water Chemistry Record:

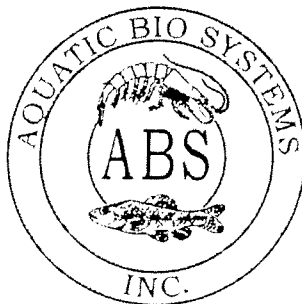
	Current	Range
TEMPERATURE:	<u>24°C</u>	<u>--</u>
SALINITY/CONDUCTIVITY:	<u>--</u>	<u>--</u>
TOTAL HARDNESS (as CaCO ₃):	<u>117 mg/l</u>	<u>--</u>
TOTAL ALKALINITY (as CaCO ₃):	<u>85 mg/l</u>	<u>--</u>
pH:	<u>8.18</u>	<u>--</u>

Comments:



Facility Supervisor

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Fort Collins, Colorado 80524



Toll Free: 800/331-5916
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ORGANISM HISTORY

DATE: 2/27/2017

SPECIES: Ceriodaphnia dubia

AGE: < 24 hour

LIFE STAGE: Neonate

HATCH DATE: 2/27/2017

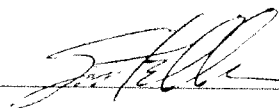
BEGAN FEEDING: Immediately

FOOD: YTC, *Raphidoceelis subcapitata**

Water Chemistry Record:

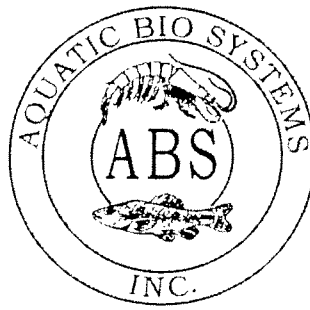
	Current	Range
TEMPERATURE:	<u>24°C</u>	<u>--</u>
SALINITY/CONDUCTIVITY:	<u>--</u>	<u>--</u>
TOTAL HARDNESS (as CaCO ₃):	<u>90 mg/l</u>	<u>--</u>
TOTAL ALKALINITY (as CaCO ₃):	<u>65 mg/l</u>	<u>--</u>
pH:	<u>8.27</u>	<u>--</u>

Comments: * Formerly known as *Psuedokirschneriella subcapitata* and *Selenastrum capricornutum*



Facility Supervisor

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Fort Collins, Colorado 80524



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Algae Preparation History

DATE: 2/27/2017

SPECIES: *Raphidocelis subcapitata**

INOCULATION DATE: 2/7/2017

HARVEST DATE: 2/13/2017

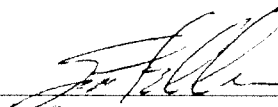
CONCENTRATION DATE: 2/15/2017

CELL COUNT (/ml): 3.0×10^7 cells/ml

Comments:

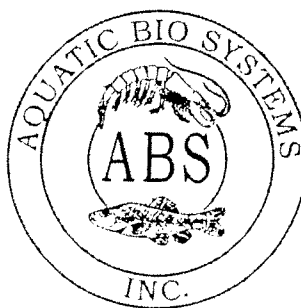
* Formerly known as *Pseudokirschneriella subcapitata* and *Selenastrum capricornutum*

** All concentrated algae diluted to proper cell count with reconstituted moderately hard DI water.



Supervisor

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YTC TOTAL SOLIDS MEASUREMENT
(Method from EPA/505/8-89-002a)

YTC Process Date: 2/22/2017; Best if used by 5/31/2017
Average Total Solids: 1770 mg/l

Ingredient Lot Numbers

Pines International® Wheat Grass: COCDW12S50; Zeigler Finfish Starter #1 (Lot 10.19.2016); Fleischmanns Yeast: G-3

EPA Required Toxic Metals and Pesticide Analyses*

Analyzed Metals	Report Limits	Results (mg/L)
Aluminum	0.03	0.08
Arsenic	0.001	U
Cadmium	0.001	U
Chromium	0.005	U
Copper	0.05	0.033
Iron	0.02	0.24
Lead	0.001	U
Mercury	0.001	U
Nickel	0.005	U
Silver	0.001	U
Zinc	0.01	0.14

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	0.8	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