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WA State Department
of Ecology (SWRO)

NPDES PERMIT APPLICATION

CITY OF WOODLAND WA

WWTP

NPDES PERMIT WA0020401

INCLUDED

Last 4 Quarters
AQUIATIC TOXICOLOGY REPORTS

Most Recent 5 Years
SLUDGE MONITORING DATA

TOPOGRAPHIC MAP

PROCESS FLOW DIAGRAM

PLANT SCHEMATIC

EPA Identification Number	NPDES Permit Number	Facility Name	Form Approved 03/05/19 OMB No. 2040-0004
	WA 0020401	City of Woodland WA WWTP	

Form 2A NPDES | EPA

U.S. Environmental Protection Agency
Application for NPDES Permit to Discharge Wastewater
NEW AND EXISTING PUBLICLY OWNED TREATMENT WORKS

SECTION 1. BASIC APPLICATION INFORMATION FOR ALL APPLICANTS (40 CFR 122.21(j)(1) and (9))

Facility Information

1.1 Facility name
City of Woodland WA WWTP

Mailing address (street or P.O. box)
PO Box 9

City or town	State	ZIP code
Woodland	WA	98674

Contact name (first and last)	Title	Phone number	Email address
Derrek Amburgey	Plant Superintendent	(360) 225-7007	amburgeyd@ci.woodland.wa.u

Location address (street, route number, or other specific identifier) ☐ Same as mailing address
755 Sandalwood Rd.

City or town	State	ZIP code
Woodland	WA	98674

1.2 Is this application for a facility that has yet to commence discharge?
☐ Yes → See instructions on data submission requirements for new dischargers. ☑ No

Applicant Information

1.3 Is applicant different from entity listed under Item 1.1 above?
☐ Yes ☑ No → SKIP to Item 1.4.

Applicant name

Applicant address (street or P.O. box)

City or town	State	ZIP code

Contact name (first and last)	Title	Phone number	Email address

1.4 Is the applicant the facility's owner, operator, or both? (Check only one response.)
☐ Owner ☐ Operator ☑ Both

1.5 To which entity should the NPDES permitting authority send correspondence? (Check only one response.)
☑ Facility ☐ Applicant ☐ Facility and applicant (they are one and the same)

Existing Environmental Permits

1.6 Indicate below any existing environmental permits. (Check all that apply and print or type the corresponding permit number for each.)

Existing Environmental Permits

☑ NPDES (discharges to surface water) WA 0020401	☐ RCRA (hazardous waste)	☐ UIC (underground injection control)
☐ PSD (air emissions)	☐ Nonattainment program (CAA)	☐ NESHAPs (CAA)
☐ Ocean dumping (MPRSA)	☐ Dredge or fill (CWA Section 404)	☐ Other (specify)

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Collection System and Population Served

1.7 Provide the collection system information requested below for the treatment works.

Municipality Served	Population Served	Collection System Type (indicate percentage)	Ownership Status
Woodland WA	6480	100 % separate sanitary sewer	☑ Own ☑ Maintain
		____ % combined storm and sanitary sewer	☐ Own ☐ Maintain
		☐ Unknown	☐ Own ☐ Maintain
		____ % separate sanitary sewer	☐ Own ☐ Maintain
		____ % combined storm and sanitary sewer	☐ Own ☐ Maintain
		☐ Unknown	☐ Own ☐ Maintain
		____ % separate sanitary sewer	☐ Own ☐ Maintain
		____ % combined storm and sanitary sewer	☐ Own ☐ Maintain
		☐ Unknown	☐ Own ☐ Maintain
		____ % separate sanitary sewer	☐ Own ☐ Maintain
		____ % combined storm and sanitary sewer	☐ Own ☐ Maintain
		☐ Unknown	☐ Own ☐ Maintain
Total Population Served	6480		

	Separate Sanitary Sewer System	Combined Storm and Sanitary Sewer
Total percentage of each type of sewer line (in miles)	100 %	0 %

Indian Country

1.8 Is the treatment works located in Indian Country?

☐ Yes ☑ No

1.9 Does the facility discharge to a receiving water that flows through Indian Country?

☐ Yes ☑ No

Design and Actual Flow Rates

1.10 Provide design *and* actual flow rates in the designated spaces.

Design Flow Rate
2.0 mgd

Annual Average Flow Rates (Actual)		
Two Years Ago	**Last Year**	**This Year**
.580 mgd	.593 mgd	.579 mgd

Maximum Daily Flow Rates (Actual)		
Two Years Ago	**Last Year**	**This Year**
1.02 mgd	.819 mgd	.894 mgd

Discharge Points by Type

1.11 Provide the total number of effluent discharge points to waters of the United States by type.

Total Number of Effluent Discharge Points by Type				
Treated Effluent	**Untreated Effluent**	**Combined Sewer Overflows**	**Bypasses**	**Constructed Emergency Overflows**
1	0	0	0	0

Outfalls and Other Discharge or Disposal Methods

Outfalls Other Than to Waters of the United States

1.12 Does the POTW discharge wastewater to basins, ponds, or other surface impoundments that do not have outlets for discharge to waters of the United States?

☐ Yes ☑ No ➔ SKIP to Item 1.14.

1.13 Provide the location of each surface impoundment and associated discharge information in the table below.

Surface Impoundment Location and Discharge Data

Location	Average Daily Volume Discharged to Surface Impoundment	Continuous or Intermittent (check one)
	gpd	☐ Continuous ☐ Intermittent
	gpd	☐ Continuous ☐ Intermittent
	gpd	☐ Continuous ☐ Intermittent

1.14 Is wastewater applied to land?

☐ Yes ☑ No ➔ SKIP to Item 1.16.

1.15 Provide the land application site and discharge data requested below.

Land Application Site and Discharge Data

Location	Size	Average Daily Volume Applied	Continuous or Intermittent (check one)
	acres	gpd	☐ Continuous ☐ Intermittent
	acres	gpd	☐ Continuous ☐ Intermittent
	acres	gpd	☐ Continuous ☐ Intermittent

1.16 Is effluent transported to another facility for treatment prior to discharge?

☐ Yes ☑ No ➔ SKIP to Item 1.21.

1.17 Describe the means by which the effluent is transported (e.g., tank truck, pipe).

1.18 Is the effluent transported by a party other than the applicant?

☐ Yes ☐ No ➔ SKIP to Item 1.20.

1.19 Provide information on the transporter below.

Transporter Data

Entity name	Mailing address (street or P.O. box)	
City or town	State	ZIP code
Contact name (first and last)	Title	
Phone number	Email address	

Outfalls and Other Discharge or Disposal Methods Continued

1.20 In the table below, indicate the name, address, contact information, NPDES number, and average daily flow rate of the receiving facility.

Receiving Facility Data		
Facility name	Mailing address (street or P.O. box)	
City or town	State	ZIP code
Contact name (first and last)	Title	
Phone number	Email address	
NPDES number of receiving facility (if any) ☐ None	Average daily flow rate mgd	

1.21 Is the wastewater disposed of in a manner other than those already mentioned in Items 1.14 through 1.21 that do not have outlets to waters of the United States (e.g., underground percolation, underground injection)?

☐ Yes ☑ No ➔ SKIP to Item 1.23.

1.22 Provide information in the table below on these other disposal methods.

Information on Other Disposal Methods				
Disposal Method Description	**Location of Disposal Site**	**Size of Disposal Site**	**Annual Average Daily Discharge Volume**	**Continuous or Intermittent** (check one)
		acres	gpd	☐ Continuous ☐ Intermittent
		acres	gpd	☐ Continuous ☐ Intermittent
		acres	gpd	☐ Continuous ☐ Intermittent

Variance Requests

1.23 Do you intend to request or renew one or more of the variances authorized at 40 CFR 122.21(n)? (Check all that apply. Consult with your NPDES permitting authority to determine what information needs to be submitted and when.)

☐ Discharges into marine waters (CWA Section 301(h))

☐ Water quality related effluent limitation (CWA Section 302(b)(2))

☑ Not applicable

Contractor Information

1.24 Are any operational or maintenance aspects (related to wastewater treatment and effluent quality) of the treatment works the responsibility of a contractor?

☐ Yes ☑ No ➔ SKIP to Section 2.

1.25 Provide location and contact information for each contractor in addition to a description of the contractor's operational and maintenance responsibilities.

Contractor Information			
	Contractor 1	**Contractor 2**	**Contractor 3**
Contractor name (company name)			
Mailing address (street or P.O. box)			
City, state, and ZIP code			
Contact name (first and last)			
Phone number			
Email address			
Operational and maintenance responsibilities of contractor			

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SECTION 2. ADDITIONAL INFORMATION (40 CFR 122.21(j)(1) and (2))

Design Flow

Outfalls to Waters of the United States

2.1 Does the treatment works have a design flow greater than or equal to 0.1 mgd?

☑ Yes ☐ No ➔ SKIP to Section 3.

Inflow and Infiltration

2.2 Provide the treatment works' current average daily volume of inflow and infiltration.

Average Daily Volume of Inflow and Infiltration
137,000 gpd

Indicate the steps the facility is taking to minimize inflow and infiltration.

13,521 feet of concrete mains and 3,959 feet of transite mains were relined in 2013.

Topographic Map

2.3 Have you attached a topographic map to this application that contains all the required information? (See instructions for specific requirements.)

☑ Yes ☐ No

Flow Diagram

2.4 Have you attached a process flow diagram or schematic to this application that contains all the required information? (See instructions for specific requirements.)

☑ Yes ☐ No

Scheduled Improvements and Schedules of Implementation

2.5 Are improvements to the facility scheduled?

☐ Yes ☑ No ➔ SKIP to Section 3.

Briefly list and describe the scheduled improvements.

1.

2.

3.

4.

2.6 Provide scheduled or actual dates of completion for improvements.

Scheduled or Actual Dates of Completion for Improvements

Scheduled Improvement (from above)	Affected Outfalls (list outfall number)	Begin Construction (MM/DD/YYYY)	End Construction (MM/DD/YYYY)	Begin Discharge (MM/DD/YYYY)	Attainment of Operational Level (MM/DD/YYYY)
1.					
2.					
3.					
4.					

2.7 Have appropriate permits/clearances concerning other federal/state requirements been obtained? Briefly explain your response.

☐ Yes ☐ No ☐ None required or applicable

Explanation:

EPA Identification Number	NPDES Permit Number	Facility Name	Form Approved 03/05/19 OMB No. 2040-0004
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SECTION 3. INFORMATION ON EFFLUENT DISCHARGES (40 CFR 122.21(j)(3) to (5))

Description of Outfalls

3.1 Provide the following information for each outfall. (Attach additional sheets if you have more than three outfalls.)

	Outfall Number 1	Outfall Number ____	Outfall Number ____
State	Washington		
County	Cowlitz		
City or town	Woodland		
Distance from shore	50 ft.	ft.	ft.
Depth below surface	4.5 ft.	ft.	ft.
Average daily flow rate	.592 mgd	mgd	mgd
Latitude	45° 54′ 04″ N	° ′ ″	° ′ ″
Longitude	122° 44′ 10″ W	° ′ ″	° ′ ″

Seasonal or Periodic Discharge Data

3.2 Do any of the outfalls described under Item 3.1 have seasonal or periodic discharges?

☑ Yes ☐ No ➔ SKIP to Item 3.4.

3.3 If so, provide the following information for each applicable outfall.

	Outfall Number 1	Outfall Number ____	Outfall Number ____
Number of times per year discharge occurs	2920		
Average duration of each discharge (specify units)	40 Minutes		
Average flow of each discharge	.074 mgd	mgd	mgd
Months in which discharge occurs	12		

Diffuser Type

3.4 Are any of the outfalls listed under Item 3.1 equipped with a diffuser?

☐ Yes ☑ No ➔ SKIP to Item 3.6.

3.5 Briefly describe the diffuser type at each applicable outfall.

Outfall Number ____	Outfall Number ____	Outfall Number ____

Waters of the U.S.

3.6 Does the treatment works discharge or plan to discharge wastewater to waters of the United States from one or more discharge points?

☑ Yes ☐ No ➔ SKIP to Section 6.

Receiving Water Description

3.7 Provide the receiving water and related information (if known) for each outfall.

	Outfall Number 1	Outfall Number _____	Outfall Number _____
Receiving water name	Lewis River		
Name of watershed, river, or stream system	Lewis River Watershed		
U.S. Soil Conservation Service 14-digit watershed code			
Name of state management/river basin	WRIA 27		
U.S. Geological Survey 8-digit hydrologic cataloging unit code			
Critical low flow (acute)	19.7 cfs	cfs	cfs
Critical low flow (chronic)	197.25 cfs	cfs	cfs
Total hardness at critical low flow	mg/L of $CaCO_3$	mg/L of $CaCO_3$	mg/L of $CaCO_3$

Treatment Description

3.8 Provide the following information describing the treatment provided for discharges from each outfall.

	Outfall Number 1	Outfall Number _____	Outfall Number _____
Highest Level of Treatment (check all that apply per outfall)	☑ Primary ☐ Equivalent to secondary ☑ Secondary ☐ Advanced ☑ Other (specify) UV Disinfection	☐ Primary ☐ Equivalent to secondary ☐ Secondary ☐ Advanced ☐ Other (specify) _____	☐ Primary ☐ Equivalent to secondary ☐ Secondary ☐ Advanced ☐ Other (specify) _____
Design Removal Rates by Outfall			
BOD_5 or $CBOD_5$	85 %	%	%
TSS	85 %	%	%
Phosphorus	☑ Not applicable %	☐ Not applicable %	☐ Not applicable %
Nitrogen	☑ Not applicable %	☐ Not applicable %	☐ Not applicable %
Other (specify) _____	☑ Not applicable %	☐ Not applicable %	☐ Not applicable %

Treatment Description Continued

3.9 Describe the type of disinfection used for the effluent from each outfall in the table below. If disinfection varies by season, describe below.

UV

	Outfall Number 1	Outfall Number ____	Outfall Number ____
Disinfection type	UV		
Seasons used	all seasons		
Dechlorination used?	☑ Not applicable ☐ Yes ☐ No	☐ Not applicable ☐ Yes ☐ No	☐ Not applicable ☐ Yes ☐ No

Effluent Testing Data

3.10 Have you completed monitoring for all Table A parameters and attached the results to the application package?

☑ Yes ☐ No

3.11 Have you conducted any WET tests during the 4.5 years prior to the date of the application on any of the facility's discharges or on any receiving water near the discharge points?

☑ Yes ☐ No ➔ SKIP to Item 3.13.

3.12 Indicate the number of acute and chronic WET tests conducted since the last permit reissuance of the facility's discharges by outfall number or of the receiving water near the discharge points.

	Outfall Number 1		Outfall Number ____		Outfall Number ____	
	Acute	Chronic	Acute	Chronic	Acute	Chronic
Number of tests of discharge water	12	12				
Number of tests of receiving water	0	0				

3.13 Does the treatment works have a design flow greater than or equal to 0.1 mgd?

☑ Yes ☐ No ➔ SKIP to Item 3.16.

3.14 Does the POTW use chlorine for disinfection, use chlorine elsewhere in the treatment process, or otherwise have reasonable potential to discharge chlorine in its effluent?

☑ Yes ➔ Complete Table B, including chlorine. ☐ No ➔ Complete Table B, omitting chlorine.

3.15 Have you completed monitoring for all applicable Table B pollutants and attached the results to this application package?

☑ Yes ☐ No

3.16 Does one or more of the following conditions apply?

- The facility has a design flow greater than or equal to 1 mgd.
- The POTW has an approved pretreatment program or is required to develop such a program.
- The NPDES permitting authority has informed the POTW that it must sample for the parameters in Table C, must sample other additional parameters (Table D), or submit the results of WET tests for acute or chronic toxicity for each of its discharge outfalls (Table E).

☑ Yes ➔ Complete Tables C, D, and E as applicable. ☐ No ➔ SKIP to Section 4.

3.17 Have you completed monitoring for all applicable Table C pollutants and attached the results to this application package?

☑ Yes ☐ No

3.18 Have you completed monitoring for all applicable Table D pollutants required by your NPDES permitting authority and attached the results to this application package?

☑ Yes ☐ No additional sampling required by NPDES permitting authority.

Effluent Testing Data Continued

3.19 Has the POTW conducted either (1) minimum of four quarterly WET tests for one year preceding this permit application or (2) at least four annual WET tests in the past 4.5 years?

☑ Yes ☐ No ➔ Complete tests and Table E and SKIP to Item 3.26.

3.20 Have you previously submitted the results of the above tests to your NPDES permitting authority?

☑ Yes ☐ No ➔ Provide results in Table E and SKIP to Item 3.26.

3.21 Indicate the dates the data were submitted to your NPDES permitting authority and provide a summary of the results.

Date(s) Submitted (MM/DD/YYYY)	Summary of Results
	See Toxicology Attachments

3.22 Regardless of how you provided your WET testing data to the NPDES permitting authority, did any of the tests result in toxicity?

☐ Yes ☑ No ➔ SKIP to Item 3.26.

3.23 Describe the cause(s) of the toxicity:

3.24 Has the treatment works conducted a toxicity reduction evaluation?

☐ Yes ☐ No ➔ SKIP to Item 3.26.

3.25 Provide details of any toxicity reduction evaluations conducted.

3.26 Have you completed Table E for all applicable outfalls and attached the results to the application package?

☐ Yes See Toxicology Attachments ☐ Not applicable because previously submitted information to the NPDES permitting authority.

SECTION 4. INDUSTRIAL DISCHARGES AND HAZARDOUS WASTES (40 CFR 122.21(j)(6) and (7))

Industrial Discharges and Hazardous Wastes

4.1 Does the POTW receive discharges from SIUs or NSCIUs?

☑ Yes ☐ No ➔ SKIP to Item 4.7.

4.2 Indicate the number of SIUs and NSCIUs that discharge to the POTW.

Number of SIUs	Number of NSCIUs
2	7

4.3 Does the POTW have an approved pretreatment program?

☐ Yes ☑ No

4.4 Have you submitted either of the following to the NPDES permitting authority that contains information substantially identical to that required in Table F: (1) a pretreatment program annual report submitted within one year of the application or (2) a pretreatment program?

☑ Yes ☐ No ➔ SKIP to Item 4.6.

4.5 Identify the title and date of the annual report or pretreatment program referenced in Item 4.4. SKIP to Item 4.7.

Industrial User Survey 01/12/2021

4.6 Have you completed and attached Table F to this application package?

☑ Yes ☐ No

Industrial Discharges and Hazardous Wastes Continued

4.7 Does the POTW receive, or has it been notified that it will receive, by truck, rail, or dedicated pipe, any wastes that are regulated as RCRA hazardous wastes pursuant to 40 CFR 261?

☐ Yes ☑ No ➔ SKIP to Item 4.9.

4.8 If yes, provide the following information:

Hazardous Waste Number	Waste Transport Method (check all that apply)	Annual Amount of Waste Received	Units
	☐ Truck ☐ Rail ☐ Dedicated pipe ☐ Other (specify) _____		
	☐ Truck ☐ Rail ☐ Dedicated pipe ☐ Other (specify) _____		
	☐ Truck ☐ Rail ☐ Dedicated pipe ☐ Other (specify) _____		

4.9 Does the POTW receive, or has it been notified that it will receive, wastewaters that originate from remedial activities, including those undertaken pursuant to CERCLA and Sections 3004(7) or 3008(h) of RCRA?

☐ Yes ☑ No ➔ SKIP to Section 5.

4.10 Does the POTW receive (or expect to receive) less than 15 kilograms per month of non-acute hazardous wastes as specified in 40 CFR 261.30(d) and 261.33(e)?

☐ Yes ➔ SKIP to Section 5. ☐ No

4.11 Have you reported the following information in an attachment to this application: identification and description of the site(s) or facility(ies) at which the wastewater originates; the identities of the wastewater's hazardous constituents; and the extent of treatment, if any, the wastewater receives or will receive before entering the POTW?

☐ Yes ☐ No

SECTION 5. COMBINED SEWER OVERFLOWS (40 CFR 122.21(j)(8))

CSO Map and Diagram

5.1 Does the treatment works have a combined sewer system?

☐ Yes ☑ No ➔ SKIP to Section 6.

5.2 Have you attached a CSO system map to this application? (See instructions for map requirements.)

☐ Yes ☐ No

5.3 Have you attached a CSO system diagram to this application? (See instructions for diagram requirements.)

☐ Yes ☐ No

CSO Outfall Description

5.4 For each CSO outfall, provide the following information. (Attach additional sheets as necessary.)

	CSO Outfall Number ___	CSO Outfall Number ___	CSO Outfall Number ___
City or town			
State and ZIP code			
County			
Latitude	° ' "	° ' "	° ' "
Longitude	° ' "	° ' "	° ' "
Distance from shore	ft.	ft.	ft.
Depth below surface	ft.	ft.	ft.

CSO Monitoring

5.5 Did the POTW monitor any of the following items in the past year for its CSO outfalls?

	CSO Outfall Number ___	CSO Outfall Number ___	CSO Outfall Number ___
Rainfall	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
CSO flow volume	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
CSO pollutant concentrations	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Receiving water quality	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
CSO frequency	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Number of storm events	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No

CSO Events in Past Year

5.6 Provide the following information for each of your CSO outfalls.

	CSO Outfall Number ___	CSO Outfall Number ___	CSO Outfall Number ___
Number of CSO events in the past year	events	events	events
Average duration per event	hours ☐ Actual or ☐ Estimated	hours ☐ Actual or ☐ Estimated	hours ☐ Actual or ☐ Estimated
Average volume per event	million gallons ☐ Actual or ☐ Estimated	million gallons ☐ Actual or ☐ Estimated	million gallons ☐ Actual or ☐ Estimated
Minimum rainfall causing a CSO event in last year	inches of rainfall ☐ Actual or ☐ Estimated	inches of rainfall ☐ Actual or ☐ Estimated	inches of rainfall ☐ Actual or ☐ Estimated

CSO Receiving Waters

5.7 Provide the information in the table below for each of your CSO outfalls.

	CSO Outfall Number ___	CSO Outfall Number ___	CSO Outfall Number ___
Receiving water name			
Name of watershed/ stream system			
U.S. Soil Conservation Service 14-digit watershed code (if known)	☐ Unknown	☐ Unknown	☐ Unknown
Name of state management/river basin			
U.S. Geological Survey 8-Digit Hydrologic Unit Code (if known)	☐ Unknown	☐ Unknown	☐ Unknown
Description of known water quality impacts on receiving stream by CSO (see instructions for examples)			

SECTION 6. CHECKLIST AND CERTIFICATION STATEMENT (40 CFR 122.22(a) and (d))

Checklist and Certification Statement

6.1 In Column 1 below, mark the sections of Form 2A that you have completed and are submitting with your application. For each section, specify in Column 2 any attachments that you are enclosing to alert the permitting authority. Note that not all applicants are required to provide attachments.

Column 1	Column 2	
☑ Section 1: Basic Application Information for All Applicants	☐ w/ variance request(s)	☐ w/ additional attachments
☑ Section 2: Additional Information	☑ w/ topographic map ☐ w/ additional attachments	☑ w/ process flow diagram
☑ Section 3: Information on Effluent Discharges	☑ w/ Table A ☑ w/ Table B ☑ w/ Table C	☐ w/ Table D ☑ w/ Table E ☑ w/ additional attachments
☑ Section 4: Industrial Discharges and Hazardous Wastes	☐ w/ SIU and NSCIU attachments ☐ w/ additional attachments	☐ w/ Table F
☐ Section 5: Combined Sewer Overflows	☐ w/ CSO map ☐ w/ CSO system diagram	☐ w/ additional attachments
☑ Section 6: Checklist and Certification Statement	☐ w/ attachments	

6.2 **Certification Statement**

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name (print or type first and last name)	Official title
William A Finn	Mayor
Signature	Date signed 1/24/2022

EPA Identification Number	NPDES Permit Number	Facility Name	Outfall Number
	WA 0020401	City of Woodland WA WWTP	1

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TABLE A. EFFLUENT PARAMETERS FOR ALL POTWS

Pollutant	Maximum Daily Discharge		Average Daily Discharge			Analytical Method[1]	ML or MDL (include units)
	Value	Units	Value	Units	Number of Samples		
Biochemical oxygen demand ☑ BOD_5 or ☐ $CBOD_5$ (report one)	22	mg/L	5.15	mg/L	520	SM 5210 B-2011	1.2 ☐ ML ☑ MDL
Fecal coliform	880	#/100 mL	59.35	#/100 mL	520	SM 9222 D-2006	5 ☐ ML ☑ MDL
Design flow rate	2.0	MGD	.585	MGD	1825		
pH (minimum)	6.7	pH					
pH (maximum)	7.4	pH					
Temperature (winter)	21.5	c	17.16	c	120		
Temperature (summer)	25.9	c	22.77	c	123		
Total suspended solids (TSS)	27.0	mg/L	4.96	mg/L	520	SM 2540 D-2011	2.0 ☐ ML ☑ MDL

[1] Sampling shall be conducted according to sufficiently sensitive test procedures (i.e., methods) approved under 40 CFR 136 for the analysis of pollutants or pollutant parameters or required under 40 CFR chapter I, subchapter N or O. See instructions and 40 CFR 122.21(e)(3).

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EPA Identification Number	NPDES Permit Number	Facility Name	Outfall Number
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TABLE B. EFFLUENT PARAMETERS FOR ALL POTWS WITH A FLOW EQUAL TO OR GREATER THAN 0.1 MGD

Pollutant	Maximum Daily Discharge		Average Daily Discharge			Analytical Method[1]	ML or MDL (include units)
	Value	Units	Value	Units	Number of Samples		
Ammonia (as N)	.795	mg/L	.152	mg/L	260	SM4500-NH3 D	.065 ☐ ML ☑ MDL
Chlorine (total residual, TRC)[2]	.11	mg/L	.027	mg/L	5	SM4500-C1 F	.02 ☐ ML ☑ MDL
Dissolved oxygen	5.81	mg/L	5.69	mg/L	5	SM5210-O G-01	n/a ☐ ML ☐ MDL
Nitrate/nitrite	6.5	mg/L	4.35	mg/L	60	300	.03 ☐ ML ☑ MDL
Kjeldahl nitrogen	4.2	mg/L	3.00	mg/L	5	D1426-15B	.04 ☐ ML ☑ MDL
Oil and grease	4.5	ug/L	2.19	ug/L	20	1664A	1300 ☐ ML ☑ MDL
Phosphorus	11.0	mg/L	4.77	mg/L	51	365.3	.042 ☐ ML ☑ MDL
Total dissolved solids	578	mg/L	526.6	mg/L	5	SM2540 C	5.0 ☐ ML ☑ MDL

[1] Sampling shall be conducted according to sufficiently sensitive test procedures (i.e., methods) approved under 40 CFR 136 for the analysis of pollutants or pollutant parameters or required under 40 CFR chapter I, subchapter N or O. See instructions and 40 CFR 122.21(e)(3).

[2] Facilities that do not use chlorine for disinfection, do not use chlorine elsewhere in the treatment process, and have no reasonable potential to discharge chlorine in their effluent are not required to report data for chlorine.

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EPA Identification Number	NPDES Permit Number	Facility Name	Outfall Number
	WA 0020401	City of Woodland WA WWTP	1

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TABLE C. EFFLUENT PARAMETERS FOR SELECTED POTWS

Pollutant	Maximum Daily Discharge		Average Daily Discharge			Analytical Method[1]	ML or MDL (include units)
	Value	Units	Value	Units	Number of Samples		
Metals, Cyanide, and Total Phenols							
Hardness (as $CaCO_3$)	130	mg/L	108.8	mg/L	51	SM 2340 B	n/a ☐ ML ☐ MDL
Antimony, total recoverable	.447	ug/L	.34	ug/L	16	200.8	.006 ☐ ML ☑ MDL
Arsenic, total recoverable	.52	ug/L	.40	ug/L	16	200.8	.2 ☐ ML ☑ MDL
Beryllium, total recoverable	nd	ug/L	nd	ug/L	16	200.8	.006 ☐ ML ☑ MDL
Cadmium, total recoverable	.064	ug/L	.041	ug/L	16	200.8	.007 ☐ ML ☐ MDL
Chromium, total recoverable	1.03	ug/L	.339	ug/L	16	200.8	.03 ☐ ML ☑ MDL
Copper, total recoverable	13.3	ug/L	9.81	ug/L	16	200.8	.02 ☐ ML ☑ MDL
Lead, total recoverable	.252	ug/L	.194	ug/L	16	200.8	.004 ☐ ML ☑ MDL
Mercury, total recoverable	.0155	ug/L	.0021	ug/L	16	1631E	.06 ☐ ML ☑ MDL
Nickel, total recoverable	1.31	ug/L	1.05	ug/L	16	200.8	.02 ☐ ML ☑ MDL
Selenium, total recoverable	.2	ug/L	.106	ug/L	16	200.8	.4 ☐ ML ☑ MDL
Silver, total recoverable	.035	ug/L	.0064	ug/L	16	200.8	.003 ☐ ML ☑ MDL
Thallium, total recoverable	.038	ug/L	.0093	ug/L	16	200.8	.002 ☐ ML ☑ MDL
Zinc, total recoverable	94.6	ug/L	71.33	ug/L	16	200.8	.2 ☐ ML ☑ MDL
Cyanide	1.3	mg/Kg	.368	ug/L	16	335.4	.9 ☐ ML ☑ MDL
Total phenolic compounds	12	ug/L	1.93	ug/L	16	420.1	4 ☐ ML ☑ MDL
Volatile Organic Compounds							
Acrolein	nd	ug/L	nd	ug/L	5	624	.98 ☐ ML ☑ MDL
Acrylonitrile	nd	ug/L	nd	ug/L	5	624	.12 ☐ ML ☑ MDL
Benzene	nd	ug/L	nd	ug/L	5	624	.031 ☐ ML ☑ MDL
Bromoform	nd	ug/L	nd	ug/L	5	624	.17 ☐ ML ☑ MDL

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TABLE C. EFFLUENT PARAMETERS FOR SELECTED POTWS

Pollutant	Maximum Daily Discharge		Average Daily Discharge			Analytical Method[1]	ML or MDL (include units)
	Value	Units	Value	Units	Number of Samples		
Carbon tetrachloride	nd	ug/L	nd	ug/L	5	624	.2 ☐ ML ☑ MDL
Chlorobenzene	nd	ug/L	nd	ug/L	5	624	.05 ☐ ML ☑ MDL
Chlorodibromomethane	nd	ug/L	nd	ug/L	5	624	.081 ☐ ML ☑ MDL
Chloroethane	nd	ug/L	nd	ug/L	5	624	.054 ☐ ML ☑ MDL
2-chloroethylvinyl ether	nd	ug/L	nd	ug/L	5	624	.12 ☐ ML ☐ MDL
Chloroform	.46	ug/L	.214	ug/L	5	624	.036 ☐ ML ☑ MDL
Dichlorobromomethane	nd	ug/L	nd	ug/L	5	624	.081 ☐ ML ☑ MDL
1,1-dichloroethane	nd	ug/L	nd	ug/L	5	624	.039 ☐ ML ☑ MDL
1,2-dichloroethane	nd	ug/L	nd	ug/L	5	624	.036 ☐ ML ☑ MDL
trans-1,2-dichloroethylene	nd	ug/L	nd	ug/L	5	624	.032 ☐ ML ☑ MDL
1,1-dichloroethylene	nd	ug/L	nd	ug/L	5	624	.039 ☐ ML ☑ MDL
1,2-dichloropropane	nd	ug/L	nd	ug/L	5	624	.044 ☐ ML ☑ MDL
1,3-dichloropropylene	nd	ug/L	nd	ug/L	5	624	.035 ☐ ML ☑ MDL
Ethylbenzene	nd	ug/L	nd	ug/L	5	624	.03 ☐ ML ☑ MDL
Methyl bromide	nd	ug/L	nd	ug/L	5	624	.034 ☐ ML ☑ MDL
Methyl chloride	.48	ug/L	.214	ug/L	5	624	.03 ☐ ML ☑ MDL
Methylene chloride	.06	ug/L	.012	ug/L	5	624	.06 ☐ ML ☑ MDL
1,1,2,2-tetrachloroethane	nd	ug/L	nd	ug/L	5	624	.063 ☐ ML ☑ MDL
Tetrachloroethylene	nd	ug/L	nd	ug/L	5	624	.032 ☐ ML ☑ MDL
Toluene	.09	ug/L	.034	ug/L	5	624	.032 ☐ ML ☑ MDL
1,1,1-trichloroethane	nd	ug/L	nd	ug/L	5	624	.044 ☐ ML ☑ MDL
1,1,2-trichloroethane	nd	ug/L	nd	ug/L	5	624	.045 ☐ ML ☑ MDL

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TABLE C. EFFLUENT PARAMETERS FOR SELECTED POTWS

Pollutant	Maximum Daily Discharge		Average Daily Discharge			Analytical Method[1]	ML or MDL (include units)
	Value	Units	Value	Units	Number of Samples		
Trichloroethylene	ND	ug/L	nd	ug/L	5	624	.05 ☐ ML ☑ MDL
Vinyl chloride	ND	ug/L	nd	ug/L	5	624	.03 ☐ ML ☑ MDL
Acid-Extractable Compounds							
p-chloro-m-cresol	ND	ug/L	ND	ug/L	5	625	☐ ML ☐ MDL
2-chlorophenol	ND	ug/L	ND	ug/L	5	625	.054 ☐ ML ☑ MDL
2,4-dichlorophenol	ND	ug/L	ND	ug/L	5	625	.047 ☐ ML ☑ MDL
2,4-dimethylphenol	ND	ug/L	ND	ug/L	5	625	.78 ☐ ML ☑ MDL
4,6-dinitro-o-cresol	ND	ug/L	ND	ug/L	5	625	.025 ☐ ML ☑ MDL
2,4-dinitrophenol	ND	ug/L	ND	ug/L	5	625	.17 ☐ ML ☑ MDL
2-nitrophenol	ND	ug/L	ND	ug/L	5	625	.063 ☐ ML ☑ MDL
4-nitrophenol	ND	ug/L	ND	ug/L	5	625	.28 ☐ ML ☑ MDL
Pentachlorophenol	.68	ug/L	.136	ug/L	5	625	.34 ☐ ML ☑ MDL
Phenol	.71	ug/L	.24	ug/L	5	625	.063 ☐ ML ☑ MDL
2,4,6-trichlorophenol	.072	ug/L	.0548	ug/L	5	625	.058 ☐ ML ☑ MDL
Base-Neutral Compounds							
Acenaphthene	ND	ug/L	ND	ug/L	5	625	.026 ☐ ML ☑ MDL
Acenaphthylene	ND	ug/L	ND	ug/L	5	625	.015 ☐ ML ☑ MDL
Anthracene	ND	ug/L	ND	ug/L	5	625	.024 ☐ ML ☑ MDL
Benzidine	ND	ug/L	ND	ug/L	5	625	29 ☐ ML ☑ MDL
Benzo(a)anthracene	ND	ug/L	ND	ug/L	5	625	.018 ☐ ML ☑ MDL
Benzo(a)pyrene	ND	ug/L	ND	ug/L	5	625	.031 ☐ ML ☑ MDL
3,4-benzofluoranthene	ND	ug/L	ND	ug/L	5	625	.017 ☐ ML ☑ MDL

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TABLE C. EFFLUENT PARAMETERS FOR SELECTED POTWS

Pollutant	Maximum Daily Discharge		Average Daily Discharge			Analytical Method[1]	ML or MDL (include units)
	Value	Units	Value	Units	Number of Samples		
Benzo(ghi)perylene	ND	ug/L	ND	ug/L	5	625	.020 ☐ ML ☑ MDL
Benzo(k)fluoranthene	ND	ug/L	ND	ug/L	5	625	.025 ☐ ML ☑ MDL
Bis (2-chloroethoxy) methane	ND	ug/L	ND	ug/L	5	625	.025 ☐ ML ☑ MDL
Bis (2-chloroethyl) ether	ND	ug/L	ND	ug/L	5	625	.036 ☐ ML ☑ MDL
Bis (2-chloroisopropyl) ether	ND	ug/L	ND	ug/L	5	625	.027 ☐ ML ☑ MDL
Bis (2-ethylhexyl) phthalate	2.5	ug/L	.596	ug/L	5	625	.14 ☐ ML ☑ MDL
4-bromophenyl phenyl ether	ND	ug/L	ND	ug/L	5	625	.027 ☐ ML ☑ MDL
Butyl benzyl phthalate	.083	ug/L	.0324	ug/L	5	625	.018 ☐ ML ☑ MDL
2-chloronaphthalene	ND	ug/L	ND	ug/L	5	625	.016 ☐ ML ☑ MDL
4-chlorophenyl phenyl ether	ND	ug/L	ND	ug/L	5	625	.21 ☐ ML ☑ MDL
Chrysene	ND	ug/L	ND	ug/L	5	625	.32 ☐ ML ☑ MDL
di-n-butyl phthalate	.1	ug/L	.0608	ug/L	5	625	.023 ☐ ML ☑ MDL
di-n-octyl phthalate	ND	ug/L	ND	ug/L	5	625	.53 ☐ ML ☑ MDL
Dibenzo(a,h)anthracene	ND	ug/L	ND	ug/L	5	625	.58 ☐ ML ☑ MDL
1,2-dichlorobenzene	ND	ug/L	ND	ug/L	5	625	.086 ☐ ML ☑ MDL
1,3-dichlorobenzene	ND	ug/L	ND	ug/L	5	625	.071 ☐ ML ☑ MDL
1,4-dichlorobenzene	.1	ug/L	.02	ug/L	5	625	.073 ☐ ML ☑ MDL
3,3-dichlorobenzidine	ND	ug/L	ND	ug/L	5	625	.44 ☐ ML ☑ MDL
Diethyl phthalate	.35	ug/L	.157	ug/L	5	625	.015 ☐ ML ☑ MDL
Dimethyl phthalate	ND	ug/L	ND	ug/L	5	625	.022 ☐ ML ☑ MDL
2,4-dinitrotoluene	ND	ug/L	ND	ug/L	5	625	.019 ☐ ML ☑ MDL
2,6-dinitrotoluene	ND	ug/L	ND	ug/L	5	625	.034 ☐ ML ☑ MDL

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	WA 0020401	City of Woodland WA WWTP	1

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TABLE C. EFFLUENT PARAMETERS FOR SELECTED POTWS

Pollutant	Maximum Daily Discharge		Average Daily Discharge			Analytical Method[1]	ML or MDL (include units)
	Value	Units	Value	Units	Number of Samples		
1,2-diphenylhydrazine	nd	ug/L	nd	ug/L	5	625	.021 ☐ ML ☑ MDL
Fluoranthene	nd	ug/L	nd	ug/L	5	625	.02 ☐ ML ☑ MDL
Fluorene	nd	ug/L	nd	ug/L	5	625	.027 ☐ ML ☑ MDL
Hexachlorobenzene	nd	ug/L	nd	ug/L	5	625	.022 ☐ ML ☑ MDL
Hexachlorobutadiene	nd	ug/L	nd	ug/L	5	625	.027 ☐ ML ☑ MDL
Hexachlorocyclo-pentadiene	nd	ug/L	nd	ug/L	5	625	.19 ☐ ML ☑ MDL
Hexachloroethane	nd	ug/L	nd	ug/L	5	625	.024 ☐ ML ☑ MDL
Indeno(1,2,3-cd)pyrene	nd	ug/L	nd	ug/L	5	625	.021 ☐ ML ☑ MDL
Isophorone	.059	ug/L	.040	ug/L	5	625	.016 ☐ ML ☑ MDL
Naphthalene	.12	ug/L	.0364	ug/L	5	625	.022 ☐ ML ☑ MDL
Nitrobenzene	nd	ug/L	nd	ug/L	5	625	.028 ☐ ML ☑ MDL
N-nitrosodi-n-propylamine	nd	ug/L	nd	ug/L	5	625	.037 ☐ ML ☑ MDL
N-nitrosodimethylamine	nd	ug/L	nd	ug/L	5	625	.42 ☐ ML ☑ MDL
N-nitrosodiphenylamine	nd	ug/L	nd	ug/L	5	625	.048 ☐ ML ☑ MDL
Phenanthrene	nd	ug/L	nd	ug/L	5	625	.022 ☐ ML ☑ MDL
Pyrene	nd	ug/L	nd	ug/L	5	625	.019 ☐ ML ☑ MDL
1,2,4-trichlorobenzene	nd	ug/L	nd	ug/L	5	625	.016 ☐ ML ☑ MDL

[1] Sampling shall be conducted according to sufficiently sensitive test procedures (i.e., methods) approved under 40 CFR 136 for the analysis of pollutants or pollutant parameters or required under 40 CFR Chapter I, Subchapter N or O. See instructions and 40 CFR 122.21(e)(3).

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TABLE D. ADDITIONAL POLLUTANTS AS REQUIRED BY NPDES PERMITTING AUTHORITY

Pollutant (list)	Maximum Daily Discharge		Average Daily Discharge			Analytical Method[1]	ML or MDL (include units)
	Value	Units	Value	Units	Number of Samples		
☑ No additional sampling is required by NPDES permitting authority.							
							☐ ML ☐ MDL
							☐ ML ☐ MDL
							☐ ML ☐ MDL
							☐ ML ☐ MDL
							☐ ML ☐ MDL
							☐ ML ☐ MDL
							☐ ML ☐ MDL
							☐ ML ☐ MDL
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							☐ ML ☐ MDL
							☐ ML ☐ MDL
							☐ ML ☐ MDL
							☐ ML ☐ MDL
							☐ ML ☐ MDL
							☐ ML ☐ MDL

[1] Sampling shall be conducted according to sufficiently sensitive test procedures (i.e., methods) approved under 40 CFR 136 for the analysis of pollutants or pollutant parameters or required under 40 CFR chapter I, subchapter N or O. See instructions and 40 CFR 122.21(e)(3).

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EPA Identification Number	NPDES Permit Number	Facility Name	Outfall Number
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TABLE E. EFFLUENT MONITORING FOR WHOLE EFFLUENT TOXICITY

The table provides response space for one whole effluent toxicity sample. Copy the table to report additional test results.

Test Information	**Test Number ____**	**Test Number ____**	**Test Number ____**
Test species	SEE TOXICOLOGY ATTACHMENTS		
Age at initiation of test			
Outfall number			
Date sample collected			
Date test started			
Duration			
Toxicity Test Methods			
Test method number			
Manual title			
Edition number and year of publication			
Page number(s)			
Sample Type			
Check one:	☐ Grab ☐ 24-hour composite	☐ Grab ☐ 24-hour composite	☐ Grab ☐ 24-hour composite
Sample Location			
Check one:	☐ Before Disinfection ☐ After Disinfection ☐ After Dechlorination	☐ Before Disinfection ☐ After Disinfection ☐ After Dechlorination	☐ Before disinfection ☐ After disinfection ☐ After dechlorination
Point in Treatment Process			
Describe the point in the treatment process at which the sample was collected for each test.			
Toxicity Type			
Indicate for each test whether the test was performed to asses acute or chronic toxicity, or both. (Check one response.)	☐ Acute ☐ Chronic ☐ Both	☐ Acute ☐ Chronic ☐ Both	☐ Acute ☐ Chronic ☐ Both

EPA Identification Number	NPDES Permit Number	Facility Name	Outfall Number
	WA 0020401	City of Woodland WA WWTP	1

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TABLE E. EFFLUENT MONITORING FOR WHOLE EFFLUENT TOXICITY

The table provides response space for one whole effluent toxicity sample. Copy the table to report additional test results.

	Test Number ____	Test Number ____	Test Number ____
Test Type			
Indicate the type of test performed. (Check one response.)	☐ Static ☐ Static-renewal ☐ Flow-through	☐ Static ☐ Static-renewal ☐ Flow-through	☐ Static ☐ Static-renewal ☐ Flow-through
Source of Dilution Water			
Indicate the source of dilution water. (Check one response.)	☐ Laboratory water ☐ Receiving water	☐ Laboratory water ☐ Receiving water	☐ Laboratory water ☐ Receiving water
If laboratory water, specify type.			
If receiving water, specify source.			
Type of Dilution Water			
Indicate the type of dilution water. If salt water, specify "natural" or type of artificial sea salts or brine used.	☐ Fresh water ☐ Salt water (specify)	☐ Fresh water ☐ Salt water (specify)	☐ Fresh water ☐ Salt water (specify)
Percentage Effluent Used			
Specify the percentage effluent used for all concentrations in the test series.			

Parameters Tested						
Check the parameters tested.	☐ pH ☐ Salinity ☐ Temperature	☐ Ammonia ☐ Dissolved oxygen	☐ pH ☐ Salinity ☐ Temperature	☐ Ammonia ☐ Dissolved oxygen	☐ pH ☐ Salinity ☐ Temperature	☐ Ammonia ☐ Dissolved oxygen
Acute Test Results						
Percent survival in 100% effluent	%		%		%	
LC_{50}						
95% confidence interval	%		%		%	
Control percent survival	%		%		%	

EPA Identification Number	NPDES Permit Number	Facility Name	Outfall Number
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TABLE E. EFFLUENT MONITORING FOR WHOLE EFFLUENT TOXICITY

The table provides response space for one whole effluent toxicity sample. Copy the table to report additional test results.

	Test Number ____		Test Number ____		Test Number ____	
Acute Test Results Continued						
Other (describe)	SEE TOXICOLOGY ATTACHMENTS					
Chronic Test Results						
NOEC	%		%		%	
IC_{25}	%		%		%	
Control percent survival	%		%		%	
Other (describe)						
Quality Control/Quality Assurance						
Is reference toxicant data available?	☐ Yes	☐ No	☐ Yes	☐ No	☐ Yes	☐ No
Was reference toxicant test within acceptable bounds?	☐ Yes	☐ No	☐ Yes	☐ No	☐ Yes	☐ No
What date was reference toxicant test run (MM/DD/YYYY)?						
Other (describe)						

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EPA Identification Number	NPDES Permit Number	Facility Name
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TABLE F. INDUSTRIAL DISCHARGE INFORMATION

Response space is provided for three SIUs. Copy the table to report information for additional SIUs.

	SIU 1	SIU 2	SIU ___
Name of SIU	Walt's Meats	Pacific Seafood	
Mailing address (street or P.O. box)	350 South Pekin Rd	1635 Down River Dr	
City, state, and ZIP code	Woodland, WA 98674	Woodland WA 98674	
Description of all industrial processes that affect or contribute to the discharge.	Slaughterhouse, Meat Packing Plant.	Processing, packing and freezing of fish products.	
List the principal products and raw materials that affect or contribute to the SIU's discharge.	Processed Beef Cattle	Bottom fish , Salmon, Crab, Shrimp, Halibut & Steelhead.	
Indicate the average daily volume of wastewater discharged by the SIU.	41954 gpd	8424 gpd	gpd
How much of the average daily volume is attributable to process flow?	n/a gpd	n/a gpd	gpd
How much of the average daily volume is attributable to non-process flow?	n/a gpd	n/a gpd	gpd
Is the SIU subject to local limits?	☑ Yes ☐ No	☑ Yes ☐ No	☐ Yes ☐ No
Is the SIU subject to categorical standards?	☐ Yes ☑ No	☐ Yes ☑ No	☐ Yes ☐ No

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TABLE F. INDUSTRIAL DISCHARGE INFORMATION

Response space is provided for three SIUs. Copy the table to report information for additional SIUs.

	SIU 1	SIU 2	SIU ___
Under what categories and subcategories is the SIU subject?	Flow, Oil/Grease, pH, BOD, TSS	Flow, BOD, TSS, Oil/Grease, Salinity, pH	
Has the POTW experienced problems (e.g., upsets, pass-through interferences) in the past 4.5 years that are attributable to the SIU?	☐ Yes ☑ No	☐ Yes ☑ No	☐ Yes ☐ No
If yes, describe.			

AQUATIC TOXICOLOGY REPORTS

Last 4 Quarters

eurofins | Environment Testing America

AQUATIC TOXICOLOGY REPORT

Project Name: CITY OF WOODLAND

Location: WOODLAND, WASHINGTON

Prepared by: Eurofins Environment Testing Northwest, LLC
(aka TestAmerica – ASL)

1100 NE Circle Boulevard, Suite 310
Corvallis, Oregon 97330
541-243-6137

Accredited in accordance with NELAP

Oregon Environmental Laboratory Accreditation Program #OR100022 (NELAP)
State of Washington DOE Environmental Laboratory Accreditation Program, Lab ID C556
California State Environmental Laboratory Accreditation Program, Certificate No.: 1726

Report Date: January 20, 2022 Released by: Michelle Bennett

Lab I.D. No. B5265

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Results relate only to the items tested and the sample(s) as received by the laboratory. The results included in this report have been reviewed for compliance and meet all requirements for accredited parameters. All data have been found to be compliant with laboratory protocol, with the exception of any items noted in this report. For questions, please contact the Project Manager (contact info on next page).

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APPENDIX A. RAW DATA SHEETS
APPENDIX B. REFERENCE TOXICANT DATA SHEETS
APPENDIX C. CHAIN OF CUSTODY

LABORATORY CONTACT: Alise Lampi, Aquatic Toxicity Department Manager
Alyssa.Lampi@eurofinset.com (541) 243-0964

INTRODUCTION

Eurofins Environment Testing Northwest, LLC Applied Sciences Laboratory (EETNW - ASL) conducted toxicity testing on sample(s) from the City of Woodland, Woodland, Washington.

Testing was initiated on: January 4, 2022

The test(s) were conducted using:

- the water flea (*Ceriodaphnia dubia*)
- the fathead minnow (*Pimephales promelas*)
- the green algae (*Selenastrum capricornutum,* aka *Raphidocelis subcapitata*, aka *Pseudokirchneriella subcapitata*).

OVERVIEW OF REGULATORY GUIDANCE

The following provides an overview and excerpts of applicable permit specifics, regulatory guidance, and other relevant information. This is intended only as a helpful guide, from a laboratory perspective, for understanding test outcomes. The final responsibility for interpretation of results remains with the client and/or regulatory agency.

The following guidance is taken from EETNW-ASL's reading of the NPDES permit for the City of Woodland (permit #WA0020401, effective Apr. 1, 2012, expired Mar. 31, 2017).

Note: No subsequent permit had been received by EETNW - ASL at the time of testing.

<u>There are no acute or chronic effluent limits for Whole Effluent Toxicity listed in the NPDES permit</u>.

Acute toxicity:

- "The acute critical effluent concentration (ACEC) equals 19 percent effluent."

Chronic toxicity:

- "The chronic critical effluent concentration (CCEC) equals 1.4 percent effluent."
- *Compliance Testing for Chronic Toxicity:*
    - "Conduct chronic toxicity testing on a series of at least five concentrations of effluent and a control. This series of dilutions must include the CCEC and ACEC."
    - "Compare the ACEC to the control using hypothesis testing at the 0.05 level of significance as described in permit."

The following is taken from the WDOE guidance (WQ-R-95-80, June 2016 revision):

- "To reduce WET limit violations due to statistically significance that is a Type I error (false positive), we lower the alpha for hypothesis testing when differences in test organisms response are small."
- "Alpha will be lowered from 0.05 to 0.01 if a 10% difference in an acute test is significant or a 20% difference in a chronic test is significant."

SUMMARY OF TEST RESULTS

Exhibits 1 and 2 provide a summary of the final test results.

EXHIBIT 1
Summary of Acute Test Results

Species	NOEC (%)	LOEC (%)	LC_{50} (%)
C. dubia	100	> 100	> 100
P. promelas	100	> 100	> 100

Note: acronyms are as defined below.

More detailed information is provided in the Results and Discussion section.

EXHIBIT 2
Summary of Chronic Test Results

Species	NOEC (%)	LOEC (%)	IC_{25} (%)
C. dubia	100	> 100	> 100
P. promelas	100	> 100	> 100
S. capricornutum	50	100	75.4

Note: acronyms are as defined below.

More detailed information is provided in the Results and Discussion section.

ACRONYM DEFINITIONS (from EPA guidance):

NOEC = No Observed Effect Concentration: The highest test concentration that causes no observable adverse effects on the test organisms (i.e. no statistically significant reduction from the control).
LOEC = Low Observed Effect Concentration: The lowest test concentration that does cause an observable adverse effect on the test organisms (i.e. is statistically significant reduction from the control).
LC_{50} = Lethal Concentration (50%): A point estimate of the test concentration that would cause death in 50 percent of the test population.
IC_{25} = Inhibition Concentration (25%): A point estimate of the test concentration that would cause a 25 percent reduction of a non-quantal biological measurement (i.e. growth, reproduction, etc.) for the test population.

SAMPLE INFORMATION

Exhibit 3 provides a summary of the sample conditions as received.

EXHIBIT 3
Sample Conditions on Receipt

Sample ID	**EFF**		
EETNW - ASL SDG + suffix	B5265		
	-01	-02	-03
Collection - Date and Time	01/03/2022 10:00	01/05/2022 10:00	01/07/2022 10:00
Receipt - Date and Time	01/04/2022 10:54	01/06/2022 12:00	01/08/2022 11:30
Temperature (°C)	0.8 to 1.4	1.6 to 2.0	0.1 to 0.3
Dissolved Oxygen (mg/L)	9.0	9.0	8.4
pH	6.9	6.9	6.9
Conductivity (µS/cm)	525	552	564
Total Residual Chlorine (mg/L)	0.04	0.02	0.03
Ammonia (mg/L as NH_3-N)	0.11	< 0.10	< 0.10
Total Hardness (mg/L as $CaCO_3$)	78	81	81
Total Alkalinity (mg/L as $CaCO_3$)	111	108	111

METHODS AND MATERIALS

TEST METHODS

The acute test methods were performed according to: *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms*, USEPA Office of Water (2002), EPA-821-R-02-012.

The chronic test methods were performed according to: *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms*, Fourth Edition, (2002), EPA-821-R-02-013.

Additional guidance was provided by:

- *Whole Effluent Toxicity Testing Guidance and Test Review Criteria*, Washington State Department of Ecology (revised Jun 2016) Pub# WQ-R-95-80.

DEVIATIONS FROM PROTOCOLS

Deviations from required procedures in the test methods:

- The D.O. measurements were not taken at test initiation as required by the EPA manual for the *S. capricornutum* chronic test. See further discussion in the Chronic Results section.

Deviations from recommended procedures in the test methods:

- For the *P. promelas* chronic test, some of the instantaneous temperature readings fell outside of the recommended range of 25±1°C. However, the required test condition of a temperature deviation (i.e. maximum minus minimum) of no more than 3 °C was met. This situation is detailed further in the Results and Discussion section of this report.

- All subsequent uses of a sample did not occur within the WDOE recommended maximum holding time of 72 hours past the time of sample collection. See further discussion in the Sample Collection and Storage section.

TEST DESIGN

The following summarizes the conditions used for both overall testing and the specifics for each test (observations and notations can be found on the datasheets in Appendix A):

Overall Test Design:

- Acute and Chronic tests: 1.4, 10, 19, 50, and 100 percent sample + dilution water for the control.

Test Organism Conditions:

- All organisms tested were fed and maintained during culturing, acclimation, and testing as prescribed by the EPA (2002).
- The test organisms appeared vigorous and in good condition prior to testing.

C. dubia acute test: (WDOE)

- Source: EETNW - ASL's in-house cultures
- Age: Less than 24 hours old
- Design: Four test vessels per concentration, five organisms per vessel
- Test Solution Renewal: None (i.e. static test)
- Monitoring:
    - Daily: Survival, DO, pH, and temperature; all concentrations.
    - Test Initiation and Termination: Conductivity, all concentrations
- Termination: 48 hours.
- Endpoints: Survival (at termination)

P. promelas acute test (renewal):

- Source: Aquatox Inc., Hot Springs, Arkansas
- Age: 1 to 14 days old, within a 24 hour age range
- Design: Four test vessels per concentration, Ten organisms per vessel
- Test Solution Renewal: Once @ 48 hours (i.e. static-renewal test)

- Monitoring:
  - Daily: Survival, DO, pH, and temperature; all concentrations.
  - Pre and Post Renewal solutions: DO and pH, all concentrations.
  - Test Initiation, with each new sample use, and Termination:
    - Conductivity, all concentrations (WDOE)
- Termination: 96 hours.
- Endpoints: Survival (at termination)

C. dubia chronic test:

- Source: EETNW - ASL's in-house cultures
- Age: Less than 24 hours old and within an 8-hour age range, with blocking by known parentage
- Design: Ten test vessels per concentration, one organism per vessel
- Test Solution Renewal: Daily
- Monitoring:
  - Daily: Survival and neonate production (with brood determination)
  - Daily: DO and pH in pre and post-renewal solutions, all concentrations
  - Daily: Temperature in pre-renewal solutions, all concentrations
  - With each new sample: Conductivity in post-renewal solutions, control and highest sample concentration
- Termination:
  - Survival: @ after 7 days.
  - Reproduction: When 60%+ of surviving control organisms produce a 3rd brood.
- Endpoints: Survival (at termination) and Reproduction (through first 3 broods)

P. promelas chronic test:

- Source: Aquatox Inc., Hot Springs, Arkansas
- Age: Less than 48 hours old and within an 24 hour age range
- Design: Four test vessels per concentration, ten organisms per vessel
- Test Solution Renewal: Daily
- Monitoring:
  - Daily: Survival
  - Daily: DO and pH in pre and post-renewal solutions, all concentrations
  - Daily: Temperature in pre-renewal solutions, all concentrations
  - With each new sample: Conductivity in post-renewal solutions, control and highest sample concentration
- Termination: 7 days after test initiation.
- Endpoints: Survival and Growth (average dry weight per organism added @ initiation)

S. capricornutum chronic test:

- Source: EETNW - ASL's in-house cultures
- Age: Culture acclimated to test conditions for 4 to 7 days.
- Design: Four test vessels per concentration, 10,000 cells/ml density at initiation
- Test Solution Renewal: None (static)
- Monitoring:
  - Initiation: DO, pH, Temperature, and Conductivity, all concentrations
  - Initiation: Hardness and Alkalinity, control + low, middle and high sample concentrations

    - Initiation: Light Intensity and Cell Density confirming counts, in triplicate
    - Daily: Temperature and pH, all concentrations
- Termination: 96 hours.
- Endpoints: Cell Density (at termination)

DILUTION WATER

The dilution water used was the standard culture water used by EETNW - ASL:

- Reconstituted, moderately hard water (as per EPA protocol) with a total hardness of 75 to 105 mg/L as $CaCO_3$ and an alkalinity of 50 to 75 mg/L as $CaCO_3$.
- For the *S. capricornutum* test: Reconstituted, DI water with nutrients added, including EDTA, which was passed through a 1.60 micron filter prior to use.

SAMPLE COLLECTION AND STORAGE

Samples were collected by City of Woodland personnel. The samples were accepted as scheduled by EETNW - ASL. Chain of Custody and Sample Receipt Records are provided in Appendix C.

- All samples were received within the EPA recommended and WDOE required 0 to 6 °C range.
- All samples were initially used for test initiation or test solution renewal within the EPA recommended maximum holding time of 36 hours of sample collection.
- All subsequent uses of a sample occurred within the EPA recommended maximum holding time of 72 hours past the time of initial use of that sample.
- Not all subsequent uses of a sample occurred within the WDOE recommended maximum holding time of 72 hours past the time of sample collection.
    - The sample was collected on January 7, 2021 at 10:00. The subsequent use of that sample took place on Day 6 of the *C. dubia* chronic test. On Day 6, the subsequent use of the sample occurred at 11:13 (73 hours and 13 minutes past collection of the sample).
    - The sample was collected on January 7, 2021 at 10:00. The subsequent use of that sample took place on Day 6 of the *P. promelas* chronic test. On Day 6, the subsequent use of the sample occurred at 12:55 (74 hours and 55 minutes past collection of the sample).
- All subsequent uses of a sample occurred within the WDOE recommended maximum holding time of 84 hours past the time of sample collection. (Extended for renewals of a 96 hour duration acute test).
- Following receipt, the samples were stored in the dark at 0 to 6 °C until test solutions were prepared and tested.

SAMPLE PREPARATION

Samples used during these tests were:

- Temperature adjusted prior to test initiation and each daily renewal.
- Organisms were noted in the sample on arrival. Sample was filtered through a 60 µm net prior to use.

- The subsample used for the *S. capricornutum* test had nutrients, including EDTA, added, and was 1.60 micron filtered prior to use.

DATA ANALYSIS

The statistical analyses performed for the acute tests were those outlined in *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms*, USEPA Office of Water, Fifth Edition (2002), EPA-821-R-02-012, using CETIS.

The statistical analyses performed for the chronic tests were those outlined in *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms*, USEPA Office of Water, Fourth Edition (EPA 2002), EPA-821-R-02-013, using CETIS.

- The specific statistical analysis and CETIS version used for each endpoint evaluation is listed with the statistical outputs included with each test in Appendix A.
- If any additional analysis methods were also used, an explanation of the rationale and reference to the source method is included with the presentation of those results below.

Additional guidance was provided by:

- *Whole Effluent Toxicity Testing Guidance and Test Review Criteria*, Washington State Department of Ecology (revised Jun 2016) Pub# WQ-R-95-80.

RESULTS AND DISCUSSION

The raw data sheets for all tests are presented in Appendix A.

ACUTE BIOASSAYS

Table 1 summarizes the survival data for the *C. dubia* acute test.

Table 1
Summary of Acute Results
C. dubia

Sample Concentration (%)	Percent Survival (at Test Termination)
Control	100
1.4	100
10	100
19	100
50	100
100	100

Statistical analysis in accordance with the EPA protocol and WDOE guidance results in:

- NOEC = 100 %
- LOEC > 100 %
- LC_{50} > 100 %

Dissolved oxygen concentrations remained at 4.0 mg/L or greater throughout the test period. Test temperatures remained in the range of 20±1 °C.

The *C. dubia* acute test meets Test Acceptability Criteria (TAC) of a minimum 90 percent control survival. Unless referenced above, the tests proceeded without any noted deviations or interruptions that could have affected test results. The testing should be considered "valid".

Table 2 summarizes the survival data for the *P. promelas* acute test.

Table 2 **Summary of Acute Results** ***P. promelas***	
Sample Concentration (%)	**Percent Survival (at Test Termination)**
Control	97.5
1.4	100
10	100
19	100
50	100
100	100

Statistical analysis in accordance with the EPA protocol and WDOE guidance results in:

- NOEC = 100 %
- LOEC > 100 %
- LC_{50} > 100 %

Dissolved oxygen concentrations remained at 4.0 mg/L or greater throughout the test period. Test temperatures remained in the range of 20±1 °C.

The *P. promelas* acute test meets Test Acceptability Criteria (TAC) of a minimum 90 percent control survival. Unless referenced above, the tests proceeded without any noted deviations or interruptions that could have affected test results. The testing should be considered "valid".

CHRONIC BIOASSAYS

Table 3 summarizes the survival and reproduction data for the *C. dubia* chronic test.

Table 3
Summary of Chronic Results
C. dubia

Sample Concentration (%)	Percent Survival	Mean Number of Young Per Adult
Control	90	14.5
1.4	90	16.9
10	80	19.0
19	90	20.7
50	100	24.2
100	90	21.0

Statistical analysis in accordance with the EPA protocol and WDOE guidance results in:

- NOEC = 100 %
- LOEC > 100 %
- IC_{25} > 100 %

Dissolved oxygen concentrations remained at 4.0 mg/L or greater throughout the test period. Test temperatures remained at 25±1 °C.

The *C. dubia* test meets Test Acceptability Criteria (TAC) for a minimum 80 percent control survival and a minimum 15 young produced per surviving control adult. In this case, the result was 16.1 young per surviving 9 adults. Unless referenced above, the tests proceeded without any noted deviations or interruptions that could have affected test results. The testing should be considered "valid".

Table 4 summarizes the survival and growth data for the *P. promelas* chronic test.

Table 4
Summary of Chronic Results
P. promelas

Sample Concentration (%)	Percent Survival	Mean Dry Weight Per Organism Added (mg)
Control	100	1.052
1.4	97.5	1.021
10	97.5	0.979
19	97.5	0.994
50	97.5	1.083
100	92.5	0.917

Statistical analysis in accordance with the EPA protocol and WDOE guidance results in:

- NOEC = 100 %
- LOEC > 100 %
- IC_{25} > 100 %

EPA guidance recommends test temperature to remain at 25±1°C for the chronic tests. On days 0 and 2 of the *P. promelas* test, the instantaneous temperatures in the test concentrations were slightly outside of this range at 23.6 to 24.1 °C. However, the required test condition of a temperature deviation (i.e. maximum minus minimum) over the entire test period of no more than 3 °C was met (25.4 – 23.6 = 1.8°C). The EPA chronic manual Section 4.9.2 states: "An individual test may be conditionally acceptable if the temperature, DO, and other specified conditions fall outside specifications, depending on the degree of departure and the objectives of the tests. The acceptability of the test would depend on the experience and professional judgment of the laboratory investigator and the reviewing staff of the regulatory authority". It is the laboratory's professional judgment that the minor deviation in the test temperature did not appear to affect the test results and the test should be accepted

Dissolved oxygen concentrations remained at 4.0 mg/L or greater throughout the test period. Other than noted, test temperatures remained at 25±1°C.

The *P. promelas* test meets Test Acceptability Criteria (TAC) for a minimum 80 percent control survival and a minimum weight of 0.250 mg per surviving control organism. Unless referenced above, the tests proceeded without any noted deviations or interruptions that could have affected test results. The testing should be considered "valid".

Table 5 summarizes the algae growth data for the *S. capricornutum* chronic test.

Table 5 **Summary of Chronic Results** ***S. capricornutum***	
Sample Concentration (%)	**Growth (Cells/ml x 10^6)**
Control	4.058
1.4	4.224
10	3.798
19	3.669
50	3.558
100	2.794 [a]
[a] Indicates a statistically significant difference from the control at alpha = 0.05.	

Statistical analysis in accordance with the EPA protocol results in:

- NOEC = 50 %
- LOEC = 100 %
- IC_{25} = 75.4 %

Note: The D.O. measurements were not taken at test initiation as required by the EPA manual. EPA manual states that D.O., pH, and temperature are to be measured in the control and all test concentrations at the beginning of the test and at test termination. The laboratory control met all TAC, therefore, it is EETNW - ASL's professional opinion that missing the required D.O. measurements had no significant impact on test results.

Test temperatures remained at 25±1°C.

The *S. capricornutum* chronic test meets Test Acceptability Criteria (TAC) for a minimum 1.0 x 10^6 cells/ml control growth and a maximum coefficient of variance (CV%) of 20% in the controls. Unless referenced above, the tests proceeded without any noted deviations or interruptions that could have affected test results. The testing should be considered "valid".

REFERENCE TOXICANT TESTS

Reference toxicant (reftox) testing is performed to document both initial and ongoing laboratory performance of the test method(s). While the health of the test organisms is primarily evaluated by the performance of the laboratory control, reftox test results also may be used to assess the health and sensitivity of the test organisms. Reftox test results within their respective cumulative summary (Cusum) chart limits are indicative of consistent laboratory performance and normal test organism sensitivity.

The results of the reftox tests indicate that the test organisms were within their respective cusum chart limits based on EPA guidelines. This demonstrates ongoing laboratory proficiency of the test methods and suggests normal test organism sensitivity in the associated client testing.

The *P. promelas* acute reftox test was conducted using sodium chloride. The *P. promelas* chronic reftox test was conducted using potassium chloride. The *C. dubia* and *S. capricornutum* reftox tests were conducted using sodium chloride. The data sheets for the reference toxicant tests are provided in Appendix B.

Tables 6 and 7 summarize the reference toxicant test results and Cusum chart limits.

Table 6
Acute Reference Toxicant Tests (g/L)

Species	LC_{50}	Cusum Chart Limits
C. dubia	2.64	1.62 to 3.07
P. promelas	7.7	5.9 to 8.7

Table 7
Chronic Reference Toxicant Tests (g/L)

Species	IC_{25}	Cusum Chart Limits
C. dubia (survival)	1.45	0.43 to 2.53
C. dubia (reproduction)	0.83	0.25 to 1.26
P. promelas (survival)	0.66	0.52 to 0.70
P. promelas (growth)	0.61	0.44 to 0.71
S. capricornutum (growth)	1.12	-0.03 to 2.72

APPENDIX A

RAW DATA SHEETS

TestAmerica **FRESHWATER TOXICITY TEST: SAMPLE AND DILUTION WATER DATA**

Client: City of Woodland | SDG # B 9265 | Test Initiation: Date 1/4/22

Contact: Derrek Amburgey | Test Termination: Date 1/11/22

Sample ID Number	Field ID	Collected Date (mm/dd/yy)	Collected Time (Pacific Zone)	Received Date (mm/dd/yy)	Received Time (Pacific Zone)	Temp (°C) as Rec'vd	Total Residual Chlorine (mg/l) ☐ Dechlorination allowed: as Rec'vd / after Dechlor.	Ammonia NH_3-N mg/l as Rec'vd	Hardness mg/l as $CaCO_3$ as Rec'vd	Alkalinity mg/l as $CaCO_3$ as Rec'vd	DO (mg/L) as Rec'vd	pH as Rec'vd	Cond. (uS) as Rec'vd	60 um filtered? (organisms noted)
BS2605-01	EFF	1/3/22	10:00	1/4/22	10:54	1.4 / 0.5	0.04 / -	0.11	78	111	9.0	6.9	525	☒ TC
BS2605-02	EFF	1/5/22	10:00	1/6/22	12:00	1.6 / 2.0	0.02 / -	<0.10	81	108	9.0	6.9	552	☒ TC
BS2605-03	EFF	1/7/22	10:00	1/8/22	11:30	0.1 / 0.3	0.03 / -	<0.10	81	111	8.4	6.9	564	☒ TC
							/							
							/							
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							/							
							/							
							/							
							/							
	Reporting Limits:					na	0.02 mg/L	0.10 mg/L	5 mg/L	5 mg/L	na	na	na	na

Note: "-" Indicates data collection or dechlorination not needed. Any other adjustments to samples prior to use are documented in Comments below or on Dilutions page.

Dilution Water	ID#	Hardness mg/l as $CaCO_3$	Alkalinity mg/l as $CaCO_3$
Recon MH (Algae)	5470	103	66
Recon MH (FHM)	5469	95	61
R06 MB 1/16/22	~~5492~~		
	5472	82	60
	5473	83	62

Comments: ☑ Indicates the action was taken, (☐= action not taken): " - " = sample not dechlorinated, or analyte not collected/needed.

☑ Subsample for algae test had nutrients added and was 1.60 um filtered

Water Quality Meters Used/ID#: Dissolved Oxygen # 1 pH # 11 Conductivity # 2

TestAmerica

FRESHWATER TOXICITY TEST: TEST ORGANISM INFORMATION

Client: City of Woodland

Sample Designation (SDG): B 5265

Test Species Information	Cd # 3918 *Ceriodaphnia dubia* Chronic	FHM # 2198 *Pimephales promelas* Chronic	Cd # 3917 *Ceriodaphnia dubia* Acute	FHM # 2197 *Pimephales promelas* Acute	Sc # 1058 *Selenastrum capricornutum* Chronic
Organism Age at Initiation	<24 hrs, all within an 8 hr window	<48 hrs, all within a 24 hour window	< 24 hrs	7 Days, within a 24 hour window	Acclimated for 4 Days
Test Container Size	30 ml	800 ml	30 ml	400 ml	125 ml
Test Volume	15 ml	500 ml	25 ml	250 ml	50 ml
Feeding: Type and Amount	0.10 ml Algae and 0.10 ml YCT daily	0.15 ml *Artemia*, 2 x Daily	Algae and YCT during acclimation	0.15 ml *Artemia*, @ 48 hrs	1 ml/L Nutrients, incl. EDTA, added
Aeration: In Test Chambers via Slow Bubble :	☒ None ☐ Prior to use	☒ None ☐ Prior to use ☐ @ _____ hrs	☒ None ☐ Prior to use	☒ None ☐ Prior to use ☐ @ _____ hrs	☒ None ☐ Prior to use
Acclimation Period	<24 hrs	<24 hrs	<24 hrs	6d ~~<24 hrs~~ Pod	4 Days
Organism Source	In-House	AquaTox	In-House	AquaTox Pod	In-House
Size	-	-	-	- 1-4-22	-
Loading Rate	-	-	-	-	-

Dissolved Oxygen aeration justifications (in test chambers):

Test(s): ☐ All ☐ _____

Date:

Comments:

Test Solution Preparation and Dilution Record

Note: ☐ Indicates task not done. ☑ Indicates task was done. Temp adj. = Temperature adjusted to ambient or test temp

Client: City of Woodland

Ditto marks ('') indicate that the same SDG, batch of dilution water, or food as the previous day's entry was used.

Ceriodaphnia dubia - Chronic

Test Concentration (%)	Sample Volume (mls)		Final Volume (mls)
Control	0.00	→	200
1.4	2.80	→	200
10	20.0	→	200
19	38.0	→	200
50	100	→	200
100	200	→	200

Total Sample volume needed per day = 361 mls

Test Day	Sample ID Used	Daily Sample Preparation (prior to dilution)	Dilution Water Used	YCT ID Used	Algae ID Used	Date	Time	Initials
0 (Initiation)	B5265-01	☐ Temp adj. ☐ Aerated	ID# ~~5469~~	# 1340	# ~~1353~~	1/4/2022	11:40	TC
1	B5265-01	☐ Temp adj. ☐ Aerated	ID# 5472	# 1340	# 1353	1/5/22	08:05	TC
2	B5265-02	☐ Temp adj. ☐ Aerated	ID# 5472	# 1355	# 1356	1/6/22	12:35	dbl
3	B5265-02	☐ Temp adj. ☐ Aerated	ID# 5472	# 1355	# 1356	1/7/22	09:30	KG
4	B5265-03	☐ Temp adj. ☐ Aerated	ID# 5472	# 1355	# 1353	1/8/22	12:10	dbl
5	B5265-03	☐ Temp adj. ☐ Aerated	ID# 5472	# 1349	# 1346	1/9/22	07:30	TC
6	B5265-03	☐ Temp adj. ☐ Aerated	ID# 5477	# 1339	# 1356	1/10/22	08:35	TC
7	B -	☐ Temp adj. ☐ Aerated	ID#	#	#	/ /	:	

Fathead minnow - Chronic

Test Concentration (%)	Sample Volume (mls)		Final Volume (mls)
Control	0.00	→	2000
1.4	28.0	→	2000
10	200	→	2000
19	380	→	2000
50	1,000	→	2000
100	2,000	→	2000

Total Sample volume needed per day = 3608 mls

Test Day	Sample ID Used	Daily Sample Preparation (prior to dilution)	Dilution Water Used	Date	Time	Initials
0 (Initiation)	B5265-01	☐ Temp adj. ☐ Aerated	ID# 5469	1/4/2022	11:23	TC
1	B5265-01	☐ Temp adj. ☐ Aerated	ID# 5469	1/5/22	08:11	TC
2	B5265-02	☐ Temp adj. ☐ Aerated	ID# 5469	1/6/22	12:25	dbl
3	B5265-02	☐ Temp adj. ☐ Aerated	ID# 5473	1/7/22	10:00	KG
4	B5265-03	☐ Temp adj. ☐ Aerated	ID# 5473	1/8/22	12:05	dbl
5	B5265-03	☐ Temp adj. ☐ Aerated	ID# 5473	1/9/22	07:25	TC
6	B5265-03	☐ Temp adj. ☐ Aerated	ID# 5473	1/10/22	08:32	TC

Ceriodaphnia dubia - Acute

Test Concentration (%)	Sample Volume (mls)		Final Volume (mls)
Control	0.00	→	200
1.4	2.80	→	200
10	20.0	→	200
19	38.0	→	200
50	100	→	200
100	200	→	200

Test Day	Sample ID Used	Daily Sample Preparation (prior to dilution)	Dilution Water Used	Date	Time	Initials
0 (Initiation)	B5265-01	☐ Temp adj. ☐ Aerated	ID# 5472	1/4/2022	11:40	TC

Total Sample volume needed per day = 361 mls

Fathead minnow - Acute

Test Concentration (%)	Sample Volume (mls)		Final Volume (mls)
Control	0.00	→	1000
1.4	14.0	→	1000
10	100	→	1000
19	190	→	1000
50	500	→	1000
100	1,000	→	1000

Test Day	Sample ID Used	Daily Sample Preparation (prior to dilution)	Dilution Water Used	Date	Time	Initials
0 (Initiation)	B5265-01	☐ Temp adj. ☐ Aerated	ID# 5469	1/4/2022	11:28	TC
2	B5265-01 ~~B -~~	☐ Temp adj, ☐ Aerated	ID# 5469	1/6/2022	11:09	TC

Total Sample volume needed per day = 1804 mls

Test Solution Preparation and Dilution Record

Note: ☐ Indicates task not done. ☑ Indicates task was done. Temp adj. = Temperature adjusted to ambient or test temp

Ditto marks ('') indicate that the same SDG, batch of dilution water, or food as the previous day's entry was used.

Client: City of Woodland

Algae - Chronic

Test Concentration (%)	Sample Volume (mls)		Final Volume (mls)
Control	0.00	→	500
1.4	7.00	→	500
10	50.0	→	500
19	95.0	→	500
50	250	→	500
100	500	→	500

Test Day	Sample ID Used	Daily Sample Preparation (prior to dilution)	Dilution Water Used	Date	Time	Initials
0 (Initiation)	B52650i	☑ Temperature adjusted ☐ Aerated ☑ Nutrients added (incl. EDTA) ~~☐ 0.45 um filtered Lot#~~ ☑ 1.60 mm filtered (WDOE clients only) Lot# C1178340	ID # 6470	14/2022	15:25	AGL

Total Sample volume needed = 752 mls

TestAmerica

48 HOUR FRESHWATER TOXICITY TEST SURVIVAL AND WATER QUALITY DATA

Rpw TC 1/4

Client: City of Woodland Sample ID # B 52165

Beginning, Date 1/4/22 Time ~~1315~~ 1315

Sample Description: Ending, Date 1/6/22 Time 1305

Random Template Used: Whiskey Cup random # 101 Waterbath/Incubator Used: # 7

Test Species: *Ceriodaphnia dubia* ID# Cd 3917

		0 hr	24 hr	48 hr
Technician		TC	TC	TC
Time		1315	1320	1305
Therm. ID#		# 252	# 250	# 250

Percent	Test Container Number	Number of Live Organisms 0	24	48	Dissolved Oxygen (mg/l) 0	24	48	pH 0	24	48	Temperature (°C) 0	24	48	Conductivity (µmohs/cm) 0	24	48
Control	Surrogate					8.5			7.7			19.6				
	A	5	5	5	8.8		8.4	8.0		8.0	19.2		19.9	287		296
	B	5	5	5												
	C	5	5	5												
	D	5	5	5												
1.4	Surrogate					8.5			7.6			19.6				
	A	5	5	5	8.9		8.4	7.8		7.7	19.3		19.9	298		299
	B	5	5	5												
	C	5	5	5												
	D	5	5	5												
10	Surrogate					8.4			7.6			19.7				
	A	5	5	5	8.9		8.5	7.7		7.6	19.3		19.9	319		340
	B	5	5	5												
	C	5	5	5												
	D	5	5	5												
19	Surrogate					8.4			7.5			19.7				
	A	5	5	5	9.0		8.5	7.6		7.6	19.3		19.9	340		352
	B	5	5	5												
	C	5	5	5												
	D	5	5	5												
50	Surrogate					8.5			7.5			19.7				
	A	5	5	5	9.0		8.5	7.3		7.6	19.4		19.9	411		422
	B	5	5	5												
	C	5	5	5												
	D	5	5	5												
100	Surrogate					8.5			7.5			19.6				
	A	5	5	5	9.2		8.5	7.1		7.8	19.2		19.9	527		531
	B	5	5	5												
	C	5	5	5												
	D	5	5	5												

Note: Use surrogate test chamber to determine temperature, DO, pH, and Conductivity measurements @ 24 hrs (before adding the organisms).

Woodland, WA, City of Woodland
Doc Control ID, ASL659-0917

Ceriodaphnia 48-h Acute Survival Test — **Eurofins TestAmerica - Corvallis**

Batch ID:	18-4901-0287	**Test Type:**	Survival (48h)	**Analyst:**	Michelle Bennett		
Start Date:	04 Jan-22 13:15	**Protocol:**	EPA/821/R-02-012 (2002)	**Diluent:**	Mod-Hard Synthetic Water		
Ending Date:	06 Jan-22 13:05	**Species:**	Ceriodaphnia dubia	**Brine:**			
Test Length:	48h	**Taxon:**	Branchiopoda	**Source:**	In-House Culture	**Age:**	<24

Sample ID:	05-1334-0574	**Code:**	B5265-01	**Project:**			
Sample Date:	03 Jan-22 10:00	**Material:**	POTW Effluent	**Source:**	Woodland, City of (WA0020401)		
Receipt Date:	04 Jan-22 10:54	**CAS (PC):**		**Station:**			
Sample Age:	27h (1.4 °C)	**Client:**					

Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	✓	NOEL	LOEL	TOEL	PMSD	TU	S
18-2034-3700	48h Survival Rate	Steel Many-One Rank Sum Test		100	>100	---	---	1	1

Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	✓	Level	%	95% LCL	95% UCL	TU	S
17-3283-4597	48h Survival Rate	Linear Interpolation (ICPIN)		EC50	>100	---	---	<1	1

Test Acceptability

				TAC Limits			
Analysis ID	**Endpoint**	**Attribute**	**Test Stat**	**Lower**	**Upper**	**Overlap**	**Decision**
17-3283-4597	48h Survival Rate	Control Resp	1	0.9	>>	Yes	Passes Criteria
18-2034-3700	48h Survival Rate	Control Resp	1	0.9	>>	Yes	Passes Criteria

48h Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	D	4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	---	0.00%
1.4		4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	---	0.00%
10		4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	---	0.00%
19		4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	---	0.00%
50		4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	---	0.00%
100		4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	---	0.00%

48h Survival Rate Detail — MD5: 4044EC3AA4B0C299FD327184584FE07D

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	1.0000	1.0000	1.0000	1.0000
1.4		1.0000	1.0000	1.0000	1.0000
10		1.0000	1.0000	1.0000	1.0000
19		1.0000	1.0000	1.0000	1.0000
50		1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000	1.0000

48h Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	5/5	5/5	5/5	5/5
1.4		5/5	5/5	5/5	5/5
10		5/5	5/5	5/5	5/5
19		5/5	5/5	5/5	5/5
50		5/5	5/5	5/5	5/5
100		5/5	5/5	5/5	5/5

Ceriodaphnia 48-h Acute Survival Test — **Eurofins TestAmerica - Corvallis**

Analysis ID:	18-2034-3700	**Endpoint:**	48h Survival Rate	**CETIS Version:**	CETISv1.9.7
Analyzed:	16 Jan-22 13:59	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1
Edit Date:	16 Jan-22 13:59	**MD5 Hash:**	4044EC3AA4B0C299FD327184584FE07D	**Editor ID:**	000-042-882-4

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU
Angular (Corrected)	C > T	100	>100	---	1

Steel Many-One Rank Sum Test

Control	vs	Conc-%	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Dilution Water		1.4	18	10	1	6	CDF	0.8333	Non-Significant Effect
		10	18	10	1	6	CDF	0.8333	Non-Significant Effect
		19	18	10	1	6	CDF	0.8333	Non-Significant Effect
		50	18	10	1	6	CDF	0.8333	Non-Significant Effect
		100	18	10	1	6	CDF	0.8333	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0	0	5			Indeterminate
Error	0	0	18			
Total	0		23			

ANOVA Assumptions Tests

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

48h Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
1.4		4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
10		4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
19		4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
50		4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
100		4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%

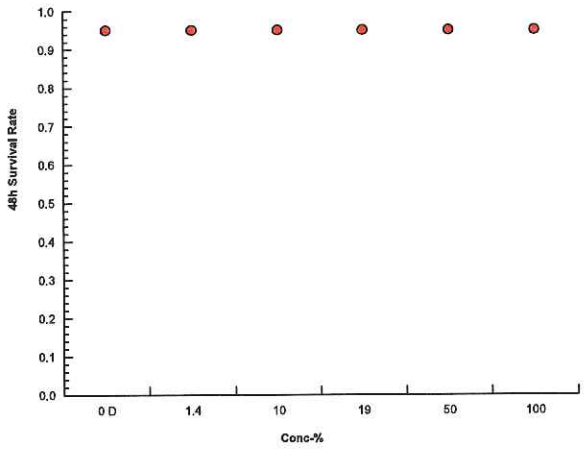
Angular (Corrected) Transformed Summary

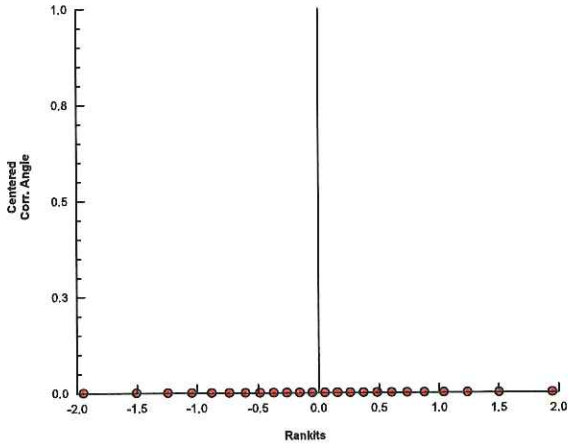
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	4	1.3450	1.3450	1.3460	1.3450	1.3450	1.3450	0.0000	0.00%	0.00%
1.4		4	1.3450	1.3450	1.3460	1.3450	1.3450	1.3450	0.0000	0.00%	0.00%
10		4	1.3450	1.3450	1.3460	1.3450	1.3450	1.3450	0.0000	0.00%	0.00%
19		4	1.3450	1.3450	1.3460	1.3450	1.3450	1.3450	0.0000	0.00%	0.00%
50		4	1.3450	1.3450	1.3460	1.3450	1.3450	1.3450	0.0000	0.00%	0.00%
100		4	1.3450	1.3450	1.3460	1.3450	1.3450	1.3450	0.0000	0.00%	0.00%

Ceriodaphnia 48-h Acute Survival Test — **Eurofins TestAmerica - Corvallis**

Analysis ID:	18-2034-3700	**Endpoint:**	48h Survival Rate	**CETIS Version:**	CETISv1.9.7
Analyzed:	16 Jan-22 13:59	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1
Edit Date:	16 Jan-22 13:59	**MD5 Hash:**	4044EC3AA4B0C299FD327184584FE07D	**Editor ID:**	000-042-882-4

Graphics





CETIS Analytical Report

Ceriodaphnia 48-h Acute Survival Test — **Eurofins TestAmerica - Corvallis**

Analysis ID:	17-3283-4597	**Endpoint:**	48h Survival Rate	**CETIS Version:**	CETISv1.9.7
Analyzed:	16 Jan-22 13:59	**Analysis:**	Linear Interpolation (ICPIN)	**Status Level:**	1
Edit Date:	16 Jan-22 13:59	**MD5 Hash:**	4044EC3AA4B0C299FD327184584FE07D	**Editor ID:**	000-042-882-4

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Log(X+1)	Linear	724332	200	Yes	Two-Point Interpolation

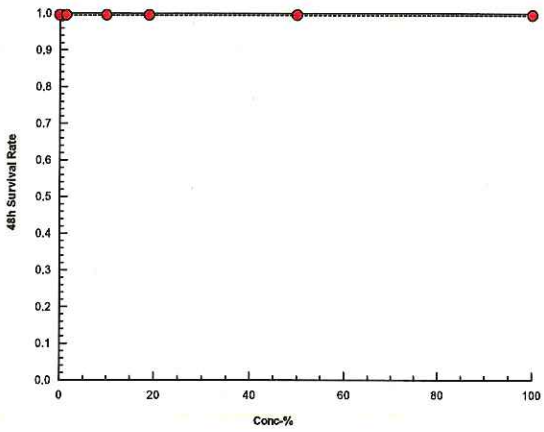
Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
EC50	>100	---	---	<1	---	---

48h Survival Rate Summary

			Calculated Variate(A/B)							Isotonic Variate	
Conc-%	Code	Count	Mean	Median	Min	Max	CV%	%Effect	A/B	Mean	%Effect
0	D	4	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	20/20	1.0000	0.00%
1.4		4	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	20/20	1.0000	0.00%
10		4	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	20/20	1.0000	0.00%
19		4	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	20/20	1.0000	0.00%
50		4	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	20/20	1.0000	0.00%
100		4	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	20/20	1.0000	0.00%

Graphics



TestAmerica

96 HOUR FRESHWATER TOXICITY TEST SURVIVAL AND WATER QUALITY DATA

22 RG KG 1-5-22

Random Template Used: 6 conc. x 4 reps. # 4

Sample Description:

Client: City of Woodland

Test Species: *Pimephales promelas* ID# FHM 2197

Waterbath/Incubator Used: # 7

Initial Sample ID # B 612105

Technician	0 hr	TC	24 hr	TC	48 hr	TC	72 hr	KG	96 hr	KG
Time	0 hr	12:47	24 hr	11:29	48 hr	10:05	72 hr	10:55	96 hr	13:55
Therm. ID#	0 hr	# 252	24 hr	# 250	48 hr	# 250	72 hr	# 250	96 hr	# 250

Test Initiation Date: 1/4/2022 Time: 15:47

Termination Date: 1/8/2022 Time: 13:55

Percent	Test Container Number	Number of Live Organisms					Dissolved Oxygen (mg/l)					pH					Temperature (°C)					Conductivity (µmohs/cm)				
		0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
Control	A	10	10	10	10	10	8.8	8.4	8.1/8.7	8.3	8.3	7.5	7.6	7.6/7.9	7.4	7.5	19.6	19.5	19.5	19.7	19.5	321		354/319		349
	B	10	10	10	10	10			/					/										/		
	C	10	10	10	10	10			/					/										/		
	D	10	9	9	9	9			/					/										/		
1.4	A	10	10	10	10	10	8.9	8.4	8.2/8.7	8.2	8.5	7.5	7.7	7.6/7.9	7.4	7.4	19.6	19.6	19.7	19.6	19.6	330		366/331		350
	B	10	10	10	10	10			/					/										/		
	C	10	10	10	10	10			/					/										/		
	D	10	10	10	10	10			/					/										/		
10	A	10	10	10	10	10	8.9	8.4	8.1/8.8	8.2	8.5	7.7	7.7	7.8/7.8	7.4	7.4	19.6	19.6	19.7	19.6	19.5	343		359/347		377
	B	10	10	10	10	10			/					/										/		
	C	10	10	10	10	10			/					/										/		
	D	10	10	10	10	10			/					/										/		

TestAmerica

96 HOUR FRESHWATER TOXICITY TEST SURVIVAL AND WATER QUALITY DATA

Random Template Used: 6 conc. x 4 reps. # 4

Sample Description

Client: City of Woodland

Test Species: *Pimephales promelas* ID# FHM 2197

Waterbath/Incubator Used: # 7

Initial Sample ID # B 52605

		0 hr	24 hr	48 hr	72 hr	96 hr
Technician		TC	TC	TC	KG	KG
Time		15:47	11:29	10:05	10:55	13:55
Therm. ID#		# 252	# 250	# 250	# 250	# 250

Test Initiation Date: 1/4/2022 Time: 15:47

Termination Date: 1/8/2022 Time: 13:55

Percent	Test Container Number	Number of Live Organisms					Dissolved Oxygen (mg/l)					pH					Temperature (°C)					Conductivity (µmohs/cm)				
		0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
19	A	10	10	10	10	10	9.0	8.4	8.1 / 5.9	8.1	8.6	7.6	7.6	7.6 / 7.7	7.5	7.4	19.5	19.7	19.5	19.6	19.4	366		402 / 364		398
	B	10	10	10	10	10																				
	C	10	10	10	10	10																				
	D	10	10	10	10	10																				
50	A	10	10	10	10	10	9.0	8.4	8.1 / 9.0	8.1	8.6	7.3	7.6	7.6 / 7.4	7.6	7.5	19.7	19.5	19.8	19.6	19.4	425		481 / 422		457
	B	10	10	10	10	10																				
	C	10	10	10	10	10																				
	D	10	10	10	10	10																				
100	A	10	10	10	10	10	9.0	8.3	8.0 / 9.1	8.0	8.6	7.0	7.0	7.0 / 7.1	7.6	7.5	19.6	19.0	19.5	19.8	19.5	527		457 / 527		563
	B	10	10	10	10	10																				
	C	10	10	10	10	10																				
	D	10	10	10	10	10																				

CETIS Summary Report

Fathead Minnow 96-h Acute Survival Test — **Eurofins TestAmerica - Corvallis**

Batch ID:	09-9489-9682	**Test Type:**	Survival (96h)	**Analyst:**	Michelle Bennett		
Start Date:	04 Jan-22 15:47	**Protocol:**	EPA/821/R-02-012 (2002)	**Diluent:**	Mod-Hard Synthetic Water		
Ending Date:	08 Jan-22 13:55	**Species:**	Pimephales promelas	**Brine:**			
Test Length:	94h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR	**Age:**	7D

Sample ID:	05-1334-0574	**Code:**	B5265-01	**Project:**	
Sample Date:	03 Jan-22 10:00	**Material:**	POTW Effluent	**Source:**	Woodland, City of (WA0020401)
Receipt Date:	04 Jan-22 10:54	**CAS (PC):**		**Station:**	
Sample Age:	30h (1.4 °C)	**Client:**			

Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	NOEL	LOEL	TOEL	PMSD	TU	S
15-4007-5498	96h Survival Rate	Steel Many-One Rank Sum Test	100	>100	---	4.02%	1	1

Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	Level	%	95% LCL	95% UCL	TU	S
06-3519-4251	96h Survival Rate	Linear Interpolation (ICPIN)	EC50	>100	---	---	<1	1

Test Acceptability

				TAC Limits			
Analysis ID	Endpoint	Attribute	Test Stat	Lower	Upper	Overlap	Decision
06-3519-4251	96h Survival Rate	Control Resp	0.975	0.9	>>	Yes	Passes Criteria
15-4007-5498	96h Survival Rate	Control Resp	0.975	0.9	>>	Yes	Passes Criteria

96h Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	D	4	0.9750	0.8954	1.0550	0.9000	1.0000	0.0250	0.0500	5.13%	0.00%
1.4		4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	---	-2.56%
10		4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	---	-2.56%
19		4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	---	-2.56%
50		4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	---	-2.56%
100		4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	---	-2.56%

96h Survival Rate Detail

MD5: 917680788385515B990CA3C79A0CD276

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	1.0000	1.0000	1.0000	0.9000
1.4		1.0000	1.0000	1.0000	1.0000
10		1.0000	1.0000	1.0000	1.0000
19		1.0000	1.0000	1.0000	1.0000
50		1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000	1.0000

96h Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	10/10	10/10	10/10	9/10
1.4		10/10	10/10	10/10	10/10
10		10/10	10/10	10/10	10/10
19		10/10	10/10	10/10	10/10
50		10/10	10/10	10/10	10/10
100		10/10	10/10	10/10	10/10

Fathead Minnow 96-h Acute Survival Test — **Eurofins TestAmerica - Corvallis**

Analysis ID:	15-4007-5498	**Endpoint:**	96h Survival Rate	**CETIS Version:**	CETISv1.9.7
Analyzed:	16 Jan-22 14:05	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1
Edit Date:	16 Jan-22 14:05	**MD5 Hash:**	917680788385515B990CA3C79A0CD276	**Editor ID:**	000-042-882-4

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	MSDu	PMSD
Angular (Corrected)	C > T	100	>100	---	1	0.03919	4.02%

Steel Many-One Rank Sum Test

Control	vs	Conc-%	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Dilution Water		1.4	20	10	1	6	CDF	0.9516	Non-Significant Effect
		10	20	10	1	6	CDF	0.9516	Non-Significant Effect
		19	20	10	1	6	CDF	0.9516	Non-Significant Effect
		50	20	10	1	6	CDF	0.9516	Non-Significant Effect
		100	20	10	1	6	CDF	0.9516	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0055332	0.0011066	5	1	0.4457	Non-Significant Effect
Error	0.0199195	0.0011066	18			
Total	0.0254527		23			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Bartlett Equality of Variance Test				Indeterminate
Distribution	Shapiro-Wilk W Normality Test	0.4634	0.884	<1.0E-05	Non-Normal Distribution

96h Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	4	0.9750	0.8954	1.0000	1.0000	0.9000	1.0000	0.0250	5.13%	0.00%
1.4		4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	-2.56%
10		4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	-2.56%
19		4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	-2.56%
50		4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	-2.56%
100		4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	-2.56%

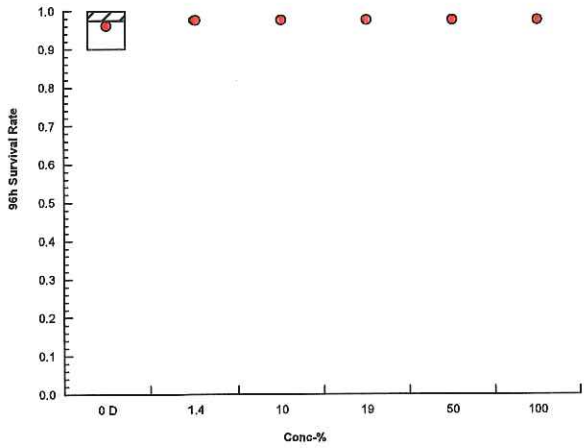
Angular (Corrected) Transformed Summary

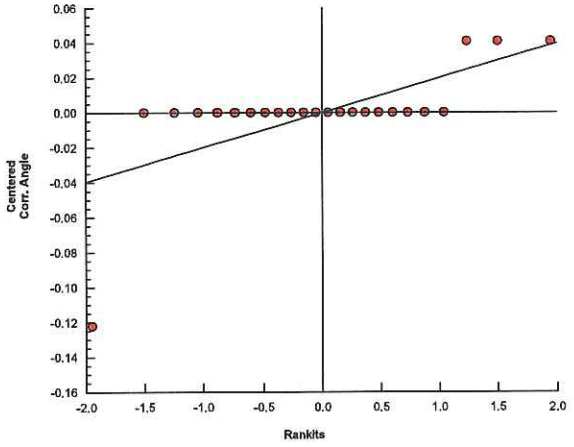
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	4	1.3710	1.2420	1.5010	1.4120	1.2490	1.4120	0.0407	5.94%	0.00%
1.4		4	1.4120	1.4120	1.4120	1.4120	1.4120	1.4120	0.0000	0.00%	-2.97%
10		4	1.4120	1.4120	1.4120	1.4120	1.4120	1.4120	0.0000	0.00%	-2.97%
19		4	1.4120	1.4120	1.4120	1.4120	1.4120	1.4120	0.0000	0.00%	-2.97%
50		4	1.4120	1.4120	1.4120	1.4120	1.4120	1.4120	0.0000	0.00%	-2.97%
100		4	1.4120	1.4120	1.4120	1.4120	1.4120	1.4120	0.0000	0.00%	-2.97%

Fathead Minnow 96-h Acute Survival Test — **Eurofins TestAmerica - Corvallis**

Analysis ID:	15-4007-5498	**Endpoint:**	96h Survival Rate	**CETIS Version:**	CETISv1.9.7
Analyzed:	16 Jan-22 14:05	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1
Edit Date:	16 Jan-22 14:05	**MD5 Hash:**	917680788385515B990CA3C79A0CD276	**Editor ID:**	000-042-882-4

Graphics





CETIS Analytical Report

Fathead Minnow 96-h Acute Survival Test — **Eurofins TestAmerica - Corvallis**

Analysis ID:	06-3519-4251	**Endpoint:**	96h Survival Rate	**CETIS Version:**	CETISv1.9.7
Analyzed:	16 Jan-22 14:06	**Analysis:**	Linear Interpolation (ICPIN)	**Status Level:**	1
Edit Date:	16 Jan-22 14:05	**MD5 Hash:**	917680788385515B990CA3C79A0CD276	**Editor ID:**	000-042-882-4

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Log(X+1)	Linear	1676770	200	Yes	Two-Point Interpolation

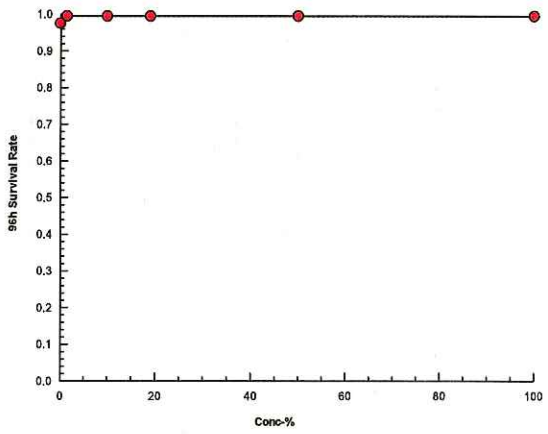
Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
EC50	>100	---	---	<1	---	---

96h Survival Rate Summary

			Calculated Variate(A/B)							Isotonic Variate	
Conc-%	Code	Count	Mean	Median	Min	Max	CV%	%Effect	A/B	Mean	%Effect
0	D	4	0.9750	1.0000	0.9000	1.0000	5.13%	0.00%	39/40	0.9958	0.00%
1.4		4	1.0000	1.0000	1.0000	1.0000	0.00%	-2.56%	40/40	0.9958	0.00%
10		4	1.0000	1.0000	1.0000	1.0000	0.00%	-2.56%	40/40	0.9958	0.00%
19		4	1.0000	1.0000	1.0000	1.0000	0.00%	-2.56%	40/40	0.9958	0.00%
50		4	1.0000	1.0000	1.0000	1.0000	0.00%	-2.56%	40/40	0.9958	0.00%
100		4	1.0000	1.0000	1.0000	1.0000	0.00%	-2.56%	40/40	0.9958	0.00%

Graphics



TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Ceriodaphnia dubia
Survival and Reproduction
Test Data Summary

Client: City of Woodland Test Start Date: 1/4/2022

Sample Description: Initial Sample ID#: B5265-01

Data summarized by: MR

Percent or Concentration	Total Live Young Produced in First 3 Broods per Replicate										# Alive Adults	Total Live Young	
	A	B	C	D	E	F	G	H	I	J			
Control	16	14	15	15	17	18	17	19	14	0	9	145	Avg= 16.1
	AD?	AD?	AD?	AD?	AD?	AD?	AD?	AD?	AD?	AD? x			
1.4 %	10	11	17	23	17	16	19	18	18	20	9	169	
	AD?	AD?	AD?	AD?	AD?	AD?	AD?	AD?	AD? x	AD?			
10 %	20	19	13	18	20	19	20	22	20	19	8	190	
	AD?	AD?	AD? x	AD? x	AD?	AD?	AD?	AD?	AD?	AD?			
19 %	22	20	22	24	14	17	22	23	23	20	9	207	
	AD?	AD?	AD?	AD?	AD? x	AD?	AD?	AD?	AD?	AD?			
50 %	20	23	25	28	28	22	23	23	24	26	10	242	
	AD?	AD?	AD?	AD?	AD?	AD?	AD?	AD?	AD?	AD?			
100 %	26	25	27	14	13	25	27	26	27	0	9	210	
	AD?	AD?	AD?	AD?	AD? x	AD?	AD?	AD?	AD?	AD?			

Survival data summarized through Day 7. 60%+ of surviving controls with 3+ broods first observed on Day _____.

Test Organism Mortality (Adult dead) = AD? ✓

Test Organism identified as Male = AD? M

Test Organism Injured during test = AD? I

# of Alive Adults = Number of test organism alive at termination (for WDOE only, = Number of test organisms alive at Day 7)

Total Live Young = Total neonates produced in first 3 broods

Footnote: As per EPA-600-4-91-002 and EPA-821-R-02-013, *Ceriodaphnia dubia* test should be terminated when 60% of the surviving control organisms have produced their third brood, or at the end of eight days, whichever occurs first.

Also as per EPA-821-R-02-013 (13.10.9.1), "In this three-brood test, offspring from fourth or higher broods should not be counted and should not be included in the total number of neonates produced during the test."

TestAmerica

CERIODAPHNIA CHRONIC SURVIVAL AND REPRODUCTION DATA

Neo's obtained from	A	B	C	D	E	F	G	H	I	J
Culture Board ID:	N	N	N	N	N	N	M	M	M	M
Slot #:	2	7	12	13	37	68	3	4	11	13

Incubator Used: # 5
Random Template Used: 6 conc # 16

Client: City of Woodland
Test Initiation: Date: 1/4/2022 Time: 14:07
Sample Description:
Initial Sample ID # BS2665-01
Termination: Date: 1/11/2022 Time: 10:50

	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8
Technician	TC	3m	dpa	3m	dpa	TC	TC	3m	
Time	1407	1310	1400	1230	1311	0837	1113	1050	

Percent	Day	Daily Number of Live Young for each Replicate A	B	C	D	E	F	G	H	I	J	No. Live Adults	Daily Total Live Young
Control	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	0	0	0	0	0	0	0	0	0	10	0
	4	4	0	4	3	4	3	3	4	4	0 poor	10	29
	5	0	0	0	0	0	0	7	7	3	0	10	40
	6	10	0	0	0	7	7	0	0	0	0	10	20
	7	6	8	5	7	0	0	7	8	7	0 AD	9	48
	8												
1.4 %	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	0	0	0	0	0	0	0	0	0	10	0
	4	4	3	4	4	4	4	4	4	4	5	10	40
	5	0	2	0	0	0	4	0	0	0	7	10	33
	6	0	0	5	0	0	0	7	0	0	0	10	40
	7	0	6	8	11	10	8	8	0	6 AD	8	9	56
	8												
10 %	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	0	0	0	0	0	0	0	0	0	10	0
	4	4	4	4	3	5	3	5	4	6	3	10	41
	5	0	7	9	6	7	9	7	0	5	7	10	57
	6	7	0	0	0	0	7	0	8	0	0	10	22
	7	9	8	0 AD	9 AD	8	0	8	10	9	9	8	70
	8												
19 %	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	0	0	0	0	0	0	0	0	0	10	0
	4	4	6	4	5	4	3	3	5	5	4	10	45
	5	0	0	0	7	7	0	10	9	0	8	10	61
	6	7	0	0	17	0	6	9	0	9	0	10	43
	7	9	8	12	0	3 AD	0	0	9	9	8	9	58
	8												
50 %	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	0	0	0	6	0	0	0	0	0	10	6
	4	4	5	4	5	0	5	5	4	5	5	10	42
	5	0	10	10	9	9	10	10	11	0	11	10	99
	6	0	0	11	0	13	7	7	8	9	0	10	56
	7	8	8	0	14	0	0	0	0	10	10	10	50
	8												
100 %	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	0	0	0	5	0	0	0	0	0	10	5
	4	4	5	5	0	0	4	6	5	5	0 poor	10	34
	5	10	11	9	4	4/AD	10	11	9	9	0	9	81
	6	0	9	0	10		0	0	0	0	0	9	28
	7	12	0	13	0		11	10	12	13	0	9	62
	8												

"AD" = Adult Dead, "AY" = Aborted young, "M" = male organism, "F" = Female, "R" = Adult releasing young, " / " = split brood (carry-over brood / current day brood),
"Inj" = Adult Injured during test solution renewal, replicate removed from analysis. "AM" = Adult missing, remove from analysis. A circled neonate count = 4th brood

Footnote: As per WDOE, C. dubia test reproduction should be when 60% of the surviving control organisms have produced their third brood (Days 6, 7, or 8). Survival is at seven days.

Woodland, WA, City of Woodland Control ID: ASL899-0917

R06 MB 1/16/22

TC 1/11

TestAmerica

CERIODAPHNIA WATER QUALITY DATA

DOE TC 1/4

Client: City of Woodland

Sample Description:

Initiated Date: 1/14/2022 Time: 14:07

Initial Sample ID #: B G2205 - 01

Adults Isolated Date: 1/3/2022 Time: 2:14:25

Neo's Collected Date: 1/3/2022 Time: 23:25

	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8
Tech:	TC/AGR	BM	AGR	BM	AGR	TC/HG	TC	BM/TC	
Time	17:30	5:30	14:46	12:50	16:05	13:56	14:29	11:15	:
Therm.	# 260	# 252	# 252	# 252	# 252	# 252	# 252	# 252	#

Dissolved Oxygen (mg/l)

%	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8
Control	8.5	8.3 / 8.3	8.0 / 8.0	8.2 / 8.5	8.6 / 8.4	8.6 / 8.9	7.5 / 7.6	8.1	
1.4 %	8.6	8.3 / 8.4	8.0 / 8.0	8.4 / 8.5	8.7 / 8.7	8.7 / 8.9	7.5 / 7.7	8.2	
10 %	8.6	8.3 / 8.6	8.1 / 8.0	8.4 / 8.5	8.3 / 8.9	8.4 / 8.9	9.5 / 7.7	8.2	
19 %	8.6	8.3 / 8.5	8.0 / 8.0	8.4 / 8.5	8.3 / 8.9	8.6 / 8.9	7.9 / 7.7	8.1	
50 %	8.6	8.3 / 8.5	8.0 / 8.0	8.4 / 8.5	8.3 / 9.0	8.2 / 8.9	7.9 / 7.7	8.0	
100 %	8.6	8.3 / 8.4	8.0 / 8.0	8.4 / 8.5	8.3 / 8.9	8.3 / 8.9	7.9 / 7.4	8.0	

pH

%	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8
Control	7.2	7.9 / 7.5	7.9 / 7.7	7.5 / 7.4	7.8 / 7.6	7.5 / 8.1	7.6 / 7.8	7.7	
1.4 %	7.1	7.7 / 7.4	7.9 / 7.7	7.5 / 7.4	7.8 / 7.6	8.0 / 8.1	7.8 / 7.7	7.7	
10 %	7.1	7.7 / 7.5	7.9 / 7.6	7.5 / 7.4	7.8 / 7.5	8.0 / 8.1	7.9 / 7.7	7.8	
19 %	7.1	7.7 / 7.5	7.9 / 7.6	7.5 / 7.4	7.8 / 7.5	8.0 / 8.0	7.9 / 7.6	7.8	
50 %	7.1	7.7 / 7.4	8.0 / 7.5	7.6 / 7.5	7.8 / 7.4	8.0 / 7.9	8.0 / 7.6	8.0	
100 %	7.1	7.8 / 7.4	8.0 / 7.4	7.7 / 7.5	8.0 / 7.4	8.2 / 7.9	8.2 / 7.9	8.1	

Temperature (°C) / Conductivity (µS) (1st use of each sample only)

%	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8
Control	24.4 / 301	25.2	25.0 / 294	25.1	24.7 / 299	24.3	24.5	25.5	
1.4 %	24.2 / 303	25.3	25.0 / 299	25.5	25.1 / 298	24.0	24.6	25.0	
10 %	24.1 / 323	25.0	25.5 / 314	24.6	25.0 / 319	25.1	24.2	25.1	
19 %	24.9 / 344	25.3	25.4 / 334	25.0	25.2 / 341	24.1	24.0	24.6	
50 %	25.0 / 413	25.3	25.2 / 399	25.3	25.3 / 441	24.1	24.3	25.0	
100 %	24.3 / 531	25.2	25.3 / 503	25.2	25.5 / 549	24.7	24.2	24.3	

COMMENTS: Temperatures taken just prior to test solution renewals. DO, pH, and Conductivity taken following organism transfer.

23.8 = Temp out of recom. range

Note: All Day 0 data represents conditions at initiation. All other days: numerator represents pre-renewal conditions, denominator represents post-renewal conditions.

Ceriodaphnia 7-d Survival and Reproduction Test — **Eurofins TestAmerica - Corvallis**

Batch ID:	13-5471-7609	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Michelle Bennett
Start Date:	04 Jan-22 14:07	**Protocol:**	EPA/821/R-02-013 (2002)	**Diluent:**	Mod-Hard Synthetic Water
Ending Date:	11 Jan-22 10:50	**Species:**	Ceriodaphnia dubia	**Brine:**	
Test Length:	6d 21h	**Taxon:**	Branchiopoda	**Source:**	In-House Culture **Age:** <24
Sample ID:	05-1334-0574	**Code:**	B5265-01	**Project:**	
Sample Date:	03 Jan-22 10:00	**Material:**	POTW Effluent	**Source:**	Woodland, City of (WA0020401)
Receipt Date:	04 Jan-22 10:54	**CAS (PC):**		**Station:**	
Sample Age:	28h (1.4 °C)	**Client:**			

Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	✓	NOEL	LOEL	TOEL	PMSD	TU	S
02-1284-4989	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test		100	>100	---	---	1	1
20-1942-9761	Reproduction	Steel Many-One Rank Sum Test		100	>100	---	35.1%	1	1

Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	✓	Level	%	95% LCL	95% UCL	TU	S
10-1300-0068	Reproduction	Linear Interpolation (ICPIN)		IC25	>100	---	---	<1	1

Test Acceptability

				TAC Limits			
Analysis ID	**Endpoint**	**Attribute**	**Test Stat**	**Lower**	**Upper**	**Overlap**	**Decision**
02-1284-4989	7d Survival Rate	Control Resp	0.9	0.8	>>	Yes	Passes Criteria
10-1300-0068	Reproduction	Control Resp	14.5	15	>>	Yes	Below Criteria
20-1942-9761	Reproduction	Control Resp	14.5	15	>>	Yes	Below Criteria
20-1942-9761	Reproduction	PMSD	0.3511	0.13	0.47	Yes	Passes Criteria

See note below

7d Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	D	10	0.9000	0.6738	1.1260	0.0000	1.0000	0.1000	0.3162	35.14%	0.00%
1.4		10	0.9000	0.6738	1.1260	0.0000	1.0000	0.1000	0.3162	35.14%	0.00%
10		10	0.8000	0.4984	1.1020	0.0000	1.0000	0.1333	0.4216	52.70%	11.11%
19		10	0.9000	0.6738	1.1260	0.0000	1.0000	0.1000	0.3162	35.14%	0.00%
50		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	---	-11.11%
100		10	0.9000	0.6738	1.1260	0.0000	1.0000	0.1000	0.3162	35.14%	0.00%

Reproduction Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	D	10	14.5	10.67	18.33	0	19	1.695	5.359	36.96%	0.00%
1.4		10	16.9	14.11	19.69	10	23	1.233	3.9	23.08%	-16.55%
10		10	19	17.31	20.69	13	22	0.7454	2.357	12.41%	-31.03%
19		10	20.7	18.49	22.91	14	24	0.9781	3.093	14.94%	-42.76%
50		10	24.2	22.36	26.04	20	28	0.8138	2.573	10.63%	-66.90%
100		10	21	14.5	27.5	0	27	2.875	9.092	43.30%	-44.83%

Per EPA, test acceptability criteria (TAC) is a minimum of 15 young produced per surviving control adult. In this case there were 9 surviving adults which results in an average number of young of 16.1. MB 1/16/22

Ceriodaphnia 7-d Survival and Reproduction Test — **Eurofins TestAmerica - Corvallis**

7d Survival Rate Detail — MD5: 7C0AAC5C90DAA3E344165183ABC51838

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	D	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000
1.4		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000
10		1.0000	1.0000	0.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
19		1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000
50		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000

Reproduction Detail — MD5: 47212BECDD6970FE14572CB5BCACEDC7

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	D	16	14	15	15	17	18	17	19	14	0
1.4		10	11	17	23	17	16	19	18	18	20
10		20	19	13	18	20	19	20	22	20	19
19		22	20	22	24	14	17	22	23	23	20
50		20	23	25	28	28	22	23	23	24	26
100		26	25	27	14	13	25	27	26	27	0

7d Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	D	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	0/1
1.4		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	0/1	1/1
10		1/1	1/1	0/1	0/1	1/1	1/1	1/1	1/1	1/1	1/1
19		1/1	1/1	1/1	1/1	0/1	1/1	1/1	1/1	1/1	1/1
50		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
100		1/1	1/1	1/1	1/1	0/1	1/1	1/1	1/1	1/1	1/1

Ceriodaphnia 7-d Survival and Reproduction Test — **Eurofins TestAmerica - Corvallis**

Analysis ID:	02-1284-4989	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.9.7
Analyzed:	16 Jan-22 14:27	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Edit Date:	16 Jan-22 14:26	**MD5 Hash:**	7C0AAC5C90DAA3E344165183ABC51838	**Editor ID:**	000-042-882-4

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU
Untransformed	C > T	100	>100	---	1

Fisher Exact/Bonferroni-Holm Test

Control	vs	Conc-%	Test Stat	P-Type	P-Value	Decision(α:5%)
Dilution Water		1.4	0.7632	Exact	1.0000	Non-Significant Effect
		10	0.5000	Exact	1.0000	Non-Significant Effect
		19	0.7632	Exact	1.0000	Non-Significant Effect
		50	1.0000	Exact	1.0000	Non-Significant Effect
		100	0.7632	Exact	1.0000	Non-Significant Effect

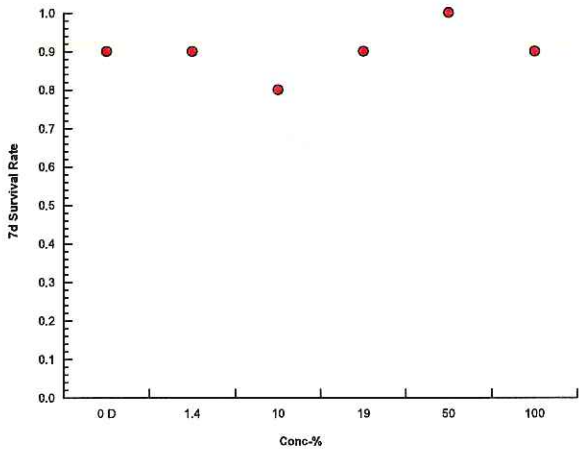
7d Survival Rate Frequencies

Conc-%	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
0	D	9	1	10	0.9000	0.1000	0.00%
1.4		9	1	10	0.9000	0.1000	0.00%
10		8	2	10	0.8000	0.2000	11.11%
19		9	1	10	0.9000	0.1000	0.00%
50		10	0	10	1.0000	0.0000	-11.11%
100		9	1	10	0.9000	0.1000	0.00%

7d Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	10	0.9000	0.6738	1.0000	1.0000	0.0000	1.0000	0.1000	35.14%	0.00%
1.4		10	0.9000	0.6738	1.0000	1.0000	0.0000	1.0000	0.1000	35.14%	0.00%
10		10	0.8000	0.4984	1.0000	1.0000	0.0000	1.0000	0.1333	52.70%	11.11%
19		10	0.9000	0.6738	1.0000	1.0000	0.0000	1.0000	0.1000	35.14%	0.00%
50		10	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	-11.11%
100		10	0.9000	0.6738	1.0000	1.0000	0.0000	1.0000	0.1000	35.14%	0.00%

Graphics



Ceriodaphnia 7-d Survival and Reproduction Test — **Eurofins TestAmerica - Corvallis**

Analysis ID:	20-1942-9761	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.7
Analyzed:	16 Jan-22 14:27	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1
Edit Date:	16 Jan-22 14:26	**MD5 Hash:**	C570FE6A8B3747F29A14019A6C448D77	**Editor ID:**	000-042-882-4

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	MSDu	PMSD
Untransformed	C > T	100	>100	---	1	5.09	35.11%

Steel Many-One Rank Sum Test

Control	vs	Conc-%	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Dilution Water		1.4	123	75	4	18	CDF	0.9955	Non-Significant Effect
		10	143	75	2	18	CDF	1.0000	Non-Significant Effect
		19	144	75	2	18	CDF	1.0000	Non-Significant Effect
		50	155	75	0	18	CDF	1.0000	Non-Significant Effect
		100	128.5	75	2	18	CDF	0.9991	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	577.083	115.417	5	4.668	0.0013	Significant Effect
Error	1335.1	24.7241	54			
Total	1912.18		59			

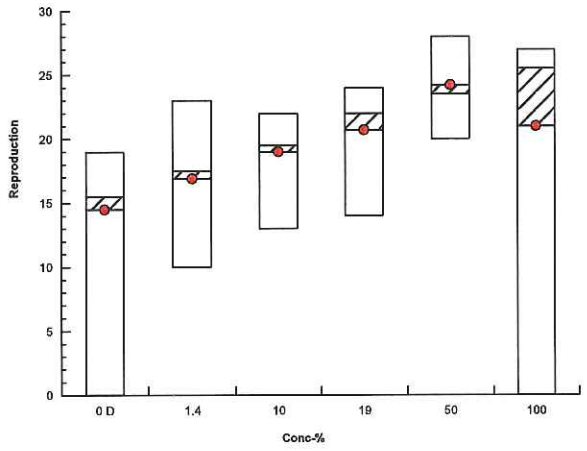
ANOVA Assumptions Tests

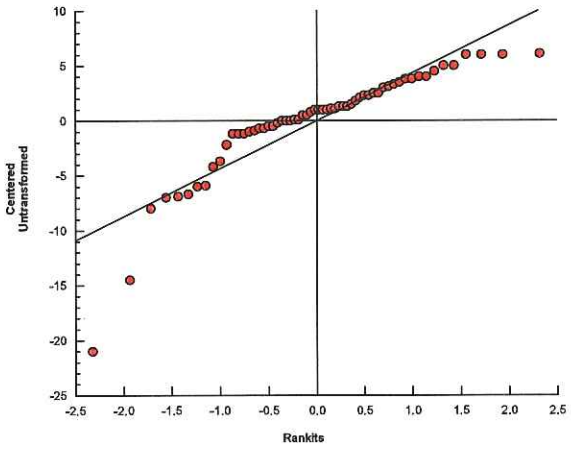
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Bartlett Equality of Variance Test	24.92	15.09	0.0001	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.8259	0.9459	<1.0E-05	Non-Normal Distribution

Reproduction Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	10	14.5	10.67	18.33	15.5	0	19	1.695	36.96%	0.00%
1.4		10	16.9	14.11	19.69	17.5	10	23	1.233	23.08%	-16.55%
10		10	19	17.31	20.69	19.5	13	22	0.7454	12.41%	-31.03%
19		10	20.7	18.49	22.91	22	14	24	0.9781	14.94%	-42.76%
50		10	24.2	22.36	26.04	23.5	20	28	0.8138	10.63%	-66.90%
100		10	21	14.5	27.5	25.5	0	27	2.875	43.30%	-44.83%

Graphics





CETIS Analytical Report

Ceriodaphnia 7-d Survival and Reproduction Test — **Eurofins TestAmerica - Corvallis**

Analysis ID:	10-1300-0068	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.7
Analyzed:	16 Jan-22 14:28	**Analysis:**	Linear Interpolation (ICPIN)	**Status Level:**	1
Edit Date:	16 Jan-22 14:26	**MD5 Hash:**	C570FE6A8B3747F29A14019A6C448D77	**Editor ID:**	000-042-882-4

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Log(X+1)	Linear	946845	200	Yes	Two-Point Interpolation

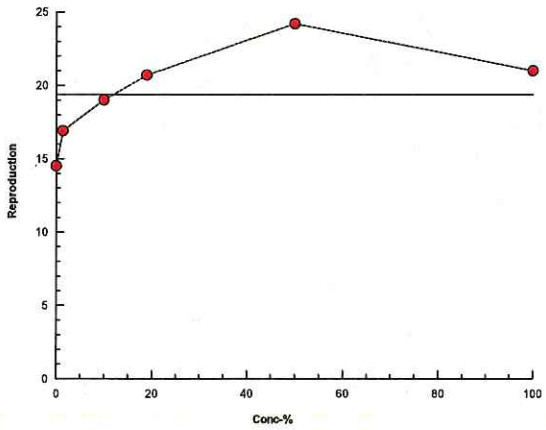
Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC25	>100	---	---	<1	---	---

Reproduction Summary

			Calculated Variate						Isotonic Variate	
Conc-%	Code	Count	Mean	Median	Min	Max	CV%	%Effect	Mean	%Effect
0	D	10	14.5	15.5	0	19	36.96%	0.00%	19.38	0.00%
1.4		10	16.9	17.5	10	23	23.08%	-16.55%	19.38	0.00%
10		10	19	19.5	13	22	12.41%	-31.03%	19.38	0.00%
19		10	20.7	22	14	24	14.94%	-42.76%	19.38	0.00%
50		10	24.2	23.5	20	28	10.63%	-66.90%	19.38	0.00%
100		10	21	25.5	0	27	43.30%	-44.83%	19.38	0.00%

Graphics



TestAmerica

FATHEAD MINNOW 7-DAY SURVIVAL AND WATER QUALITY DATA

Random Template Used: 6 conc. x 4 reps. # 7 | Waterbath/incubator Used: # 4 | Date Initiated 1/4/2022 Time 15:50

Initial sample ID B 52165 -01 | Date Terminated 1/11/2022 Time 10:05

Client City of Woodland | Sample Description

Tech: Day 0 JW/KG Day 1 TC Day 2 TC Day 3 KG Day 4 KG Day 5 KG Day 6 KG Day 7 KG

Time: Day 0 1550 Day 1 1417 Day 2 1640 Day 3 1237 Day 4 1605 Day 5 1330 Day 6 1255 Day 7 1005

Conc. or Percent	Day	Number of Live Organisms A	B	C	D	Dissolved O_2 (mg/l) Pre	Post	pH Pre	Post	Temp. (°C) Pre	Therm. ID #	Conductivity (µS) Post (1st use)
Control	0	10	10	10	10		8.5		7.6	Post: 23.8	252	328
	1	10	10	10	10	7.2	8.1	7.6	7.9	23.8	250	
	2	10	10	10	10	6.9	8.4	7.2	7.9	(23.6)	250	323
	3	10	10	10	10	7.5	8.4	7.1	7.9	24.2	250	
	4	10	10	10	10	7.2	8.3	7.2	7.9	24.1	250	313
	5	10	10	10	10	7.4	8.1	7.1	7.9	24.0	250	
	6	10	10	10	10	6.9	7.9	7.3	7.9	24.9	250	
	7	10	10	10	10	7.2		7.1		25.3	250	
1.4 %	0	10	10	10	10		8.7		7.6	Post: 23.8		329
	1	10	10	10	10	7.2	8.3	7.6	8.0	24.0		
	2	10	10✓	10	10✓	6.8	8.4	7.4	7.9	(23.6)		331
	3	10	10	10	10	7.4	8.4	7.1	7.9	24.2		
	4	9	10	10	10	7.3	8.3	7.2	7.8	24.1		328
	5	9	10	10	10	7.3	8.4	7.1	7.8	24.0		
	6	9	10	10	10	6.8	7.9	7.2	7.9	25.0		
	7	9	10	10	10	7.0		7.2		25.4		
10 %	0	10	10	10	10		8.7		7.5	Post: 24.1		346
	1	10	10	10	10	7.1	8.3	7.5	7.9	24.0		
	2	10	10	10	10	6.6	① 8.7	7.4	7.9	(23.6)		349
	3	10	10	10	10	7.1	8.5	7.2	7.9	24.4		
	4	10	10	9	10	7.0	8.5	7.1	7.8	24.1		348
	5	10✓	10	9	10	7.2	8.5	7.2	7.8	24.3		
	6	10	10	9	10	6.6	7.9	7.3	7.8	25.1		
	7	10	10	9	10	6.8		7.2		25.4		
19 %	0	10	10	10	10		8.7		7.4	Post: 24.0		3105
	1	10	10	10	10	7.1	8.3	7.5	7.8	24.1		
	2	10	9	10	10✓	6.9	① 8.7	7.3	7.8	(23.8)		3107
	3	10	9	10	10	6.7	8.6	7.3	7.8	24.3		
	4	10	9	10	10	6.9	8.6	7.2	7.6	24.1		3109
	5	10✓	9✓✓	10	10	7.1	8.6	7.2	7.7	24.2		
	6	10	9	10	10	6.8	8.0	7.3	7.8	25.2		
	7	10	9	10	10	6.7		7.5		25.3		
50 %	0	10	10	10	10		8.7		7.1	Post: 24.0		4216
	1	10	10	10	10	7.0	8.4	7.5	7.5	24.1		
	2	10	10	10	10	6.6	① 8.8	7.4	7.6	(23.9)		421
	3	9✓	10	10	10	7.0	8.6	7.4	7.6	24.5		
	4	9✓✓	10	10	10	7.0	8.6	7.4	7.4	24.2		439
	5	9	10	10	10	7.2	8.4	7.4	7.5	24.4		
	6	9	10	10	10	6.4	8.0	7.4	7.5	25.3		
	7	9	10	10	10	6.4		7.4		25.1		
100 %	0	10	10	10	10		8.8		6.9	Post: (23.8)		528
	1	10	10	10	10	6.9	8.4	7.6	7.3	24.0		
	2	10	10	9	10	6.3	① 8.9	7.5	7.2	(23.6)		516
	3	10✓	10	9	10	6.6	8.6	7.5	7.3	24.1		
	4	9	10	9	10✓	6.9	8.7	7.5	7.2	24.1		558
	5	8	10	9	10	7.1	8.4	7.5	7.2	24.2		
	6	8	10	9	10	6.5	8.0	7.5	7.3	25.1		
	7	8	10	9	10	6.3		7.6		25.1		

✓ Indicates one organism inadvertently poured off during solution renewal, replaced into container.

"M" = organism missing, start count reduced. "Inj" = organism injured, remove from stats.

"F" = fungus noted on dead organisms.

☐ Aeration in test chambers begun @ _____ (Note observations on Test Organism Info sheet)

① Post shake down TC 1/6/22

Pre =Pre-renewal solutions. Post =Post-renewal solutions.

Day 0 Temperatures = Post-renewals

Therm ID# = Thermometer ID used for all measurements that day.

(23.8) = Temp. out of recommended range

FATHEAD MINNOW 7-DAY GROWTH DATA

Client: Woodland | Tins Labeled As: Woodlnd

Lab ID: | Start Date: 1/4/2022

Sample Description:

Technician:		KG
Date:		1/8/2022
Balance Serial #:	B328543647	B328543647

Percent	Replicate	Total Weight (mg)	Tare Weight (mg)	No. of Fish
Control	A		805.89	10
	B		796.05	10
	C		796.36	10
	D		787.83	10
1.4 %	A		816.75	9
	B		807.15	10
	C		798.70	10
	D		762.92	10
10 %	A		775.50	10
	B		771.44	10
	C		781.18	9
	D		779.55	10
19 %	A		838.21	10
	B		783.40	9
	C		783.98	10
	D		829.69	10
50 %	A		792.70	9
	B		785.66	10
	C		847.30	10
	D		788.14	10
100 %	A		781.85	8
	B		787.30	10
	C		782.43	9
	D		797.67	10
	A			
	B			
	C			
	D			

weigh to 0.01 mg

FATHEAD MINNOW 7-DAY GROWTH DATA

Client: Woodland | Tins Labeled As: Woodlnd

Lab ID: | Start Date: 1/4/2022

Sample Description:

Technician:	TC	KG
Date:	1/13/2022	1/8/2022
Balance Serial #:	B328543647	B328543647

Percent	Replicate	Total Weight (mg)	Tare Weight (mg)	No. of Fish
Control	A	817.17	805.89	10
	B	807.05	796.05	10
	C	806.11	796.36	10
	D	797.89	787.83	10
1.4 %	A	825.47	816.75	9
	B	818.29	807.15	10
	C	808.82	798.70	10
	D	773.79	762.92	10
10 %	A	784.90	775.50	10
	B	779.91	771.44	10
	C	790.86	781.18	9
	D	791.14	779.55	10
19 %	A	847.49	838.21	10
	B	792.10	783.40	9
	C	794.36	783.98	10
	D	841.09	829.69	10
50 %	A	802.51	792.70	9
	B	796.64	785.66	10
	C	858.11	847.30	10
	D	799.87	788.14	10
100 %	A	789.81	781.85	8
	B	797.11	787.30	10
	C	791.79	782.43	9
	D	807.20	797.67	10
	A			
	B			
	C			
	D			

weigh to 0.01 mg

Fathead Minnow 7-d Larval Survival and Growth Test — **Eurofins TestAmerica - Corvallis**

Batch ID:	04-3081-1898	**Test Type:**	Growth-Survival (7d)	**Analyst:**	Michelle Bennett		
Start Date:	04 Jan-22 15:50	**Protocol:**	EPA/821/R-02-013 (2002)	**Diluent:**	Mod-Hard Synthetic Water		
Ending Date:	11 Jan-22 10:05	**Species:**	Pimephales promelas	**Brine:**			
Test Length:	6d 18h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR	**Age:**	1D
Sample ID:	05-1334-0574	**Code:**	B5265-01	**Project:**			
Sample Date:	03 Jan-22 10:00	**Material:**	POTW Effluent	**Source:**	Woodland, City of (WA0020401)		
Receipt Date:	04 Jan-22 10:54	**CAS (PC):**		**Station:**			
Sample Age:	30h (1.4 °C)	**Client:**					

Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	✓	NOEL	LOEL	TOEL	PMSD	TU	S
13-2139-0246	7d Survival Rate	Steel Many-One Rank Sum Test		100	>100	---	9.38%	1	1
02-5092-5441	Mean Dry Biomass-mg	Dunnett Multiple Comparison Test		100	>100	---	16.4%	1	1

Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	✓	Level	%	95% LCL	95% UCL	TU	S
12-7250-6575	Mean Dry Biomass-mg	Linear Interpolation (ICPIN)		IC25	>100	---	---	<1	1

Test Acceptability

				TAC Limits			
Analysis ID	**Endpoint**	**Attribute**	**Test Stat**	**Lower**	**Upper**	**Overlap**	**Decision**
13-2139-0246	7d Survival Rate	Control Resp	1	0.8	>>	Yes	Passes Criteria
02-5092-5441	Mean Dry Biomass-mg	Control Resp	1.052	0.25	>>	Yes	Passes Criteria
12-7250-6575	Mean Dry Biomass-mg	Control Resp	1.052	0.25	>>	Yes	Passes Criteria
02-5092-5441	Mean Dry Biomass-mg	PMSD	0.164	0.12	0.3	Yes	Passes Criteria

7d Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	D	4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	---	0.00%
1.4		4	0.9750	0.8954	1.0550	0.9000	1.0000	0.0250	0.0500	5.13%	2.50%
10		4	0.9750	0.8954	1.0550	0.9000	1.0000	0.0250	0.0500	5.13%	2.50%
19		4	0.9750	0.8954	1.0550	0.9000	1.0000	0.0250	0.0500	5.13%	2.50%
50		4	0.9750	0.8954	1.0550	0.9000	1.0000	0.0250	0.0500	5.13%	2.50%
100		4	0.9250	0.7727	1.0770	0.8000	1.0000	0.0479	0.0957	10.35%	7.50%

Mean Dry Biomass-mg Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	D	4	1.052	0.9356	1.169	0.975	1.128	0.03666	0.07331	6.97%	0.00%
1.4		4	1.021	0.8487	1.194	0.872	1.114	0.05423	0.1085	10.62%	2.95%
10		4	0.9785	0.7701	1.187	0.847	1.159	0.06549	0.131	13.39%	7.01%
19		4	0.994	0.8035	1.184	0.87	1.14	0.05985	0.1197	12.04%	5.54%
50		4	1.083	0.9575	1.209	0.981	1.173	0.03951	0.07902	7.29%	-2.95%
100		4	0.9165	0.7853	1.048	0.796	0.981	0.04122	0.08245	9.00%	12.90%

Fathead Minnow 7-d Larval Survival and Growth Test — **Eurofins TestAmerica - Corvallis**

7d Survival Rate Detail — MD5: E0B6F04A78DCD8A602495D273074A6BA

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	1.0000	1.0000	1.0000	1.0000
1.4		0.9000	1.0000	1.0000	1.0000
10		1.0000	1.0000	0.9000	1.0000
19		1.0000	0.9000	1.0000	1.0000
50		0.9000	1.0000	1.0000	1.0000
100		0.8000	1.0000	0.9000	1.0000

Mean Dry Biomass-mg Detail — MD5: A84B1BD6B39AB99E731660E1D3709566

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	1.128	1.1	0.975	1.006
1.4		0.872	1.114	1.012	1.087
10		0.94	0.847	0.968	1.159
19		0.928	0.87	1.038	1.14
50		0.981	1.098	1.081	1.173
100		0.796	0.981	0.936	0.953

7d Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	10/10	10/10	10/10	10/10
1.4		9/10	10/10	10/10	10/10
10		10/10	10/10	9/10	10/10
19		10/10	9/10	10/10	10/10
50		9/10	10/10	10/10	10/10
100		8/10	10/10	9/10	10/10

Fathead Minnow 7-d Larval Survival and Growth Test — **Eurofins TestAmerica - Corvallis**

Analysis ID:	13-2139-0246	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.9.7
Analyzed:	16 Jan-22 14:42	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1
Edit Date:		**MD5 Hash:**	E0B6F04A78DCD8A602495D273074A6BA	**Editor ID:**	

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	MSDu	PMSD
Angular (Corrected)	C > T	100	>100	---	1	0.0938	9.38%

Steel Many-One Rank Sum Test

Control	vs	Conc-%	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Dilution Water		1.4	16	10	1	6	CDF	0.6105	Non-Significant Effect
		10	16	10	1	6	CDF	0.6105	Non-Significant Effect
		19	16	10	1	6	CDF	0.6105	Non-Significant Effect
		50	16	10	1	6	CDF	0.6105	Non-Significant Effect
		100	14	10	1	6	CDF	0.3451	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0290369	0.0058074	5	0.7236	0.6145	Non-Significant Effect
Error	0.144463	0.0080258	18			
Total	0.1735		23			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Bartlett Equality of Variance Test				Indeterminate
Distribution	Shapiro-Wilk W Normality Test	0.8229	0.884	0.0007	Non-Normal Distribution

7d Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
1.4		4	0.9750	0.8954	1.0000	1.0000	0.9000	1.0000	0.0250	5.13%	2.50%
10		4	0.9750	0.8954	1.0000	1.0000	0.9000	1.0000	0.0250	5.13%	2.50%
19		4	0.9750	0.8954	1.0000	1.0000	0.9000	1.0000	0.0250	5.13%	2.50%
50		4	0.9750	0.8954	1.0000	1.0000	0.9000	1.0000	0.0250	5.13%	2.50%
100		4	0.9250	0.7727	1.0000	0.9500	0.8000	1.0000	0.0479	10.35%	7.50%

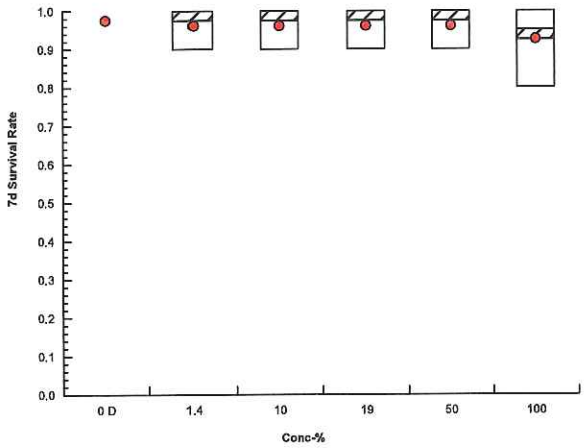
Angular (Corrected) Transformed Summary

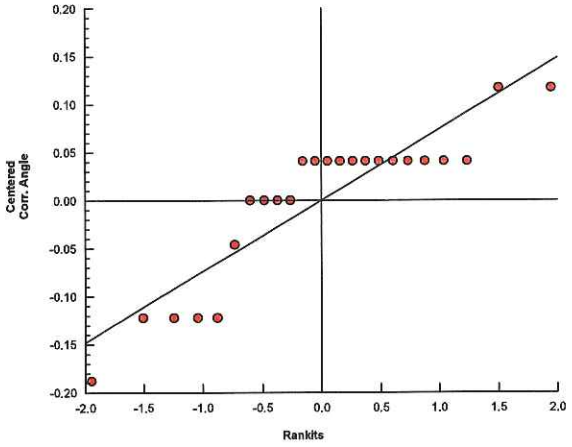
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	4	1.4120	1.4120	1.4120	1.4120	1.4120	1.4120	0.0000	0.00%	0.00%
1.4		4	1.3710	1.2420	1.5010	1.4120	1.2490	1.4120	0.0407	5.94%	2.89%
10		4	1.3710	1.2420	1.5010	1.4120	1.2490	1.4120	0.0407	5.94%	2.89%
19		4	1.3710	1.2420	1.5010	1.4120	1.2490	1.4120	0.0407	5.94%	2.89%
50		4	1.3710	1.2420	1.5010	1.4120	1.2490	1.4120	0.0407	5.94%	2.89%
100		4	1.2950	1.0610	1.5290	1.3310	1.1070	1.4120	0.0735	11.35%	8.28%

Fathead Minnow 7-d Larval Survival and Growth Test — **Eurofins TestAmerica - Corvallis**

Analysis ID:	13-2139-0246	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.9.7
Analyzed:	16 Jan-22 14:42	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1
Edit Date:		**MD5 Hash:**	E0B6F04A78DCD8A602495D273074A6BA	**Editor ID:**	

Graphics





Fathead Minnow 7-d Larval Survival and Growth Test — **Eurofins TestAmerica - Corvallis**

Analysis ID:	02-5092-5441	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.7
Analyzed:	16 Jan-22 14:42	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Edit Date:		**MD5 Hash:**	A84B1BD6B39AB99E731660E1D3709566	**Editor ID:**	

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	MSDu	PMSD
Untransformed	C > T	100	>100	---	1	0.1726	16.40%

Dunnett Multiple Comparison Test

Control	vs	Conc-%	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Dilution Water		1.4	0.4325	2.407	0.173	6	CDF	0.6765	Non-Significant Effect
		10	1.029	2.407	0.173	6	CDF	0.4092	Non-Significant Effect
		19	0.8126	2.407	0.173	6	CDF	0.5065	Non-Significant Effect
		50	-0.4325	2.407	0.173	6	CDF	0.9297	Non-Significant Effect
		100	1.894	2.407	0.173	6	CDF	0.1246	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0689345	0.0137869	5	1.342	0.2919	Non-Significant Effect
Error	0.184989	0.0102772	18			
Total	0.253924		23			

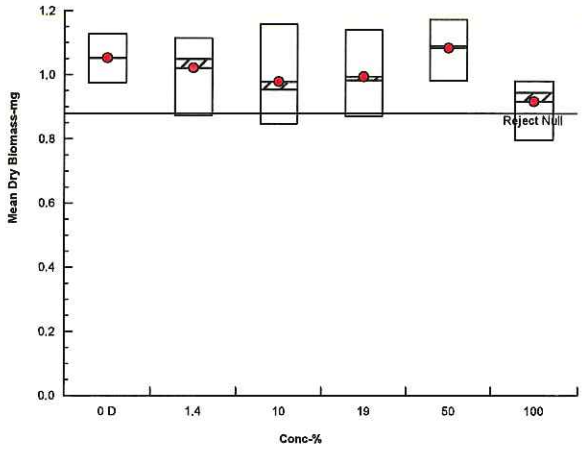
ANOVA Assumptions Tests

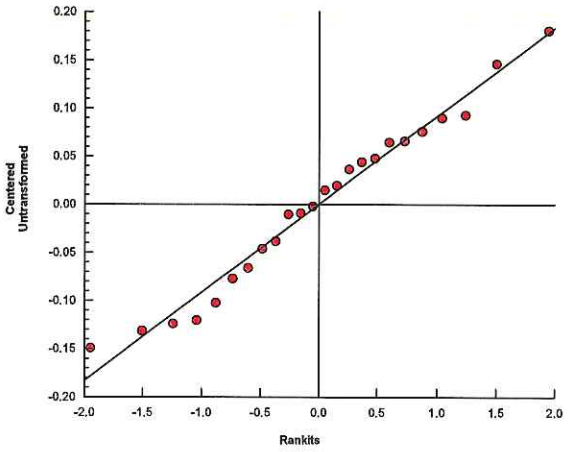
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Bartlett Equality of Variance Test	1.541	15.09	0.9083	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9722	0.884	0.7217	Normal Distribution

Mean Dry Biomass-mg Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	4	1.052	0.9356	1.169	1.053	0.975	1.128	0.03666	6.97%	0.00%
1.4		4	1.021	0.8487	1.194	1.049	0.872	1.114	0.05423	10.62%	2.95%
10		4	0.9785	0.7701	1.187	0.954	0.847	1.159	0.06549	13.39%	7.01%
19		4	0.994	0.8035	1.184	0.983	0.87	1.14	0.05985	12.04%	5.54%
50		4	1.083	0.9575	1.209	1.09	0.981	1.173	0.03951	7.29%	-2.95%
100		4	0.9165	0.7853	1.048	0.9445	0.796	0.981	0.04122	9.00%	12.90%

Graphics





Fathead Minnow 7-d Larval Survival and Growth Test — **Eurofins TestAmerica - Corvallis**

Analysis ID:	12-7250-6575	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.7
Analyzed:	16 Jan-22 14:42	**Analysis:**	Linear Interpolation (ICPIN)	**Status Level:**	1
Edit Date:		**MD5 Hash:**	A84B1BD6B39AB99E731660E1D3709566	**Editor ID:**	

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Log(X+1)	Linear	1441975	200	Yes	Two-Point Interpolation

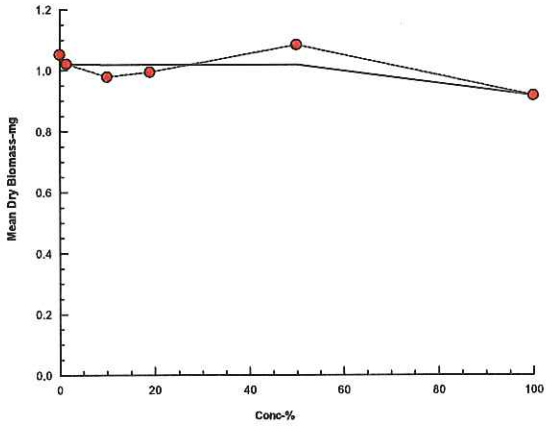
Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC25	>100	---	---	<1	---	---

Mean Dry Biomass-mg Summary

			Calculated Variate						Isotonic Variate	
Conc-%	Code	Count	Mean	Median	Min	Max	CV%	%Effect	Mean	%Effect
0	D	4	1.052	1.053	0.975	1.128	6.97%	0.00%	1.052	0.00%
1.4		4	1.021	1.049	0.872	1.114	10.62%	2.95%	1.021	2.95%
10		4	0.9785	0.954	0.847	1.159	13.39%	7.01%	1.019	3.20%
19		4	0.994	0.983	0.87	1.14	12.04%	5.54%	1.019	3.20%
50		4	1.083	1.09	0.981	1.173	7.29%	-2.95%	1.019	3.20%
100		4	0.9165	0.9445	0.796	0.981	9.00%	12.90%	0.9165	12.90%

Graphics



TestAmerica

GREEN ALGAE (*Selenastrum capricornutum*) TEST CONDITIONS

Client: City of Woodland

Sample Description: _____ Sample ID: B 57605 - 01

Test Start Date: 1 / 4 / 2022 Time: 16 : 19 Initials: ABr

Test End Date: 1 / 8 / 2022 Time: 15 : 43 Initials: KG

TEST CONDITIONS AT INITIATION:

Species ID#: SC 1058 Culturing period: 4 days Incubator ID#: 2

INOCULUM (Axenic Culture)	
# Cells	# Fields
582	250
MEAN	2.33

Culture Density = Mean # of Cells/Field x 250,000

	Culture Density
x 250,000 =	582,500

Filtration	0.45 um filter	
	1.6 um filter	X

Test Vol. / Replicate	50 mls
No. of Reps	4
Nutrient Dosage	1 ml per L

Test Start Density	x	Test Volume	/	Culture Density	=	Inoculum Volume
10,000	x	50 ml	/	582,500	=	0.860 ml

Confirming Counts			
	# Cells	# Fields	Cell Conc. x10^6
Flask #1	5	250	0.005
Flask #2	8	250	0.008
Flask #3	10	250	0.010

Light Intensity at Test Initiation (foot-candles)		
Location #1	Location #2	Location #3
414	400	397

	0 hr	24 hr	48 hr	72 hr	96 hr
Technician	ABr	TC	TC	KG	KG
Time	16:19	12:49	15:46	11:15	15:35
Therm. ID#	#250	#2604	#2604	#2604	#2604

Test Concen.	D.O. (mg/L)	pH					Temperature (°C)					Conductivity (umohs/cm)	Hard.	Alk.
	0 hr	0 hr	24	48	72	96	0 hr	24	48	72	96	0 hr	0 hr	0 hr
Control	*	7.5	7.9	7.7	8.4	9.0	24.6	24.5	24.7	24.7	24.7	391	103	66
1.4 %	*	7.5	8.0	7.9	8.3	9.0	24.6	24.4	24.7	24.6	24.6	393	111	69
10 %	*	7.4	8.0	8.0	8.5	9.1	24.7	24.4	24.7	24.6	24.8	410		
19 %	*	7.4	8.0	8.1	8.6	9.6	24.6	24.5	24.6	24.6	24.7	431	100	75
50 %	*	7.2	8.0	8.1	8.5	9.5	24.8	24.5	24.7	24.5	24.6	498		
100 %	*	7.1	8.1	8.3	8.6	9.3	24.8	24.5	24.7	24.4	24.4	610	94	117

Comments: Flasks positioned randomly in incubator. Positions changed every day. Temp and pH taken in surrogate flasks.

* Measurements missed TC 1/5/22

(23.8) = Temp. out of recommended range

Peer Reviewer_____
Review Date_____

Raphidocelis subcapitata HEMOCYTOMETER WORKSHEET

Client: City of Woodland

Sample Description: _____

Lab ID: B5265-01

Test Start Date: 1/4/2022

Test Count Date: 1/13/2022 Initials: TC

Microscope ID#: SCOPE-1

Hemocytometer ID #'s: A,B,D,E

Minimum counts: at least 400 cells in each of the Control replicates
For each concentration thereafter, count a minimum of 400 cells or the same number of fields used in the Control rep with the highest number of fields counted. Whichever is reached first. (This results in either the 400 minimum count needed for a ± 10% confidence, or the same volume of solution as assessed in the Control)

Dilution factor (DF) Default value: 1 (i.e no dilution)
If a primary dilution is used, the DF needs to be changed to reflect this. A 1ml of sample + 9 ml of DI = a DF of 10

COMMENTS
100% Rep C looks clumpy in the flask but clumpy under scope.

TEST CONCENTRATION	Control			
	DF	# Cells	# Fields	Cell Conc. x10*6
Rep A	1	408	30	3.400
Rep B	1	418	23	4.543
Rep C	1	405	23	4.402
Rep D	1	404	26	3.885
Concentration Average			Cell Conc. x10*6 =	**4.058**
			CV % =	12.9%

TEST CONCENTRATION	1.4 %			
	DF	# Cells	# Fields	Cell Conc. x10*6
Rep A	1	405	28	3.616
Rep B	1	420	24	4.375
Rep C	1	419	27	3.880
Rep D	1	422	21	5.024
Concentration Average			Cell Conc. x10*6 =	**4.224**
			CV % =	14.7%

TEST CONCENTRATION	10 %			
	DF	# Cells	# Fields	Cell Conc. x10*6
Rep A	1	407	27	3.769
Rep B	1	414	24	4.313
Rep C	1	415	27	3.843
Rep D	1	392	30	3.267
Concentration Average			Cell Conc. x10*6 =	**3.798**
			CV % =	11.3%

TEST CONCENTRATION	19 %			
	DF	# Cells	# Fields	Cell Conc. x10*6
Rep A	1	401	28	3.580
Rep B	1	404	30	3.367
Rep C	1	411	28	3.670
Rep D	1	422	26	4.058
Concentration Average				**3.669**
			CV % =	7.9%

TEST CONCENTRATION	50 %			
	DF	# Cells	# Fields	Cell Conc. x10*6
Rep A	1	347	30	2.892
Rep B	1	382	30	3.183
Rep C	1	406	30	3.383
Rep D	1	420	22	4.773
Concentration Average			Cell Conc. x10*6 =	**3.558**
			CV % =	23.5%

TEST CONCENTRATION	100 %			
	DF	# Cells	# Fields	Cell Conc. x10*6
Rep A	1	409	30	3.408
Rep B	1	367	30	3.058
Rep C	1	177	30	1.475
Rep D	1	388	30	3.233
Concentration Average			Cell Conc. x10*6 =	**2.794**
			CV % =	31.9%

CETIS Summary Report

Report Date: 17 Jan-22 14:30 (p 1 of 1)
Test Code/ID: B526501scc / 06-3867-2214

Green Algae Growth Test — **Eurofins TestAmerica - Corvallis**

Batch ID:	08-1983-7876	**Test Type:**	Cell Growth	**Analyst:**	Michelle Bennett
Start Date:	04 Jan-22 16:19	**Protocol:**	EPA/821/R-02-013 (2002)	**Diluent:**	
Ending Date:	08 Jan-22 15:43	**Species:**	Selenastrum capricornutum	**Brine:**	
Test Length:	95h	**Taxon:**	Chlorophyta	**Source:**	In-House Culture **Age:** 4D
Sample ID:	05-1334-0574	**Code:**	B5265-01	**Project:**	
Sample Date:	03 Jan-22 10:00	**Material:**	POTW Effluent	**Source:**	Woodland, City of (WA0020401)
Receipt Date:	04 Jan-22 10:54	**CAS (PC):**		**Station:**	
Sample Age:	30h (1.4 °C)	**Client:**			

Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	✓	NOEL	LOEL	TOEL	PMSD	TU	S
15-5867-3179	Cell Density	Dunnett Multiple Comparison Test		50	100	70.71	26.6%	2	1

Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	✓	Level	%	95% LCL	95% UCL	TU	S
07-9251-9587	Cell Density	Linear Interpolation (ICPIN)		IC25	75.43	9.332	---	1.326	1

Test Acceptability

				TAC Limits			
Analysis ID	**Endpoint**	**Attribute**	**Test Stat**	**Lower**	**Upper**	**Overlap**	**Decision**
07-9251-9587	Cell Density	Control CV	0.1286	<<	0.2	Yes	Passes Criteria
15-5867-3179	Cell Density	Control CV	0.1286	<<	0.2	Yes	Passes Criteria
07-9251-9587	Cell Density	Control Resp	4.06E+6	1000000	>>	Yes	Passes Criteria
15-5867-3179	Cell Density	Control Resp	4.06E+6	1000000	>>	Yes	Passes Criteria
15-5867-3179	Cell Density	PMSD	0.266	0.091	0.29	Yes	Passes Criteria

Cell Density Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	D	4	4.058E+6	3.227E+6	4.888E+6	3.400E+6	4.543E+6	2.610E+5	5.219E+5	12.86%	0.00%
1.4		4	4.224E+6	3.238E+6	5.209E+6	3.616E+6	5.024E+6	3.097E+5	6.193E+5	14.66%	-4.09%
10		4	3.798E+6	3.116E+6	4.479E+6	3.267E+6	4.312E+6	2.141E+5	4.281E+5	11.27%	6.41%
19		4	3.669E+6	3.209E+6	4.128E+6	3.367E+6	4.058E+6	1.444E+5	2.889E+5	7.87%	9.59%
50		4	3.558E+6	2.229E+6	4.886E+6	2.892E+6	4.773E+6	4.174E+5	8.348E+5	23.46%	12.32%
100		4	2.794E+6	1.376E+6	4.211E+6	1.475E+6	3.408E+6	4.454E+5	8.907E+5	31.88%	31.15%

Cell Density Detail MD5: 56285CE6CA09E2E08A97061F7CFCEA51

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	3.400E+6	4.543E+6	4.402E+6	3.885E+6
1.4		3.616E+6	4.375E+6	3.880E+6	5.024E+6
10		3.769E+6	4.312E+6	3.843E+6	3.267E+6
19		3.580E+6	3.367E+6	3.670E+6	4.058E+6
50		2.892E+6	3.183E+6	3.383E+6	4.773E+6
100		3.408E+6	3.058E+6	1.475E+6	3.233E+6

Green Algae Growth Test — **Eurofins TestAmerica - Corvallis**

Analysis ID:	15-5867-3179	**Endpoint:**	Cell Density	**CETIS Version:**	CETISv1.9.7
Analyzed:	17 Jan-22 14:29	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Edit Date:		**MD5 Hash:**	A2DBBD8F6C3BD74A2671AAC77B6340E	**Editor ID:**	

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	MSDu	PMSD
Untransformed	C > T	50	100	70.71	2	1079000	26.60%

Dunnett Multiple Comparison Test

Control	vs	Conc-%	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Dilution Water		1.4	-0.3703	2.407	1E+06	6	CDF	0.9195	Non-Significant Effect
		10	0.5798	2.407	1E+06	6	CDF	0.6124	Non-Significant Effect
		19	0.8675	2.407	1E+06	6	CDF	0.4814	Non-Significant Effect
		50	1.115	2.407	1E+06	6	CDF	0.3724	Non-Significant Effect
		100*	2.818	2.407	1E+06	6	CDF	0.0223	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	5.009E+12	1.002E+12	5	2.491	0.0698	Non-Significant Effect
Error	7.239E+12	4.021E+11	18			
Total	1.225E+13		23			

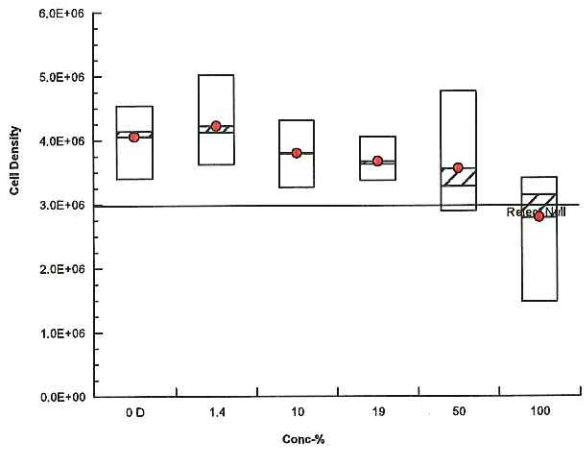
ANOVA Assumptions Tests

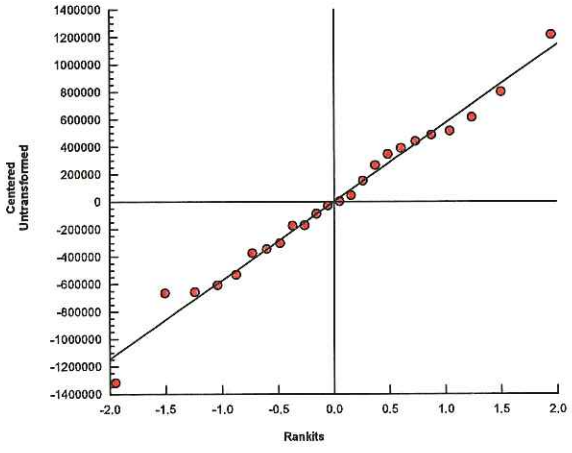
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Bartlett Equality of Variance Test	4.159	15.09	0.5268	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9892	0.884	0.9939	Normal Distribution

Cell Density Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	4	4.058E+6	3.227E+6	4.888E+6	4.143E+6	3.400E+6	4.543E+6	2.610E+5	12.86%	0.00%
1.4		4	4.224E+6	3.238E+6	5.209E+6	4.127E+6	3.616E+6	5.024E+6	3.097E+5	14.66%	-4.09%
10		4	3.798E+6	3.116E+6	4.479E+6	3.806E+6	3.267E+6	4.312E+6	2.141E+5	11.27%	6.41%
19		4	3.669E+6	3.209E+6	4.128E+6	3.625E+6	3.367E+6	4.058E+6	1.444E+5	7.87%	9.59%
50		4	3.558E+6	2.229E+6	4.886E+6	3.283E+6	2.892E+6	4.773E+6	4.174E+5	23.46%	12.32%
100		4	2.794E+6	1.376E+6	4.211E+6	3.146E+6	1.475E+6	3.408E+6	4.454E+5	31.88%	31.15%

Graphics





CETIS Analytical Report

Report Date: 17 Jan-22 14:30 (p 1 of 1)
Test Code/ID: B526501scc / 06-3867-2214

Green Algae Growth Test — **Eurofins TestAmerica - Corvallis**

Analysis ID:	07-9251-9587	**Endpoint:**	Cell Density	**CETIS Version:**	CETISv1.9.7
Analyzed:	17 Jan-22 14:29	**Analysis:**	Linear Interpolation (ICPIN)	**Status Level:**	1
Edit Date:		**MD5 Hash:**	A2DBBD8F6C3BD74A2671AAC77B6340E	**Editor ID:**	

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Log(X+1)	Linear	1045835	200	Yes	Two-Point Interpolation

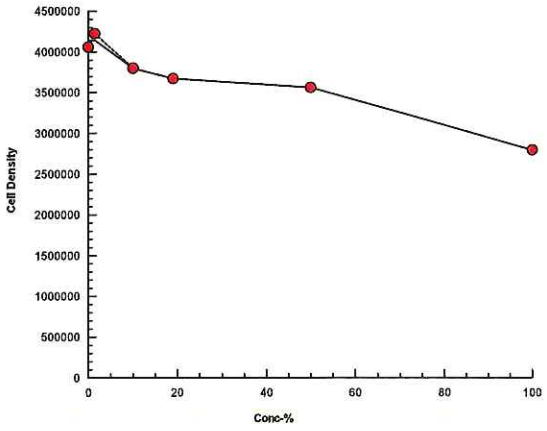
Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC25	75.43	9.332	---	1.326	---	10.72

Cell Density Summary

			Calculated Variate						Isotonic Variate	
Conc-%	Code	Count	Mean	Median	Min	Max	CV%	%Effect	Mean	%Effect
0	D	4	4.058E+6	4.143E+6	3.400E+6	4.543E+6	12.86%	0.00%	4.141E+6	0.00%
1.4		4	4.224E+6	4.127E+6	3.616E+6	5.024E+6	14.66%	-4.09%	4.141E+6	0.00%
10		4	3.798E+6	3.806E+6	3.267E+6	4.312E+6	11.27%	6.41%	3.798E+6	8.28%
19		4	3.669E+6	3.625E+6	3.367E+6	4.058E+6	7.87%	9.59%	3.669E+6	11.40%
50		4	3.558E+6	3.283E+6	2.892E+6	4.773E+6	23.46%	12.32%	3.558E+6	14.08%
100		4	2.794E+6	3.146E+6	1.475E+6	3.408E+6	31.88%	31.15%	2.794E+6	32.53%

Graphics



Analyst: MR QA:

APPENDIX B

REFERENCE TOXICANT DATA SHEETS

REFERENCE TOXICANT DATA SHEET

Client	QA / QC	Reference Toxican	NaCl	Test Begin: Date	1 /4 /2022 Time 12 : 59
Test Organism	*Ceriodaphnia dubia*	Stock Solution	20 g/L in DI (ASTM Type I) water	Test End: Date	1/6/2022 Time 12 : 53
Source	In-House culture	Reagent Log ID #	7B091-03	*Dilution Water (Recon MH) ID#	5472
ID#	Cd 3917	Designed Test Temperature	20 ± 1 °C	Dilution Water Hardness (as $CaCO_3$)	52
Age	< 24 hours			Dilution Water Alkalinity (as $CaCO_3$)	60
Feeding:	none	Technician	0 hr TC	24 hr TC	48 hr TC
Test Chamber Size	30 ml	Time	0 hr 1259	24 hr 1036	48 hr 1256
Volume per Replicate	25 ml	Therm. ID #	0 hr 252	24 hr 250	48 hr 250

Toxicant Concentration (g/L)	Test Chamber Number	Number of Live Organisms			Dissolved Oxygen (mg/l)			pH			Temperature (°C)			Conductivity (µS)		
		0	24	48	0	24	48	0	24	48	0	24	48	0	24	48
Control	A	5	5	5	8.9		8.5	7.5		7.3	19.1	19.1	19.9	303		301
	B	5	5	5												
1.0	A	5	5	5	8.8		8.5	7.7		7.6	19.1	19.3	19.8	2320		2270
	B	5	5	5												
1.5	A	5	5	5	8.8		8.5	7.6		7.7	19.1	19.2	19.8	3400		3220
	B	5	5	5												
2.0	A	5	5	5	8.8		8.5	7.5		7.7	19.1	19.1	19.8	4360		4350
	B	5	5	4												
3.0	A	5	3	2	8.8		8.5	7.7		7.7	19.1	19.3	19.0	5790		5640
	B	5	3	1												
4.0	A	5	0	—	8.8	8.4	—	7.7	7.6	—	19.3	19.3	—	6000	7400	—
	B	5	0	—												
Test Acceptability Criteria (TAC) or test condition:		Survival in Controls: ≥ 90% (required TAC)			(@ 20°C): > 4.0 and < 9.1 (recommended)			pH: > 6.0 and < 9.0 (recommended)			Temperature + 1 °C (recommended)			(QA) none		

Note: If organisms are alive @ 24hrs, no DO, pH, or Cond. measurements to be taken in that test chamber to avoid injuring the organisms

We verify this data is true and correct.

*Dilution Water Code
Recon. - reconstituted water
MH - moderately hard

48 Hour LC_{50}: 2.64

Cusum Chart Limits: 1.67 to 3.07

Statistical Method: Probit

Task Manager: [signature]

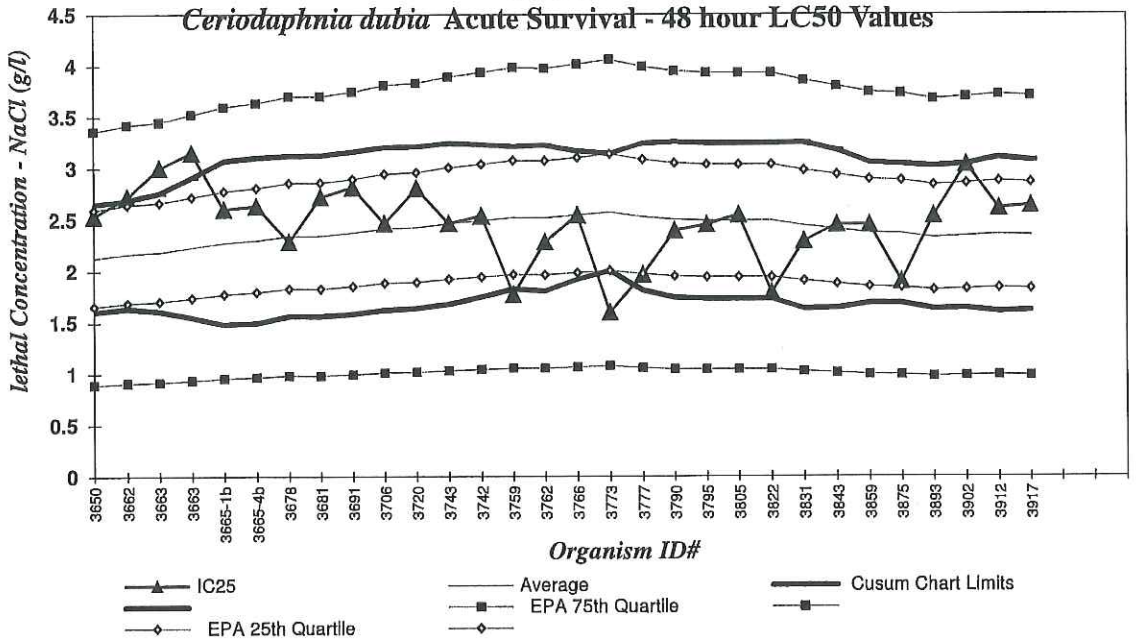
Project Manager: Alyssa Lampi

QA Officer: [signature]

REFTOX - Cd acute (ASL 670-0220).xlsm

Doc Control ID: ASL670-0220

REFERENCE TOXICANT CUMLATIVE SUMMARY (CUSUM) CHART



***Ceriodaphnia dubia* - ACUTE (EPA Test Method 2002.0)**

SODIUM CHLORIDE (g/L)

Endpoint: 48 hour Survival

Stats Method: Probit, Spearman-Karber, Linear Interpolation

Test Conditions: Recon MH, 20 oC

From EPA 833-R-00-003:

10th Quartile CV (*control limit*) =	0.06
25th Quartile CV (*warning limit*) =	0.11
75th Quartile CV (warning *limit*) =	0.29
90th Quartile CV (*control limit*) =	0.34

*Intralab CV is compared to EPA **Warning limits** (25th and 75th CV's) and **Control limits** (10th and 90th CV's), If lab CV is outside EPA Control limits, the EPA Control limits are used to set Cusum chart limits.*

Event #	Cerio ID #	Test Start Date	LC50	Running Average	Running SD	Cusum Chart Limits AVG-2SD	Cusum Chart Limits AVG+2SD	Intralab CV
185	3805	04/01/21	**2.54**	2.5	0.38	**1.73**	**3.24**	0.15
185	3822	05/11/21	**1.79**	2.5	0.38	**1.73**	**3.24**	0.17
185	3831	06/01/21	**2.29**	2.4	0.40	**1.63**	**3.25**	0.16
185	3843	07/07/21	**2.45**	2.4	0.38	**1.64**	**3.17**	0.14
185	3859	08/10/21	**2.45**	2.4	0.34	**1.69**	**3.05**	0.14
185	3875	09/21/21	**1.90**	2.4	0.34	**1.69**	**3.04**	0.15
185	3893	10/21/21	**2.54**	2.3	0.35	**1.63**	**3.02**	0.15
185	3902	11/04/21	**3.03**	2.3	0.35	**1.64**	**3.04**	0.16
185	3912	12/07/21	**2.61**	2.4	0.37	**1.61**	**3.10**	0.16
185	3917	01/04/22	**2.64**	2.3	0.36	**1.62**	**3.07**	0.16
185								

REFERENCE TOXICANT DATA SHEET

Client	QA / QC	Reference Toxican	NaCl	Test Begin: Date	1/4/2022 Time 13:50
Test Organism	*Pimephales promelas*	Stock Solution	20 g/L in DI (ASTM Type I) water	Test End: Date	1/6/2022 Time 13:47
Source	Aquatox	Reagent Log ID #	2B091-03	*Dilution Water (Recon MH) ID#	5469
ID#	FHM 2197	Designed Test Temperature	20 ± 1 °C	Dilution Water Hardness (as $CaCO_3$)	95
Age	7 Days			Dilution Water Alkalinity (as $CaCO_3$)	61
Feeding:	none	Technician	0 hr AGL/TC	24 hr TC	48 hr TC
Test Chamber Size	800 ml	Time	0 hr 1350	24 hr 1039	48 hr 1347
Volume per Replicate	750 ml	Therm. ID #	0 hr 250	24 hr 250	48 hr 250

Toxicant Concentration (g/L)	Test Chamber Number	Number of Live Organisms			Dissolved Oxygen (mg/l)			pH			Temperature (°C)			Conductivity (µS)		
		0	24	48	0	24	48	0	24	48	0	24	48	0	24	48
Control	A	10	10	10	8.6	8.6	8.4	7.9	7.7	7.7	19.8	19.3	19.3	330		337
4.0	A	10	10	10	8.6	8.6	8.4	8.0	7.9	7.8	19.7	19.3	19.3	7390		7530
6.0	A	10	10	10	8.7	8.5	8.4	8.0	7.9	7.9	19.6	19.3	19.7	10950		11250
8.0	A	10	9	4	8.7	8.5	8.4	8.0	7.9	7.9	19.7	19.3	19.7	14310		14650
10.0	A	10	0	—	8.7	8.5	—	7.9	7.9	—	19.6	19.3	—	17520	17920	—
12.0	A	10	0	—	8.8	8.5	—	7.9	7.9	—	19.6	19.3	—	20700	20800	—
Test Acceptability Criteria (TAC) or test condition:		Survival in Controls: ≥ 90% (required TAC)			(@ 20°C): > 4.0 and < 9.1 (recommended)			pH: > 6.0 and < 9.0 (recommended)			Temperature + 1 °C (recommended)			(QA) none		

*Dilution Water Code
Recon. - reconstituted water
S - soft
MH - moderately hard
H - hard
Art. Sea - Artificial Sea Water

48 Hour LC_{50} 7.7

Cusum Chart Limits 5.9 to 8.7

Statistical Method Spearman Karber

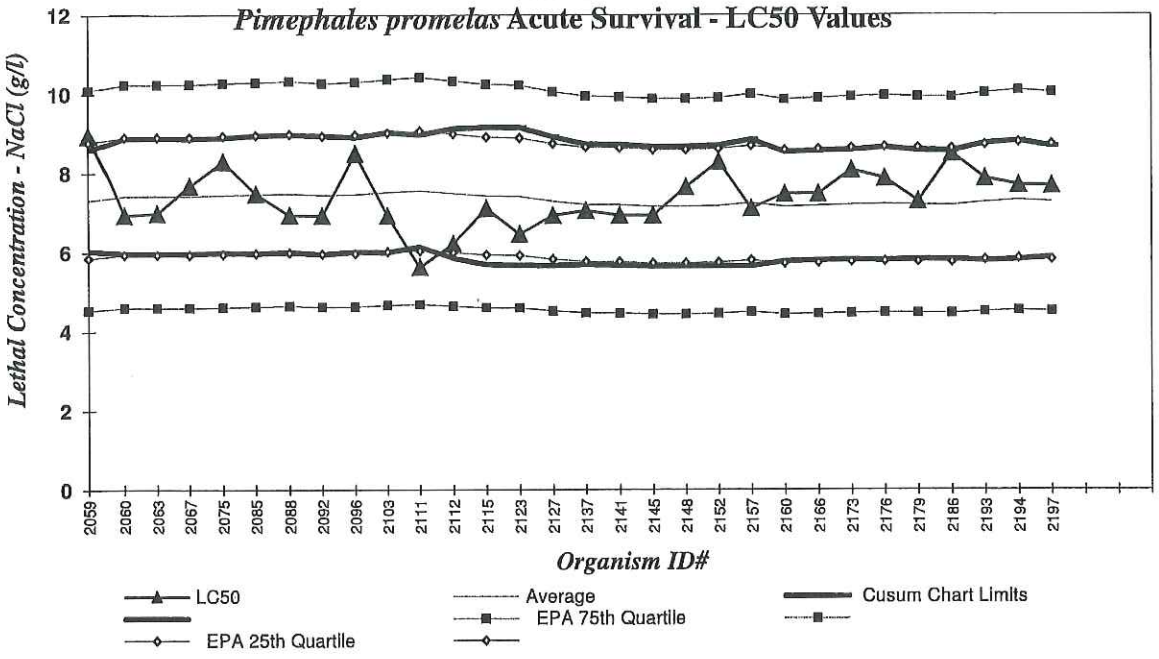
We verify this data is true and correct.

Task Manager TCJA

Project Manager Alyssa Zampi

QA Officer MB

REFERENCE TOXICANT CUMLATIVE SUMMARY (CUSUM) CHART



Pimephales promelas **- ACUTE (EPA Test Method 2000.0)**

SODIUM CHLORIDE (g/L)

Organism age: 1 to 14 days

Endpoint: 48 hour Survival

Stats Method: Probit, Spearman-Karber, Linear Interpolation

Test Conditions: Recon MH, 20 oC

From EPA 833-R-00-003:

10th Quartile CV (*control limit*) =	0.08
25th Quartile CV (*warning limit*) =	0.10
75th Quartile CV (*warning limit*) =	0.19
90th Quartile CV (*control limit*) =	0.33

Intralab CV is compared to EPA ***Warning limits*** *(25th and 75th CV's) and* ***Control limits*** *(10th and 90th CV's), If lab CV is outside EPA Control limits, the EPA Control limits are used to set Cusum chart limits.*

Event #	FHM ID #	Test Start Date	LC50	Running Average	Running SD	Cusum Chart Limits AVG-2SD	Cusum Chart Limits AVG+2SD	Intralab CV
947	2137	12/8/2020	**7.0**	7.2	0.76	**5.7**	**8.7**	0.11
948	2141	1/6/2021	**6.9**	7.2	0.76	**5.7**	**8.7**	0.11
949	2145	2/2/2021	**6.9**	7.2	0.75	**5.6**	**8.7**	0.11
950	2148	3/3/2021	**7.6**	7.2	0.75	**5.6**	**8.7**	0.11
951	2152	4/1/2021	**8.3**	7.2	0.76	**5.6**	**8.7**	0.11
952	2157	5/11/2021	**7.1**	7.2	0.80	**5.6**	**8.8**	0.10
953	2160	6/1/2021	**7.5**	7.1	0.69	**5.8**	**8.5**	0.10
954	2166	7/7/2021	**7.5**	7.2	0.69	**5.8**	**8.6**	0.10
955	2173	8/10/2021	**8.1**	7.2	0.69	**5.8**	**8.6**	0.10
956	2176	8/25/2021	**7.9**	7.2	0.71	**5.8**	**8.6**	0.10
957	2179	9/21/2021	**7.3**	7.2	0.69	**5.8**	**8.6**	0.10
958	2186	10/21/2021	**8.5**	7.2	0.68	**5.8**	**8.6**	0.10
959	2193	11/23/2021	**7.9**	7.3	0.74	**5.8**	**8.7**	0.10
960	2194	12/7/2021	**7.7**	7.3	0.75	**5.8**	**8.8**	0.10
961	2197	1/4/2022	**7.7**	7.3	0.70	**5.9**	**8.7**	0.10

Ceriodaphnia dubia
Survival and Reproduction
Test Data Summary

Client: QA / QC Test Start Date: 1-4-22

Sample Description: NaCl Initial Sample ID#: 2 B 088 - 05

Data summarized by: Kendal Gile

Percent or Concentration	Total Live Young Produced in First 3 Broods per Replicate										# Alive Adults	Total Live Young
	A	B	C	D	E	F	G	H	I	J		
Control	22	20	19	21	22	22	19	22	19	20	8	206 ~~184~~ Rep Ka 1-11-22
	AD?	AD?	AD? ✓	AD?	AD?	AD?	AD? ✓	AD?	AD?	AD?		
0.25 g/L	21	19	25	22	15	21	17	3	13	16	7	172
	AD?	AD?	AD?	AD?	AD? ✓	AD?	AD?	AD? ✓	AD? ✓	AD?		
0.50 g/L	16	19	17	17	18	10	16	19	16	17	8	165
	AD?	AD?	AD?	AD?	AD?	AD? ✓	AD?	AD? ✓	AD?	AD?		
1.0 g/L	15	13	14	15	14	15	16	19	15	14	10	150
	AD?	AD?	AD?	AD?	AD?	AD?	AD?	AD?	AD?	AD?		
1.5 g/L	5	12	0	9	19	13	9	11	9	5	6	92
	AD? ✓	AD?	AD? ✓	AD?	AD?	AD? ✓	AD? ✓	AD?	AD?	AD?		
2.0 g/L	0	0	0	0	0	0	0	0	0	0	0	0
	AD? ✓	AD? ✓	AD? ✓	AD? ✓	AD?	AD? ✓	AD? ✓	AD? ✓	AD? ✓	AD? ✓		
4.0 g/L	0	0	0	0	0	0	0	0	0	0	0	0
	AD? ✓	AD? ✓	AD? ✓	AD? ✓	AD? ✓	AD? ✓	AD? ✓	AD? ✓	AD? ✓	AD? ✓		

Test Organism Mortality (Adult dead) = AD? ✓

Test Organism identified as Male = AD? M

Test Organism Injured during test = AD? I

# of Alive Adults = Number of test organism alive at termination

Total Live Young = Total neonates produced in first 3 broods

Footnote: As per EPA-600-4-91-002 and EPA-821-R-02-013, *Ceriodaphnia dubia* test should be terminated when 60% of the surviving control organisms have produced their third brood, or at the end of eight days, whichever occurs first.

Also as per EPA-821-R-02-013 (13.10.9.1), "In this three-brood test, offspring from fourth or higher broods should not be counted and should not be included in the total number of neonates produced during the test."

Endpoint	Value	Cusum Chart Limits
Survival - EC_{25}	1.45	0.43 to 2.53
Reproduction - IC_{25}	0.83	0.25 to 1.26

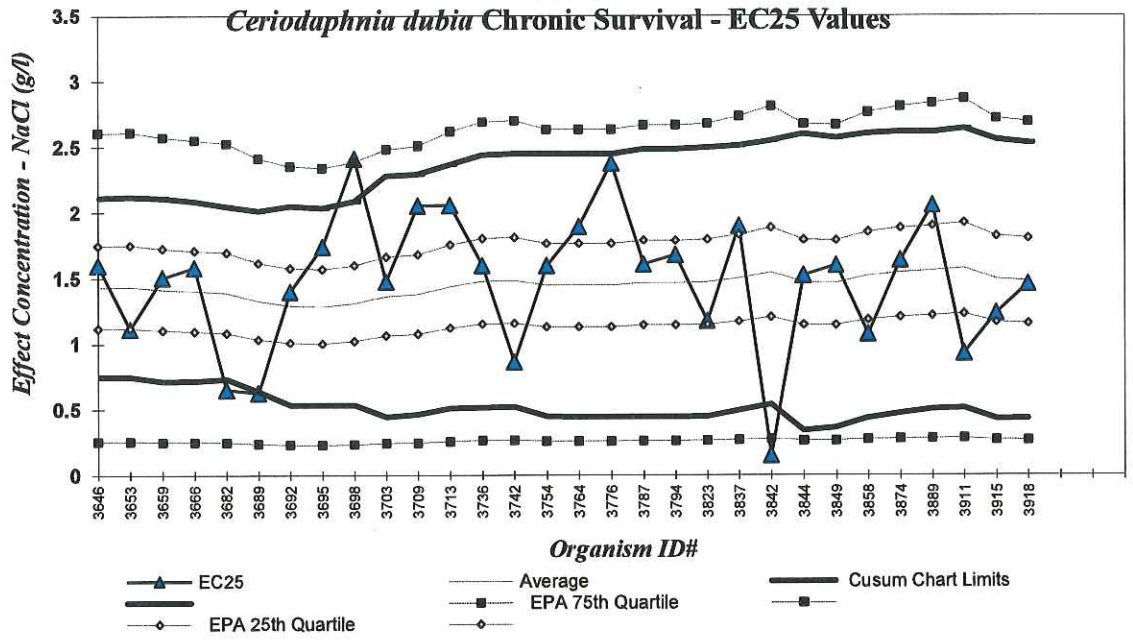
Task Manager: Kendal Gile

Project Manager: [signature]

QA Officer: [signature]

Rep Ka not dead 1-11-22

REFERENCE TOXICANT CUMLATIVE SUMMARY (CUSUM) CHART



Ceriodaphnia dubia **- Chronic (EPA Test Method 1002.0)**

SODIUM CHLORIDE (g/L)

Endpoint: Chronic Survival

Stats Method: Linear Interpolation

Test Conditions: Recon MH, 25 oC

From EPA 833-R-00-003:

10th Quartile CV (*control limit*) = 0.07

25th Quartile CV (*warning limit*) = 0.11

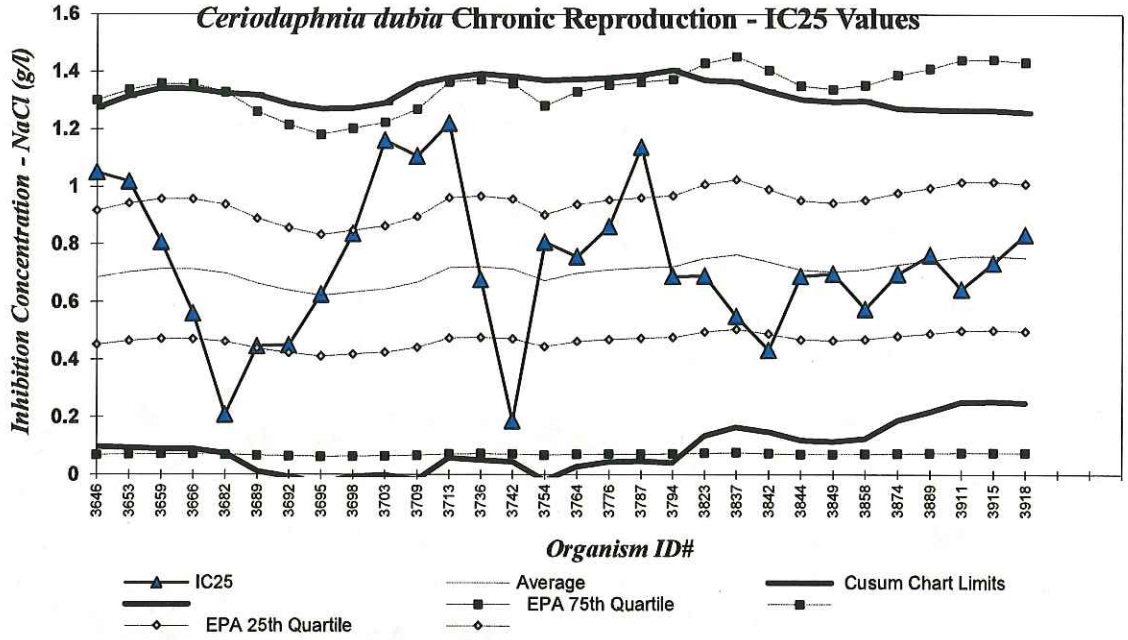
75th Quartile CV (warning *limit*) = 0.41

90th Quartile CV (*control limit*) = 0.81

Intralab CV is compared to EPA ***Warning limits*** *(25th and 75th CV's) and* ***Control limits*** *(10th and 90th CV's), If lab CV is outside EPA Control limits, the EPA Control limits are used to set Cusum chart limits.*

Event #	Cerio ID #	Test Start Date	EC25	Running Average	Running SD	Cusum Chart Limits AVG-2SD	Cusum Chart Limits AVG+2SD	Intralab CV
369	3814	04/24/21	**< 0.25**	1.46	0.51	**0.44**	**2.48**	0.33
370	3819	05/04/21	**<0.25**	1.46	0.51	**0.44**	**2.48**	0.32
371	3823	05/13/21	1.17	1.47	0.51	**0.45**	**2.50**	0.33
372	3837	06/22/21	1.90	1.50	0.50	**0.49**	**2.51**	0.33
373	3842	06/29/21	**0.15**	1.54	0.50	**0.54**	**2.55**	0.38
374	3844	07/13/21	1.52	1.47	0.56	**0.34**	**2.60**	0.34
375	3849	07/20/21	1.60	1.47	0.55	**0.36**	**2.57**	0.33
376	3858	08/10/21	1.08	1.52	0.54	**0.43**	**2.60**	0.35
377	3874	09/14/21	1.64	1.54	0.54	**0.47**	**2.62**	0.33
378	3889	10/14/21	2.06	1.56	0.53	**0.50**	**2.61**	0.34
379	3911	11/30/21	0.93	1.57	0.53	**0.51**	**2.64**	0.36
380	3915	12/15/21	1.24	1.49	0.53	**0.43**	**2.56**	0.36
381	3918	01/04/22	1.45	1.48	0.52	**0.43**	**2.53**	0.36
382								

REFERENCE TOXICANT CUMLATIVE SUMMARY (CUSUM) CHART



Ceriodaphnia dubia **- Chronic (EPA Test Method 1002.0)**

SODIUM CHLORIDE (g/L)

Endpoint: Chronic Reproduction

Stats Method: Linear Interpolation

Test Conditions: Recon MH, 25 oC

From EPA 833-R-00-003:

10th Quartile CV (*control limit*) =	0.08
25th Quartile CV (*warning limit*) =	0.17
75th Quartile CV (warning *limit*) =	0.45
90th Quartile CV (*control limit*) =	0.62

Intralab CV is compared to EPA ***Warning limits*** *(25th and 75th CV's) and* ***Control limits*** *(10th and 90th CV's), If lab CV is outside EPA Control limits, the EPA Control limits are used to set Cusum chart limits.*

Event #	Cerio ID #	Test Start Date	IC25	Running Average	Running SD	Cusum Chart Limits AVG-2SD	Cusum Chart Limits AVG+2SD	Intralab CV
368	3811	04/20/21	**< 0.25**	0.72	0.34	**0.04**	**1.40**	0.40
369	3814	04/27/21	**<0.25**	0.72	0.34	**0.04**	**1.40**	0.41
370	3819	05/04/21	**<0.25**	0.72	0.34	**0.04**	**1.40**	0.42
371	3823	05/13/21	0.69	0.75	0.31	**0.13**	**1.37**	0.43
372	3837	06/22/21	0.55	0.76	0.30	**0.16**	**1.37**	0.43
373	3842	06/29/21	0.43	0.74	0.30	**0.15**	**1.33**	0.39
374	3844	07/13/21	0.69	0.71	0.30	**0.12**	**1.30**	0.37
375	3849	07/20/21	0.70	0.70	0.30	**0.11**	**1.29**	0.35
376	3858	08/10/21	0.58	0.71	0.29	**0.13**	**1.30**	0.36
377	3874	09/14/21	0.70	0.73	0.27	**0.19**	**1.27**	0.36
378	3889	10/14/21	0.76	0.74	0.26	**0.22**	**1.27**	0.34
379	3911	11/30/21	0.64	0.76	0.25	**0.25**	**1.26**	0.33
380	3915	12/15/21	0.73	0.76	0.25	**0.25**	**1.26**	0.29
381	3918	01/04/22	0.83	0.75	0.25	**0.25**	**1.26**	0.29

TestAmerica

FATHEAD MINNOW 7-DAY SURVIVAL AND WATER QUALITY DATA

Random Template Used: 6 conc. x 4 reps. # 7 | Waterbath/incubator Used: # 4 | Date Initiated 12 / 7 / 2021 Time 16:00

Stock Sol. ID 2B 095 - - 01 | Date Terminated 12 / 14 / 2021 Time 12:15

Organism ID: FHM 2195 | Test Container Size: 800 ml | Solution Volume / rep: 500 ml

Client: QA / QC - RefTox | Sample Description: KCl (50 g/L stock)

Tech: Day 0 KG Day 1 TC/BC Day 2 TC Day 3 KG Day 4 KG Day 5 KG Day 6 KG Day 7 KG

Time: Day 0 1600 Day 1 1115 Day 2 1407 Day 3 1448 Day 4 1040 Day 5 1147 Day 6 1535 Day 7 1210

Conc. or Percent	Day	Number of Live Organisms A	B	C	D	Dissolved O_2 (mg/l) Pre	Post	pH Pre	Post	Temp. (°C) Pre	Therm. ID#	Conductivity (µS) Post (daily)
Control	0	10	10	10	10		8.1		8.0	Post: 24.4	251	334
	1	10	10	10	10	7.3	8.2	7.9	8.2	24.1	251	327
	2	10	10	10	10	6.7	8.2	7.5	7.9	24.0	251	327
	3	10	10	10	10	7.1	8.1	7.5	8.1	25.0	251	324
	4	10	10	10	10 ✓	6.5	8.1	7.4	7.9	24.3	251	329
	5	10	10	10	10	7.4	8.2	7.4	7.9	24.3	251	316
	6	10 ✓	10	10	10	6.3	8.0	7.2	7.9	24.2	251	332
	7	9	10	10	10	7.3		7.5		24.3	251	
0.25 g/L	0	10	10	10	10		8.2		8.0	Post: 24.4		776
	1	10	10	10	10	7.3	8.3	7.7	8.1	24.3		761
	2	10	10	10	10	6.6	8.3	7.5	8.0	24.0		781
	3	10	10	10	10	6.9	8.3	7.6	8.1	24.8		777
	4	10	10	10	10	6.4	8.2	7.2	8.0	24.3		777
	5	10	10	10	10	7.2	8.4	7.4	8.0	24.2		774
	6	10	10	10	10 ✓	6.0	8.1	7.2	8.0	24.3		764
	7	10	10	10	10	7.5		7.5		24.1		
0.50 g/L	0	10	10	10	10		8.2		8.1	Post: 24.5		1226
	1	10	10	10	10	7.2	8.21	7.6	8.1	24.2		1246
	2	10	10	10	10	6.2	8.4	7.4	8.1	24.1		1212
	3	10	10	10	10	6.9	8.2	7.7	8.2	25.0		1253
	4	10	10	10	10	6.4	8.3	7.3	8.1	24.3		1246
	5	10	10 ✓	10	10	6.9	8.5	7.4	8.1	24.2		1243
	6	10 ✓	10 ✓	10	10	6.1	8.1	7.3	8.1	24.3		1229
	7	10	10	10	10	7.3		7.6		24.2		
1.0 g/L	0	10	10	10	10		8.2		8.1	Post: 24.3		2120
	1	7	9	10	8	7.2	8.4	7.6	8.1	24.3		2130
	2	6	6	10	8	6.1	8.4	7.4	8.1	24.0		2100
	3	6	5	10	5	6.6	8.2	7.7	8.2	25.0		2110
	4	1	3	4	4	4.1	8.3	7.3	8.1	24.3		2120
	5	1	3	4	4	6.7	8.5	7.5	8.2	24.1		2100
	6	1	3	4	4	6.4	8.0	7.5	8.1	24.3		2110
	7	1	3	4	4	7.3		7.8		24.2		
2.0 g/L	0	10	10	10	10		8.0		8.1	Post: 24.5		3870
	1	0	0	0	0	7.3	8.4	7.7	8.2	24.2		3500
	2											
	3											
	4											
	5											
	6											
	7											
4.0 g/L	0	10	10	10	10		8.1		8.1	Post: 24.4		7190
	1	0	0	0	0	7.2		7.7		24.1		
	2											
	3											
	4											
	5											
	6											
	7											

✓ Indicates one organism inadvertently poured off during solution renewal, replaced into container.

"M" = organism missing, start count reduced. "Inj" = organism injured, remove from stats.

"F" = fungus noted on dead organisms.

Pre =Pre-renewal solutions. Post =Post-renewal solutions.

Day 0 Temperatures = Post-renewals

Therm ID# = Thermometer ID used for all measurements that day.

(23.8) = Temp. out of recommended range

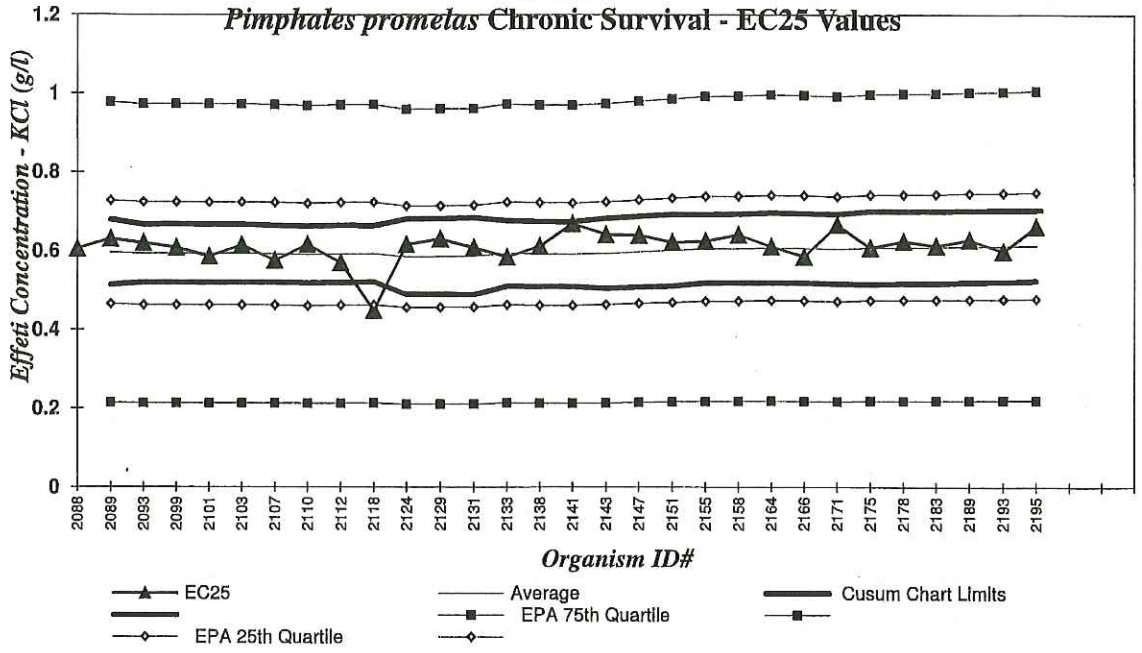
Endpoint		Cusum Chart Limits	
Survival - EC_{25}	0.666	0.52 to	0.70
Growth - IC_{25}	0.61	0.44 to	0.71

Task Manager: Kendall Pe

Project Manager: [signature]

QA Officer: [signature]

REFERENCE TOXICANT CUMLATIVE SUMMARY (CUSUM) CHART



Pimephales promelas **- Chronic (EPA Test Method 1000.0)**

POTASSIUM CHLORIDE (g/L)

Endpoint: Chronic Survival

Stats Method: Linear Interpolation

Test Conditions: Recon MH, 25 oC

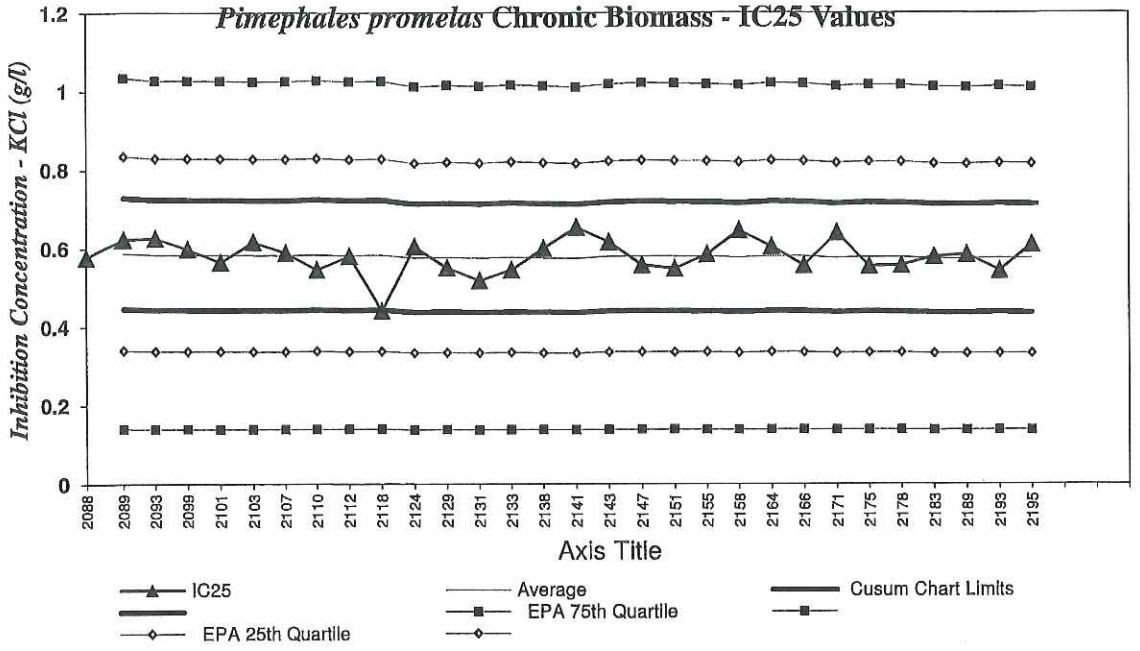
From EPA 833-R-00-003:

10th Quartile CV (*control limit*) =	0.03
25th Quartile CV (*warning limit*) =	0.11
75th Quartile CV (*warning limit*) =	0.32
90th Quartile CV (*control limit*) =	0.52

Intralab CV is compared to EPA ***Warning limits*** *(25th and 75th CV's) and* ***Control limits*** *(10th and 90th CV's), If lab CV is outside EPA Control limits, the EPA Control limits are used to set Cusum chart limits.*

Event #	FHM ID #	Test Start Date	EC25	Running Average	Running SD	Cusum Chart Limits		Intralab CV
						AVG-2SD	AVG+2SD	
65	2138	12/3/2020	**0.61**	0.6	0.04	**0.51**	**0.67**	0.07
66	2141	12/29/2020	**0.67**	0.6	0.04	**0.51**	**0.67**	0.07
67	2143	1/12/2021	**0.64**	0.6	0.04	**0.51**	**0.68**	0.08
68	2147	2/2/2021	**0.64**	0.6	0.04	**0.51**	**0.69**	0.08
69	2151	3/23/2021	**0.62**	0.6	0.05	**0.51**	**0.69**	0.07
70	2155	4/15/2021	**0.63**	0.6	0.04	**0.52**	**0.69**	0.07
71	2158	5/11/2021	**0.64**	0.6	0.04	**0.52**	**0.69**	0.07
72	2164	6/22/2021	**0.61**	0.6	0.04	**0.52**	**0.70**	0.07
73	2166	7/1/2021	**0.59**	0.6	0.04	**0.52**	**0.70**	0.07
74	2171	7/20/2021	**0.67**	0.6	0.04	**0.52**	**0.69**	0.08
75	2175	8/17/2021	**0.61**	0.6	0.05	**0.52**	**0.70**	0.08
76	2178	9/9/2021	**0.63**	0.6	0.05	**0.52**	**0.70**	0.08
77	2183	9/28/2021	**0.61**	0.6	0.05	**0.52**	**0.70**	0.07
78	2189	11/2/2021	**0.63**	0.6	0.05	**0.52**	**0.70**	0.07
79	2193	11/16/2021	**0.60**	0.6	0.05	**0.52**	**0.70**	0.07
80	2195	12/7/2021	**0.66**	0.6	0.04	**0.52**	**0.70**	0.04

REFERENCE TOXICANT CUMLATIVE SUMMARY (CUSUM) CHART



Pimephales promelas **- Chronic (EPA Test Method 1000.0)**

POTASSIUM CHLORIDE (g/L)

Endpoint: Chronic Growth (Biomass)

Stats Method: Linear Interpolation

Test Conditions: Recon MH, 25 oC

From EPA 833-R-00-003:

10th Quartile CV (*control limit*) =	0.12
25th Quartile CV (*warning limit*) =	0.21
75th Quartile CV (*warning limit*) =	0.38
90th Quartile CV (*control limit*) =	0.45

Intralab CV is compared to EPA ***Warning limits*** *(25th and 75th CV's) and* ***Control limits*** *(10th and 90th CV's), If lab CV is outside EPA Control limits, the EPA Control limits are used to set Cusum chart limits.*

Event #	FHM ID #	Test Start Date	IC25	Running Average	Running SD	Cusum Chart Limits AVG-2SD	Cusum Chart Limits AVG+2SD	Intralab CV
67	2143	1/12/2021	**0.62**	0.58	0.05	**0.44**	**0.72**	0.08
68	2147	2/2/2021	**0.56**	0.58	0.05	**0.44**	**0.72**	0.08
69	2151	3/23/2021	**0.55**	0.58	0.05	**0.44**	**0.72**	0.08
70	2155	4/15/2021	**0.58**	0.58	0.05	**0.44**	**0.72**	0.08
71	2158	5/11/2021	**0.65**	0.58	0.05	**0.44**	**0.72**	0.08
72	2164	6/22/2021	**0.60**	0.58	0.05	**0.44**	**0.72**	0.08
73	2166	7/1/2021	**0.56**	0.58	0.05	**0.44**	**0.72**	0.08
74	2171	7/20/2021	**0.64**	0.58	0.05	**0.44**	**0.71**	0.09
75	2175	8/17/2021	**0.55**	0.58	0.05	**0.44**	**0.72**	0.09
76	2178	9/9/2021	**0.56**	0.58	0.05	**0.44**	**0.72**	0.09
77	2183	9/28/2021	**0.58**	0.57	0.05	**0.44**	**0.71**	0.09
78	2189	11/2/2021	**0.58**	0.57	0.05	**0.44**	**0.71**	0.08
79	2193	11/16/2021	**0.54**	0.58	0.05	**0.44**	**0.71**	0.09
80	2195	12/7/2021	**0.61**	0.57	0.05	**0.44**	**0.71**	0.07

TestAmerica

GREEN ALGAE (*Selenastrum capricornutum*) TEST CONDITIONS

Client: QA / QC

Sample Description: NaCl Reagent Log #: 2B088-05

Test Start Date: 1-4-22 Time: 1625 Initials: KG

Test End Date: 1-8-22 Time: 1525 Initials: KG

TEST CONDITIONS AT INITIATION:

Species ID#: SC 1058 Dilution Water ID #: 5470

Age: 4 days Note: includes EDTA

INOCULUM (Axenic Culture)		Culture Density = Mean # of Cells/Field x 250,000	
# Cells	# Fields		Culture Density
582	250		
MEAN	2.33	x 250,000 =	582,500

Filtration	None
Note: 50 g/L NaCl stock based off of DI water (0.2 um filtered)	

Test Vol. / Replicate	50 mls
No. of Reps	4
Nutrient Dosage	
1 ml per L in Dilution water only. NaCl stock not nutrient dosed	

Test Start Density	x	Test Volume	/	Culture Density	=	Inoculum Volume
10,000	x	50 ml	/	582,500	=	0.86 ml

Confirming Counts			
	# Cells	# Fields	Cell Conc.x10^6 (cells/ml)
Flask #1	5	250	0.005
Flask #2	8	250	0.008
Flask #3	10	250	0.010

Light Intensity at Test Initiation (foot-candles)		
Location #1	Location #2	Location #3
414	400	397

Technician	0 hr	KG	24 hr	TC	48 hr	TC	72 hr	KG	96 hr	KG
Time	0 hr	1625	24 hr	1245	48 hr	1649	72 hr	1105	96 hr	1520
Thermometer ID:	0 hr	#264	24 hr	#264	48 hr	#264	72 hr	#264	96 hr	#264

Test Concen. (g/L)	D.O. (mg/L)	pH					Temperature (°C)					Conductivity (umohs/cm)	Hard.	Alk.
	0 hr	0 hr	24	48	72	96	0 hr	24	48	72	96	0 hr	0 hr	0 hr
Control	8.0	7.6	7.8	8.1	8.5	9.3	24.1	24.9	24.7	24.8 KG	24.8	379	103	66
0.25	8.0	7.5	7.9	8.1	8.4	9.3	24.0	24.9	24.9	24.8	24.4	881	100	67
0.50	8.0	7.5	8.0	8.2	8.5	9.2	24.0	24.9	24.9	24.9	24.5	1385		
1.0	8.0	7.5	8.0	8.2	8.4	9.2	24.0	24.7	24.9	24.7	24.6	2330	100	67
2.0	8.0	7.6	8.1	8.2	8.3	8.8	24.0	24.7	24.7	24.8	24.6	4120		
4.0	8.0	7.6	8.1	8.1	8.2	8.4	(23.9)	24.6	25.0	24.7	24.5	7850	97	64

Task Manager Kendall Ogilvie

Project Manager Alyssa Lemay

QA Officer

Endpoint : Growth

IC25 : 1.12

Cusum Chart Limits : -0.03 to 2.72

Comments:

Peer Reviewer_____
Review Date_____

Raphidocelis subcapitata HEMOCYTOMETER WORKSHEET

Client QAQC

Sample Description

Lab ID 2B088-05

Test Start Date 1/4/2022

Test Count Date 1/9/2022 Initials TC

Microscope ID# SCOPE-01

Hemocytometer ID #'s A,B,D,E

Minimum counts: at least 400 cells in each of the Control replicates
For each concentration thereafter, count a minimum of 400 cells or the same number of fields used in the Control rep with the highest number of fields counted. Whichever is reached first. (This results in either the 400 minimum count needed fo a ± 10% confidence, or the same volume of solution as assessed in the Control)

Dilution factor (DF) Default value: 1 (i.e no dilution)
If a primary dilution is used, the DF needs to be changed to reflect this. A 1ml of sample + 9 ml of DI = a DF of 10

COMMENTS

TEST CONCENTRATION	Control			
	DF	# Cells	# Fields	Cell Conc. x10*6
Rep A	1	435	23	4.728
Rep B	1	416	24	4.333
Rep C	1	426	20	5.325
Rep D	1	412	20	5.150
Concentration Average			Cell Conc. x10*6 =	4.884
			CV % =	9.1%

TEST CONCENTRATION	0.25 g/L			
	DF	# Cells	# Fields	Cell Conc. x10*6
Rep A	1	405	22	4.602
Rep B	1	338	24	3.521
Rep C	1	405	24	4.219
Rep D	1	409	20	5.113
Concentration Average			Cell Conc. x10*6 =	4.364
			CV % =	15.4%

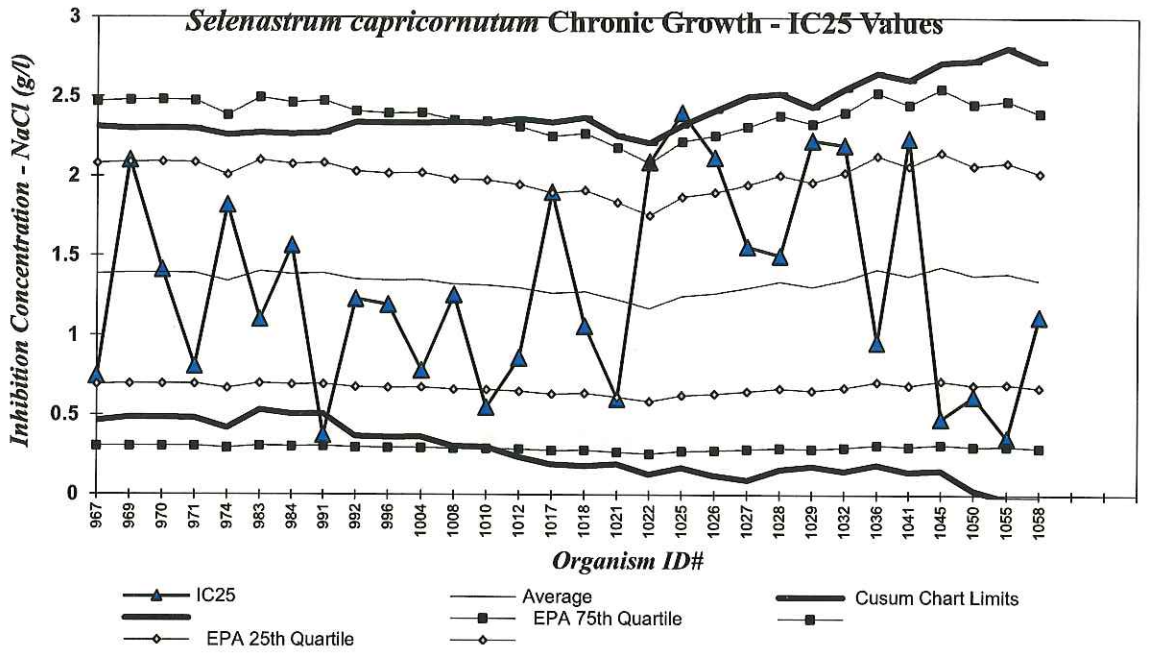
TEST CONCENTRATION	0.5 g/L			
	DF	# Cells	# Fields	Cell Conc. x10*6
Rep A	1	352	24	3.667
Rep B	1	415	19	5.461
Rep C	1	434	19	5.711
Rep D	1	386	24	4.021
Concentration Average			Cell Conc. x10*6 =	4.715
			CV % =	21.7%

TEST CONCENTRATION	1.0 g/L			
	DF	# Cells	# Fields	Cell Conc. x10*6
Rep A	1	297	24	3.094
Rep B	1	371	24	3.865
Rep C	1	328	24	3.417
Rep D	1	415	20	5.188
Concentration Average			Cell Conc. x10*6 =	3.891
			CV % =	23.7%

TEST CONCENTRATION	2.0 g/L			
	DF	# Cells	# Fields	Cell Conc. x10*6
Rep A	1	151	24	1.573
Rep B	1	235	24	2.448
Rep C	1	222	24	2.313
Rep D	1	291	24	3.031
Concentration Average			Cell Conc. x10*6 =	2.341
			CV % =	25.6%

TEST CONCENTRATION	4.0 g/L			
	DF	# Cells	# Fields	Cell Conc. x10*6
Rep A	1	99	24	1.031
Rep B	1	87	24	0.906
Rep C	1	100	24	1.042
Rep D	1	116	24	1.208
Concentration Average			Cell Conc. x10*6 =	1.047
			CV % =	11.8%

REFERENCE TOXICANT CUMLATIVE SUMMARY (CUSUM) CHART



Selenastrum capricornutum **- Green Algae - Chronic (EPA Test Method 1003.0)**

SODIUM CHLORIDE (g/L)

Endpoint: Chronic Growth

Stats Method: Linear Interpolation

Test Conditions: Recon MH, 25 oC

From EPA 833-R-00-003:

10th Quartile CV (*control limit*) =	0.02
25th Quartile CV (*warning limit*) =	0.25
75th Quartile CV (*warning limit*) =	0.39
90th Quartile CV (*control limit*) =	0.51

As per EPA 833-R-00-003, section B.2.1, the quartiles listed above are from just a few labs (6) and therefore not to be considered typical or representative. Cusum limits are based on ASL data only.

Event #	Algae ID #	Test Start Date	IC25	Running Average	Running SD	Cusum Chart Limits AVG-2SD	Cusum Chart Limits AVG+2SD	Intralab CV
216	1022	4/13/2021	**2.09**	1.17	0.52	**0.13**	**2.21**	0.43
217	1025	4/28/2021	**2.40**	1.25	0.54	**0.17**	**2.32**	0.45
218	1026	5/15/2021	**2.12**	1.27	0.57	**0.12**	**2.41**	0.46
219	1027	5/18/2021	**1.56**	1.30	0.60	**0.09**	**2.51**	0.44
220	1028	5/27/2021	**1.51**	1.34	0.59	**0.16**	**2.52**	0.43
221	1029	6/8/2021	**2.23**	1.31	0.56	**0.18**	**2.44**	0.44
222	1032	7/8/2021	**2.20**	1.35	0.60	**0.15**	**2.55**	0.43
223	1036	7/30/2021	**0.96**	1.42	0.62	**0.19**	**2.65**	0.45
224	1041	8/26/2021	**2.24**	1.38	0.62	**0.15**	**2.61**	0.45
225	1045	10/14/2021	**0.48**	1.43	0.64	**0.15**	**2.72**	0.49
226	1050	11/9/2021	**0.62**	1.38	0.67	**0.03**	**2.73**	0.47
227	1055	12/7/2021	**0.36**	1.39	0.66	**-0.03**	**2.81**	0.52
228	1058	1/4/2022	**1.12**	1.35	0.70	**-0.03**	**2.72**	0.52
229								
230								

APPENDIX C

CHAIN OF CUSTODY

eurofins | Environment Testing TestAmerica

Sample Receipt Record

Batch Number: B92669-01 Date Received: 1/4/22

Client/Project: Woodland Received By: TC

Were custody seals intact?	☒ Yes ☐ No ☐ N/A	
Packing Material:	☒ Ice ☒ Blue Ice ☐ Box	POL TC 1/4
Temp OK? (≤ 6°C) Therm ID: TH169 Expires: 3/14/2024 Observed: 1.2 °C, Actual Temp: 1.4 °C	☒ Yes ☐ No ☐ N/A	0.6 0.4
If sample is noted @ ≤ 0.0 °C, is the sample frozen or partially frozen?	☐ Yes ☐ No ☒ N/A	
Was a Chain of Custody (CoC) Provided?	☒ Yes ☐ No ☐ N/A	
Was the CoC correctly filled out? (If No, document below)	☒ Yes ☐ No ☐ N/A	
Were the sample containers in good condition (not broken or leaking)?	☒ Yes ☐ No ☐ N/A	
Are all samples within 36 hours of collection?	☒ Yes ☐ No ☐ N/A	
Method of Shipment: ☐ Hand Delivered, ☒ FedEx, ☐ UPS, ☐ Greyhound, ☐ Other: _____	☐ N/A	

Sample Exception Report (The following exceptions were noted)

Tracking #: 7912 1859 5314

Client was notified on: Client contact:

Resolution to Exception:

CHAIN OF CUSTODY RECORD - FOR AQUATIC TOXICITY TESTING

eurofins | Environment Testing TestAmerica

Client: CITY OF WOODLAND NPDES# WA 0020401

Address: 755 SANDALWOOD RD
WOODLAND WA
98674

Contact Person: Derrek Amburgey
Phone: 360-225-7007

PO# 37314

Composite Sample Information
Samples/Hour N/A Volume/Sample N/A
Total Hours 24 Total Volume 20L
Initiated: Date 1-2-22 Time 10AM
Ended: Date 1-3-22 Time 10AM
Chilled During Collection Yes

Ship Samples to:
Eurofins TestAmerica
Attention: Aquatic Toxicology Laboratory
1100 NE Circle Blvd. Suite 310
Corvallis, OR 97330
Phone: 541-243-6137

Analysis Required / Comments

Sample ID	Date	Time	Sample Type Comp.	Sample Type Grab	# of Containers	Lab ID#	Fathead Acute	Fathead Chronic	Cerio Acute	Cerio Chronic	Daphnia Acute	Trout Acute	SHM Acute	SHM Chronic	MB Acute	MB Chronic	MYS Acute	MYS Chronic	Algae Chronic	CA Haz Waste	WA Haz Waste	DAPHNIA CHRONIC	Concentration and/or Comments
EFF			X		2	~~B5236-04~~ BG2205-01	X	X			X								X			X	

Project ID: Q21-05391 | Prepared By: Brett Muckey

Qty	Description
1	Algae chronic, definitive (5 concentration) bioassay
1	Concurrent Algae chronic Reference Toxicant test
1	Ceriodaphnia dubia acute, definitive (5 conc.), non-renewal, 48 hr, bioassay
1	Ceriodaphnia dubia chronic, definitive (5 conc.), bioassay
1	Fathead minnow acute, definitive (5 conc.), renewal (@ 48 hr), 96 hr duration, bioassay
1	Fathead minnow chronic, definitive (5 conc.), bioassay

Sampled By & Title: Derrek Amburgey (Please sign and print name)	Date/Time 1-2-22 10AM	Relinquished By (Please sign and print name): BJB Fowler	Date/Time 1-3-22 10:10
Received By: Tori Crumrine (Please sign and print name)	Date/Time 1/4/22 1054	Relinquished By (Please sign and print name)	Date/Time
Received By (Please sign and print name)	Date/Time	Relinquished By (Please sign and print name)	Date/Time
Received By (Please sign and print name)	Date/Time	Shipped Via: UPS Bus Fed-Ex Hand Other	Shipping # COC_Bioassay
Work Authorized By (Please sign and print name)	Remarks		Doc Control ID: ASL612-0519

eurofins | Environment Testing TestAmerica

Sample Receipt Record

Batch Number: B5265-02 Date Received: 1/6/22

Client/Project: City of Woodland Received By: MBC

Were custody seals intact?	☑ Yes	☐ No	☐ N/A	
Packing Material:	☐ Ice	☑ Blue Ice	☐ Box	
Temp OK? (≤ 6°C) Therm ID: TH169 Expires: 3/14/2022 Observed: 1.2 / 1.6 °C, Actual Temp: 1.6 / 2.0 °C	☑ Yes	☐ No	☐ N/A	
If sample is noted @ ≤ 0.0 °C, is the sample frozen or partially frozen?	☐ Yes	☐ No	☑ N/A	
Was a Chain of Custody (CoC) Provided?	☑ Yes	☐ No	☐ N/A	
Was the CoC correctly filled out? (If No, document below)	☑ Yes	☐ No	☐ N/A	
Were the sample containers in good condition (not broken or leaking)?	☑ Yes	☐ No	☐ N/A	
Are all samples within 36 hours of collection?	☑ Yes	☐ No	☐ N/A	

Method of Shipment: ☐ Hand Delivered, ☑ FedEx, ☐ UPS, ☐ Greyhound, ☐ Other: _____ ☐ N/A

Sample Exception Report (The following exceptions were noted)

Tracking #: 791218594719

Client was notified on: Client contact:

Resolution to Exception:

Bioassay Receipt verification
Doc Control ID: ASL993-1119

CHAIN OF CUSTODY RECORD - FOR AQUATIC TOXICITY TESTING

eurofins | Environment Testing TestAmerica

Client: City of Woodland NPDES# WA 0020401

Address: 755 Sandalwood Rd
Woodland WA
98674

Contact Person: Derrick Amburgey

Phone: 360-225-7007

PO# 37314

Composite Sample Information

Samples/Hour N/A Volume/Sample N/A
Total Hours 24 Total Volume 20L
Initiated: Date 1-4-21 Time 10AM
Ended: Date 1-5-21 Time 10AM
Chilled During Collection Yes

Ship Samples to:

Eurofins TestAmerica
Attention: Aquatic Toxicology Laboratory
1100 NE Circle Blvd. Suite 310
Corvallis, OR 97330
Phone: 541-243-6137

Analysis Required / Comments

Sample ID	Date	Time	Sample Type Comp.	Sample Type Grab	# of Containers	Lab ID#	Fathead Acute	Fathead Chronic	Cerio Acute	Cerio Chronic	Daphnia Acute	Trout Acute	SHM Acute	SHM Chronic	MB Acute	MB Chronic	MYS Acute	MYS Chronic	Algae Chronic	CA Haz Waste	WA Haz Waste	Daphnia Chronic	Concentration and/or Comments
EFF	1-4-21	10AM	X		2	~~B5236-04~~	X	X			X								X				
			ROGUE 1-6-22			B5265-02																	

Project ID: Q21-05391 | Prepared By: Brett Muckey

Qty	Description
1	Algae chronic, definitive (5 concentration) bioassay
1	Concurrent Algae chronic Reference Toxicant test
1	Ceriodaphnia dubia acute, definitive (5 conc.), non-renewal, 48 hr, bioassay
1	Ceriodaphnia dubia chronic, definitive (5 conc.), bioassay
1	Fathead minnow acute, definitive (5 conc.), renewal (@ 48 hr), 96 hr duration, bioassay
1	Fathead minnow chronic, definitive (5 conc.), bioassay

Sampled By & Title (Please sign and print name) Derrick Amburgey	Date/Time 1-4-21 10AM	Relinquished By (Please sign and print name) Bob Fowler	Date/Time 1-5-2022/10:10AM
Received By (Please sign and print name) Alyssa Lamp	Date/Time 1/6/22 1200	Relinquished By (Please sign and print name)	Date/Time
Received By (Please sign and print name)	Date/Time	Relinquished By (Please sign and print name)	Date/Time
Received By (Please sign and print name)	Date/Time	Shipped Via UPS Bus Fed-Ex Hand Other	Shipping # COC_Bioassay
Work Authorized By (Please sign and print name)	Remarks		Doc Control ID: ASL612-0519

eurofins | Environment Testing TestAmerica

Sample Receipt Record

Batch Number: BS265-03 Date Received: 1-8-22

Client/Project: Woodland Received By: KG

Were custody seals intact? ☒ Yes ☐ No ☐ N/A

Packing Material: ☒ Ice ☐ Blue Ice ☐ Box

Temp OK? (≤ 6°C) Therm ID: 169 Expires: 3 / 14 /2022 Observed: 1.7 / 1.4 °C, Actual Temp: 0.1 / 0.3 °C ☒ Yes ☐ No ☐ N/A

If sample is noted @ ≤ 0.0 °C, is the sample frozen or partially frozen? ☐ Yes ☐ No ☒ N/A

Was a Chain of Custody (CoC) Provided? ☒ Yes ☐ No ☐ N/A

Was the CoC correctly filled out? (If No, document below) ☒ Yes ☐ No ☐ N/A

Were the sample containers in good condition (not broken or leaking)? ☒ Yes ☐ No ☐ N/A

Are all samples within 36 hours of collection? ☒ Yes ☐ No ☐ N/A

Method of Shipment: ☐ Hand Delivered, ☒ FedEx, ☐ UPS, ☐ Greyhound, ☐ Other: _____ ☐ N/A

Sample Exception Report (The following exceptions were noted)

TN: 7912 1859 5781

Client was notified on: Client contact:

Resolution to Exception:

CHAIN OF CUSTODY RECORD - FOR AQUATIC TOXICITY TESTING

eurofins | Environment Testing TestAmerica

Client: City of Woodland NPDES# WA 0020401

Address: 755 Sandalwood Rd
Woodland WA
98674

Contact Person: Derrick Ambrosey
Phone: 360-225-7007

PO# 37314

Composite Sample Information

Samples/Hour: N/A Volume/Sample: NA
Total Hours: 24 Total Volume: 20L
Initiated: Date 1-6-22 Time 10Am
Ended: Date 1-7-22 Time 10AM
Chilled During Collection: Yes

Ship Samples to:
Eurofins TestAmerica
Attention: Aquatic Toxicology Laboratory
1100 NE Circle Blvd. Suite 310
Corvallis, OR 97330
Phone: 541-243-6137

Analysis Required / Comments

Sample ID	Date	Time	Sample Type: Comp.	Sample Type: Grab	# of Containers	Lab ID#	Fathead Acute	Fathead Chronic	Cerio Acute	Cerio Chronic	Daphnia Acute	Trout Acute	SHM Acute	SHM Chronic	MB Acute	MB Chronic	MYS Acute	MYS Chronic	Algae Chronic	CA Haz Waste	WA Haz Waste	DAPHNIA CHRONIC	Concentration and/or Comments
EFF	1-6-22	10AM	X		2	BS265-93	X	X			X								X				

Project ID: Q21-05391 | Prepared By: Brett Muckey

Qty	Description
1	Algae chronic, definitive (5 concentration) bioassay
1	Concurrent Algae chronic Reference Toxicant test
1	Ceriodaphnia dubia acute, definitive (5 conc.), non-renewal, 48 hr, bioassay
1	Ceriodaphnia dubia chronic, definitive (5 conc.), bioassay
1	Fathead minnow acute, definitive (5 conc.), renewal (@ 48 hr), 96 hr duration, bioassay
1	Fathead minnow chronic, definitive (5 conc.), bioassay

Sampled By & Title: Derrick Ambrosey	(Please sign and print name)	Date/Time: 1-6-22 12Pm	Relinquished By: Bob Fowler	(Please sign and print name) Date/Time: 1-7-2022 10:10Am
Received By: Kendal Gile	(Please sign and print name)	Date/Time: 1-8-22 11:30	Relinquished By	(Please sign and print name) Date/Time
Received By	(Please sign and print name)	Date/Time	Relinquished By	(Please sign and print name) Date/Time
Received By	(Please sign and print name)	Date/Time	Shipped Via: UPS Bus Fed-Ex Hand Other	Shipping #: COC Bioassay
Work Authorized By	(Please sign and print name)	Remarks		Doc Control ID: ASL612-0519

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AQUATIC TOXICOLOGY REPORT

Project Name: CITY OF WOODLAND

Location: WOODLAND, WASHINGTON

Prepared by: Eurofins TestAmerica - Corvallis
(aka TestAmerica – ASL)

1100 NE Circle Boulevard, Suite 310
Corvallis, Oregon 97330
541-243-6137

Accredited in accordance with NELAP

Oregon Environmental Laboratory Accreditation Program #OR100022 (NELAP)
State of Washington DOE Environmental Laboratory Accreditation Program, Lab ID C556
California State Environmental Laboratory Accreditation Program, Certificate No.: 1726

Report Date: June 21, 2021 Released by: Michelle Bennett

Lab I.D. No. B5059

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LABORATORY CONTACT: Alise Lampi, Aquatic Toxicity Department Manager
Alyssa.Lampi@eurofinset.com (541) 243-0964

INTRODUCTION

Eurofins TestAmerica – Corvallis (ET-C) Aquatic Toxicology Laboratory conducted toxicity testing on sample(s) from the City of Woodland, Woodland, Washington.

Testing was initiated on: May 18, 2021

The test(s) were conducted using:

- the water flea (*Ceriodaphnia dubia*)
- the fathead minnow (*Pimephales promelas*)
- the green algae (*Selenastrum capricornutum,* aka *Raphidocelis subcapitata*, aka *Pseudokirchneriella subcapitata*).

OVERVIEW OF REGULATORY GUIDANCE

The following provides an overview and excerpts of applicable permit specifics, regulatory guidance, and other relevant information. This is intended only as a helpful guide, from a laboratory perspective, for understanding test outcomes. The final responsibility for interpretation of results remains with the client and/or regulatory agency.

The following guidance is taken from ET-C's reading of the NPDES permit for the City of Woodland (permit #WA0020401, effective Apr. 1, 2012, expired Mar. 31, 2017). No current NPDES permit information was provided to or found by ET-C at the time of testing.

<u>There are no acute or chronic effluent limits for Whole Effluent Toxicity listed in the NPDES permit</u>.

Acute toxicity:

- "The acute critical effluent concentration (ACEC) equals 19 percent effluent."

Chronic toxicity:

- "The chronic critical effluent concentration (CCEC) equals 1.4 percent effluent."
- *Compliance Testing for Chronic Toxicity:*
  - "Conduct chronic toxicity testing on a series of at least five concentrations of effluent and a control. This series of dilutions must include the CCEC and ACEC."
  - "Compare the ACEC to the control using hypothesis testing at the 0.05 level of significance as described in permit."

The following is taken from the WDOE guidance (WQ-R-95-80, June 2016 revision):

- "To reduce WET limit violations due to statistically significance that is a Type I error (false positive), we lower the alpha for hypothesis testing when differences in test organisms response are small."
- "Alpha will be lowered from 0.05 to 0.01 if a 10% difference in an acute test is significant or a 20% difference in a chronic test is significant."

SUMMARY OF TEST RESULTS

Exhibits 1 and 2 provide a summary of the final test results.

EXHIBIT 1
Summary of Acute Test Results

Species	NOEC (%)	LOEC (%)	LC_{50} (%)
C. dubia	100	> 100	> 100
P. promelas	100	> 100	> 100

Note: acronyms are as defined below.

More detailed information is provided in the Results and Discussion section.

EXHIBIT 2
Summary of Chronic Test Results

Species	NOEC (%)	LOEC (%)	IC_{25} (%)
C. dubia	100	> 100	> 100
P. promelas	100	> 100	> 100
S. capricornutum	19.0	50.0	40.8

Note: acronyms are as defined below.

More detailed information is provided in the Results and Discussion section.

ACRONYM DEFINITIONS (from EPA guidance):

NOEC = No Observed Effect Concentration: The highest test concentration that causes no observable adverse effects on the test organisms (i.e. no statistically significant reduction from the control).
LOEC = Low Observed Effect Concentration: The lowest test concentration that does cause an observable adverse effect on the test organisms (i.e. is statistically significant reduction from the control).
LC_{50} = Lethal Concentration (50%): A point estimate of the test concentration that would cause death in 50 percent of the test population.
IC_{25} = Inhibition Concentration (25%): A point estimate of the test concentration that would cause a 25 percent reduction of a non-quantal biological measurement (i.e. growth, reproduction, etc.) for the test population.

SAMPLE INFORMATION

Exhibit 3 provides a summary of the sample conditions as received.

EXHIBIT 3
Sample Conditions on Receipt

Sample ID	EFF		
ET-C SDG + suffix	B5059 -01	B5059 -02	B5059 -03
Collection - Date and Time	05/17/2021 08:00	05/19/2021 08:00	05/21/2021 08:00
Receipt - Date and Time	05/18/2021 11:00	05/20/2021 11:00	05/24/2021 10:33
Temperature (°C)	2.0 to 3.0	4.8	6.8 to 6.9
Dissolved Oxygen (mg/L)	9.7	9.1	NA
pH	7.4	7.4	NA
Conductivity (µS/cm)	840	904	NA
Total Residual Chlorine (mg/L)	0.05	0.04	NA
Ammonia (mg/L as NH_3-N)	0.17	0.21	NA
Total Hardness (mg/L as $CaCO_3$)	111	111	NA
Total Alkalinity (mg/L as $CaCO_3$)	156	156	NA

As noted in the Deviations section, the third sample was delayed in shipping and not used for testing.

METHODS AND MATERIALS

TEST METHODS

The acute test methods were performed according to: *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms*, USEPA Office of Water (2002), EPA-821-R-02-012.

The chronic test methods were performed according to: *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms*, Fourth Edition, (2002), EPA-821-R-02-013.

Additional guidance was provided by:

- *Whole Effluent Toxicity Testing Guidance and Test Review Criteria*, Washington State Department of Ecology (revised Jun 2016) Pub# WQ-R-95-80.

DEVIATIONS FROM PROTOCOLS

Deviations from required procedures in the test methods:

- Not all of the samples were within the WDOE required holding temperature range of 0 to 6 °C upon arrival at the laboratory. See further discussion in the Sample Collection and Storage section.

Deviations from recommended procedures in the test methods:

- Not all of the samples were within the EPA recommended holding temperature range of 0 to 6 °C upon arrival at the laboratory. See further discussion in the Sample Collection and Storage section.
- The sample collected on May 21, 2021 was not successfully delivered as scheduled. The sample was received in poor condition, not in the temperature range of 0 – 6 °C, and was not used for test solution renewals. See further discussion in the Sample Collection and Storage section.
- All subsequent uses of a sample did not occur within the WDOE recommended maximum holding time of 72 hours past the time of sample collection. See further discussion in the Sample Collection and Storage section.

TEST DESIGN

The following summarizes the conditions used for both overall testing and the specifics for each test (observations and notations can be found on the datasheets in Appendix A):

Overall Test Design:

- Acute and Chronic tests: 1.4, 10, 19, 50, and 100 percent sample + dilution water for the control.

Test Organism Conditions:

- All organisms tested were fed and maintained during culturing, acclimation, and testing as prescribed by the EPA (2002).
- The test organisms appeared vigorous and in good condition prior to testing.

C. dubia acute test:

- Source: ET-C's in-house cultures
- Age: Less than 24 hours old
- Design: Four test vessels per concentration, five organisms per vessel
- Test Solution Renewal: None (i.e. static test)
- Monitoring:
    - Daily: Survival, DO, pH, and temperature; all concentrations.
    - Test Initiation and Termination: Conductivity, all concentrations
- Termination: 48 hours.
- Endpoints: Survival (at termination)

P. promelas acute test (renewal):

- Source: Aquatox Inc., Hot Springs, Arkansas
- Age: 1 to 14 days old, within a 24 hour age range
- Design: Four test vessels per concentration, Ten organisms per vessel

- Test Solution Renewal: Once @ 48 hours (i.e. static-renewal test)
- Monitoring:
    - Daily: Survival, DO, pH, and temperature; all concentrations.
    - Pre and Post Renewal solutions: DO and pH, all concentrations.
    - Test Initiation, with each new sample use, and Termination:
        - Conductivity, all concentrations (WDOE)
- Termination: 96 hours.
- Endpoints: Survival (at termination)

C. dubia chronic test:

- Source: ET-C's in-house cultures
- Age: Less than 24 hours old and within an 8-hour age range, with blocking by known parentage
- Design: Ten test vessels per concentration, one organism per vessel
- Test Solution Renewal: Daily
- Monitoring:
    - Daily: Survival and neonate production (with brood determination)
    - Daily: DO and pH in pre and post-renewal solutions, all concentrations
    - Daily: Temperature in pre-renewal solutions, all concentrations
    - With each new sample: Conductivity in post-renewal solutions, control and highest sample concentration
- Termination: When 60%+ of surviving control organisms produce a 3rd brood.
    - Survival: @ after 7 days.
    - Reproduction: When 60%+ of surviving control organisms produce a 3rd brood.
- Endpoints: Survival (at termination) and Reproduction (through first 3 broods)

P. promelas chronic test:

- Source: Aquatox Inc., Hot Springs, Arkansas
- Age: Less than 48 hours old and within an 24 hour age range
- Design: Four test vessels per concentration, ten organisms per vessel
- Test Solution Renewal: Daily
- Monitoring:
    - Daily: Survival
    - Daily: DO and pH in pre and post-renewal solutions, all concentrations
    - Daily: Temperature in pre-renewal solutions, all concentrations
    - With each new sample: Conductivity in post-renewal solutions, control and highest sample concentration
- Termination: 7 days after test initiation.
- Endpoints: Survival and Growth (average dry weight per organism added @ initiation)

S. capricornutum chronic test:

- Source: ET-C's in-house cultures
- Age: Culture acclimated to test conditions for 4 to 7 days.
- Design: Four test vessels per concentration, 10,000 cells/ml density at initiation
- Test Solution Renewal: None (static)
- Monitoring:
    - Initiation: DO, pH, Temperature, and Conductivity, all concentrations

    - Initiation: Hardness and Alkalinity, control + low, middle and high sample concentrations
    - Initiation: Light Intensity and Cell Density confirming counts, in triplicate
    - Daily: Temperature and pH, all concentrations
- Termination: 96 hours.
- Endpoints: Cell Density (at termination)

DILUTION WATER

The dilution water used was the standard culture water used by ET-C:

- Reconstituted, moderately hard water (as per EPA protocol) with a total hardness of 75 to 105 mg/L as $CaCO_3$ and an alkalinity of 50 to 75 mg/L as $CaCO_3$.
- For the *S. capricornutum* test: Reconstituted, moderately hard water with nutrients added, including EDTA, that was passed through a 1.60 micron filter prior to use.

SAMPLE COLLECTION AND STORAGE

Samples were collected by City of Woodland personnel. The samples were accepted as scheduled by ET-C. Chain of Custody and Sample Receipt Records are provided in Appendix C.

- Not all samples were received within the EPA recommended and WDOE required 0 to 6 °C range.
    - The sample collected on May 21, 2021 was received at 6.8 °C which is outside of the EPA recommended and WDOE required 0 to 6 °C range.
    - The May 17th and May 19th samples were received in the 0 to 6 °C range.
- All samples were initially used for test initiation or test solution renewal within the EPA recommended maximum holding time of 36 hours of sample collection.
    - The sample collected on May 21, 2021 was not successfully delivered to the laboratory as scheduled. The sample was received May 24, 2021, in poor condition and not used for testing.
- Not all subsequent uses of a sample occurred within the EPA recommended maximum holding time of 72 hours past the time of initial use of that sample.
    - The sample was used on (Day 2) May 20, 2021 at 14:45. The subsequent use of that sample took place on Days 6 and 7 of the *C. dubia* chronic test at 15:10. (96 hours and 25 minutes past initial use of the sample).
    - The sample was used on (Day 2) May 20, 2021 at 13:51. The subsequent use of that sample took place on Day 6 of the *P. promelas* chronic test at 13:39. (95 hours and 48 minutes past initial use of the sample).
- Not all subsequent uses of a sample occurred within the WDOE recommended maximum holding time of 72 hours past the time of sample collection.
    - The sample was collected on May 19, 2021 at 08:00. The subsequent use of that sample took place on Days 4, 5, 6, and 7 of the *C. dubia* chronic test. On Day 4 the subsequent use of the sample occurred at 12:40 (76 hours and 40 minutes past collection of the sample).
    - The sample was collected on May 19, 2021 at 08:00. The subsequent use of that sample took place on Days 4, 5, and 6 of the *P. promelas* chronic test. On Day 4

the subsequent use of the sample occurred at 13:10 (77 hours and 10 minutes past collection of the sample).

- Not all subsequent uses of a sample occurred within the WDOE recommended maximum holding time of 84 hours past the time of sample collection. (Extended for renewals of a 96 hour duration acute test).
- Following receipt, the samples were stored in the dark at 0 to 6 °C until test solutions were prepared and tested.

SAMPLE PREPARATION

Samples used during these tests were:

- Temperature adjusted prior to test initiation and each daily renewal.
- Organisms were noted in the sample on arrival. Sample was filtered through a 60 µm net prior to use.
- The subsample used for the *S. capricornutum* test had nutrients, including EDTA, added, and was 1.60 micron filtered prior to use.

DATA ANALYSIS

The statistical analyses performed for the acute tests were those outlined in *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms*, USEPA Office of Water, Fifth Edition (2002), EPA-821-R-02-012, using CETIS.

The statistical analyses performed for the chronic tests were those outlined in *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms*, USEPA Office of Water, Fourth Edition (EPA 2002), EPA-821-R-02-013, using CETIS.

- The specific statistical analysis and CETIS version used for each endpoint evaluation is listed with the statistical outputs included with each test in Appendix A.
- If any additional analysis methods were also used, an explanation of the rationale and reference to the source method is included with the presentation of those results below.

Additional guidance was provided by:

- *Whole Effluent Toxicity Testing Guidance and Test Review Criteria*, Washington State Department of Ecology (revised Jun 2016) Pub# WQ-R-95-80.

RESULTS AND DISCUSSION

The raw data sheets for all tests are presented in Appendix A.

ACUTE BIOASSAYS

Table 1 summarizes the survival data for the *C. dubia* acute test.

Table 1
Summary of Acute Results
C. dubia

Sample Concentration (%)	Percent Survival (at Test Termination)
Control	95
1.4	100
10	100
19	95
50	100
100	95

Statistical analysis in accordance with the EPA protocol and WDOE guidance results in:

- NOEC = 100 %
- LOEC > 100 %
- LC_{50} > 100 %

Dissolved oxygen concentrations remained at 4.0 mg/L or greater throughout the test period. Test temperatures remained in the range of 20±1 °C.

The *C. dubia* acute test meets Test Acceptability Criteria (TAC) of a minimum 90 percent control survival. Unless referenced above, the tests proceeded without any noted deviations or interruptions that could have affected test results. The testing should be considered "valid".

Table 2 summarizes the survival data for the *P. promelas* acute test.

Table 2 **Summary of Acute Results** ***P. promelas***	
Sample Concentration (%)	**Percent Survival (at Test Termination)**
Control	100
1.4	97.5
10	100
19	100
50	100
100	97.5

Statistical analysis in accordance with the EPA protocol and WDOE guidance results in:

- NOEC = 100 %
- LOEC > 100 %
- LC_{50} > 100 %

Dissolved oxygen concentrations remained at 4.0 mg/L or greater throughout the test period. Test temperatures remained in the range of 20±1 °C.

The *P. promelas* acute test meets Test Acceptability Criteria (TAC) of a minimum 90 percent control survival. Unless referenced above, the tests proceeded without any noted deviations or interruptions that could have affected test results. The testing should be considered "valid".

CHRONIC BIOASSAYS

Table 3 summarizes the survival and reproduction data for the *C. dubia* chronic test.

Table 3
Summary of Chronic Results
C. dubia

Sample Concentration (%)	Percent Survival	Mean Number of Young Per Adult
Control	90	21.1
1.4	90	21.4
10	90	17.1
19	90	20.1
50	100	19.4
100	80	16.2

Statistical analysis in accordance with the EPA protocol and WDOE guidance results in:

- NOEC = 100 %
- LOEC > 100 %
- IC_{25} > 100 %

Dissolved oxygen concentrations remained at 4.0 mg/L or greater throughout the test period. Test temperatures remained at 25±1 °C.

The *C. dubia* test meets Test Acceptability Criteria (TAC) for a minimum 80 percent control survival and a minimum 15 young produced per surviving control adult. Unless referenced above, the tests proceeded without any noted deviations or interruptions that could have affected test results. The testing should be considered "valid".

Table 4 summarizes the survival and growth data for the *P. promelas* chronic test.

Table 4
Summary of Chronic Results
P. promelas

Sample Concentration (%)	Percent Survival	Mean Dry Weight Per Organism Added (mg)
Control	100	0.940
1.4	97.5	0.897
10	100	0.905
19	100	0.856
50	92.5	0.850
100	97.5	0.892

Statistical analysis in accordance with the EPA protocol and WDOE guidance results in:

- NOEC = 100 %
- LOEC > 100 %
- IC_{25} > 100 %

Dissolved oxygen concentrations remained at 4.0 mg/L or greater throughout the test period. Test temperatures remained at 25±1°C.

The *P. promelas* test meets Test Acceptability Criteria (TAC) for a minimum 80 percent control survival and a minimum weight of 0.250 mg per surviving control organism. Unless referenced above, the tests proceeded without any noted deviations or interruptions that could have affected test results. The testing should be considered "valid".

Table 5 summarizes the algae growth data for the *S. capricornutum* chronic test.

Table 5 **Summary of Chronic Results** ***S. capricornutum***	
Sample Concentration (%)	**Growth (Cells/ml x 10^6)**
Control	3.026
1.4	2.904
10	2.617
19	2.510 [a]
50	2.204 [a,b]
100	0.485 [a,b]
[a] Indicates a statistically significant difference from the control at alpha = 0.05. [b] Indicates a statistically significant difference from the control at alpha = 0.01.	

Statistical analysis in accordance with the EPA protocol and WDOE guidance results in:

- NOEC = 19 %
- LOEC = 50 %
- IC_{25} = 40.8 %

EPA 821-B-00-004, Chapter 2, allows for reduction of alpha (p) levels from 0.05 to 0.01 in an effort to reduce Type I or "false positive" statistical errors. This approach is contingent on the test maintaining appropriate test sensitivity and allowances in the NPDES permit or by the regulating authority. Using p=0.01, the *S. capricornutum* test results showed a statistically significant reduction in growth at the 50 and 100 percent effluent concentration when compared to the control.

In addition, Washington DOE Pub# WQ-R-95-80 (Page 17) guidance states that if a significant difference in test organism response from the control in a chronic test is less than 20%, the level of significance (alpha) will be reduced from 0.05 to 0.01.

- For this data set, the reduction in growth at the 19 percent sample concentration was 17.1 percent from control values.
- Analysis at the alpha = 0.01 level, the 19 percent sample concentration did not show a statistically significant reduction in growth.
- Overall, analysis at the appropriate alpha level (based on percent reduction from the control) for each sample concentration showed statistically significant reductions in grwoth only at the 50 and 100 percent sample concentrations.
- Note: This adjustment in alpha levels does not impact the IC_{25} calculation.

As a result, in accordance with the additional WDOE guidance:

- NOEC = 19 %
- LOEC = 50 %

The initial dissolved oxygen levels in the chronic test remained was at or above 4.0 mg/L. Test temperatures remained at 25±1°C.

The *S. capricornutum* chronic test meets Test Acceptability Criteria (TAC) for a minimum 1.0 x 10^6 cells/ml control growth and a maximum coefficient of variance (CV%) of 20% in the controls. Unless referenced above, the tests proceeded without any noted deviations or interruptions that could have affected test results. The testing should be considered "valid".

REFERENCE TOXICANT TESTS

Reference toxicant (reftox) testing is performed to document both initial and ongoing laboratory performance of the test method(s). While the health of the test organisms is primarily evaluated by the performance of the laboratory control, reftox test results also may be used to assess the health and sensitivity of the test organisms. Reftox test results within their respective cumulative summary (Cusum) chart limits are indicative of consistent laboratory performance and normal test organism sensitivity.

The results of the reftox tests indicate that the test organisms were within their respective cusum chart limits based on EPA guidelines. This demonstrates ongoing laboratory proficiency of the test methods and suggests normal test organism sensitivity in the associated client testing.

The *P. promelas* and *C. dubia* acute reftox test was conducted using sodium chloride. The *P. promelas* chronic reftox test was conducted using potassium chloride. The *C. dubia* and *S. capricornutum* chronic reftox tests were conducted using sodium chloride. The data sheets for the reference toxicant tests are provided in Appendix B.

Tables 6 and 7 summarize the reference toxicant test results and Cusum chart limits.

Table 6
Acute Reference Toxicant Tests (g/L)

Species	LC_{50}	Cusum Chart Limits
C. dubia	1.79	1.73 to 3.24
P. promelas	7.1	5.6 to 8.8

Table 7
Chronic Reference Toxicant Tests (g/L)

Species	IC_{25}	Cusum Chart Limits
C. dubia (survival)	1.17	0.84 to 2.21
C. dubia (reproduction)	0.69	0.37 to 1.15
P. promelas (survival)	0.64	0.52 to 0.69
P. promelas (growth)	0.65	0.44 to 0.72
S. capricornutum (growth)	1.56	0.09 to 2.51

APPENDIX A

RAW DATA SHEETS

TestAmerica

FRESHWATER TOXICITY TEST: SAMPLE AND DILUTION WATER DATA

Client: City of Woodland

Contact: Derrek Amburgey

SDG # B 5059

Test Initiation: Date 5/18/21

Test Termination: Date 5-26-21

Sample ID Number	Field ID	Collected Date (mm/dd/yy)	Collected Time (Pacific Zone)	Received Date (mm/dd/yy)	Received Time (Pacific Zone)	Temp (°C) as Rc'vd	Total Residual Chlorine (mg/l) ☐ Dechlorination allowed as Rc'vd / after Dechlor.	Ammonia NH_3-N mg/l as Rc'vd	Hardness mg/l as $CaCO_3$ as Rc'vd	Alkalinity mg/l as $CaCO_3$ as Rc'vd	DO (mg/L) as Rc'vd	pH as Rc'vd	Cond. (uS) as Rc'vd	60 um filtered? (organisms noted)
B5059-01	EFF	5/17/21	05:00	5/18/21	11:00	3.0 2.0	0.051 -	0.17	111	156	9.7	7.2	840	☒ TC
B5059 -02	EFF	5/19/21	08:00	5/20/21	11:00	4.5	0.041 -	0.21	111	156	9.1	7.4	904	☒ TC
B5059 -03	EFF	5/21/21	09:00	5/24/21	10:33	6.5 6.9	/ -							☐
							/							
							/							
							/							
							/							
							/							
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							/							
							/							
							/							
			Reporting Limits:			na	0.02 mg/L	0.10 mg/L	5 mg/L	5 mg/L	na	na	na	na

Note: "–" Indicates data collection or dechlorination not needed. Any other adjustments to samples prior to use are documented in Comments below or on Dilutions page.

Dilution Water	ID#	Hardness mg/l as $CaCO_3$	Alkalinity mg/l as $CaCO_3$
Recon MH (Algae)	5320	100	69
Recon MH (FHM)	5329	85	60
	5331	78	58
	5332	97	62

Comments: ☑ Indicates the action was taken, (☐= action not taken): "–" = sample not dechlorinated, or analyte not collected/needed.

☑ Subsample for algae test had nutrients added and was 1.60 um filtered

-03 sample out of hold time and temp.

MB 06/05/21

Water Quality Meters Used/ID#: Dissolved Oxygen # 4 pH # 11 Conductivity # 1

TestAmerica

FRESHWATER TOXICITY TEST: TEST ORGANISM INFORMATION

Client: City of Woodland

Sample Designation (SDG): B 5059

Test Species Information	Cd # 3825 *Ceriodaphnia dubia* Chronic	FHM # 2159 *Pimephales promelas* Chronic	Cd # 3826 ~~*Ceriodaphnia dubia*~~ Acute	FHM # 2158 ~~*Pimephales promelas*~~ Acute	Sc # 1027 *Selenastrum capricornutum* Chronic
Organism Age at Initiation	<24 hrs, all within an 8 hr window	<48 hrs, all within a 24 hour window	< 24 hrs	7 Days, within a 24 hour window	Acclimated for 4 Days
Test Container Size	30 ml	800 ml	30 ml	400 ml	125 ml
Test Volume	15 ml	500 ml	25 ml	250 ml	50 ml
Feeding: Type and Amount	0.10 ml Algae and 0.10 ml YCT daily	0.15 ml *Artemia*, 2 x Daily	Algae and YCT during acclimation	0.15 ml *Artemia*, @ 48 hrs	1 ml/L Nutrients, incl. EDTA, added
Aeration: In Test Chambers via Slow Bubble :	☒ None ☐ Prior to use	☒ None ☐ Prior to use ☐ @ _____ hrs	☒ None ☐ Prior to use	☒ None ☐ Prior to use ☐ @ _____ hrs	☒ None ☐ Prior to use
Acclimation Period	<24 hrs	<24 hrs	<24 hrs	~~<24 hrs~~ 7 Days	4 Days
Organism Source	In-House	Aquatox	In-House	Aquatox	In-House
Size	-	-	-	-	-
Loading Rate	-	-	-	-	-

Dissolved Oxygen aeration justifications (in test chambers):

Test(s): ☐ All ☐ _____

Date:

The cerio and FHM acute tests were not run as dual endpoint and should not be crossed out. R06 MB 06/05/21

Comments:

Test Solution Preparation and Dilution Record

Client: City of Woodland

Note: ☐ Indicates task not done, ☑ Indicates task was done. Temp adj. = Temperature adjusted to ambient or test temp

Ditto marks ('') indicate that the same SDG, batch of dilution water, or food as the previous day's entry was used.

Ceriodaphnia dubia - Chronic

Test Concentration (%)	Sample Volume (mls)		Final Volume (mls)
Control	0.00	→	200
1.4	2.80	→	200
10	20.0	→	200
19	38.0	→	200
50	100	→	200
100	200	→	200

Total Sample volume needed per day = 361 mls

Test Day	Sample ID Used	Daily Sample Preparation (prior to dilution)	Dilution Water Used	YCT ID Used	Algae ID Used	Date	Time	Initials
0 (Initiation)	B5059 01	☐ Temp adj, ☐ Aerated	ID# 5331	#1297	#1298	5/18/2021	12:01	[illegible]
1	B5059-01	☐ Temp adj, ☐ Aerated	ID# 5329	#1297	#1298	5/19/21	09:58	TC
2	B5059-02	☐ Temp adj, ☐ Aerated	ID# 5331	#1296	#1299	5/20/21	11:30	[illegible]
3	B5059-02	☐ Temp adj, ☐ Aerated	ID# 5331	#1296	#1299	5/21/21	07:24	TC
4	B5059-02	☐ Temp adj, ☐ Aerated	ID# 5331	#1297	#1299	5/22/21	10:55	[illegible]
5	B5059-02	☐ Temp adj, ☐ Aerated	ID# 5332	#1297	#1299	5/23/21	09:43	TC
6	B5059-02	☐ Temp adj, ☐ Aerated	ID# 5332	#1296	#1299	5/24/21	11:00	TC
7	B5059-02	☐ Temp adj, ☐ Aerated	ID# 5335	#1296	#1299	5/25/21	10:00	BC

Fathead minnow - Chronic

Test Concentration (%)	Sample Volume (mls)		Final Volume (mls)
Control	0.00	→	1000
1.4	14.0	→	1000
10	100	→	1000
19	190	→	1000
50	500	→	1000
100	1,000	→	1000

Total Sample volume needed per day = 1804 mls

Test Day	Sample ID Used	Daily Sample Preparation (prior to dilution)	Dilution Water Used	Date	Time	Initials
0 (Initiation)	B5059 01	☐ Temp adj, ☐ Aerated	ID# 5331	5/18/2021	11:50	[illegible]
1	B5059-01	☐ Temp adj, ☐ Aerated	ID# 5329	5/19/21	09:03	TC
2	B [illegible] -02	☐ Temp adj, ☐ Aerated	ID# 5331	5/20"	11:30	[illegible]
3	B5059-02	☐ Temp adj, ☐ Aerated	ID# 5331	5/21"21	07:28	TC
4	B5059-02	☐ Temp adj, ☐ Aerated	ID# 5332	5/22"21	11:00	[illegible]
5	B5059-02	☐ Temp adj, ☐ Aerated	ID# 5332	5/23/21	09:47	TC
6	B5059-02	☐ Temp adj, ☐ Aerated	ID# 5332	5/24"21	11 06	TC

Ceriodaphnia dubia - Acute

Test Concentration (%)	Sample Volume (mls)		Final Volume (mls)
Control	0.00	→	200
1.4	2.80	→	200
10	20.0	→	200
19	38.0	→	200
50	100	→	200
100	200	→	200

Test Day	Sample ID Used	Daily Sample Preparation (prior to dilution)	Dilution Water Used	Date	Time	Initials
0 (Initiation)	B5059-01	☐ Temp adj, ☐ Aerated	ID# 5331	5/18/2021	12:07	[illegible]

Total Sample volume needed per day = 361 mls

Fathead minnow - Acute

Test Concentration (%)	Sample Volume (mls)		Final Volume (mls)
Control	0.00	→	1000
1.4	14.0	→	1000
10	100	→	1000
19	190	→	1000
50	500	→	1000
100	1,000	→	1000

Test Day	Sample ID Used	Daily Sample Preparation (prior to dilution)	Dilution Water Used	Date	Time	Initials
0 (Initiation)	B5059 01	☐ Temp adj, ☐ Aerated	ID# 5331	5/18/2021	11:50	[illegible]
2	B5059-02	☐ Temp adj, ☐ Aerated	ID# 5331	5/20/2021	11:30	[illegible]

Total Sample volume needed per day = 1804 mls

Test Solution Preparation and Dilution Record

Client: City of Woodland

Note: ☐ Indicates task not done, ☑ Indicates task was done. Temp adj. = Temperature adjusted to ambient or test temp

Ditto marks ('') indicate that the same SDG, batch of dilution water, or food as the previous day's entry was used.

Algae - Chronic

Test Concentration (%)	Sample Volume (mls)		Final Volume (mls)
Control	0.00	→	500
1.4	7.00	→	500
10	50.0	→	500
19	95.0	→	500
50	250	→	500
100	500	→	500

Test Day	Sample ID Used	Daily Sample Preparation (prior to dilution)	Dilution Water Used	Date	Time	Initials
0 (Initiation)	B5059	☑ Temperature adjusted ☐ Aerated ☑ Nutrients added (incl. EDTA) ~~☐ 0.45 um filtered Lot#~~ ☑ 1.60 mm filtered (WDOE clients only) Lot# C1178340	ID# 5320	5/18/2021	13:40	ABL

Total Sample volume needed = 752 mls

TestAmerica

48 HOUR FRESHWATER TOXICITY TEST SURVIVAL AND WATER QUALITY DATA

Client: City of Woodland Sample ID # B 5059-01 Beginning, Date 5/18/21 Time 1550

Sample Description: Ending, Date 5/20/21 Time 1510

Dilution Template Used: Whiskey Cup random # 50 Waterbath/Incubator Used: # 7

Test Species: *Ceriodaphnia dubia* ID# Cd 34210

		0 hr	24 hr	48 hr
Technician		SAGR	JR	JR
Time		1550	1415	1510
Therm. ID#		# 251	# 251	# 251

Percent	Test Container Number	Number of Live Organisms 0	24	48	Dissolved Oxygen (mg/l) 0	24	48	pH 0	24	48	Temperature (°C) 0	24	48	Conductivity (µmohs/cm) 0	24	48
Control	Surrogate					7.4			8.1			19.6				
	A	5	5	5	7.8		7.2	8.0		7.9	19.9		20.0	305		341
	B	5	5	4												
	C	5	5	5												
	D	5	5	5												
1.4	Surrogate					7.4			8.1			20.1				
	A	5	5	5	7.8		7.4	7.9		7.8	19.9		20.0	314		315
	B	5	5	5												
	C	5	5	5												
	D	5	5	5												
10	Surrogate					7.5			8.1			20.0				
	A	5	5	5	7.8		7.5	7.8		7.8	19.9		20.1	358		380
	B	5	5	5												
	C	5	5	5												
	D	5	5	5												
19	Surrogate					7.5			8.0			20.1				
	A	5	5	5	7.9		7.5	7.7		7.9	19.8		19.5	403		423
	B	5	5	4												
	C	5	5	5												
	D	5	5	5												
50	Surrogate					7.6			8.1			20.2				
	A	5	5	5	7.9		7.6	7.5		7.9	19.8		20.0	556		582
	B	5	5	5												
	C	5	5	5												
	D	5	5	5												
100	Surrogate					7.6			8.1			20.0				
	A	5	5	4	8.0		7.8	7.4		8.1	19.8		19.9	809		861
	B	5	5	5												
	C	5	5	5												
	D	5	5	5												

Note: Use surrogate test chamber to determine temperature, DO, pH, and Conductivity measurements @ 24 hrs (to avoid injuring the organisms).

CETIS Summary Report

Ceriodaphnia 48-h Acute Survival Test — **Eurofins TestAmerica - Corvallis**

Batch ID:	12-8859-1506	**Test Type:**	Survival (48h)	**Analyst:**	Michelle Bennett
Start Date:	18 May-21 15:50	**Protocol:**	EPA/821/R-02-012 (2002)	**Diluent:**	Mod-Hard Synthetic Water
Ending Date:	20 May-21 15:10	**Species:**	Ceriodaphnia dubia	**Brine:**	
Test Length:	47h	**Taxon:**		**Source:**	In-House Culture **Age:** <24
Sample ID:	02-6854-3994	**Code:**	B5059-01	**Project:**	
Sample Date:	17 May-21 08:00	**Material:**	POTW Effluent	**Source:**	Woodland, City of (WA0020401)
Receipt Date:	18 May-21 11:00	**CAS (PC):**		**Station:**	
Sample Age:	32h (3 °C)	**Client:**			

Comments: -03 sample was out of hold time and temp, not used for testing. MB 06/05/21

Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	✓ NOEL	LOEL	TOEL	PMSD	TU	S
15-9383-2135	48h Survival Rate	Steel Many-One Rank Sum Test	100	>100	---	12.9%	1	1

Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	✓ Level	%	95% LCL	95% UCL	TU	S
07-5155-9796	48h Survival Rate	Linear Interpolation (ICPIN)	EC50	>100	---	---	<1	1

Test Acceptability

				TAC Limits			
Analysis ID	**Endpoint**	**Attribute**	**Test Stat**	**Lower**	**Upper**	**Overlap**	**Decision**
07-5155-9796	48h Survival Rate	Control Resp	0.95	0.9	>>	Yes	Passes Criteria
15-9383-2135	48h Survival Rate	Control Resp	0.95	0.9	>>	Yes	Passes Criteria

48h Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	D	4	0.9500	0.7909	1.1090	0.8000	1.0000	0.0500	0.1000	10.53%	0.00%
1.4		4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	---	-5.26%
10		4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	---	-5.26%
19		4	0.9500	0.7909	1.1090	0.8000	1.0000	0.0500	0.1000	10.53%	0.00%
50		4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	---	-5.26%
100		4	0.9500	0.7909	1.1090	0.8000	1.0000	0.0500	0.1000	10.53%	0.00%

48h Survival Rate Detail — MD5: 768657E85C584861E19076E5177F3864

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	1.0000	0.8000	1.0000	1.0000
1.4		1.0000	1.0000	1.0000	1.0000
10		1.0000	1.0000	1.0000	1.0000
19		1.0000	0.8000	1.0000	1.0000
50		1.0000	1.0000	1.0000	1.0000
100		0.8000	1.0000	1.0000	1.0000

48h Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	5/5	4/5	5/5	5/5
1.4		5/5	5/5	5/5	5/5
10		5/5	5/5	5/5	5/5
19		5/5	4/5	5/5	5/5
50		5/5	5/5	5/5	5/5
100		4/5	5/5	5/5	5/5

Ceriodaphnia 48-h Acute Survival Test — **Eurofins TestAmerica - Corvallis**

Analysis ID:	15-9383-2135	**Endpoint:**	48h Survival Rate	**CETIS Version:**	CETISv1.9.7
Analyzed:	05 Jun-21 14:49	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1
Edit Date:	05 Jun-21 14:48	**MD5 Hash:**	768657E85C584861E19076E5177F3864	**Editor ID:**	006-834-630-9

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	MSDu	PMSD
Angular (Corrected)	C > T	100	>100	---	1	0.1225	12.90%

Steel Many-One Rank Sum Test

Control	vs	Conc-%	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Dilution Water		1.4	20	10	1	6	CDF	0.9516	Non-Significant Effect
		10	20	10	1	6	CDF	0.9516	Non-Significant Effect
		19	18	10	2	6	CDF	0.8333	Non-Significant Effect
		50	20	10	1	6	CDF	0.9516	Non-Significant Effect
		100	18	10	2	6	CDF	0.8333	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0212655	0.0042531	5	0.6	0.7006	Non-Significant Effect
Error	0.127593	0.0070885	18			
Total	0.148858		23			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Bartlett Equality of Variance Test				Indeterminate
Distribution	Shapiro-Wilk W Normality Test	0.6694	0.884	<1.0E-05	Non-Normal Distribution

48h Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	4	0.9500	0.7909	1.0000	1.0000	0.8000	1.0000	0.0500	10.53%	0.00%
1.4		4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	-5.26%
10		4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	-5.26%
19		4	0.9500	0.7909	1.0000	1.0000	0.8000	1.0000	0.0500	10.53%	0.00%
50		4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	-5.26%
100		4	0.9500	0.7909	1.0000	1.0000	0.8000	1.0000	0.0500	10.53%	0.00%

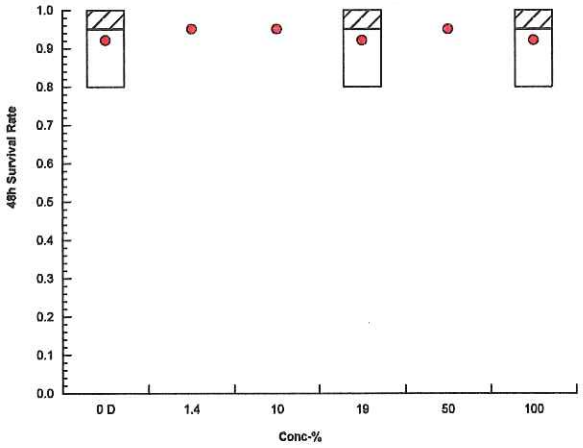
Angular (Corrected) Transformed Summary

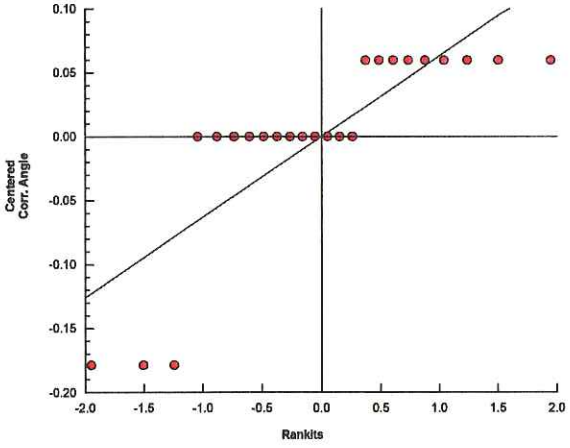
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	4	1.2860	1.0960	1.4750	1.3450	1.1070	1.3450	0.0595	9.26%	0.00%
1.4		4	1.3450	1.3450	1.3460	1.3450	1.3450	1.3450	0.0000	0.00%	-4.63%
10		4	1.3450	1.3450	1.3460	1.3450	1.3450	1.3450	0.0000	0.00%	-4.63%
19		4	1.2860	1.0960	1.4750	1.3450	1.1070	1.3450	0.0595	9.26%	0.00%
50		4	1.3450	1.3450	1.3460	1.3450	1.3450	1.3450	0.0000	0.00%	-4.63%
100		4	1.2860	1.0960	1.4750	1.3450	1.1070	1.3450	0.0595	9.26%	0.00%

Ceriodaphnia 48-h Acute Survival Test — **Eurofins TestAmerica - Corvallis**

Analysis ID:	15-9383-2135	**Endpoint:**	48h Survival Rate	**CETIS Version:**	CETISv1.9.7
Analyzed:	05 Jun-21 14:49	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1
Edit Date:	05 Jun-21 14:48	**MD5 Hash:**	768657E85C584861E19076E5177F3864	**Editor ID:**	006-834-630-9

Graphics





CETIS Analytical Report

Ceriodaphnia 48-h Acute Survival Test — **Eurofins TestAmerica - Corvallis**

Analysis ID:	07-5155-9796	**Endpoint:**	48h Survival Rate	**CETIS Version:**	CETISv1.9.7
Analyzed:	05 Jun-21 14:49	**Analysis:**	Linear Interpolation (ICPIN)	**Status Level:**	1
Edit Date:	05 Jun-21 14:48	**MD5 Hash:**	768657E85C584861E19076E5177F3864	**Editor ID:**	006-834-630-9

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Log(X+1)	Linear	733503	200	Yes	Two-Point Interpolation

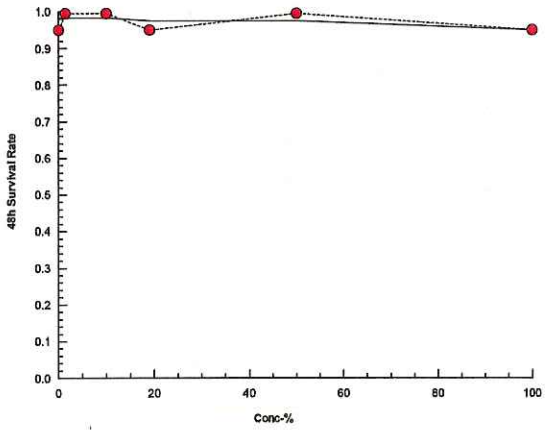
Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
EC50	>100	---	---	<1	---	---

48h Survival Rate Summary

			Calculated Variate(A/B)							Isotonic Variate	
Conc-%	Code	Count	Mean	Median	Min	Max	CV%	%Effect	A/B	Mean	%Effect
0	D	4	0.9500	1.0000	0.8000	1.0000	10.53%	0.00%	19/20	0.9833	0.00%
1.4		4	1.0000	1.0000	1.0000	1.0000	0.00%	-5.26%	20/20	0.9833	0.00%
10		4	1.0000	1.0000	1.0000	1.0000	0.00%	-5.26%	20/20	0.9833	0.00%
19		4	0.9500	1.0000	0.8000	1.0000	10.53%	0.00%	19/20	0.9750	0.85%
50		4	1.0000	1.0000	1.0000	1.0000	0.00%	-5.26%	20/20	0.9750	0.85%
100		4	0.9500	1.0000	0.8000	1.0000	10.53%	0.00%	19/20	0.9500	3.39%

Graphics



TestAmerica

96 HOUR FRESHWATER TOXICITY TEST SURVIVAL AND WATER QUALITY DATA

Random Template Used: 6 conc. x 4 reps. # 11

Sample Description

Client: City of Woodland

Test Species: *Pimephales promelas* ID# FHM 2158

Waterbath/Incubator Used: # 7

Initial Sample ID # B 5059

		0 hr	24 hr	48 hr	72 hr	96 hr
Technician		TC	TC	TC	TC	MS
Time		13:31	10:38	14:07	09:29	11:40
Therm. ID#		# 267	# 267	# 251	# 267	# 267

Test Initiation Date: 5/19/20 21 Time: 13:31

Termination Date: 5/24/20 21 Time: 11:40

Percent	Test Container Number	Number of Live Organisms 0	24	48	72	96	Dissolved Oxygen (mg/l) 0	24	48	72	96	pH 0	24	48	72	96	Temperature (°C) 0	24	48	72	96	Conductivity (µmohs/cm) 0	24	48	72	96
Control	A	10	10	10	10	10	7.6	7.2	7.0 / 7.4	6.6	6.4	7.8	7.5	7.6 / 8.1	7.8	7.4	20.3	20.1	19.9	20.1	20.3	310		344 / 317		338
	B	10	10	10	10	10																				
	C	10	10	10	10	10																				
	D	10	10	10	10	10																				
1.4	A	10	9	~~10~~ 9	9	9	7.8	7.2	7.1 / 7.5	6.7	6.5	7.8	7.5	7.6 / 8.1	7.6	7.5	20.3	20.1	19.8	20.0	20.1	312		334 / 318		339
	B	10	10	10	10	10																				
	C	10	10	10	10	10																				
	D	10	10	10	10	10																				
10	A	10	10	10	10	10	8.0	7.3	7.1 / 7.6	6.9	6.4	7.7	7.4	7.7 / 7.9	7.5	7.6	20.2	20.1	19.3	19.9	20.3	355		376 / 333		334 / ~~334~~ 336
	B	10	10	10	10	10																				
	C	10	10	10	10	10																				
	D	10	10	10	10	10																				

5-21

* Pull - TC 5/20/21

TestAmerica

96 HOUR FRESHWATER TOXICITY TEST SURVIVAL AND WATER QUALITY DATA

Random Template Used: 6 conc. x 4 reps. # 11

Sample Description

Client: City of Woodland

Test Species: *Pimephales promelas* ID# FHM 2158

Waterbath/Incubator Used: # 7

Initial Sample ID # B

		0 hr	24 hr	48 hr	72 hr	96 hr
Technician		TC	TC	TC	TC	MS
Time		13:31	10:38	14:07	09:29	11:40
Therm. ID#	#	267	267	191	267	# 267

Test Initiation Date: 5/19/2021 Time: 13:31

Termination Date: 5/22/2021 Time: 11:40

Percent	Test Container Number	Number of Live Organisms 0	24	48	72	96	Dissolved Oxygen (mg/l) 0	24	48	72	96	pH 0	24	48	72	96	Temperature (°C) 0	24	48	72	96	Conductivity (µmohs/cm) 0	24	48	72	96
19	A	10	10	10	10	10	8.0	7.3	7.1 / 7.6	7.1	6.9	7.6	7.3	7.7 / 7.8	7.4	7.9	20.0	20.0	19.8	19.9	20.1	404		415 / 411		434
	B	10	10	10	10	10																				
	C	10	10	10	10	10																				
	D	10	10	10	10	10																				
50	A	10	10	10	10	10	8.0	7.3	7.1 / 7.6	6.9	7.0	7.4	7.3	7.7 / 7.6	7.3	7.9	19.6	20.0	19.8	20.0	20.1	557		564 / 542		611
	B	10	10	10	10	10																				
	C	10	10	10	10	10																				
	D	10	10	10	10	10																				
100	A	10	10	10	9	9	8.2	7.3	7.9 / 7.7	6.9	6.9	7.2	7.5	7.9 / 7.9	7.5	8.1	19.1	20.0	19.9	20.0	20.1	794		504 / 546		885
	B	10	10	10	10	10																				
	C	10	10	10	10	10																				
	D	10	10	10	10	10																				

(R) R206 TC 5/20/21

R206 5.22.21

CETIS Summary Report

Report Date: 21 Jun-21 10:40 (p 1 of 1)
Test Code/ID: B505901ppa / 03-6144-6883

Fathead Minnow 96-h Acute Survival Test — **Eurofins TestAmerica - Corvallis**

Batch ID:	02-9959-8378	**Test Type:**	Survival (96h)	**Analyst:**	Michelle Bennett	
Start Date:	18 May-21 13:31	**Protocol:**	EPA/821/R-02-012 (2002)	**Diluent:**	Mod-Hard Synthetic Water	
Ending Date:	22 May-21 11:40	**Species:**	Pimephales promelas	**Brine:**		
Test Length:	94h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR	**Age:** 8D
Sample ID:	02-6854-3994	**Code:**	B5059-01	**Project:**		
Sample Date:	17 May-21 08:00	**Material:**	POTW Effluent	**Source:**	Woodland, City of (WA0020401)	
Receipt Date:	18 May-21 11:00	**CAS (PC):**		**Station:**		
Sample Age:	30h (3 °C)	**Client:**				

Comments: -03 sample was out of hold time and temp, not used for testing. MB 06/05/21

Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	NOEL	LOEL	TOEL	PMSD	TU	S
12-3420-1326	96h Survival Rate	Steel Many-One Rank Sum Test	100	>100	---	5.6%	1	1

Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	Level	%	95% LCL	95% UCL	TU	S
07-9012-2615	96h Survival Rate	Linear Interpolation (ICPIN)	EC50	>100	---	---	<1	1

Test Acceptability

				TAC Limits			
Analysis ID	**Endpoint**	**Attribute**	**Test Stat**	**Lower**	**Upper**	**Overlap**	**Decision**
07-9012-2615	96h Survival Rate	Control Resp	1	0.9	>>	Yes	Passes Criteria
12-3420-1326	96h Survival Rate	Control Resp	1	0.9	>>	Yes	Passes Criteria

96h Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	D	4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	---	0.00%
1.4		4	0.9750	0.8954	1.0550	0.9000	1.0000	0.0250	0.0500	5.13%	2.50%
10		4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	---	0.00%
19		4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	---	0.00%
50		4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	---	0.00%
100		4	0.9750	0.8954	1.0550	0.9000	1.0000	0.0250	0.0500	5.13%	2.50%

96h Survival Rate Detail — MD5: 2A27083C9A6992B0D462BFB1A8DE8904

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	1.0000	1.0000	1.0000	1.0000
1.4		0.9000	1.0000	1.0000	1.0000
10		1.0000	1.0000	1.0000	1.0000
19		1.0000	1.0000	1.0000	1.0000
50		1.0000	1.0000	1.0000	1.0000
100		0.9000	1.0000	1.0000	1.0000

96h Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	10/10	10/10	10/10	10/10
1.4		9/10	10/10	10/10	10/10
10		10/10	10/10	10/10	10/10
19		10/10	10/10	10/10	10/10
50		10/10	10/10	10/10	10/10
100		9/10	10/10	10/10	10/10

Fathead Minnow 96-h Acute Survival Test — **Eurofins TestAmerica - Corvallis**

Analysis ID:	12-3420-1326	**Endpoint:**	96h Survival Rate	**CETIS Version:**	CETISv1.9.7
Analyzed:	21 Jun-21 10:39	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1
Edit Date:	21 Jun-21 10:38	**MD5 Hash:**	2A27083C9A6992B0D462BFB1A8DE8904	**Editor ID:**	006-834-630-9

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	MSDu	PMSD
Angular (Corrected)	C > T	100	>100	---	1	0.05598	5.60%

Steel Many-One Rank Sum Test

Control	vs	Conc-%	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Dilution Water		1.4	16	10	1	6	CDF	0.6105	Non-Significant Effect
		10	18	10	1	6	CDF	0.8333	Non-Significant Effect
		19	18	10	1	6	CDF	0.8333	Non-Significant Effect
		50	18	10	1	6	CDF	0.8333	Non-Significant Effect
		100	16	10	1	6	CDF	0.6105	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0088531	0.0017706	5	0.8	0.5640	Non-Significant Effect
Error	0.039839	0.0022133	18			
Total	0.0486921		23			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Bartlett Equality of Variance Test				Indeterminate
Distribution	Shapiro-Wilk W Normality Test	0.6154	0.884	<1.0E-05	Non-Normal Distribution

96h Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
1.4		4	0.9750	0.8954	1.0000	1.0000	0.9000	1.0000	0.0250	5.13%	2.50%
10		4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
19		4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
50		4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
100		4	0.9750	0.8954	1.0000	1.0000	0.9000	1.0000	0.0250	5.13%	2.50%

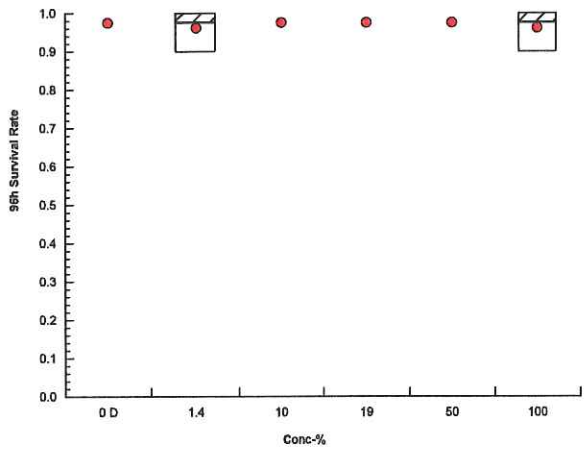
Angular (Corrected) Transformed Summary

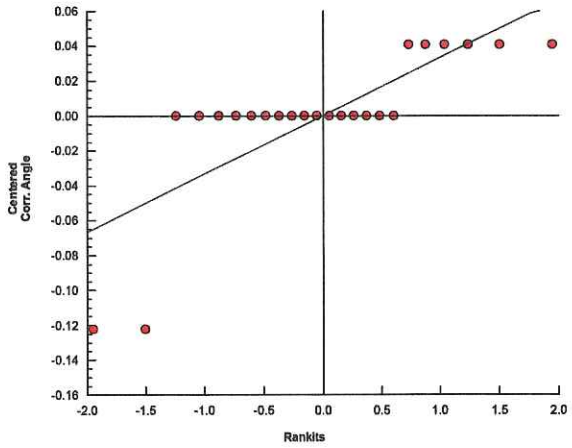
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	4	1.4120	1.4120	1.4120	1.4120	1.4120	1.4120	0.0000	0.00%	0.00%
1.4		4	1.3710	1.2420	1.5010	1.4120	1.2490	1.4120	0.0407	5.94%	2.89%
10		4	1.4120	1.4120	1.4120	1.4120	1.4120	1.4120	0.0000	0.00%	0.00%
19		4	1.4120	1.4120	1.4120	1.4120	1.4120	1.4120	0.0000	0.00%	0.00%
50		4	1.4120	1.4120	1.4120	1.4120	1.4120	1.4120	0.0000	0.00%	0.00%
100		4	1.3710	1.2420	1.5010	1.4120	1.2490	1.4120	0.0407	5.94%	2.89%

Fathead Minnow 96-h Acute Survival Test — **Eurofins TestAmerica - Corvallis**

Analysis ID:	12-3420-1326	**Endpoint:**	96h Survival Rate	**CETIS Version:**	CETISv1.9.7
Analyzed:	21 Jun-21 10:39	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1
Edit Date:	21 Jun-21 10:38	**MD5 Hash:**	2A27083C9A6992B0D462BFB1A8DE8904	**Editor ID:**	006-834-630-9

Graphics





CETIS Analytical Report

Fathead Minnow 96-h Acute Survival Test — **Eurofins TestAmerica - Corvallis**

Analysis ID:	07-9012-2615	**Endpoint:**	96h Survival Rate	**CETIS Version:**	CETISv1.9.7
Analyzed:	21 Jun-21 10:39	**Analysis:**	Linear Interpolation (ICPIN)	**Status Level:**	1
Edit Date:	21 Jun-21 10:38	**MD5 Hash:**	2A27083C9A6992B0D462BFB1A8DE8904	**Editor ID:**	006-834-630-9

Linear Interpolation Options

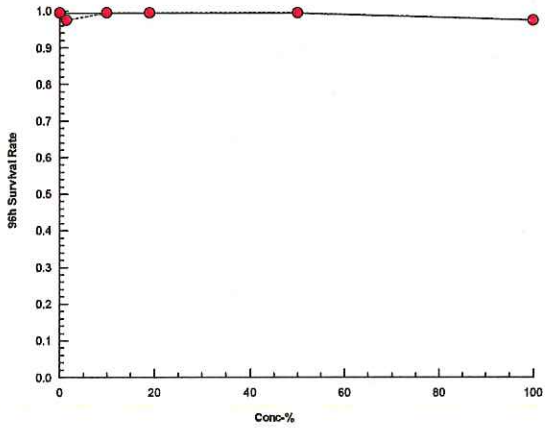
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Log(X+1)	Linear	695095	200	Yes	Two-Point Interpolation

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
EC50	>100	---	---	<1	---	---

96h Survival Rate Summary			Calculated Variate(A/B)							Isotonic Variate	
Conc-%	Code	Count	Mean	Median	Min	Max	CV%	%Effect	A/B	Mean	%Effect
0	D	4	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	40/40	1.0000	0.00%
1.4		4	0.9750	1.0000	0.9000	1.0000	5.13%	2.50%	39/40	0.9937	0.63%
10		4	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	40/40	0.9937	0.63%
19		4	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	40/40	0.9937	0.63%
50		4	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	40/40	0.9937	0.63%
100		4	0.9750	1.0000	0.9000	1.0000	5.13%	2.50%	39/40	0.9750	2.50%

Graphics



TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Ceriodaphnia dubia
Survival and Reproduction
Test Data Summary

Client: City of Woodland Test Start Date: 05/18/2021

Sample Description: Initial Sample ID#: B 5059-01

Data summarized by: MB

Percent or Concentration	Total Live Young Produced in First 3 Broods per Replicate										# Alive Adults	Total Live Young
	A	B	C	D	E	F	G	H	I	J		
Control	27	26	22	27	23	0	28	18	20	20	9	211
	AD?	AD?	AD?	AD?	AD?	AD? x	AD?	AD?	AD?	AD?		
1.4 %	23	14	10	26	28	26	20	23	21	23	9	214
	AD?	AD?	AD?	AD?	AD?	AD?	AD?	AD?	AD? x	AD?		
10 %	0	20	4	24	23	18	19	24	18	21	9	171
	AD?	AD?	AD? x	AD?	AD?	AD?	AD?	AD?	AD?	AD?		
19 %	2	29	22	22	21	24	21	19	18	23	9	201
	AD? x	AD?	AD?	AD?	AD?	AD?	AD?	AD?	AD?	AD?		
50 %	4	25	22	22	21	23	22	22	10	23	10	194
	AD?	AD?	AD?	AD?	AD?	AD?	AD?	AD?	AD?	AD?		
100 %	29	20	0	15	0	18	0	24	28	28	8	162
	AD?	AD?	AD? x	AD?	AD? x	AD?	AD?	AD?	AD?	AD?		

Survival data summarized through Day 7. 60%+ of surviving controls with 3+ broods first observed on Day 8.

Test Organism Mortality (Adult dead) = AD? ✓

Test Organism identified as Male = AD? M

Test Organism Injured during test = AD? I

# of Alive Adults = Number of test organism alive at termination (for WDOE only, = Number of test organisms alive at Day 7)

Total Live Young = Total neonates produced in first 3 broods

Footnote: As per EPA-600-4-91-002 and EPA-821-R-02-013, *Ceriodaphnia dubia* test should be terminated when 60% of the surviving control organisms have produced their third brood, or at the end of eight days, whichever occurs first.

Also as per EPA-821-R-02-013 (13.10.9.1), "In this three-brood test, offspring from fourth or higher broods should not be counted and should not be included in the total number of neonates produced during the test."

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

CERIODAPHNIA CHRONIC SURVIVAL AND REPRODUCTION DATA

Neo's obtained from	A	B	C	D	E	F	G	H	I	J
Culture Board ID:	P	P	P	P	P	P	P	P	P	D
Slot #:	34	56	58	10	16	26	46	54	50	16

Incubator Used: # 5
Random Template Used: 6 conc # 12

Client: City of Woodland
Sample Description:
Initial Sample ID # B505959 - 01

Test Initiation: Date: 5/18/2021 Time: 12:25
Termination: Date: 5/26/2021 Time: 12:00

Technician: Day 0 Jm Day 1 Jm Day 2 Jm Day 3 JRM Day 4 MS Day 5 JRM Day 6 Jm Day 7 Jm Day 8 Jm
Time: Day 0 1225 Day 1 1125 Day 2 1048 Day 3 1110 Day 4 1240 Day 5 1115 Day 6 1510 Day 7 1120 Day 8 1200

Percent	Day	Daily Number of Live Young for each Replicate A	B	C	D	E	F	G	H	I	J	No. Live Adults	Daily Total Live Young
Control	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	0	0	0	0	0	0	0	0	0	10	0
	4	0	0	4	0	0	0 AD	0	2	3	0	9	9
	5	4	6	0	5	4		8	6	0	0	9	35
	6	0	0	9	10	8		11	0	9	8	9	55
	7	12	10	9	0	0		0	10	8	12	9	61
	8	9	10	(8)	12	11		9	(13)	8	0	9	51+ (8)
1.4%	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	0	0	0	0	0	0	0	0	0	10	0
	4	0	2	0	0	0	0	2	3	4	4	10	12
	5	5	5	4	5	6	5	6	5	0	0	10	37 41
	6	7	8	3	0	10	10	12	10	9	8	10	69
	7	0	7	2 pup	11	0	0	0	0	8 AD	11	9	39
	8	11	(8)	1/0	10	12	11	(13)	2	1	0	9	53+ (8)
10%	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	0	0	0	0	0	0	0	0	0	10	0
	4	0	0	0	3	0	2	3	2	0	3	10	13
	5	0	5	4	8	4	0	5	8	0	0	10	34
	6	0 F	7	1+4 AD	0	10	7	0	0	9	7	9	40
	7	0	0	1	13	0	9	11	14	9	0	9	56
	8	0	8	1	(13)	9	0	(10)	(12)	0	11	9	22+ (0)
19%	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	0	0	0	0	0	0	0	0	0	10	0
	4	2	0	2	3	3	3	4	2	2	2	10	23
	5	0 AD	5	8	5	8	10	6	8	0	0	9	50
	6		10	0	0	10	11	11	8 F	9	10	9	69
	7		0	12	14	0	0	0	1/0	0	11	9	38
	8		14	(14)	(13)	(12)	(15)	(13)	(15)	7	0	9	21+ (0)
50%	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	0	0	0	0	0	0	0	0	0	10	0
	4	0	4	4	4	4	4	5	3	0	3	10	31
	5	4	8	8	8	8	8	6	8	0	0	10	58
	6	0	0	10	10	9	11	0	11	5	8	10	64
	7	0	13	0	0	0	0	11	0	5	12	10	41
	8	0	(13)	(13)	(13)	(12)	(15)	(14)	(14)	0	0	10	0+ (0)
100%	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	0	0	0	0	0	0	0	0	0	10	0
	4	4	4	0	2	0	3	0	4	0	0	10	4
	5	1/0	8	0 AD	5	0	8	0	8	4	5	10	22
	6	13	8		8	2 0 AD	7	0 F	10	0	0	9	30
	7	11	0		0	1	0	0	3/0	11	11	8	65
	8	0	(15)		(8)		(13)	0	(2)	13	12	8	38
										(13)	0	8	0+1 (1)

"AD" = Adult Dead, "AY" = Aborted young, "M" = male organism, "F" = Female, "R" = Adult releasing young, " / " = split brood (carry-over brood / current day brood),
"Inj" = Adult Injured during test solution renewal, replicate removed from analysis. "AM" = Adult missing, remove from analysis. A circled neonate count = 4th brood

Footnote: As per WDOE, C. dubia test reproduction should be when 60% of the surviving control organisms have produced their third brood (Days 6, 7, or 8). Survival is at seven days.

R06 MB 6/5/21

TestAmerica

CERIODAPHNIA WATER QUALITY DATA

Client: City of Woodland
Sample Description:
Initiated Date: 5/18/2021 Time: 12:25
Initial Sample ID #: B505-9 - 01
Adults Isolated Date: 5/17/2021 Time: 15:31
Neo's Collected Date: 5/17/2021 Time: 23:23

Tech: Day 0	BW	Day 1	BW	Day 2	BW	Day 3	ABL	Day 4	MG	Day 5	ABL	Day 6	BW	Day 7	BW	Day 8	BW
Time Day 0	13:40	Day 1	14:35	Day 2	15:25	Day 3	11:50	Day 4	12:40	Day 5	13:05	Day 6	15:20	Day 7	14:00	Day 8	14:45
Therm. Day 0 #	251	Day 1 #	251	Day 2 #	251	Day 3 #	251	Day 4 #	251	Day 5 #	251	Day 6 #	251	Day 7 #	251	Day 8 #	251

Dissolved Oxygen (mg/l)

%	Day 0	1	2	3	4	5	6	7	8
Control	7.4	7.9 / 7.3	7.8 / 6.7	8.0 / 7.0	6.8 / 6.8	8.3 / 7.8	7.2 / 6.7	6.8 / 6.0	8.0
1.4 %	7.4	7.9 / 7.4	7.9 / 6.8	7.9 / 6.9	6.9 / 6.9	8.0 / 7.8	7.8 / 6.8	6.9 / 6.2	8.1
10 %	7.4	8.2 / 7.5	7.9 / 6.9	8.1 / 6.9	6.9 / 6.9	8.8 / 7.7	7.5 / 6.9	6.9 / 6.3	8.1
19 %	7.5	8.2 / 7.5	8.0 / 7.0	8.1 / 7.0	6.9 / 7.1	8.8 / 7.8	7.6 / 7.0	6.8 / 6.5	8.1
50 %	7.8	8.4 / 7.6	7.9 / 7.1	8.2 / 7.0	7.0 / 7.0	8.8 / 7.9	7.6 / 7.1	6.9 / 6.5	8.1
100 %	7.6	8.4 / 7.6	8.1 / 7.2	8.4 / 7.1	7.0 / 7.1	8.8 / 8.8	7.5 / 7.2	6.8 / 6.7	8.1

pH

%	Day 0	1	2	3	4	5	6	7	8
Control	7.9	7.7 / 7.8	7.9 / 7.7	7.8 / 7.8	8.4 / 7.5	7.9 / 8.0	7.9 / 7.9	7.9 / 7.7	8.0
1.4 %	7.9	7.7 / 7.8	7.9 / 7.7	7.8 / 7.7	8.0 / 7.9	7.9 / 8.0	7.9 / 7.9	7.9 / 7.8	8.1
10 %	7.8	7.7 / 7.7	7.9 / 7.7	7.9 / 7.7	8.0 / 7.8	7.9 / 7.9	7.9 / 7.9	7.9 / 7.8	8.1
19 %	7.9	7.8 / 7.7	8.0 / 7.6	8.0 / 7.6	8.1 / 7.7	8.0 / 7.8	8.1 / 7.7	8.0 / 7.8	8.1
50 %	7.6	7.9 / 7.6	8.1 / 7.5	8.1 / 7.6	8.2 / 7.4	8.2 / 7.7	8.2 / 7.6	8.1 / 7.8	8.2
100 %	7.6	8.1 / 7.7	8.3 / 7.6	8.3 / 7.5	8.4 / 7.5	8.3 / 7.8	8.4 / 7.7	8.3 / 7.8	8.3

Temperature (°C) / Conductivity (µS) (1st use of each sample only)

%	Day 0	1	2	3	4	5	6	7	8
Control	25.3 / 301	25.3	25.5 / 315	25.1	25.1	25.5	25.4 / 334	25.4	25.3
1.4 %	25.2 / 313	24.8	24.6 / 322	24.6	25.3	25.5	25.3 / 345	25.2	25.1
10 %	25.2 / 353	24.9	24.7 / 362	24.8	25.0	24.6	24.2 / 390	24.3	24.4
19 %	25.2 / 399	25.1	25.2 / 416	25.1	25.1	25.4	25.2 / 437	25.3	24.8
50 %	25.1 / 852	25.1	25.1 / 581	25.2	25.1	25.5	25.2 / 590	25.2	24.8
100 %	25.2 / 792	25.1	25.3 / 850	25.1	25.1	25.2	25.4 / 855	25.4	25.2

COMMENTS: Temperatures taken just prior to test solution renewals. DO, pH, and Conductivity taken following organism transfer.

23.8 = Temp out of recom. range

Note: All Day 0 data represents conditions at initiation. All other days: numerator represents pre-renewal conditions, denominator represents post-renewal conditions.

Ceriodaphnia 7-d Survival and Reproduction Test — **Eurofins TestAmerica - Corvallis**

Batch ID:	05-2205-1063	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Michelle Bennett		
Start Date:	18 May-21 12:25	**Protocol:**	EPA/821/R-02-013 (2002)	**Diluent:**	Mod-Hard Synthetic Water		
Ending Date:	26 May-21 12:00	**Species:**	Ceriodaphnia dubia	**Brine:**			
Test Length:	8d	**Taxon:**		**Source:**	In-House Culture	**Age:**	<24

Sample ID:	02-6854-3994	**Code:**	B5059-01	**Project:**	
Sample Date:	17 May-21 08:00	**Material:**	POTW Effluent	**Source:**	Woodland, City of (WA0020401)
Receipt Date:	18 May-21 11:00	**CAS (PC):**		**Station:**	
Sample Age:	28h (3 °C)	**Client:**			

Comments: -03 sample was out of hold time and temp, not used for testing. MB 06/05/21

Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	✓	NOEL	LOEL	TOEL	PMSD	TU	S
13-6999-8371	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test		100	>100	---	---	1	1
09-4536-0032	Reproduction	Steel Many-One Rank Sum Test		100	>100	---	40.0%	1	1

Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	✓	Level	%	95% LCL	95% UCL	TU	S
05-5524-0856	Reproduction	Linear Interpolation (ICPIN)		IC25	>100	---	---	<1	1

Test Acceptability

TAC Limits

Analysis ID	Endpoint	Attribute	Test Stat	Lower	Upper	Overlap	Decision
13-6999-8371	7d Survival Rate	Control Resp	0.9	0.8	>>	Yes	Passes Criteria
05-5524-0856	Reproduction	Control Resp	21.1	15	>>	Yes	Passes Criteria
09-4536-0032	Reproduction	Control Resp	21.1	15	>>	Yes	Passes Criteria
09-4536-0032	Reproduction	PMSD	0.4002	0.13	0.47	Yes	Passes Criteria

7d Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	D	10	0.9000	0.6738	1.1260	0.0000	1.0000	0.1000	0.3162	35.14%	0.00%
1.4		10	0.9000	0.6738	1.1260	0.0000	1.0000	0.1000	0.3162	35.14%	0.00%
10		10	0.9000	0.6738	1.1260	0.0000	1.0000	0.1000	0.3162	35.14%	0.00%
19		10	0.9000	0.6738	1.1260	0.0000	1.0000	0.1000	0.3162	35.14%	0.00%
50		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	---	-11.11%
100		10	0.8000	0.4984	1.1020	0.0000	1.0000	0.1333	0.4216	52.70%	11.11%

Reproduction Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	D	10	21.1	15.25	26.95	0	28	2.588	8.185	38.79%	0.00%
1.4		10	21.4	17.41	25.39	10	28	1.765	5.582	26.08%	-1.42%
10		10	17.1	11.15	23.05	0	24	2.631	8.319	48.65%	18.96%
19		10	20.1	15.07	25.13	2	29	2.223	7.031	34.98%	4.74%
50		10	19.4	14.56	24.24	4	25	2.141	6.769	34.89%	8.06%
100		10	16.2	7.571	24.83	0	29	3.815	12.06	74.46%	23.22%

Ceriodaphnia 7-d Survival and Reproduction Test — **Eurofins TestAmerica - Corvallis**

7d Survival Rate Detail — MD5: 4F25C9238D56D9581268F36DCE8C4B68

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	D	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000
1.4		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000
10		1.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
19		0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
50		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	0.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000

Reproduction Detail — MD5: F05821FCB7A3ACF377C55EF8F78497E9

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	D	27	26	22	27	23	0	28	18	20	20
1.4		23	14	10	26	28	26	20	23	21	23
10		0	20	4	24	23	18	19	24	18	21
19		2	29	22	22	21	24	21	19	18	23
50		4	25	22	22	21	23	22	22	10	23
100		29	20	0	15	0	18	0	24	28	28

7d Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	D	1/1	1/1	1/1	1/1	1/1	0/1	1/1	1/1	1/1	1/1
1.4		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	0/1	1/1
10		1/1	1/1	0/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
19		0/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
50		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
100		1/1	1/1	0/1	1/1	0/1	1/1	1/1	1/1	1/1	1/1

Ceriodaphnia 7-d Survival and Reproduction Test

Eurofins TestAmerica - Corvallis

Analysis ID:	13-6999-8371	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.9.7
Analyzed:	05 Jun-21 15:00	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Edit Date:	05 Jun-21 14:59	**MD5 Hash:**	4F25C9238D56D9581268F36DCE8C4B68	**Editor ID:**	006-834-630-9

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU
Untransformed	C > T	100	>100	---	1

Fisher Exact/Bonferroni-Holm Test

Control	vs	Conc-%	Test Stat	P-Type	P-Value	Decision(α:5%)
Dilution Water		1.4	0.7632	Exact	1.0000	Non-Significant Effect
		10	0.7632	Exact	1.0000	Non-Significant Effect
		19	0.7632	Exact	1.0000	Non-Significant Effect
		50	1.0000	Exact	1.0000	Non-Significant Effect
		100	0.5000	Exact	1.0000	Non-Significant Effect

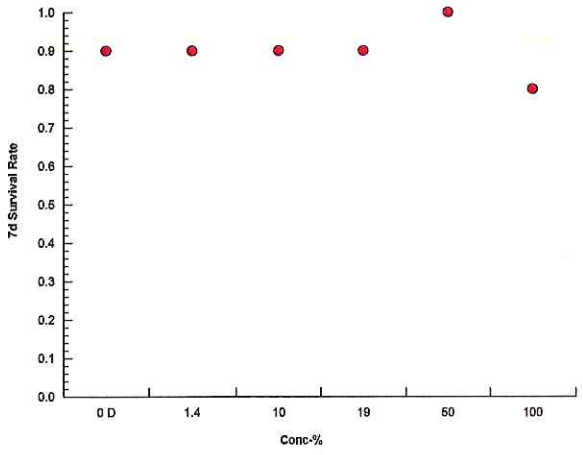
7d Survival Rate Frequencies

Conc-%	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
0	D	9	1	10	0.9000	0.1000	0.00%
1.4		9	1	10	0.9000	0.1000	0.00%
10		9	1	10	0.9000	0.1000	0.00%
19		9	1	10	0.9000	0.1000	0.00%
50		10	0	10	1.0000	0.0000	-11.11%
100		8	2	10	0.8000	0.2000	11.11%

7d Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	10	0.9000	0.6738	1.0000	1.0000	0.0000	1.0000	0.1000	35.14%	0.00%
1.4		10	0.9000	0.6738	1.0000	1.0000	0.0000	1.0000	0.1000	35.14%	0.00%
10		10	0.9000	0.6738	1.0000	1.0000	0.0000	1.0000	0.1000	35.14%	0.00%
19		10	0.9000	0.6738	1.0000	1.0000	0.0000	1.0000	0.1000	35.14%	0.00%
50		10	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	-11.11%
100		10	0.8000	0.4984	1.0000	1.0000	0.0000	1.0000	0.1333	52.70%	11.11%

Graphics



Ceriodaphnia 7-d Survival and Reproduction Test — **Eurofins TestAmerica - Corvallis**

Analysis ID:	09-4536-0032	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.7
Analyzed:	05 Jun-21 15:01	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1
Edit Date:	05 Jun-21 14:59	**MD5 Hash:**	FD9C474E79985EE680432CE892EA5CF4	**Editor ID:**	006-834-630-9

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	MSDu	PMSD
Untransformed	C > T	100	>100	---	1	8.443	40.02%

Steel Many-One Rank Sum Test

Control	vs	Conc-%	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Dilution Water		1.4	103	75	4	18	CDF	0.7843	Non-Significant Effect
		10	86	75	4	18	CDF	0.2336	Non-Significant Effect
		19	98	75	3	18	CDF	0.6322	Non-Significant Effect
		50	96	75	2	18	CDF	0.5631	Non-Significant Effect
		100	97	75	4	18	CDF	0.5980	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	227.083	45.4167	5	0.6677	0.6496	Non-Significant Effect
Error	3673.1	68.0204	54			
Total	3900.18		59			

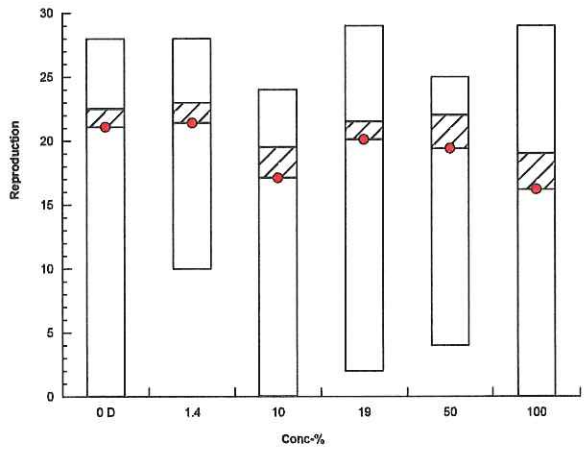
ANOVA Assumptions Tests

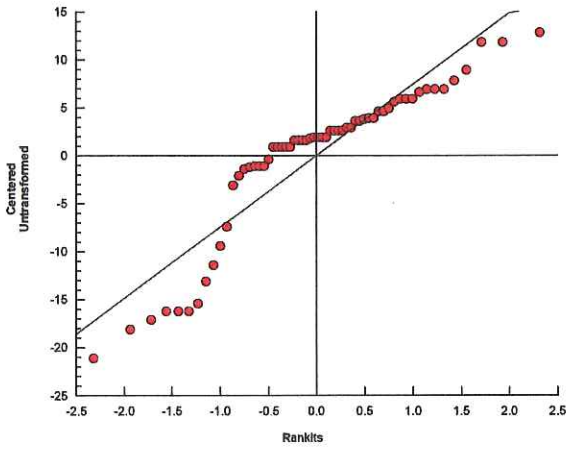
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Bartlett Equality of Variance Test	6.32	15.09	0.2764	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.8604	0.9459	<1.0E-05	Non-Normal Distribution

Reproduction Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	10	21.1	15.25	26.95	22.5	0	28	2.588	38.79%	0.00%
1.4		10	21.4	17.41	25.39	23	10	28	1.765	26.08%	-1.42%
10		10	17.1	11.15	23.05	19.5	0	24	2.631	48.65%	18.96%
19		10	20.1	15.07	25.13	21.5	2	29	2.223	34.98%	4.74%
50		10	19.4	14.56	24.24	22	4	25	2.141	34.89%	8.06%
100		10	16.2	7.571	24.83	19	0	29	3.815	74.46%	23.22%

Graphics





Ceriodaphnia 7-d Survival and Reproduction Test

Eurofins TestAmerica - Corvallis

Analysis ID:	05-5524-0856	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.7
Analyzed:	05 Jun-21 15:01	**Analysis:**	Linear Interpolation (ICPIN)	**Status Level:**	1
Edit Date:	05 Jun-21 14:59	**MD5 Hash:**	FD9C474E79985EE680432CE892EA5CF4	**Editor ID:**	006-834-630-9

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Log(X+1)	Linear	917092	200	Yes	Two-Point Interpolation

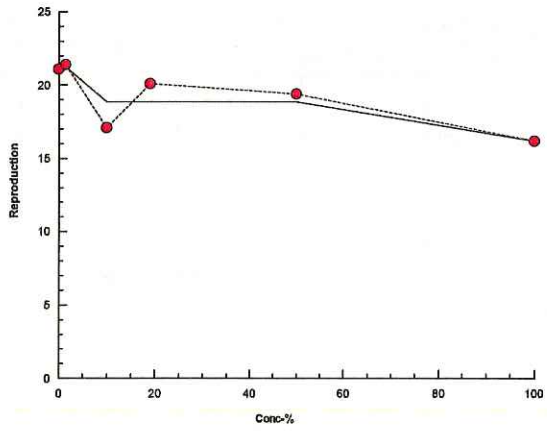
Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC25	>100	---	---	<1	---	---

Reproduction Summary

			Calculated Variate						Isotonic Variate	
Conc-%	Code	Count	Mean	Median	Min	Max	CV%	%Effect	Mean	%Effect
0	D	10	21.1	22.5	0	28	38.79%	0.00%	21.25	0.00%
1.4		10	21.4	23	10	28	26.08%	-1.42%	21.25	0.00%
10		10	17.1	19.5	0	24	48.65%	18.96%	18.87	11.22%
19		10	20.1	21.5	2	29	34.98%	4.74%	18.87	11.22%
50		10	19.4	22	4	25	34.89%	8.06%	18.87	11.22%
100		10	16.2	19	0	29	74.46%	23.22%	16.2	23.76%

Graphics



TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

FATHEAD MINNOW 7-DAY SURVIVAL AND WATER QUALITY DATA

Random Template Used: 6 conc. x 4 reps. # 3 | Waterbath/incubator Used: # 10 | Date Initiated 5/10/2021 Time 14:29

Initial sample ID B 5059 - | Date Terminated 5/25/2021 Time 09:57

Client: City of Woodland | Sample Description:

Tech: Day 0 TC Day 1 TC Day 2 TC Day 3 TC Day 4 MS Day 5 TC Day 6 TC Day 7 TC

Time: Day 0 1429 Day 1 1017 Day 2 1351 Day 3 0926 Day 4 1310 Day 5 1026 Day 6 1339 Day 7 0960

Conc. or Percent	Day	Number of Live Organisms A	B	C	D	Dissolved O_2 (mg/l) Pre	Post	pH Pre	Post	Temp. (°C) Pre	Therm. ID #	Conductivity (µS) Post (1st use)
Control	0	9 10 POM PE start	10	10	10		7.2		8.0	Post: 24.8	251	298
	1	10	10	10	10✓	6.9	7.1	7.5	8.1	25.2	251	
	2	9M POM	10	10	10	6.5	7.8	7.6	8.1	25.1	251	303
	3	9 10 PE start	10	10	10	6.9	7.7	7.6	8.0	24.8	251	
	4	9	10	10	10	5.4	6.7	7.4	7.9	24.6	257	
	5	9✓	10	10	10✓	6.6	8.3	7.5	8.2	25.0	251	
	6	9✓	10✓	10	10	6.9	7.3	7.3	8.2	25.1	251	
	7	9	10	10	10	6.7		7.1		25.0	251	
1.4 %	0	10	10	10	10		7.3		7.9	Post: 24.8		313
	1	10	10	10	10	6.0	7.3	7.5	8.0	25.0		
	2	10	10	10	10✓	6.6	7.9	7.6	8.0	25.0		317
	3	10	10	10	10	6.2	7.7	7.6	8.0	24.7		
	4	10	10	10	10	5.5	7.0	7.4	7.9	24.5		
	5	10	10	9	10	6.5	8.1	7.7	8.2	24.9		
	6	10	10✓	9	10✓	6.9	7.5	7.6	8.1	25.1		
	7	10	10	9	10	6.6		7.6		24.9		
10 %	0	10	10	10	10		7.4		7.7	Post: 24.8		356
	1	10	10	10	10	6.0	7.4	7.5	7.9	24.7		
	2	10	10	10	10	6.5	7.9	7.5	7.9	25.0		363
	3	10	10✓	10	10✓	6.9	7.8	7.5	7.9	24.6		
	4	10	10	10	10	5.6	7.0	7.3	7.8	24.5		
	5	10	10	10	10	6.6	8.4	7.7	8.1	24.9		
	6	10	10	10	10✓	6.0	7.5	7.7	8.1	25.1		
	7	10	10	10	10	6.5		7.6		25.0		
19 %	0	10	10	10	10		7.4		7.6	Post: 24.8		400
	1	10	10	10✓	10	6.2	7.5	7.5	7.7	24.9		pre TC 5/20
	2	10	10	10	10	6.5	7.9	7.5	7.8	25.1		~~403~~ 412
	3	10	10	10	10	6.0	7.3	7.5	7.8	24.8		
	4	10	10	10	10	5.6	7.1	7.3	7.8	24.6		
	5	10	10	10	10	6.5	8.3	7.7	8.0	24.9		
	6	10	10	10	10	6.8	7.6	7.6	7.9	25.1		
	7	10	10	10	10	6.4		7.6		25.0		
50 %	0	10	10	10	10		7.5		7.4	Post: 24.8		552
	1	10✓	10	10	10	6.0	7.7	7.6	7.4	24.2		
	2	9	10	9	9	6.6	8.0	7.5	7.6	25.0		543
	3	9	10	9	9	6.9	7.9	7.5	7.6	24.8		
	4	9	10	9	9	5.6	7.1	7.4	7.6	24.6		
	5	9✓	10	9	9✓	6.6	8.3	7.9	7.8	25.0		
	6	9	10	9	9✓	5.9	7.9	7.5	7.7	25.1		
	7	9	10	9	9	6.7		7.7		25.0		
100 %	0	10	10	10	10		7.5		7.3	Post: 24.8		800
	1	10	10	10	10	6.5	7.8	7.9	7.2	24.2		
	2	10	10	10	10	6.3	8.1	7.7	7.5	25.1		549
	3	10	10			6.6	8.0	7.7	7.4	24.8		
	4	10	9 F M	10	10	5.6	7.2	7.7	7.3	24.5		
	5	10	9	10	10	6.5	8.2	8.0	7.6	25.0		
	6	10	9	10	10	6.7	8.0	7.9	7.6	25.1		
	7	10	9	10	10	5.8		7.7		25.0		

✓ Indicates one organism inadvertently poured off during solution renewal, replaced into container.
"M" = organism missing, start count reduced. "Inj" = organism injured, remove from stats.
"F" = fungus noted on dead organisms.
☐ Aeration in test chambers begun @ _____ (Note observations on Test Organism Info sheet)

Pre =Pre-renewal solutions. Post =Post-renewal solution
Day 0 Temperatures = Post-renewals
Therm ID# = Thermometer ID used for all measurements that day.
(23.8) = Temp. out of recommended range

FATHEAD MINNOW 7-DAY GROWTH DATA

Client: City of Woodland | Tins Labeled As: Wood

Lab ID: B5059 | Start Date: 5/18/2021

Sample Description:

Technician:	TC	ABL
Date:	6/13/2021	5/24/2021
Balance Serial #:	B328543647	B328543647

Percent	Replicate	Total Weight (mg)	Tare Weight (mg)	No. of Fish
Control	A	819.96	809.57	9 of 9
	B	809.26	799.55	10
	C	821.03	812.88	10
	D	820.64	812.43	10
1.4 %	A	828.47	819.43	10
	B	830.98	821.98	10
	C	805.13	796.49	9
	D	815.42	806.22	10
10 %	A	802.28	792.06	10
	B	790.66	782.40	10
	C	827.39	817.31	10
	D	795.80	788.16	10
19 %	A	808.50	800.89	10
	B	810.43	801.07	10
	C	806.44	798.04	10
	D	807.74	798.87	10
50 %	A	804.42	796.34	9
	B	802.86	793.47	10
	C	810.48	801.16	9
	D	806.49	799.29	9
100 %	A	819.35	810.11	10
	B	820.25	811.86	9
	C	794.99	786.74	10
	D	819.36	809.55	10
	A			
	B			
	C			
	D			

weigh to 0.01 mg

FATHEAD MINNOW 7-DAY GROWTH DATA

Client: City of Woodland | Tins Labeled As: Wood

Lab ID: B5059 | Start Date: 5/18/2021

Sample Description:

Technician:		ABL
Date:		5/24/2021
Balance Serial #:	B328543647	B328543647

Percent	Replicate	Total Weight (mg)	Tare Weight (mg)	No. of Fish
Control	A		809.57	9 of 9
	B		799.55	10
	C		812.88	10
	D		812.43	10
1.4 %	A		819.43	10
	B		821.98	10
	C		796.49	9
	D		806.22	10
10 %	A		792.06	10
	B		782.40	10
	C		817.31	10
	D		788.16	10
19 %	A		800.89	10
	B		801.07	10
	C		798.04	10
	D		798.87	10
50 %	A		796.34	9
	B		793.47	10
	C		801.16	9
	D		799.29	9
100 %	A		810.11	10
	B		811.86	9
	C		786.74	10
	D		809.55	10
	A			
	B			
	C			
	D			

weigh to 0.01 mg

Fathead Minnow 7-d Larval Survival and Growth Test — **Eurofins TestAmerica - Corvallis**

Batch ID:	15-8949-9975	**Test Type:**	Growth-Survival (7d)	**Analyst:**	Michelle Bennett		
Start Date:	18 May-21 14:29	**Protocol:**	EPA/821/R-02-013 (2002)	**Diluent:**	Mod-Hard Synthetic Water		
Ending Date:	25 May-21 09:50	**Species:**	Pimephales promelas	**Brine:**			
Test Length:	6d 19h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR	**Age:**	1D
Sample ID:	02-6854-3994	**Code:**	B5059-01	**Project:**			
Sample Date:	17 May-21 08:00	**Material:**	POTW Effluent	**Source:**	Woodland, City of (WA0020401)		
Receipt Date:	18 May-21 11:00	**CAS (PC):**		**Station:**			
Sample Age:	30h (3 °C)	**Client:**					

Comments: -03 sample was out of hold time and temp, not used for testing. MB 06/05/21

Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	NOEL	LOEL	TOEL	PMSD	TU	S
06-3284-4119	7d Survival Rate	Steel Many-One Rank Sum Test	100	>100	---	6.56%	1	1
04-5890-4170	Mean Dry Biomass-mg	Dunnett Multiple Comparison Test	100	>100	---	18.8%	1	1

Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	Level	%	95% LCL	95% UCL	TU	S
17-5003-7062	Mean Dry Biomass-mg	Linear Interpolation (ICPIN)	IC25	>100	---	---	<1	1

Test Acceptability

				TAC Limits			
Analysis ID	Endpoint	Attribute	Test Stat	Lower	Upper	Overlap	Decision
06-3284-4119	7d Survival Rate	Control Resp	1	0.8	>>	Yes	Passes Criteria
04-5890-4170	Mean Dry Biomass-mg	Control Resp	0.9404	0.25	>>	Yes	Passes Criteria
17-5003-7062	Mean Dry Biomass-mg	Control Resp	0.9404	0.25	>>	Yes	Passes Criteria
04-5890-4170	Mean Dry Biomass-mg	PMSD	0.1884	0.12	0.3	Yes	Passes Criteria

7d Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	D	4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	---	0.00%
1.4		4	0.9750	0.8954	1.0550	0.9000	1.0000	0.0250	0.0500	5.13%	2.50%
10		4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	---	0.00%
19		4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	---	0.00%
50		4	0.9250	0.8454	1.0050	0.9000	1.0000	0.0250	0.0500	5.41%	7.50%
100		4	0.9750	0.8954	1.0550	0.9000	1.0000	0.0250	0.0500	5.13%	2.50%

Mean Dry Biomass-mg Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	D	4	0.9404	0.6859	1.195	0.815	1.154	0.07996	0.1599	17.01%	0.00%
1.4		4	0.897	0.8594	0.9346	0.864	0.92	0.01182	0.02364	2.63%	4.61%
10		4	0.905	0.6987	1.111	0.764	1.022	0.06482	0.1296	14.33%	3.76%
19		4	0.856	0.7375	0.9745	0.761	0.936	0.03724	0.07448	8.70%	8.97%
50		4	0.8497	0.6821	1.017	0.72	0.939	0.05269	0.1054	12.40%	9.64%
100		4	0.8923	0.7752	1.009	0.825	0.981	0.03679	0.07358	8.25%	5.12%

Fathead Minnow 7-d Larval Survival and Growth Test — Eurofins TestAmerica - Corvallis

7d Survival Rate Detail — MD5: 358E8C9706280EF2FD230797BB16CC24

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	1.0000	1.0000	1.0000	1.0000
1.4		1.0000	1.0000	0.9000	1.0000
10		1.0000	1.0000	1.0000	1.0000
19		1.0000	1.0000	1.0000	1.0000
50		0.9000	1.0000	0.9000	0.9000
100		1.0000	0.9000	1.0000	1.0000

Mean Dry Biomass-mg Detail — MD5: DE40A59436A83A545B219B2FD779FE4A

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	1.154	0.971	0.815	0.821
1.4		0.904	0.9	0.864	0.92
10		1.022	0.826	1.008	0.764
19		0.761	0.936	0.84	0.887
50		0.808	0.939	0.932	0.72
100		0.924	0.839	0.825	0.981

7d Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	9/9	10/10	10/10	10/10
1.4		10/10	10/10	9/10	10/10
10		10/10	10/10	10/10	10/10
19		10/10	10/10	10/10	10/10
50		9/10	10/10	9/10	9/10
100		10/10	9/10	10/10	10/10

Fathead Minnow 7-d Larval Survival and Growth Test — **Eurofins TestAmerica - Corvallis**

Analysis ID:	06-3284-4119	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.9.7
Analyzed:	17 Jun-21 13:47	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1
Edit Date:	17 Jun-21 13:47	**MD5 Hash:**	358E8C9706280EF2FD230797BB16CC24	**Editor ID:**	006-834-630-9

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	MSDu	PMSD
Angular (Corrected)	C > T	100	>100	---	1	0.06563	6.56%

Steel Many-One Rank Sum Test

Control	vs	Conc-%	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Dilution Water		1.4	16	10	1	6	CDF	0.6105	Non-Significant Effect
		10	18	10	1	6	CDF	0.8333	Non-Significant Effect
		19	18	10	1	6	CDF	0.8333	Non-Significant Effect
		50	12	10	1	6	CDF	0.1424	Non-Significant Effect
		100	16	10	1	6	CDF	0.6105	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0447993	0.0089599	5	2.696	0.0547	Non-Significant Effect
Error	0.0598148	0.0033231	18			
Total	0.104614		23			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Bartlett Equality of Variance Test				Indeterminate
Distribution	Shapiro-Wilk W Normality Test	0.8545	0.884	0.0027	Non-Normal Distribution

7d Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
1.4		4	0.9750	0.8954	1.0000	1.0000	0.9000	1.0000	0.0250	5.13%	2.50%
10		4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
19		4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
50		4	0.9250	0.8454	1.0000	0.9000	0.9000	1.0000	0.0250	5.41%	7.50%
100		4	0.9750	0.8954	1.0000	1.0000	0.9000	1.0000	0.0250	5.13%	2.50%

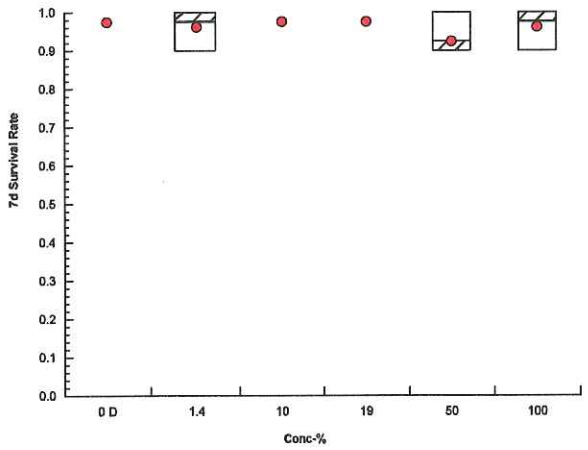
Angular (Corrected) Transformed Summary

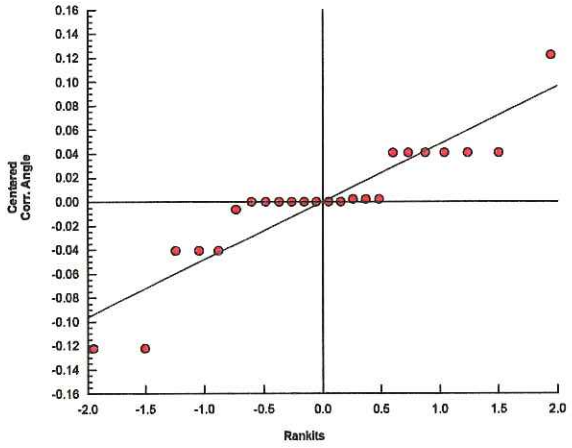
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	4	1.4100	1.4030	1.4170	1.4120	1.4030	1.4120	0.0022	0.31%	0.00%
1.4		4	1.3710	1.2420	1.5010	1.4120	1.2490	1.4120	0.0407	5.94%	2.74%
10		4	1.4120	1.4120	1.4120	1.4120	1.4120	1.4120	0.0000	0.00%	-0.15%
19		4	1.4120	1.4120	1.4120	1.4120	1.4120	1.4120	0.0000	0.00%	-0.15%
50		4	1.2900	1.1600	1.4190	1.2490	1.2490	1.4120	0.0407	6.32%	8.52%
100		4	1.3710	1.2420	1.5010	1.4120	1.2490	1.4120	0.0407	5.94%	2.74%

Fathead Minnow 7-d Larval Survival and Growth Test — **Eurofins TestAmerica - Corvallis**

Analysis ID:	06-3284-4119	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.9.7
Analyzed:	17 Jun-21 13:47	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1
Edit Date:	17 Jun-21 13:47	**MD5 Hash:**	358E8C9706280EF2FD230797BB16CC24	**Editor ID:**	006-834-630-9

Graphics





Fathead Minnow 7-d Larval Survival and Growth Test

Eurofins TestAmerica - Corvallis

Analysis ID:	04-5890-4170	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.7
Analyzed:	17 Jun-21 13:47	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Edit Date:	17 Jun-21 13:47	**MD5 Hash:**	DE40A59436A83A545B219B2FD779FE4A	**Editor ID:**	006-834-630-9

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	MSDu	PMSD
Untransformed	C > T	100	>100	---	1	0.1772	18.84%

Dunnett Multiple Comparison Test

Control	vs	Conc-%	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Dilution Water		1.4	0.5892	2.407	0.177	6	CDF	0.6082	Non-Significant Effect
		10	0.4805	2.407	0.177	6	CDF	0.6560	Non-Significant Effect
		19	1.146	2.407	0.177	6	CDF	0.3591	Non-Significant Effect
		50	1.231	2.407	0.177	6	CDF	0.3247	Non-Significant Effect
		100	0.6537	2.407	0.177	6	CDF	0.5791	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0223664	0.0044733	5	0.4129	0.8336	Non-Significant Effect
Error	0.195024	0.0108346	18			
Total	0.21739		23			

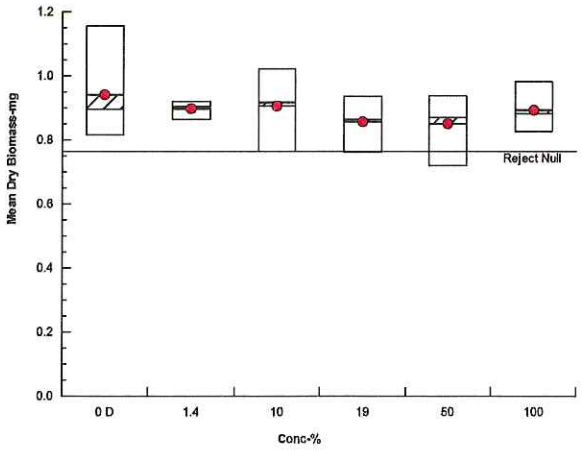
ANOVA Assumptions Tests

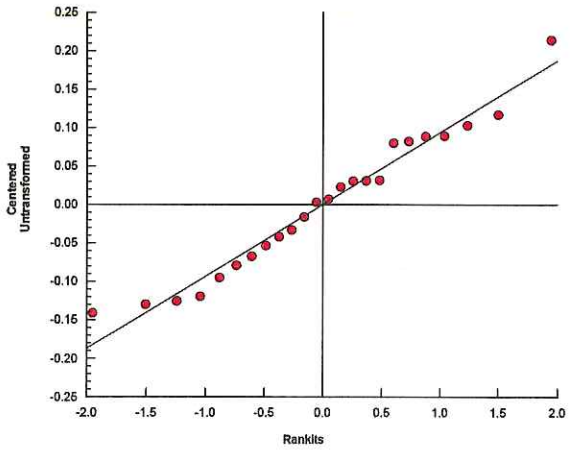
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Bartlett Equality of Variance Test	7.982	15.09	0.1572	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9646	0.884	0.5380	Normal Distribution

Mean Dry Biomass-mg Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	4	0.9404	0.6859	1.195	0.896	0.815	1.154	0.07996	17.01%	0.00%
1.4		4	0.897	0.8594	0.9346	0.902	0.864	0.92	0.01182	2.63%	4.61%
10		4	0.905	0.6987	1.111	0.917	0.764	1.022	0.06482	14.33%	3.76%
19		4	0.856	0.7375	0.9745	0.8635	0.761	0.936	0.03724	8.70%	8.97%
50		4	0.8497	0.6821	1.017	0.87	0.72	0.939	0.05269	12.40%	9.64%
100		4	0.8923	0.7752	1.009	0.8815	0.825	0.981	0.03679	8.25%	5.12%

Graphics





Fathead Minnow 7-d Larval Survival and Growth Test — **Eurofins TestAmerica - Corvallis**

Analysis ID:	17-5003-7062	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.7
Analyzed:	17 Jun-21 13:47	**Analysis:**	Linear Interpolation (ICPIN)	**Status Level:**	1
Edit Date:	17 Jun-21 13:47	**MD5 Hash:**	DE40A59436A83A545B219B2FD779FE4A	**Editor ID:**	006-834-630-9

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Log(X+1)	Linear	189840	200	Yes	Two-Point Interpolation

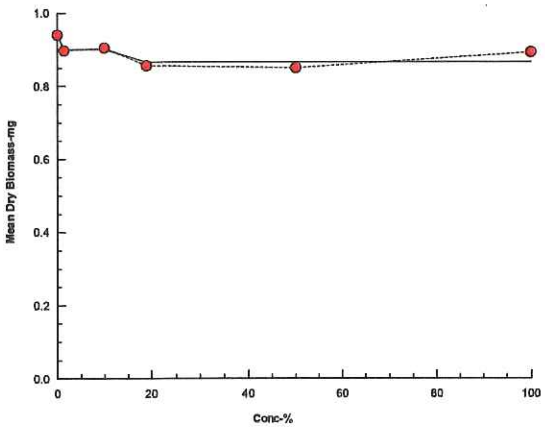
Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC25	>100	---	---	<1	---	---

Mean Dry Biomass-mg Summary

			Calculated Variate						Isotonic Variate	
Conc-%	Code	Count	Mean	Median	Min	Max	CV%	%Effect	Mean	%Effect
0	D	4	0.9404	0.896	0.815	1.154	17.01%	0.00%	0.9404	0.00%
1.4		4	0.897	0.902	0.864	0.92	2.63%	4.61%	0.901	4.19%
10		4	0.905	0.917	0.764	1.022	14.33%	3.76%	0.901	4.19%
19		4	0.856	0.8635	0.761	0.936	8.70%	8.97%	0.866	7.91%
50		4	0.8497	0.87	0.72	0.939	12.40%	9.64%	0.866	7.91%
100		4	0.8923	0.8815	0.825	0.981	8.25%	5.12%	0.866	7.91%

Graphics



TestAmerica GREEN ALGAE (*Selenastrum capricornutum*) TEST CONDITIONS

Client: City of Woodland

Sample Description: _____ Sample ID: B 5059 - 01

Test Start Date: 5/14/2021 Time: 15:15 Initials: ABL

Test End Date: 5/22/2021 Time: 14:10 Initials: ABL

TEST CONDITIONS AT INITIATION: ROUTAR 5-18-21

Species ID#: SC 1027 Culturing period: 4 days Incubator ID#: 28

INOCULUM (Axenic Culture)			Culture Density
# Cells	# Fields		
490	250		
MEAN	1.96	x 250,000 =	490,000

Culture Density = Mean # of Cells/Field x 250,000

Filtration	0.45 um filter	
	1.6 um filter	X

Test Vol. / Replicate	50 mls
No. of Reps	4
Nutrient Dosage	1 ml per L

Test Start Density	x	Test Volume	/	Culture Density	=	Inoculum Volume
10,000	x	50 ml	/	490,000	=	1.02 ml

Confirming Counts			
	# Cells	# Fields	Cell Conc. x10*6
Flask #1	4	250	4.0
Flask #2	5	250	5.0
Flask #3	6	250	6.0

Light Intensity at Test Initiation (foot-candles)		
Location #1	Location #2	Location #3
404	416	413

	0 hr	24 hr	48 hr	72 hr	96 hr
Technician	ABL	TC	TC	TC	ABL
Time	15:15	14:02	10:16	10:09	14:12
Therm. ID#	#264	#F264 TC 5/19	#264	#264	#264

Test Concen.	D.O. (mg/L)	pH					Temperature (°C)					Conductivity (umohs/cm)	Hard.	Alk.
	0 hr	0 hr	24	48	72	96	0 hr	24	48	72	96	0 hr	0 hr	0 hr
Control	7.5	8.0	8.0 8.2 ROLE TC 5/19	8.3	8.9	9.6	25.4	24.8	24.6	24.5	25.0	403	100	69
1.4 %	7.7	7.9	8.0	8.3	8.8	9.6	25.8	24.8	24.5	24.9	24.7	411	100	72
10 %	7.8	7.8	8.0	8.2	8.5	9.6	25.8	24.8	24.5	24.8	24.9	452		
19 %	7.9	7.7	8.0	8.3	8.6	9.6	25.6	24.6	24.3	24.8	24.9	496	106	83
50 %	7.8	7.6	8.2	8.4	8.5	9.4	25.7	24.6	24.6	24.8	24.8	643		
100 %	7.9	7.4	8.2	8.4	8.7	9.0	25.3	24.5 24.7 ROLE TC 5/19	24.6	24.8	24.8	886	117	164

Comments: Flasks positioned randomly in incubator. Positions changed every day. Temp and pH taken in surrogate flasks.

(23.8) = Temp. out of recommended range

As of Aug 2016, all data is typed directly into form by analyst. No review needed.

Raphidocelis subcapitata COULTER COUNTER WORKSHEET

Client: City of Woodland

Sample Description:

Lab ID: B5059

Test Start Date: 5/18/2021

Test Count Date: 6/8/2021 Initials: bc

Instrument Settings:

Counter ID: PCOUNT3

As of: 30-Aug-16

the settings were as listed below

Apperture size	100 um
Apperture Kd value:	59.94
Set size	3.2 um
Gain:	256
Current:	1.414
Preamp Gain:	179.20

Dilution factor (DF) Default value: 51

Output: Concentration

Metered volume (ml): 0.5

Blank counts (use ISOTONE II):

Run	BLANK
DF	51
1	21216
2	14994
3	7650
4	7650
5	7752
6	9180

Note: Blank concentrations are Cells per ml (net x 10^6)

Dilutions: DF = 11 (1.0 ml sample to 10mL Isotone II)

DF = 51 (0.20 ml sample to 10mL Isotone II)

DF = 101 (0.20 ml sample to 20mL Isotone II)

Where: * = Concentrations are in Cells per mL x 10^6

COMMENTS

TEST CONCENTRATION	Control			
Run	REP A	REP B	REP C	REP D
DF (if other than default)				
1	3.605	3.042	3.007	2.758
2	3.157	3.019	2.997	2.767
3	3.173	3.072	2.974	2.740
Replicate Average	**3.312**	**3.044**	**2.993**	**2.755**
CONCENTRATION MEAN # Cells / mL* =	**3.026**	CV % =	7.5%	

TEST CONCENTRATION	1.4 %			
Run	REP A	REP B	REP C	REP D
DF (if other than default)				
1	2.742	2.753	2.907	3.240
2	2.772	2.686	2.880	3.249
3	2.769	2.706	2.904	3.246
Replicate Average	**2.761**	**2.715**	**2.897**	**3.245**
CONCENTRATION MEAN # Cells / mL* =	**2.905**	CV % =	8.3%	

TEST CONCENTRATION	10 %			
Run	REP A	REP B	REP C	REP D
DF (if other than default)				
1	2.586	2.340	2.835	2.709
2	2.547	2.326	2.847	2.737
3	2.592	2.331	2.835	2.717
Replicate Average	**2.575**	**2.332**	**2.839**	**2.721**
CONCENTRATION MEAN # Cells / mL* =	**2.617**	CV % =	8.[illegible]	

TEST CONCENTRATION	19 %			
Run	REP A	REP B	REP C	REP D
DF (if other than default)				
1	2.177	2.460	2.562	2.828
2	2.192	2.467	2.581	2.813
3	2.193	2.451	2.564	2.831
Replicate Average	**2.187**	**2.459**	**2.569**	**2.824**
CONCENTRATION MEAN # Cells / mL* =	**2.510**	CV % =	10.5%	

TEST CONCENTRATION	50 %			
Run	REP A	REP B	REP C	REP D
DF (if other than default)				
1	1.966	2.423	1.827	2.590
2	1.962	2.397	1.875	2.608
3	1.927	2.417	1.825	2.632
Replicate Average	**1.952**	**2.412**	**1.842**	**2.610**
CONCENTRATION MEAN # Cells / mL* =	**2.204**	CV % =	16.6%	

TEST CONCENTRATION	100 %			
Run	REP A	REP B	REP C	REP D
DF (if other than default)				
1	0.405	0.327	0.451	0.188
2	0.410	0.318	0.438	1.[illegible]
3	0.387	0.316	0.446	0.1[illegible]
Replicate Average	**0.401**	**0.320**	**0.445**	**0.774**
CONCENTRATION MEAN # Cells / mL* =	**0.485**	CV % =	41.2%	

CETIS Summary Report

Report Date: 17 Jun-21 14:03 (p 1 of 1)
Test Code/ID: B505901scc / 02-8046-7512

Green Algae Growth Test — **Eurofins TestAmerica - Corvallis**

Batch ID:	08-2612-2198	**Test Type:**	Cell Growth	**Analyst:**	Michelle Bennett		
Start Date:	18 May-21 15:15	**Protocol:**	EPA/821/R-02-013 (2002)	**Diluent:**	Mod-Hard Synthetic Water		
Ending Date:	22 May-21 14:10	**Species:**	Selenastrum capricornutum	**Brine:**			
Test Length:	95h	**Taxon:**	Chlorophyta	**Source:**	In-House Culture	**Age:**	4D
Sample ID:	02-6854-3994	**Code:**	B5059-01	**Project:**			
Sample Date:	17 May-21 08:00	**Material:**	POTW Effluent	**Source:**	Woodland, City of (WA0020401)		
Receipt Date:	18 May-21 11:00	**CAS (PC):**		**Station:**			
Sample Age:	31h (3 °C)	**Client:**					

Comments: -03 sample was out of hold time and temp, not used for testing. MB 06/05/21

Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	✓	NOEL	LOEL	TOEL	PMSD	TU	S
05-1987-7314	Cell Density	Dunnett Multiple Comparison Test	Alpha = 0.01	19	50	30.82	19.4%	5.263	1
07-2638-0396	Cell Density	Dunnett Multiple Comparison Test	✓ Alpha = 0.05	10	19	13.78	14.5%	10	1

Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	✓	Level	%	95% LCL	95% UCL	TU	S
10-1672-3377	Cell Density	Linear Interpolation (ICPIN)		IC25	40.75	5.457	62.67	2.454	1

Test Acceptability

				TAC Limits			
Analysis ID	**Endpoint**	**Attribute**	**Test Stat**	**Lower**	**Upper**	**Overlap**	**Decision**
05-1987-7314	Cell Density	Control CV	0.07548	<<	0.2	Yes	Passes Criteria
07-2638-0396	Cell Density	Control CV	0.07548	<<	0.2	Yes	Passes Criteria
10-1672-3377	Cell Density	Control CV	0.07548	<<	0.2	Yes	Passes Criteria
05-1987-7314	Cell Density	Control Resp	3.03E+6	1000000	>>	Yes	Passes Criteria
07-2638-0396	Cell Density	Control Resp	3.03E+6	1000000	>>	Yes	Passes Criteria
10-1672-3377	Cell Density	Control Resp	3.03E+6	1000000	>>	Yes	Passes Criteria
05-1987-7314	Cell Density	PMSD	0.1937	0.091	0.29	Yes	Passes Criteria
07-2638-0396	Cell Density	PMSD	0.1454	0.091	0.29	Yes	Passes Criteria

Cell Density Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	D	4	3.026E+6	2.662E+6	3.389E+6	2.755E+6	3.312E+6	1.142E+5	2.284E+5	7.55%	0.00%
1.4		4	2.904E+6	2.523E+6	3.286E+6	2.715E+6	3.245E+6	1.199E+5	2.398E+5	8.26%	4.01%
10		4	2.617E+6	2.270E+6	2.964E+6	2.332E+6	2.839E+6	1.091E+5	2.183E+5	8.34%	13.52%
19		4	2.510E+6	2.090E+6	2.930E+6	2.187E+6	2.824E+6	1.319E+5	2.638E+5	10.51%	17.05%
50		4	2.204E+6	1.621E+6	2.787E+6	1.842E+6	2.610E+6	1.832E+5	3.664E+5	16.62%	27.16%
100		4	4.850E+5	1.674E+5	8.025E+5	3.202E+5	7.741E+5	9.979E+4	1.996E+5	41.15%	83.97%

<20% reduction Alpha level reduced to 0.01. MB 6/17/21

Cell Density Detail — MD5: 3670ECF03689D8E043F485448A937578

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	3.312E+6	3.044E+6	2.993E+6	2.755E+6
1.4		2.761E+6	2.715E+6	2.897E+6	3.245E+6
10		2.575E+6	2.332E+6	2.839E+6	2.721E+6
19		2.187E+6	2.459E+6	2.569E+6	2.824E+6
50		1.952E+6	2.412E+6	1.842E+6	2.610E+6
100		4.006E+5	3.202E+5	4.449E+5	7.741E+5

Green Algae Growth Test — **Eurofins TestAmerica - Corvallis**

Analysis ID:	07-2638-0396	**Endpoint:**	Cell Density	**CETIS Version:**	CETISv1.9.7
Analyzed:	17 Jun-21 13:56	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Edit Date:		**MD5 Hash:**	35CD50BD26911807A69617B3E7480F72	**Editor ID:**	

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	MSDu	PMSD
Untransformed	C > T	10	19	13.78	10	440000	14.54%

Dunnett Multiple Comparison Test

Control	vs	Conc-%	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Dilution Water		1.4	0.6642	2.407	4E+05	6	CDF	0.5743	Non-Significant Effect
		10	2.238	2.407	4E+05	6	CDF	0.0685	Non-Significant Effect
		19*	2.823	2.407	4E+05	6	CDF	0.0221	Significant Effect
		50*	4.496	2.407	4E+05	6	CDF	0.0006	Significant Effect
		100*	13.9	2.407	4E+05	6	CDF	2.7E-05	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	1.736E+13	3.472E+12	5	51.96	<1.0E-05	Significant Effect
Error	1.203E+12	6.683E+10	18			
Total	1.856E+13		23			

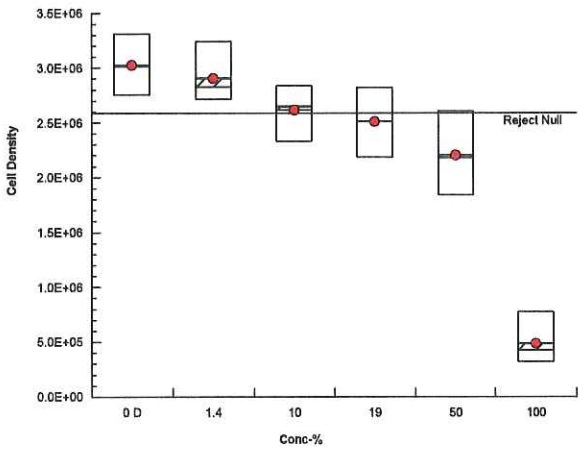
ANOVA Assumptions Tests

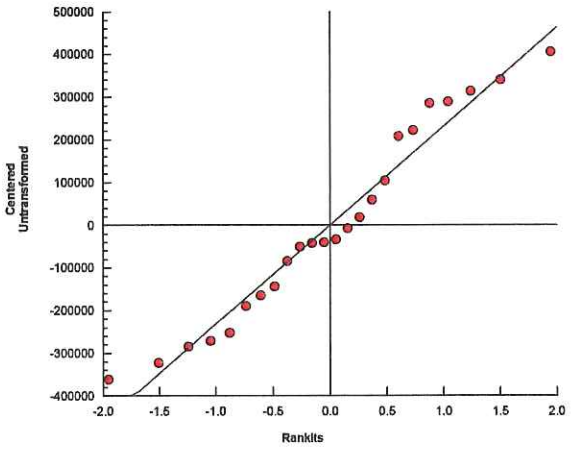
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Bartlett Equality of Variance Test	1.37	15.09	0.9275	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9521	0.884	0.3012	Normal Distribution

Cell Density Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	4	3.026E+6	2.662E+6	3.389E+6	3.018E+6	2.755E+6	3.312E+6	1.142E+5	7.55%	0.00%
1.4		4	2.904E+6	2.523E+6	3.286E+6	2.829E+6	2.715E+6	3.245E+6	1.199E+5	8.26%	4.01%
10		4	2.617E+6	2.270E+6	2.964E+6	2.648E+6	2.332E+6	2.839E+6	1.091E+5	8.34%	13.52%
19		4	2.510E+6	2.090E+6	2.930E+6	2.514E+6	2.187E+6	2.824E+6	1.319E+5	10.51%	17.05%
50		4	2.204E+6	1.621E+6	2.787E+6	2.182E+6	1.842E+6	2.610E+6	1.832E+5	16.62%	27.16%
100		4	4.850E+5	1.674E+5	8.025E+5	4.227E+5	3.202E+5	7.741E+5	9.979E+4	41.15%	83.97%

Graphics





Green Algae Growth Test — **Eurofins TestAmerica - Corvallis**

Analysis ID:	05-1987-7314	**Endpoint:**	Cell Density	**CETIS Version:**	CETISv1.9.7
Analyzed:	17 Jun-21 14:01	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Edit Date:		**MD5 Hash:**	35CD50BD26911807A69617B3E7480F72	**Editor ID:**	

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	MSDu	PMSD
Untransformed	C > T	19	50	30.82	5.263	586000	19.37%

Dunnett Multiple Comparison Test

Control	vs	Conc-%	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:1%)
Dilution Water		1.4	0.6642	3.206	6E+05	6	CDF	0.5743	Non-Significant Effect
		10	2.238	3.206	6E+05	6	CDF	0.0685	Non-Significant Effect
		19	2.823	3.206	6E+05	6	CDF	0.0221	Non-Significant Effect
		50*	4.496	3.206	6E+05	6	CDF	0.0006	Significant Effect
		100*	13.9	3.206	6E+05	6	CDF	2.7E-05	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	1.736E+13	3.472E+12	5	51.96	<1.0E-05	Significant Effect
Error	1.203E+12	6.683E+10	18			
Total	1.856E+13		23			

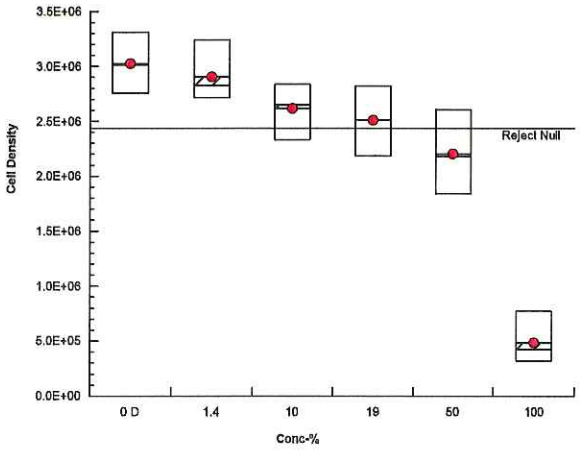
ANOVA Assumptions Tests

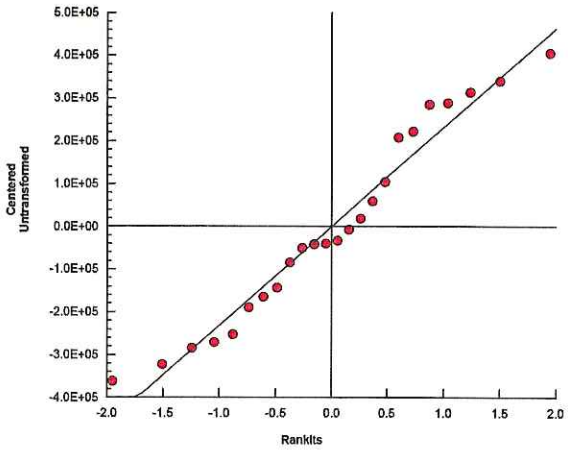
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Bartlett Equality of Variance Test	1.37	15.09	0.9275	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9521	0.884	0.3012	Normal Distribution

Cell Density Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	4	3.026E+6	2.662E+6	3.389E+6	3.018E+6	2.755E+6	3.312E+6	1.142E+5	7.55%	0.00%
1.4		4	2.904E+6	2.523E+6	3.286E+6	2.829E+6	2.715E+6	3.245E+6	1.199E+5	8.26%	4.01%
10		4	2.617E+6	2.270E+6	2.964E+6	2.648E+6	2.332E+6	2.839E+6	1.091E+5	8.34%	13.52%
19		4	2.510E+6	2.090E+6	2.930E+6	2.514E+6	2.187E+6	2.824E+6	1.319E+5	10.51%	17.05%
50		4	2.204E+6	1.621E+6	2.787E+6	2.182E+6	1.842E+6	2.610E+6	1.832E+5	16.62%	27.16%
100		4	4.850E+5	1.674E+5	8.025E+5	4.227E+5	3.202E+5	7.741E+5	9.979E+4	41.15%	83.97%

Graphics





Green Algae Growth Test — **Eurofins TestAmerica - Corvallis**

Analysis ID:	10-1672-3377	**Endpoint:**	Cell Density	**CETIS Version:**	CETISv1.9.7
Analyzed:	17 Jun-21 13:56	**Analysis:**	Linear Interpolation (ICPIN)	**Status Level:**	1
Edit Date:		**MD5 Hash:**	35CD50BD26911807A69617B3E7480F72	**Editor ID:**	

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Log(X+1)	Linear	167382	200	Yes	Two-Point Interpolation

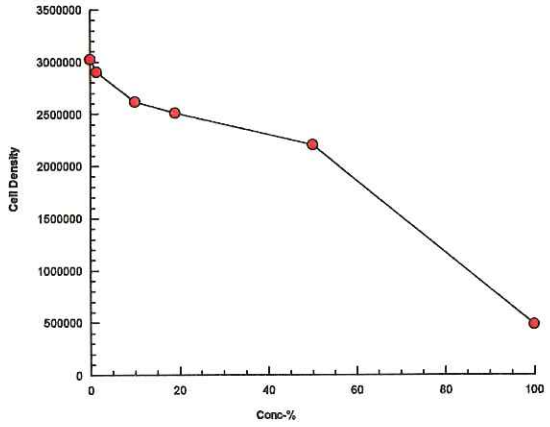
Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC25	40.75	5.457	62.67	2.454	1.596	18.33

Cell Density Summary

			Calculated Variate						Isotonic Variate	
Conc-%	Code	Count	Mean	Median	Min	Max	CV%	%Effect	Mean	%Effect
0	D	4	3.026E+6	3.018E+6	2.755E+6	3.312E+6	7.55%	0.00%	3.026E+6	0.00%
1.4		4	2.904E+6	2.829E+6	2.715E+6	3.245E+6	8.26%	4.01%	2.904E+6	4.01%
10		4	2.617E+6	2.648E+6	2.332E+6	2.839E+6	8.34%	13.52%	2.617E+6	13.52%
19		4	2.510E+6	2.514E+6	2.187E+6	2.824E+6	10.51%	17.05%	2.510E+6	17.05%
50		4	2.204E+6	2.182E+6	1.842E+6	2.610E+6	16.62%	27.16%	2.204E+6	27.16%
100		4	4.850E+5	4.227E+5	3.202E+5	7.741E+5	41.15%	83.97%	4.850E+5	83.97%

Graphics



APPENDIX B

REFERENCE TOXICANT DATA SHEETS

REFERENCE TOXICANT DATA SHEET

Client: QA / QC
Test Organism: *Ceriodaphnia dubia*
Source: In-House culture
ID#: Cd 3827
Age: < 24 hours
Feeding: none
Test Chamber Size: 30 ml
Volume per Replicate: 25 ml

Reference Toxican: NaCl
Stock Solution: 20 g/L in DI (ASTM Type I) water
Reagent Log ID #: 2B099-06
Designed Test Temperature: 20 ± 1 °C

Test Begin: Date 5/11/2021 Time 16:25
Test End: Date 5/13/2021 Time 14:50
*Dilution Water (Recon MH) ID# 5325
Dilution Water Hardness (as $CaCO_3$) 90
Dilution Water Alkalinity (as $CaCO_3$) 62

		0 hr	24 hr	48 hr
Technician		BC	BC	BM
Time		1625	1730	1450
Therm. ID #		251	267	251

Toxicant Concentration (g/L)	Test Chamber Number	Number of Live Organisms			Dissolved Oxygen (mg/l)			pH			Temperature (°C)			Conductivity (µS)		
		0	24	48	0	24	48	0	24	48	0	24	48	0	24	48
Control	A	5	5	5	7.9		7.6	8.2		8.1	20.0	20.4	20.3	325		333
	B	5	5	4 (BM)												
1.0	A	5	5	4	7.9		7.3	8.1		8.1	19.9	20.3	20.6	2760		2270
	B	5	5	5												
1.5	A	5	5	3	8.0		7.9	8.2		8.0	19.8	20.4	20.5	3780		3090
	B	5	5	5												
2.0	A	5	5	2	8.0		8.0	8.1		8.0	19.8	20.4	20.4	4210		4120
	B	5	5	0												
3.0	A	5	1	0	8.0		8.1	8.1		8.0	19.8	20.5	20.5	5900		5500
	B	5	0	—												
4.0	A	5	0	—	8.0	7.2	—	8.1	7.5	—	19.8	20.5		7580	7210	
	B	5	0	—												
Test Acceptability Criteria (TAC) or test condition:		Survival in Controls: ≥ 90% (required TAC)			(@ 20°C): > 4.0 and < 9.1 (recommended)			pH: > 6.0 and < 9.0 (recommended)			Temperature + 1 °C (recommended)			(QA) none		

Note: If organisms are alive @ 24hrs, no DO, pH, or Cond. measurements to be taken in that test chamber to avoid injuring the organisms

*Dilution Water Code
Recon. - reconstituted water
MH - moderately hard

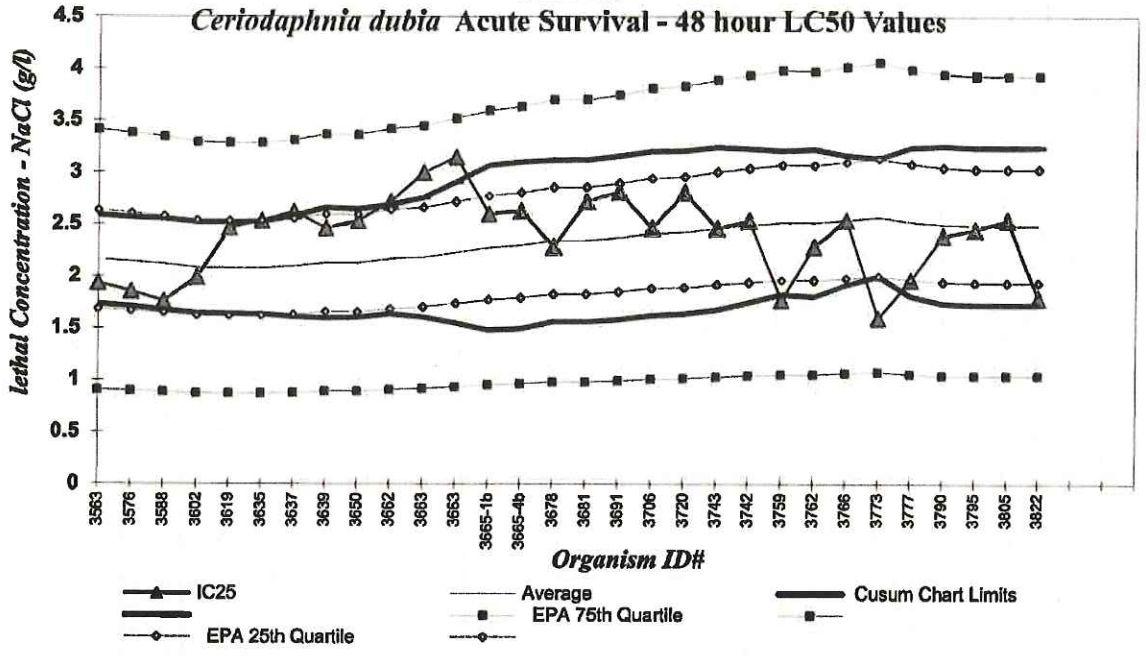
48 Hour LC_{50}: 1.79
Cusum Chart Limits: 1.73 to 3.24
Statistical Method: Probit

We verify this data is true and correct.
Task Manager
Project Manager
QA Officer

BL RG
5/12/21

REFTOX - Cd acute (ASL 670-0220).xlr
Doc Control ID: ASL670-0..

REFERENCE TOXICANT CUMLATIVE SUMMARY (CUSUM) CHART



Ceriodaphnia dubia - ACUTE (EPA Test Method 2002.0)

SODIUM CHLORIDE (g/L)

Endpoint: 48 hour Survival

Stats Method: Probit, Spearman-Karber, Linear Interpolation

Test Conditions: Recon MH, 20 oC

From EPA 833-R-00-003:

10th Quartile CV (*control limit*) = 0.06

25th Quartile CV (*warning limit*) = 0.11

75th Quartile CV (warning *limit*) = 0.29

90th Quartile CV (*control limit*) = 0.34

Intralab CV is compared to EPA Warning limits (25th and 75th CV's) and Control limits (10th and 90th CV's), If lab CV is outside EPA Control limits, the EPA Control limits are used to set Cusum chart limits.

Event #	Cerio ID #	Test Start Date	LC50	Running Average	Running SD	Cusum Chart Limits AVG-2SD	Cusum Chart Limits AVG+2SD	Intralab CV
185	3720	08/06/20	**2.81**	2.4	0.39	**1.64**	**3.21**	0.16
185	3743	09/10/20	**2.46**	2.5	0.39	**1.68**	**3.25**	0.15
185	3742	10/06/20	**2.54**	2.5	0.37	**1.75**	**3.23**	0.14
185	3759	11/11/20	**1.78**	2.5	0.35	**1.83**	**3.21**	0.14
185	3762	11/23/20	**2.29**	2.5	0.35	**1.81**	**3.23**	0.12
185	3766	12/08/20	**2.54**	2.5	0.31	**1.92**	**3.17**	0.11
185	3773	01/09/21	**1.60**	2.6	0.28	**2.00**	**3.14**	0.14
185	3777	01/12/21	**1.97**	2.5	0.36	**1.81**	**3.24**	0.15
185	3790	02/03/21	**2.39**	2.5	0.38	**1.74**	**3.26**	0.15
185	3795	03/03/21	**2.45**	2.5	0.38	**1.73**	**3.24**	0.15
185	3805	04/01/21	**2.54**	2.5	0.38	**1.73**	**3.24**	0.15
185	3822	05/11/21	**1.79**	2.5	0.38	**1.73**	**3.24**	0.17

REFERENCE TOXICANT DATA SHEET

Client: QA / QC
Test Organism: *Pimephales promelas*
Source: Aquatox
ID#: FHM 2157
Age: 13 Days
Feeding: none
Test Chamber Size: 800 ml
Volume per Replicate: 750 ml

Reference Toxican: NaCl
Stock Solution: 20 g/L in DI (ASTM Type I) water
Reagent Log ID #: ZB088-06
Designed Test Temperature: 20 ± 1 °C

Test Begin: Date 5/11/2021 Time 13:36
Test End: Date 5/13/2021 Time 13:00
*Dilution Water (Recon MH) ID# 5327
Dilution Water Hardness (as $CaCO_3$) 82
Dilution Water Alkalinity (as $CaCO_3$) 60

		0 hr	24 hr	48 hr
Technician		TC	TC	TC
Time		1336	1425	1330
Therm. ID #		267	267	291

Toxicant Concentration (g/L)	Test Chamber Number	Number of Live Organisms			Dissolved Oxygen (mg/l)			pH			Temperature (°C)			Conductivity (µS)		
		0	24	48	0	24	48	0	24	48	0	24	48	0	24	48
Control	A	10	10	10	DAV TC 5/11 7.6	7.3	7.2	8.6	8.0	8.0	20.6	20.5	20.1	3060		315
4.0	A	10	10	10	7.6	7.4	7.5	8.6	8.1	8.0	20.6	20.4	20.1	7360		7250
6.0	A	10	10	10	7.7	7.4	7.6	8.6	8.0	7.9	20.6	20.4	20.2	10900		11040
8.0	A	10	3	1	7.8	7.5	7.7	8.5	7.9	7.9	20.6	20.4	20.2	14320		14440
10.0	A	10	0	—	7.9	7.7	—	8.4	7.9	—	20.5	20.4	—	17480	17420	—
12.0	A	10	0	—	7.9	7.7	—	8.4	7.8	—	20.6	20.4	—	20700	20600	—
Test Acceptability Criteria (TAC) or test condition:		Survival in Controls: ≥ 90% (required TAC)			(@ 20°C): > 4.0 and < 9.1 (recommended)			pH: > 6.0 and < 9.0 (recommended)			Temperature ± 1 °C (recommended)			(QA) none		

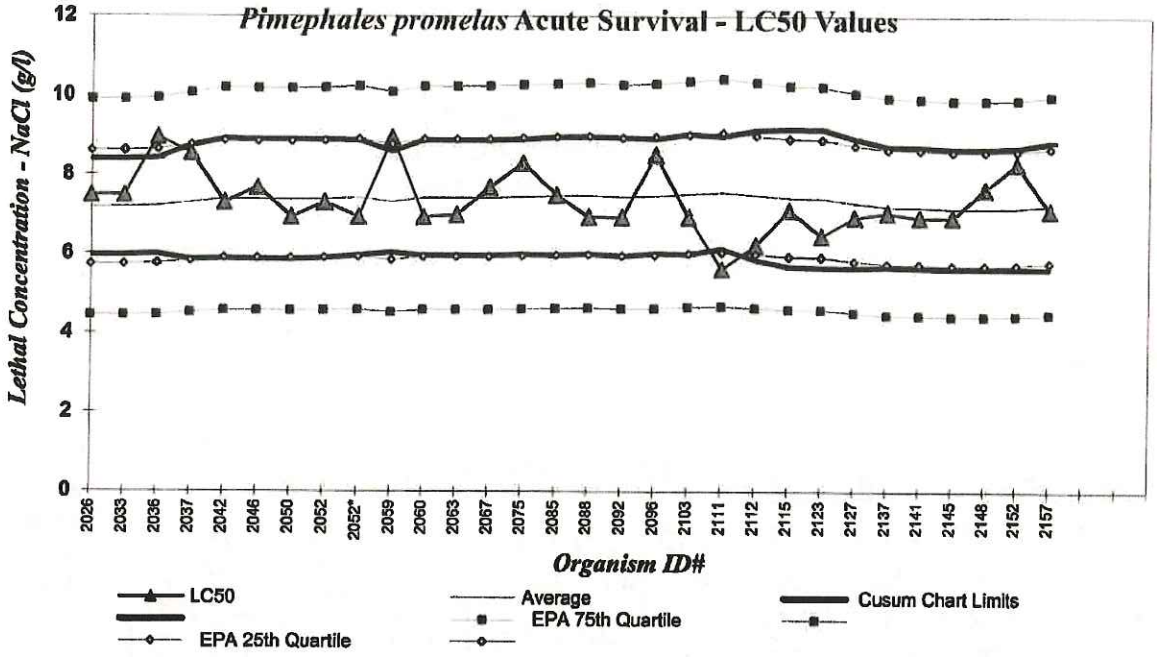
*Dilution Water Code
Recon. - reconstituted water
S - soft
MH - moderately hard
H - hard
Art. Sea - Artificial Sea Water

48 Hour LC_{50}: 7.1
Cusum Chart Limits: 5.6 to 8.8
Statistical Method: Spearman Karber

We verify this data is true and correct.
Task Manager
Project Manager: Alyssa Lampi
QA Officer

REFTOX - FHM acute (ASL 674-02)
Doc Control ID: ASL 0220

REFERENCE TOXICANT CUMLATIVE SUMMARY (CUSUM) CHART



Pimephales promelas - ACUTE (EPA Test Method 2000.0)

SODIUM CHLORIDE (g/L)

Organism age: 1 to 14 days

Endpoint: 48 hour Survival

Stats Method: Probit, Spearman-Karber, Linear Interpolation

Test Conditions: Recon MH, 20 oC

From EPA 833-R-00-003:

10th Quartile CV (*control limit*) = 0.08

25th Quartile CV (*warning limit*) = 0.10

75th Quartile CV (*warning limit*) = 0.19

90th Quartile CV (*control limit*) = 0.33

*Intralab CV is compared to EPA **Warning limits** (25th and 75th CV's) and **Control limits** (10th and 90th CV's), If lab CV is outside EPA Control limits, the EPA Control limits are used to set Cusum chart limits.*

Event #	FHM ID #	Test Start Date	LC50	Running Average	Running SD	Cusum Chart Limits AVG-2SD	Cusum Chart Limits AVG+2SD	Intralab CV
933	2060	8/20/2019	6.9	7.4	0.73	6.0	8.9	0.10
934	2063	9/13/2019	7.0	7.4	0.73	6.0	8.9	0.10
935	2067	10/1/2019	7.7	7.4	0.73	6.0	8.9	0.10
936	2075	11/6/2019	8.3	7.4	0.73	6.0	8.9	0.10
937	2085	1/14/2020	7.5	7.5	0.75	6.0	9.0	0.10
938	2088	2/4/2020	6.9	7.5	0.74	6.0	9.0	0.10
939	2092	3/3/2020	6.9	7.4	0.75	5.9	8.9	0.10
940	2096	4/3/2020	8.5	7.5	0.72	6.0	8.9	0.10
941	2103	5/12/2020	6.9	7.5	0.76	6.0	9.0	0.09
942	2111	7/14/2020	5.6	7.6	0.71	6.1	9.0	0.11
943	2112	7/21/2020	6.2	7.5	0.82	5.9	9.1	0.12
944	2115	8/6/2020	7.1	7.4	0.87	5.7	9.2	0.12
945	2123	9/11/2020	6.5	7.4	0.87	5.7	9.1	0.11
946	2127	10/6/2020	6.9	7.3	0.81	5.7	8.9	0.11
947	2137	12/8/2020	7.0	7.2	0.76	5.7	8.7	0.11
948	2141	1/6/2021	6.9	7.2	0.76	5.7	8.7	0.11
949	2145	2/2/2021	6.9	7.2	0.75	5.6	8.7	0.11
950	2148	3/3/2021	7.6	7.2	0.75	5.6	8.7	0.11
951	2152	4/1/2021	8.3	7.2	0.76	5.6	8.7	0.11
952	2157	5/11/2021	7.1	7.2	0.80	5.6	8.8	0.10

Ceriodaphnia dubia
Survival and Reproduction
Test Data Summary

Client: QA / QC Test Start Date: 5/13/21

Sample Description: NaCl Initial Sample ID#: 2B0804

Data summarized by: TC

Percent or Concentration	Total Live Young Produced in First 3 Broods per Replicate										# Alive Adults	Total Live Young
	A	B	C	D	E	F	G	H	I	J		
Control	15	12	2	28	22	4	14	15	18	24	8	154
	AD?	AD?	AD? ✓	AD?	AD?	AD? ✓	AD?	AD?	AD?	AD?		
0.25 g/L	22	17	0	1	21	13	19	14	15	21	8	143
	AD?	AD?	AD? ✓	AD? ✓	AD?	AD?	AD?	AD?	AD?	AD?		
0.50 g/L	14	9	15	10	16	18	13	16	4	22	9	137
	AD?	AD?	AD?	AD?	AD?	AD?	AD?	AD?	AD? ✓	AD?		
1.0 g/L	9	15	0	13	0	11	12	14	0	11	7	85
	AD?	AD?	AD? ✓	AD?	AD? ✓	AD?	AD?	AD?	AD? ✓	AD?		
1.5 g/L	7	0	0	5	10	4	11	0	0	0	5	37
	AD?	AD? ✓	AD? ✓	AD?	AD?	AD?	AD?	AD? ✓	AD? ✓	AD? ✓		
2.0 g/L	0	0	0	3	0	0	0	0	0	0	1	3
	AD? ✓	AD? ✓	AD? ✓	AD? -	AD? ✓	AD? ✓	AD? ✓	AD? ✓	AD? ✓	AD? ✓		
4.0 g/L	0	0	0	0	0	0	0	0	0	0	0	0
	AD? ✓	AD? ✓	AD? ✓	AD? ✓	AD? ✓	AD? ✓	AD? ✓	AD? ✓	AD? ✓	AD? ✓		

Test Organism Mortality (Adult dead) = AD? ✓

Test Organism identified as Male = AD? M

Test Organism Injured during test = AD? I

# of Alive Adults = Number of test organism alive at termination

Total Live Young = Total neonates produced in first 3 broods

Footnote: As per EPA-600-4-91-002 and EPA-821-R-02-013, *Ceriodaphnia dubia* test should be terminated when 60% of the surviving control organisms have produced their third brood, or at the end of eight days, whichever occurs first.

Also as per EPA-821-R-02-013 (13.10.9.1), "In this three-brood test, offspring from fourth or higher broods should not be counted and should not be included in the total number of neonates produced during the test."

Endpoint	Value	Cusum Chart Limits
Survival - EC_{25}	1.17	0.84 to 2.21
Reproduction - IC_{25}	0.69	0.37 to 1.15

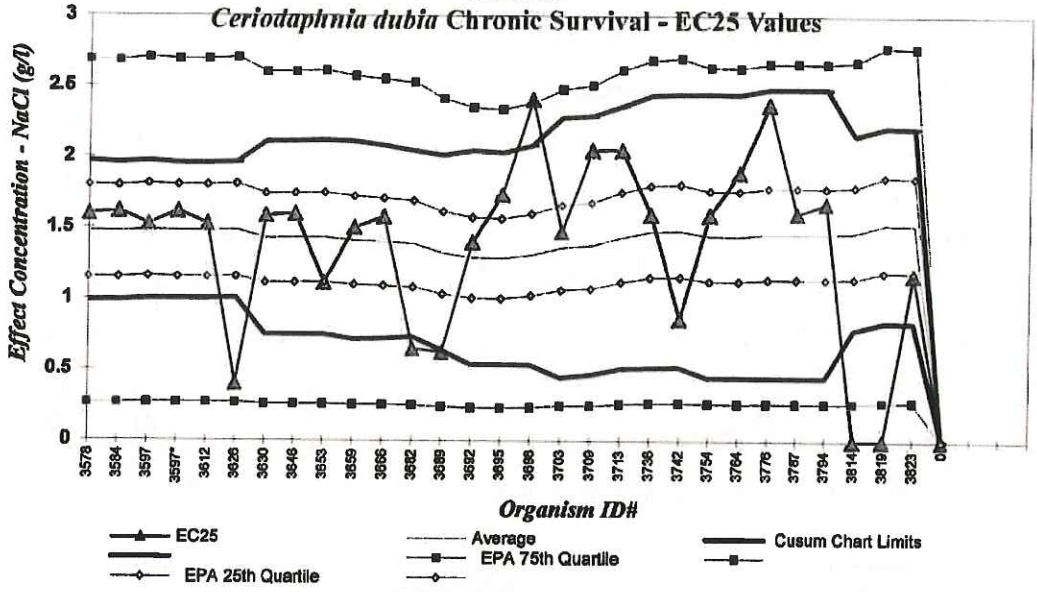
Task Manager: TC

Project Manager: Alyssa Lampi

QA Officer: MB

RBFTOX - Cerio chronic.xlsmDoc Control ID: ASL671-0313

REFERENCE TOXICANT CUMLATIVE SUMMARY (CUSUM) CHART



Ceriodaphnia dubia **- Chronic (EPA Test Method 1002.0)**

SODIUM CHLORIDE (g/L)

Endpoint: Chronic Survival

Stats Method: Linear Interpolation

Test Conditions: Recon MH, 25 oC

From EPA 833-R-00-003:

10th Quartile CV (*control limit*) = 0.07

25th Quartile CV (*warning limit*) = 0.11

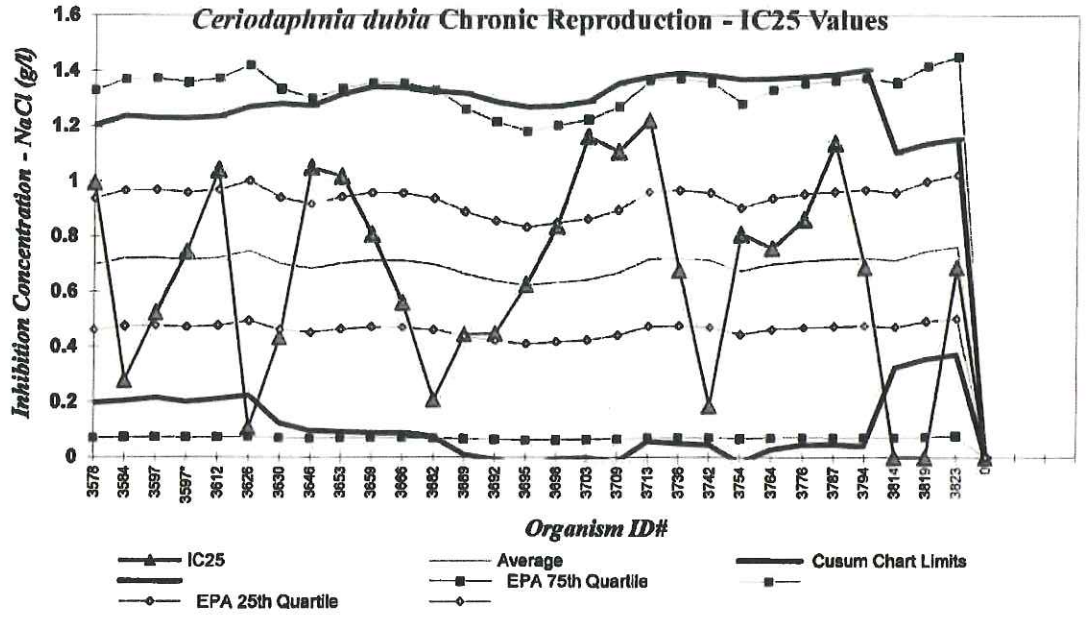
75th Quartile CV (warning *limit*) = 0.41

90th Quartile CV (*control limit*) = 0.81

Intralab CV is compared to EPA ***Warning limits*** *(25th and 75th CV's) and* ***Control limits*** *(10th and 90th CV's). If lab CV is outside EPA Control limits, the EPA Control limits are used to set Cusum chart limits.*

Event #	Cerio ID #	Test Start Date	EC25	Running Average	Running SD	Cusum Chart Limits AVG-2SD	Cusum Chart Limits AVG+2SD	Intralab CV
356	3695	05/19/20	1.74	1.29	0.37	0.54	2.03	0.30
357	3698	06/02/20	2.41	1.31	0.39	0.54	2.09	0.34
358	3703	06/23/20	1.48	1.36	0.46	0.45	2.28	0.33
359	3709	07/14/20	2.05	1.38	0.46	0.46	2.29	0.32
360	3713	07/28/20	2.06	1.44	0.46	0.51	2.37	0.33
361	3736	09/15/20	1.60	1.48	0.48	0.52	2.44	0.32
362	3742	10/06/20	0.86	1.48	0.48	0.52	2.45	0.35
363	3754	11/03/20	1.60	1.45	0.50	0.45	2.45	0.35
364	3764	12/01/20	1.89	1.45	0.50	0.45	2.45	0.35
365	3776	01/12/21	2.38	1.46	0.51	0.44	2.48	0.37
366	3787	02/02/21	1.61	1.46	0.51	0.44	2.48	0.36
367	3794	03/02/21	1.68	1.46	0.51	0.44	2.48	0.31
368	3811	04/20/21	< 0.25	1.47	0.51	0.45	2.50	0.32
369	3814	04/24/21	< 0.25	1.47	0.34	0.78	2.16	0.33
370	3819	05/04/21	<0.25	1.53	0.34	0.84	2.22	0.32
371	3823	05/13/21	1.17	1.52	0.34	0.84	2.21	0.33
372								

REFERENCE TOXICANT CUMLATIVE SUMMARY (CUSUM) CHART



Ceriodaphnia dubia - Chronic (EPA Test Method 1002.0)

SODIUM CHLORIDE (g/L)

Endpoint: Chronic Reproduction

Stats Method: Linear Interpolation

Test Conditions: Recon MH, 25 oC

From EPA 833-R-00-003:

10th Quartile CV (*control limit*) = 0.08

25th Quartile CV (*warning limit*) = 0.17

75th Quartile CV (warning *limit*) = 0.45

90th Quartile CV (*control limit*) = 0.62

Intralab CV is compared to EPA Warning limits (25th and 75th CV's) and Control limits (10th and 90th CV's), If lab CV is outside EPA Control limits, the EPA Control limits are used to set Cusum chart limits.

Event #	Cerio ID #	Test Start Date	IC25	Running Average	Running SD	Cusum Chart Limits AVG-2SD	Cusum Chart Limits AVG+2SD	Intralab CV
357	3698	6/2/2020	0.84	0.63	0.32	**-0.01**	**1.27**	0.50
358	3703	6/23/2020	1.16	0.64	0.32	**0.00**	**1.29**	0.51
359	3709	7/14/2020	1.11	0.67	0.34	**-0.02**	**1.35**	0.46
360	3713	7/28/2020	1.22	0.72	0.33	**0.06**	**1.38**	0.46
361	3736	9/15/2020	0.68	0.72	0.34	**0.05**	**1.39**	0.47
362	3742	10/6/2020	0.19	0.71	0.33	**0.04**	**1.38**	0.52
363	3754	11/3/2020	0.81	0.67	0.35	**-0.02**	**1.37**	0.48
364	3764	12/1/2020	0.76	0.70	0.34	**0.03**	**1.37**	0.47
365	3776	1/12/2021	0.86	0.71	0.33	**0.05**	**1.38**	0.47
366	3787	2/2/2021	1.14	0.72	0.34	**0.05**	**1.39**	0.47
367	3794	3/2/2021	0.69	0.72	0.34	**0.04**	**1.40**	0.41
368	3811	04/20/21	**< 0.25**	0.71	0.34	**0.04**	**1.39**	0.40
369	3814	04/27/21	**<0.25**	0.71	0.19	**0.32**	**1.10**	0.41
370	3819	05/04/21	**<0.25**	0.75	0.20	**0.36**	**1.14**	0.42
371	3823	05/13/21	0.69	0.76	0.20	**0.37**	**1.15**	0.43

TestAmerica

FATHEAD MINNOW 7-DAY SURVIVAL AND WATER QUALITY DATA

Random Template Used: 6 conc. x 4 reps. # 10 | Waterbath/incubator Used: # 4 | Date Initiated 5/11/2021 Time 15:15

Stock Sol. ID 2B088 - 01 | Date Terminated 5/18/2021 Time 10:19

Organism ID: FHM 2158 | Test Container Size: 800 ml | Solution Volume / rep: 500 ml

Client: QA / QC - RefTox | Sample Description: KCl (50 g/L stock)

Tech: Day 0 TC Day 1 TC Day 2 TC Day 3 BC Day 4 BC Day 5 TC Day 6 TC Day 7 TC

Time: Day 0 1615 Day 1 1112 Day 2 1313 Day 3 1630 Day 4 1435 Day 5 1140 Day 6 1155 Day 7 1019

Conc. or Percent	Day	Number of Live Organisms A	B	C	D	Dissolved O_2 (mg/l) Pre	Post	pH Pre	Post	Temp. (°C) Pre	Therm. ID #	Conductivity (µS) Post (daily)
Control	0	10	10	10	10		7.5		8.4	Post: 21.6	267	306
	1	10	10	10	9	7.1	7.9	8.1	8.3	24.6	267	298
	2	10	10	10	9✓	10.9	7.6	7.7	7.8	24.4	267	307
	3	10	10	10	9	6.1	7.4	7.9	8.1	24.5	267	321
	4	10✓	10✓	10	9	6.1	7.9	7.4	8.0	24.9	264	317
	5	10	10	10✓	9	5.9	7.6	8.0	8.2	24.6	267	318
	6	10	10	10	9	5.8	10.9	8.0	8.3	24.6	267	320
	7	10	10	10	9	10.5		8.1		24.7	267	
0.25 g/L	0	10	10	10	10		7.5		8.6	Post: 21.8		735
	1	10	10	10	10	7.1	7.9	8.2	8.2	25.0		732
	2	10	10	10	10	10.6	7.7	7.5	7.8	24.6		776
	3	10	10✓	10	10	6.3	7.6	8.0	8.0	24.7		766
	4	10	10	10	10	6.4	8.1	7.4	8.1	24.8		774
	5	10✓	10	10	10	10.2	7.6	8.0	8.2	24.7		751
	6	10	10	10	10	5.8	10.9	8.0	8.2	24.8		730
	7	10	10	10	10	10.5		8.1		24.7		
0.50 g/L	0	10	10	10	10		7.5		8.6	Post: 24.7		1155
	1	10	10	10	10	7.2	8.0	8.1	8.2	25.0		1177
	2	10✓	10	10	10	10.6	7.7	7.5	7.9	24.6		1213
	3	10	10	10	10	6.5	7.7	7.9	8.0	24.8		1210
	4	10	10	10	10	6.6	8.1	7.4	8.2	24.9		1237
	5	10	10	10	10	10.3	7.7	7.9	8.2	24.9		1189
	6	10✓	10	10	10	5.9	10.9	7.9	8.7	25.1		1200
	7	10	10	10	10	10.6		8.0		24.8		
1.0 g/L	0	10	10	10	10		7.5		8.6	Post: 24.7		2040
	1	8	5	7	5	7.3	8.1	8.1	8.2	25.0		2040
	2	4	3	4	4	10.8	7.7	7.5	8.0	24.7		2100
	3	4	3	4	4	6.7	7.7	7.9	8.0	24.7		2090
	4	4	3	4	3	6.9	8.2	7.6	8.2	24.8		2090
	5	3	3	3	2	10.3	7.4	7.8	8.2	24.9		2050
	6	2	3	3	1	5.0	10.9	7.9	8.2	24.9		2060
	7	1	3	3	1	10.6		7.9		24.8		
2.0 g/L	0	10	10	10	10		7.4		8.6	Post: 24.6		3770
	1	0	0	0	0	7.3	8.1	8.1	8.2	25.0		3710
	2											
	3											
	4											
	5											
	6											
	7											
4.0 g/L	0	10	10	10	10		7.3		8.5	Post: 24.7		7070
	1	0	0	0	0	7.3	8.0	8.0	8.2	25.0		6990
	2											
	3											
	4											
	5											
	6											
	7											

✓ Indicates one organism inadvertently poured off during solution renewal, replaced into container.

"M" = organism missing, start count reduced. "Inj" = organism injured, remove from stats.

"F" = fungus noted on dead organisms.

Pre =Pre-renewal solutions. Post =Post-renewal solutions.

Day 0 Temperatures = Post-renewals

Therm ID# = Thermometer ID used for all measurements that day.

(23.8) = Temp. out of recommended range

Endpoint

		Cusum Chart Limits	
Survival - EC_{25}	0.604	0.52 to	0.689
Growth - IC_{25}	0.605	0.44 to	0.72

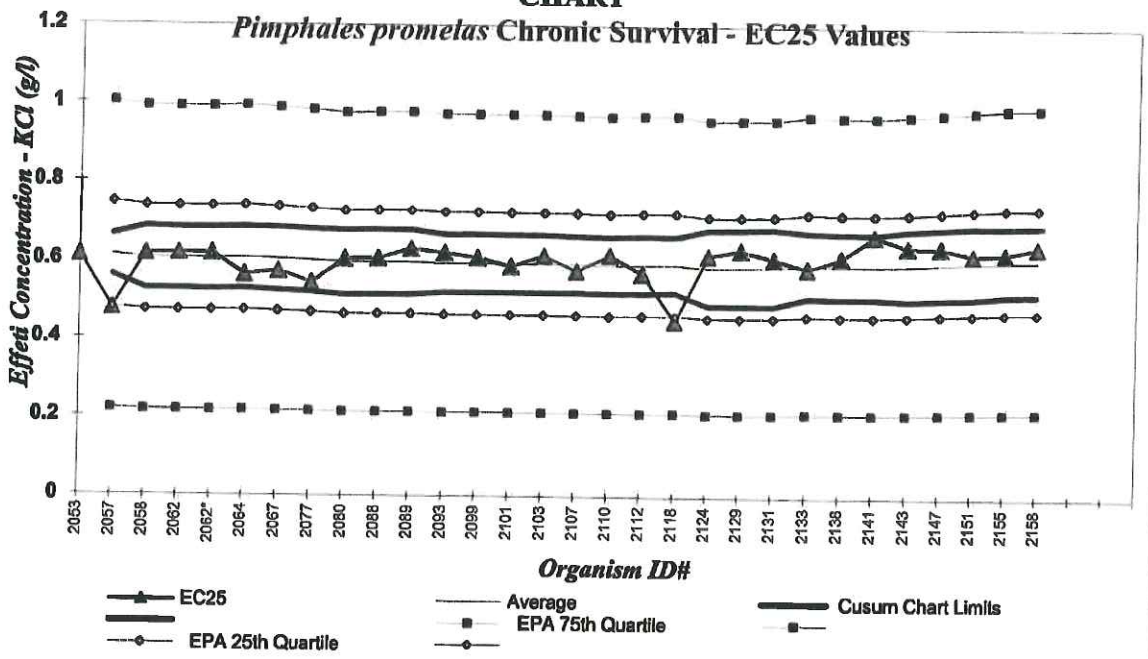
Task Manager

Project Manager Alyssa Lampi

QA Officer

REFTOX - FHM chronic (KCl) ASL1282-1118.xlsm Doc Control ID: ASL1282-1118

REFERENCE TOXICANT CUMLATIVE SUMMARY (CUSUM) CHART



***Pimephales promelas* - Chronic (EPA Test Method 1000.0)**

POTASSIUM CHLORIDE (g/L)

Endpoint: Chronic Survival

Stats Method: Linear Interpolation

Test Conditions: Recon MH, 25 oC

From EPA 833-R-00-003:

10th Quartile CV (*control limit*) = 0.03

25th Quartile CV (*warning limit*) = 0.11

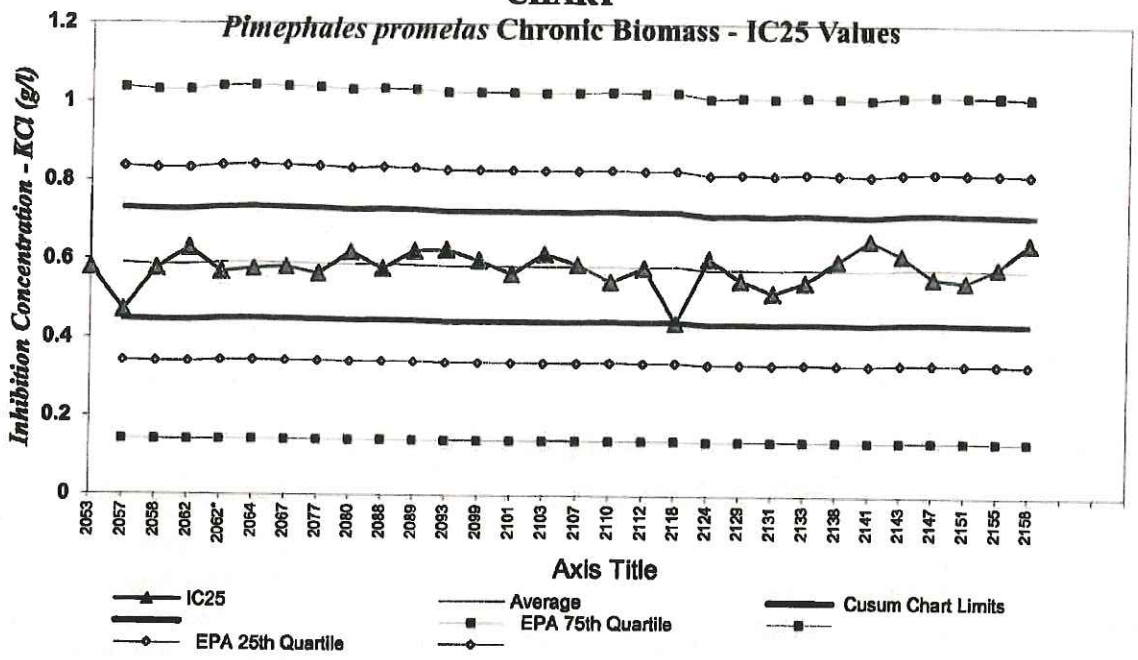
75th Quartile CV (*warning limit*) = 0.32

90th Quartile CV (*control limit*) = 0.52

Intralab CV is compared to EPA Warning limits (25th and 75th CV's) and Control limits (10th and 90th CV's), If lab CV is outside EPA Control limits, the EPA Control limits are used to set Cusum chart limits.

Event #	FHM ID #	Test Start Date	EC25	Running Average	Running SD	Cusum Chart Limits AVG-2SD	Cusum Chart Limits AVG+2SD	Intralab CV
61	2124	9/3/2020	**0.62**	0.6	0.05	**0.49**	**0.68**	0.08
62	2129	10/6/2020	**0.63**	0.6	0.05	**0.49**	**0.68**	0.08
63	2131	10/20/2020	**0.61**	0.6	0.05	**0.49**	**0.68**	0.07
64	2133	10/27/2020	**0.58**	0.6	0.04	**0.51**	**0.68**	0.07
65	2138	12/3/2020	**0.61**	0.6	0.04	**0.51**	**0.67**	0.07
66	2141	12/29/2020	**0.67**	0.6	0.04	**0.51**	**0.67**	0.07
67	2143	1/12/2021	**0.64**	0.6	0.04	**0.51**	**0.68**	0.08
68	2147	2/2/2021	**0.64**	0.6	0.04	**0.51**	**0.69**	0.08
69	2151	3/23/2021	**0.62**	0.6	0.05	**0.51**	**0.69**	0.07
70	2155	4/15/2021	**0.63**	0.6	0.04	**0.52**	**0.69**	0.07
71	2158	5/11/2021	**0.64**	0.6	0.04	**0.52**	**0.69**	0.07
72								
73								
74								

REFERENCE TOXICANT CUMLATIVE SUMMARY (CUSUM) CHART



***Pimephales promelas* - Chronic (EPA Test Method 1000.0)**

POTASSIUM CHLORIDE (g/L)

Endpoint: Chronic Growth (Biomass)

Stats Method: Linear Interpolation

Test Conditions: Recon MH, 25 oC

From EPA 833-R-00-003:

10th Quartile CV (*control limit*) =	0.12
25th Quartile CV (*warning limit*) =	0.21
75th Quartile CV (*warning limit*) =	0.38
90th Quartile CV (*control limit*) =	0.45

Intralab CV is compared to EPA Warning limits (25th and 75th CV's) and Control limits (10th and 90th CV's), If lab CV is outside EPA Control limits, the EPA Control limits are used to set Cusum chart limits.

Event #	FHM ID #	Test Start Date	IC25	Running Average	Running SD	Cusum Chart Limits AVG-2SD	Cusum Chart Limits AVG+2SD	Intralab CV
61	2124	9/3/2020	**0.60**	0.57	0.05	**0.44**	**0.71**	0.08
62	2129	10/6/2020	**0.55**	0.58	0.05	**0.44**	**0.71**	0.08
63	2131	10/20/2020	**0.52**	0.57	0.05	**0.44**	**0.71**	0.08
64	2133	10/27/2020	**0.54**	0.58	0.04	**0.44**	**0.72**	0.08
65	2138	12/3/2020	**0.60**	0.58	0.04	**0.44**	**0.71**	0.07
66	2141	12/29/2020	**0.65**	0.57	0.04	**0.44**	**0.71**	0.08
67	2143	1/12/2021	**0.62**	0.58	0.05	**0.44**	**0.72**	0.08
68	2147	2/2/2021	**0.56**	0.58	0.05	**0.44**	**0.72**	0.08
69	2151	3/23/2021	**0.55**	0.58	0.05	**0.44**	**0.72**	0.08
70	2155	4/15/2021	**0.58**	0.58	0.05	**0.44**	**0.72**	0.08
71	2158	5/11/2021	**0.65**	0.58	0.05	**0.44**	**0.72**	0.08
72								
73								
74								

TestAmerica

GREEN ALGAE (*Selenastrum capricornutum*) TEST CONDITIONS

Client: QA / QC

Sample Description: NaCl Reagent Log #: 2B089-04

Test Start Date: 5/18/21 Time: 1534 Initials: ABR

Test End Date: 5/22/21 Time: 1420 Initials: ABR

TEST CONDITIONS AT INITIATION:

Species ID#: SC1027

Age: 4 days

Dilution Water ID #: 5370

Note: includes EDTA INCOS

INOCULUM (Axenic Culture)			
# Cells	# Fields		
490	250		Culture Density
MEAN	1.96	x 250,000 =	490,000

Culture Density = Mean # of Cells/Field x 250,000

Filtration	None
Note: 50 g/L NaCl stock based off of DI water (0.2 um filtered)	

Test Vol. / Replicate	50 mls
No. of Reps	4
Nutrient Dosage	
1 ml per L in Dilution water only. NaCl stock not nutrient dosed	

Test Start Density	x	Test Volume	/	Culture Density	=	Inoculum Volume
10,000	x	50 ml	/	490,000	=	1.02 ml

Confirming Counts			ROL ABR 5-18-21
	# Cells	# Fields	Cell Conc ~~x10^6~~ (cells/ml)
Flask #1	4	250	4,000
Flask #2	5	250	5,000
Flask #3	6	250	6,000

Light Intensity at Test Initiation (foot-candles)		
Location #1	Location #2	Location #3
397	399	405

Technician	0 hr	ABR	24 hr	TC	48 hr	TC	72 hr	TC	96 hr	ABR
Time	0 hr	1534	24 hr	1411	48 hr	1013	72 hr	1016	96 hr	1420
Thermometer ID:	0 hr	#2604	24 hr	#2604	48 hr	#2604	72 hr	#2604	96 hr	#2604

Test Concen. (g/L)	D.O. (mg/L)	pH					Temperature (°C)					Conductivity (umohs/cm)	Hard.	Alk.
	0 hr	0 hr	24	48	72	96	0 hr	24	48	72	96	0 hr	0 hr	0 hr
Control	7.7	7.9	8.2	8.0	8.2	8.6	25.3	24.1	24.8	24.9	24.7	399	100	69
0.25	7.8	7.9	8.1	8.1	8.6	9.1	25.3	24.5	24.8	24.8	24.8	895	100	72
0.50	7.8	7.9	8.0	8.2	8.7	9.3	25.3	24.5	24.8	24.8	24.6	1380		
1.0	7.8	7.9	8.0	8.2	8.6	9.2	25.5	24.6	24.9	24.8	24.5	2320	106	72
2.0	7.8	7.9	8.0	8.1	8.5	9.0	25.1	24.6	~~25.0~~ 24.8	24.8	24.7	4140		
4.0	8.2	7.9	8.0	8.1	8.4	9.0	25.4	24.5	24.9	24.9	24.6	7640	100	67

Task Manager Alyssa Lamp

Project Manager MR

QA Officer MR

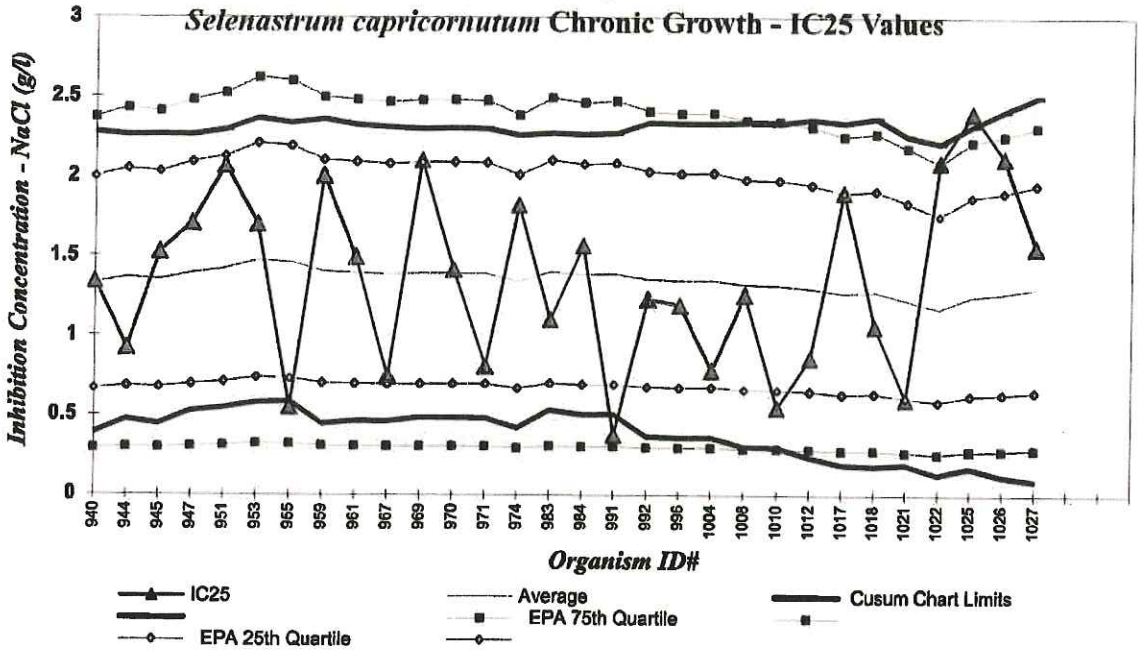
Endpoint : Growth

IC25 : 1.56

Cusum Chart Limits : 0.09 - 2.51

Comments:

REFERENCE TOXICANT CUMLATIVE SUMMARY (CUSUM) CHART



Selenastrum capricornutum **- Green Algae - Chronic (EPA Test Method 1003.0)**

SODIUM CHLORIDE (g/L)

Endpoint: Chronic Growth

Stats Method: Linear Interpolation

Test Conditions: Recon MH, 25 oC

From EPA 833-R-00-003:

10th Quartile CV (*control limit*) = 0.02

25th Quartile CV (*warning limit*) = 0.25

75th Quartile CV (*warning limit*) = 0.39

90th Quartile CV (*control limit*) = 0.51

As per EPA 833-R-00-003, section B.2.1, the quartiles listed above are from just a few labs (6) and therefore not to be considered typical or representative. Cusum limits are based on ASL data only.

Event #	Algae ID #	Test Start Date	IC25	Running Average	Running SD	Cusum Chart Limits AVG-2SD	Cusum Chart Limits AVG+2SD	Intralab CV
203	974	3/3/2020	**1.82**	1.34	0.46	**0.42**	**2.26**	0.31
204	983	4/28/2020	**1.10**	1.40	0.43	**0.53**	**2.27**	0.32
205	984	5/5/2020	**1.57**	1.38	0.44	**0.51**	**2.26**	0.32
206	991	7/7/2020	**0.38**	1.39	0.44	**0.51**	**2.27**	0.36
207	992	7/14/2022	**1.23**	1.35	0.49	**0.37**	**2.34**	0.37
208	996	7/28/2020	**1.19**	1.35	0.49	**0.36**	**2.33**	0.37
209	1004	9/10/2020	**0.78**	1.35	0.49	**0.36**	**2.33**	0.39
210	1008	10/27/2020	**1.26**	1.32	0.51	**0.30**	**2.34**	0.39
211	1010	11/10/2020	**0.55**	1.32	0.51	**0.30**	**2.34**	0.41
212	1012	12/1/2020	**0.86**	1.30	0.53	**0.24**	**2.36**	0.42
213	1017	1/26/2021	**1.90**	1.27	0.54	**0.19**	**2.34**	0.43
214	1018	2/2/2021	**1.06**	1.28	0.55	**0.18**	**2.37**	0.42
215	1021	3/2/2021	**0.60**	1.23	0.52	**0.19**	**2.26**	0.44
216	1022	4/13/2021	**2.09**	1.17	0.52	**0.13**	**2.21**	0.43
217	1025	4/28/2021	**2.40**	1.25	0.54	**0.17**	**2.32**	0.45
218	1026	5/15/2021	**2.12**	1.27	0.57	**0.12**	**2.41**	0.46
219	1027	5/18/2021	**1.56**	1.30	0.60	**0.09**	**2.51**	0.44

APPENDIX C

CHAIN OF CUSTODY

eurofins | Environment Testing TestAmerica

Sample Receipt Record

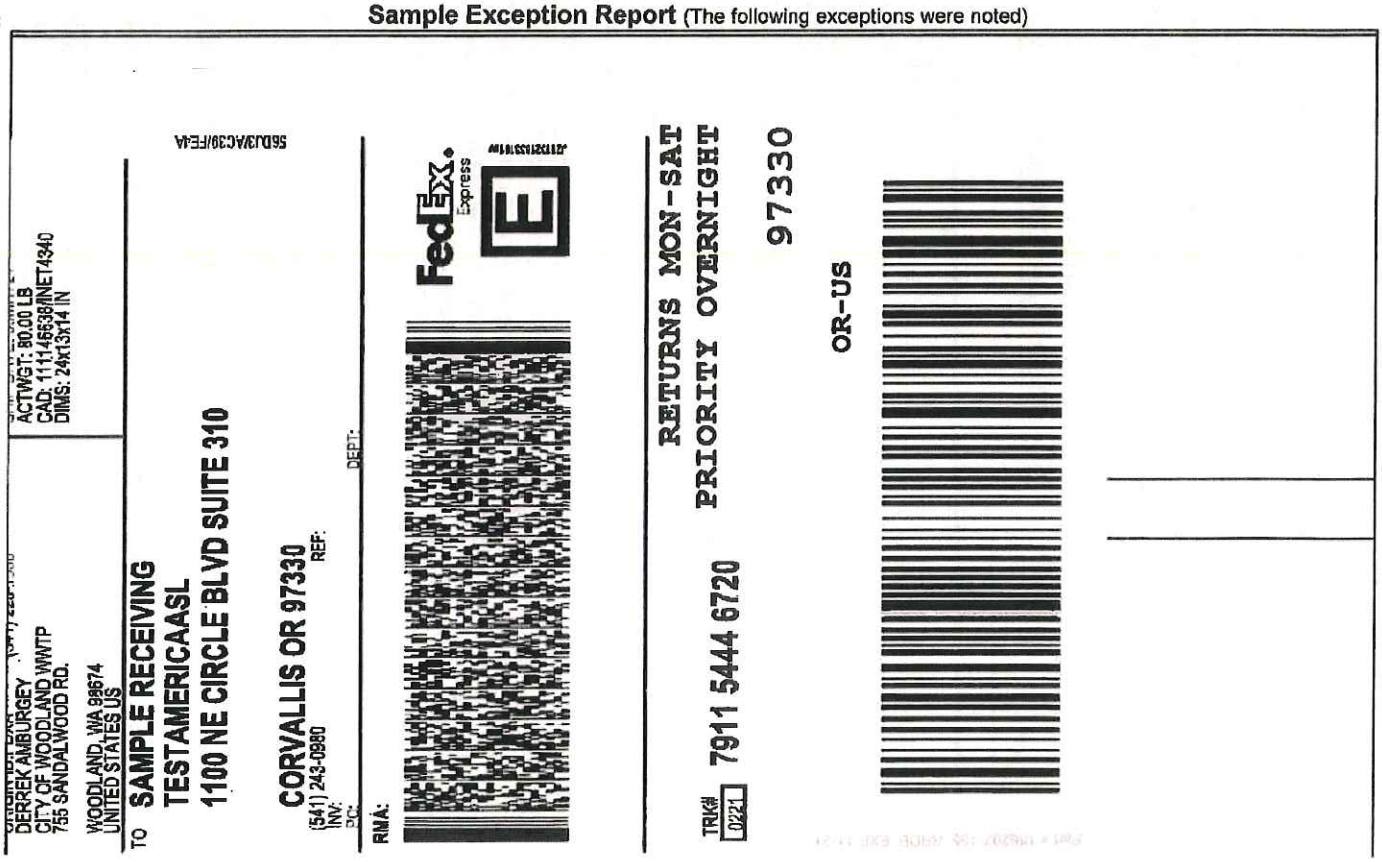
Batch Number: B5059-01 Date Received: 5/18/21

Client/Project: Woodland Received By: ABR

Were custody seals intact?	☒ Yes ☐ No	☐ N/A
Packing Material:	RO ABR 5-18-21 ☐ Ice ☒ Blue Ice ☐ Box	
Temp OK? (≤ 6°C) Therm ID: 77173 Expires: 6/9/20 21 Observed: 3.1 / 2.1 °C, Actual Temp: 3.0 / 2.0 °C	☒ Yes ☐ No	☐ N/A
If sample is noted @ ≤ 0.0 °C, is the sample frozen or partially frozen?	☐ Yes ☐ No	☒ N/A
Was a Chain of Custody (CoC) Provided?	☒ Yes ☐ No	☐ N/A
Was the CoC correctly filled out? (If No, document below)	☒ Yes ☐ No	☐ N/A
Were the sample containers in good condition (not broken or leaking)?	☒ Yes ☐ No	☐ N/A
Are all samples within 36 hours of collection?	☒ Yes ☐ No	☐ N/A

Method of Shipment: ☐ Hand Delivered, ☒ FedEx, ☐ UPS, ☐ Greyhound, ☐ Other: _____ ☐ N/A

Sample Exception Report (The following exceptions were noted)



Bioassay Receipt verification
Doc Control ID: ASL993-1119

CHAIN OF CUSTODY RECORD - FOR AQUATIC TOXICITY TESTING

eurofins | Environment Testing TestAmerica

Client: City of Woodland NPDES# WA0020401

Address: 755 Sandalwood Rd Woodland WA 98674

Contact Person: Derrek Amburgey

Phone: 360-225-7007

PO# 37314

Composite Sample Information

Samples/Hour N/A Volume/Sample N/A

Total Hours 24 Total Volume 20L

Initiated: Date 5-16-21 Time 9AM

Ended: Date 5-17-21 Time 9am

Chilled During Collection Yes

Ship Samples to:

Eurofins TestAmerica
Attention: Aquatic Toxicology Laboratory
1100 NE Circle Blvd. Suite 310
Corvallis, OR 97330
Phone: 541-243-6137

Analysis Required / Comments

Sample ID	Date	Time	Sample Type: Comp.	Sample Type: Grab	# of Containers	Lab ID#	Fathead Acute	Fathead Chronic	Cerio Acute	Cerio Chronic	Daphnia Acute	Trout Acute	SHM Acute	SHM Chronic	MB Acute	MB Chronic	MYS Acute	MYS Chronic	Algae Chronic	CA Haz Waste	WA Haz Waste	Daphnia Chronic	Concentration and/or Comments
EFF			X		2	B505901	X	X			X								X			X	

Project ID: Q21-05391 | Prepared By: Brett Muckey

Qty	Description
1	Algae chronic, definitive (5 concentration) bioassay
1	Concurrent Algae chronic Reference Toxicant test
1	Ceriodaphnia dubia acute, definitive (5 conc.), non-renewal, 48 hr, bioassay
1	Ceriodaphnia dubia chronic, definitive (5 conc.), bioassay
1	Fathead minnow acute, definitive (5 conc.), renewal (@ 48 hr), 96 hr duration, bioassay
1	Fathead minnow chronic, definitive (5 conc.), bioassay

Sampled By & Title (Please sign and print name) Derrek Amburgey	Date/Time 5-16-21 9am	Relinquished By (Please sign and print name) Bob Fowler	Date/Time 5-17-21
Received By (Please sign and print name) Alyssa Lamp	Date/Time 5-15-21 1100	Relinquished By (Please sign and print name)	Date/Time
Received By (Please sign and print name)	Date/Time	Relinquished By (Please sign and print name)	Date/Time
Received By (Please sign and print name)	Date/Time	Shipped Via UPS Bus Fed-Ex Hand Other	Shipping # COC_Bioassay
Work Authorized By (Please sign and print name)	Remarks		Doc Control ID: ASL612-0519

eurofins | Environment Testing TestAmerica

Sample Receipt Record

Batch Number: BS059-02 Date Received: 5/20/21

Client/Project: Woodland Received By: TC

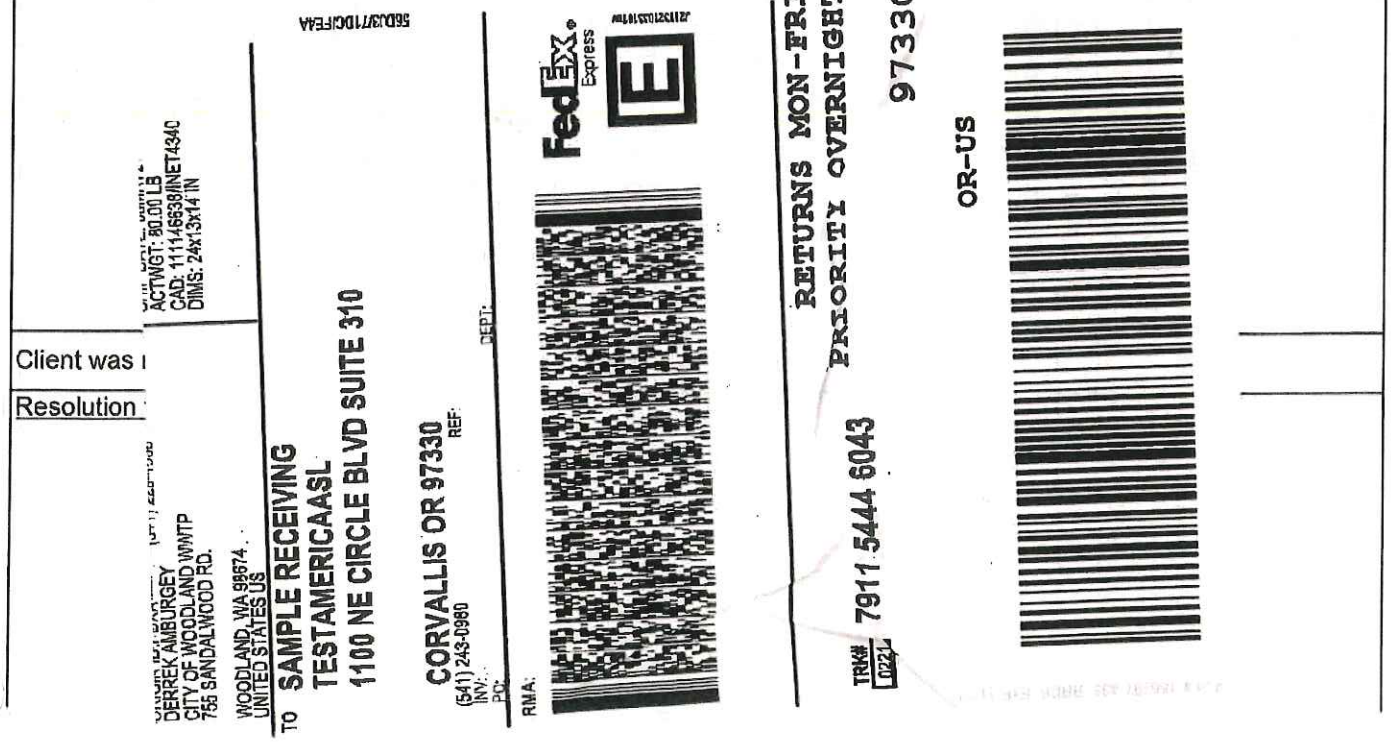
Were custody seals intact?	☒ Yes	☐ No	☐ N/A
Packing Material:	☐ Ice	☒ Blue Ice	☐ Box
Temp OK? (≤ 6°C) Therm ID: 173 Expires: 6/9 /2021 Observed: 5.1 °C, Actual Temp: 4.8 °C	☒ Yes	☐ No	☐ N/A
If sample is noted @ ≤ 0.0 °C, is the sample frozen or partially frozen?	☐ Yes	☐ No	☒ N/A
Was a Chain of Custody (CoC) Provided?	☒ Yes	☐ No	☐ N/A
Was the CoC correctly filled out? (If No, document below)	☒ Yes	☐ No	☐ N/A
Were the sample containers in good condition (not broken or leaking)?	☒ Yes	☐ No	☐ N/A
Are all samples within 36 hours of collection?	☒ Yes	☐ No	☐ N/A

Method of Shipment: ☐ Hand Delivered, ☒ FedEx, ☐ UPS, ☐ Greyhound, ☐ Other: _____ ☐ N/A

Sample Exception Report (The following exceptions were noted)

Client was i

Resolution



CHAIN OF CUSTODY RECORD - FOR AQUATIC TOXICITY TESTING

eurofins | Environment Testing TestAmerica

Client: City of Woodland NPDES# WA0020401

Address: 755 Sandalwood Rd Woodland WA 98674

Contact Person: Derrek Amburgey

Phone: 360-225-7007

PO# 37314

Composite Sample Information
Samples/Hour ~~24~~ Volume/Sample N/A
Total Hours 24 Total Volume 20L
Initiated: Date 5-18-21 Time 9AM
Ended: Date 5-19-21 Time 8AM
Chilled During Collection Yes

Ship Samples to:
Eurofins TestAmerica
Attention: Aquatic Toxicology Laboratory
1100 NE Circle Blvd. Suite 310
Corvallis, OR 97330
Phone: 541-243-6137

Analysis Required / Comments

Sample ID	Date	Time	Sample Type: Comp.	Sample Type: Grab	# of Containers	Lab ID#	Fathead Acute	Fathead Chronic	Cerio Acute	Cerio Chronic	Daphnia Acute	Trout Acute	SHM Acute	SHM Chronic	MB Acute	MB Chronic	MYS Acute	MYS Chronic	Algae Chronic	CA Haz Waste	WA Haz Waste	Daphnia Chron	Concentration and/or Comments
EFF			X		2	BS0591-02	X	X			X								X			X	

Project ID: Q21-05391 | Prepared By: Brett Muckey

Qty	Description
1	Algae chronic, definitive (5 concentration) bioassay
1	Concurrent Algae chronic Reference Toxicant test
1	Ceriodaphnia dubia acute, definitive (5 conc.), non-renewal, 48 hr, bioassay
1	Ceriodaphnia dubia chronic, definitive (5 conc.), bioassay
1	Fathead minnow acute, definitive (5 conc.), renewal (@ 48 hr), 96 hr duration, bioassay
1	Fathead minnow chronic, definitive (5 conc.), bioassay

Sampled By & Title	(Please sign and print name) Derrek Amburgey	Date/Time 5-19-21 8AM	Relinquished By (Please sign and print name) Bob Fowler	Date/Time 5-19-21
Received By Tori Crumrine	(Please sign and print name)	Date/Time 5/20/21 1100	Relinquished By (Please sign and print name)	Date/Time
Received By	(Please sign and print name)	Date/Time	Relinquished By (Please sign and print name)	Date/Time
Received By	(Please sign and print name)	Date/Time	Shipped Via UPS___ Bus___ Fed-Ex___ Hand___ Other___	Shipping # COC_Bioassay
Work Authorized By	(Please sign and print name)	Remarks		Doc Control ID: ASI-543-0519

eurofins | Environment Testing TestAmerica

Sample Receipt Record

Batch Number: BS059-03 Date Received: 5/24/21

Client/Project: Woodland Received By: TC

Were custody seals intact?	☒ Yes	☐ No	☐ N/A
Packing Material:	☐ Ice	☒ Blue Ice	☐ Box
Temp OK? (≤ 6°C) Therm ID: Expires: / /20 Observed: 5.9 6.0°C, Actual Temp: 6.8 6.9°C	☐ Yes	☒ No	☐ N/A
If sample is noted @ ≤ 0.0 °C, is the sample frozen or partially frozen?	☐ Yes	☐ No	☒ N/A
Was a Chain of Custody (CoC) Provided?	☒ Yes	☐ No	☐ N/A
Was the CoC correctly filled out? (If No, document below)	☒ Yes	☐ No	☐ N/A
Were the sample containers in good condition (not broken or leaking)?	☒ Yes	☐ No	☐ N/A
Are all samples within 36 hours of collection?	☐ Yes	☒ No	☐ N/A

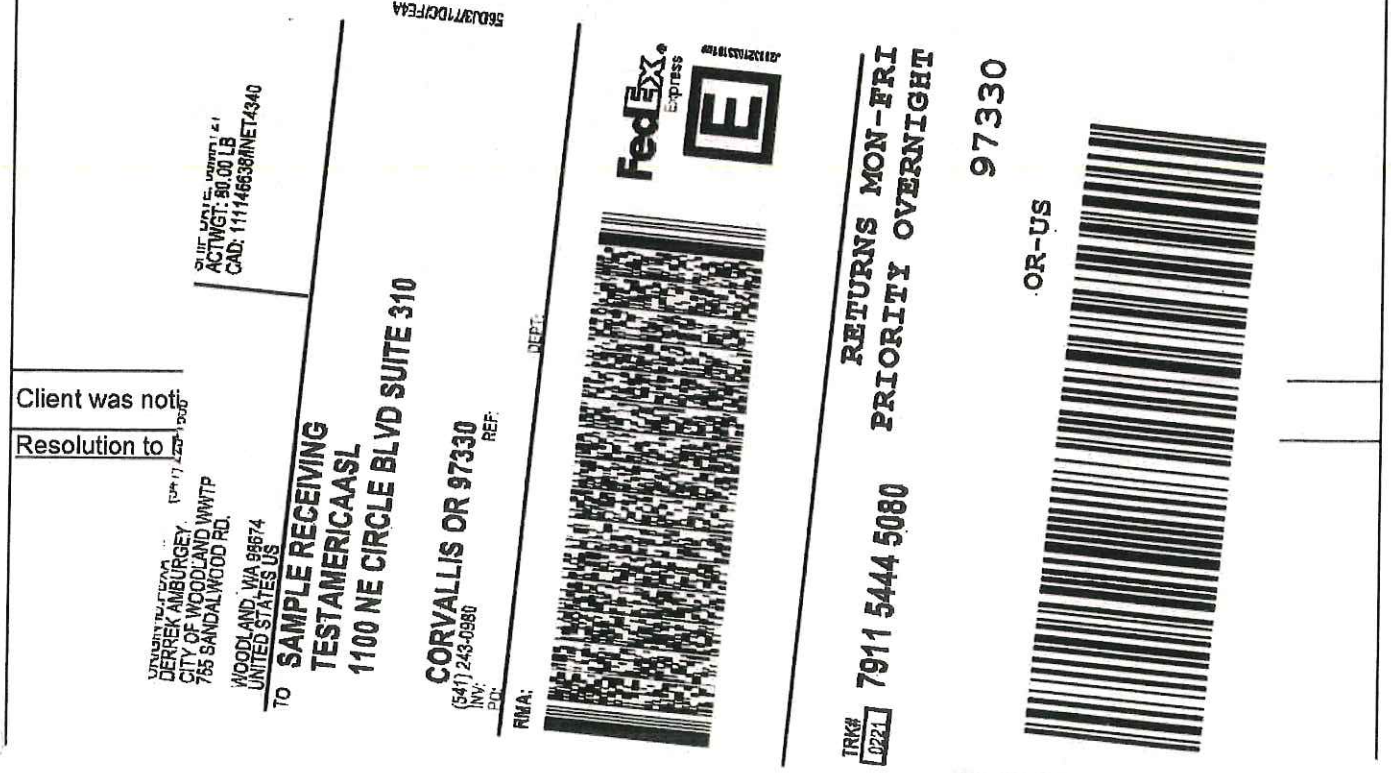
Method of Shipment: ☐ Hand Delivered, ☒ FedEx, ☐ UPS, ☐ Greyhound, ☐ Other: _____ ☐ N/A

Sample Exception Report (The following exceptions were noted)

Sample out of hold & out-of temp TC 5/24/21

Client was noti

Resolution to



CHAIN OF CUSTODY RECORD - FOR AQUATIC TOXICITY TESTING

eurofins | Environment Testing TestAmerica

Client: City of Woodland NPDES# WA0020401

Address: 755 Sandalwood Rd Woodland WA 98674

Contact Person: Derrek Amburgey

Phone: 360-225-7007

PO# 37314

Composite Sample Information

Samples/Hour N/A Volume/Sample N/A

Total Hours 24 Total Volume 20L

Initiated: Date 5-20-21 Time 8AM

Ended: Date 5-21-21 Time 8AM

Chilled During Collection Yes

Ship Samples to:

Eurofins TestAmerica
Attention: Aquatic Toxicology Laboratory
1100 NE Circle Blvd. Suite 310
Corvallis, OR 97330
Phone: 541-243-6137

Analysis Required / Comments

Sample ID	Date	Time	Sample Type: Comp.	Sample Type: Grab	# of Containers	Lab ID#	Fathead Acute	Fathead Chronic	Cerio Acute	Cerio Chronic	Daphnia Acute	Trout Acute	SHM Acute	SHM Chronic	MB Acute	MB Chronic	MYS Acute	MYS Chronic	Algae Chronic	CA Haz Waste	WA Haz Waste	Daphnia Chronic	Concentration and/or Comments
EFF			X		2		X	X			X								X			X	Sample unused and discarded TC 5/24/21

Project ID: Q21-05391 | Prepared By: Brett Muckey

Qty	Description
1	Algae chronic, definitive (5 concentration) bioassay
1	Concurrent Algae chronic Reference Toxicant test
1	Ceriodaphnia dubia acute, definitive (5 conc.), non-renewal, 48 hr, bioassay
1	Ceriodaphnia dubia chronic, definitive (5 conc.), bioassay
1	Fathead minnow acute, definitive (5 conc.), renewal (@ 48 hr), 96 hr duration, bioassay
1	Fathead minnow chronic, definitive (5 conc.), bioassay

Sampled By & Title (Please sign and print name) Derrek Amburgey		Date/Time 5-21-21 8AM	Relinquished By (Please sign and print name) Bob Fowler	Date/Time 5-21-21 1045
Received By (Please sign and print name) Lori Crumrine		Date/Time 5/24/21 1033	Relinquished By (Please sign and print name)	Date/Time
Received By (Please sign and print name)		Date/Time	Relinquished By (Please sign and print name)	Date/Time
Received By (Please sign and print name)		Date/Time	Shipped Via UPS Bus Fed-Ex Hand Other	Shipping # COC_Bioassay
Work Authorized By (Please sign and print name)		Remarks		Doc Control ID: ASI [illegible]9519

AQUATIC TOXICOLOGY REPORT

Project Name: CITY OF WOODLAND

Location: WOODLAND, WASHINGTON

Prepared by: Eurofins TestAmerica - Corvallis
(aka TestAmerica – ASL)

1100 NE Circle Boulevard, Suite 310
Corvallis, Oregon 97330
541-243-6137

Accredited in accordance with NELAP

Oregon Environmental Laboratory Accreditation Program #OR100022 (NELAP)
State of Washington DOE Environmental Laboratory Accreditation Program, Lab ID C556
California State Environmental Laboratory Accreditation Program, Certificate No.: 1726

Report Date: September 20, 2021 Released by: Michelle Bennett

Lab I.D. No. B5151

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APPENDIX A. RAW DATA SHEETS
APPENDIX B. REFERENCE TOXICANT DATA SHEETS
APPENDIX C. CHAIN OF CUSTODY

LABORATORY CONTACT: Alise Lampi, Aquatic Toxicity Department Manager
Alyssa.Lampi@eurofinset.com (541) 243-0964

INTRODUCTION

Eurofins TestAmerica – Corvallis (ET-C) Aquatic Toxicology Laboratory conducted toxicity testing on sample(s) from the City of Woodland, Woodland, Washington.

Testing was initiated on: August 24, 2021

The test(s) were conducted using:

- the water flea (*Ceriodaphnia dubia*)
- the fathead minnow (*Pimephales promelas*)
- the green algae (*Selenastrum capricornutum,* aka *Raphidocelis subcapitata*, aka *Pseudokirchneriella subcapitata*).

OVERVIEW OF REGULATORY GUIDANCE

The following provides an overview and excerpts of applicable permit specifics, regulatory guidance, and other relevant information. This is intended only as a helpful guide, from a laboratory perspective, for understanding test outcomes. The final responsibility for interpretation of results remains with the client and/or regulatory agency.

The following guidance is taken from ET-C's reading of the NPDES permit for the City of Woodland (permit #WA0020401, effective Apr. 1, 2012, expired Mar. 31, 2017). No current NPDES permit information was provided to or found by ET-C at the time of testing.

There are no acute or chronic effluent limits for Whole Effluent Toxicity listed in the NPDES permit.

Acute toxicity:

- "The acute critical effluent concentration (ACEC) equals 19 percent effluent."

Chronic toxicity:

- "The chronic critical effluent concentration (CCEC) equals 1.4 percent effluent."
- *Compliance Testing for Chronic Toxicity:*
    - "Conduct chronic toxicity testing on a series of at least five concentrations of effluent and a control. This series of dilutions must include the CCEC and ACEC."
    - "Compare the ACEC to the control using hypothesis testing at the 0.05 level of significance as described in permit."

The following is taken from the WDOE guidance (WQ-R-95-80, June 2016 revision):

- "To reduce WET limit violations due to statistically significance that is a Type I error (false positive), we lower the alpha for hypothesis testing when differences in test organisms response are small."
- "Alpha will be lowered from 0.05 to 0.01 if a 10% difference in an acute test is significant or a 20% difference in a chronic test is significant."

SUMMARY OF TEST RESULTS

Exhibits 1 and 2 provide a summary of the final test results.

EXHIBIT 1
Summary of Acute Test Results

Species	NOEC (%)	LOEC (%)	LC_{50} (%)
C. dubia	100	> 100	> 100
P. promelas	100	> 100	> 100

Note: acronyms are as defined below.

More detailed information is provided in the Results and Discussion section.

EXHIBIT 2
Summary of Chronic Test Results

Species	NOEC (%)	LOEC (%)	IC_{25} (%)
C. dubia	100	> 100	> 100
P. promelas	100	> 100	> 100
S. capricornutum	19.0	50.0	51.2

Note: acronyms are as defined below.

More detailed information is provided in the Results and Discussion section.

ACRONYM DEFINITIONS (from EPA guidance):

NOEC = No Observed Effect Concentration: The highest test concentration that causes no observable adverse effects on the test organisms (i.e. no statistically significant reduction from the control).
LOEC = Low Observed Effect Concentration: The lowest test concentration that does cause an observable adverse effect on the test organisms (i.e. is statistically significant reduction from the control).
LC_{50} = Lethal Concentration (50%): A point estimate of the test concentration that would cause death in 50 percent of the test population.
IC_{25} = Inhibition Concentration (25%): A point estimate of the test concentration that would cause a 25 percent reduction of a non-quantal biological measurement (i.e. growth, reproduction, etc.) for the test population.

SAMPLE INFORMATION

Exhibit 3 provides a summary of the sample conditions as received.

EXHIBIT 3
Sample Conditions on Receipt

Sample ID	**EFF**		
ET-C SDG + suffix	B5151 -01	-02	-03
Collection - Date and Time	08/23/2021 09:00	08/25/2021 09:30	08/27/2021 09:00
Receipt - Date and Time	08/24/2021 11:55	08/26/2021 12:22	08/28/2021 11:18
Temperature (°C)	1.5 to 2.1	2.6	0.5 to 1.5
Dissolved Oxygen (mg/L)	9.2	9.1	8.4
pH	7.5	7.5	7.6
Conductivity (µS/cm)	821	970	1024
Total Residual Chlorine (mg/L)	0.02	0.05	0.04
Ammonia (mg/L as NH_3-N)	0.21	0.30	0.27
Total Hardness (mg/L as $CaCO_3$)	111	133	139
Total Alkalinity (mg/L as $CaCO_3$)	122	161	161

METHODS AND MATERIALS

TEST METHODS

The acute test methods were performed according to: *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms*, USEPA Office of Water (2002), EPA-821-R-02-012.

The chronic test methods were performed according to: *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms*, Fourth Edition, (2002), EPA-821-R-02-013.

Additional guidance was provided by:

- *Whole Effluent Toxicity Testing Guidance and Test Review Criteria*, Washington State Department of Ecology (revised Jun 2016) Pub# WQ-R-95-80.

DEVIATIONS FROM PROTOCOLS

Deviations from required procedures in the test methods:

- The conductivity measurements were not taken at test initiation in the *P. promelas* acute test as required by the WDOE. See further discussion in the Acute Results section.

Deviations from recommended procedures in the test methods:

- For the *P. promelas* chronic test, some of the instantaneous temperature readings fell outside of the recommended range of 25±1°C. However, the required test condition of a temperature deviation (i.e. maximum minus minimum) of no more than 3 °C was met. This situation is detailed further in the Results and Discussion section of this report.

- All subsequent uses of a sample did not occur within the WDOE recommended maximum holding time of 72 hours past the time of sample collection. See further discussion in the Sample Collection and Storage section.

TEST DESIGN

The following summarizes the conditions used for both overall testing and the specifics for each test (observations and notations can be found on the datasheets in Appendix A):

Overall Test Design:

- Acute and Chronic tests: 1.4, 10, 19, 50, and 100 percent sample + dilution water for the control.

Test Organism Conditions:

- All organisms tested were fed and maintained during culturing, acclimation, and testing as prescribed by the EPA (2002).
- The test organisms appeared vigorous and in good condition prior to testing.

C. dubia acute test:

- Source: ET-C's in-house cultures
- Age: Less than 24 hours old
- Design: Four test vessels per concentration, five organisms per vessel
- Test Solution Renewal: None (i.e. static test)
- Monitoring:
    - Daily: Survival, DO, pH, and temperature; all concentrations.
    - Test Initiation and Termination: Conductivity, all concentrations
- Termination: 48 hours.
- Endpoints: Survival (at termination)

P. promelas acute test (renewal):

- Source: Aquatox Inc., Hot Springs, Arkansas
- Age: 1 to 14 days old, within a 24 hour age range
- Design: Four test vessels per concentration, Ten organisms per vessel
- Test Solution Renewal: Once @ 48 hours (i.e. static-renewal test)
- Monitoring:
    - Daily: Survival, DO, pH, and temperature; all concentrations.

    - Pre and Post Renewal solutions: DO and pH, all concentrations.
    - Test Initiation, with each new sample use, and Termination:
        - Conductivity, all concentrations (WDOE)
- Termination: 96 hours.
- Endpoints: Survival (at termination)

C. dubia chronic test:

- Source: ET-C's in-house cultures
- Age: Less than 24 hours old and within an 8-hour age range, with blocking by known parentage
- Design: Ten test vessels per concentration, one organism per vessel
- Test Solution Renewal: Daily
- Monitoring:
    - Daily: Survival and neonate production (with brood determination)
    - Daily: DO and pH in pre and post-renewal solutions, all concentrations
    - Daily: Temperature in pre-renewal solutions, all concentrations
    - With each new sample: Conductivity in post-renewal solutions, control and highest sample concentration
- Termination: When 60%+ of surviving control organisms produce a 3rd brood.
    - Survival: @ after 7 days.
    - Reproduction: When 60%+ of surviving control organisms produce a 3rd brood.
- Endpoints: Survival (at termination) and Reproduction (through first 3 broods)

P. promelas chronic test:

- Source: Aquatox Inc., Hot Springs, Arkansas
- Age: Less than 48 hours old and within an 24 hour age range
- Design: Four test vessels per concentration, ten organisms per vessel
- Test Solution Renewal: Daily
- Monitoring:
    - Daily: Survival
    - Daily: DO and pH in pre and post-renewal solutions, all concentrations
    - Daily: Temperature in pre-renewal solutions, all concentrations
    - With each new sample: Conductivity in post-renewal solutions, control and highest sample concentration
- Termination: 7 days after test initiation.
- Endpoints: Survival and Growth (average dry weight per organism added @ initiation)

S. capricornutum chronic test:

- Source: ET-C's in-house cultures
- Age: Culture acclimated to test conditions for 4 to 7 days.
- Design: Four test vessels per concentration, 10,000 cells/ml density at initiation
- Test Solution Renewal: None (static)
- Monitoring:
    - Initiation: DO, pH, Temperature, and Conductivity, all concentrations
    - Initiation: Hardness and Alkalinity, control + low, middle and high sample concentrations
    - Initiation: Light Intensity and Cell Density confirming counts, in triplicate
    - Daily: Temperature and pH, all concentrations

- Termination: 96 hours.
- Endpoints: Cell Density (at termination)

DILUTION WATER

The dilution water used was the standard culture water used by ET-C:

- Reconstituted, moderately hard water (as per EPA protocol) with a total hardness of 75 to 105 mg/L as $CaCO_3$ and an alkalinity of 50 to 75 mg/L as $CaCO_3$.
- For the *S. capricornutum* test: Reconstituted, moderately hard water with nutrients added, including EDTA, that was passed through a 1.60 micron filter prior to use.

SAMPLE COLLECTION AND STORAGE

Samples were collected by City of Woodland personnel. The samples were accepted as scheduled by ET-C. Chain of Custody and Sample Receipt Records are provided in Appendix C.

- All samples were received within the EPA recommended and WDOE required 0 to 6 °C range.
- All samples were initially used for test initiation or test solution renewal within the EPA recommended maximum holding time of 36 hours of sample collection.
- All subsequent uses of a sample occurred within the EPA recommended maximum holding time of 72 hours past the time of initial use of that sample.
- Not all subsequent uses of a sample occurred within the WDOE recommended maximum holding time of 72 hours past the time of sample collection.
    - The sample was collected on August 27, 2021 at 09:00. The subsequent use of that sample took place on Day 6 of the *C. dubia* chronic test. On Day 6 the subsequent use of the sample occurred at 14:05 (78 hours and 5 minutes past collection of the sample).
    - The sample was collected on August 27, 2021 at 09:00. The subsequent use of that sample took place on Day 6 of the *P. promelas* chronic test. On Day 6 the subsequent use of the sample occurred at 14:29 (78 hours and 29 minutes past collection of the sample).
- All subsequent uses of a sample occurred within the WDOE recommended maximum holding time of 84 hours past the time of sample collection. (Extended for renewals of a 96 hour duration acute test).
- Following receipt, the samples were stored in the dark at 0 to 6 °C until test solutions were prepared and tested.

SAMPLE PREPARATION

Samples used during these tests were:

- Temperature adjusted prior to test initiation and each daily renewal.
- Organisms were noted in the first and second samples on arrival. Samples were filtered through a 60 µm net prior to use.
- The subsample used for the *S. capricornutum* test had nutrients, including EDTA, added, and was 1.60 micron filtered prior to use.

DATA ANALYSIS

The statistical analyses performed for the acute tests were those outlined in *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms*, USEPA Office of Water, Fifth Edition (2002), EPA-821-R-02-012, using CETIS.

The statistical analyses performed for the chronic tests were those outlined in *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms*, USEPA Office of Water, Fourth Edition (EPA 2002), EPA-821-R-02-013, using CETIS.

- The specific statistical analysis and CETIS version used for each endpoint evaluation is listed with the statistical outputs included with each test in Appendix A.
- If any additional analysis methods were also used, an explanation of the rationale and reference to the source method is included with the presentation of those results below.

Additional guidance was provided by:

- *Whole Effluent Toxicity Testing Guidance and Test Review Criteria*, Washington State Department of Ecology (revised Jun 2016) Pub# WQ-R-95-80.

RESULTS AND DISCUSSION

The raw data sheets for all tests are presented in Appendix A.

ACUTE BIOASSAYS

Table 1 summarizes the survival data for the *C. dubia* acute test.

Table 1
Summary of Acute Results
C. dubia

Sample Concentration (%)	Percent Survival (at Test Termination)
Control	100
1.4	100
10	100
19	100
50	100
100	100

Statistical analysis in accordance with the EPA protocol and WDOE guidance results in:

- NOEC = 100 %
- LOEC > 100 %
- LC_{50} > 100 %

Dissolved oxygen concentrations remained at 4.0 mg/L or greater throughout the test period. Test temperatures remained in the range of 20±1 °C.

The *C. dubia* acute test meets Test Acceptability Criteria (TAC) of a minimum 90 percent control survival. Unless referenced above, the tests proceeded without any noted deviations or interruptions that could have affected test results. The testing should be considered "valid".

Table 2 summarizes the survival data for the *P. promelas* acute test.

Table 2 **Summary of Acute Results** ***P. promelas***	
Sample Concentration (%)	**Percent Survival (at Test Termination)**
Control	100
1.4	97.5
10	100
19	97.5
50	97.5
100	100

Statistical analysis in accordance with the EPA protocol and WDOE guidance results in:

- NOEC = 100 %
- LOEC > 100 %
- LC_{50} > 100 %

The conductivity measurements were not taken in all concentrations at test initiation in the *P. promelas* acute test as required by the WDOE. WDOE manual states, "Conductivity is measured in all samples and in one test chamber at each test concentration at the beginning of a test using freshwater organisms, prior to test solution renewal, and at test termination." However, it is ET-C's professional opinion that missing the required conductivity measurements had no significant impact on test results.

Dissolved oxygen concentrations remained at 4.0 mg/L or greater throughout the test period. Test temperatures remained in the range of 20±1 °C.

The *P. promelas* acute test meets Test Acceptability Criteria (TAC) of a minimum 90 percent control survival. Unless referenced above, the tests proceeded without any noted deviations or interruptions that could have affected test results. The testing should be considered "valid".

CHRONIC BIOASSAYS

Table 3 summarizes the survival and reproduction data for the *C. dubia* chronic test.

Table 3
Summary of Chronic Results
C. dubia

Sample Concentration (%)	Percent Survival	Mean Number of Young Per Adult
Control	100	17.7
1.4	90	16.3
10	100	18.3
19	80	15.7
50	100	16.9
100	90	22.5

Statistical analysis in accordance with the EPA protocol and WDOE guidance results in:

- NOEC = 100 %
- LOEC > 100 %
- IC_{25} > 100 %

Dissolved oxygen concentrations remained at 4.0 mg/L or greater throughout the test period. Test temperatures remained at 25±1 °C.

The *C. dubia* test meets Test Acceptability Criteria (TAC) for a minimum 80 percent control survival and a minimum 15 young produced per surviving control adult. Unless referenced above, the tests proceeded without any noted deviations or interruptions that could have affected test results. The testing should be considered "valid".

Table 4 summarizes the survival and growth data for the *P. promelas* chronic test.

Table 4
Summary of Chronic Results
P. promelas

Sample Concentration (%)	Percent Survival	Mean Dry Weight Per Organism Added (mg)
Control	100	1.095
1.4	97.2	0.927 [a]
10	97.5	0.931 [a]
19	97.5	1.007
50	100	1.039
100	97.5	0.97

[a] Indicates a statistically significant difference from the control at alpha = 0.05.
[b] Indicates a statistically significant difference from the control at alpha = 0.01.

Statistical analysis in accordance with the EPA protocol and WDOE guidance results in:

- NOEC = 100 %
- LOEC = 1.4 %
- IC_{25} > 100 %

EPA guidance recommends test temperature to remain at 25±1°C for the *P. promelas* chronic test. On Days 5, 6, and 7, the instantaneous temperatures in the test concentrations were slightly outside of this range at 23.5 to 23.8 °C. However, the required test condition of a temperature deviation (i.e. maximum minus minimum) over the entire test period of no more than 3 °C was met (25.0 – 23.5 = 1.5°C). The EPA chronic manual Section 4.9.2 states: "An individual test may be conditionally acceptable if the temperature, DO, and other specified conditions fall outside specifications, depending on the degree of departure and the objectives of the tests. The acceptability of the test would depend on the experience and professional judgment of the laboratory investigator and the reviewing staff of the regulatory authority". It is the laboratory's professional judgment that the minor deviation in the test temperature from the recommended conditions did not appear to affect the test results and the test should be accepted.

EPA 821-B-00-004, Chapter 2, allows for reduction of alpha (p) levels from 0.05 to 0.01 in an effort to reduce Type I or "false positive" statistical errors. This approach is contingent on the test maintaining appropriate test sensitivity and allowances in the NPDES permit or by the regulating authority. Using p=0.01, the *P. promelas* test results showed no statistically significant reduction at any sample concentrations when compared to the control.

In addition, Washington DOE Pub# WQ-R-95-80 guidance states that if a significant difference in test organism response from the control in a chronic test is less than 20%, the level of significance (alpha) will be reduced from 0.05 to 0.01.

- For this data set, the reduction in growth at the 1.4 and 10 percent sample concentrations were 15.3 and 15.0, respectively, percent from control values.

- Analysis at the alpha = 0.01 level, the 1.4 and 10 percent sample concentrations did not show a statistically significant reduction in growth.
- Overall, analysis at the appropriate alpha level (based on percent reduction from the control) for each sample concentration showed no statistically significant reductions in growth only at any sample concentrations.
- Note: This adjustment in alpha levels does not impact the IC_{25} calculation.

As a result, in accordance with the additional WDOE guidance:

- NOEC = 100 %
- LOEC > 100 %
- IC_{25} > 100 %

Dissolved oxygen concentrations remained at 4.0 mg/L or greater throughout the test period. Test temperatures remained at 25±1°C.

The *P. promelas* test meets Test Acceptability Criteria (TAC) for a minimum 80 percent control survival and a minimum weight of 0.250 mg per surviving control organism. Unless referenced above, the tests proceeded without any noted deviations or interruptions that could have affected test results. The testing should be considered "valid".

Table 5 summarizes the algae growth data for the *S. capricornutum* chronic test.

Table 5
Summary of Chronic Results
S. capricornutum

Sample Concentration (%)	Growth (Cells/ml x 10^6)
Control	3.826
1.4	3.478
10	3.076 [a]
19	3.420
50	2.933 [a,b]
100	1.069 [a,b]

[a] Indicates a statistically significant difference from the control at alpha = 0.05.
[b] Indicates a statistically significant difference from the control at alpha = 0.01.

Statistical analysis in accordance with the EPA protocol results in:

- NOEC = 19 %
- LOEC = 10 %
- IC_{25} = 51.2 %

EPA 821-B-00-004, Chapter 2, allows for reduction of alpha (p) levels from 0.05 to 0.01 in an effort to reduce Type I or "false positive" statistical errors. This approach is contingent on the test maintaining appropriate test sensitivity and allowances in the NPDES permit or by the regulating authority. Using p=0.01, the *S. capricornutum* test results showed a statistically significant reduction in growth at the 50 and 100 percent effluent concentration when compared to the control.

In addition, Washington DOE Pub# WQ-R-95-80 (Page 17) guidance states that if a significant difference in test organism response from the control in a chronic test is less than 20%, the level of significance (alpha) will be reduced from 0.05 to 0.01.

- For this data set, the reduction in growth at the 10 percent sample concentration was 19.6 percent from control values.
- Analysis at the alpha = 0.01 level, the 10 percent sample concentration did not show a statistically significant reduction in growth.
- Overall, analysis at the appropriate alpha level (based on percent reduction from the control) for each sample concentration showed statistically significant reductions in growth only at the 50 and 100 percent sample concentrations.
- Note: This adjustment in alpha levels does not impact the IC_{25} calculation.

As a result, in accordance with the additional WDOE guidance:

- NOEC = 19 %
- LOEC = 50 %
- IC_{25} = 51.2 %

The initial dissolved oxygen levels in the chronic test remained was at or above 4.0 mg/L. Test temperatures remained at 25±1°C.

The *S. capricornutum* chronic test meets Test Acceptability Criteria (TAC) for a minimum 1.0×10^6 cells/ml control growth and a maximum coefficient of variance (CV%) of 20% in the controls. Unless referenced above, the tests proceeded without any noted deviations or interruptions that could have affected test results. The testing should be considered "valid".

REFERENCE TOXICANT TESTS

Reference toxicant (reftox) testing is performed to document both initial and ongoing laboratory performance of the test method(s). While the health of the test organisms is primarily evaluated by the performance of the laboratory control, reftox test results also may be used to assess the health and sensitivity of the test organisms. Reftox test results within their respective cumulative summary (Cusum) chart limits are indicative of consistent laboratory performance and normal test organism sensitivity.

The results of the reftox tests indicate that the test organisms were within their respective cusum chart limits based on EPA guidelines. This demonstrates ongoing laboratory proficiency of the test methods and suggests normal test organism sensitivity in the associated client testing.

The *P. promelas* and *C. dubia* acute reftox test was conducted using sodium chloride. The *P. promelas* chronic reftox test was conducted using potassium chloride. The *C. dubia* and *S. capricornutum* chronic reftox tests were conducted using sodium chloride. The data sheets for the reference toxicant tests are provided in Appendix B.

Tables 6 and 7 summarize the reference toxicant test results and Cusum chart limits.

Table 6
Acute Reference Toxicant Tests (g/L)

Species	LC_{50}	Cusum Chart Limits
C. dubia	2.45	1.69 to 3.05
P. promelas	8.1	5.8 to 8.6

Table 7
Chronic Reference Toxicant Tests (g/L)

Species	IC_{25}	Cusum Chart Limits
C. dubia (survival)	1.08	0.43 to 2.60
C. dubia (reproduction)	0.58	0.13 to 1.30
P. promelas (survival)	0.61	0.52 to 0.70
P. promelas (growth)	0.55	0.44 to 0.72
S. capricornutum (growth)	2.24	0.15 to 2.61

APPENDIX A

RAW DATA SHEETS

TestAmerica

FRESHWATER TOXICITY TEST: SAMPLE AND DILUTION WATER DATA

Client: City of Woodland | SDG # B G1G1 | Test Initiation: Date 4/24/21

Contact: Derrek Amburgey | Test Termination: Date 4/31/21

Sample ID Number	Field ID	Collected Date (mm/dd/yy)	Collected Time (Pacific Zone)	Received Date (mm/dd/yy)	Received Time (Pacific Zone)	Temp (°C) as Rc'vd	Total Residual Chlorine (mg/l) ☐ Dechlorination allowed: as Rc'vd / after Dechlor.	Ammonia NH_3-N mg/l as Rc'vd	Hardness mg/l as $CaCO_3$ as Rc'vd	Alkalinity mg/l as $CaCO_3$ as Rc'vd	DO (mg/L) as Rc'vd	pH as Rc'vd	Cond. (uS) as Rc'vd	60 um filtered? (organisms noted)
B5151 -01	EFF	4/23/21	09:00	4/24/21	11:55	1.5 2.1	0.02 / -	0.21	111	122	9.2	7.5	821	☒ TC
B5151 -02	EFF	4/25/21	09:30	4/26/21	12:22	2.6	0.05 / -	0.30	133	161	9.1	7.5	970	☒ TC 1/KG
B5151 -03	EFF	4/27/21	9:00	4/29/21	11:15	0.3 1.3	0.04 / -	0.27	139	161	8.4	7.6	1024	~~☒ TC~~ 2nd 5/2 TC
							/							NOT filtered
							/							
							/							
							/							
							/							
							/							
							/							
							/							
							/							
							/							
	Reporting Limits:					na	0.02 mg/L	0.10 mg/L	5 mg/L	5 mg/L	na	na	na	na

Note: "-" Indicates data collection or dechlorination not needed. Any other adjustments to samples prior to use are documented in Comments below or on Dilutions page.

Dilution Water	ID#	Hardness mg/l as $CaCO_3$	Alkalinity mg/l as $CaCO_3$
Recon MH (Algae)	G392	103	71
Recon MH (FHM)	G393	99	61
	G390	91	62
	G393	95	59

Comments: ☑ Indicates the action was taken, (☐= action not taken): " - " = sample not dechlorinated, or analyte not collected/needed.

☑ Subsample for algae test had nutrients added and was 1.60 um filtered

Water Quality Meters Used/ID#: Dissolved Oxygen # 7 pH # 11 Conductivity # 2

TestAmerica

FRESHWATER TOXICITY TEST: TEST ORGANISM INFORMATION

Client: City of Woodland Sample Designation (SDG): B 5151

Test Species Information	Cd # 3863 *Ceriodaphnia dubia* Chronic	FHM # 2170 *Pimephales promelas* Chronic	Cd # 3864 *Ceriodaphnia dubia* Acute	FHM # 2175 *Pimephales promelas* Acute	Sc # 1041 *Selenastrum capricornutum* Chronic
Organism Age at Initiation	<24 hrs, all within an 8 hr window	<48 hrs, all within a 24 hour window	< 24 hrs	9 Days, within a 24 hour window	Acclimated for 4 Days
Test Container Size	30 ml	800 ml	30 ml	400 ml	125 ml
Test Volume	15 ml	500 ml	25 ml	250 ml	50 ml
Feeding: Type and Amount	0.10 ml Algae and 0.10 ml YCT daily	0.15 ml *Artemia*, 2 x Daily	Algae and YCT during acclimation	0.15 ml *Artemia*, @ 48 hrs	1 ml/L Nutrients, incl. EDTA, added
Aeration: In Test Chambers via Slow Bubble :	☒ None ☐ Prior to use	☒ None ☐ Prior to use ☐ @ _____ hrs	☒ None ☐ Prior to use	☒ None ☐ Prior to use ☐ @ _____ hrs	☒ None ☐ Prior to use
Acclimation Period	<24 hrs	<24 hrs	<24 hrs	7d2n ~~<24 hrs~~ PVT	3d24h Days
Organism Source	In-House	Aquatox	In-House	Aquatox	In-House
Size	-	-	-	-	-
Loading Rate	-	-	-	-	-

Dissolved Oxygen aeration justifications (in test chambers):

Test(s): ☐ All ☐ _____

Date:

Comments:

Test Solution Preparation and Dilution Record

Note: ☐ Indicates task not done, ☑ Indicates task was done. Temp adj. = Temperature adjusted to ambient or test temp

Ditto marks ('') indicate that the same SDG, batch of dilution water, or food as the previous day's entry was used.

Client: City of Woodland

Ceriodaphnia dubia - Chronic

Test Concentration (%)	Sample Volume (mls)		Final Volume (mls)
Control	0.00	→	200
1.4	2.80	→	200
10	20.0	→	200
19	38.0	→	200
50	100	→	200
100	200	→	200

Total Sample volume needed per day = 361 mls

Test Day	Sample ID Used	Daily Sample Preparation (prior to dilution)	Dilution Water Used	YCT ID Used	Algae ID Used	Date	Time	Initials
0 (Initiation)	B5151 -01	☐ Temp adj, ☐ Aerated	ID# 5388	#1318	# 1326	8/24/2021	13:05	BC
1	B5151-01	☐ Temp adj, ☐ Aerated	ID# 5395	#1319	# 1326	8/25/21	09:05	TC
2	B5151-02	☐ Temp adj, ☐ Aerated	ID# 5390	# 1325	# 1320	8/26/"	12:58	BW
3	B5151-02	☐ Temp adj, ☐ Aerated	ID# 5390	#1325	# 1320	8/27/21	08:22	TC
4	B5151-03	☐ Temp adj, ☐ Aerated	ID# 5390	#1319	# 1326	8/28/21	11:52	TC
5	B5151-03	☐ Temp adj, ☐ Aerated	ID# 5390	#1318	#1326	8/29/21	08:30	BC
6	B5151-03	☐ Temp adj, ☐ Aerated	ID# 5393	# 13H	#1320	8/30/21	10:20	MG
7	B -	☐ Temp adj, ☐ Aerated	ID#	#	#	/ /"	:	

Fathead minnow - Chronic

Test Concentration (%)	Sample Volume (mls)		Final Volume (mls)
Control	0.00	→	2000
1.4	28.0	→	2000
10	200	→	2000
19	380	→	2000
50	1,000	→	2000
100	2,000	→	2000

Total Sample volume needed per day = 3608 mls

Test Day	Sample ID Used	Daily Sample Preparation (prior to dilution)	Dilution Water Used	Date	Time	Initials
0 (Initiation)	B5151 -01	☐ Temp adj, ☐ Aerated	ID# 5388	8/24/2021	13:20	BC
1	B5151 -01	☐ Temp adj, ☐ Aerated	ID# 5395	8/25/"21	09:10	TC
2	B5151 -02	☐ Temp adj, ☐ Aerated	ID# 5390	8/26/"	12:58	BW
3	B5151 -02	☐ Temp adj, ☐ Aerated	ID# 5390	8/27/"21	08:25	TC
4	B5151-03	☐ Temp adj, ☐ Aerated	ID# 5390	8/28/"21	11:57	TC
5	B5151 -03	☐ Temp adj, ☐ Aerated	ID# 5390	8/29/"21	08:35	BC
6	B5151 -03	☐ Temp adj, ☐ Aerated	ID# 5393	8/30/21	10:30	MG

Ceriodaphnia dubia - Acute

Test Concentration (%)	Sample Volume (mls)		Final Volume (mls)
Control	0.00	→	200
1.4	2.80	→	200
10	20.0	→	200
19	38.0	→	200
50	100	→	200
100	200	→	200

Test Day	Sample ID Used	Daily Sample Preparation (prior to dilution)	Dilution Water Used	Date	Time	Initials
0 (Initiation)	B5151 - 01	☐ Temp adj, ☐ Aerated	ID# 5388	8/24/2021	13:30	BC

Total Sample volume needed per day = 361 mls

Fathead minnow - Acute

Test Concentration (%)	Sample Volume (mls)		Final Volume (mls)
Control	0.00	→	1000
1.4	14.0	→	1000
10	100	→	1000
19	190	→	1000
50	500	→	1000
100	1,000	→	1000

Test Day	Sample ID Used	Daily Sample Preparation (prior to dilution)	Dilution Water Used	Date	Time	Initials
0 (Initiation)	B5151 - 01	☐ Temp adj, ☐ Aerated	ID# 5388	8/24/2021	13:35	BC
2	B5151 - 01	☐ Temp adj, ☐ Aerated	ID# 5390	8/26/2021	08:26	TC

Total Sample volume needed per day = 1804 mls

Test Solution Preparation and Dilution Record

Client: City of Woodland

Note: ☐ Indicates task not done, ☑ Indicates task was done. Temp adj. = Temperature adjusted to ambient or test temp

Ditto marks ('') indicate that the same SDG, batch of dilution water, or food as the previous day's entry was used.

Algae - Chronic

Test Concentration (%)	Sample Volume (mls)		Final Volume (mls)
Control	0.00	→	500
1.4	7.00	→	500
10	50.0	→	500
19	95.0	→	500
50	250	→	500
100	500	→	500

Test Day	Sample ID Used
0 (Initiation)	B5151-02

Daily Sample Preparation (prior to dilution)

☑ Temperature adjusted

☐ Aerated

☑ Nutrients added (incl. EDTA)

~~☑ 0.45 um filtered Lot#~~

☐ 1.60 mm filtered (WDOE clients only) Lot# 9752442

Dilution Water Used: ID # 5392

Date: 9/26/2021

Time: 14:13

Initials: TC

Total Sample volume needed = 752 mls

TestAmerica

48 HOUR FRESHWATER TOXICITY TEST SURVIVAL AND WATER QUALITY DATA

Client: City of Woodland Sample ID # B 5151-01 Beginning, Date 9-24-21 Time 1615

Sample Description: Ending, Date 9/26/21 Time 1611

	0 hr	24 hr	48 hr	
Technician	TC/Bm	TC	48 hr	TC
Time	1615	1017	48 hr	1611
Therm. ID#	#260	#260	48 hr	#267

Random Template Used: Whiskey Cup random # 6 Waterbath/Incubator Used: #7

Test Species: *Ceriodaphnia dubia* ID# Cd 3464

Percent	Test Container Number	Number of Live Organisms			Dissolved Oxygen (mg/l)			pH			Temperature (°C)			Conductivity (µmohs/cm)		
		0	24	48	0	24	48	0	24	48	0	24	48	0	24	48
Control	Surrogate					8.3			8.1			19.6				
	A	5	5	5	7.9		8.0	7.9		8.0	19.5		20.1	330		334
	B	5	5	5												
	C	5	5	5												
	D	5	5	5												
1.4	Surrogate					8.3			8.0			19.7				
	A	5	5	5	8.1		8.1	8.0		8.1	19.9		20.3	346		346
	B	5	5	5												
	C	5	5	5												
	D	5	5	5												
10	Surrogate					8.4			8.0			19.9				
	A	5	5	5	8.2		8.2	7.9		8.1	19.5		20.3	352		393
	B	5	5	5												
	C	5	5	5												
	D	5	5	5												
19	Surrogate					8.4			8.0			19.9				
	A	5	5	5	8.3		8.3	7.7		8.0	19.9		20.4	424		429
	B	5	5	5												
	C	5	5	5												
	D	5	5	5												
50	Surrogate					8.4			8.1			19.9				
	A	5	5	5	8.3		8.3	7.5		8.0	19.8		20.3	564		569
	B	5	5	5												
	C	5	5	5												
	D	5	5	5												
100	Surrogate					8.4			8.2			19.6				
	A	5	5	5	8.5		8.4	7.4		8.2	19.9		20.2	~~796~~ 760		794
	B	5	5	5												
	C	5	5	5												
	D	5	5	5												

Note: Use surrogate test chamber to determine temperature, DO, pH, and Conductivity measurements @ 24 hrs (to avoid injuring the organisms).

CETIS Summary Report

Ceriodaphnia 48-h Acute Survival Test — **Eurofins TestAmerica - Corvallis**

Batch ID:	19-5750-8384	**Test Type:**	Survival (48h)	**Analyst:**	Michelle Bennett
Start Date:	24 Aug-21 16:15	**Protocol:**	EPA/821/R-02-012 (2002)	**Diluent:**	Mod-Hard Synthetic Water
Ending Date:	26 Aug-21 16:11	**Species:**	Ceriodaphnia dubia	**Brine:**	
Test Length:	48h	**Taxon:**		**Source:**	In-House Culture **Age:** <24

Sample ID:	09-4990-1125	**Code:**	B5151-01	**Project:**	
Sample Date:	23 Aug-21 09:00	**Material:**	POTW Effluent	**Source:**	Woodland, City of (WA0020401)
Receipt Date:	24 Aug-21 11:55	**CAS (PC):**		**Station:**	
Sample Age:	31h (1.5 °C)	**Client:**			

Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	✓	NOEL	LOEL	TOEL	PMSD	TU	S
11-0065-2536	48h Survival Rate	Steel Many-One Rank Sum Test		100	>100	---	---	1	1

Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	✓	Level	%	95% LCL	95% UCL	TU	S
14-6066-0285	48h Survival Rate	Linear Interpolation (ICPIN)		EC50	>100	---	---	<1	1

Test Acceptability

				TAC Limits			
Analysis ID	Endpoint	Attribute	Test Stat	Lower	Upper	Overlap	Decision
11-0065-2536	48h Survival Rate	Control Resp	1	0.9	>>	Yes	Passes Criteria
14-6066-0285	48h Survival Rate	Control Resp	1	0.9	>>	Yes	Passes Criteria

48h Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	D	4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	---	0.00%
1.4		4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	---	0.00%
10		4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	---	0.00%
19		4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	---	0.00%
50		4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	---	0.00%
100		4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	---	0.00%

Ceriodaphnia 48-h Acute Survival Test — **Eurofins TestAmerica - Corvallis**

Analysis ID:	11-0065-2536	**Endpoint:**	48h Survival Rate	**CETIS Version:**	CETISv1.9.7
Analyzed:	12 Sep-21 14:52	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1
Edit Date:	12 Sep-21 14:52	**MD5 Hash:**	4044EC3AA4B0C299FD327184584FE07D	**Editor ID:**	001-027-905-7
Batch ID:	19-5750-8384	**Test Type:**	Survival (48h)	**Analyst:**	Michelle Bennett
Start Date:	24 Aug-21 16:15	**Protocol:**	EPA/821/R-02-012 (2002)	**Diluent:**	Mod-Hard Synthetic Water
Ending Date:	26 Aug-21 16:11	**Species:**	Ceriodaphnia dubia	**Brine:**	
Test Length:	48h	**Taxon:**		**Source:**	In-House Culture **Age:** <24
Sample ID:	09-4990-1125	**Code:**	B5151-01	**Project:**	
Sample Date:	23 Aug-21 09:00	**Material:**	POTW Effluent	**Source:**	Woodland, City of (WA0020401)
Receipt Date:	24 Aug-21 11:55	**CAS (PC):**		**Station:**	
Sample Age:	31h (1.5 °C)	**Client:**			

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU
Angular (Corrected)	C > T	100	>100	---	1

Steel Many-One Rank Sum Test

Control	vs	Conc-%	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Dilution Water		1.4	18	10	1	6	CDF	0.8333	Non-Significant Effect
		10	18	10	1	6	CDF	0.8333	Non-Significant Effect
		19	18	10	1	6	CDF	0.8333	Non-Significant Effect
		50	18	10	1	6	CDF	0.8333	Non-Significant Effect
		100	18	10	1	6	CDF	0.8333	Non-Significant Effect

Test Acceptability Criteria

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

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0	0	5			Indeterminate
Error	0	0	18			
Total	0		23			

ANOVA Assumptions Tests

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

48h Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
1.4		4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
10		4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
19		4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
50		4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
100		4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%

Angular (Corrected) Transformed Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	4	1.3450	1.3450	1.3460	1.3450	1.3450	1.3450	0.0000	0.00%	0.00%
1.4		4	1.3450	1.3450	1.3460	1.3450	1.3450	1.3450	0.0000	0.00%	0.00%
10		4	1.3450	1.3450	1.3460	1.3450	1.3450	1.3450	0.0000	0.00%	0.00%
19		4	1.3450	1.3450	1.3460	1.3450	1.3450	1.3450	0.0000	0.00%	0.00%
50		4	1.3450	1.3450	1.3460	1.3450	1.3450	1.3450	0.0000	0.00%	0.00%
100		4	1.3450	1.3450	1.3460	1.3450	1.3450	1.3450	0.0000	0.00%	0.00%

Ceriodaphnia 48-h Acute Survival Test — **Eurofins TestAmerica - Corvallis**

Analysis ID:	11-0065-2536	**Endpoint:**	48h Survival Rate	**CETIS Version:**	CETISv1.9.7
Analyzed:	12 Sep-21 14:52	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1
Edit Date:	12 Sep-21 14:52	**MD5 Hash:**	4044EC3AA4B0C299FD327184584FE07D	**Editor ID:**	001-027-905-7

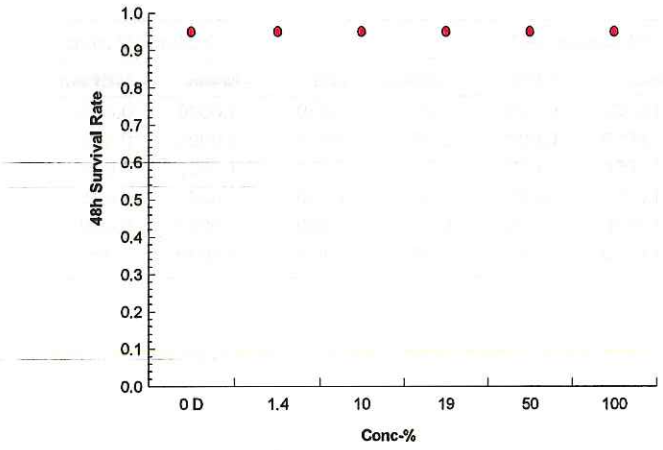
48h Survival Rate Detail

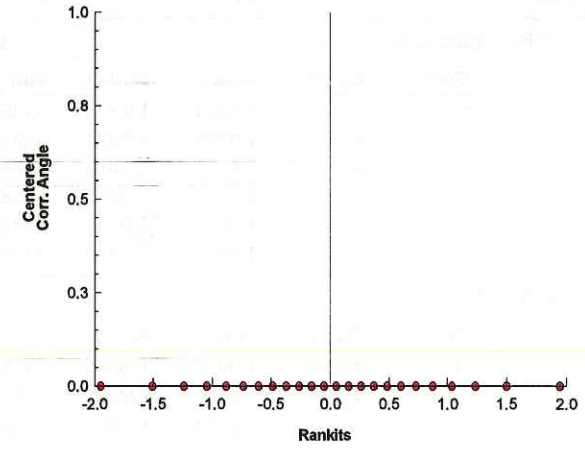
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	1.0000	1.0000	1.0000	1.0000
1.4		1.0000	1.0000	1.0000	1.0000
10		1.0000	1.0000	1.0000	1.0000
19		1.0000	1.0000	1.0000	1.0000
50		1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000	1.0000

Angular (Corrected) Transformed Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	1.3450	1.3450	1.3450	1.3450
1.4		1.3450	1.3450	1.3450	1.3450
10		1.3450	1.3450	1.3450	1.3450
19		1.3450	1.3450	1.3450	1.3450
50		1.3450	1.3450	1.3450	1.3450
100		1.3450	1.3450	1.3450	1.3450

Graphics





CETIS Analytical Report

Ceriodaphnia 48-h Acute Survival Test — **Eurofins TestAmerica - Corvallis**

Analysis ID:	14-6066-0285	**Endpoint:**	48h Survival Rate	**CETIS Version:**	CETISv1.9.7
Analyzed:	12 Sep-21 14:52	**Analysis:**	Linear Interpolation (ICPIN)	**Status Level:**	1
Edit Date:	12 Sep-21 14:52	**MD5 Hash:**	4044EC3AA4B0C299FD327184584FE07D	**Editor ID:**	001-027-905-7
Batch ID:	19-5750-8384	**Test Type:**	Survival (48h)	**Analyst:**	Michelle Bennett
Start Date:	24 Aug-21 16:15	**Protocol:**	EPA/821/R-02-012 (2002)	**Diluent:**	Mod-Hard Synthetic Water
Ending Date:	26 Aug-21 16:11	**Species:**	Ceriodaphnia dubia	**Brine:**	
Test Length:	48h	**Taxon:**		**Source:**	In-House Culture **Age:** <24
Sample ID:	09-4990-1125	**Code:**	B5151-01	**Project:**	
Sample Date:	23 Aug-21 09:00	**Material:**	POTW Effluent	**Source:**	Woodland, City of (WA0020401)
Receipt Date:	24 Aug-21 11:55	**CAS (PC):**		**Station:**	
Sample Age:	31h (1.5 °C)	**Client:**			

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Log(X+1)	Linear	1228801	200	Yes	Two-Point Interpolation

Test Acceptability Criteria

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

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
EC50	>100	---	---	<1	---	---

48h Survival Rate Summary

			Calculated Variate(A/B)							Isotonic Variate	
Conc-%	**Code**	**Count**	**Mean**	**Median**	**Min**	**Max**	**CV%**	**%Effect**	**A/B**	**Mean**	**%Effect**
0	D	4	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	20/20	1.0000	0.00%
1.4		4	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	20/20	1.0000	0.00%
10		4	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	20/20	1.0000	0.00%
19		4	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	20/20	1.0000	0.00%
50		4	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	20/20	1.0000	0.00%
100		4	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	20/20	1.0000	0.00%

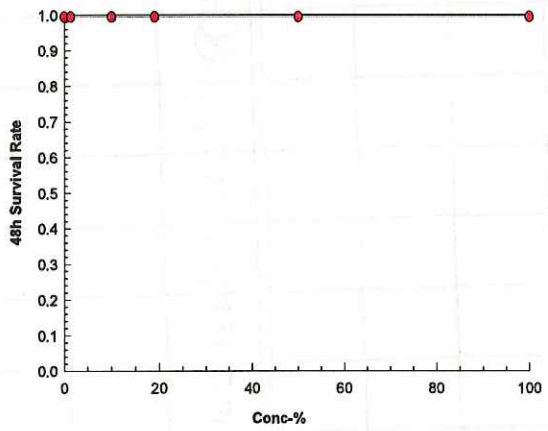
48h Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	1.0000	1.0000	1.0000	1.0000
1.4		1.0000	1.0000	1.0000	1.0000
10		1.0000	1.0000	1.0000	1.0000
19		1.0000	1.0000	1.0000	1.0000
50		1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000	1.0000

Ceriodaphnia 48-h Acute Survival Test — **Eurofins TestAmerica - Corvallis**

Analysis ID:	14-6066-0285	**Endpoint:**	48h Survival Rate	**CETIS Version:**	CETISv1.9.7
Analyzed:	12 Sep-21 14:52	**Analysis:**	Linear Interpolation (ICPIN)	**Status Level:**	1
Edit Date:	12 Sep-21 14:52	**MD5 Hash:**	4044EC3AA4B0C299FD327184584FE07D	**Editor ID:**	001-027-905-7

Graphics



TestAmerica

96 HOUR FRESHWATER TOXICITY TEST SURVIVAL AND WATER QUALITY DATA

Random Template Used: 6 conc. x 4 reps. # 5

Sample Description

Waterbath/Incubator Used: # 7

Initial Sample ID # B 5161-01

Client: City of Woodland

Test Species: *Pimephales promelas* ID# FHM 2175

		0 hr	24 hr	48 hr	72 hr	96 hr
Technician		TC	KG/BC	TC	KG	TC
Time		14:15	12:45	09:50	09:15	13:51
Therm. ID#	#	250	# 255	# 255	# 255	# 267

Test Initiation Date: 6/24/2021 Time: 15:15

Termination Date: 6/28/2021 Time: 13:51

Percent	Test Container Number	Number of Live Organisms 0	24	48	72	96	Dissolved Oxygen (mg/l) 0	24	48	72	96	pH 0	24	48	72	96	Temperature (°C) 0	24	48	72	96	Conductivity (µmohs/cm) 0	24	48	72	96
Control	A	10	10	10	10	10	7.8	8.0	7.8 / 8.5	8.1	7.8	7.7	8.0	7.8 / 7.9	7.9	7.3	19.7	19.9	19.7	19.8	19.5	335		355 / 341		347
	B	10	10	10	10	10																				
	C	10	10	10	10	10																				
	D	10	10	10	10	10																				
1.4 128	A	10	10	10	10	10	8.0	8.0	7.7 / 8.5	8.0	7.9	8.0	8.0	7.8 / 7.9	7.9	7.3	19.7	19.8	19.7	19.9	19.5	⊛	372	357 / 345		361
	B	10	10	10	10	10																				
	C	10	10	10	10	10																				
	D	10	10	10	10	9																				
10	A	10	10	10	10	10	8.1	8.1	7.9 / 8.5	8.1	7.9	7.9	8.0	7.8 / 7.7	8.0	7.3	19.7	19.9	19.7	19.9	19.5	⊛	385	394 / 396		400
	B	10	10	10	10	10																				
	C	10	10	10	10	10																				
	D	10	10	10	10	10																				

⊛ measurement missed TC 6/25

TestAmerica

96 HOUR FRESHWATER TOXICITY TEST SURVIVAL AND WATER QUALITY DATA

Random Template Used: 6 conc. x 4 reps. # 5

Sample Description

Client: City of Woodland

Test Species: *Pimephales promelas* ID# FHM 2175

Waterbath/Incubator Used: # 7

Initial Sample ID # B 9191-01

Test Initiation Date: 8/24/2021 Time: 15:15

Termination Date: 8/29/2021 Time: 13:51

	0 hr	24 hr	48 hr	72 hr	96 hr
Technician	TC	KG / BC	TC	KG	TC
Time	15:15	12:45	09:50	09:15	13:51
Therm. ID#	# 250	# 255	# 255	# 255	# 267

Percent	Test Container Number	Number of Live Organisms 0	24	48	72	96	Dissolved Oxygen (mg/l) 0	24	48	72	96	pH (Date TC 8/26) 0	24	48	72	96	Temperature (°C) 0	24	48	72	96	Conductivity (µmohs/cm) 0	24	48	72	96
19	A	10	10	10	10	10	8.2	8.1	7.9 / 8.6	8.1	8.0	7.5	8.0	7.9 / 7.6	8.0	7.4	19.5	19.8	19.7	19.8	19.9	*	425	434 / 428		445
	B	10	10	10	10	10																				
	C	10	10	10	10	10																				
	D	10	10	9	9	9																				
250	A	10	10	10	10	9	8.3	8.2	7.9 / 8.5	8.1	7.9	7.6	8.0	7.5 / 7.2	7.9	7.5	19.5	19.9	19.7	19.9	19.9	*	553	564 / 568		579
	B	10	10	10	10	10																				
	C	10	10	10	10	10																				
	D	10	10	10	10	10																				
100	A	10	10	10	10	10	8.5	8.2	7.9 / 9.1	8.1	8.0	7.4	7.9	7.6 / 6.9	8.0	7.6	19.5	19.8	19.7	19.8	19.8	754		755 / 801		529
	B	10	10	10	10	10																				
	C	10	10	10	10	10																				
	D	10	10	10	10	10																				

* measurement missed TC 8/25

CETIS Summary Report

Fathead Minnow 96-h Acute Survival Test — **Eurofins TestAmerica - Corvallis**

Batch ID:	15-7012-8846	**Test Type:**	Survival (96h)	**Analyst:**	Michelle Bennett		
Start Date:	24 Aug-21 15:15	**Protocol:**	EPA/821/R-02-012 (2002)	**Diluent:**	Mod-Hard Synthetic Water		
Ending Date:	28 Aug-21 13:51	**Species:**	Pimephales promelas	**Brine:**			
Test Length:	95h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR	**Age:**	8D

Sample ID:	09-4990-1125	**Code:**	B5151-01	**Project:**	
Sample Date:	23 Aug-21 09:00	**Material:**	POTW Effluent	**Source:**	Woodland, City of (WA0020401)
Receipt Date:	24 Aug-21 11:55	**CAS (PC):**		**Station:**	
Sample Age:	30h (1.5 °C)	**Client:**			

Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	✓	NOEL	LOEL	TOEL	PMSD	TU	S
11-8844-3679	96h Survival Rate	Steel Many-One Rank Sum Test		100	>100	---	6.45%	1	1

Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	✓	Level	%	95% LCL	95% UCL	TU	S
18-5422-5048	96h Survival Rate	Linear Interpolation (ICPIN)		EC50	>100	---	---	<1	1

Test Acceptability

				TAC Limits			
Analysis ID	**Endpoint**	**Attribute**	**Test Stat**	**Lower**	**Upper**	**Overlap**	**Decision**
11-8844-3679	96h Survival Rate	Control Resp	1	0.9	>>	Yes	Passes Criteria
18-5422-5048	96h Survival Rate	Control Resp	1	0.9	>>	Yes	Passes Criteria

96h Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	D	4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	---	0.00%
1.4		4	0.9750	0.8954	1.0550	0.9000	1.0000	0.0250	0.0500	5.13%	2.50%
10		4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	---	0.00%
19		4	0.9750	0.8954	1.0550	0.9000	1.0000	0.0250	0.0500	5.13%	2.50%
50		4	0.9750	0.8954	1.0550	0.9000	1.0000	0.0250	0.0500	5.13%	2.50%
100		4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	---	0.00%

CETIS Analytical Report

Fathead Minnow 96-h Acute Survival Test — **Eurofins TestAmerica - Corvallis**

Analysis ID:	11-8844-3679	**Endpoint:**	96h Survival Rate	**CETIS Version:**	CETISv1.9.7
Analyzed:	12 Sep-21 15:09	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1
Edit Date:	12 Sep-21 15:08	**MD5 Hash:**	B09E4711102E9EEC88093AB84A77AD34	**Editor ID:**	001-027-905-7
Batch ID:	15-7012-8846	**Test Type:**	Survival (96h)	**Analyst:**	Michelle Bennett
Start Date:	24 Aug-21 15:15	**Protocol:**	EPA/821/R-02-012 (2002)	**Diluent:**	Mod-Hard Synthetic Water
Ending Date:	28 Aug-21 13:51	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	95h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:** 8D
Sample ID:	09-4990-1125	**Code:**	B5151-01	**Project:**	
Sample Date:	23 Aug-21 09:00	**Material:**	POTW Effluent	**Source:**	Woodland, City of (WA0020401)
Receipt Date:	24 Aug-21 11:55	**CAS (PC):**		**Station:**	
Sample Age:	30h (1.5 °C)	**Client:**			

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	MSDu	PMSD
Angular (Corrected)	C > T	100	>100	---	1	0.06453	6.45%

Steel Many-One Rank Sum Test

Control	vs	Conc-%	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Dilution Water		1.4	16	10	1	6	CDF	0.6105	Non-Significant Effect
		10	18	10	1	6	CDF	0.8333	Non-Significant Effect
		19	16	10	1	6	CDF	0.6105	Non-Significant Effect
		50	16	10	1	6	CDF	0.6105	Non-Significant Effect
		100	18	10	1	6	CDF	0.8333	Non-Significant Effect

Test Acceptability Criteria

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

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0099598	0.001992	5	0.6	0.7006	Non-Significant Effect
Error	0.0597585	0.0033199	18			
Total	0.0697182		23			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Bartlett Equality of Variance Test				Indeterminate
Distribution	Shapiro-Wilk W Normality Test	0.6694	0.884	<1.0E-05	Non-Normal Distribution

96h Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
1.4		4	0.9750	0.8954	1.0000	1.0000	0.9000	1.0000	0.0250	5.13%	2.50%
10		4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
19		4	0.9750	0.8954	1.0000	1.0000	0.9000	1.0000	0.0250	5.13%	2.50%
50		4	0.9750	0.8954	1.0000	1.0000	0.9000	1.0000	0.0250	5.13%	2.50%
100		4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%

Angular (Corrected) Transformed Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	4	1.4120	1.4120	1.4120	1.4120	1.4120	1.4120	0.0000	0.00%	0.00%
1.4		4	1.3710	1.2420	1.5010	1.4120	1.2490	1.4120	0.0407	5.94%	2.89%
10		4	1.4120	1.4120	1.4120	1.4120	1.4120	1.4120	0.0000	0.00%	0.00%
19		4	1.3710	1.2420	1.5010	1.4120	1.2490	1.4120	0.0407	5.94%	2.89%
50		4	1.3710	1.2420	1.5010	1.4120	1.2490	1.4120	0.0407	5.94%	2.89%
100		4	1.4120	1.4120	1.4120	1.4120	1.4120	1.4120	0.0000	0.00%	0.00%

Fathead Minnow 96-h Acute Survival Test — **Eurofins TestAmerica - Corvallis**

Analysis ID:	11-8844-3679	**Endpoint:**	96h Survival Rate	**CETIS Version:**	CETISv1.9.7
Analyzed:	12 Sep-21 15:09	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1
Edit Date:	12 Sep-21 15:08	**MD5 Hash:**	B09E4711102E9EEC88093AB84A77AD34	**Editor ID:**	001-027-905-7

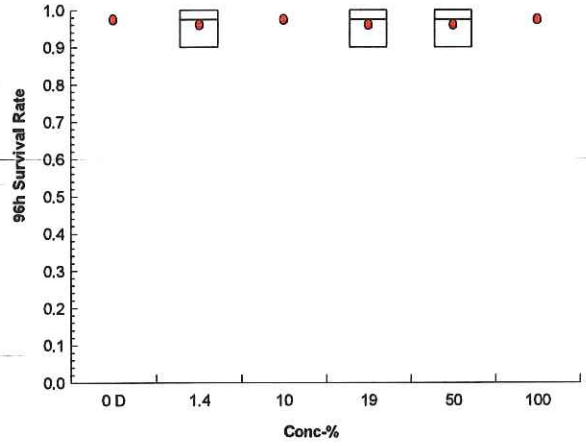
96h Survival Rate Detail

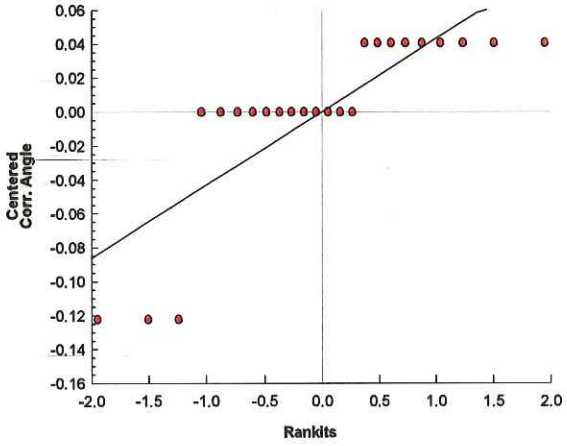
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	1.0000	1.0000	1.0000	1.0000
1.4		1.0000	1.0000	1.0000	0.9000
10		1.0000	1.0000	1.0000	1.0000
19		1.0000	1.0000	1.0000	0.9000
50		0.9000	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000	1.0000

Angular (Corrected) Transformed Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	1.4120	1.4120	1.4120	1.4120
1.4		1.4120	1.4120	1.4120	1.2490
10		1.4120	1.4120	1.4120	1.4120
19		1.4120	1.4120	1.4120	1.2490
50		1.2490	1.4120	1.4120	1.4120
100		1.4120	1.4120	1.4120	1.4120

Graphics





Fathead Minnow 96-h Acute Survival Test — **Eurofins TestAmerica - Corvallis**

Analysis ID:	18-5422-5048	**Endpoint:**	96h Survival Rate	**CETIS Version:**	CETISv1.9.7
Analyzed:	12 Sep-21 15:09	**Analysis:**	Linear Interpolation (ICPIN)	**Status Level:**	1
Edit Date:	12 Sep-21 15:08	**MD5 Hash:**	B09E4711102E9EEC88093AB84A77AD34	**Editor ID:**	001-027-905-7
Batch ID:	15-7012-8846	**Test Type:**	Survival (96h)	**Analyst:**	Michelle Bennett
Start Date:	24 Aug-21 15:15	**Protocol:**	EPA/821/R-02-012 (2002)	**Diluent:**	Mod-Hard Synthetic Water
Ending Date:	28 Aug-21 13:51	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	95h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:** 8D
Sample ID:	09-4990-1125	**Code:**	B5151-01	**Project:**	
Sample Date:	23 Aug-21 09:00	**Material:**	POTW Effluent	**Source:**	Woodland, City of (WA0020401)
Receipt Date:	24 Aug-21 11:55	**CAS (PC):**		**Station:**	
Sample Age:	30h (1.5 °C)	**Client:**			

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Log(X+1)	Linear	1818333	200	Yes	Two-Point Interpolation

Test Acceptability Criteria

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

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
EC50	>100	---	---	<1	---	---

96h Survival Rate Summary

			Calculated Variate(A/B)							Isotonic Variate	
Conc-%	**Code**	**Count**	**Mean**	**Median**	**Min**	**Max**	**CV%**	**%Effect**	**A/B**	**Mean**	**%Effect**
0	D	4	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	40/40	1.0000	0.00%
1.4		4	0.9750	1.0000	0.9000	1.0000	5.13%	2.50%	39/40	0.9875	1.25%
10		4	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	40/40	0.9875	1.25%
19		4	0.9750	1.0000	0.9000	1.0000	5.13%	2.50%	39/40	0.9833	1.67%
50		4	0.9750	1.0000	0.9000	1.0000	5.13%	2.50%	39/40	0.9833	1.67%
100		4	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	40/40	0.9833	1.67%

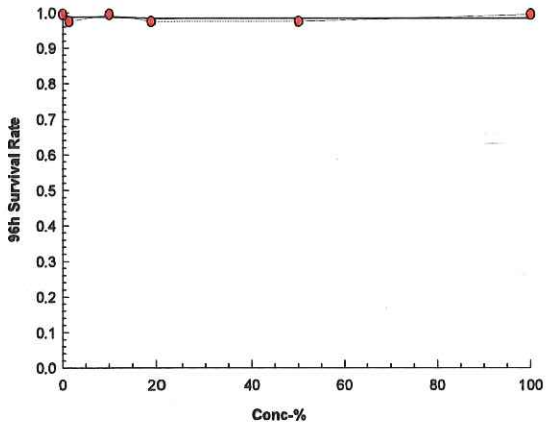
96h Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	1.0000	1.0000	1.0000	1.0000
1.4		1.0000	1.0000	1.0000	0.9000
10		1.0000	1.0000	1.0000	1.0000
19		1.0000	1.0000	1.0000	0.9000
50		0.9000	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000	1.0000

Fathead Minnow 96-h Acute Survival Test — **Eurofins TestAmerica - Corvallis**

Analysis ID:	18-5422-5048	**Endpoint:**	96h Survival Rate	**CETIS Version:**	CETISv1.9.7
Analyzed:	12 Sep-21 15:09	**Analysis:**	Linear Interpolation (ICPIN)	**Status Level:**	1
Edit Date:	12 Sep-21 15:08	**MD5 Hash:**	B09E4711102E9EEC88093AB84A77AD34	**Editor ID:**	001-027-905-7

Graphics



TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Ceriodaphnia dubia
Survival and Reproduction
Test Data Summary

Client: City of Woodland Test Start Date: 8/24/2021

Sample Description: Initial Sample ID#: B5151-01

Data summarized by: MB

Percent or Concentration	Total Live Young Produced in First 3 Broods per Replicate										# Alive Adults	Total Live Young
	A	B	C	D	E	F	G	H	I	J		
Control	15	17	17	17	21	17	20	18	17	18	10	177
	AD?	AD?	AD?	AD?	AD?	AD?	AD?	AD?	AD?	AD?		
1.4 %	12	13	23	19	19	11	22	15	19	10	9	163
	AD?	AD?	AD?	AD?	AD?	AD? x	AD?	AD?	AD?	AD?		
10 %	14	21	20	19	18	17	20	19	19	16	10	183
	AD?	AD?	AD?	AD?	AD?	AD?	AD?	AD?	AD?	AD?		
19 %	10	21	19	20	10	20	18	0	20	19	8	157
	AD?	AD?	AD?	AD?	AD? x	AD?	AD?	AD? x	AD?	AD?		
50 %	0	0	22	22	24	16	22	19	20	24	10	169
	AD?	AD?	AD?	AD?	AD?	AD?	AD?	AD?	AD?	AD?		
100 %	22	20	20	23	24	19	26	26	26	19	9	225
	AD? x	AD?	AD?	AD?	AD?	AD?	AD?	AD?	AD?	AD?		

Survival data summarized through Day 7. 60%+ of surviving controls with 3+ broods first observed on Day 6.

Test Organism Mortality (Adult dead) = AD? ✓

Test Organism identified as Male = AD? M

Test Organism Injured during test = AD? I

# of Alive Adults = Number of test organism alive at termination (for WDOE only, = Number of test organisms alive at Day 7)

Total Live Young = Total neonates produced in first 3 broods

Footnote: As per EPA-600-4-91-002 and EPA-821-R-02-013, *Ceriodaphnia dubia* test should be terminated when 60% of the surviving control organisms have produced their third brood, or at the end of eight days, whichever occurs first.

Also as per EPA-821-R-02-013 (13.10.9.1), "In this three-brood test, offspring from fourth or higher broods should not be counted and should not be included in the total number of neonates produced during the test."

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

CERIODAPHNIA CHRONIC SURVIVAL AND REPRODUCTION DATA

Neo's obtained from	A	B	C	D	E	F	G	H	I	J
Culture Board ID:	KOD	KOD	DAPKOD	D	D	AST	AST	AST	D	D
Slot #:	5	6	EA	25	12	13	14	15	10	2

Incubator Used: # 5
Random Template Used: 6 conc # 9

Client: City of Woodland
Sample Description:
Initial Sample ID # B 5151 - 01

Test Initiation: Date: 8/24/2021 Time: 14:15
Termination: Date: 8/31/2021 Time: 11:50

Technician: Day 0 BW Day 1 BW Day 2 BW Day 3 TC Day 4 BW Day 5 BW Day 6 BW Day 7 BW Day 8 ____
Time: Day 0 1415 Day 1 1210 Day 2 1430 Day 3 1015 Day 4 1450 Day 5 1345 Day 6 1405 Day 7 1150 Day 8 ____

Reproduction TAC met Day 6 BW

Percent	Day	Daily Number of Live Young for each Replicate A	B	C	D	E	F	G	H	I	J	No. Live Adults	Daily Total Live Young
Control	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	0	4	4	4	0	0	0	3	0	10	15
	4	5	4	0	0	8	4	4	4	0	4	10	25
	5	10	5	4	6	8	7	8	8	6	7	10	69
	6	0	0	9	7	9	6	8	6	8	7	10	68
	7	5	-	-	-	-	-	-	-	-	-	10	-
	8												
1.4 %	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	0	0	4	4	0	5	0	0	0	10	13
	4	5	4	4	0	0	4	0	3	4	3	10	27
	5	7	9	10	7	7	7 AD	7	7	7	7	9	* ~~73~~ 75
	6	0	0	9	8	8	(	10	5	8	0	9	48
	7	8	5	-	-	-	)	-	-	-	7	9	-
	8												
10 %	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	0	4	3	3	0	0	0	0	0	10	10
	4	4	4	0	0	0	4	5	5	3	4	10	29
	5	10	8	6	8	6	6	7	8	8	3	10	71
	6	0	9	10	8	9	7	8	6	8	4	10	69
	7	7	-	-	-	-	-	-	-	-	-	10	-
	8												
19 %	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	0	5	4	4	0	0	0/AD	3	0	9	16
	4	4 3 BW AM	4	0	0	0	4	4	(	0	5	9	20
	5	7	3	5	7	6 AD	0	5	(	4	8	8	60
	6	0	9	9	9	(	8	9	(	11	6	8	61
	7	8	-	-	-	)	-	-	)	-	-	8	-
	8												
50 %	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	0	4	3	3	0	3	0	3	0	10	16
	4	0	0	7	0	8 BW AM	5	0	4	0	5	10	29
	5	0	0	0	9	0	5	8	8	8	8	10	46
	6	0	0	11	10	13	6	11	7	9	11	10	78
	7	7	OF	-	-	-	-	-	-	-	-	10	-
	8												
100 %	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	0	4	3	4	0	0	0	4	0	10	15
	4	2	3	4	8	0	4	5	4	0	3	10	* ~~31~~ 32
	5	10	10	0	0	9	5	10	7	8	7	10	66
	6	10 AD	7	10	12	11	10	11	15	14	12	9	112
	7	(	-	-	-	-	-	-	-	-	0	9	-
	8	)											

"AD" = Adult Dead, "AY" = Aborted young, "M" = male organism, "F" = Female, "R" = Adult releasing young, " / " = split brood (carry-over brood / current day brood), "Inj" = Adult Injured during test solution renewal, replicate removed from analysis. "AM" = Adult missing, remove from analysis. A circled neonate count = 4th brood

Footnote: As per WDOE, C. dubia test reproduction should be when 60% of the surviving control organisms have produced their third brood (Days 6, 7, or 8). Survival is at seven days.

* R06 MB 9/12/21

TestAmerica

CERIODAPHNIA WATER QUALITY DATA

Client: City of Woodland | Initiated Date: 8/24/2021 Time: 14:15 | Adults Isolated Date: 8/23/2021 Time: 16:49

Sample Description: | Initial Sample ID #: B 5151 - 01 | Neo's Collected Date: 8/23/2021 Time: 23:28

	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8
Tech:	BM	BM	BM	TC	BM	BM	BM	BM	
Time	14:35	13:00	15:25	12:50	15:25	14:25	17:35	15:25	:
Therm.	# 250	# 267	# 255	# 255	# 255	# 255	# 267	# 251	#

Dissolved Oxygen (mg/l)

%	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8
Control	7.7	8.0 / 7.7	8.0 / 7.6	8.3 / 8.4	7.8 / 7.6	7.9 / 7.3	7.7 / 7.5	7.9	
1.4 %	7.9	8.0 / 7.9	7.9 / 7.8	8.3 / 8.4	7.8 / 7.7	7.8 / 7.4	7.7 / 7.6	8.0	
10 %	7.9	8.0 / 7.9	7.9 / 7.9	8.3 / 8.4	7.8 / 7.7	7.8 / 7.4	7.9 / 7.7	8.2	
19 %	8.0	8.0 / 8.0	7.9 / 8.0	8.3 / 8.5	7.8 / 7.8	7.7 / 7.5	7.7 / 7.6	8.1	
50 %	7.9	8.0 / 8.0	7.9 / 8.1	8.4 / 8.4	7.8 / 7.8	7.9 / 7.5	7.9 / 7.7	8.2	
100 %	8.0	7.9 / 8.0	7.9 / 8.1	8.4 / 8.5	7.8 / 7.8	7.8 / 7.6	7.8 / 7.6	8.2	

pH

%	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8
Control	7.8	7.8 / 7.4	7.9 / 8.1	8.2 / 8.1	7.9 / 7.9	7.9 / 7.9	8.0 / 7.8	8.0	
1.4 %	7.9	7.9 / 7.8	7.9 / 8.1	8.2 / 8.1	7.9 / 7.9	7.9 / 7.9	7.9 / 7.7	8.0	
10 %	7.8	7.9 / 7.8	8.0 / 8.0	8.2 / 8.1	7.9 / 7.9	8.0 / 7.9	8.0 / 7.7	8.0	
19 %	7.7	7.9 / 7.7	8.0 / 7.8	8.2 / 8.1	8.0 / 7.9	8.0 / 7.9	8.0 / 7.7	8.0	
50 %	7.6	8.1 / 7.6	8.2 / 7.7	8.4 / 8.2	8.1 / 7.9	8.2 / 7.6	8.2 / 7.7	8.1	
100 %	7.6	8.3 / 7.7	8.3 / 7.7	8.5 / 8.2	8.3 / 7.9	8.3 / 7.7	8.3 / 7.9	8.2	

Temperature (°C) / Conductivity (µS) (1st use of each sample only)

%	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8
Control	25.1 / 332	25.6	25.4 / 333	25.4	25.2 / 345	24.9	24.9	25.3	
1.4 %	25.0 / 344	25.9	25.9 / 345	25.9	25.2 / 357	24.9	25.3	25.5	
10 %	25.1 / 382	25.0	25.4 / 395	24.2	24.9 / 407	24.8	25.1	25.4	
19 %	25.0 / 426	25.3	25.6 / 449	25.4	25.3 / 461	24.8	25.3	25.4	
50 %	24.9 / 555	25.7	25.9 / 639	26.3	25.6 / 646	24.9	25.3	25.1	
100 %	25.1 / 722	25.6	25.4 / 943	24.3	24.7 / 956	24.9	25.0	25.2	

COMMENTS: Temperatures taken just prior to test solution renewals. DO, pH, and Conductivity taken following organism transfer.

23.8 = Temp out of recom. range

Note: All Day 0 data represents conditions at initiation. All other days: numerator represents pre-renewal conditions, denominator represents post-renewal conditions.

CETIS Summary Report

Ceriodaphnia 7-d Survival and Reproduction Test — **Eurofins TestAmerica - Corvallis**

Batch ID:	12-8892-1884	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Michelle Bennett
Start Date:	24 Aug-21 14:15	**Protocol:**	EPA/821/R-02-013 (2002)	**Diluent:**	Mod-Hard Synthetic Water
Ending Date:	31 Aug-21 11:50	**Species:**	Ceriodaphnia dubia	**Brine:**	
Test Length:	6d 22h	**Taxon:**		**Source:**	In-House Culture **Age:** <24

Sample ID:	09-4990-1125	**Code:**	B5151-01	**Project:**	
Sample Date:	23 Aug-21 09:00	**Material:**	POTW Effluent	**Source:**	Woodland, City of (WA0020401)
Receipt Date:	24 Aug-21 11:55	**CAS (PC):**		**Station:**	
Sample Age:	29h (1.5 °C)	**Client:**			

Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	✓ NOEL	LOEL	TOEL	PMSD	TU	S
20-0622-3047	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	100	>100	---	---	1	1
19-0200-0716	Reproduction	Steel Many-One Rank Sum Test	100	>100	---	30.8%	1	1

Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	✓ Level	%	95% LCL	95% UCL	TU	S
12-0552-1972	Reproduction	Linear Interpolation (ICPIN)	IC25	>100	---	---	<1	1

Test Acceptability

				TAC Limits			
Analysis ID	**Endpoint**	**Attribute**	**Test Stat**	**Lower**	**Upper**	**Overlap**	**Decision**
20-0622-3047	7d Survival Rate	Control Resp	1	0.8	>>	Yes	Passes Criteria
12-0552-1972	Reproduction	Control Resp	17.7	15	>>	Yes	Passes Criteria
19-0200-0716	Reproduction	Control Resp	17.7	15	>>	Yes	Passes Criteria
19-0200-0716	Reproduction	PMSD	0.3077	0.13	0.47	Yes	Passes Criteria

7d Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	D	10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	---	0.00%
1.4		10	0.9000	0.6738	1.1260	0.0000	1.0000	0.1000	0.3162	35.14%	10.00%
10		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	---	0.00%
19		10	0.8000	0.4984	1.1020	0.0000	1.0000	0.1333	0.4216	52.70%	20.00%
50		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	---	0.00%
100		10	0.9000	0.6738	1.1260	0.0000	1.0000	0.1000	0.3162	35.14%	10.00%

Reproduction Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	D	10	17.7	16.48	18.92	15	21	0.5385	1.703	9.62%	0.00%
1.4		10	16.3	12.94	19.66	10	23	1.484	4.692	28.78%	7.91%
10		10	18.3	16.79	19.81	14	21	0.6675	2.111	11.53%	-3.39%
19		10	15.7	10.8	20.6	0	21	2.166	6.848	43.62%	11.30%
50		10	16.9	10.31	23.49	0	24	2.915	9.219	54.55%	4.52%
100		10	22.5	20.41	24.59	19	26	0.922	2.915	12.96%	-27.12%

Ceriodaphnia 7-d Survival and Reproduction Test

Eurofins TestAmerica - Corvallis

Analysis ID:	20-0622-3047	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.9.7
Analyzed:	12 Sep-21 15:58	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Edit Date:	12 Sep-21 15:57	**MD5 Hash:**	032FE6FB5EAE5958BCBB860E461BB1EC	**Editor ID:**	001-027-905-7
Batch ID:	12-8892-1884	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Michelle Bennett
Start Date:	24 Aug-21 14:15	**Protocol:**	EPA/821/R-02-013 (2002)	**Diluent:**	Mod-Hard Synthetic Water
Ending Date:	31 Aug-21 11:50	**Species:**	Ceriodaphnia dubia	**Brine:**	
Test Length:	6d 22h	**Taxon:**		**Source:**	In-House Culture **Age:** <24
Sample ID:	09-4990-1125	**Code:**	B5151-01	**Project:**	
Sample Date:	23 Aug-21 09:00	**Material:**	POTW Effluent	**Source:**	Woodland, City of (WA0020401)
Receipt Date:	24 Aug-21 11:55	**CAS (PC):**		**Station:**	
Sample Age:	29h (1.5 °C)	**Client:**			

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU
Untransformed	C > T	100	>100	---	1

Fisher Exact/Bonferroni-Holm Test

Control	vs	Conc-%	Test Stat	P-Type	P-Value	Decision(α:5%)
Dilution Water		1.4	0.5000	Exact	1.0000	Non-Significant Effect
		10	1.0000	Exact	1.0000	Non-Significant Effect
		19	0.2368	Exact	1.0000	Non-Significant Effect
		50	1.0000	Exact	1.0000	Non-Significant Effect
		100	0.5000	Exact	1.0000	Non-Significant Effect

Test Acceptability Criteria

		TAC Limits			
Attribute	**Test Stat**	**Lower**	**Upper**	**Overlap**	**Decision**
Control Resp	1	0.8	>>	Yes	Passes Criteria

7d Survival Rate Frequencies

Conc-%	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
0	D	10	0	10	1.0000	0.0000	0.00%
1.4		9	1	10	0.9000	0.1000	10.00%
10		10	0	10	1.0000	0.0000	0.00%
19		8	2	10	0.8000	0.2000	20.00%
50		10	0	10	1.0000	0.0000	0.00%
100		9	1	10	0.9000	0.1000	10.00%

7d Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	10	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
1.4		10	0.9000	0.6738	1.0000	1.0000	0.0000	1.0000	0.1000	35.14%	10.00%
10		10	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
19		10	0.8000	0.4984	1.0000	1.0000	0.0000	1.0000	0.1333	52.70%	20.00%
50		10	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
100		10	0.9000	0.6738	1.0000	1.0000	0.0000	1.0000	0.1000	35.14%	10.00%

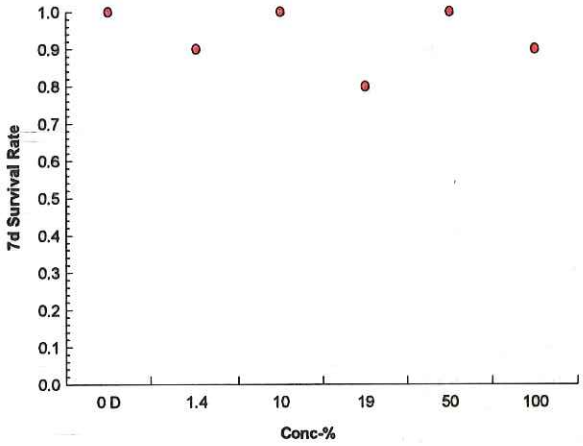
7d Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	D	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
1.4		1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000
10		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
19		1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	0.0000	1.0000	1.0000
50		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
100		0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

Ceriodaphnia 7-d Survival and Reproduction Test — **Eurofins TestAmerica - Corvallis**

Analysis ID:	20-0622-3047	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.9.7
Analyzed:	12 Sep-21 15:58	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Edit Date:	12 Sep-21 15:57	**MD5 Hash:**	032FE6FB5EAE5958BCBB860E461BB1EC	**Editor ID:**	001-027-905-7

Graphics



Ceriodaphnia 7-d Survival and Reproduction Test — **Eurofins TestAmerica - Corvallis**

Analysis ID:	19-0200-0716	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.7
Analyzed:	12 Sep-21 15:58	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1
Edit Date:	12 Sep-21 15:57	**MD5 Hash:**	98F9F2337DC921418A95846586303AE2	**Editor ID:**	001-027-905-7
Batch ID:	12-8892-1884	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Michelle Bennett
Start Date:	24 Aug-21 14:15	**Protocol:**	EPA/821/R-02-013 (2002)	**Diluent:**	Mod-Hard Synthetic Water
Ending Date:	31 Aug-21 11:50	**Species:**	Ceriodaphnia dubia	**Brine:**	
Test Length:	6d 22h	**Taxon:**		**Source:**	In-House Culture **Age:** <24
Sample ID:	09-4990-1125	**Code:**	B5151-01	**Project:**	
Sample Date:	23 Aug-21 09:00	**Material:**	POTW Effluent	**Source:**	Woodland, City of (WA0020401)
Receipt Date:	24 Aug-21 11:55	**CAS (PC):**		**Station:**	
Sample Age:	29h (1.5 °C)	**Client:**			

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	MSDu	PMSD
Untransformed	C > T	100	>100	---	1	5.445	30.77%

Steel Many-One Rank Sum Test

Control	vs	Conc-%	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Dilution Water		1.4	99.5	75	1	18	CDF	0.6816	Non-Significant Effect
		10	117	75	4	18	CDF	0.9803	Non-Significant Effect
		19	113	75	3	18	CDF	0.9548	Non-Significant Effect
		50	122.5	75	1	18	CDF	0.9948	Non-Significant Effect
		100	148	75	1	18	CDF	1.0000	Non-Significant Effect

Test Acceptability Criteria

		TAC Limits			
Attribute	**Test Stat**	**Lower**	**Upper**	**Overlap**	**Decision**
Control Resp	17.7	15	>>	Yes	Passes Criteria
PMSD	0.3077	0.13	0.47	Yes	Passes Criteria

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	297.6	59.52	5	2.104	0.0790	Non-Significant Effect
Error	1527.8	28.2926	54			
Total	1825.4		59			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Bartlett Equality of Variance Test	34.29	15.09	<1.0E-05	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.8602	0.9459	<1.0E-05	Non-Normal Distribution

Reproduction Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	10	17.7	16.48	18.92	17	15	21	0.5385	9.62%	0.00%
1.4		10	16.3	12.94	19.66	17	10	23	1.484	28.78%	7.91%
10		10	18.3	16.79	19.81	19	14	21	0.6675	11.53%	-3.39%
19		10	15.7	10.8	20.6	19	0	21	2.166	43.62%	11.30%
50		10	16.9	10.31	23.49	21	0	24	2.915	54.55%	4.52%
100		10	22.5	20.41	24.59	22.5	19	26	0.922	12.96%	-27.12%

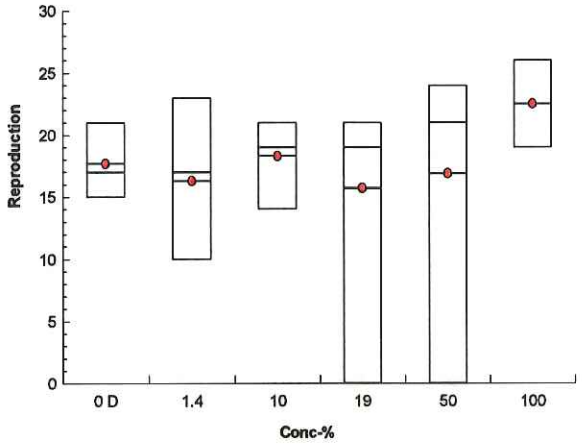
Reproduction Detail

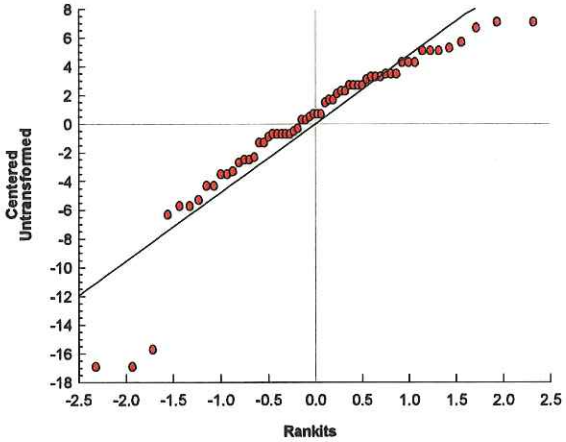
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	D	15	17	17	17	21	17	20	18	17	18
1.4		12	13	23	19	19	11	22	15	19	10
10		14	21	20	19	18	17	20	19	19	16
19		10	21	19	20	10	20	18	0	20	19
50		0	0	22	22	24	16	22	19	20	24
100		22	20	20	23	24	19	26	26	26	19

Ceriodaphnia 7-d Survival and Reproduction Test — **Eurofins TestAmerica - Corvallis**

Analysis ID:	19-0200-0716	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.7
Analyzed:	12 Sep-21 15:58	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1
Edit Date:	12 Sep-21 15:57	**MD5 Hash:**	98F9F2337DC921418A95846586303AE2	**Editor ID:**	001-027-905-7

Graphics





CETIS Analytical Report

Ceriodaphnia 7-d Survival and Reproduction Test — **Eurofins TestAmerica - Corvallis**

Analysis ID:	12-0552-1972	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.7
Analyzed:	12 Sep-21 15:59	**Analysis:**	Linear Interpolation (ICPIN)	**Status Level:**	1
Edit Date:	12 Sep-21 15:57	**MD5 Hash:**	98F9F2337DC921418A95846586303AE2	**Editor ID:**	001-027-905-7
Batch ID:	12-8892-1884	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Michelle Bennett
Start Date:	24 Aug-21 14:15	**Protocol:**	EPA/821/R-02-013 (2002)	**Diluent:**	Mod-Hard Synthetic Water
Ending Date:	31 Aug-21 11:50	**Species:**	Ceriodaphnia dubia	**Brine:**	
Test Length:	6d 22h	**Taxon:**		**Source:**	In-House Culture **Age:** <24
Sample ID:	09-4990-1125	**Code:**	B5151-01	**Project:**	
Sample Date:	23 Aug-21 09:00	**Material:**	POTW Effluent	**Source:**	Woodland, City of (WA0020401)
Receipt Date:	24 Aug-21 11:55	**CAS (PC):**		**Station:**	
Sample Age:	29h (1.5 °C)	**Client:**			

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Log(X+1)	Linear	396534	200	Yes	Two-Point Interpolation

Test Acceptability Criteria

		TAC Limits			
Attribute	**Test Stat**	**Lower**	**Upper**	**Overlap**	**Decision**
Control Resp	17.7	15	>>	Yes	Passes Criteria

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC25	>100	---	---	<1	---	---

Reproduction Summary

			Calculated Variate						Isotonic Variate	
Conc-%	**Code**	**Count**	**Mean**	**Median**	**Min**	**Max**	**CV%**	**%Effect**	**Mean**	**%Effect**
0	D	10	17.7	17	15	21	9.62%	0.00%	17.9	0.00%
1.4		10	16.3	17	10	23	28.78%	7.91%	17.9	0.00%
10		10	18.3	19	14	21	11.53%	-3.39%	17.9	0.00%
19		10	15.7	19	0	21	43.62%	11.30%	17.9	0.00%
50		10	16.9	21	0	24	54.55%	4.52%	17.9	0.00%
100		10	22.5	22.5	19	26	12.96%	-27.12%	17.9	0.00%

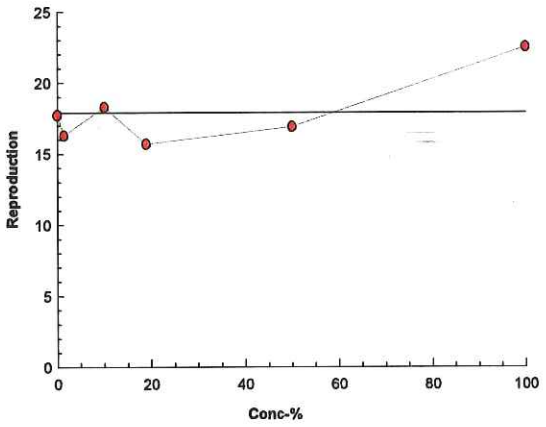
Reproduction Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	D	15	17	17	17	21	17	20	18	17	18
1.4		12	13	23	19	19	11	22	15	19	10
10		14	21	20	19	18	17	20	19	19	16
19		10	21	19	20	10	20	18	0	20	19
50		0	0	22	22	24	16	22	19	20	24
100		22	20	20	23	24	19	26	26	26	19

Ceriodaphnia 7-d Survival and Reproduction Test — **Eurofins TestAmerica - Corvallis**

Analysis ID:	12-0552-1972	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.7
Analyzed:	12 Sep-21 15:59	**Analysis:**	Linear Interpolation (ICPIN)	**Status Level:**	1
Edit Date:	12 Sep-21 15:57	**MD5 Hash:**	98F9F2337DC921418A95846586303AE2	**Editor ID:**	001-027-905-7

Graphics



TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

FATHEAD MINNOW 7-DAY SURVIVAL AND WATER QUALITY DATA

Random Template Used: 6 conc. x 4 reps. # 9 | Waterbath/incubator Used: # 4 | Date Initiated 8/24/2021 Time 16:25

Initial sample ID B 6161 -01 | Date Terminated 8/31/2021 Time 11:57

Client City of Woodland | Sample Description

Tech: Day 0 KG/TC Day 1 KG Day 2 KG Day 3 KG Day 4 TC Day 5 BC Day 6 KG Day 7 TC

Time Day 0 1625 Day 1 1445 Day 2 1520 Day 3 1412 Day 4 1441 Day 5 1115 Day 6 1429 Day 7 1157

Conc. or Percent	Day	Number of Live Organisms A	B	C	D	Dissolved O_2 (mg/l) Pre	Post	pH Pre	Post	Temp. (°C) Pre	Therm. ID #	Conductivity (µS) Post (1st use)
Control	0	10	10	10	10		8.1		8.0	Post 24.2	267	
	1	10	10	10	10	7.1	8.0	7.8	8.0	24.2	250	327
	2	10	10	10	10	6.7	8.2	7.4	8.3	24.1	255	347
	3	10	10	10	10	7.1	8.3	7.5	8.2	24.1	267	
	4	10	10	10	10	6.4	7.9	7.3	8.2	24.3	250	358
	5	10	10	10	10 ✓	6.7	7.9	7.8	8.3	(23.8)	251	
	6	10	10	10	10	6.6	7.8	7.7	8.1	24.0	251	
	7	10	10	10	10	7.0		7.5		24.1	255	
1.4 %	0	10	10	RoG 8/30 10 9	10		8.3		8.1	Post: 24.3		343
	1	10	10	10	10	6.8	8.2	7.8	7.9	24.2		
	2	10	10	9	10	6.5	8.1	7.4	8.2	24.1		351
	3	10	10	9	10	7.2	8.5	7.5	8.1	24.2		
	4	10	10	9	10	6.5	8.1	7.2	8.2	24.3		354
	5	10	10	9	10	6.5	8.1	7.7	8.3	(23.8)		
	6	10	10	8m	10	6.4	8.1	7.7	8.1	(23.9)		
	7	10	10	9	10	7.0		7.5		24.1		
10 %	0	10	10	10	10		8.3		7.9	Post: 24.4		383
	1	10	10	10	9	6.7	8.3	7.7	7.8	24.4		
	2	10	10	10	9	6.3	8.3	7.5	8.0	24.3		403
	3	10	10	10	9	7.1	8.4	7.6	8.0	24.3 DUP		
	4	10	10	10	9	6.3	8.2	7.7	8.1	24.3		414
	5	10	10	10	9	6.5	8.2	7.7	8.1	24.0		
	6	10	10	10	9	6.5	8.1	7.7	7.9	24.1		
	7	10	10	10	9	6.9		7.5		24.2		
19 %	0	10	10	10	10		8.4		7.9	Post: 24.3		426
	1	10	10	10	10	6.6	8.5	7.8	7.7	24.2		
	2	10	9 ✓	10	10	6.2	8.2	7.5	7.9	24.1		457
	3	10	9	10	10	6.9	8.2	7.6	7.8	24.4		
	4	10 ✓	9	10	10	6.3	8.4	7.4	7.9	24.0		461
	5	10	9	10	10	6.5	8.4	7.7	7.8	24.0		
	6	10	9	10	10	6.6	8.2	7.7	7.8	(23.9) 24.3		
	7	10	9	10	10	6.7		7.5		24 RoG 8/30		
50 %	0	10	10	10	10		8.5		7.7	Post: 24.3		565
	1	10	10	10	10	6.6	8.5	7.8	7.6	24.3		
	2	10	10	10	10	6.2	8.5	7.8	7.6	24.1		652
	3	10	10	10	10	6.8	8.5	7.7	7.8	24.3		
	4	10	10	10 ✓	10	6.3	8.6	7.7	7.6	24.3		681
	5	10	10	10	10	6.5	8.5	7.7	7.7	(23.9)		
	6	10	10	10	10	6.6	8.3	7.8	7.6	24.0		
	7	10	10	10	10	6.6		7.6		24.3		
100 %	0	10	10	10	10		8.5		7.5	Post: 24.5		795
	1	10	10	10	10	6.7	8.2	7.9	7.6	24.5		
	2	10	10	10	9	6.4	8.6	7.9	7.4	24.3		952
	3	10 ✓	10	10	9	6.9	8.6	7.8	7.6	24.3		
	4	10	10	10	9	6.1	8.5	7.9	7.4	24.5		969
	5	10	10	10	9	6.3	8.7	7.9	7.4	24.1		
	6	10 ✓	10	10 ✓	9 ✓	6.2	8.7	7.9	7.4	24.3		
	7	10	10	10	9	6.2		7.6		24.3		

✓ Indicates one organism inadvertently poured off during solution renewal, replaced into container.
"M" = organism missing, start count reduced. "Inj" = organism injured, remove from stats.
"F" = fungus noted on dead organisms.
☐ Aeration in test chambers begun @ _____ (Note observations on Test Organism Info sheet)

Pre =Pre-renewal solutions. Post =Post-renewal solutions.
Day 0 Temperatures = Post-renewals
Therm ID# = Thermometer ID used for all measurements that day.
(23.8) = Temp. out of recommended range

& RoG KG 8/27/21 @ BC RoG 8/29/21

FATHEAD MINNOW 7-DAY GROWTH DATA

Client: Woodland | Tins Labeled As: Wood

Lab ID: B5151 | Start Date: 8/24/2021

Sample Description:

Technician:		TC
Date:		8/26/2021
Balance Serial #:	B328543647	B328543647

Percent	Replicate	Total Weight (mg)	Tare Weight (mg)	No. of Fish
Control	A		799.43	10
	B		805.24	10
	C		784.11	10
	D		785.36	10
1.4 %	A		785.03	10
	B		786.45	10
	C		798.47	8 of 9
	D		796.66	10
10 %	A		810.31	10
	B		793.34	10
	C		801.15	10
	D		808.15	9
19 %	A		806.94	10
	B		801.96	9
	C		806.19	10
	D		798.48	10
50 %	A		797.95	10
	B		814.52	10
	C		814.84	10
	D		805.13	10
100 %	A		787.40	10
	B		786.86	10
	C		791.65	10
	D		794.16	9
	A			
	B			
	C			
	D			

weigh to 0.01 mg

FATHEAD MINNOW 7-DAY GROWTH DATA

Client: Woodland | Tins Labeled As: Wood

Lab ID: B5151 | Start Date: 8/24/2021

Sample Description:

Technician:	bc	TC
Date:	9/8/2021	8/26/2021
Balance Serial #:	B328543647	B328543647

Percent	Replicate	Total Weight (mg)	Tare Weight (mg)	No. of Fish
Control	A	810.43	799.43	10
	B	816.47	805.24	10
	C	793.89	784.11	10
	D	797.16	785.36	10
1.4 %	A	795.25	785.03	10
	B	796.17	786.45	10
	C	805.25	798.47	8 of 9
	D	806.28	796.66	10
10 %	A	818.00	810.31	10
	B	803.84	793.34	10
	C	810.46	801.15	10
	D	817.90	808.15	9
19 %	A	817.39	806.94	10
	B	811.76	801.96	9
	C	816.58	806.19	10
	D	808.11	798.48	10
50 %	A	808.37	797.95	10
	B	825.44	814.52	10
	C	824.41	814.84	10
	D	815.80	805.13	10
100 %	A	798.20	787.40	10
	B	796.13	786.86	10
	C	801.53	791.65	10
	D	803.01	794.16	9
	A			
	B			
	C			
	D			

weigh to 0.01 mg

CETIS Summary Report

Test Code/ID: B515101ppc / 05-2237-5403

Fathead Minnow 7-d Larval Survival and Growth Test — **Eurofins TestAmerica - Corvallis**

Batch ID:	15-6378-7890	**Test Type:**	Growth-Survival (7d)	**Analyst:**	Michelle Bennett		
Start Date:	24 Aug-21 16:25	**Protocol:**	EPA/821/R-02-013 (2002)	**Diluent:**	Mod-Hard Synthetic Water		
Ending Date:	31 Aug-21 11:57	**Species:**	Pimephales promelas	**Brine:**			
Test Length:	6d 20h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR	**Age:**	1D

Sample ID:	09-4990-1125	**Code:**	B5151-01	**Project:**	
Sample Date:	23 Aug-21 09:00	**Material:**	POTW Effluent	**Source:**	Woodland, City of (WA0020401)
Receipt Date:	24 Aug-21 11:55	**CAS (PC):**		**Station:**	
Sample Age:	31h (1.5 °C)	**Client:**			

Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	✓	NOEL	LOEL	TOEL	PMSD	TU	S
12-9381-8550	7d Survival Rate	Steel Many-One Rank Sum Test		100	>100	---	7.39%	1	1
10-0979-6854	Mean Dry Biomass-mg	Dunnett Multiple Comparison Test alpha @ 0.01		100	>100	---	18.5%	1	1
16-2984-9087	Mean Dry Biomass-mg	Dunnett Multiple Comparison Test alpha @ 0.05		<1.4	1.4	---	13.9%	>71.43	1

Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	✓	Level	%	95% LCL	95% UCL	TU	S
21-2084-3196	Mean Dry Biomass-mg	Linear Interpolation (ICPIN)		IC25	>100	---	---	<1	1

Test Acceptability

				TAC Limits			
Analysis ID	Endpoint	Attribute	Test Stat	Lower	Upper	Overlap	Decision
12-9381-8550	7d Survival Rate	Control Resp	1	0.8	>>	Yes	Passes Criteria
10-0979-6854	Mean Dry Biomass-mg	Control Resp	1.095	0.25	>>	Yes	Passes Criteria
16-2984-9087	Mean Dry Biomass-mg	Control Resp	1.095	0.25	>>	Yes	Passes Criteria
21-2084-3196	Mean Dry Biomass-mg	Control Resp	1.095	0.25	>>	Yes	Passes Criteria
10-0979-6854	Mean Dry Biomass-mg	PMSD	0.1848	0.12	0.3	Yes	Passes Criteria
16-2984-9087	Mean Dry Biomass-mg	PMSD	0.1387	0.12	0.3	Yes	Passes Criteria

7d Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	D	4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	---	0.00%
1.4		4	0.9722	0.8838	1.0610	0.8889	1.0000	0.0278	0.0556	5.71%	2.78%
10		4	0.9750	0.8954	1.0550	0.9000	1.0000	0.0250	0.0500	5.13%	2.50%
19		4	0.9750	0.8954	1.0550	0.9000	1.0000	0.0250	0.0500	5.13%	2.50%
50		4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	---	0.00%
100		4	0.9750	0.8954	1.0550	0.9000	1.0000	0.0250	0.0500	5.13%	2.50%

Mean Dry Biomass-mg Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	D	4	1.095	0.9599	1.231	0.978	1.18	0.04255	0.08509	7.77%	0.00%
1.4		4	0.9273	0.7381	1.117	0.7533	1.022	0.05947	0.1189	12.82%	15.33%
10		4	0.9312	0.7422	1.12	0.769	1.05	0.0594	0.1188	12.76%	14.97%
19		4	1.007	0.9409	1.073	0.963	1.045	0.02068	0.04136	4.11%	8.08%
50		4	1.039	0.9461	1.133	0.957	1.092	0.02933	0.05867	5.64%	5.09%
100		4	0.97	0.8353	1.105	0.885	1.08	0.04233	0.08465	8.73%	11.44%

According to WDOE manual, alpha will be lowered from 0.05 to 0.01 if a 20% difference in a chronic test is significant. This was done with biomass to reduce Type I errors. MB 9/13/21

^ at the 1.4 and 10% concentrations for the growth endpoint. BM 9/16/21

Analyst: MB QA: _____

Fathead Minnow 7-d Larval Survival and Growth Test — **Eurofins TestAmerica - Corvallis**

Analysis ID:	12-9381-8550	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.9.7
Analyzed:	13 Sep-21 10:31	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1
Edit Date:	13 Sep-21 10:38	**MD5 Hash:**	244B281F5E52411A584B5020F9D179CD	**Editor ID:**	001-027-905-7
Batch ID:	15-6378-7890	**Test Type:**	Growth-Survival (7d)	**Analyst:**	Michelle Bennett
Start Date:	24 Aug-21 16:25	**Protocol:**	EPA/821/R-02-013 (2002)	**Diluent:**	Mod-Hard Synthetic Water
Ending Date:	31 Aug-21 11:57	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	6d 20h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:** 1D
Sample ID:	09-4990-1125	**Code:**	B5151-01	**Project:**	
Sample Date:	23 Aug-21 09:00	**Material:**	POTW Effluent	**Source:**	Woodland, City of (WA0020401)
Receipt Date:	24 Aug-21 11:55	**CAS (PC):**		**Station:**	
Sample Age:	31h (1.5 °C)	**Client:**			

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	MSDu	PMSD
Angular (Corrected)	C > T	100	>100	---	1	0.07389	7.39%

Steel Many-One Rank Sum Test

Control	vs	Conc-%	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Dilution Water		1.4	16	10	1	6	CDF	0.6105	Non-Significant Effect
		10	16	10	1	6	CDF	0.6105	Non-Significant Effect
		19	16	10	1	6	CDF	0.6105	Non-Significant Effect
		50	18	10	1	6	CDF	0.8333	Non-Significant Effect
		100	16	10	1	6	CDF	0.6105	Non-Significant Effect

Test Acceptability Criteria

		TAC Limits			
Attribute	**Test Stat**	**Lower**	**Upper**	**Overlap**	**Decision**
Control Resp	1	0.8	>>	Yes	Passes Criteria

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.242	2.802	0.4381	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0094125	0.0018825	5	0.4017	0.8412	Non-Significant Effect
Error	0.0843446	0.0046858	18			
Total	0.0937572		23			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Bartlett Equality of Variance Test				Indeterminate
Distribution	Shapiro-Wilk W Normality Test	0.6875	0.884	<1.0E-05	Non-Normal Distribution

7d Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
1.4		4	0.9722	0.8838	1.0000	1.0000	0.8889	1.0000	0.0278	5.71%	2.78%
10		4	0.9750	0.8954	1.0000	1.0000	0.9000	1.0000	0.0250	5.13%	2.50%
19		4	0.9750	0.8954	1.0000	1.0000	0.9000	1.0000	0.0250	5.13%	2.50%
50		4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
100		4	0.9750	0.8954	1.0000	1.0000	0.9000	1.0000	0.0250	5.13%	2.50%

Fathead Minnow 7-d Larval Survival and Growth Test — **Eurofins TestAmerica - Corvallis**

Analysis ID:	12-9381-8550	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.9.7
Analyzed:	13 Sep-21 10:31	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1
Edit Date:	13 Sep-21 10:38	**MD5 Hash:**	244B281F5E52411A584B5020F9D179CD	**Editor ID:**	001-027-905-7

Angular (Corrected) Transformed Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	4	1.4120	1.4120	1.4120	1.4120	1.4120	1.4120	0.0000	0.00%	0.00%
1.4		4	1.3670	1.2230	1.5110	1.4120	1.2310	1.4120	0.0453	6.62%	3.21%
10		4	1.3710	1.2420	1.5010	1.4120	1.2490	1.4120	0.0407	5.94%	2.89%
19		4	1.3710	1.2420	1.5010	1.4120	1.2490	1.4120	0.0407	5.94%	2.89%
50		4	1.4120	1.4120	1.4120	1.4120	1.4120	1.4120	0.0000	0.00%	0.00%
100		4	1.3710	1.2420	1.5010	1.4120	1.2490	1.4120	0.0407	5.94%	2.89%

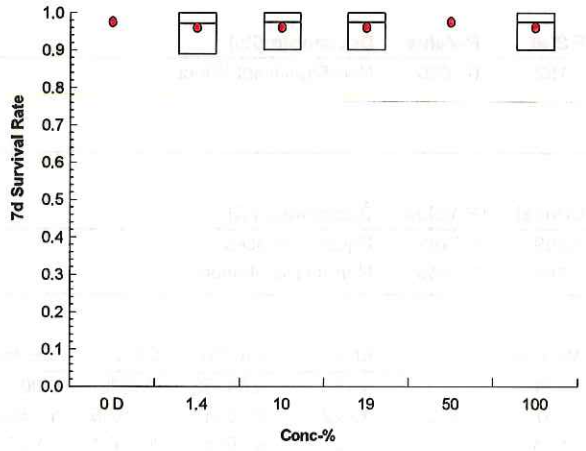
7d Survival Rate Detail

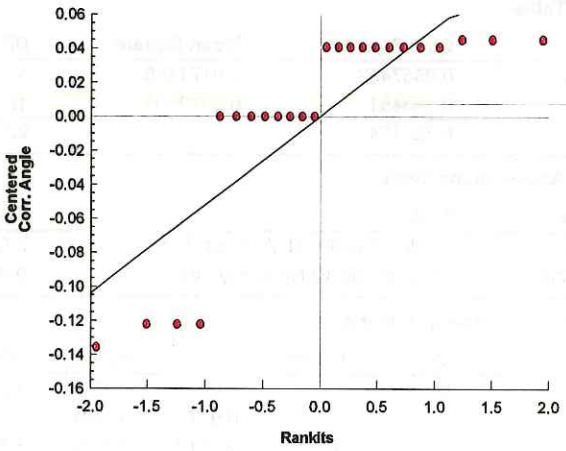
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	1.0000	1.0000	1.0000	1.0000
1.4		1.0000	1.0000	0.8889	1.0000
10		1.0000	1.0000	1.0000	0.9000
19		1.0000	0.9000	1.0000	1.0000
50		1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000	0.9000

Angular (Corrected) Transformed Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	1.4120	1.4120	1.4120	1.4120
1.4		1.4120	1.4120	1.2310	1.4120
10		1.4120	1.4120	1.4120	1.2490
19		1.4120	1.2490	1.4120	1.4120
50		1.4120	1.4120	1.4120	1.4120
100		1.4120	1.4120	1.4120	1.2490

Graphics





Fathead Minnow 7-d Larval Survival and Growth Test — **Eurofins TestAmerica - Corvallis**

Analysis ID:	10-0979-6854	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.7
Analyzed:	13 Sep-21 11:02	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Edit Date:	13 Sep-21 10:38	**MD5 Hash:**	7BF149A1E854846BB9E725FAD2F783DA	**Editor ID:**	001-027-905-7
Batch ID:	15-6378-7890	**Test Type:**	Growth-Survival (7d)	**Analyst:**	Michelle Bennett
Start Date:	24 Aug-21 16:25	**Protocol:**	EPA/821/R-02-013 (2002)	**Diluent:**	Mod-Hard Synthetic Water
Ending Date:	31 Aug-21 11:57	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	6d 20h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:** 1D
Sample ID:	09-4990-1125	**Code:**	B5151-01	**Project:**	
Sample Date:	23 Aug-21 09:00	**Material:**	POTW Effluent	**Source:**	Woodland, City of (WA0020401)
Receipt Date:	24 Aug-21 11:55	**CAS (PC):**		**Station:**	
Sample Age:	31h (1.5 °C)	**Client:**			

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	MSDu	PMSD
Untransformed	C > T	100	>100	---	1	0.2024	18.48%

Dunnett Multiple Comparison Test

Control	vs	Conc-%	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:1%)
Dilution Water		1.4	2.66	3.206	0.202	6	CDF	0.0306	Non-Significant Effect
		10	2.598	3.206	0.202	6	CDF	0.0346	Non-Significant Effect
		19	1.402	3.206	0.202	6	CDF	0.2609	Non-Significant Effect
		50	0.8832	3.206	0.202	6	CDF	0.4742	Non-Significant Effect
		100	1.984	3.206	0.202	6	CDF	0.1071	Non-Significant Effect

Test Acceptability Criteria

		TAC Limits			
Attribute	Test Stat	Lower	Upper	Overlap	Decision
Control Resp	1.095	0.25	>>	Yes	Passes Criteria
PMSD	0.1848	0.12	0.3	Yes	Passes Criteria

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.203	2.802	0.4967	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0857432	0.0171486	5	2.152	0.1056	Non-Significant Effect
Error	0.143451	0.0079695	18			
Total	0.229194		23			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Bartlett Equality of Variance Test	3.811	15.09	0.5769	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9378	0.884	0.1458	Normal Distribution

Mean Dry Biomass-mg Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	4	1.095	0.9599	1.231	1.111	0.978	1.18	0.04255	7.77%	0.00%
1.4		4	0.9273	0.7381	1.117	0.967	0.7533	1.022	0.05947	12.82%	15.33%
10		4	0.9312	0.7422	1.12	0.953	0.769	1.05	0.0594	12.76%	14.97%
19		4	1.007	0.9409	1.073	1.01	0.963	1.045	0.02068	4.11%	8.08%
50		4	1.039	0.9461	1.133	1.054	0.957	1.092	0.02933	5.64%	5.09%
100		4	0.97	0.8353	1.105	0.9575	0.885	1.08	0.04233	8.73%	11.44%

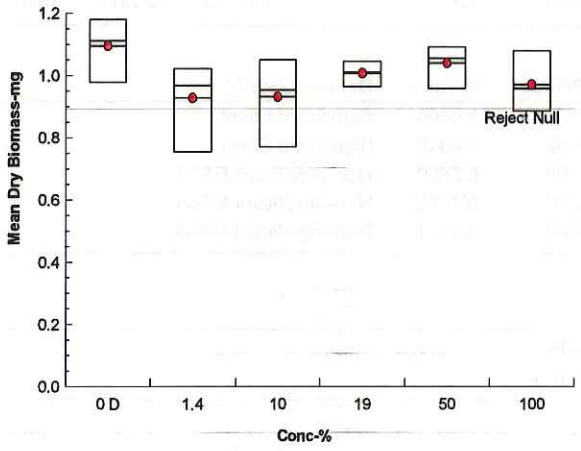
Fathead Minnow 7-d Larval Survival and Growth Test — **Eurofins TestAmerica - Corvallis**

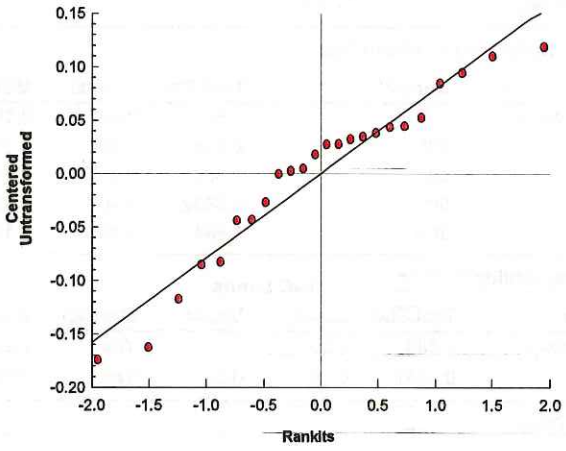
Analysis ID:	10-0979-6854	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.7
Analyzed:	13 Sep-21 11:02	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Edit Date:	13 Sep-21 10:38	**MD5 Hash:**	7BF149A1E854846BB9E725FAD2F783DA	**Editor ID:**	001-027-905-7

Mean Dry Biomass-mg Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	1.1	1.123	0.978	1.18
1.4		1.022	0.972	0.7533	0.962
10		0.769	1.05	0.931	0.975
19		1.045	0.98	1.039	0.963
50		1.042	1.092	0.957	1.067
100		1.08	0.927	0.988	0.885

Graphics





Fathead Minnow 7-d Larval Survival and Growth Test — **Eurofins TestAmerica - Corvallis**

Analysis ID:	16-2984-9087	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.7
Analyzed:	13 Sep-21 11:07	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Edit Date:	13 Sep-21 10:38	**MD5 Hash:**	7BF149A1E854846BB9E725FAD2F783DA	**Editor ID:**	001-027-905-7
Batch ID:	15-6378-7890	**Test Type:**	Growth-Survival (7d)	**Analyst:**	Michelle Bennett
Start Date:	24 Aug-21 16:25	**Protocol:**	EPA/821/R-02-013 (2002)	**Diluent:**	Mod-Hard Synthetic Water
Ending Date:	31 Aug-21 11:57	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	6d 20h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:** 1D
Sample ID:	09-4990-1125	**Code:**	B5151-01	**Project:**	
Sample Date:	23 Aug-21 09:00	**Material:**	POTW Effluent	**Source:**	Woodland, City of (WA0020401)
Receipt Date:	24 Aug-21 11:55	**CAS (PC):**		**Station:**	
Sample Age:	31h (1.5 °C)	**Client:**			

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	MSDu	PMSD
Untransformed	C > T	<1.4	1.4	---	>71.43	0.1519	13.87%

Dunnett Multiple Comparison Test

Control	vs	Conc-%	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Dilution Water		1.4*	2.66	2.407	0.152	6	CDF	0.0306	Significant Effect
		10*	2.598	2.407	0.152	6	CDF	0.0346	Significant Effect
		19	1.402	2.407	0.152	6	CDF	0.2609	Non-Significant Effect
		50	0.8832	2.407	0.152	6	CDF	0.4742	Non-Significant Effect
		100	1.984	2.407	0.152	6	CDF	0.1071	Non-Significant Effect

Test Acceptability Criteria

		TAC Limits			
Attribute	Test Stat	Lower	Upper	Overlap	Decision
Control Resp	1.095	0.25	>>	Yes	Passes Criteria
PMSD	0.1387	0.12	0.3	Yes	Passes Criteria

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0857432	0.0171486	5	2.152	0.1056	Non-Significant Effect
Error	0.143451	0.0079695	18			
Total	0.229194		23			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Bartlett Equality of Variance Test	3.811	15.09	0.5769	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9378	0.884	0.1458	Normal Distribution

Mean Dry Biomass-mg Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	4	1.095	0.9599	1.231	1.111	0.978	1.18	0.04255	7.77%	0.00%
1.4		4	0.9273	0.7381	1.117	0.967	0.7533	1.022	0.05947	12.82%	15.33%
10		4	0.9312	0.7422	1.12	0.953	0.769	1.05	0.0594	12.76%	14.97%
19		4	1.007	0.9409	1.073	1.01	0.963	1.045	0.02068	4.11%	8.08%
50		4	1.039	0.9461	1.133	1.054	0.957	1.092	0.02933	5.64%	5.09%
100		4	0.97	0.8353	1.105	0.9575	0.885	1.08	0.04233	8.73%	11.44%

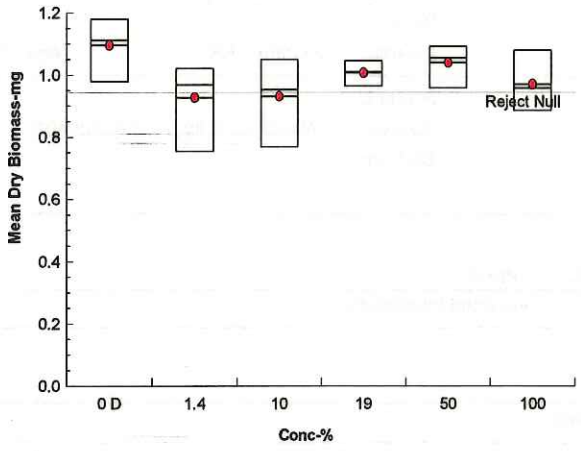
Mean Dry Biomass-mg Detail

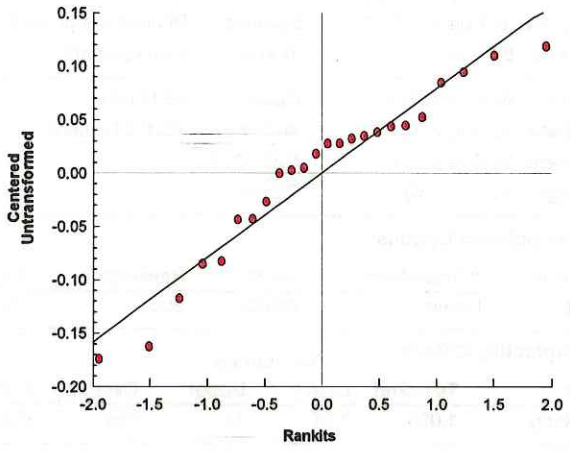
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	1.1	1.123	0.978	1.18
1.4		1.022	0.972	0.7533	0.962
10		0.769	1.05	0.931	0.975
19		1.045	0.98	1.039	0.963
50		1.042	1.092	0.957	1.067
100		1.08	0.927	0.988	0.885

Fathead Minnow 7-d Larval Survival and Growth Test **Eurofins TestAmerica - Corvallis**

Analysis ID:	16-2984-9087	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.7
Analyzed:	13 Sep-21 11:07	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Edit Date:	13 Sep-21 10:38	**MD5 Hash:**	7BF149A1E854846BB9E725FAD2F783DA	**Editor ID:**	001-027-905-7

Graphics





Fathead Minnow 7-d Larval Survival and Growth Test — **Eurofins TestAmerica - Corvallis**

Analysis ID:	21-2084-3196	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.7
Analyzed:	13 Sep-21 10:32	**Analysis:**	Linear Interpolation (ICPIN)	**Status Level:**	1
Edit Date:	13 Sep-21 10:38	**MD5 Hash:**	7BF149A1E854846BB9E725FAD2F783DA	**Editor ID:**	001-027-905-7
Batch ID:	15-6378-7890	**Test Type:**	Growth-Survival (7d)	**Analyst:**	Michelle Bennett
Start Date:	24 Aug-21 16:25	**Protocol:**	EPA/821/R-02-013 (2002)	**Diluent:**	Mod-Hard Synthetic Water
Ending Date:	31 Aug-21 11:57	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	6d 20h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:** 1D
Sample ID:	09-4990-1125	**Code:**	B5151-01	**Project:**	
Sample Date:	23 Aug-21 09:00	**Material:**	POTW Effluent	**Source:**	Woodland, City of (WA0020401)
Receipt Date:	24 Aug-21 11:55	**CAS (PC):**		**Station:**	
Sample Age:	31h (1.5 °C)	**Client:**			

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Log(X+1)	Linear	74812	200	Yes	Two-Point Interpolation

Test Acceptability Criteria

		TAC Limits			
Attribute	**Test Stat**	**Lower**	**Upper**	**Overlap**	**Decision**
Control Resp	1.095	0.25	>>	Yes	Passes Criteria

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC25	>100	---	---	<1	---	---

Mean Dry Biomass-mg Summary

			Calculated Variate						Isotonic Variate	
Conc-%	**Code**	**Count**	**Mean**	**Median**	**Min**	**Max**	**CV%**	**%Effect**	**Mean**	**%Effect**
0	D	4	1.095	1.111	0.978	1.18	7.77%	0.00%	1.095	0.00%
1.4		4	0.9273	0.967	0.7533	1.022	12.82%	15.33%	0.9762	10.87%
10		4	0.9312	0.953	0.769	1.05	12.76%	14.97%	0.9762	10.87%
19		4	1.007	1.01	0.963	1.045	4.11%	8.08%	0.9762	10.87%
50		4	1.039	1.054	0.957	1.092	5.64%	5.09%	0.9762	10.87%
100		4	0.97	0.9575	0.885	1.08	8.73%	11.44%	0.97	11.44%

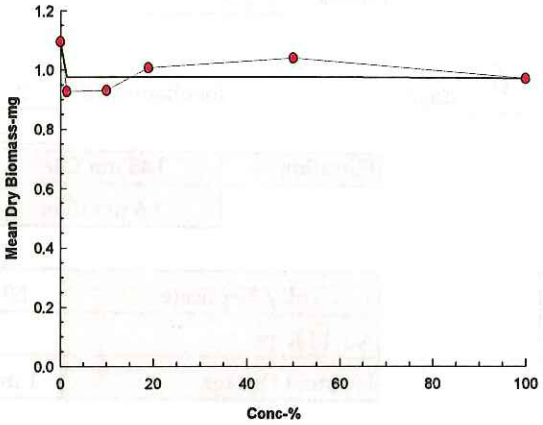
Mean Dry Biomass-mg Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	1.1	1.123	0.978	1.18
1.4		1.022	0.972	0.7533	0.962
10		0.769	1.05	0.931	0.975
19		1.045	0.98	1.039	0.963
50		1.042	1.092	0.957	1.067
100		1.08	0.927	0.988	0.885

Fathead Minnow 7-d Larval Survival and Growth Test — **Eurofins TestAmerica - Corvallis**

Analysis ID:	21-2084-3196	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.7
Analyzed:	13 Sep-21 10:32	**Analysis:**	Linear Interpolation (ICPIN)	**Status Level:**	1
Edit Date:	13 Sep-21 10:38	**MD5 Hash:**	7BF149A1E854846BB9E725FAD2F783DA	**Editor ID:**	001-027-905-7

Graphics



TestAmerica

GREEN ALGAE (*Selenastrum capricornutum*) TEST CONDITIONS

Client: City of Woodland

Sample Description: Sample ID: BS151 -02

Test Start Date: 8 /26 /2021 Time: 14 :30 Initials: BC

Test End Date: 8 / 30 /2021 Time: 13 : 20 Initials: BC

TEST CONDITIONS AT INITIATION:

Species ID#: SC 104 Culturing period: 6 days Incubator ID#: 2

INOCULUM (Axenic Culture)			
# Cells	# Fields		
459	250		Culture Density
MEAN	1.836	x 250,000 =	459000

Culture Density = Mean # of Cells/Field x 250,000

Filtration	0.45 um filter	
	1.6 um filter	X

Test Vol. / Replicate	50 mls
No. of Reps	4
Nutrient Dosage	1 ml per L

Test Start Density	x	Test Volume	/	Culture Density	=	Inoculum Volume
10,000	x	50 ml	/	459000	=	1.09 ml

Confirming Counts			
	# Cells	# Fields	Cell Conc. x10^6
Flask #1	7 BC	250	0.007
Flask #2	4 BC6 3n/n	250	0.004
Flask #3	6	250	0.006

Light Intensity at Test Initiation (foot-candles)		
Location #1	Location #2	Location #3
414	383	395

	0 hr	24 hr	48 hr	72 hr	96 hr
Technician	BC	3m	TC	BC	BC
Time	14:35	10 15	13:39	14 45	13 20
Therm. ID#	#250	#251	#264	#264	#264

Test Concen.	D.O. (mg/L)	pH					Temperature (°C)					Conductivity (umohs/cm)	Hard.	Alk.
	0 hr	0 hr	24	48	72	96	0 hr	24	48	72	96	0 hr	0 hr	0 hr
Control	7.7	7.8	8.2	8.3	8.2	8.4	25.2	25.4	25.3	25.4	25.3	415	103	71
1.4 %	7.9	8.3	8.2	8.3	8.3	8.5	25.2	25.3	25.3	25.6	25.3	427	108	72
10 %	8.0	8.3	8.2	8.3	8.4	8.6	25.1	25.3	25.3	25.3	25.3	486		
19 %	8.0	8.2	8.2	8.3	8.4	8.6	25.3	25.2	25.3	25.4	25.4	541	111	94
50 %	8.1	8.0	8.1	8.4	8.5	8.6	25.1	25.3	25.3	25.3	25.4	726		
100 %	8.2	7.8	8.4	8.5	8.5	8.7	25.3	25.1	25.4	25.2	25.6	1028	144	167

Comments: Flasks positioned randomly in incubator. Positions changed every day. Temp and pH taken in surrogate flasks.

(23.8) = Temp. out of recommended range

As of Aug 2016, all data is typed directly into form by analyst. No review needed.

Raphidocelis subcapitata COULTER COUNTER WORKSHEET

Client: City of Woodland

Sample Description:

Lab ID: B5151-02

Test Start Date: 8/26/2021

Test Count Date: 9/1/2021 Initials: JF

Instrument Settings:

Counter ID: PCOUNT3
As of: 30-Aug-16
the settings were as listed below

Apperture size	100 um
Apperture Kd value:	59.94
Set size	3.2 um
Gain:	256
Current:	1.414
Preamp Gain:	179.20

Dilution factor (DF) Default value: 51
Output: Concentration
Metered volume (ml): 0.5

Blank counts (use ISOTONE II):

Run	BLANK
DF	51
1	9898
2	8282
3	4848
4	5656
5	4848
6	3434

Note: Blank concentrations are Cells per ml (not x 10^6)

Dilutions: DF = 11 (1.0 ml sample to 10mL Isotone II)
DF = 51 (0.20 ml sample to 10mL Isotone II)
DF = 101 (0.20 ml sample to 20mL Isotone II)

Where : * = Concentrations are in Cells per mL x 10^6

COMMENTS
50% Rep D was retested in additional counts; counts are very similar.

TEST CONCENTRATION		Control		
Run	REP A	REP B	REP C	REP D
DF (if other than default)				
1	3.455	3.806	3.910	4.034
2	3.627	3.832	3.930	4.039
3	3.534	3.838	3.857	4.054
Replicate Average	**3.539**	**3.825**	**3.899**	**4.042**
CONCENTRATION MEAN # Cells / mL* =		**3.826**	CV % =	5.5%

TEST CONCENTRATION		1.4 %		
Run	REP A	REP B	REP C	REP D
DF (if other than default)				
1	3.548	2.984	4.085	3.307
2	3.530	2.967	4.103	3.321
3	3.557	2.943	4.109	3.277
Replicate Average	**3.545**	**2.965**	**4.099**	**3.302**
CONCENTRATION MEAN # Cells / mL* =		**3.478**	CV % =	13.7%

TEST CONCENTRATION		10 %		
Run	REP A	REP B	REP C	REP D
DF (if other than default)				
1	3.209	2.896	2.928	3.293
2	3.222	2.883	2.938	3.279
3	3.161	2.887	2.966	3.245
Replicate Average	**3.197**	**2.889**	**2.944**	**3.272**
CONCENTRATION MEAN # Cells / mL* =		**3.076**	CV % =	6.1%

TEST CONCENTRATION		19 %		
Run	REP A	REP B	REP C	REP D
DF (if other than default)				
1	3.894	3.538	2.885	3.370
2	4.143	3.507	2.878	3.309
3	3.798	3.493	2.857	3.368
Replicate Average	**3.945**	**3.513**	**2.873**	**3.349**
CONCENTRATION MEAN # Cells / mL* =		**3.420**	CV % =	12.9%

TEST CONCENTRATION		50 %		
Run	REP A	REP B	REP C	REP D
DF (if other than default)				
1	3.415	3.386	3.030	2.163
2	3.034	3.429	3.052	2.191
3	2.842	3.453	3.049	2.152
Replicate Average	**3.097**	**3.423**	**3.044**	**2.169**
CONCENTRATION MEAN # Cells / mL* =		**2.933**	CV % =	18.3%

TEST CONCENTRATION		100 %		
Run	REP A	REP B	REP C	REP D
DF (if other than default)				
1	1.066	1.064	1.249	0.923
2	1.056	1.047	1.116	0.941
3	1.052	1.274	1.101	0.942
Replicate Average	**1.058**	**1.128**	**1.155**	**0.935**
CONCENTRATION MEAN # Cells / mL* =		**1.069**	CV % =	9.2%

CETIS Summary Report

Green Algae Growth Test — **Eurofins TestAmerica - Corvallis**

Batch ID:	19-6506-4650	**Test Type:**	Cell Growth	**Analyst:**	Michelle Bennett
Start Date:	26 Aug-21 14:30	**Protocol:**	EPA/821/R-02-013 (2002)	**Diluent:**	Mod-Hard Synthetic Water
Ending Date:	30 Aug-21 13:20	**Species:**	Selenastrum capricornutum	**Brine:**	
Test Length:	95h	**Taxon:**	Chlorophyta	**Source:**	In-House Culture **Age:** 6D
Sample ID:	16-2106-2028	**Code:**	B5151-02	**Project:**	
Sample Date:	25 Aug-21 09:30	**Material:**	POTW Effluent	**Source:**	Woodland, City of (WA0020401)
Receipt Date:	26 Aug-21 12:22	**CAS (PC):**		**Station:**	
Sample Age:	29h (2.6 °C)	**Client:**			

Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	✓	NOEL	LOEL	TOEL	PMSD	TU	S
11-8989-4090	Cell Density	Dunnett Multiple Comparison Test alpha a@ 0.05	✓	1.4	10	3.742	16.3%	71.43	1
15-9013-0616	Cell Density	Dunnett Multiple Comparison Test alpha @ 0.01		19	50	30.82	21.7%	5.263	1

Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	✓	Level	%	95% LCL	95% UCL	TU	S
20-3788-1127	Cell Density	Linear Interpolation (ICPIN)		IC25	51.2	12.28	61.75	1.953	1

Test Acceptability

				TAC Limits				
Analysis ID	**Endpoint**	**Attribute**	**Test Stat**	**Lower**	**Upper**	**Overlap**	**Decision**	
11-8989-4090	Cell Density	Control CV	0.05538	<<	0.2	Yes	Passes Criteria	
15-9013-0616	Cell Density	Control CV	0.05538	<<	0.2	Yes	Passes Criteria	
20-3788-1127	Cell Density	Control CV	0.05538	<<	0.2	Yes	Passes Criteria	
11-8989-4090	Cell Density	Control Resp	3.83E+6	1000000	>>	Yes	Passes Criteria	
15-9013-0616	Cell Density	Control Resp	3.83E+6	1000000	>>	Yes	Passes Criteria	
20-3788-1127	Cell Density	Control Resp	3.83E+6	1000000	>>	Yes	Passes Criteria	
11-8989-4090	Cell Density	PMSD	0.1626	0.091	0.29	Yes	Passes Criteria	
15-9013-0616	Cell Density	PMSD	0.2166	0.091	0.29	Yes	Passes Criteria	

Cell Density Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	D	4	3.826E+6	3.489E+6	4.163E+6	3.539E+6	4.042E+6	1.059E+5	2.119E+5	5.54%	0.00%
1.4		4	3.478E+6	2.717E+6	4.238E+6	2.965E+6	4.099E+6	2.389E+5	4.777E+5	13.74%	9.11%
10		4	3.076E+6	2.777E+6	3.374E+6	2.889E+6	3.272E+6	9.389E+4	1.878E+5	6.11%	19.62%
19		4	3.420E+6	2.715E+6	4.125E+6	2.873E+6	3.945E+6	2.214E+5	4.428E+5	12.95%	10.62%
50		4	2.933E+6	2.079E+6	3.787E+6	2.169E+6	3.423E+6	2.682E+5	5.364E+5	18.29%	23.35%
100		4	1.069E+6	9.126E+5	1.226E+6	9.350E+5	1.155E+6	4.920E+4	9.841E+4	9.20%	72.06%

According to WDOE manual, alpha will be lowered from 0.05 to 0.01 if a 20% difference in a chronic test is significant. This was done to reduce Type I errors. MB 9/13/21

^ at the 10% effluent concentration. BM 9/16/21

Green Algae Growth Test — **Eurofins TestAmerica - Corvallis**

Analysis ID:	15-9013-0616	**Endpoint:**	Cell Density	**CETIS Version:**	CETISv1.9.7
Analyzed:	13 Sep-21 11:15	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Edit Date:		**MD5 Hash:**	610A83D5FE1728FF636A1C5716F66428	**Editor ID:**	
Batch ID:	19-6506-4650	**Test Type:**	Cell Growth	**Analyst:**	Michelle Bennett
Start Date:	26 Aug-21 14:30	**Protocol:**	EPA/821/R-02-013 (2002)	**Diluent:**	Mod-Hard Synthetic Water
Ending Date:	30 Aug-21 13:20	**Species:**	Selenastrum capricornutum	**Brine:**	
Test Length:	95h	**Taxon:**	Chlorophyta	**Source:**	In-House Culture **Age:** 6D
Sample ID:	16-2106-2028	**Code:**	B5151-02	**Project:**	
Sample Date:	25 Aug-21 09:30	**Material:**	POTW Effluent	**Source:**	Woodland, City of (WA0020401)
Receipt Date:	26 Aug-21 12:22	**CAS (PC):**		**Station:**	
Sample Age:	29h (2.6 °C)	**Client:**			

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	MSDu	PMSD
Untransformed	C > T	19	50	30.82	5.263	828700	21.66%

Dunnett Multiple Comparison Test

Control	vs	Conc-%	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:1%)
Dilution Water		1.4	1.349	3.206	8E+05	6	CDF	0.2797	Non-Significant Effect
		10	2.904	3.206	8E+05	6	CDF	0.0187	Non-Significant Effect
		19	1.572	3.206	8E+05	6	CDF	0.2056	Non-Significant Effect
		50*	3.456	3.206	8E+05	6	CDF	0.0059	Significant Effect
		100*	10.67	3.206	8E+05	6	CDF	2.7E-05	Significant Effect

Test Acceptability Criteria

		TAC Limits			
Attribute	Test Stat	Lower	Upper	Overlap	Decision
Control CV	0.05538	<<	0.2	Yes	Passes Criteria
Control Resp	3.83E+6	1000000	>>	Yes	Passes Criteria
PMSD	0.2166	0.091	0.29	Yes	Passes Criteria

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	1.928E+13	3.855E+12	5	28.85	<1.0E-05	Significant Effect
Error	2.405E+12	1.336E+11	18			
Total	2.168E+13		23			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Bartlett Equality of Variance Test	8.93	15.09	0.1119	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9556	0.884	0.3557	Normal Distribution

Cell Density Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	4	3.826E+6	3.489E+6	4.163E+6	3.862E+6	3.539E+6	4.042E+6	1.059E+5	5.54%	0.00%
1.4		4	3.478E+6	2.717E+6	4.238E+6	3.423E+6	2.965E+6	4.099E+6	2.389E+5	13.74%	9.11%
10		4	3.076E+6	2.777E+6	3.374E+6	3.071E+6	2.889E+6	3.272E+6	9.389E+4	6.11%	19.62%
19		4	3.420E+6	2.715E+6	4.125E+6	3.431E+6	2.873E+6	3.945E+6	2.214E+5	12.95%	10.62%
50		4	2.933E+6	2.079E+6	3.787E+6	3.070E+6	2.169E+6	3.423E+6	2.682E+5	18.29%	23.35%
100		4	1.069E+6	9.126E+5	1.226E+6	1.093E+6	9.350E+5	1.155E+6	4.920E+4	9.20%	72.06%

Cell Density Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	3.539E+6	3.825E+6	3.899E+6	4.042E+6
1.4		3.545E+6	2.965E+6	4.099E+6	3.302E+6
10		3.197E+6	2.889E+6	2.944E+6	3.272E+6
19		3.945E+6	3.513E+6	2.873E+6	3.349E+6
50		3.097E+6	3.423E+6	3.044E+6	2.169E+6
100		1.058E+6	1.128E+6	1.155E+6	9.350E+5

Green Algae Growth Test — **Eurofins TestAmerica - Corvallis**

Analysis ID:	15-9013-0616	**Endpoint:**	Cell Density	**CETIS Version:**	CETISv1.9.7
Analyzed:	13 Sep-21 11:15	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Edit Date:		**MD5 Hash:**	610A83D5FE1728FF636A1C5716F66428	**Editor ID:**	

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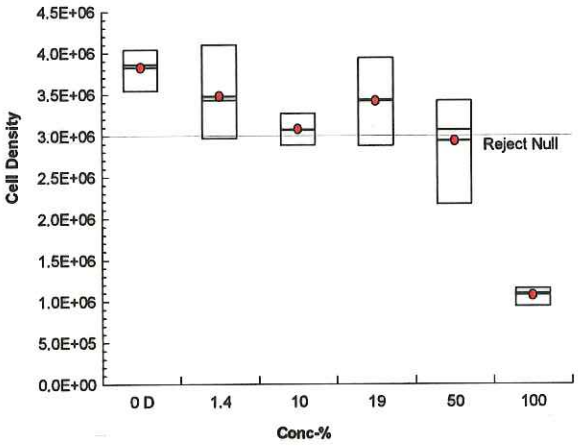
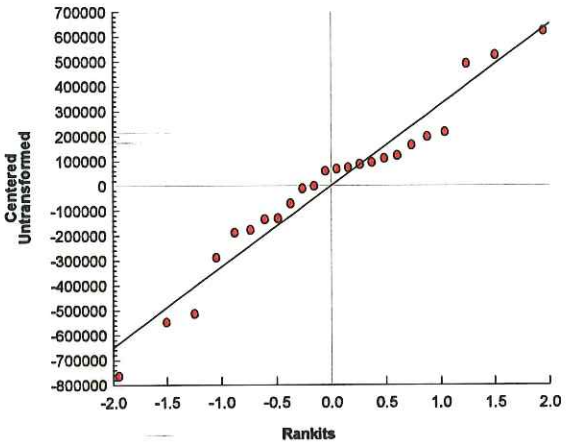




Green Algae Growth Test — **Eurofins TestAmerica - Corvallis**

Analysis ID:	11-8989-4090	**Endpoint:**	Cell Density	**CETIS Version:**	CETISv1.9.7
Analyzed:	13 Sep-21 11:15	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Edit Date:		**MD5 Hash:**	610A83D5FE1728FF636A1C5716F66428	**Editor ID:**	
Batch ID:	19-6506-4650	**Test Type:**	Cell Growth	**Analyst:**	Michelle Bennett
Start Date:	26 Aug-21 14:30	**Protocol:**	EPA/821/R-02-013 (2002)	**Diluent:**	Mod-Hard Synthetic Water
Ending Date:	30 Aug-21 13:20	**Species:**	Selenastrum capricornutum	**Brine:**	
Test Length:	95h	**Taxon:**	Chlorophyta	**Source:**	In-House Culture **Age:** 6D
Sample ID:	16-2106-2028	**Code:**	B5151-02	**Project:**	
Sample Date:	25 Aug-21 09:30	**Material:**	POTW Effluent	**Source:**	Woodland, City of (WA0020401)
Receipt Date:	26 Aug-21 12:22	**CAS (PC):**		**Station:**	
Sample Age:	29h (2.6 °C)	**Client:**			

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	MSDu	PMSD
Untransformed	C > T	1.4	10	3.742	71.43	622200	16.26%

Dunnett Multiple Comparison Test

Control	vs	Conc-%	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Dilution Water		1.4	1.349	2.407	6E+05	6	CDF	0.2797	Non-Significant Effect
		10*	2.904	2.407	6E+05	6	CDF	0.0187	Significant Effect
		19	1.572	2.407	6E+05	6	CDF	0.2056	Non-Significant Effect
		50*	3.456	2.407	6E+05	6	CDF	0.0059	Significant Effect
		100*	10.67	2.407	6E+05	6	CDF	2.7E-05	Significant Effect

Test Acceptability Criteria

		TAC Limits			
Attribute	Test Stat	Lower	Upper	Overlap	Decision
Control CV	0.05538	<<	0.2	Yes	Passes Criteria
Control Resp	3.83E+6	1000000	>>	Yes	Passes Criteria
PMSD	0.1626	0.091	0.29	Yes	Passes Criteria

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	1.928E+13	3.855E+12	5	28.85	<1.0E-05	Significant Effect
Error	2.405E+12	1.336E+11	18			
Total	2.168E+13		23			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Bartlett Equality of Variance Test	8.93	15.09	0.1119	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9556	0.884	0.3557	Normal Distribution

Cell Density Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	4	3.826E+6	3.489E+6	4.163E+6	3.862E+6	3.539E+6	4.042E+6	1.059E+5	5.54%	0.00%
1.4		4	3.478E+6	2.717E+6	4.238E+6	3.423E+6	2.965E+6	4.099E+6	2.389E+5	13.74%	9.11%
10		4	3.076E+6	2.777E+6	3.374E+6	3.071E+6	2.889E+6	3.272E+6	9.389E+4	6.11%	19.62%
19		4	3.420E+6	2.715E+6	4.125E+6	3.431E+6	2.873E+6	3.945E+6	2.214E+5	12.95%	10.62%
50		4	2.933E+6	2.079E+6	3.787E+6	3.070E+6	2.169E+6	3.423E+6	2.682E+5	18.29%	23.35%
100		4	1.069E+6	9.126E+5	1.226E+6	1.093E+6	9.350E+5	1.155E+6	4.920E+4	9.20%	72.06%

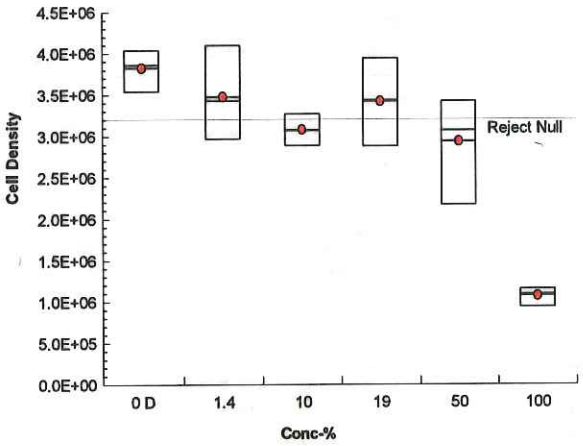
Cell Density Detail

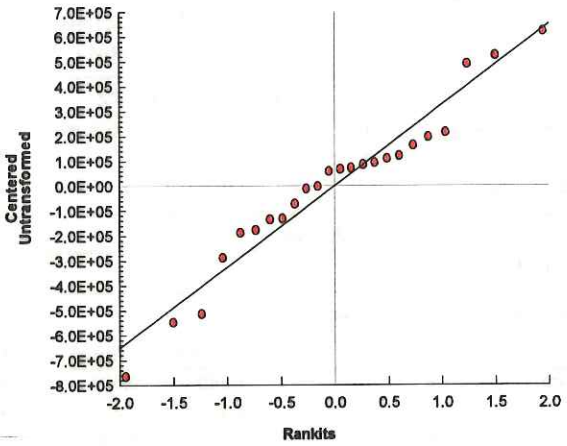
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	3.539E+6	3.825E+6	3.899E+6	4.042E+6
1.4		3.545E+6	2.965E+6	4.099E+6	3.302E+6
10		3.197E+6	2.889E+6	2.944E+6	3.272E+6
19		3.945E+6	3.513E+6	2.873E+6	3.349E+6
50		3.097E+6	3.423E+6	3.044E+6	2.169E+6
100		1.058E+6	1.128E+6	1.155E+6	9.350E+5

Green Algae Growth Test — **Eurofins TestAmerica - Corvallis**

Analysis ID:	11-8989-4090	**Endpoint:**	Cell Density	**CETIS Version:**	CETISv1.9.7
Analyzed:	13 Sep-21 11:15	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Edit Date:		**MD5 Hash:**	610A83D5FE1728FF636A1C5716F66428	**Editor ID:**	

Graphics





Green Algae Growth Test — **Eurofins TestAmerica - Corvallis**

Analysis ID:	20-3788-1127	**Endpoint:**	Cell Density	**CETIS Version:**	CETISv1.9.7
Analyzed:	13 Sep-21 10:55	**Analysis:**	Linear Interpolation (ICPIN)	**Status Level:**	1
Edit Date:		**MD5 Hash:**	610A83D5FE1728FF636A1C5716F66428	**Editor ID:**	
Batch ID:	19-6506-4650	**Test Type:**	Cell Growth	**Analyst:**	Michelle Bennett
Start Date:	26 Aug-21 14:30	**Protocol:**	EPA/821/R-02-013 (2002)	**Diluent:**	Mod-Hard Synthetic Water
Ending Date:	30 Aug-21 13:20	**Species:**	Selenastrum capricornutum	**Brine:**	
Test Length:	95h	**Taxon:**	Chlorophyta	**Source:**	In-House Culture **Age:** 6D
Sample ID:	16-2106-2028	**Code:**	B5151-02	**Project:**	
Sample Date:	25 Aug-21 09:30	**Material:**	POTW Effluent	**Source:**	Woodland, City of (WA0020401)
Receipt Date:	26 Aug-21 12:22	**CAS (PC):**		**Station:**	
Sample Age:	29h (2.6 °C)	**Client:**			

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Log(X+1)	Linear	2016309	200	Yes	Two-Point Interpolation

Test Acceptability Criteria

		TAC Limits			
Attribute	**Test Stat**	**Lower**	**Upper**	**Overlap**	**Decision**
Control CV	0.05538	<<	0.2	Yes	Passes Criteria
Control Resp	3.83E+6	1000000	>>	Yes	Passes Criteria

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC25	51.2	12.28	61.75	1.953	1.62	8.143

Cell Density Summary

			Calculated Variate						Isotonic Variate	
Conc-%	**Code**	**Count**	**Mean**	**Median**	**Min**	**Max**	**CV%**	**%Effect**	**Mean**	**%Effect**
0	D	4	3.826E+6	3.862E+6	3.539E+6	4.042E+6	5.54%	0.00%	3.826E+6	0.00%
1.4		4	3.478E+6	3.423E+6	2.965E+6	4.099E+6	13.74%	9.11%	3.478E+6	9.11%
10		4	3.076E+6	3.071E+6	2.889E+6	3.272E+6	6.11%	19.62%	3.248E+6	15.12%
19		4	3.420E+6	3.431E+6	2.873E+6	3.945E+6	12.95%	10.62%	3.248E+6	15.12%
50		4	2.933E+6	3.070E+6	2.169E+6	3.423E+6	18.29%	23.35%	2.933E+6	23.35%
100		4	1.069E+6	1.093E+6	9.350E+5	1.155E+6	9.20%	72.06%	1.069E+6	72.06%

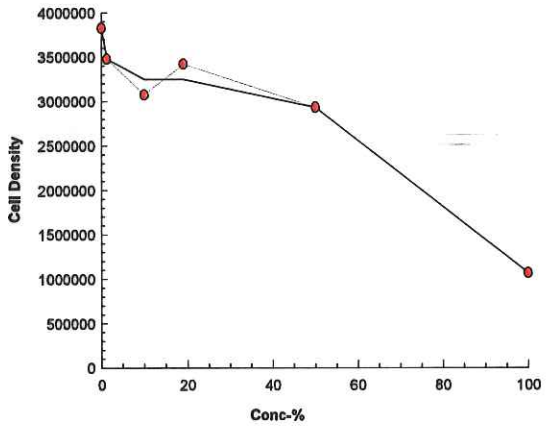
Cell Density Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	3.539E+6	3.825E+6	3.899E+6	4.042E+6
1.4		3.545E+6	2.965E+6	4.099E+6	3.302E+6
10		3.197E+6	2.889E+6	2.944E+6	3.272E+6
19		3.945E+6	3.513E+6	2.873E+6	3.349E+6
50		3.097E+6	3.423E+6	3.044E+6	2.169E+6
100		1.058E+6	1.128E+6	1.155E+6	9.350E+5

Green Algae Growth Test — **Eurofins TestAmerica - Corvallis**

Analysis ID:	20-3788-1127	**Endpoint:**	Cell Density	**CETIS Version:**	CETISv1.9.7
Analyzed:	13 Sep-21 10:55	**Analysis:**	Linear Interpolation (ICPIN)	**Status Level:**	1
Edit Date:		**MD5 Hash:**	610A83D5FE1728FF636A1C5716F66428	**Editor ID:**	

Graphics



APPENDIX B

REFERENCE TOXICANT DATA SHEETS

REFERENCE TOXICANT DATA SHEET

Client: QA / QC
Test Organism: *Ceriodaphnia dubia*
Source: In-House culture
ID#: Cd 3859
Age: < 24 hours
Feeding: none
Test Chamber Size: 30 ml
Volume per Replicate: 25 ml

Reference Toxican: NaCl
Stock Solution: 20 g/L in DI (ASTM Type I) water
Reagent Log ID #: ZB 080-04
Designed Test Temperature: 20 ± 1 °C

Test Begin: Date 8/10/2021 Time 13:23
Test End: Date 8/12/2021 Time 12:55
*Dilution Water (Recon MH) ID# 5371
Dilution Water Hardness (as $CaCO_3$) 78
Dilution Water Alkalinity (as $CaCO_3$) 64

		0 hr	24 hr	48 hr
Technician		TC	TC	MS
Time		1323	1602	1255
Therm. ID #		255	250	255

Toxicant Concentration (g/L)	Test Chamber Number	Number of Live Organisms			Dissolved Oxygen (mg/l)			pH			Temperature (°C)			Conductivity (µS)		
		0	24	48	0	24	48	0	24	48	0	24	48	0	24	48
Control	A	5	5	5	7.3		7.6	8.2			20.2	20.7	21.7	330		340
	B	5	5	5												
1.0	A	5	5	5	8.0		8.0	8.2			20.3	21.1	21.6	2230		2270
	B	5	5	5												
1.5	A	5	5	5	8.1		8.2	8.2			20.4	21.0	21.5	3300		3320
	B	5	5	5												
2.0	A	5	5	4	8.0		8.3	~~8.1~~ 8.2	rec'd TC 8/10		20.2	21.0	21.2	4220		4330
	B	5	5	3												
3.0	A	5	5	2	8.1		8.4	8.3			20.3	21.3	21.4	5360		5230
	B	5	5	1												
4.0	A	5	1	0	8.1		8.4	8.2			20.3	21.3	21.4	7500		7420
	B	5	0			7.7			7.5						7410	
Test Acceptability Criteria (TAC) or test condition:		Survival in Controls: ≥ 90% (required TAC)			(@ 20°C): > 4.0 and < 9.1 (recommended)			pH: > 6.0 and < 9.0 (recommended)			Temperature ± 1 °C (recommended)			(QA) none		

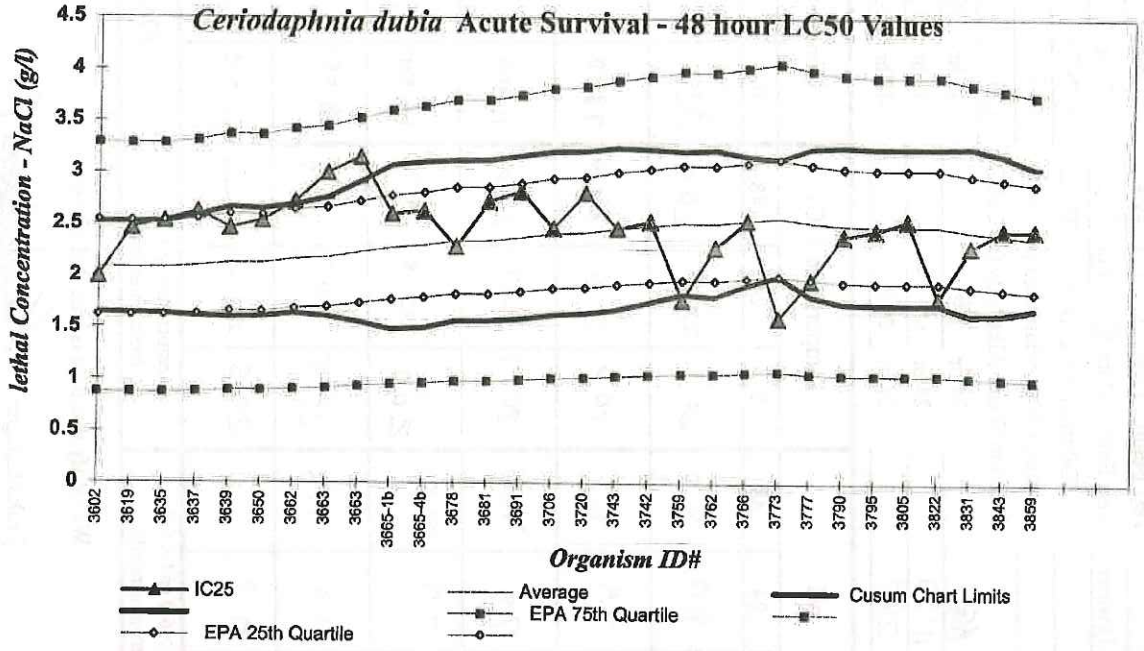
Note: If organisms are alive @ 24hrs, no DO, pH, or Cond. measurements to be taken in that test chamber to avoid injuring the organisms

*Dilution Water Code
Recon. - reconstituted water
MH - moderately hard

48 Hour LC_{50}: 2.45
Cusum Chart Limits: 1.69 to 3.05
Statistical Method: Spearman/Karber

We verify this data is true and correct.
Task Manager
Project Manager
QA Officer

REFERENCE TOXICANT CUMLATIVE SUMMARY (CUSUM) CHART



Ceriodaphnia dubia - ACUTE (EPA Test Method 2002.0)

SODIUM CHLORIDE (g/L)

Endpoint: 48 hour Survival

Stats Method: Probit, Spearman-Karber, Linear Interpolation

Test Conditions: Recon MH, 20 oC

From EPA 833-R-00-003:

10th Quartile CV (*control limit*) =	0.06
25th Quartile CV (*warning limit*) =	0.11
75th Quartile CV (warning *limit*) =	0.29
90th Quartile CV (*control limit*) =	0.34

*Intralab CV is compared to EPA **Warning limits** (25th and 75th CV's) and **Control limits** (10th and 90th CV's), If lab CV is outside EPA Control limits, the EPA Control limits are used to set Cusum chart limits.*

Event #	Cerio ID #	Test Start Date	LC50	Running Average	Running SD	Cusum Chart Limits AVG-2SD	Cusum Chart Limits AVG+2SD	Intralab CV
185	3777	01/12/21	**1.97**	2.5	0.36	**1.81**	**3.24**	0.15
185	3790	02/03/21	**2.39**	2.5	0.38	**1.74**	**3.26**	0.15
185	3795	03/03/21	**2.45**	2.5	0.38	**1.73**	**3.24**	0.15
185	3805	04/01/21	**2.54**	2.5	0.38	**1.73**	**3.24**	0.15
185	3822	05/11/21	**1.79**	2.5	0.38	**1.73**	**3.24**	0.17
185	3831	06/01/21	**2.29**	2.4	0.40	**1.63**	**3.25**	0.16
185	3843	07/07/21	**2.45**	2.4	0.38	**1.64**	**3.17**	0.14
185	3859	08/10/21	**2.45**	2.4	0.34	**1.69**	**3.05**	0.14
185								
185								
185								

REFERENCE TOXICANT DATA SHEET

Client: QA / QC
Test Organism: *Pimephales promelas*
Source: Aquatox
ID#: FHM 2173
Age: 7 Days
Feeding: none
Test Chamber Size: 800 ml
Volume per Replicate: 750 ml

Reference Toxican: NaCl
Stock Solution: 20 g/L in DI (ASTM Type I) water
Reagent Log ID #: 2B 082-06
Designed Test Temperature: 20 ± 1 °C

Test Begin: Date 8/10/2021 Time 11:35
Test End: Date 8/12/2021 Time 17:45
*Dilution Water (Recon MH) ID# 5371
Dilution Water Hardness (as $CaCO_3$) 78
Dilution Water Alkalinity (as $CaCO_3$) 64

	0 hr	24 hr	48 hr
Technician	KG	KG	KG
Time	11:35	12:25	17:45
Therm. ID #	267	250	255

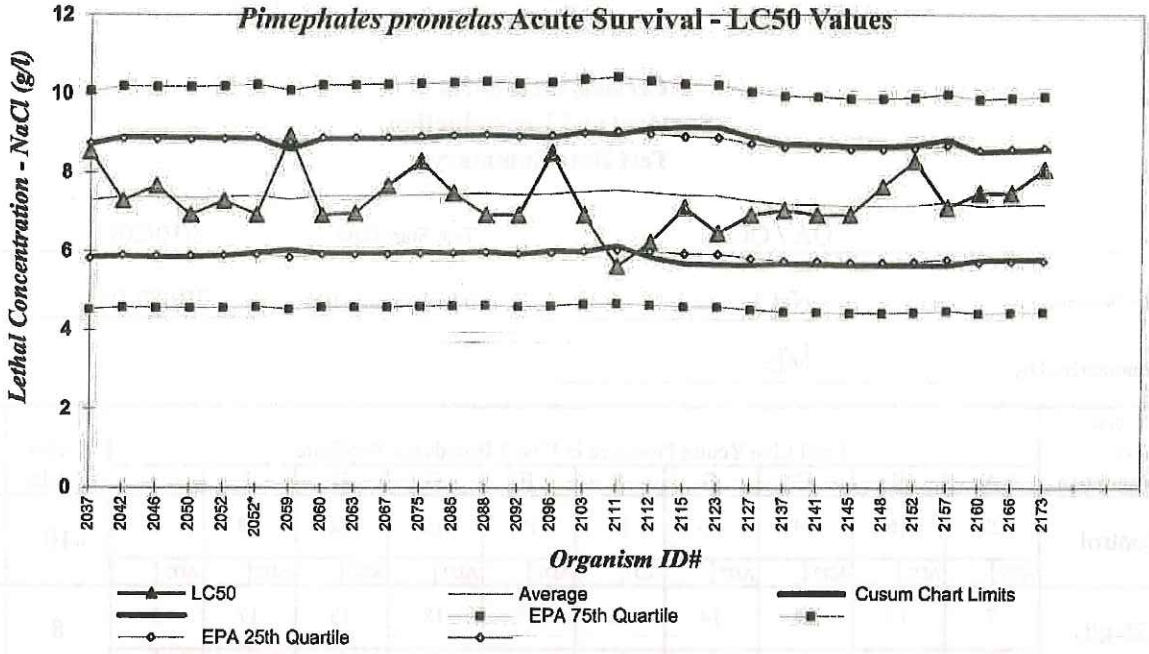
Toxicant Concentration (g/L)	Test Chamber Number	Number of Live Organisms			Dissolved Oxygen (mg/l)			pH			Temperature (°C)			Conductivity (µS)		
		0	24	48	0	24	48	0	24	48	0	24	48	0	24	48
Control	A	10	10	10	7.9	7.9	8.3	8.3	8.0	8.0	20.7	20.8	20.7	320		355
4.0	A	10	10	10	8.0	8.0	8.2	8.1	7.9	7.7	20.6	20.6	20.6	7830		7830
6.0	A	10	10	10	8.0	8.0	8.3	8.0	7.8	7.6	20.7	20.7	20.6	11,300		11350
8.0	A	10	10	6	8.0	8.0	8.0	7.9	7.7	7.5	20.5	20.8	20.7	14,640		14,610
10.0	A	10	2	0	8.2 8.1 RDO KS 8.0 8.2	8.0	8.2	7.9	7.8	7.5	20.5	20.7	20.8	18,050		17,250
12.0	A	10	0	—	8.1	8.0	—	7.8	7.7	—	20.5	20.6	—	21,200	20,700	—
Test Acceptability Criteria (TAC) or test condition:		Survival in Controls: ≥ 90% (required TAC)			(@ 20°C): > 4.0 and < 9.1 (recommended)			pH: > 6.0 and < 9.0 (recommended)			Temperature ± 1 °C (recommended)			(QA) none		

*Dilution Water Code
Recon. - reconstituted water
S - soft
MH - moderately hard
H - hard
Art. Sea - Artificial Sea Water

48 Hour LC_{50}: 8.1
Cusum Chart Limits: 5.8 to 8.6
Statistical Method: Spearman Karber

We verify this data is true and correct.
Task Manager
Project Manager
QA Officer

REFERENCE TOXICANT CUMLATIVE SUMMARY (CUSUM) CHART



Pimephales promelas **- ACUTE (EPA Test Method 2000.0)**

SODIUM CHLORIDE (g/L)

Organism age: 1 to 14 days

Endpoint: 48 hour Survival

Stats Method: Probit, Spearman-Karber, Linear Interpolation

Test Conditions: Recon MH, 20 oC

From EPA 833-R-00-003:

10th Quartile CV (*control limit*) =	0.08
25th Quartile CV (*warning limit*) =	0.10
75th Quartile CV (*warning limit*) =	0.19
90th Quartile CV (*control limit*) =	0.33

Intralab CV is compared to EPA ***Warning limits*** *(25th and 75th CV's) and* ***Control limits*** *(10th and 90th CV's), If lab CV is outside EPA Control limits, the EPA Control limits are used to set Cusum chart limits.*

Event #	FHM ID #	Test Start Date	LC50	Running Average	Running SD	Cusum Chart Limits AVG-2SD	Cusum Chart Limits AVG+2SD	Intralab CV
947	2137	12/8/2020	**7.0**	7.2	0.76	**5.7**	**8.7**	0.11
948	2141	1/6/2021	**6.9**	7.2	0.76	**5.7**	**8.7**	0.11
949	2145	2/2/2021	**6.9**	7.2	0.75	**5.6**	**8.7**	0.11
950	2148	3/3/2021	**7.6**	7.2	0.75	**5.6**	**8.7**	0.11
951	2152	4/1/2021	**8.3**	7.2	0.76	**5.6**	**8.7**	0.11
952	2157	5/11/2021	**7.1**	7.2	0.80	**5.6**	**8.8**	0.10
953	2160	6/1/2021	**7.5**	7.1	0.69	**5.8**	**8.5**	0.10
954	2166	7/7/2021	**7.5**	7.2	0.69	**5.8**	**8.6**	0.10
955	2173	8/10/2021	**8.1**	7.2	0.69	**5.8**	**8.6**	0.10
956								
957								
958								
959								
960								

Ceriodaphnia dubia
Survival and Reproduction
Test Data Summary

Client: QA / QC Test Start Date: 8/10/2021

Sample Description: NaCl Initial Sample ID#: 2B089-04

Data summarized by: MB

Percent or Concentration	Total Live Young Produced in First 3 Broods per Replicate										# Alive Adults	Total Live Young
	A	B	C	D	E	F	G	H	I	J		
Control	22	16	14	16	15	19	19	22	18	8	10	169
	AD?	AD?	AD?	AD?	AD?	AD?	AD?	AD?	AD?	AD?		
0.25 g/L	7	15	14	14	16	17	18	13	17	5	8	136
	AD?	AD?	AD? x	AD?	AD?	AD?	AD?	AD? x	AD?	AD?		
0.50 g/L	19	14	10	16	9	15	16	16	15	8	9	138
	AD?	AD?	AD? x	AD?	AD?	AD?	AD?	AD?	AD?	AD?		
1.0 g/L	8	11	12	6	14	8	3	11	3	1	8	77
	AD?	AD?	AD?	AD? x	AD?	AD?	AD? x	AD?	AD?	AD?		
1.5 g/L	0	3	0	0	0	4	0	2	3	0	5	12
	AD?	AD?	AD? x	AD? x	AD? x	AD?	AD?	AD? x	AD?	AD? x		
2.0 g/L	0	0	0	0	0	0	0	0	0	0	0	0
	AD? x	AD? x	AD? x	AD? x	AD? x	AD? x	AD? x	AD? x	AD? x	AD? x		
4.0 g/L	0	0	0	0	0	0	0	0	0	0	0	0
	AD? x	AD? x	AD? x	AD? x	AD? x	AD? x	AD? x	AD? x	AD? x	AD? x		

Test Organism Mortality (Adult dead) = AD? ✓

Test Organism identified as Male = AD? M

Test Organism Injured during test = AD? I

# of Alive Adults = Number of test organism alive at termination

Total Live Young = Total neonates produced in first 3 broods

Footnote: As per EPA-600-4-91-002 and EPA-821-R-02-013, *Ceriodaphnia dubia* test should be terminated when 60% of the surviving control organisms have produced their third brood, or at the end of eight days, whichever occurs first.

Also as per EPA-821-R-02-013 (13.10.9.1), "In this three-brood test, offspring from fourth or higher broods should not be counted and should not be included in the total number of neonates produced during the test."

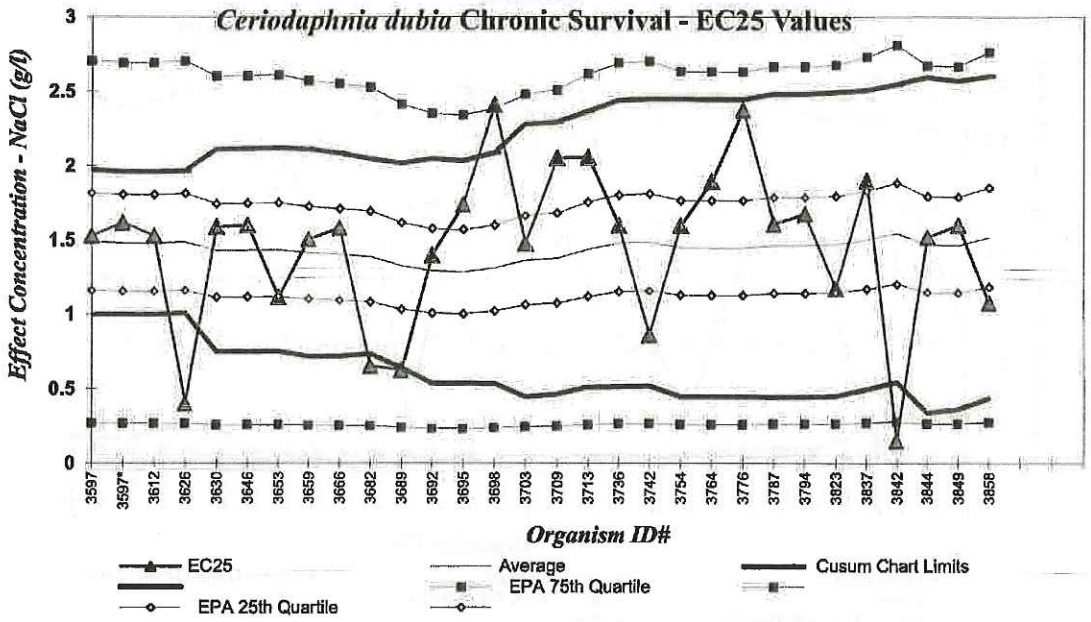
Endpoint	Value	Cusum Chart Limits
Survival - EC_{25}	1.08	0.43 to 2.60
Reproduction - IC_{25}	0.58	0.13 to 1.30

Task Manager

Project Manager

QA Officer

REFERENCE TOXICANT CUMLATIVE SUMMARY (CUSUM) CHART



Ceriodaphnia dubia **- Chronic (EPA Test Method 1002.0)**

SODIUM CHLORIDE (g/L)

Endpoint: Chronic Survival

Stats Method: Linear Interpolation

Test Conditions: Recon MH, 25 oC

From EPA 833-R-00-003:

10th Quartile CV (*control limit*) = 0.07

25th Quartile CV (*warning limit*) = 0.11

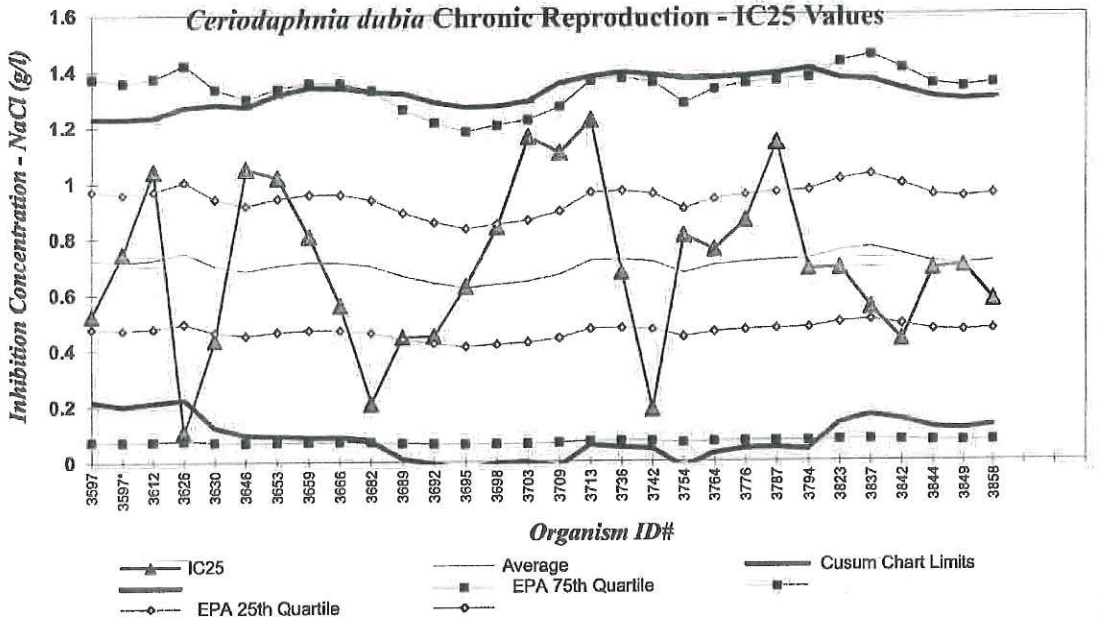
75th Quartile CV (warning *limit*) = 0.41

90th Quartile CV (*control limit*) = 0.81

Intralab CV is compared to EPA ***Warning limits*** *(25th and 75th CV's) and* ***Control limits*** *(10th and 90th CV's), If lab CV is outside EPA Control limits, the EPA Control limits are used to set Cusum chart limits.*

Event #	Cerio ID #	Test Start Date	EC25	Running Average	Running SD	Cusum Chart Limits AVG-2SD	Cusum Chart Limits AVG+2SD	Intralab CV
365	3776	01/12/21	2.38	1.45	0.50	**0.45**	**2.45**	0.37
366	3787	02/02/21	1.61	1.46	0.51	**0.44**	**2.48**	0.36
367	3794	03/02/21	1.68	1.46	0.51	**0.44**	**2.48**	0.31
368	3811	04/20/21	**< 0.25**	1.46	0.51	**0.44**	**2.48**	0.32
369	3814	04/24/21	**< 0.25**	1.46	0.51	**0.44**	**2.48**	0.33
370	3819	05/04/21	**<0.25**	1.46	0.51	**0.44**	**2.48**	0.32
371	3823	05/13/21	1.17	1.47	0.51	**0.45**	**2.50**	0.33
372	3837	06/22/21	1.90	1.50	0.50	**0.49**	**2.51**	0.33
373	3842	06/29/21	**0.15**	1.54	0.50	**0.54**	**2.55**	0.38
374	3844	07/13/21	1.52	1.47	0.56	**0.34**	**2.60**	0.34
375	3849	07/20/21	1.60	1.47	0.55	**0.36**	**2.57**	0.33
376	3858	08/10/21	1.08	1.52	0.54	**0.43**	**2.60**	0.35
377								

REFERENCE TOXICANT CUMLATIVE SUMMARY (CUSUM) CHART



***Ceriodaphnia dubia* - Chronic (EPA Test Method 1002.0)**

SODIUM CHLORIDE (g/L)

Endpoint: Chronic Reproduction

Stats Method: Linear Interpolation

Test Conditions: Recon MH, 25 oC

From EPA 833-R-00-003:

10th Quartile CV (*control limit*) =	0.08
25th Quartile CV (*warning limit*) =	0.17
75th Quartile CV (warning *limit*) =	0.45
90th Quartile CV (*control limit*) =	0.62

Intralab CV is compared to EPA ***Warning limits*** *(25th and 75th CV's) and* ***Control limits*** *(10th and 90th CV's), If lab CV is outside EPA Control limits, the EPA Control limits are used to set Cusum chart limits.*

Event #	Cerio ID #	Test Start Date	IC25	Running Average	Running SD	Cusum Chart Limits AVG-2SD	Cusum Chart Limits AVG+2SD	Intralab CV
367	3794	3/2/2021	0.69	0.72	0.34	**0.04**	**1.40**	0.41
368	3811	04/20/21	**< 0.25**	0.72	0.34	**0.04**	**1.40**	0.40
369	3814	04/27/21	**<0.25**	0.72	0.34	**0.04**	**1.40**	0.41
370	3819	05/04/21	**<0.25**	0.72	0.34	**0.04**	**1.40**	0.42
371	3823	05/13/21	0.69	0.75	0.31	**0.13**	**1.37**	0.43
372	3837	06/22/21	0.55	0.76	0.30	**0.16**	**1.37**	0.43
373	3842	06/29/21	0.43	0.74	0.30	**0.15**	**1.33**	0.39
374	3844	07/13/21	0.69	0.71	0.30	**0.12**	**1.30**	0.37
375	3849	07/20/21	0.70	0.70	0.30	**0.11**	**1.29**	0.35
376	3858	08/10/21	0.58	0.71	0.29	**0.13**	**1.30**	0.36
377								
378								
379								
380								

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

FATHEAD MINNOW 7-DAY SURVIVAL AND WATER QUALITY DATA

Random Template Used: 6 conc. x 4 reps. # 4 | Waterbath/incubator Used: # 4 | Date Initiated 8/17/2021 Time 16:10
Stock Sol. ID 2B090 - 08 | Date Terminated 8/24/2021 Time 09:20
Organism ID: FHM 2175 | Test Container Size: 800 ml | Solution Volume / rep: 500 ml
Client QA / QC - RefTox | Sample Description KCl (50 g/L stock)

Tech: Day 0 KG | Day 1 KG | Day 2 KG | Day 3 ~~KG~~ KG | Day 4 TC | Day 5 TC/KG | Day 6 ~~KG~~ KG | Day 7 KG
Time: Day 0 ~~15:30~~ 16:10 | Day 1 1050 | Day 2 1235 | Day 3 1425 | Day 4 1420 | Day 5 1313 | Day 6 1150 | Day 7 0920

Conc. or Percent	Day	Number of Live Organisms A	B	C	D	Dissolved O_2 (mg/l) Pre	Post	pH Pre	Post	Temp. (°C) Pre	Therm. ID #	Conductivity (µS) Post (daily)
Control	0	10	10	10	10		7.9		8.3	Post: 24.4	269	340
	1	10	10	10	10	7.1	8.0	7.9	8.1	24.3	269	*
	2	10	10	10	10	6.9	8.0	7.7	7.9	24.2	269	323
	3	10	10	10	10 Post Renew 8/21	6.6 7.1	8.5 ROG	7.6	7.9	24.4	267	328
	4	10	10	10	10	6.7	8.1 ~~8.4~~	7.6	8.2	24.3	267	333
	5	10	10	10	10	6.7	8.0 8.3	7.7	8.3	24.0	267	334
	6	10	10 ✓	10	10	7.4	~~8.4~~ 8.0	7.6	8.1	24.0	267	333
	7	10	10	10	10	7.0		7.7		24.0	267	
0.25 g/L	0	10	10	10	10		8.1		8.3	Post: 24.1		849
	1	10	10	10	10	7.0	8.0	7.9	8.0	24.2		*
	2	10	10 ✓	10	10	6.8	8.2	7.6	7.8	24.1		777
	3	10	10	10	10	7.0	8.5	7.6	7.9	24.3		786
	4	10 ✓	10	10	10	6.7	8.3	7.6	8.2	24.4		817
	5	10	10	10	10	6.7	8.2	7.7	8.3	24.1		793
	6	10	10	10	10	7.4	8.3	7.6	8.1	24.2		761
	7	10	10	10	10	6.9		7.7		24.0		
0.50 g/L	0	10	10	10	10		8.2		8.3	Post: 24.2		1324
	1	10	10	10	10	6.8	8.1	7.9	8.0	24.2		*
	2	10	10	10	10	6.7	8.3	7.6	7.8	24.2		1260
	3	10	8	10	10	6.8	8.5	7.6	7.9	24.4		1244
	4	10	10	10	10	6.9	8.3	7.6	8.3	24.3		1309
	5	10	8	10	10	6.9	8.4	7.7	8.3	24.2		1264
	6	10	8	10	10	7.1	8.4	7.6	8.1	24.2		1250
	7	10	8	10	10	6.8		7.7		24.0		
1.0 g/L	0	10	10	10	10		8.1		8.2	Post: 24.2		2290
	1	6	6	6	7	6.9	8.1	7.8	8.0	24.2		*
	2	3	6	4	7	6.7	8.3	7.5	7.8	24.2		2180
	3	3	6	4	7	7.0	8.5	7.6	7.9	24.4		2170
	4	2	4	3	7	6.9	8.3	7.6	8.1	24.3		2170
	5	2	0	2	4	6.7	8.4	7.6	8.3	24.1		2190
	6	2	1	2	2	7.2	8.4	7.6	8.1	24.2		2160
	7	1	1	2	2	7.1		7.8		24.1		
2.0 g/L	0	10	10	10	10		8.1		8.3	Post: 24.3		4040
	1	0	0	0	1	6.8	8.2	7.8	8.1	24.9		*
	2				0	6.7	—	7.5		24.4		
	3											
	4											
	5											
	6											
	7											
4.0 g/L	0	10	10	10	10		8.4		8.2	Post: 24.1		7340
	1	0	0	0	0	6.8	—	7.8	8.1 ROG KG 8/19/21	24.2		
	2											
	3											
	4											
	5											
	6											
	7											

✓ Indicates one organism inadvertently poured off during solution renewal, replaced into container.
"-" = organism missing, start count reduced. "Inj" = organism injured, remove from stats.
Fungus noted on dead organisms. Pre =Pre-renewal solutions. Post =Post-renewal solutions.

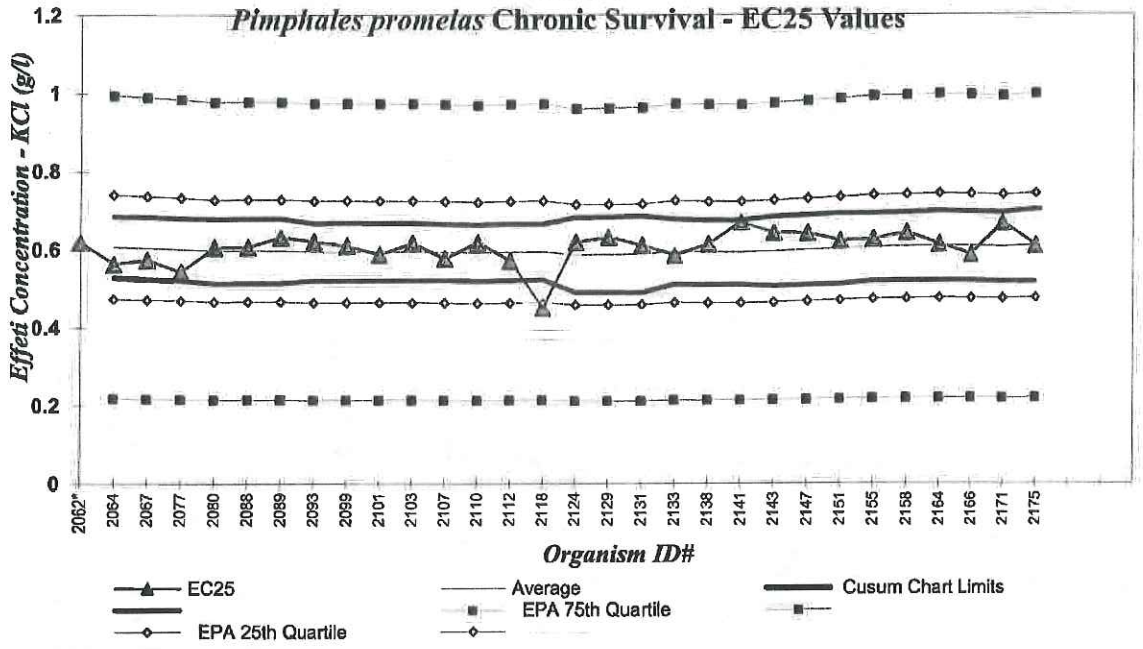
Day 0 Temperatures = Post-renewals
Therm ID# = Thermometer ID used for all measurements that day.
(23.8) = Temp. out of recommended range

Endpoint		Cusum Chart Limits
IC_{25}	0.61	0.52 to 0.70
	0.55	0.44 to 0.72

Conductivity missed ROG KG 8/19/21

Task Manager Rudolf Kiss
Project Manager Alyssa Swanson
QA Officer

REFERENCE TOXICANT CUMLATIVE SUMMARY (CUSUM) CHART



Pimephales promelas **- Chronic (EPA Test Method 1000.0)**

POTASSIUM CHLORIDE (g/L)

Endpoint: Chronic Survival

Stats Method: Linear Interpolation

Test Conditions: Recon MH, 25 oC

From EPA 833-R-00-003:

10th Quartile CV (*control limit*) = 0.03

25th Quartile CV (*warning limit*) = 0.11

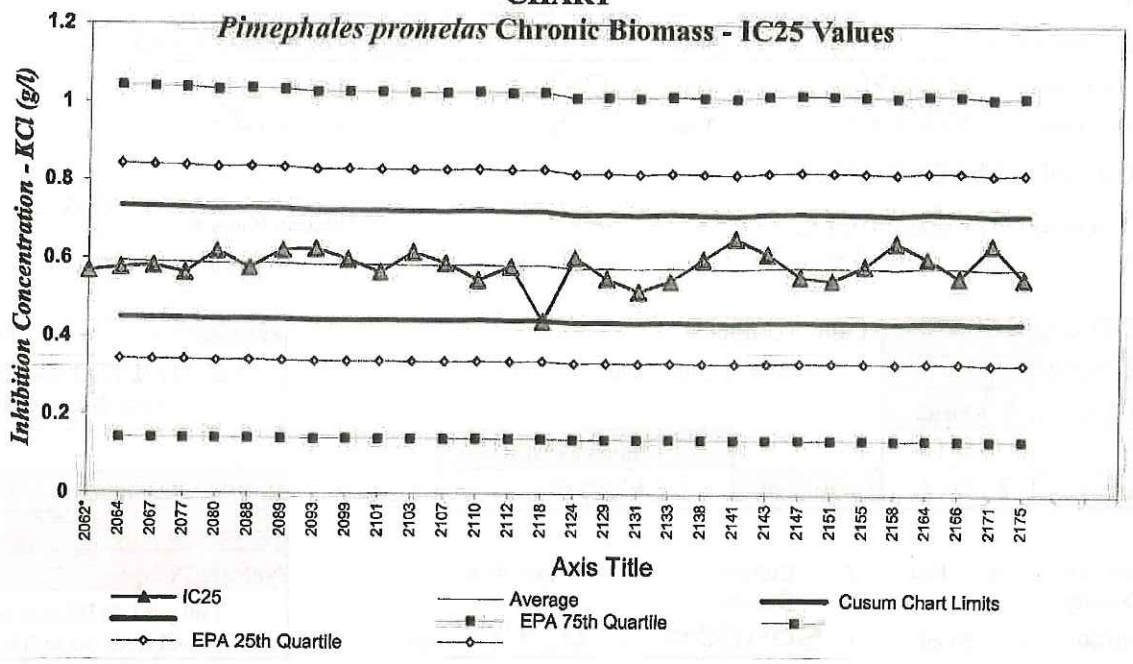
75th Quartile CV (*warning limit*) = 0.32

90th Quartile CV (*control limit*) = 0.52

Intralab CV is compared to EPA ***Warning limits*** *(25th and 75th CV's) and* ***Control limits*** *(10th and 90th CV's), If lab CV is outside EPA Control limits, the EPA Control limits are used to set Cusum chart limits.*

Event #	FHM ID #	Test Start Date	EC25	Running Average	Running SD	Cusum Chart Limits AVG-2SD	Cusum Chart Limits AVG+2SD	Intralab CV
61	2124	9/3/2020	**0.62**	0.6	0.05	**0.49**	**0.68**	0.08
62	2129	10/6/2020	**0.63**	0.6	0.05	**0.49**	**0.68**	0.08
63	2131	10/20/2020	**0.61**	0.6	0.05	**0.49**	**0.68**	0.07
64	2133	10/27/2020	**0.58**	0.6	0.04	**0.51**	**0.68**	0.07
65	2138	12/3/2020	**0.61**	0.6	0.04	**0.51**	**0.67**	0.07
66	2141	12/29/2020	**0.67**	0.6	0.04	**0.51**	**0.67**	0.07
67	2143	1/12/2021	**0.64**	0.6	0.04	**0.51**	**0.68**	0.08
68	2147	2/2/2021	**0.64**	0.6	0.04	**0.51**	**0.69**	0.08
69	2151	3/23/2021	**0.62**	0.6	0.05	**0.51**	**0.69**	0.07
70	2155	4/15/2021	**0.63**	0.6	0.04	**0.52**	**0.69**	0.07
71	2158	5/11/2021	**0.64**	0.6	0.04	**0.52**	**0.69**	0.07
72	2164	6/22/2021	**0.61**	0.6	0.04	**0.52**	**0.70**	0.07
73	2166	7/1/2021	**0.59**	0.6	0.04	**0.52**	**0.70**	0.07
74	2171	7/20/2021	**0.67**	0.6	0.04	**0.52**	**0.69**	0.08
75	2175	8/17/2021	**0.61**	0.6	0.05	**0.52**	**0.70**	0.08

REFERENCE TOXICANT CUMLATIVE SUMMARY (CUSUM) CHART



Pimephales promelas **- Chronic (EPA Test Method 1000.0)**

POTASSIUM CHLORIDE (g/L)

Endpoint: Chronic Growth (Biomass)

Stats Method: Linear Interpolation

Test Conditions: Recon MH, 25 oC

From EPA 833-R-00-003:

10th Quartile CV (*control limit*) =	0.12
25th Quartile CV (*warning limit*) =	0.21
75th Quartile CV (*warning limit*) =	0.38
90th Quartile CV (*control limit*) =	0.45

Intralab CV is compared to EPA ***Warning limits*** *(25th and 75th CV's) and* ***Control limits*** *(10th and 90th CV's), If lab CV is outside EPA Control limits, the EPA Control limits are used to set Cusum chart limits.*

Event #	FHM ID #	Test Start Date	IC25	Running Average	Running SD	Cusum Chart Limits		Intralab CV
						AVG-2SD	AVG+2SD	
61	2124	9/3/2020	**0.60**	0.57	0.05	**0.44**	**0.71**	0.08
62	2129	10/6/2020	**0.55**	0.58	0.05	**0.44**	**0.71**	0.08
63	2131	10/20/2020	**0.52**	0.57	0.05	**0.44**	**0.71**	0.08
64	2133	10/27/2020	**0.54**	0.58	0.04	**0.44**	**0.72**	0.08
65	2138	12/3/2020	**0.60**	0.58	0.04	**0.44**	**0.71**	0.07
66	2141	12/29/2020	**0.65**	0.57	0.04	**0.44**	**0.71**	0.08
67	2143	1/12/2021	**0.62**	0.58	0.05	**0.44**	**0.72**	0.08
68	2147	2/2/2021	**0.56**	0.58	0.05	**0.44**	**0.72**	0.08
69	2151	3/23/2021	**0.55**	0.58	0.05	**0.44**	**0.72**	0.08
70	2155	4/15/2021	**0.58**	0.58	0.05	**0.44**	**0.72**	0.08
71	2158	5/11/2021	**0.65**	0.58	0.05	**0.44**	**0.72**	0.08
72	2164	6/22/2021	**0.60**	0.58	0.05	**0.44**	**0.72**	0.08
73	2166	7/1/2021	**0.56**	0.58	0.05	**0.44**	**0.72**	0.08
74	2171	7/20/2021	**0.64**	0.58	0.05	**0.44**	**0.71**	0.09
75	2175	8/17/2021	**0.55**	0.58	0.05	**0.44**	**0.72**	0.09

TestAmerica

GREEN ALGAE (*Selenastrum capricornutum*) TEST CONDITIONS

Client: QA / QC

Sample Description: NaCl Reagent Log #: 280422-05

Test Start Date: 4.26.21 Time: 1725 Initials: JM

Test End Date: 5/30/21 Time: 1535 Initials: BC

TEST CONDITIONS AT INITIATION:

Species ID#: Sc 1041 Dilution Water ID #: 5391

Age: 6 days Note: includes EDTA

INOCULUM (Axenic Culture)			
# Cells	# Fields		Culture Density
504	250		
MEAN	2.016	x 250,000 =	504000

Culture Density = Mean # of Cells/Field x 250,000

Filtration	None
Note: 50 g/L NaCl stock based off of DI water (0.2 um filtered)	

Test Vol. / Replicate	50 mls
No. of Reps	4
Nutrient Dosage	
1 ml per L in Dilution water only. NaCl stock not nutrient dosed	

Test Start Density	x	Test Volume	/	Culture Density	=	Inoculum Volume
10,000	x	50 ml	/	504000	=	0.99 ml

Confirming Counts			
	# Cells	# Fields	Cell Conc.x10^6 (cells/ml)
Flask #1	2	250	0.006
Flask #2	3	250	0.003
Flask #3	1	250	0.007

Light Intensity at Test Initiation (foot-candles)		
Location #1	Location #2	Location #3
414	383	395

Technician	0 hr	JM	24 hr	[illegible]	48 hr	TC	72 hr	BC	96 hr	BC
Time	0 hr	1725	24 hr	1015	48 hr	1337	72 hr	1145	96 hr	1535
Thermometer ID:	0 hr	# 267	24 hr	# 351	48 hr	# 264	72 hr	# 264	96 hr	# 264

Test Concen. (g/L)	D.O. (mg/L)	pH					Temperature (°C)					Conductivity (umohs/cm)	Hard.	Alk.
	0 hr	0 hr	24	48	72	96	0 hr	24	48	72	96	0 hr	0 hr	0 hr
Control	7.7	8.2	8.3	8.3	8.3	8.6	24.2	25.3	25.4	26.1	25.4	415	103	71
0.25	7.8	8.2	8.2	8.3	8.4	8.5	24.2	25.4	25.8	25.8	25.1	943	111	72
0.50	7.9	8.2	8.1	8.3	8.4	8.6	24.2	25.6	25.4	25.4	25.3	1465		
1.0	7.9	8.2	8.1	8.2	8.4	8.5	24.3	26.1	26.0	26.1	25.7	2970	106	72
2.0	8.0	8.2	8.2	8.2	8.3	8.3	24.4	26.0	25.9	25.8	25.8	4450		
4.0	8.0	8.1	8.1	8.2	8.2	8.4	24.4	26.3	26.3	26.4	25.5	8130	106	67

Task Manager

Project Manager

QA Officer

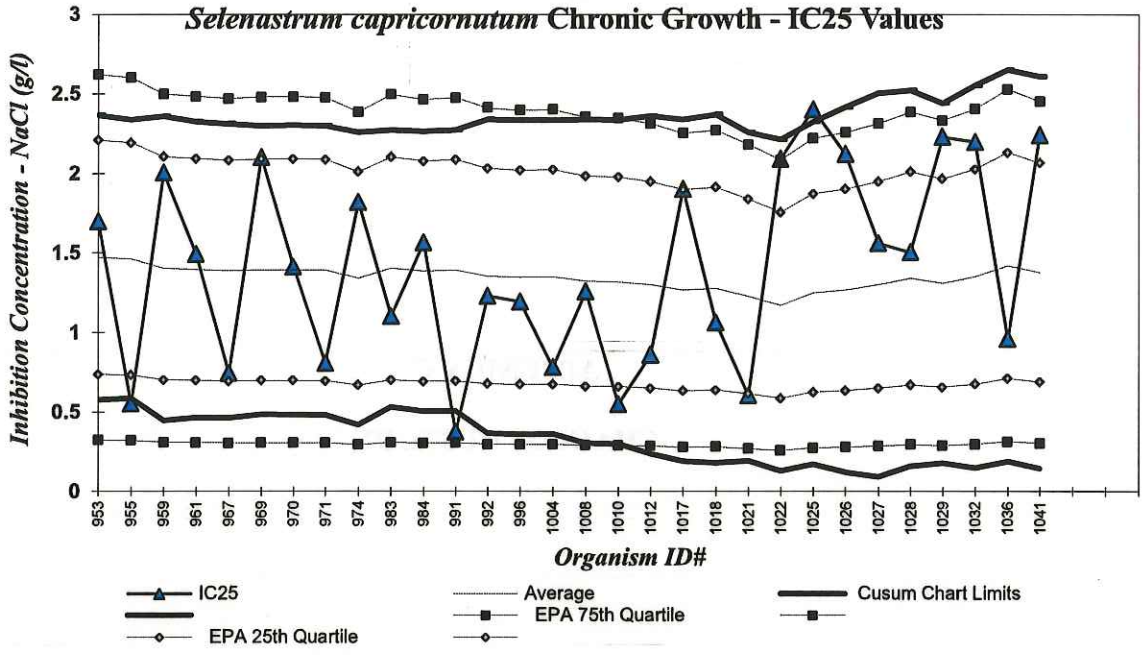
Endpoint : Growth

IC25 : 2.24

Cusum Chart Limits : 0.15 to 2.61

Comments:

REFERENCE TOXICANT CUMLATIVE SUMMARY (CUSUM) CHART



Selenastrum capricornutum **- Green Algae - Chronic (EPA Test Method 1003.0)**

SODIUM CHLORIDE (g/L)

Endpoint: Chronic Growth

Stats Method: Linear Interpolation

Test Conditions: Recon MH, 25 oC

From EPA 833-R-00-003:

10th Quartile CV (*control limit*) =	0.02
25th Quartile CV (*warning limit*) =	0.25
75th Quartile CV (*warning limit*) =	0.39
90th Quartile CV (*control limit*) =	0.51

As per EPA 833-R-00-003, section B.2.1, the quartiles listed above are from just a few labs (6) and therefore not to be considered typical or representative. Cusum limits are based on ASL data only.

Event #	Algae ID #	Test Start Date	IC25	Running Average	Running SD	Cusum Chart Limits AVG-2SD	Cusum Chart Limits AVG+2SD	Intralab CV
210	1008	10/27/2020	**1.26**	1.32	0.51	**0.30**	**2.34**	0.39
211	1010	11/10/2020	**0.55**	1.32	0.51	**0.30**	**2.34**	0.41
212	1012	12/1/2020	**0.86**	1.30	0.53	**0.24**	**2.36**	0.42
213	1017	1/26/2021	**1.90**	1.27	0.54	**0.19**	**2.34**	0.43
214	1018	2/2/2021	**1.06**	1.28	0.55	**0.18**	**2.37**	0.42
215	1021	3/2/2021	**0.60**	1.23	0.52	**0.19**	**2.26**	0.44
216	1022	4/13/2021	**2.09**	1.17	0.52	**0.13**	**2.21**	0.43
217	1025	4/28/2021	**2.40**	1.25	0.54	**0.17**	**2.32**	0.45
218	1026	5/15/2021	**2.12**	1.27	0.57	**0.12**	**2.41**	0.46
219	1027	5/18/2021	**1.56**	1.30	0.60	**0.09**	**2.51**	0.44
220	1028	5/27/2021	**1.51**	1.34	0.59	**0.16**	**2.52**	0.43
221	1029	6/8/2021	**2.23**	1.31	0.56	**0.18**	**2.44**	0.44
222	1032	7/8/2021	**2.20**	1.35	0.60	**0.15**	**2.55**	0.43
223	1036	7/30/2021	**0.96**	1.42	0.62	**0.19**	**2.65**	0.45
224	1041	8/26/2021	**2.24**	1.38	0.62	**0.15**	**2.61**	0.45
225								

APPENDIX C

CHAIN OF CUSTODY

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Sample Receipt Record

Batch Number: BS151-01 Date Received: 8/24/21

Client/Project: City of Woodland Received By: [illegible]

Were custody seals intact? ☑ Yes ☐ No ☐ N/A

Packing Material: ☐ Ice ☒ Blue Ice ☐ Box

Temp OK? (≤ 6°C) Therm ID: TH169 Expires: 9/9/2021 Observed: 1.6, 2.2 °C, Actual Temp: 1.5, 2.1 °C ☑ Yes ☐ No ☐ N/A

If sample is noted @ ≤ 0.0 °C, is the sample frozen or partially frozen? ☐ Yes ☐ No ☑ N/A

Was a Chain of Custody (CoC) Provided? ☑ Yes ☐ No ☐ N/A

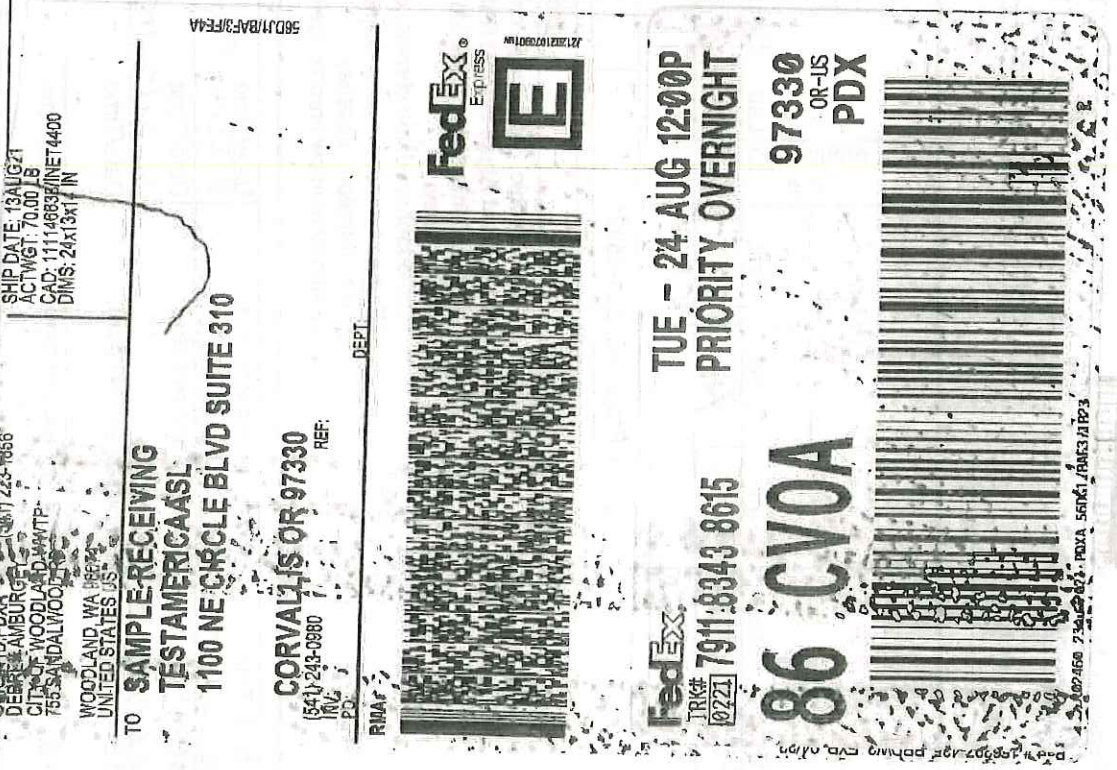
Was the CoC correctly filled out? (If No, document below) ☑ Yes ☐ No ☐ N/A

Were the sample containers in good condition (not broken or leaking)? ☑ Yes ☐ No ☐ N/A

Are all samples within 36 hours of collection? ☑ Yes ☐ No ☐ N/A

Method of Shipment: ☐ Hand Delivered, ☑ FedEx, ☐ UPS, ☐ Greyhound, ☐ Other: _____ ☐ N/A

Sample Exception Report (The following exceptions were noted)



CHAIN OF CUSTODY RECORD - FOR AQUATIC TOXICITY TESTING

eurofins | Environment Testing TestAmerica

Client: City of Woodland NPDES# WA0020401

Address: 755 Sandalwood Rd Woodland WA 98674

Contact Person: Derrek Amburgey

Phone: 360-225-7007

PO# 37314

Composite Sample Information

Samples/Hour N/A Volume/Sample N/A

Total Hours 24 Total Volume 20L

Initiated: Date 9-22-21 Time 9AM

Ended: Date 9-23-21 Time 9AM

Chilled During Collection Yes

Ship Samples to:

Eurofins TestAmerica
Attention: Aquatic Toxicology Laboratory
1100 NE Circle Blvd. Suite 310
Corvallis, OR 97330
Phone: 541-243-6137

Analysis Required / Comments

Sample ID	Date	Time	Sample Type: Comp.	Sample Type: Grab	# of Containers	Lab ID#	Fathead Acute	Fathead Chronic	Cerio Acute	Cerio Chronic	Daphnia Acute	Trout Acute	SHM Acute	SHM Chronic	MB Acute	MB Chronic	MYS Acute	MYS Chronic	Algae Chronic	CA Haz Waste	WA Haz Waste	Daphnia Chronic	Concentration and/or Comments
EFF	9-23-21	9AM	X		2	B5151-01	X	X			X								X			X	
18																							

Project ID: Q21-05391 | Prepared By: Brett Muckey

Qty	Description
1	Algae chronic, definitive (5 concentration) bioassay
1	Concurrent Algae chronic Reference Toxicant test
1	Ceriodaphnia dubia acute, definitive (5 conc.), non-renewal, 48 hr, bioassay
1	Ceriodaphnia dubia chronic, definitive (5 conc.), bioassay
1	Fathead minnow acute, definitive (5 conc.), renewal (@ 48 hr), 96 hr duration, bioassay
1	Fathead minnow chronic, definitive (5 conc.), bioassay

Sampled By & Title (Please sign and print name) Derrek Amburgey		Date/Time 9-22-21 9AM	Relinquished By (Please sign and print name) Bob Fowler	Date/Time 9-23-21 10:00
Received By (Please sign and print name)		Date/Time 9/24/21 1155	Relinquished By (Please sign and print name)	Date/Time
Received By (Please sign and print name)		Date/Time	Relinquished By (Please sign and print name)	Date/Time
Received By (Please sign and print name)		Date/Time	Shipped Via UPS Bus Fed-Ex Hand Other	Shipping # COC_Bioassay
Work Authorized By (Please sign and print name)		Remarks		Doc Control ID: ASL612-0519

eurofins | Environment Testing TestAmerica

Sample Receipt Record

Batch Number: Due TC 9/26 BS BS151-02

Date Received: 9/26/21

Client/Project: Woodland

Received By: TC

Were custody seals intact? ☒ Yes ☐ No ☐ N/A

Packing Material: ☐ Ice ☒ Blue Ice ☐ Box

Temp OK? (≤ 6°C) Therm ID: 109 Expires: 9/9/2021 Observed: 26 26 °C, Actual Temp: 26 26 °C ☒ Yes ☐ No ☐ N/A

If sample is noted @ ≤ 0.0 °C, is the sample frozen or partially frozen? ☐ Yes ☐ No ☒ N/A

Was a Chain of Custody (CoC) Provided? ☒ Yes ☐ No ☐ N/A

Was the CoC correctly filled out? (If No, document below) ☒ Yes ☐ No ☐ N/A

Were the sample containers in good condition (not broken or leaking)? ☒ Yes ☐ No ☐ N/A

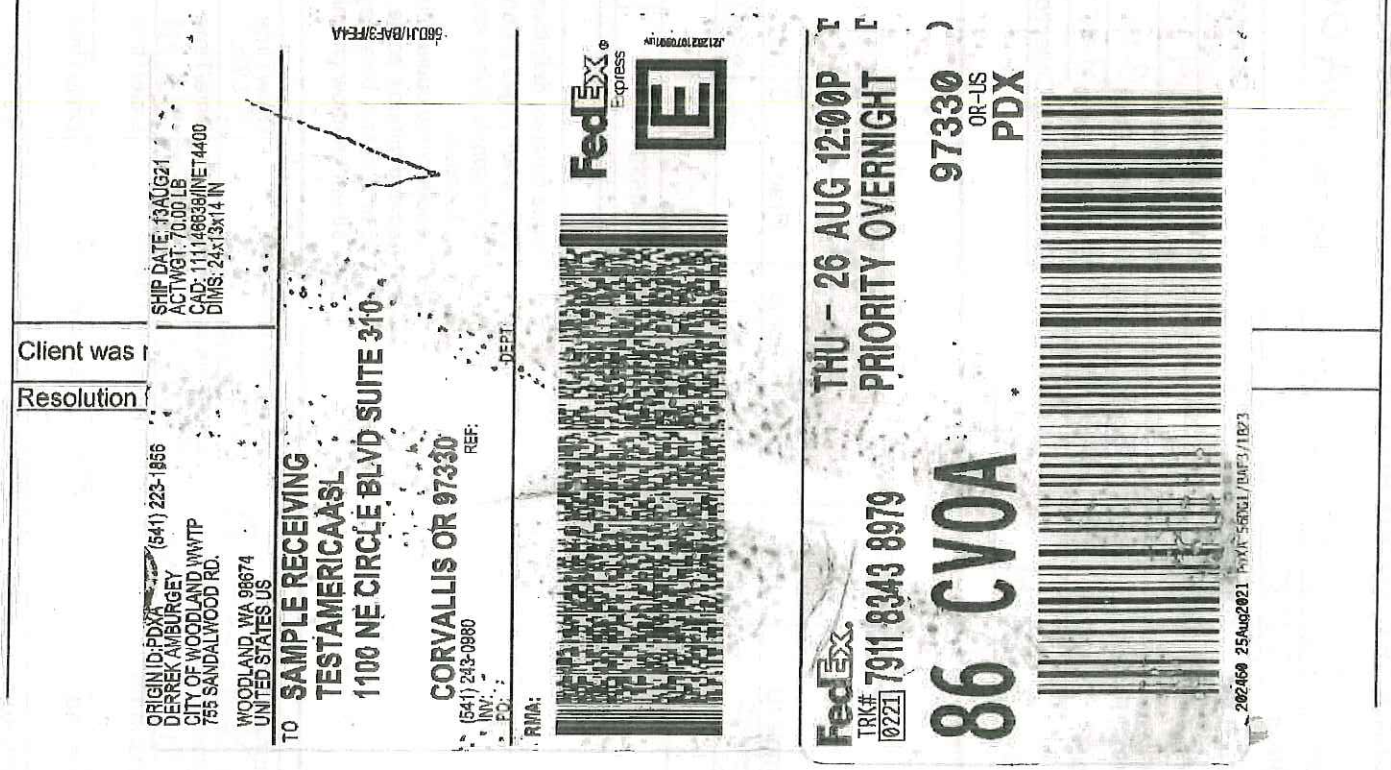
Are all samples within 36 hours of collection? ☒ Yes ☐ No ☐ N/A

Method of Shipment: ☐ Hand Delivered, ☒ FedEx, ☐ UPS, ☐ Greyhound, ☐ Other: _____ ☐ N/A

Sample Exception Report (The following exceptions were noted)

Client was

Resolution



Bioassay Receipt verification
Doc Control ID: ASL993-1119

CHAIN OF CUSTODY RECORD - FOR AQUATIC TOXICITY TESTING

eurofins | Environment Testing TestAmerica

Client: City of Woodland NPDES# WA0020401

Address: 755 Sandalwood Rd Woodland WA 98674

Contact Person: Derrek Amburgey

Phone: 360-225-7007

PO# 37314

Composite Sample Information

Samples/Hour NA Volume/Sample NA

Total Hours 24 Total Volume 20L

Initiated: Date 8-24-21 Time 930am

Ended: Date 8-25-21 Time 930AM

Chilled During Collection Yes

Ship Samples to:

Eurofins TestAmerica
Attention: Aquatic Toxicology Laboratory
1100 NE Circle Blvd. Suite 310
Corvallis, OR 97330
Phone: 541-243-6137

Analysis Required / Comments

Sample ID	Date	Time	Sample Type: Comp.	Sample Type: Grab	# of Containers	Lab ID#	Fathead Acute	Fathead Chronic	Cerio Acute	Cerio Chronic	Daphnia Acute	Trout Acute	SHM Acute	SHM Chronic	MB Acute	MB Chronic	MYS Acute	MYS Chronic	Algae Chronic	CA Haz Waste	WA Haz Waste	Daphnia Chronic	Concentration and/or Comments
EFF	8-24-21	930am	X		2	B5151-02	X	X			X								X			X	
83																							

Project ID: Q21-05391 | Prepared By: Brett Muckey

Qty	Description
1	Algae chronic, definitive (5 concentration) bioassay
1	Concurrent Algae chronic Reference Toxicant test
1	Ceriodaphnia dubia acute, definitive (5 conc.), non-renewal, 48 hr, bioassay
1	Ceriodaphnia dubia chronic, definitive (5 conc.), bioassay
1	Fathead minnow acute, definitive (5 conc.), renewal (@ 48 hr), 96 hr duration, bioassay
1	Fathead minnow chronic, definitive (5 conc.), bioassay

Sampled By & Title	(Please sign and print name) Derrek Amburgey	Date/Time 8-25-21 930	Relinquished By (Please sign and print name) Bob Fowler	Date/Time 8-25-21 730am
Received By Tori Crumvine	(Please sign and print name)	Date/Time 9/26/21 1222	Relinquished By (Please sign and print name)	Date/Time
Received By	(Please sign and print name)	Date/Time	Relinquished By (Please sign and print name)	Date/Time
Received By	(Please sign and print name)	Date/Time	Shipped Via UPS Bus Fed-Ex Hand Other	Shipping # COC_Bioassay
Work Authorized By	(Please sign and print name)	Remarks		Doc Control ID: ASL612-0519

eurofins | Environment Testing TestAmerica

Sample Receipt Record

Batch Number: BSI51-03

Client/Project: Woodland

Date Received: 8/28/21

Received By: TC

Were custody seals intact? [X] Yes [ ] No [ ] N/A

Packing Material: [X] Ice [X] Blue Ice [ ] Box

Blue TC 8/28

Temp OK? (≤ 6°C) Therm ID: 169 Expires: 9/ 9/20 21 Observed: 1.2 2.2°C, Actual Temp: 0.6 1.5°C [X] Yes [ ] No [ ] N/A

If sample is noted @ ≤ 0.0 °C, is the sample frozen or partially frozen? [ ] Yes [ ] No [X] N/A

Was a Chain of Custody (CoC) Provided? [X] Yes [ ] No [ ] N/A

Was the CoC correctly filled out? (If No, document below) [X] Yes [ ] No [ ] N/A

Were the sample containers in good condition (not broken or leaking)? [X] Yes [ ] No [ ] N/A

Are all samples within 36 hours of collection? [X] Yes [ ] No [ ] N/A

Method of Shipment: [ ] Hand Delivered, [X] FedEx, [ ] UPS, [ ] Greyhound, [ ] Other: _____ [ ] N/A

Sample Exception Report (The following exceptions were noted)

Client wa

Resoluti

Bioassay Receipt verification
Doc Control ID: ASL993-1119

CHAIN OF CUSTODY RECORD - FOR AQUATIC TOXICITY TESTING

eurofins | Environment Testing TestAmerica

Client: City of Woodland NPDES# WA0020401

Address: 755 Sandalwood Rd Woodland WA 98674

Contact Person: Derrek Ambuger

Phone: 360-225-7007

PO# 37314

Composite Sample Information

Samples/Hour: NA Volume/Sample: NA

Total Hours: 24 Total Volume: 20L

Initiated: Date 8-26-21 Time 9AM

Ended: Date 8-27-21 Time 9AM

Chilled During Collection: Yes

Ship Samples to:

Eurofins TestAmerica
Attention: Aquatic Toxicology Laboratory
1100 NE Circle Blvd. Suite 310
Corvallis, OR 97330
Phone: 541-243-6137

Analysis Required / Comments

Sample ID	Date	Time	Sample Type: Comp.	Sample Type: Grab	# of Containers	Lab ID#	Fathead Acute	Fathead Chronic	Cerio Acute	Cerio Chronic	Daphnia Acute	Trout Acute	SHM Acute	SHM Chronic	MB Acute	MB Chronic	MYS Acute	MYS Chronic	Algae Chronic	CA Haz Waste	WA Haz Waste	Daphnia Chronic	Concentration and/or Comments
EFF	8-26-21	9AM	X		2	BS151-03	X	X			X								X			X	
85																							

Project ID: Q21-05391 | Prepared By: Brett Muckey

Qty	Description
1	Algae chronic, definitive (5 concentration) bioassay
1	Concurrent Algae chronic Reference Toxicant test
1	Ceriodaphnia dubia acute, definitive (5 conc.), non-renewal, 48 hr, bioassay
1	Ceriodaphnia dubia chronic, definitive (5 conc.), bioassay
1	Fathead minnow acute, definitive (5 conc.), renewal (@ 48 hr), 96 hr duration, bioassay
1	Fathead minnow chronic, definitive (5 conc.), bioassay

Sampled By & Title (Please sign and print name): Derrek Ambuger	Date/Time: 8-27-21 915	Relinquished By (Please sign and print name): Bob Fowler	Date/Time: 8-27-21 915
Received By (Please sign and print name): Tori Crumrine	Date/Time: 8/28/21 1119	Relinquished By (Please sign and print name):	Date/Time:
Received By (Please sign and print name):	Date/Time: 8/29	Relinquished By (Please sign and print name):	Date/Time:
Received By (Please sign and print name):	Date/Time:	Shipped Via: UPS Bus Fed-Ex Hand Other	Shipping #: COC_Bioassay
Work Authorized By (Please sign and print name):	Remarks:		Doc Control ID: ASL612-0519

eurofins | Environment Testing TestAmerica

AQUATIC TOXICOLOGY REPORT

Project Name: CITY OF WOODLAND

Location: WOODLAND, WASHINGTON

Prepared by: Eurofins TestAmerica - Corvallis
(aka TestAmerica – ASL)

1100 NE Circle Boulevard, Suite 310
Corvallis, Oregon 97330
541-243-6137

Accredited in accordance with NELAP

Oregon Environmental Laboratory Accreditation Program #OR100022 (NELAP)
State of Washington DOE Environmental Laboratory Accreditation Program, Lab ID C556
California State Environmental Laboratory Accreditation Program, Certificate No.: 1726

Report Date: December 14, 2021 Released by: Michelle Bennett

Lab I.D. No. B5236

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APPENDIX A. RAW DATA SHEETS
APPENDIX B. REFERENCE TOXICANT DATA SHEETS
APPENDIX C. CHAIN OF CUSTODY

LABORATORY CONTACT: Alise Lampi, Aquatic Toxicity Department Manager
Alyssa.Lampi@eurofinset.com (541) 243-0964

INTRODUCTION

Eurofins TestAmerica – Corvallis (ET-C) Aquatic Toxicology Laboratory conducted toxicity testing on sample(s) from the City of Woodland, Woodland, Washington.

Testing was initiated on: November 9, 2021

The test(s) were conducted using:

- the water flea (*Ceriodaphnia dubia*)
- the fathead minnow (*Pimephales promelas*)
- the green algae (*Selenastrum capricornutum,* aka *Raphidocelis subcapitata*, aka *Pseudokirchneriella subcapitata*).

OVERVIEW OF REGULATORY GUIDANCE

The following provides an overview and excerpts of applicable permit specifics, regulatory guidance, and other relevant information. This is intended only as a helpful guide, from a laboratory perspective, for understanding test outcomes. The final responsibility for interpretation of results remains with the client and/or regulatory agency.

The following guidance is taken from ET-C's reading of the NPDES permit for the City of Woodland (permit #WA0020401, effective Apr. 1, 2012, expired Mar. 31, 2017). No current NPDES permit information was provided to or found by ET-C at the time of testing.

<u>There are no acute or chronic effluent limits for Whole Effluent Toxicity listed in the NPDES permit</u>.

Acute toxicity:

- "The acute critical effluent concentration (ACEC) equals 19 percent effluent."

Chronic toxicity:

- "The chronic critical effluent concentration (CCEC) equals 1.4 percent effluent."
- *Compliance Testing for Chronic Toxicity:*
    - "Conduct chronic toxicity testing on a series of at least five concentrations of effluent and a control. This series of dilutions must include the CCEC and ACEC."
    - "Compare the ACEC to the control using hypothesis testing at the 0.05 level of significance as described in permit."

The following is taken from the WDOE guidance (WQ-R-95-80, June 2016 revision):

- "To reduce WET limit violations due to statistically significance that is a Type I error (false positive), we lower the alpha for hypothesis testing when differences in test organisms response are small."
- "Alpha will be lowered from 0.05 to 0.01 if a 10% difference in an acute test is significant or a 20% difference in a chronic test is significant."

SUMMARY OF TEST RESULTS

Exhibits 1 and 2 provide a summary of the final test results.

EXHIBIT 1
Summary of Acute Test Results

Species	NOEC (%)	LOEC (%)	LC_{50} (%)
C. dubia	100	> 100	> 100
P. promelas	100	> 100	> 100

Note: acronyms are as defined below.

More detailed information is provided in the Results and Discussion section.

EXHIBIT 2
Summary of Chronic Test Results

Species	NOEC (%)	LOEC (%)	IC_{25} (%)
C. dubia	100 [a]	> 100 [a]	> 100
P. promelas	100	> 100	> 100
S. capricornutum	1.4	10.0	29.8

[a] Indicates that the test showed an interrupted dose response. As such, the hypothesis testing endpoints (NOEC/LOEC) should be interpreted carefully. See Table 3 for further discussion
Note: acronyms are as defined below.

More detailed information is provided in the Results and Discussion section.

ACRONYM DEFINITIONS (from EPA guidance):

NOEC = No Observed Effect Concentration: The highest test concentration that causes no observable adverse effects on the test organisms (i.e. no statistically significant reduction from the control).
LOEC = Low Observed Effect Concentration: The lowest test concentration that does cause an observable adverse effect on the test organisms (i.e. is statistically significant reduction from the control).
LC_{50} = Lethal Concentration (50%): A point estimate of the test concentration that would cause death in 50 percent of the test population.
IC_{25} = Inhibition Concentration (25%): A point estimate of the test concentration that would cause a 25 percent reduction of a non-quantal biological measurement (i.e. growth, reproduction, etc.) for the test population.

SAMPLE INFORMATION

Exhibit 3 provides a summary of the sample conditions as received.

EXHIBIT 3
Sample Conditions on Receipt

Sample ID	**EFF**			
ET-C SDG	B5236			
+ suffix	-01	-02	-03	-04
Collection - Date and Time	11/08/2021 09:00	11/10/2021 10:00	11/12/2021 09:00	11/15/2021 10:00
Receipt - Date and Time	11/09/2021 10:10	11/11/2021 12:25	11/13/2021 11:00	11/16/2021 11:20
Temperature (°C)	1.8 to 2.2	1.8 to 3.0	1.7 to 1.9	1.2 to 1.6
Dissolved Oxygen (mg/L)	9.9	8.9	8.5	6.5
pH	6.8	6.9	6.9	7.3
Conductivity (µS/cm)	711	691	698	687
Total Residual Chlorine (mg/L)	0.03	0.02	0.03	0.02
Ammonia (mg/L as NH_3-N)	0.23	0.18	0.12	0.33
Total Hardness (mg/L as $CaCO_3$)	97	92	92	89
Total Alkalinity (mg/L as $CaCO_3$)	122	119	122	117

METHODS AND MATERIALS

TEST METHODS

The acute test methods were performed according to: *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms*, USEPA Office of Water (2002), EPA-821-R-02-012.

The chronic test methods were performed according to: *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms*, Fourth Edition, (2002), EPA-821-R-02-013.

Additional guidance was provided by:

- *Whole Effluent Toxicity Testing Guidance and Test Review Criteria*, Washington State Department of Ecology (revised Jun 2016) Pub# WQ-R-95-80.

DEVIATIONS FROM PROTOCOLS

Deviations from required procedures in the test methods:

- The number of surviving organisms was not recorded at 24 hours in the *P. promelas* acute test as required by the EPA. This situation is detailed further in the Results and Discussion section of this report.

Deviations from recommended procedures in the test methods:

- For the *C. dubia* chronic test, some of the instantaneous temperature readings fell outside of the recommended range of 25±1°C. However, the required test condition of a temperature deviation (i.e. maximum minus minimum) of no more than 3 °C was met. This situation is detailed further in the Results and Discussion section of this report.

- All subsequent uses of a sample did not occur within the WDOE recommended maximum holding time of 72 hours past the time of sample collection. See further discussion in the Sample Collection and Storage section.

TEST DESIGN

The following summarizes the conditions used for both overall testing and the specifics for each test (observations and notations can be found on the datasheets in Appendix A):

Overall Test Design:

- Acute and Chronic tests: 1.4, 10, 19, 50, and 100 percent sample + dilution water for the control.

Test Organism Conditions:

- All organisms tested were fed and maintained during culturing, acclimation, and testing as prescribed by the EPA (2002).
- The test organisms appeared vigorous and in good condition prior to testing.

C. dubia acute test:

- Source: ET-C's in-house cultures
- Age: Less than 24 hours old
- Design: Four test vessels per concentration, five organisms per vessel
- Test Solution Renewal: None (i.e. static test)
- Monitoring:
    - Daily: Survival, DO, pH, and temperature; all concentrations.
    - Test Initiation and Termination: Conductivity, all concentrations
- Termination: 48 hours.
- Endpoints: Survival (at termination)

P. promelas acute test (renewal):

- Source: Aquatox Inc., Hot Springs, Arkansas
- Age: 1 to 14 days old, within a 24 hour age range
- Design: Four test vessels per concentration, Ten organisms per vessel
- Test Solution Renewal: Once @ 48 hours (i.e. static-renewal test)
- Monitoring:

    - Daily: Survival, DO, pH, and temperature; all concentrations.
    - Pre and Post Renewal solutions: DO and pH, all concentrations.
    - Test Initiation, with each new sample use, and Termination:
        - Conductivity, all concentrations (WDOE)
- Termination: 96 hours.
- Endpoints: Survival (at termination)

<u>*C. dubia* chronic test:</u>

- Source: ET-C's in-house cultures
- Age: Less than 24 hours old and within an 8-hour age range, with blocking by known parentage
- Design: Ten test vessels per concentration, one organism per vessel
- Test Solution Renewal: Daily
- Monitoring:
    - Daily: Survival and neonate production (with brood determination)
    - Daily: DO and pH in pre and post-renewal solutions, all concentrations
    - Daily: Temperature in pre-renewal solutions, all concentrations
    - With each new sample: Conductivity in post-renewal solutions, control and highest sample concentration
- Termination: When 60%+ of surviving control organisms produce a 3rd brood.
    - Survival: @ after 7 days.
    - Reproduction: When 60%+ of surviving control organisms produce a 3rd brood.
- Endpoints: Survival (at termination) and Reproduction (through first 3 broods)

<u>*P. promelas* chronic test:</u>

- Source: Aquatox Inc., Hot Springs, Arkansas
- Age: Less than 48 hours old and within an 24 hour age range
- Design: Four test vessels per concentration, ten organisms per vessel
- Test Solution Renewal: Daily
- Monitoring:
    - Daily: Survival
    - Daily: DO and pH in pre and post-renewal solutions, all concentrations
    - Daily: Temperature in pre-renewal solutions, all concentrations
    - With each new sample: Conductivity in post-renewal solutions, control and highest sample concentration
- Termination: 7 days after test initiation.
- Endpoints: Survival and Growth (average dry weight per organism added @ initiation)

<u>*S. capricornutum* chronic test:</u>

- Source: ET-C's in-house cultures
- Age: Culture acclimated to test conditions for 4 to 7 days.
- Design: Four test vessels per concentration, 10,000 cells/ml density at initiation
- Test Solution Renewal: None (static)
- Monitoring:
    - Initiation: DO, pH, Temperature, and Conductivity, all concentrations
    - Initiation: Hardness and Alkalinity, control + low, middle and high sample concentrations
    - Initiation: Light Intensity and Cell Density confirming counts, in triplicate

    - Daily: Temperature and pH, all concentrations
- Termination: 96 hours.
- Endpoints: Cell Density (at termination)

DILUTION WATER

The dilution water used was the standard culture water used by ET-C:

- Reconstituted, moderately hard water (as per EPA protocol) with a total hardness of 75 to 105 mg/L as $CaCO_3$ and an alkalinity of 50 to 75 mg/L as $CaCO_3$.
- For the *S. capricornutum* test: Reconstituted, moderately hard water with nutrients added, including EDTA, that was passed through a 1.60 micron filter prior to use.

SAMPLE COLLECTION AND STORAGE

Samples were collected by City of Woodland personnel. The samples were accepted as scheduled by ET-C. Chain of Custody and Sample Receipt Records are provided in Appendix C.

- All samples were received within the EPA recommended and WDOE required 0 to 6 °C range.
- All samples were initially used for test initiation or test solution renewal within the EPA recommended maximum holding time of 36 hours of sample collection.
- All subsequent uses of a sample occurred within the EPA recommended maximum holding time of 72 hours past the time of initial use of that sample.
- Not all subsequent uses of a sample occurred within the WDOE recommended maximum holding time of 72 hours past the time of sample collection.
    - The sample was collected on November 12, 2021 at 09:00. The subsequent use of that sample took place on Day 6 of the *C. dubia* chronic test. On Day 6 the subsequent use of the sample occurred at 11:50 (74 hours and 50 minutes past collection of the sample).
    - The sample was collected on November 12, 2021 at 09:00. The subsequent use of that sample took place on Day 4 of the *P. promelas* chronic test. On Day 4 the subsequent use of the sample occurred at 10:43 (73 hours and 43 minutes past collection of the sample).
- All subsequent uses of a sample occurred within the WDOE recommended maximum holding time of 84 hours past the time of sample collection. (Extended for renewals of a 96 hour duration acute test).
- Following receipt, the samples were stored in the dark at 0 to 6 °C until test solutions were prepared and tested.

SAMPLE PREPARATION

Samples used during these tests were:

- Temperature adjusted prior to test initiation and each daily renewal.
- Organisms were noted in the first and second samples on arrival. Samples were filtered through a 60 µm net prior to use.
- The subsample used for the *S. capricornutum* test had nutrients, including EDTA, added, and was 1.60 micron filtered prior to use.

DATA ANALYSIS

The statistical analyses performed for the acute tests were those outlined in *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms*, USEPA Office of Water, Fifth Edition (2002), EPA-821-R-02-012, using CETIS.

The statistical analyses performed for the chronic tests were those outlined in *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms*, USEPA Office of Water, Fourth Edition (EPA 2002), EPA-821-R-02-013, using CETIS.

- The specific statistical analysis and CETIS version used for each endpoint evaluation is listed with the statistical outputs included with each test in Appendix A.
- If any additional analysis methods were also used, an explanation of the rationale and reference to the source method is included with the presentation of those results below.

Additional guidance was provided by:

- *Whole Effluent Toxicity Testing Guidance and Test Review Criteria*, Washington State Department of Ecology (revised Jun 2016) Pub# WQ-R-95-80.

RESULTS AND DISCUSSION

The raw data sheets for all tests are presented in Appendix A.

ACUTE BIOASSAYS

Table 1 summarizes the survival data for the *C. dubia* acute test.

Table 1
Summary of Acute Results
C. dubia

Sample Concentration (%)	Percent Survival (at Test Termination)
Control	95
1.4	100
10	95
19	95
50	100
100	100

Statistical analysis in accordance with the EPA protocol and WDOE guidance results in:

- NOEC = 100 %
- LOEC > 100 %
- LC_{50} > 100 %

Dissolved oxygen concentrations remained at 4.0 mg/L or greater throughout the test period. Test temperatures remained in the range of 20±1 °C.

The *C. dubia* acute test meets Test Acceptability Criteria (TAC) of a minimum 90 percent control survival. Unless referenced above, the tests proceeded without any noted deviations or interruptions that could have affected test results. The testing should be considered "valid".

Table 2 summarizes the survival data for the *P. promelas* acute test.

Table 2 **Summary of Acute Results** ***P. promelas***	
Sample Concentration (%)	**Percent Survival (at Test Termination)**
Control	100
1.4	97.5
10	97.5
19	100
50	97.5
100	100

Statistical analysis in accordance with the EPA protocol and WDOE guidance results in:

- NOEC = 100 %
- LOEC > 100 %
- LC_{50} > 100 %

Note: The number of surviving organisms was not recorded at 24 hours in the *P. promelas* acute test. EPA manual states, "The number of surviving organisms in each test chamber is recorded at the end of each 24-hour period." The surviving numbers of organisms was recorded for the remainder of the test. As no toxicity was observed, it is ET-C's professional opinion that missing the required survival numbers had no significant impact on test results (Test Termination date (@96 hours) data is accurate).

Dissolved oxygen concentrations remained at 4.0 mg/L or greater throughout the test period. Test temperatures remained in the range of 20±1 °C.

The *P. promelas* acute test meets Test Acceptability Criteria (TAC) of a minimum 90 percent control survival. Unless referenced above, the tests proceeded without any noted deviations or interruptions that could have affected test results. The testing should be considered "valid".

CHRONIC BIOASSAYS

Table 3 summarizes the survival and reproduction data for the *C. dubia* chronic test.

Table 3
Summary of Chronic Results
C. dubia

Sample Concentration (%)	Percent Survival	Mean Number of Young Per Adult
Control	100	15.4
1.4	90	12.6
10	90	5.9 [a]
19	90	10.5
50	90	18.8
100	100	19.1

[a] Indicates a statistically significant difference from the control at alpha = 0.05.

Statistical analysis in accordance with the EPA protocol and WDOE guidance results in:

- NOEC = 100 %
- LOEC = 10.0 %
- IC_{25} > 100 %

EPA 821-B-00-004, page 4-11, identifies this data set as an interrupted concentration-response with a single significant effect bracketed by non-significant effects. With this pattern "point estimation techniques generally will yield reliable results, but hypothesis testing results should be interpreted carefully." The results of the EPA recommended review actions were as follows; there were no test condition or procedural errors, within treatment variability was typical, and test sensitivity was moderate to high. Under these conditions "it is likely that the significantly different treatment is the result of a Type I error (false positive)" and should be "considered anomalous due to the analysis of the concentration-response curve …". Also, "the NOEC should be determined as the highest concentration that was not significantly different from the control." In this case, the reported values should be:

- NOEC = 100 %
- LOEC > 100 %
- IC_{25} > 100 %

EPA guidance recommends test temperature to remain at 25±1°C for the *C. dubia* chronic test. On Days 6 and 7, the instantaneous temperatures in the test concentrations were slightly outside of this range at 22.1 to 24.8 °C. Also, the required test condition of a temperature deviation (i.e. maximum minus minimum) over the entire test period of no more than 3 °C was met (25.7 – 22.1 = 3.6°C). The EPA chronic manual Section 4.9.2 states: "An individual test may be conditionally acceptable if the temperature, DO, and other specified conditions fall outside specifications, depending on the degree of departure and the objectives of the tests. The acceptability of the test would depend on the experience and professional

judgment of the laboratory investigator and the reviewing staff of the regulatory authority". The 100% effluent outperformed the laboratory control. Therefore, it is the laboratory's professional judgment that the minor deviation in the test temperature from the recommended conditions did not appear to affect the test results and the test should be accepted.

Dissolved oxygen concentrations remained at 4.0 mg/L or greater throughout the test period. Test temperatures remained at 25±1 °C.

The *C. dubia* test meets Test Acceptability Criteria (TAC) for a minimum 80 percent control survival and a minimum 15 young produced per surviving control adult. Unless referenced above, the tests proceeded without any noted deviations or interruptions that could have affected test results. The testing should be considered "valid".

Table 4 summarizes the survival and growth data for the *P. promelas* chronic test.

Table 4
Summary of Chronic Results
P. promelas

Sample Concentration (%)	Percent Survival	Mean Dry Weight Per Organism Added (mg)
Control	100	0.759
1.4	100	0.763
10	100	0.851
19	97.5	0.824
50	100	0.898
100	97.5	0.809

Statistical analysis in accordance with the EPA protocol and WDOE guidance results in:

- NOEC = 100 %
- LOEC > 100 %
- IC_{25} > 100 %

Dissolved oxygen concentrations remained at 4.0 mg/L or greater throughout the test period. Test temperatures remained at 25±1°C.

The *P. promelas* test meets Test Acceptability Criteria (TAC) for a minimum 80 percent control survival and a minimum weight of 0.250 mg per surviving control organism. Unless referenced above, the tests proceeded without any noted deviations or interruptions that could have affected test results. The testing should be considered "valid".

Table 5 summarizes the algae growth data for the *S. capricornutum* chronic test.

Table 5 **Summary of Chronic Results** ***S. capricornutum***	
Sample Concentration (%)	**Growth (Cells/ml x 10^6)**
Control	3.311
1.4	3.047 [a]
10	2.648 [a]
19	2.656 [a]
50	2.286 [a]
100	0.339 [a]
[a] Indicates a statistically significant difference from the control at alpha = 0.05.	

Statistical analysis in accordance with the EPA protocol results in:

- NOEC < 1.4 %
- LOEC = 1.4 %
- IC_{25} = 29.8 %

However, additional guidance in EPA-821-R-02-013 (section 10.2.8.2.5) states "a test concentration shall not be considered toxic (i.e. significantly different from the control) if the relative difference from the control is less than the lower PMSD bounds." The lower percent minimum significant difference (PMSD) bound for *S. capricornutum* growth is 9.1 percent. The reduction at the 1.4 percent sample concentration was 8.0 percent and therefore should not be considered statistically significant. As a result, test results should be reported as:

- NOEC = 1.4 %
- LOEC = 10.0 %
- IC_{25} = 29.8 %

The initial dissolved oxygen levels in the chronic test remained was at or above 4.0 mg/L. Test temperatures remained at 25±1°C.

The *S. capricornutum* chronic test meets Test Acceptability Criteria (TAC) for a minimum 1.0 x 10^6 cells/ml control growth and a maximum coefficient of variance (CV%) of 20% in the controls. Unless referenced above, the tests proceeded without any noted deviations or interruptions that could have affected test results. The testing should be considered "valid".

REFERENCE TOXICANT TESTS

Reference toxicant (reftox) testing is performed to document both initial and ongoing laboratory performance of the test method(s). While the health of the test organisms is primarily evaluated by the performance of the laboratory control, reftox test results also may be used to assess the health and sensitivity of the test organisms. Reftox test results within their respective cumulative summary (Cusum) chart limits are indicative of consistent laboratory performance and normal test organism sensitivity.

Note: The C. dubia chronic reftox, which was initiated concurrently with the client test, failed test acceptability criteria (TAC). The re-test was initiated on November 30, 2021 which met all TAC and was within cusum chart limits. The data is listed in Table 6. EPA 821-R-02-013, section 4.16.6 recognizes that "reference toxicant test results should not be used as a *de facto* criterion for rejection of individual effluent or receiving water tests." Rather, "the reviewer should consider the degree to which the reference toxicant test result fell outside of control chart limits, the width of the limits, the direction of the deviation ... , the test conditions ..., and the objective of the test."

The results of the reftox tests indicate that the test organisms were within their respective cusum chart limits based on EPA guidelines. This demonstrates ongoing laboratory proficiency of the test methods and suggests normal test organism sensitivity in the associated client testing.

The *P. promelas* and *C. dubia* acute reftox test was conducted using sodium chloride. The *P. promelas* chronic reftox test was conducted using potassium chloride. The *C. dubia* and *S. capricornutum* chronic reftox tests were conducted using sodium chloride. The data sheets for the reference toxicant tests are provided in Appendix B.

Tables 6 and 7 summarize the reference toxicant test results and Cusum chart limits.

Table 6
Acute Reference Toxicant Tests (g/L)

Species	LC_{50}	Cusum Chart Limits
C. dubia	3.03	1.64 to 3.04
P. promelas	7.9	5.8 to 8.7

Table 7
Chronic Reference Toxicant Tests (g/L)

Species	IC_{25}	Cusum Chart Limits
C. dubia (survival)	0.93	0.51 to 2.64
C. dubia (reproduction)	0.64	0.25 to 1.26
P. promelas (survival)	0.60	0.52 to 0.70
P. promelas (growth)	0.54	0.44 to 0.71
S. capricornutum (growth)	0.62	0.03 to 2.73

APPENDIX A

RAW DATA SHEETS

TestAmerica

FRESHWATER TOXICITY TEST: SAMPLE AND DILUTION WATER DATA

Client: City of Woodland — SDG # B 52346 — Test Initiation: Date 11/9/21

Contact: Derrek Amburgey — Test Termination: Date 11-18-21

Sample ID Number	Field ID	Collected Date (mm/dd/yy)	Collected Time (Pacific Zone)	Received Date (mm/dd/yy)	Received Time (Pacific Zone)	Temp (°C) as Rc'vd	Total Residual Chlorine (mg/l) ☐ Dechlorination allowed: as Rc'vd / after Dechlor.	Ammonia NH_3-N mg/l as Rc'vd	Hardness mg/l as $CaCO_3$ as Rc'vd	Alkalinity mg/l as $CaCO_3$ as Rc'vd	DO (mg/L) as Rc'vd	pH as Rc'vd	Cond. (uS) as Rc'vd	60 um filtered? (organisms noted)
352346-01	EFF	11/9/21	09:00	11/9/21	10:10	1.5 / 2.2	0.03 / -	0.23	97	122	9.9	6.5	711	☑ IC
-02		11/10/21	10:00	11/11/21	12:25	3.0 / 1.8	0.02 / -	0.18	92	119	8.9	6.9	691	☒ BC
-03	11/12/21 R06 MB 12/11/21	~~11/12/21~~	09:50	11/13/21	11:00	1.7 / 1.9	0.03 / -	0.12	92	122	8.5	6.9	698	☐ KG
352346-04	EFF	11/15/21	1000	11/16/21	1120	1.8	0.02 /	0.33	89	117	6.5	7.3	687	
							/							
							/							
							/							
							/							
							/							
							/							
							/							
							/							
Reporting Limits:						na	0.02 mg/L	0.10 mg/L	5 mg/L	5 mg/L	na	na	na	na

Note: "–" Indicates data collection or dechlorination not needed. Any other adjustments to samples prior to use are documented in Comments below or on Dilutions page.

Dilution Water	ID#	Hardness mg/l as $CaCO_3$	Alkalinity mg/l as $CaCO_3$
Recon MH (Algae)	5447	10	15
Recon MH (FHM)	5446	15	60
	5448	18	56
	5449	91	59
	5450	40	60

Comments: ☑ Indicates the action was taken, (☐= action not taken): " – " = sample not dechlorinated, or analyte not collected/needed.

☑ Subsample for algae test had nutrients added and was 1.60 um filtered

5452 → 93 58

Water Quality Meters Used/ID#: Dissolved Oxygen # 7 pH # 11 Conductivity # 2

TestAmerica

FRESHWATER TOXICITY TEST: TEST ORGANISM INFORMATION

Client City of Woodland Sample Designation (SDG): B 92360

Test Species Information	Cd # 3904 *Ceriodaphnia dubia* Chronic	FHM # 2192 *Pimephales promelas* Chronic	Cd # 3903 *Ceriodaphnia dubia* Acute	FHM # 2189 *Pimephales promelas* Acute	Sc # 1060 *Selenastrum capricornutum* Chronic
Organism Age at Initiation	<24 hrs, all within an 8 hr window	<48 hrs, all within a 24 hour window	< 24 hrs	0 Days, within a 24 hour window	Acclimated for 4 Days
Test Container Size	30 ml	800 ml	30 ml	400 ml	125 ml
Test Volume	15 ml	500 ml	25 ml	250 ml	50 ml
Feeding: Type and Amount	0.10 ml Algae and 0.10 ml YCT daily	0.15 ml *Artemia*, 2 x Daily	Algae and YCT during acclimation	0.15 ml *Artemia*, @ 48 hrs	1 ml/L Nutrients, incl. EDTA, added
Aeration: In Test Chambers via Slow Bubble :	☒ None ☐ Prior to use	☒ None ☐ Prior to use ☐ @ _____ hrs	☒ None ☐ Prior to use	☒ None ☐ Prior to use ☐ @ _____ hrs	☒ None ☐ Prior to use
Acclimation Period	<24 hrs	<24 hrs	<24 hrs	7days ~~<24 hrs~~	4 Days
Organism Source	In-House	Aquatox	In-House	Aquatox	In-House
Size	-	-	-	-	-
Loading Rate	-	-	-	-	-

Dissolved Oxygen aeration justifications (in test chambers):

Test(s): ☐ All ☐ _____

Date:

Comments:

Test Solution Preparation and Dilution Record

Note: ☐ Indicates task not done, ☑ Indicates task was done. Temp adj. = Temperature adjusted to ambient or test temp

Ditto marks (' ') indicate that the same SDG, batch of dilution water, or food as the previous day's entry was used.

Client: City of Woodland

Ceriodaphnia dubia - Chronic

Test Concentration (%)	Sample Volume (mls)		Final Volume (mls)
Control	0.00	→	200
1.4	2.80	→	200
10	20.0	→	200
19	38.0	→	200
50	100	→	200
100	200	→	200

Total Sample volume needed per day = 361 mls

Test Day	Sample ID Used	Daily Sample Preparation (prior to dilution)	Dilution Water Used	YCT ID Used	Algae ID Used	Date	Time	Initials
0 (Initiation)	B5236-01	☐ Temp adj, ☐ Aerated	ID # 5446	#1345	#1344	11/9/2021	10:53	TC
1	B5236-01	☐ Temp adj, ☐ Aerated	ID # 5446	#1345	#1344	11/10/"21	09:18	TC
2	B5236-02	☐ Temp adj, ☐ Aerated	ID # 5448	#1338	#1349	11/11/"21	12:50	BC
3	B5236-02	☐ Temp adj, ☐ Aerated	ID # 5449	#1349	#1338	11/12/"21	10:15	~~ABC~~
4	B5236-03	☐ Temp adj, ☐ Aerated	ID # 5449	#1345	#1344	11/13/"	12:10	BC
5	B5236-03	☐ Temp adj, ☐ Aerated	ID # 5450	#1349	#1344	11/14/"21	05:18	TC
6	B5236-03	☐ Temp adj, ☐ Aerated	ID # 5450	#1349	#1334	11/15/"21	07:55	TC
7	B -	☐ Temp adj, ☐ Aerated	ID #	#	#	/ /"	:	

Fathead minnow - Chronic

Test Concentration (%)	Sample Volume (mls)		Final Volume (mls)
Control	0.00	→	2000
1.4	28.0	→	2000
10	200	→	2000
19	380	→	2000
50	1,000	→	2000
100	2,000	→	2000

Total Sample volume needed per day = 3608 mls

Test Day	Sample ID Used	Daily Sample Preparation (prior to dilution)	Dilution Water Used	Date	Time	Initials
0 (Initiation)	B5236-02	☐ Temp adj, ☐ Aerated	5449	11/11/21	1300	BC
1	~~B5236-02~~	☐ Temp adj, ☐ Aerated	ID # ~~5446~~	~~11/9/2021~~	~~11:03~~	TC
2	~~B5236-~~	☐ Temp adj, ☐ Aerated	ID # 5449	11/12/21	10:10	~~ABC~~
3	B5236-03	☐ Temp adj, ☐ Aerated	ID # 5450	11/13/"21	12:35	KG
4	B5236-03	☐ Temp adj, ☐ Aerated	ID # 5450	11/14/"21	08:23	TC
5	B5236-04	☐ Temp adj, ☐ Aerated	ID # 5450	11/15/"21	07:59	TC
6	B5236-04	☐ Temp adj, ☐ Aerated	ID # 5452, 5460	11/16/"21	11:50	BC
				11/17/"21	07:19	TC

*BC R06 11/11/21

B5236-02

B5236-03 R06 MB 12/11/21

Ceriodaphnia dubia - Acute

Test Concentration (%)	Sample Volume (mls)		Final Volume (mls)
Control	0.00	→	200
1.4	2.80	→	200
10	20.0	→	200
19	38.0	→	200
50	100	→	200
100	200	→	200

Test Day	Sample ID Used	Daily Sample Preparation (prior to dilution)	Dilution Water Used	Date	Time	Initials
0 (Initiation)	B5236-01	☐ Temp adj, ☐ Aerated	ID # 5446	11/9/2021	10:53	TC

Total Sample volume needed per day = 361 mls

Fathead minnow - Acute

Test Concentration (%)	Sample Volume (mls)		Final Volume (mls)
Control	0.00	→	1000
1.4	14.0	→	1000
10	100	→	1000
19	190	→	1000
50	500	→	1000
100	1,000	→	1000

Test Day	Sample ID Used	Daily Sample Preparation (prior to dilution)	Dilution Water Used	Date	Time	Initials
0 (Initiation)	B5236-01	☐ Temp adj, ☐ Aerated	ID # 5446	11/9/2021	10:55	TC
2	B5236-02	☐ Temp adj, ☐ Aerated	ID # 5449	11/11/2021	13:50	BC

Total Sample volume needed per day = 1804 mls

Test Solution Preparation and Dilution Record

Note: ☐ Indicates task not done, ☑ Indicates task was done. Temp adj. = Temperature adjusted to ambient or test temp

Ditto marks ('') indicate that the same SDG, batch of dilution water, or food as the previous day's entry was used.

Client: City of Woodland

Algae - Chronic

Test Concentration (%)	Sample Volume (mls)		Final Volume (mls)
Control	0.00	→	500
1.4	7.00	→	500
10	50.0	→	500
19	95.0	→	500
50	250	→	500
100	500	→	500

Test Day	Sample ID Used	Daily Sample Preparation (prior to dilution)	Dilution Water Used	Date	Time	Initials
0 (Initiation)	B52360-01	☒ Temperature adjusted	ID # 5447	1/9/2021	11:27	TC

☐ Aerated

☒ Nutrients added (incl. EDTA)

~~☐ 0.45 um filtered Lot#____~~

☒ 1.60 mm filtered (WDOE clients only) Lot# C1175340

Total Sample volume needed = 752 mls

TestAmerica

48 HOUR FRESHWATER TOXICITY TEST SURVIVAL AND WATER QUALITY DATA

Client: City of Woodland Sample ID # B 92360

Beginning, Date 11/9/21 Time 1219

Sample Description: Ending, Date 11/11/21 Time 1145

		0 hr	24 hr	48 hr
Technician		TC	TC	BC
Time		1219	1302	1145
Therm. ID#		# 252	# 251	# 251

Random Template Used: Whiskey Cup random # 10 Waterbath/Incubator Used: # 7

Test Species: *Ceriodaphnia dubia* ID# Cd 3903

Percent	Test Container Number	Number of Live Organisms 0	24	48	Dissolved Oxygen (mg/l) 0	24	48	pH 0	24	48	Temperature (°C) 0	24	48	Conductivity (µmohs/cm) 0	24	48
Control	Surrogate					9.0			7.9			19.9				
	A	5	5	5	8.1		7.5	8.0		7.9	19.5		20.0	308		311
	B	5	5	5												
	C	5	5	4												
	D	5	5	5												
1.4	Surrogate					9.0			8.0			20.0				
	A	5	5	5	8.4		7.5	8.0		7.9	19.5		20.0	320		326
	B	6 BC 11/12/21	5	6												
	C	5	5	5												
	D	5	5	5												
10	Surrogate					9.0			7.9			19.9				
	A	5	5	5	8.7		7.6	7.8		7.8	19.5		20.0	342		34
	B	5 BC 11/12/21	5	5												
	C	4 ~~5~~	4	4												
	D	5	5	5												
19	Surrogate					8.8			7.9			20.0				
	A	5	5	5	8.8		7.7	7.7		7.6	19.5		20.0	385		396
	B	5	5	5												
	C	5	5	5												
	D	5	5	4												
50	Surrogate					8.6			8.0			20.0				
	A	5	5	5	9.3		7.7	7.4		7.6	19.3		20.0	497		507
	B	5	5	5												
	C	5	5	5												
	D	5	5	5												
100	Surrogate					8.4			8.1			19.8				
	A	5	5	5	9.0		7.7	7.2		7.7	19.0		19.8	678		680
	B	5	5	5												
	C	5	5	5												
	D	5	5	5												

Note: Use surrogate test chamber to determine temperature, DO, pH, and Conductivity measurements @ 24 hrs (to avoid injuring the organisms).

CETIS Summary Report

Report Date: 11 Dec-21 11:36 (p 1 of 1)
Test Code/ID: B523601cda / 00-3367-2243

Ceriodaphnia 48-h Acute Survival Test — **Eurofins TestAmerica - Corvallis**

Batch ID:	01-2966-8847	**Test Type:**	Survival (48h)	**Analyst:**	Michelle Bennett
Start Date:	09 Nov-21 12:19	**Protocol:**	EPA/821/R-02-012 (2002)	**Diluent:**	Mod-Hard Synthetic Water
Ending Date:	11 Nov-21 11:45	**Species:**	Ceriodaphnia dubia	**Brine:**	
Test Length:	47h	**Taxon:**		**Source:**	In-House Culture **Age:** <24

Sample ID:	09-0711-5296	**Code:**	B5236-01	**Project:**	
Sample Date:	08 Nov-21 09:00	**Material:**	POTW Effluent	**Source:**	Woodland, City of (WA0020401)
Receipt Date:	09 Nov-21 10:10	**CAS (PC):**		**Station:**	
Sample Age:	27h (2.2 °C)	**Client:**			

Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	√	NOEL	LOEL	TOEL	PMSD	TU	S
11-3173-1793	48h Survival Rate	Steel Many-One Rank Sum Test		100	>100	---	12.9%	1	1

Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	√	Level	%	95% LCL	95% UCL	TU	S
10-2620-1730	48h Survival Rate	Linear Interpolation (ICPIN)		EC50	>100	---	---	<1	1

Test Acceptability

				TAC Limits			
Analysis ID	**Endpoint**	**Attribute**	**Test Stat**	**Lower**	**Upper**	**Overlap**	**Decision**
10-2620-1730	48h Survival Rate	Control Resp	0.95	0.9	>>	Yes	Passes Criteria
11-3173-1793	48h Survival Rate	Control Resp	0.95	0.9	>>	Yes	Passes Criteria

48h Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	D	4	0.9500	0.7909	1.1090	0.8000	1.0000	0.0500	0.1000	10.53%	0.00%
1.4		4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	---	-5.26%
10		4	0.9500	0.7909	1.1090	0.8000	1.0000	0.0500	0.1000	10.53%	0.00%
19		4	0.9500	0.7909	1.1090	0.8000	1.0000	0.0500	0.1000	10.53%	0.00%
50		4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	---	-5.26%
100		4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	---	-5.26%

48h Survival Rate Detail — MD5: 4B8442F2492ECBA69AF8AFAF0C4E770D

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	1.0000	1.0000	0.8000	1.0000
1.4		1.0000	1.0000	1.0000	1.0000
10		1.0000	1.0000	0.8000	1.0000
19		1.0000	1.0000	1.0000	0.8000
50		1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000	1.0000

48h Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	5/5	5/5	4/5	5/5
1.4		5/5	6/6	5/5	5/5
10		5/5	5/5	4/5	5/5
19		5/5	5/5	5/5	4/5
50		5/5	5/5	5/5	5/5
100		5/5	5/5	5/5	5/5

Analyst: MB QA:

Ceriodaphnia 48-h Acute Survival Test — **Eurofins TestAmerica - Corvallis**

Analysis ID:	11-3173-1793	**Endpoint:**	48h Survival Rate	**CETIS Version:**	CETISv1.9.7
Analyzed:	11 Dec-21 11:24	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1
Edit Date:	11 Dec-21 11:23	**MD5 Hash:**	4B8442F2492ECBA69AF8AFAF0C4E770D	**Editor ID:**	000-042-882-4

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	MSDu	PMSD
Angular (Corrected)	C > T	100	>100	---	1	0.1227	12.91%

Steel Many-One Rank Sum Test

Control	vs	Conc-%	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Dilution Water		1.4	20	10	1	6	CDF	0.9516	Non-Significant Effect
		10	18	10	2	6	CDF	0.8333	Non-Significant Effect
		19	18	10	2	6	CDF	0.8333	Non-Significant Effect
		50	20	10	1	6	CDF	0.9516	Non-Significant Effect
		100	20	10	1	6	CDF	0.9516	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0225357	0.0045071	5	0.6344	0.6762	Non-Significant Effect
Error	0.127891	0.0071051	18			
Total	0.150427		23			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Bartlett Equality of Variance Test				Indeterminate
Distribution	Shapiro-Wilk W Normality Test	0.684	0.884	<1.0E-05	Non-Normal Distribution

48h Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	4	0.9500	0.7909	1.0000	1.0000	0.8000	1.0000	0.0500	10.53%	0.00%
1.4		4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	-5.26%
10		4	0.9500	0.7909	1.0000	1.0000	0.8000	1.0000	0.0500	10.53%	0.00%
19		4	0.9500	0.7909	1.0000	1.0000	0.8000	1.0000	0.0500	10.53%	0.00%
50		4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	-5.26%
100		4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	-5.26%

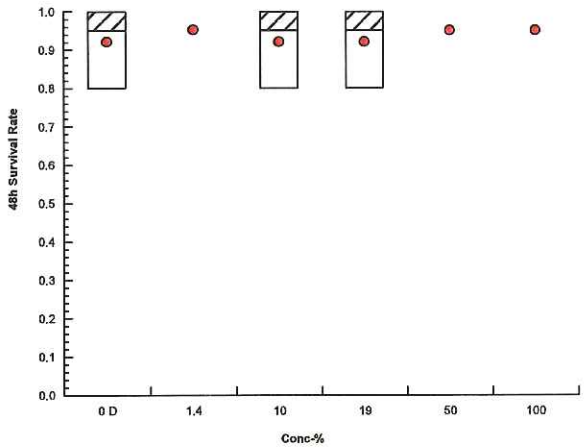
Angular (Corrected) Transformed Summary

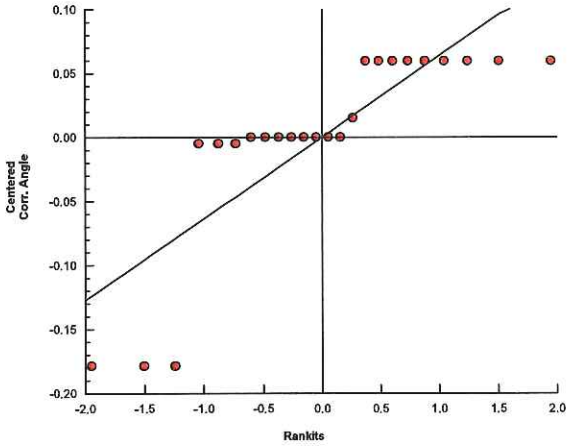
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	4	1.2860	1.0960	1.4750	1.3450	1.1070	1.3450	0.0595	9.26%	0.00%
1.4		4	1.3500	1.3340	1.3660	1.3450	1.3450	1.3650	0.0050	0.74%	-5.02%
10		4	1.2860	1.0960	1.4750	1.3450	1.1070	1.3450	0.0595	9.26%	0.00%
19		4	1.2860	1.0960	1.4750	1.3450	1.1070	1.3450	0.0595	9.26%	0.00%
50		4	1.3450	1.3450	1.3460	1.3450	1.3450	1.3450	0.0000	0.00%	-4.63%
100		4	1.3450	1.3450	1.3460	1.3450	1.3450	1.3450	0.0000	0.00%	-4.63%

Ceriodaphnia 48-h Acute Survival Test — **Eurofins TestAmerica - Corvallis**

Analysis ID:	11-3173-1793	**Endpoint:**	48h Survival Rate	**CETIS Version:**	CETISv1.9.7
Analyzed:	11 Dec-21 11:24	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1
Edit Date:	11 Dec-21 11:23	**MD5 Hash:**	4B8442F2492ECBA69AF8AFAF0C4E770D	**Editor ID:**	000-042-882-4

Graphics





Ceriodaphnia 48-h Acute Survival Test — **Eurofins TestAmerica - Corvallis**

Analysis ID:	10-2620-1730	**Endpoint:**	48h Survival Rate	**CETIS Version:**	CETISv1.9.7
Analyzed:	11 Dec-21 11:24	**Analysis:**	Linear Interpolation (ICPIN)	**Status Level:**	1
Edit Date:	11 Dec-21 11:23	**MD5 Hash:**	4B8442F2492ECBA69AF8AFAF0C4E770D	**Editor ID:**	000-042-882-4

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Log(X+1)	Linear	1442819	200	Yes	Two-Point Interpolation

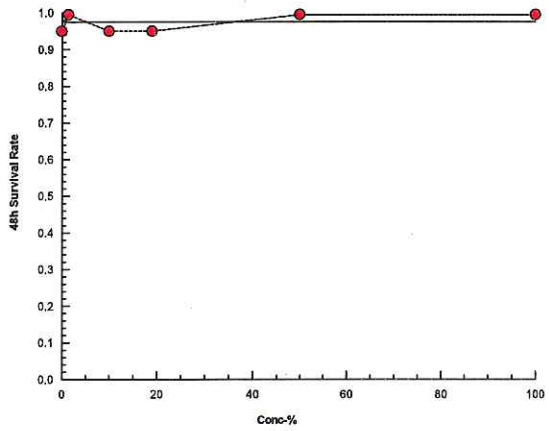
Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
EC50	>100	---	---	<1	---	---

48h Survival Rate Summary

			Calculated Variate(A/B)							Isotonic Variate	
Conc-%	Code	Count	Mean	Median	Min	Max	CV%	%Effect	A/B	Mean	%Effect
0	D	4	0.9500	1.0000	0.8000	1.0000	10.53%	0.00%	19/20	0.9750	0.00%
1.4		4	1.0000	1.0000	1.0000	1.0000	0.00%	-5.26%	21/21	0.9750	0.00%
10		4	0.9500	1.0000	0.8000	1.0000	10.53%	0.00%	19/20	0.9750	0.00%
19		4	0.9500	1.0000	0.8000	1.0000	10.53%	0.00%	19/20	0.9750	0.00%
50		4	1.0000	1.0000	1.0000	1.0000	0.00%	-5.26%	20/20	0.9750	0.00%
100		4	1.0000	1.0000	1.0000	1.0000	0.00%	-5.26%	20/20	0.9750	0.00%

Graphics



TestAmerica

96 HOUR FRESHWATER TOXICITY TEST SURVIVAL AND WATER QUALITY DATA

Random Template Used: 6 conc. x 4 reps. # 7

Waterbath/Incubator Used: # 7

Test Initiation Date: 11 / 9 / 20 21 Time: 15 : 15

Sample Description

Initial Sample ID # B72360-01

Termination Date: 11 / 13 / 20 21 Time: 15 : 10

Technician 0 hr TC/KG 24 hr TC 48 hr BM 72 hr KG 96 hr KG

Client City of Woodland

Time 0 hr 15 : 15 24 hr 12 : 40 48 hr 1640 72 hr 11 : 10 96 hr 15 : 10

Test Species *Pimephales promelas* ID# FHM 2139

Therm. ID# 0 hr # 252 24 hr # 251 48 hr # 251 72 hr # 251 96 hr # 252

Percent	Test Container Number	Number of Live Organisms					Dissolved Oxygen (mg/l)					pH					Temperature (°C)					Conductivity (µmohs/cm)				
		0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
Control	A	10	*	10	10	10	8.2	7.8	6.7/7.3	7.6	7.5	7.9	7.7	7.6/7.9	7.3	7.5	19.6	19.6	19.6	19.8	19.8	307		327/326		331
	B	10	*	10	10	10																				
	C	10	*	10	10	10																				
	D	10	*	10	10	10																				
1.4	A	10	*	10	10	10	8.4	8.0	6.7/7.4	7.8	7.6	7.9	7.8	7.6/7.9	7.4	7.5	19.5	19.6	19.6	19.7	19.8	321		325/328		346
	B	10	*	10	10	10																				
	C	10	*	9+	9	9	+ One found dead at 48hrs BM																			
	D	10	*	10	10	10																				
10	A	10	*	10	10	10	9.5	8.0	6.8/7.4	8.0	7.7	7.8	7.7	7.6/7.7	7.6	7.5	19.5	19.6	19.6	19.8	19.8	352		334/365		371
	B	10	*	10	10	10																				
	C	10	*	10	9	9																				
	D	10	*	10	10	10																				

*R06 ABL 11-23-21 No counts recorded

TestAmerica

96 HOUR FRESHWATER TOXICITY TEST SURVIVAL AND WATER QUALITY DATA

Random Template Used: 6 conc. x 4 reps. # 7

Sample Description

Client: City of Woodland

Test Species: *Pimephales promelas* ID# FHM 2109

Waterbath/Incubator Used: # 7

Initial Sample ID # B 52360

Test Initiation Date: 11 / 9 / 2021 Time: 15:15

Termination Date: 11 / 13 / 2021 Time: 15:10

		24 hr	48 hr	72 hr	96 hr
Technician	TC / KG	TC	[illegible]	KG	KG
Time	15:15	12:46	16:40	11:10	15:10
Therm. ID#	# 252	# 251	# 251	# 251	# 252

Percent	Test Container Number	Number of Live Organisms					Dissolved Oxygen (mg/l)					pH					Temperature (°C)					Conductivity (µmohs/cm)				
		0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
19	A	10		10	10	10	8.0	8.0	6.9 / 7.6	7.7	7.8	7.7 ~~7.9~~	7.7	7.5 / 7.6	7.6	7.5	19.5	19.6	19.6	19.8	19.8	354		394 / 395		409
	B	10		10	10	10						R@6 TC 1119														
	C	10		10	10	10																				
	D	10		10	10	10																				
50	A	10		10	10	10	8.9	8.0	6.9 / 7.6	7.8	7.8	7.4 ~~7.9~~	7.7	7.6 / 7.3	7.7	7.6	19.3	19.6	19.5	19.8	19.8	492		~~506~~ 496		509
	B	10		10	10	10						R@6 TC 1119														
	C	10		10	9	9																				
	D	10		10	10	10																				
100	A	10		10	10	10	9.2	8.1	6.9 / 7.8	7.8	7.8	7.7 ~~7.7~~	7.7	7.7 / 7.0	7.7	7.6	19.1	19.6	19.6	19.8	19.8	678		TNTC / 665		687
	B	10		10	10	10																				
	C	10		10	10	10																				
	D	10		10	10	10																				

CETIS Summary Report

Fathead Minnow 96-h Acute Survival Test — **Eurofins TestAmerica - Corvallis**

Batch ID:	10-8400-1930	**Test Type:**	Survival (96h)	**Analyst:**	Michelle Bennett
Start Date:	09 Nov-21 15:15	**Protocol:**	EPA/821/R-02-012 (2002)	**Diluent:**	Mod-Hard Synthetic Water
Ending Date:	13 Nov-21 15:10	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	96h	**Taxon:**	Actinopterygii	**Source:**	In-House Culture **Age:** 8D
Sample ID:	09-0711-5296	**Code:**	B5236-01	**Project:**	
Sample Date:	08 Nov-21 09:00	**Material:**	POTW Effluent	**Source:**	Woodland, City of (WA0020401)
Receipt Date:	09 Nov-21 10:10	**CAS (PC):**		**Station:**	
Sample Age:	30h (2.2 °C)	**Client:**			

Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	✓	NOEL	LOEL	TOEL	PMSD	TU	S
12-0666-0825	96h Survival Rate	Steel Many-One Rank Sum Test		100	>100	---	6.45%	1	1

Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	✓	Level	%	95% LCL	95% UCL	TU	S
20-1183-4280	96h Survival Rate	Linear Interpolation (ICPIN)		EC50	>100	---	---	<1	1

Test Acceptability

				TAC Limits			
Analysis ID	**Endpoint**	**Attribute**	**Test Stat**	**Lower**	**Upper**	**Overlap**	**Decision**
12-0666-0825	96h Survival Rate	Control Resp	1	0.9	>>	Yes	Passes Criteria
20-1183-4280	96h Survival Rate	Control Resp	1	0.9	>>	Yes	Passes Criteria

96h Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	D	4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	---	0.00%
1.4		4	0.9750	0.8954	1.0550	0.9000	1.0000	0.0250	0.0500	5.13%	2.50%
10		4	0.9750	0.8954	1.0550	0.9000	1.0000	0.0250	0.0500	5.13%	2.50%
19		4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	---	0.00%
50		4	0.9750	0.8954	1.0550	0.9000	1.0000	0.0250	0.0500	5.13%	2.50%
100		4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	---	0.00%

96h Survival Rate Detail

MD5: 4A41D7F22FF5A6AF5AB38AAF83DDACEF

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	1.0000	1.0000	1.0000	1.0000
1.4		1.0000	1.0000	0.9000	1.0000
10		1.0000	1.0000	0.9000	1.0000
19		1.0000	1.0000	1.0000	1.0000
50		1.0000	1.0000	0.9000	1.0000
100		1.0000	1.0000	1.0000	1.0000

96h Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	10/10	10/10	10/10	10/10
1.4		10/10	10/10	9/10	10/10
10		10/10	10/10	9/10	10/10
19		10/10	10/10	10/10	10/10
50		10/10	10/10	9/10	10/10
100		10/10	10/10	10/10	10/10

Fathead Minnow 96-h Acute Survival Test — **Eurofins TestAmerica - Corvallis**

Analysis ID:	12-0666-0825	**Endpoint:**	96h Survival Rate	**CETIS Version:**	CETISv1.9.7
Analyzed:	11 Dec-21 11:44	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1
Edit Date:	11 Dec-21 11:44	**MD5 Hash:**	4A41D7F22FF5A6AF5AB38AAF83DDACE	**Editor ID:**	000-042-882-4

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	MSDu	PMSD
Angular (Corrected)	C > T	100	>100	---	1	0.06453	6.45%

Steel Many-One Rank Sum Test

Control	vs	Conc-%	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Dilution Water		1.4	16	10	1	6	CDF	0.6105	Non-Significant Effect
		10	16	10	1	6	CDF	0.6105	Non-Significant Effect
		19	18	10	1	6	CDF	0.8333	Non-Significant Effect
		50	16	10	1	6	CDF	0.6105	Non-Significant Effect
		100	18	10	1	6	CDF	0.8333	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0099598	0.001992	5	0.6	0.7006	Non-Significant Effect
Error	0.0597585	0.0033199	18			
Total	0.0697182		23			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Bartlett Equality of Variance Test				Indeterminate
Distribution	Shapiro-Wilk W Normality Test	0.6694	0.884	<1.0E-05	Non-Normal Distribution

96h Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
1.4		4	0.9750	0.8954	1.0000	1.0000	0.9000	1.0000	0.0250	5.13%	2.50%
10		4	0.9750	0.8954	1.0000	1.0000	0.9000	1.0000	0.0250	5.13%	2.50%
19		4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
50		4	0.9750	0.8954	1.0000	1.0000	0.9000	1.0000	0.0250	5.13%	2.50%
100		4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%

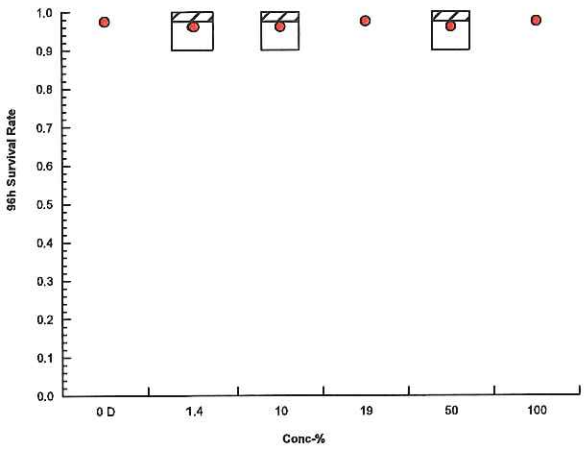
Angular (Corrected) Transformed Summary

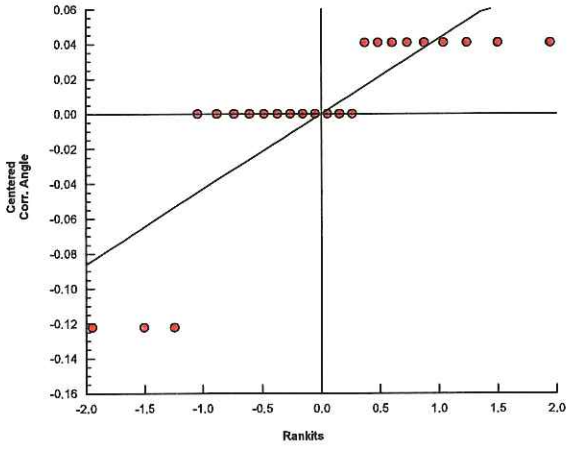
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	4	1.4120	1.4120	1.4120	1.4120	1.4120	1.4120	0.0000	0.00%	0.00%
1.4		4	1.3710	1.2420	1.5010	1.4120	1.2490	1.4120	0.0407	5.94%	2.89%
10		4	1.3710	1.2420	1.5010	1.4120	1.2490	1.4120	0.0407	5.94%	2.89%
19		4	1.4120	1.4120	1.4120	1.4120	1.4120	1.4120	0.0000	0.00%	0.00%
50		4	1.3710	1.2420	1.5010	1.4120	1.2490	1.4120	0.0407	5.94%	2.89%
100		4	1.4120	1.4120	1.4120	1.4120	1.4120	1.4120	0.0000	0.00%	0.00%

Fathead Minnow 96-h Acute Survival Test — **Eurofins TestAmerica - Corvallis**

Analysis ID:	12-0666-0825	**Endpoint:**	96h Survival Rate	**CETIS Version:**	CETISv1.9.7
Analyzed:	11 Dec-21 11:44	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1
Edit Date:	11 Dec-21 11:44	**MD5 Hash:**	4A41D7F22FF5A6AF5AB38AAF83DDACE	**Editor ID:**	000-042-882-4

Graphics





CETIS Analytical Report

Fathead Minnow 96-h Acute Survival Test — **Eurofins TestAmerica - Corvallis**

Analysis ID:	20-1183-4280	**Endpoint:**	96h Survival Rate	**CETIS Version:**	CETISv1.9.7
Analyzed:	11 Dec-21 11:44	**Analysis:**	Linear Interpolation (ICPIN)	**Status Level:**	1
Edit Date:	11 Dec-21 11:44	**MD5 Hash:**	4A41D7F22FF5A6AF5AB38AAF83DDACE	**Editor ID:**	000-042-882-4

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Log(X+1)	Linear	1321857	200	Yes	Two-Point Interpolation

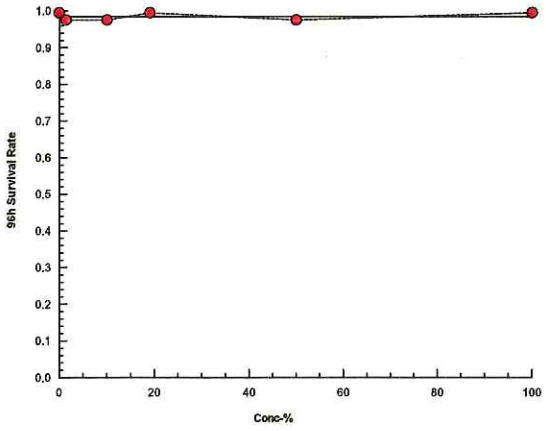
Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
EC50	>100	---	---	<1	---	---

96h Survival Rate Summary

			Calculated Variate(A/B)							Isotonic Variate	
Conc-%	Code	Count	Mean	Median	Min	Max	CV%	%Effect	A/B	Mean	%Effect
0	D	4	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	40/40	1.0000	0.00%
1.4		4	0.9750	1.0000	0.9000	1.0000	5.13%	2.50%	39/40	0.9850	1.50%
10		4	0.9750	1.0000	0.9000	1.0000	5.13%	2.50%	39/40	0.9850	1.50%
19		4	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	40/40	0.9850	1.50%
50		4	0.9750	1.0000	0.9000	1.0000	5.13%	2.50%	39/40	0.9850	1.50%
100		4	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	40/40	0.9850	1.50%

Graphics



TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Ceriodaphnia dubia
Survival and Reproduction
Test Data Summary

Client: City of Woodland Test Start Date: 11/9/2021

Sample Description: Initial Sample ID#: B5236-01

Data summarized by: MB

Percent or Concentration	Total Live Young Produced in First 3 Broods per Replicate										# Alive Adults	Total Live Young
	A	B	C	D	E	F	G	H	I	J		
Control	14	15	15	16	14	15	16	13	19	17	10	154
	AD?	AD?	AD?	AD?	AD?	AD?	AD?	AD?	AD?	AD?		
1.4 %	17	14	13	15	12	13	10	1	15	16	9	126
	AD?	AD?	AD?	AD?	AD?	AD?	AD?	AD? x	AD?	AD?		
10 %	9	11	13	8	0	0	7	0	11	0	9	59
	AD?	AD?	AD?	AD?	AD?	AD? x	AD?	AD?	AD?	AD?		
19 %	14	13	14	19	15	0	3	6	3	18	9	105
	AD?	AD?	AD?	AD?	AD?	AD?	AD?	AD?	AD? x	AD?		
50 %	17	17	19	21	30	17	13	18	19	17	9	188
	AD?	AD?	AD?	AD?	AD?	AD?	AD?	AD?	AD?	AD? x		
100 %	18	19	23	25	16	16	15	17	22	20	10	191
	AD?	AD?	AD?	AD?	AD?	AD?	AD?	AD?	AD?	AD?		

Survival data summarized through Day 7. 60%+ of surviving controls with 3+ broods first observed on Day 7.

Test Organism Mortality (Adult dead) = AD? ✓

Test Organism identified as Male = AD? M

Test Organism Injured during test = AD? I

# of Alive Adults = Number of test organism alive at termination (for WDOE only, = Number of test organisms alive at Day 7)

Total Live Young = Total neonates produced in first 3 broods

Footnote: As per EPA-600-4-91-002 and EPA-821-R-02-013, *Ceriodaphnia dubia* test should be terminated when 60% of the surviving control organisms have produced their third brood, or at the end of eight days, whichever occurs first.

Also as per EPA-821-R-02-013 (13.10.9.1), "In this three-brood test, offspring from fourth or higher broods should not be counted and should not be included in the total number of neonates produced during the test."

TestAmerica

CERIODAPHNIA CHRONIC SURVIVAL AND REPRODUCTION DATA

Neo's obtained from	A	B	C	D	E	F	G	H	I	J
Culture Board ID:	A	A	A	A	A	A	A	A	A	B
Slot #:	59	12	13	13	23	37	39	47	43	7

Incubator Used: #5

Random Template Used: 6 conc # 21

Client: City of Woodland

Test Initiation: Date: 11/9/2021 Time: 1610

Sample Description: Initial Sample ID # B5236 - 01

Termination: Date: 11/16/2021 Time: 09:15

Technician: Day 0 BM Day 1 BC Day 2 BM Day 3 BC Day 4 ABC Day 5 TC Day 6 BC Day 7 BC Day 8 ____

Time: Day 0 1610 Day 1 1000 Day 2 1435 Day 3 1210 Day 4 1358 Day 5 1230 Day 6 1150 Day 7 0915 Day 8 ____

Percent	Day	Daily Number of Live Young for each Replicate A	B	C	D	E	F	G	H	I	J	No. Live Adults	Daily Total Live Young
Control	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	0	0	0	0	0	0	0	0	0	10	0
	4	0	0	1	3	0	4	3	0	4	3	10	18
	5	4	7	4	5	4	5	4	5	0	5	10	51
	6	8	17	0	0	8	0	0	8	6	0	10	38
	7	0	0	8	8	0	6	7	0	9	9	10	47
	8												
1.4 %	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	0	0	0	0	0	0	0	0	0	10	0
	4	3	2	2	2	0	3	3	0	3	3	10	21
	5	4	0	5	0	5	4	1	1/AD	4	5	9	31
	6	8	4	0	5	7	0	4		0	0	9	24
	7	0	8	6	8	0	6	6	|	8	8	9	50
	8												
10 %	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	0	0	0	0	0	0	0	0	0	10	0
	4	0	2	3	0	0 poor	0 AD	0	0	2	0	9	7
	5	4	2	0	0	0	|	0	0	2	0	9	5
	6	4	0	2	1	0	|	0	0	0	0	9	7
	7	10	7	8	7	0	|	7	0	7	0	9	37
	8												
19 %	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	0	0	0	0	0	0	0	0	0	10	0
	4	2	0	3	3	0	0	0	0	3	2	10	13
	5	4	4	1/2	4	4	0	0	0	0	0	10	24
	6	0	7	0	0	9	0	0	0	0AD	5	9	21
	7	8	0	8	10	0	0	3	6	1	11	9	47
	8												
50 %	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	0	0	0	0	0	0	0	0	0	10	0
	4	0	1	2	1	0	3	2	1	2	2	10	14
	5	4	4	4	0	4	4	0	5	2	0	10	17
	6	11	0	0	7	10	6	0	0	0		10	28
	7	0	10	11	13	14	10	11	12	10	8AD	9	99
	8												
100 %	1	0	0	0	0	0	0	0	0	0	0	10	0
	2	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	0	0	0	0	0	0	0	0	0	10	0
	4	0	2	2	4	2	3	0	0	2	2	10	17
	5	7	4	0	4	8	8	1/4	4	0 4	0	10	36 59
	6	10	0	7	0	8	5	0	0			10	30
	7	1/0	11	14	15	0	0	8	11	14	11	10	85
	8												

"AD" = Adult Dead, "AY" = Aborted young, "M" = male organism, "F" = Female, "R" = Adult releasing young, " / " = split brood (carry-over brood / current day brood),
"Inj" = Adult Injured during test solution renewal, replicate removed from analysis. "AM" = Adult missing, remove from analysis. A circled neonate count = 4th brood

Footnote: As per WDOE, C. dubia test reproduction should be when 60% of the surviving control organisms have produced their third brood (Days 6, 7, or 8). Survival is at seven days.

R06 MB 12/11/21

TestAmerica

CERIODAPHNIA WATER QUALITY DATA

Client: City of Woodland

Initiated Date: 11/9/2021 Time: 16 : 10

Initial Sample ID #: B 5236 -01

Adults Isolated Date: 11/5/2021 Time: 23:10

Neo's Collected Date: 11/9/2021 Time: 00:56

Sample Description:

	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8
Tech:	~~SA~~	BC	Bm	BC	~~AB~~	TC	BC/TC	BC/TC	
Time	16:35	11:45	1430	12:55	14:30	13:44	14:03	14:19	:
Therm.	# 250	# 250	# 250	# 250	# 250	# 250	# 250	# 250	#

Dissolved Oxygen (mg/l)

%	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8
Control	8.0	7.8 / 7.0	7.4 / 6.9	7.8 / 7.2	7.5 / 7.5	7.5 / 7.2	7.0 / 7.4	8.1	
1.4 %	8.1	8.9 / 7.2	7.4 / 7.0	8.0 / 7.5	7.5 / 7.6	7.9 / 7.3	7.7 / 7.6	7.9	
10 %	8.1	8.1 / 7.3	7.6 / 7.0	8.2 / 7.6	7.6 / 7.7	7.9 / 7.3	7.9 / 7.5	8.0	
19 %	8.1	8.2 / 7.3	7.6 / 7.0	8.0 / 7.8	7.6 / 7.7	7.8 / 7.3	8.1 / 7.6	8.0	
50 %	8.1	8.2 / 7.4	7.5 / 7.1	8.0 / 7.8	7.7 / 7.8	7.9 / 7.3	7.9 / 7.7	8.0	
100 %	8.1	8.0 / 7.6	7.4 / 7.5	8.1 / 7.9	7.7 / 7.9	7.9 / 7.4	7.9 / 7.7	8.2	

pH

%	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8
Control	7.6	7.9 / 7.8	7.6 / 7.9	8.0 / 8.1	7.7 / 7.3	7.9 / 7.5	8.0 / 8.0	7.7	
1.4 %	7.6	7.9 / 7.8	7.6 / 7.9	8.0 / 8.1	7.6 / 7.7	7.8 / 7.5	8.0 / 8.0	7.7	
10 %	7.5	7.8 / 7.6	7.7 / 7.8	8.0 / 8.0	7.6 / 7.7	7.6 / 7.7	8.0 / 7.9	7.6	
19 %	7.4	7.8 / 7.5	7.7 / 7.7	8.0 / 7.9	7.6 / 7.6	7.8 / 7.7	8.0 / 7.9	7.7	
50 %	7.3	7.9 / 7.4	7.9 / 7.8	8.1 / 7.7	7.7 / 7.4	8.0 / 7.5	8.1 / 7.7	7.5	
100 %	7.4	8.0 / 7.3	8.1 / 7.3	8.2 / 7.6	7.9 / 7.3	8.2 / 7.5	8.3 / 7.5	8.1	

Temperature (°C) / Conductivity (µS) (1st use of each sample only)

%	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8
Control	24.9 / 330	24.1	25.6 / 327	25.0	25.0 / 334	24.5	(22.7)	24.8	
1.4 %	24.7 / 335	24.8	25.6 / 315	25.3	25.3 / 339	25.1	(22.6)	24.7	
10 %	24.5 / 356	24.9	25.4 / 342	25.4	25.5 / 368	25.1	(22.4)	(23.8)	
19 %	24.4 / 390	25.4	25.7 / 324	25.1	25.1 / 403	24.1	(22.3)	24.8	
50 %	24.7 / 497	25.1	24.8 / 472	25.2	25.1 / 514	24.4	(22.1)	(23.9)	
100 %	24.9 / 679	24.8	25.1 / 658	25.3	25.1 / 698	24.1	(22.3)	24.4	

COMMENTS: Temperatures taken just prior to test solution renewals. DO, pH, and Conductivity taken following organism transfer.

(23.8) = Temp out of recom. range

Note: All Day 0 data represents conditions at initiation. All other days: numerator represents pre-renewal conditions, denominator represents post-renewal conditions.

Ceriodaphnia 7-d Survival and Reproduction Test — **Eurofins TestAmerica - Corvallis**

Batch ID:	20-1118-2707	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Michelle Bennett
Start Date:	09 Nov-21 16:10	**Protocol:**	EPA/821/R-02-013 (2002)	**Diluent:**	Mod-Hard Synthetic Water
Ending Date:	16 Nov-21 09:15	**Species:**	Ceriodaphnia dubia	**Brine:**	
Test Length:	6d 17h	**Taxon:**		**Source:**	In-House Culture **Age:** <24

Sample ID:	09-0711-5296	**Code:**	B5236-01	**Project:**	
Sample Date:	08 Nov-21 09:00	**Material:**	POTW Effluent	**Source:**	Woodland, City of (WA0020401)
Receipt Date:	09 Nov-21 10:10	**CAS (PC):**		**Station:**	
Sample Age:	31h (2.2 °C)	**Client:**			

Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	✓	NOEL	LOEL	TOEL	PMSD	TU	S
12-9146-5702	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test		100	>100	---	---	1	1
10-6694-1306	Reproduction	Steel Many-One Rank Sum Test		100	~~>100~~ 10	---	31.0%	1	1

R06 MB 12/11/21
Interrupted Dose Response

Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	✓	Level	%	95% LCL	95% UCL	TU	S
07-2358-1336	Reproduction	Linear Interpolation (ICPIN)		IC25	>100	---	---	<1	1

Test Acceptability

				TAC Limits			
Analysis ID	**Endpoint**	**Attribute**	**Test Stat**	**Lower**	**Upper**	**Overlap**	**Decision**
12-9146-5702	7d Survival Rate	Control Resp	1	0.8	>>	Yes	Passes Criteria
07-2358-1336	Reproduction	Control Resp	15.4	15	>>	Yes	Passes Criteria
10-6694-1306	Reproduction	Control Resp	15.4	15	>>	Yes	Passes Criteria
10-6694-1306	Reproduction	PMSD	0.3095	0.13	0.47	Yes	Passes Criteria

7d Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	D	10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	---	0.00%
1.4		10	0.9000	0.6738	1.1260	0.0000	1.0000	0.1000	0.3162	35.14%	10.00%
10		10	0.9000	0.6738	1.1260	0.0000	1.0000	0.1000	0.3162	35.14%	10.00%
19		10	0.9000	0.6738	1.1260	0.0000	1.0000	0.1000	0.3162	35.14%	10.00%
50		10	0.9000	0.6738	1.1260	0.0000	1.0000	0.1000	0.3162	35.14%	10.00%
100		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	---	0.00%

Reproduction Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	D	10	15.4	14.17	16.63	13	19	0.5416	1.713	11.12%	0.00%
1.4		10	12.6	9.344	15.86	1	17	1.439	4.551	36.12%	18.18%
10		10	5.9	2.078	9.722	0	13	1.69	5.343	90.55%	61.69%
19		10	10.5	5.599	15.4	0	19	2.167	6.852	65.25%	31.82%
50		10	18.8	15.62	21.98	13	30	1.405	4.442	23.63%	-22.08%
100		10	19.1	16.7	21.5	15	25	1.059	3.348	17.53%	-24.03%

Analyst: MB QA:

Ceriodaphnia 7-d Survival and Reproduction Test — Eurofins TestAmerica - Corvallis

7d Survival Rate Detail MD5: F059469A11B44A329FA6FE84183CF94B

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	D	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
1.4		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000
10		1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000
19		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000
50		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000
100		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

Reproduction Detail MD5: F70B90B6F0CAB949B52F28222F60E4E8

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	D	14	15	15	16	14	15	16	13	19	17
1.4		17	14	13	15	12	13	10	1	15	16
10		9	11	13	8	0	0	7	0	11	0
19		14	13	14	19	15	0	3	6	3	18
50		17	17	19	21	30	17	13	18	19	17
100		18	19	23	25	16	16	15	17	22	20

7d Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	D	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
1.4		1/1	1/1	1/1	1/1	1/1	1/1	1/1	0/1	1/1	1/1
10		1/1	1/1	1/1	1/1	1/1	0/1	1/1	1/1	1/1	1/1
19		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	0/1	1/1
50		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	0/1
100		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1

CETIS Analytical Report

Ceriodaphnia 7-d Survival and Reproduction Test — **Eurofins TestAmerica - Corvallis**

Analysis ID:	12-9146-5702	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.9.7
Analyzed:	11 Dec-21 12:18	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Edit Date:	11 Dec-21 12:16	**MD5 Hash:**	F059469A11B44A329FA6FE84183CF94B	**Editor ID:**	000-042-882-4

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU
Untransformed	C > T	100	>100	---	1

Fisher Exact/Bonferroni-Holm Test

Control	vs	Conc-%	Test Stat	P-Type	P-Value	Decision(α:5%)
Dilution Water		1.4	0.5000	Exact	1.0000	Non-Significant Effect
		10	0.5000	Exact	1.0000	Non-Significant Effect
		19	0.5000	Exact	1.0000	Non-Significant Effect
		50	0.5000	Exact	1.0000	Non-Significant Effect
		100	1.0000	Exact	1.0000	Non-Significant Effect

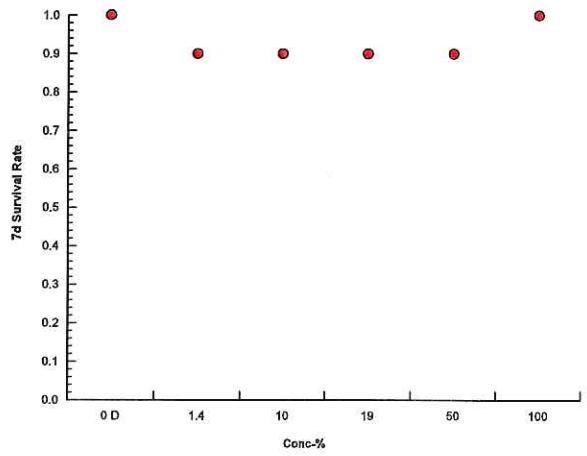
7d Survival Rate Frequencies

Conc-%	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
0	D	10	0	10	1.0000	0.0000	0.00%
1.4		9	1	10	0.9000	0.1000	10.00%
10		9	1	10	0.9000	0.1000	10.00%
19		9	1	10	0.9000	0.1000	10.00%
50		9	1	10	0.9000	0.1000	10.00%
100		10	0	10	1.0000	0.0000	0.00%

7d Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	10	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
1.4		10	0.9000	0.6738	1.0000	1.0000	0.0000	1.0000	0.1000	35.14%	10.00%
10		10	0.9000	0.6738	1.0000	1.0000	0.0000	1.0000	0.1000	35.14%	10.00%
19		10	0.9000	0.6738	1.0000	1.0000	0.0000	1.0000	0.1000	35.14%	10.00%
50		10	0.9000	0.6738	1.0000	1.0000	0.0000	1.0000	0.1000	35.14%	10.00%
100		10	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%

Graphics



CETIS Analytical Report

Report Date: 11 Dec-21 12:19 (p 1 of 1)
Test Code/ID: B523601cdc / 04-7367-7388

Ceriodaphnia 7-d Survival and Reproduction Test — **Eurofins TestAmerica - Corvallis**

Analysis ID:	10-6694-1306	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.7
Analyzed:	11 Dec-21 12:18	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1
Edit Date:	11 Dec-21 12:16	**MD5 Hash:**	14D3F82D36BB5A5527F058ED5A320834	**Editor ID:**	000-042-882-4

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	MSDu	PMSD
Untransformed	C > T	100	>100	---	1	4.767	30.95%

Steel Many-One Rank Sum Test

Control	vs	Conc-%	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Dilution Water		1.4	82.5	75	5	18	CDF	0.1507	Non-Significant Effect
		10*	55.5	75	1	18	CDF	0.0004	Significant Effect
		19	82.5	75	4	18	CDF	0.1507	Non-Significant Effect
		50	137.5	75	3	18	CDF	1.0000	Non-Significant Effect
		100	140.5	75	4	18	CDF	1.0000	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	1303.48	260.697	5	12.02	<1.0E-05	Significant Effect
Error	1170.7	21.6796	54			
Total	2474.18		59			

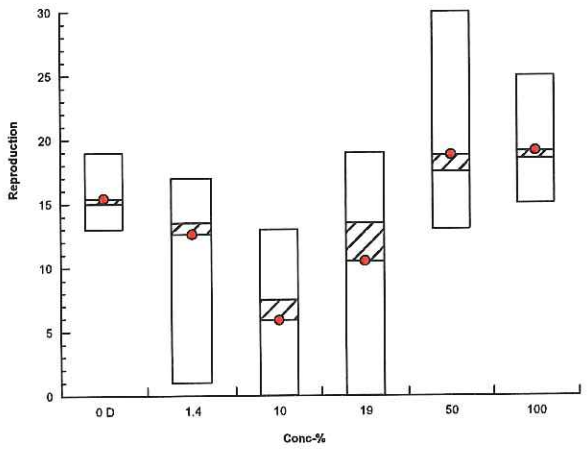
ANOVA Assumptions Tests

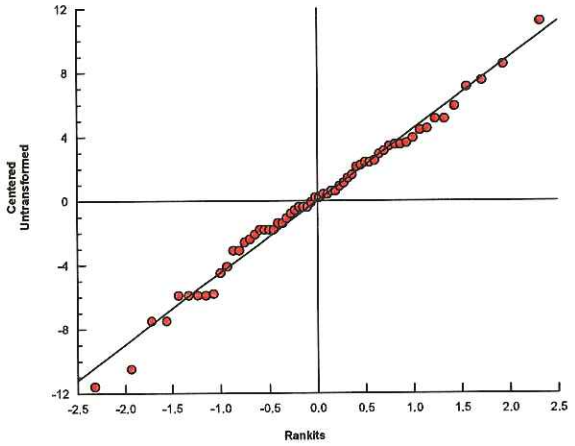
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Bartlett Equality of Variance Test	15.11	15.09	0.0099	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9888	0.9459	0.8565	Normal Distribution

Reproduction Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	10	15.4	14.17	16.63	15	13	19	0.5416	11.12%	0.00%
1.4		10	12.6	9.344	15.86	13.5	1	17	1.439	36.12%	18.18%
10		10	5.9	2.078	9.722	7.5	0	13	1.69	90.55%	61.69%
19		10	10.5	5.599	15.4	13.5	0	19	2.167	65.25%	31.82%
50		10	18.8	15.62	21.98	17.5	13	30	1.405	23.63%	-22.08%
100		10	19.1	16.7	21.5	18.5	15	25	1.059	17.53%	-24.03%

Graphics





CETIS Analytical Report

Ceriodaphnia 7-d Survival and Reproduction Test — **Eurofins TestAmerica - Corvallis**

Analysis ID:	07-2358-1336	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.7
Analyzed:	11 Dec-21 12:18	**Analysis:**	Linear Interpolation (ICPIN)	**Status Level:**	1
Edit Date:	11 Dec-21 12:16	**MD5 Hash:**	14D3F82D36BB5A5527F058ED5A320834	**Editor ID:**	000-042-882-4

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Log(X+1)	Linear	1518444	200	Yes	Two-Point Interpolation

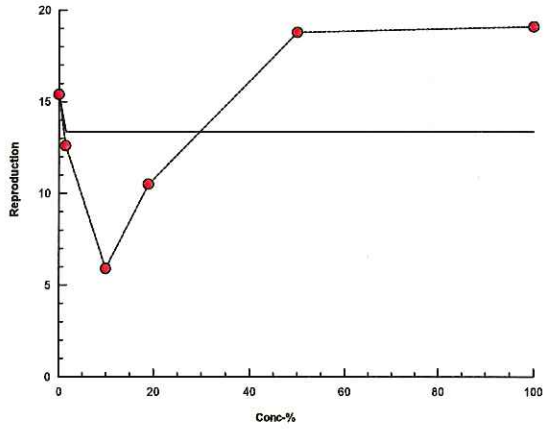
Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC25	>100	---	---	<1	---	---

Reproduction Summary

			Calculated Variate						Isotonic Variate	
Conc-%	Code	Count	Mean	Median	Min	Max	CV%	%Effect	Mean	%Effect
0	D	10	15.4	15	13	19	11.12%	0.00%	15.4	0.00%
1.4		10	12.6	13.5	1	17	36.12%	18.18%	13.38	13.12%
10		10	5.9	7.5	0	13	90.55%	61.69%	13.38	13.12%
19		10	10.5	13.5	0	19	65.25%	31.82%	13.38	13.12%
50		10	18.8	17.5	13	30	23.63%	-22.08%	13.38	13.12%
100		10	19.1	18.5	15	25	17.53%	-24.03%	13.38	13.12%

Graphics



TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

FATHEAD MINNOW 7-DAY SURVIVAL AND WATER QUALITY DATA

Random Template Used: 6 conc. x 4 reps. # 9 | Waterbath/incubator Used: # 10 | Date Initiated 11 / 11 / 2021 Time 16:05

Initial sample ID B 5236-01 - | Date Terminated 11 / 18 / 2021 Time 10 : 45

Client: City of Woodland | Sample Description:

Tech: Day 0 JW Day 1 KG Day 2 KG/KG Day 3 TC/KG Day 4 KG Day 5 KG/MS Day 6 TC Day 7 BC

Time: Day 0 1615 Day 1 1232 Day 2 1435 Day 3 1121 Day 4 1043 Day 5 1313 Day 6 0940 Day 7 1045

Conc. or Percent	Day	Number of Live Organisms A	B	C	D	Dissolved O_2 (mg/l) Pre	Post	pH Pre	Post	Temp. (°C) Pre	Therm ID #	Conductivity (µS) Post (1st use)
Control	0	10	Pooled TC 10/9 11/17	10	10		7.3		7.9	Post: 24.3	250	324
	1	10	10	10	10	10.8	8.0	7.5	8.2	24.5	251	
	2	10	10	10	10	10.3	7.4	7.3	7.9	24.4	250	309
	3	10	10	10	10	10.9	8.2	7.5	8.0	24.1	250	
	4	10	10	10	10	10.8	7.8	7.2	8.0	24.5	250	
	5	10	10	10	10	10.5	7.7	7.4	8.0	24.4	250	308
	6	10	9M	10	10	10.6	8.0	7.7	8.0	24.3	252	
	7	10	9	10	10	6.8		7.5		24.4	252	
1.4 %	0	10	10	10	10		7.5		7.9	Post: 24.3		333
	1	10	10	10	10	6.7	8.1	7.3	8.2	24.5		
	2	10	10	10	10	10.5	8.0	7.3	7.9	24.4		310
	3	10	10	10	10	10.10	8.1	7.5	8.1	24.10		
	4	10	10	10	10	6.5	7.9	7.3	8.0	24.4		
	5	10	10	10	10	6.7	7.4	7.4	8.0	24.3		336
	6	10✓	10	10	10	10.10	8.2	7.7	8.0	24.3		
	7	10	10	10	10	6.9		7.7		24.3		
10 %	0	10	10	10	10		7.5		7.9	Post: 24.1		366
	1	10	10	10	10	7.0	8.2	7.6	8.0	24.5		
	2	10	10	10	10	10.4	8.2	7.8	7.8	24.4		350
	3	10	10	10	10	10.3	8.2	7.5	7.9	24.2		
	4	10	10	10	10	10.4	8.1	7.3	7.9	24.4		
	5	10	10	10	10	6.5	7.9	7.3	7.9	24.5		364
	6	10	10	10	10	10.10	8.1	7.10	7.9	24.0		
	7	10	10	10	10	7.0		7.7		24.1		
19 %	0	10	10	10	10		7.6		7.7	Post: 24.2		376
	1	10	10	10	10	10.8	8.2	7.7	7.9	24.5		
	2	10✓	9	10	10	10.3	8.3	7.8	7.5	24.4		384
	3	10	9	10	10✓	10.1	8.2	7.5	7.7	24.4		
	4	10	9	10	10	6.3	8.3	7.4	7.7	24.4		
	5	10	9	10	10	10.3	8.1	7.3	7.7	24.5		391
	6	10	9	10	10	10.10	8.2	7.5	7.8	24.3		
	7	10	9	10	10	6.7		7.6		24.3		
50 %	0	10	10	10	10		7.6 pH		7.7	Post: 24.3		496
	1	10	10	10	10	6.8	8.3 AM	7.8	7.6	24.5		
	2	10	10	10	10	10.3	8.3 11-13	7.7 7.4	7.3	24.4		504
	3	10	10	10	10✓	10.1	8.4	7.10	7.4	24.1		
	4	10	10	10	10	10.2	8.3	7.10	7.5	24.4		
	5	10	10	10	10	10.1	8.3	7.4	7.5	24.5		490
	6	10	10	10	10	10.3	8.5	7.6	7.5	24.5		
	7	10	10	10	10	6.6		7.6		24.4		
100 %	0	10	10	10	10		7.8		7.2	Post: 24.2		465
	1	10	10	10	10	6.8	8.3	7.8	7.3	24.3		
	2	10	9	10✓	10	10.3	8.5	7.5	7.1	24.4		696
	3	10	9	10	10	5.9	8.4	7.7	7.2	24.10		
	4	10	9	10	10	10.1	8.5	7.8	7.3	24.4		
	5	10	9	10	10	5.9	8.5	7.4	7.3	25.4		649
	6	10	9	10	10	10.2	8.2	7.7	7.2	24.4		
	7	10	9	10	10	6.4		7.6		24.2		

✓ Indicates one organism inadvertently poured off during solution renewal, replaced into container.
"M" = organism missing, start count reduced. "Inj" = organism injured, remove from stats.
"F" = fungus noted on dead organisms.
☐ Aeration in test chambers begun @ _____ (Note observations on Test Organism Info sheet)
(1) Post shake down TC 11/14/21 | TC 11/17/21

Pre =Pre-renewal solutions. Post =Post-renewal solutions.
Day 0 Temperatures = Post-renewals
Therm ID# = Thermometer ID used for all measurements that day.
(23.8) = Temp. out of recommended range

FATHEAD MINNOW 7-DAY GROWTH DATA

Client: City of Woodland | Tins Labeled As: Wood

Lab ID: B5236 | Start Date: 11/11/2021

Sample Description:

Technician:	JF	JF
Date:	11/22/2021	11/12/2021
Balance Serial #:	B328543647	B328543647

Percent	Replicate	Total Weight (mg)	Tare Weight (mg)	No. of Fish
Control	A	808.50	800.88	10
	B	811.79	805.36	9 of 9
	C	810.62	803.11	10
	D	813.36	805.26	10
1.4 %	A	810.20	803.45	10
	B	816.53	808.66	10
	C	811.37	804.11	10
	D	813.09	804.45	10
10 %	A	813.49	806.20	10
	B	812.36	804.14	10
	C	826.71	816.11	10
	D	832.79	824.85	10
19 %	A	815.39	807.82	10
	B	808.87	801.73	9
	C	817.88	809.30	10
	D	816.11	806.46	10
50 %	A	810.78	801.65	10
	B	804.21	796.07	10
	C	811.73	802.96	10
	D	802.46	792.60	10
100 %	A	810.31	803.02	10
	B	809.15	801.62	9
	C	817.62	808.56	10
	D	817.27	808.80	10
	A			
	B			
	C			
	D			

weigh to 0.01 mg

FATHEAD MINNOW 7-DAY GROWTH DATA

Client: City of Woodland | Tins Labeled As: Wood

Lab ID: B5236 | Start Date: 11/11/2021

Sample Description: POC 4pt 11-17-21

Technician:	~~JF~~	JF
Date:	~~11/12/2021~~	11/12/2021
Balance Serial #:	B328543647	B328543647

Percent	Replicate	Total Weight (mg)	Tare Weight (mg)	No. of Fish
Control	A		800.88	10
	B		805.36	9 of 9
	C		803.11	10
	D		805.26	10
1.4 %	A		803.45	10
	B		808.66	10
	C		804.11	10
	D		804.45	10
10 %	A		806.20	10
	B		804.14	10
	C		816.11	10
	D		824.85	10
19 %	A		807.82	10
	B		801.73	9
	C		809.30	10
	D		806.46	10
50 %	A		801.65	10
	B		796.07	10
	C		802.96	10
	D		792.60	10
100 %	A		803.02	10
	B		801.62	9
	C		808.56	10
	D		808.80	10
	A			
	B			
	C			
	D			

weigh to 0.01 mg

Fathead Minnow 7-d Larval Survival and Growth Test — **Eurofins TestAmerica - Corvallis**

Batch ID:	20-8119-8474	**Test Type:**	Growth-Survival (7d)	**Analyst:**	Michelle Bennett		
Start Date:	11 Nov-21 16:15	**Protocol:**	EPA/821/R-02-013 (2002)	**Diluent:**	Mod-Hard Synthetic Water		
Ending Date:	18 Nov-21 10:45	**Species:**	Pimephales promelas	**Brine:**			
Test Length:	6d 18h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR	**Age:**	1D
Sample ID:	03-2374-1761	**Code:**	B5236-02	**Project:**			
Sample Date:	10 Nov-21 10:00	**Material:**	POTW Effluent	**Source:**	Woodland, City of (WA0020401)		
Receipt Date:	11 Nov-21 12:25	**CAS (PC):**		**Station:**			
Sample Age:	30h (3 °C)	**Client:**					

Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	√	NOEL	LOEL	TOEL	PMSD	TU	S
03-2220-7283	7d Survival Rate	Steel Many-One Rank Sum Test		100	>100	---	5.7%	1	1
17-5347-7827	Mean Dry Biomass-mg	Dunnett Multiple Comparison Test		100	>100	---	21.2%	1	1

Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	√	Level	%	95% LCL	95% UCL	TU	S
17-4516-4060	Mean Dry Biomass-mg	Linear Interpolation (ICPIN)		IC25	>100	---	---	<1	1

Test Acceptability

				TAC Limits			
Analysis ID	**Endpoint**	**Attribute**	**Test Stat**	**Lower**	**Upper**	**Overlap**	**Decision**
03-2220-7283	7d Survival Rate	Control Resp	1	0.8	>>	Yes	Passes Criteria
17-4516-4060	Mean Dry Biomass-mg	Control Resp	0.7594	0.25	>>	Yes	Passes Criteria
17-5347-7827	Mean Dry Biomass-mg	Control Resp	0.7594	0.25	>>	Yes	Passes Criteria
17-5347-7827	Mean Dry Biomass-mg	PMSD	0.2118	0.12	0.3	Yes	Passes Criteria

7d Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	D	4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	---	0.00%
1.4		4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	---	0.00%
10		4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	---	0.00%
19		4	0.9750	0.8954	1.0550	0.9000	1.0000	0.0250	0.0500	5.13%	2.50%
50		4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	---	0.00%
100		4	0.9750	0.8954	1.0550	0.9000	1.0000	0.0250	0.0500	5.13%	2.50%

Mean Dry Biomass-mg Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	D	4	0.7594	0.6967	0.8221	0.7144	0.81	0.0197	0.03941	5.19%	0.00%
1.4		4	0.763	0.6334	0.8926	0.675	0.864	0.04071	0.08143	10.67%	-0.48%
10		4	0.8512	0.6213	1.081	0.729	1.06	0.07226	0.1445	16.98%	-12.10%
19		4	0.8235	0.6453	1.002	0.714	0.965	0.05599	0.112	13.60%	-8.45%
50		4	0.8975	0.7833	1.012	0.814	0.986	0.0359	0.0718	8.00%	-18.19%
100		4	0.8088	0.6776	0.9399	0.729	0.906	0.04122	0.08244	10.19%	-6.50%

Fathead Minnow 7-d Larval Survival and Growth Test **Eurofins TestAmerica - Corvallis**

7d Survival Rate Detail MD5: 0A89F4F4FEE64B274D6F6EF5768402D7

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	1.0000	1.0000	1.0000	1.0000
1.4		1.0000	1.0000	1.0000	1.0000
10		1.0000	1.0000	1.0000	1.0000
19		1.0000	0.9000	1.0000	1.0000
50		1.0000	1.0000	1.0000	1.0000
100		1.0000	0.9000	1.0000	1.0000

Mean Dry Biomass-mg Detail MD5: 92E220B86249D06900AA66F74B385218

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	0.762	0.7144	0.751	0.81
1.4		0.675	0.787	0.726	0.864
10		0.729	0.822	1.06	0.794
19		0.757	0.714	0.858	0.965
50		0.913	0.814	0.877	0.986
100		0.729	0.753	0.906	0.847

7d Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	10/10	9/9	10/10	10/10
1.4		10/10	10/10	10/10	10/10
10		10/10	10/10	10/10	10/10
19		10/10	9/10	10/10	10/10
50		10/10	10/10	10/10	10/10
100		10/10	9/10	10/10	10/10

Fathead Minnow 7-d Larval Survival and Growth Test — **Eurofins TestAmerica - Corvallis**

Analysis ID:	03-2220-7283	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.9.7
Analyzed:	11 Dec-21 12:29	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1
Edit Date:	11 Dec-21 12:28	**MD5 Hash:**	0A89F4F4FEE64B274D6F6EF5768402D7	**Editor ID:**	000-042-882-4

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	MSDu	PMSD
Angular (Corrected)	C > T	100	>100	—	1	0.057	5.70%

Steel Many-One Rank Sum Test

Control	vs	Conc-%	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Dilution Water		1.4	18	10	1	6	CDF	0.8333	Non-Significant Effect
		10	18	10	1	6	CDF	0.8333	Non-Significant Effect
		19	16	10	1	6	CDF	0.6105	Non-Significant Effect
		50	18	10	1	6	CDF	0.8333	Non-Significant Effect
		100	16	10	1	6	CDF	0.6105	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0086333	0.0017267	5	0.779	0.5776	Non-Significant Effect
Error	0.0398953	0.0022164	18			
Total	0.0485287		23			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Bartlett Equality of Variance Test				Indeterminate
Distribution	Shapiro-Wilk W Normality Test	0.6328	0.884	<1.0E-05	Non-Normal Distribution

7d Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
1.4		4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
10		4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
19		4	0.9750	0.8954	1.0000	1.0000	0.9000	1.0000	0.0250	5.13%	2.50%
50		4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
100		4	0.9750	0.8954	1.0000	1.0000	0.9000	1.0000	0.0250	5.13%	2.50%

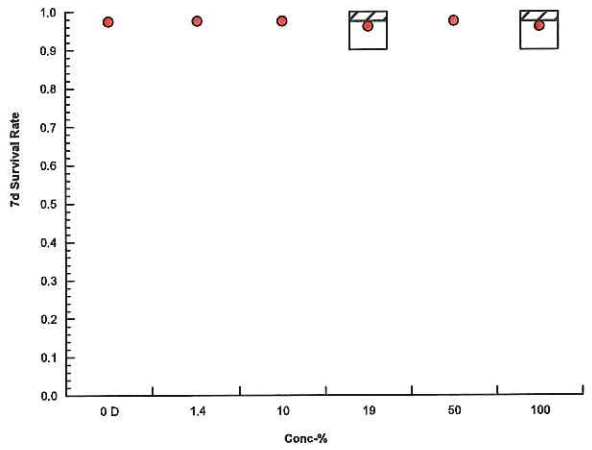
Angular (Corrected) Transformed Summary

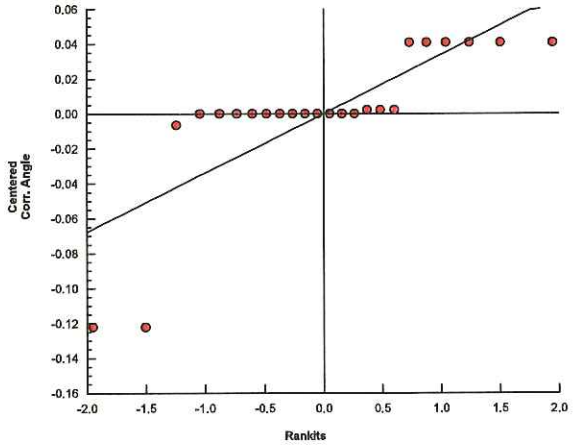
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	4	1.4100	1.4030	1.4170	1.4120	1.4030	1.4120	0.0022	0.31%	0.00%
1.4		4	1.4120	1.4120	1.4120	1.4120	1.4120	1.4120	0.0000	0.00%	-0.15%
10		4	1.4120	1.4120	1.4120	1.4120	1.4120	1.4120	0.0000	0.00%	-0.15%
19		4	1.3710	1.2420	1.5010	1.4120	1.2490	1.4120	0.0407	5.94%	2.74%
50		4	1.4120	1.4120	1.4120	1.4120	1.4120	1.4120	0.0000	0.00%	-0.15%
100		4	1.3710	1.2420	1.5010	1.4120	1.2490	1.4120	0.0407	5.94%	2.74%

Fathead Minnow 7-d Larval Survival and Growth Test — **Eurofins TestAmerica - Corvallis**

Analysis ID:	03-2220-7283	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.9.7
Analyzed:	11 Dec-21 12:29	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1
Edit Date:	11 Dec-21 12:28	**MD5 Hash:**	0A89F4F4FEE64B274D6F6EF5768402D7	**Editor ID:**	000-042-882-4

Graphics





Fathead Minnow 7-d Larval Survival and Growth Test — **Eurofins TestAmerica - Corvallis**

Analysis ID:	17-5347-7827	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.7
Analyzed:	11 Dec-21 12:29	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Edit Date:	11 Dec-21 12:28	**MD5 Hash:**	92E220B86249D06900AA66F74B385218	**Editor ID:**	000-042-882-4

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	MSDu	PMSD
Untransformed	C > T	100	>100	---	1	0.1608	21.18%

Dunnett Multiple Comparison Test

Control	vs	Conc-%	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Dilution Water		1.4	-0.05451	2.407	0.161	6	CDF	0.8489	Non-Significant Effect
		10	-1.375	2.407	0.161	6	CDF	0.9940	Non-Significant Effect
		19	-0.96	2.407	0.161	6	CDF	0.9808	Non-Significant Effect
		50	-2.068	2.407	0.161	6	CDF	0.9993	Non-Significant Effect
		100	-0.7393	2.407	0.161	6	CDF	0.9660	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0560059	0.0112012	5	1.255	0.3255	Non-Significant Effect
Error	0.160684	0.0089269	18			
Total	0.21669		23			

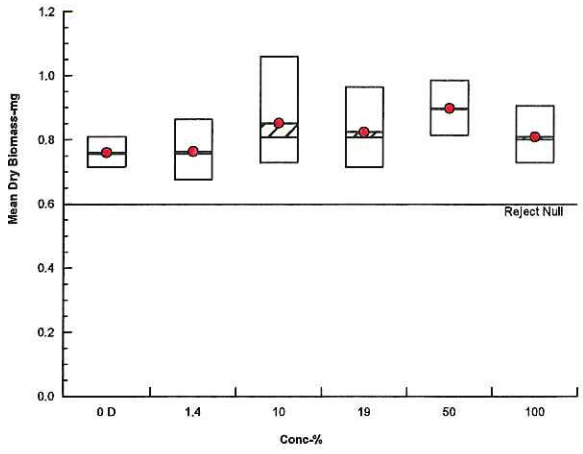
ANOVA Assumptions Tests

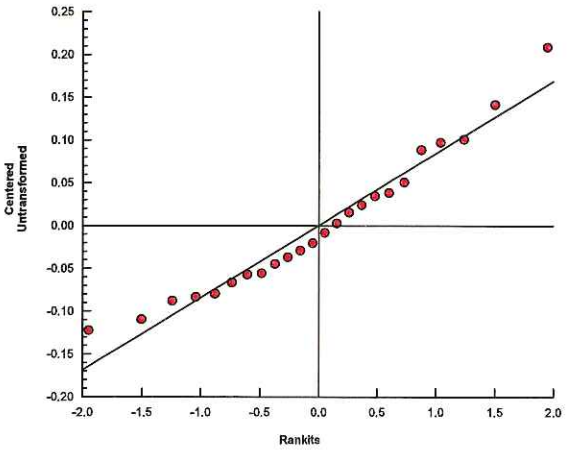
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Bartlett Equality of Variance Test	4.457	15.09	0.4857	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9556	0.884	0.3570	Normal Distribution

Mean Dry Biomass-mg Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	4	0.7594	0.6967	0.8221	0.7565	0.7144	0.81	0.0197	5.19%	0.00%
1.4		4	0.763	0.6334	0.8926	0.7565	0.675	0.864	0.04071	10.67%	-0.48%
10		4	0.8512	0.6213	1.081	0.808	0.729	1.06	0.07226	16.98%	-12.10%
19		4	0.8235	0.6453	1.002	0.8075	0.714	0.965	0.05599	13.60%	-8.45%
50		4	0.8975	0.7833	1.012	0.895	0.814	0.986	0.0359	8.00%	-18.19%
100		4	0.8088	0.6776	0.9399	0.8	0.729	0.906	0.04122	10.19%	-6.50%

Graphics





CETIS Analytical Report

Report Date: 11 Dec-21 12:30 (p 1 of 1)
Test Code/ID: B523602ppc / 13-4094-7514

Fathead Minnow 7-d Larval Survival and Growth Test — **Eurofins TestAmerica - Corvallis**

Analysis ID:	17-4516-4060	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.7
Analyzed:	11 Dec-21 12:29	**Analysis:**	Linear Interpolation (ICPIN)	**Status Level:**	1
Edit Date:	11 Dec-21 12:28	**MD5 Hash:**	92E220B86249D06900AA66F74B385218	**Editor ID:**	000-042-882-4

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Log(X+1)	Linear	581952	200	Yes	Two-Point Interpolation

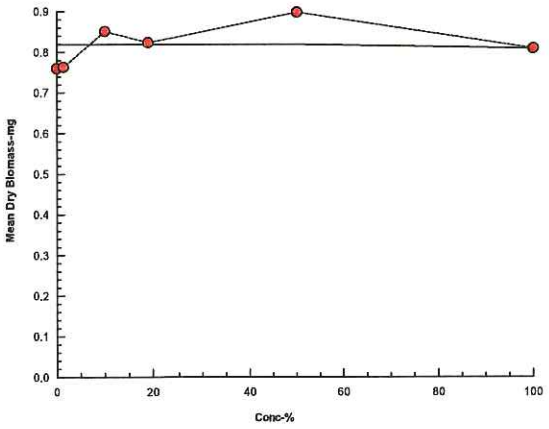
Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC25	>100	---	---	<1	---	---

Mean Dry Biomass-mg Summary

			Calculated Variate						Isotonic Variate	
Conc-%	Code	Count	Mean	Median	Min	Max	CV%	%Effect	Mean	%Effect
0	D	4	0.7594	0.7565	0.7144	0.81	5.19%	0.00%	0.8189	0.00%
1.4		4	0.763	0.7565	0.675	0.864	10.67%	-0.48%	0.8189	0.00%
10		4	0.8512	0.808	0.729	1.06	16.98%	-12.10%	0.8189	0.00%
19		4	0.8235	0.8075	0.714	0.965	13.60%	-8.45%	0.8189	0.00%
50		4	0.8975	0.895	0.814	0.986	8.00%	-18.19%	0.8189	0.00%
100		4	0.8088	0.8	0.729	0.906	10.19%	-6.50%	0.8088	1.24%

Graphics



TestAmerica

GREEN ALGAE (*Selenastrum capricornutum*) TEST CONDITIONS

Client: City of Woodland

Sample Description: _____ Sample ID: B9236 - 01

Test Start Date: 11 / 9 / 2021 Time: 16:30 Initials: TC

Test End Date: 11 / 13 / 2021 Time: 13:44 Initials: ABL

TEST CONDITIONS AT INITIATION:

Species ID#: SC 1050 Culturing period: 4 days Incubator ID#: 2

INOCULUM (Axenic Culture)	
# Cells	# Fields
509	250
MEAN	2.04

Culture Density = Mean # of Cells/Field x 250,000

Culture Density
x 250,000 = 510,000

Filtration	0.45 um filter	
	1.6 um filter	X

Test Vol. / Replicate	50 mls
No. of Reps	4
Nutrient Dosage	1 ml per L

Test Start Density	x	Test Volume	/	Culture Density	=	Inoculum Volume
10,000	x	50 ml	/	510,000	=	0.98 ml

Confirming Counts			
	# Cells	# Fields	Cell Conc. x10*6
Flask #1	5	250	0.005
Flask #2	5	250	0.005
Flask #3	7	250	0.007

Light Intensity at Test Initiation (foot-candles)		
Location #1	Location #2	Location #3
369	374	395

Technician	0 hr	TC	24 hr	ABL	48 hr	ABL	72 hr	ABL	96 hr	ABL
Time	0 hr	13:23	24 hr	13:09	48 hr	14:37	72 hr	13:53	96 hr	13:44
Therm. ID#	0 hr	#264	24 hr	#264	48 hr	#264	72 hr	#264	96 hr	#264

Test Concen.	D.O. (mg/L)	pH					Temperature (°C)					Conductivity (umohs/cm)	Hard.	Alk.
	0 hr	0 hr	24	48	72	96	0 hr	24	48	72	96	0 hr	0 hr	0 hr
Control	6.5	7.2	6.9	6.9	7.6	9.0	24.7	25.1	24.6	24.9	24.8	96.6	10	15
1.4 %	6.6	7.2	6.9	6.9	7.6	8.7	24.8	24.9	24.7	24.8	24.7	107.4	17	11
10 %	6.6	7.1	7.0	7.0	7.5	8.6	24.5	25.1	24.9	24.8	24.7	116.0		
19 %	6.7	7.1	7.1	7.4	7.8	8.8	24.4	24.9	24.8	24.7	24.9	229	31	33
50 %	6.6	7.3	7.1	7.8	8.2	8.8	24.4	24.9	24.5	24.8	24.8	432		
100 %	6.9	7.5	8.2	8.2	8.4	8.6	24.2	24.9	24.7	24.7	24.9	759	111	128

Comments: Flasks positioned randomly in incubator. Positions changed every day. Temp and pH taken in surrogate flasks.

(23.8) = Temp. out of recommended range

As of Aug 2016, all data is typed directly into form by analyst. No review needed.

Raphidocelis subcapitata COULTER COUNTER WORKSHEET

Client: City of Woodland

Sample Description:

Lab ID: B9236-01

Test Start Date: 11/9/2021

Test Count Date: 11/16/2021 Initials: JF

Instrument Settings:

Counter ID: PCOUNT3
As of: 30-Aug-16
the settings were as listed below
Apperture size: 100 um
Apperture Kd value: 59.94
Set size: 3.2 um
Gain: 256
Current: 1.414
Preamp Gain: 179.20

Dilution factor (DF) Default value: 51
Output: Concentration
Metered volume (ml): 0.5

Blank counts (use ISOTONE II):

Run	BLANK
DF	51
1	4488
2	4488
3	3672
4	3570
5	2346
6	2550

Note: Blank concentrations are Cells per ml (**not** x 10^6)

Dilutions: DF = 11 (1.0 ml sample to 10mL Isotone II)
DF = 51 (0.20 ml sample to 10mL Isotone II)
DF = 101 (0.20 ml sample to 20mL Isotone II)

Where : * = Concentrations are in Cells per mL x 10^6

COMMENTS

TEST CONCENTRATION		Control		
Run	REP A	REP B	REP C	REP D
DF (if other than default)				
1	3.259	3.345	3.253	3.375
2	3.251	3.370	3.229	3.355
3	3.282	3.358	3.284	3.367
Replicate Average	**3.264**	**3.358**	**3.255**	**3.366**
CONCENTRATION MEAN # Cells / mL* =		**3.311**	CV % =	1.8%

TEST CONCENTRATION		1.4 %		
Run	REP A	REP B	REP C	REP D
DF (if other than default)				
1	2.931	2.926	3.127	3.257
2	2.839	2.899	3.169	3.247
3	2.827	2.913	3.186	3.237
Replicate Average	**2.866**	**2.913**	**3.161**	**3.247**
CONCENTRATION MEAN # Cells / mL* =		**3.047**	CV % =	6.1%

TEST CONCENTRATION		10 %		
Run	REP A	REP B	REP C	REP D
DF (if other than default)				
1	2.830	2.598	2.725	2.516
2	2.695	2.587	2.770	2.540
3	2.699	2.604	2.706	2.501
Replicate Average	**2.741**	**2.596**	**2.734**	**2.519**
CONCENTRATION MEAN # Cells / mL* =		**2.648**	CV % =	4.1%

TEST CONCENTRATION		19 %		
Run	REP A	REP B	REP C	REP D
DF (if other than default)				
1	2.613	2.556	2.887	2.634
2	2.601	2.457	2.911	2.617
3	2.607	2.451	2.907	2.630
Replicate Average	**2.607**	**2.488**	**2.902**	**2.627**
CONCENTRATION MEAN # Cells / mL* =		**2.656**	CV % =	6.6%

TEST CONCENTRATION		50 %		
Run	REP A	REP B	REP C	REP D
DF (if other than default)				
1	2.360	2.269	2.368	2.152
2	2.333	2.311	2.358	2.198
3	2.346	2.288	2.281	2.171
Replicate Average	**2.346**	**2.289**	**2.336**	**2.174**
CONCENTRATION MEAN # Cells / mL* =		**2.286**	CV % =	3.5%

TEST CONCENTRATION		100 %		
Run	REP A	REP B	REP C	REP D
DF (if other than default)				
1	0.369	0.343	0.325	0.336
2	0.372	0.327	0.334	0.329
3	0.370	0.321	0.327	0.320
Replicate Average	**0.370**	**0.330**	**0.329**	**0.328**
CONCENTRATION MEAN # Cells / mL* =		**0.339**	CV % =	6.0%

CETIS Summary Report

Report Date: 11 Dec-21 12:38 (p 1 of 1)
Test Code/ID: B523601scc / 00-4471-6531

Green Algae Growth Test — **Eurofins TestAmerica - Corvallis**

Batch ID:	12-4730-9536	**Test Type:**	Cell Growth	**Analyst:**	Michelle Bennett
Start Date:	09 Nov-21 15:30	**Protocol:**	EPA/821/R-02-013 (2002)	**Diluent:**	
Ending Date:	13 Nov-21 13:44	**Species:**	Selenastrum capricornutum	**Brine:**	
Test Length:	94h	**Taxon:**	Chlorophyta	**Source:**	In-House Culture **Age:** 4D
Sample ID:	09-0711-5296	**Code:**	B5236-01	**Project:**	
Sample Date:	08 Nov-21 09:00	**Material:**	POTW Effluent	**Source:**	Woodland, City of (WA0020401)
Receipt Date:	09 Nov-21 10:10	**CAS (PC):**		**Station:**	
Sample Age:	31h (2.2 °C)	**Client:**			

Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	✓	NOEL	LOEL	TOEL	PMSD	TU	S
12-9035-8981	Cell Density	Dunnett Multiple Comparison Test	alpha 0.05	<1.4	1.4	---	6.2%	>71.43	1
18-8081-9031	Cell Density	Dunnett Multiple Comparison Test	alpha 0.01	1.4	10	3.742	8.25%	71.43	1

Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	✓	Level	%	95% LCL	95% UCL	TU	S
15-7999-8353	Cell Density	Linear Interpolation (ICPIN)		IC25	29.81	17.06	37.59	3.354	1

Test Acceptability

				TAC Limits			
Analysis ID	**Endpoint**	**Attribute**	**Test Stat**	**Lower**	**Upper**	**Overlap**	**Decision**
12-9035-8981	Cell Density	Control CV	0.01785	<<	0.2	Yes	Passes Criteria
15-7999-8353	Cell Density	Control CV	0.01785	<<	0.2	Yes	Passes Criteria
18-8081-9031	Cell Density	Control CV	0.01785	<<	0.2	Yes	Passes Criteria
12-9035-8981	Cell Density	Control Resp	3.31E+6	1000000	>>	Yes	Passes Criteria
15-7999-8353	Cell Density	Control Resp	3.31E+6	1000000	>>	Yes	Passes Criteria
18-8081-9031	Cell Density	Control Resp	3.31E+6	1000000	>>	Yes	Passes Criteria
12-9035-8981	Cell Density	PMSD	0.06197	0.091	0.29	Yes	Below Criteria
18-8081-9031	Cell Density	PMSD	0.08253	0.091	0.29	Yes	Below Criteria

Cell Density Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	D	4	3.311E+6	3.217E+6	3.405E+6	3.255E+6	3.366E+6	2.954E+4	5.909E+4	1.78%	0.00%
1.4		4	3.047E+6	2.750E+6	3.343E+6	2.866E+6	3.247E+6	9.303E+4	1.861E+5	6.11%	7.98%
10		4	2.648E+6	2.475E+6	2.820E+6	2.519E+6	2.741E+6	5.428E+4	1.086E+5	4.10%	20.03%
19		4	2.656E+6	2.378E+6	2.934E+6	2.488E+6	2.902E+6	8.747E+4	1.749E+5	6.59%	19.78%
50		4	2.286E+6	2.160E+6	2.412E+6	2.174E+6	2.346E+6	3.951E+4	7.903E+4	3.46%	30.94%
100		4	3.394E+5	3.068E+5	3.720E+5	3.285E+5	3.701E+5	1.025E+4	2.051E+4	6.04%	89.75%

Cell Density Detail MD5: C5224567AFE9D94CCBA6A3D948BEC744

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	3.264E+6	3.358E+6	3.255E+6	3.366E+6
1.4		2.866E+6	2.913E+6	3.161E+6	3.247E+6
10		2.741E+6	2.596E+6	2.734E+6	2.519E+6
19		2.607E+6	2.488E+6	2.902E+6	2.627E+6
50		2.346E+6	2.289E+6	2.336E+6	2.174E+6
100		3.701E+5	3.302E+5	3.287E+5	3.285E+5

Analyst: MB QA:

Green Algae Growth Test — **Eurofins TestAmerica - Corvallis**

Analysis ID:	12-9035-8981	**Endpoint:**	Cell Density	**CETIS Version:**	CETISv1.9.7
Analyzed:	11 Dec-21 12:33	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Edit Date:		**MD5 Hash:**	05142DDA45FF7B8909E29B38C64F0EC5	**Editor ID:**	

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	MSDu	PMSD
Untransformed	C > T	<1.4	1.4	---	>71.43	205200	6.20%

Dunnett Multiple Comparison Test

Control	vs	Conc-%	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Dilution Water		1.4*	3.1	2.407	2E+05	6	CDF	0.0125	Significant Effect
		10*	7.78	2.407	2E+05	6	CDF	2.8E-05	Significant Effect
		19*	7.682	2.407	2E+05	6	CDF	2.8E-05	Significant Effect
		50*	12.02	2.407	2E+05	6	CDF	2.7E-05	Significant Effect
		100*	34.86	2.407	2E+05	6	CDF	2.7E-05	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	2.252E+13	4.505E+12	5	310.1	<1.0E-05	Significant Effect
Error	2.615E+11	1.453E+10	18			
Total	2.279E+13		23			

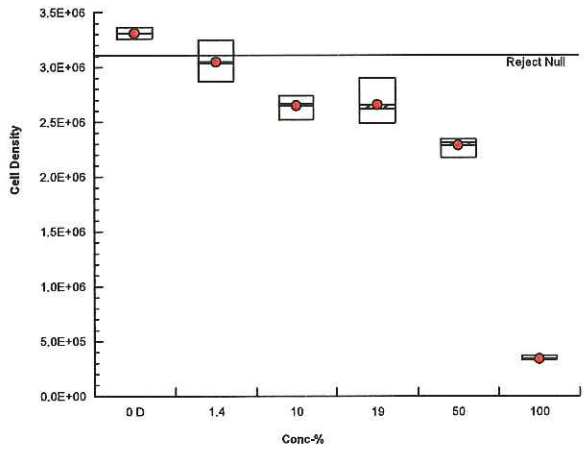
ANOVA Assumptions Tests

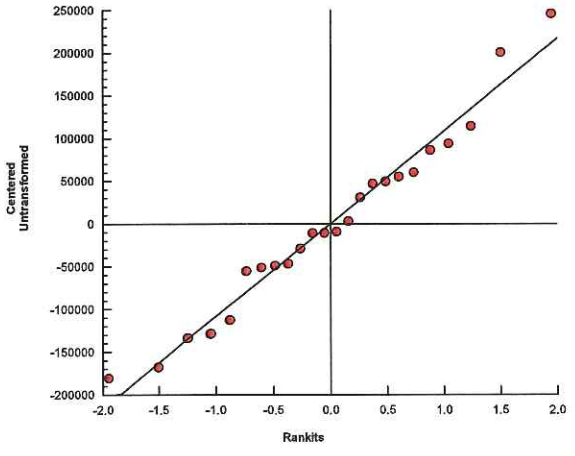
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Bartlett Equality of Variance Test	11.71	15.09	0.0390	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9726	0.884	0.7310	Normal Distribution

Cell Density Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	4	3.311E+6	3.217E+6	3.405E+6	3.311E+6	3.255E+6	3.366E+6	2.954E+4	1.78%	0.00%
1.4		4	3.047E+6	2.750E+6	3.343E+6	3.037E+6	2.866E+6	3.247E+6	9.303E+4	6.11%	7.98%
10		4	2.648E+6	2.475E+6	2.820E+6	2.665E+6	2.519E+6	2.741E+6	5.428E+4	4.10%	20.03%
19		4	2.656E+6	2.378E+6	2.934E+6	2.617E+6	2.488E+6	2.902E+6	8.747E+4	6.59%	19.78%
50		4	2.286E+6	2.160E+6	2.412E+6	2.312E+6	2.174E+6	2.346E+6	3.951E+4	3.46%	30.94%
100		4	3.394E+5	3.068E+5	3.720E+5	3.295E+5	3.285E+5	3.701E+5	1.025E+4	6.04%	89.75%

Graphics





Green Algae Growth Test — **Eurofins TestAmerica - Corvallis**

Analysis ID: 18-8081-9031 **Endpoint:** Cell Density **CETIS Version:** CETISv1.9.7
Analyzed: 11 Dec-21 12:34 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1
Edit Date: **MD5 Hash:** 05142DDA45FF7B8909E29B38C64F0EC5 **Editor ID:**

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	MSDu	PMSD
Untransformed	C > T	1.4	10	3.742	71.43	273200	8.25%

Dunnett Multiple Comparison Test

Control	vs	Conc-%	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:1%)
Dilution Water		1.4	3.1	3.206	3E+05	6	CDF	0.0125	Non-Significant Effect
		10*	7.78	3.206	3E+05	6	CDF	2.8E-05	Significant Effect
		19*	7.682	3.206	3E+05	6	CDF	2.8E-05	Significant Effect
		50*	12.02	3.206	3E+05	6	CDF	2.7E-05	Significant Effect
		100*	34.86	3.206	3E+05	6	CDF	2.7E-05	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	2.252E+13	4.505E+12	5	310.1	<1.0E-05	Significant Effect
Error	2.615E+11	1.453E+10	18			
Total	2.279E+13		23			

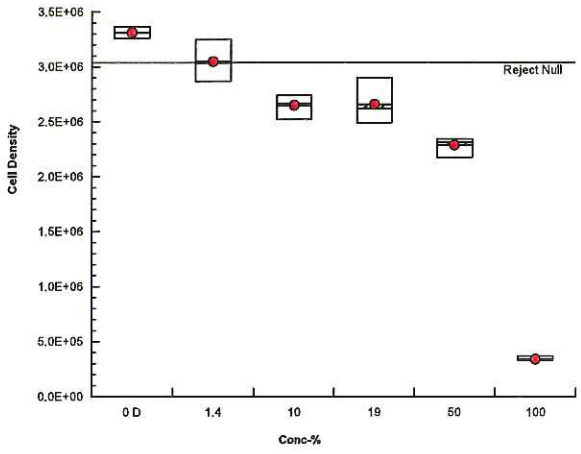
ANOVA Assumptions Tests

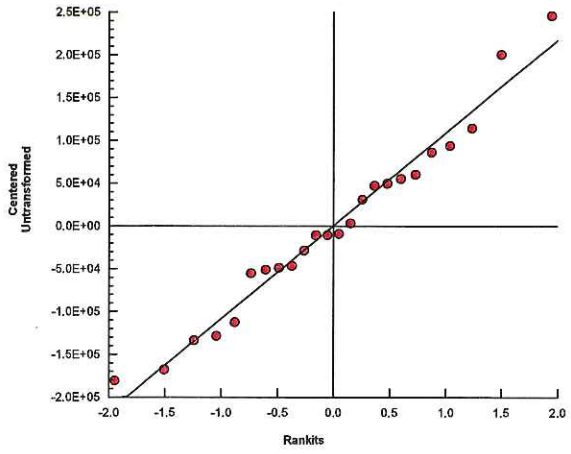
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Bartlett Equality of Variance Test	11.71	15.09	0.0390	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9726	0.884	0.7310	Normal Distribution

Cell Density Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	4	3.311E+6	3.217E+6	3.405E+6	3.311E+6	3.255E+6	3.366E+6	2.954E+4	1.78%	0.00%
1.4		4	3.047E+6	2.750E+6	3.343E+6	3.037E+6	2.866E+6	3.247E+6	9.303E+4	6.11%	7.98%
10		4	2.648E+6	2.475E+6	2.820E+6	2.665E+6	2.519E+6	2.741E+6	5.428E+4	4.10%	20.03%
19		4	2.656E+6	2.378E+6	2.934E+6	2.617E+6	2.488E+6	2.902E+6	8.747E+4	6.59%	19.78%
50		4	2.286E+6	2.160E+6	2.412E+6	2.312E+6	2.174E+6	2.346E+6	3.951E+4	3.46%	30.94%
100		4	3.394E+5	3.068E+5	3.720E+5	3.295E+5	3.285E+5	3.701E+5	1.025E+4	6.04%	89.75%

Graphics





Green Algae Growth Test — **Eurofins TestAmerica - Corvallis**

Analysis ID:	15-7999-8353	**Endpoint:**	Cell Density	**CETIS Version:**	CETISv1.9.7
Analyzed:	11 Dec-21 12:33	**Analysis:**	Linear Interpolation (ICPIN)	**Status Level:**	1
Edit Date:		**MD5 Hash:**	05142DDA45FF7B8909E29B38C64F0EC5	**Editor ID:**	

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Log(X+1)	Linear	216817	200	Yes	Two-Point Interpolation

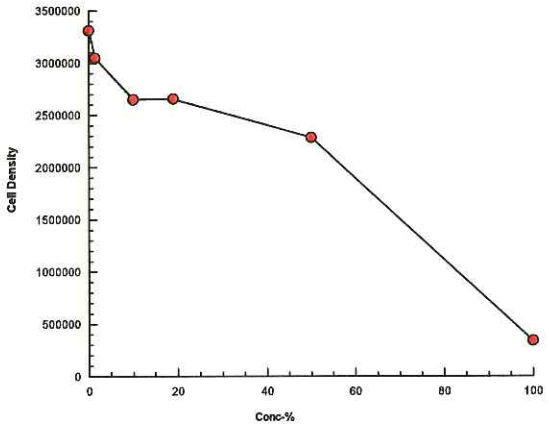
Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC25	29.81	17.06	37.59	3.354	2.66	5.86

Cell Density Summary

			Calculated Variate						Isotonic Variate	
Conc-%	Code	Count	Mean	Median	Min	Max	CV%	%Effect	Mean	%Effect
0	D	4	3.311E+6	3.311E+6	3.255E+6	3.366E+6	1.78%	0.00%	3.311E+6	0.00%
1.4		4	3.047E+6	3.037E+6	2.866E+6	3.247E+6	6.11%	7.98%	3.047E+6	7.98%
10		4	2.648E+6	2.665E+6	2.519E+6	2.741E+6	4.10%	20.03%	2.652E+6	19.90%
19		4	2.656E+6	2.617E+6	2.488E+6	2.902E+6	6.59%	19.78%	2.652E+6	19.90%
50		4	2.286E+6	2.312E+6	2.174E+6	2.346E+6	3.46%	30.94%	2.286E+6	30.94%
100		4	3.394E+5	3.295E+5	3.285E+5	3.701E+5	6.04%	89.75%	3.394E+5	89.75%

Graphics



APPENDIX B

REFERENCE TOXICANT DATA SHEETS

REFERENCE TOXICANT DATA SHEET

Client: QA / QC | Reference Toxican: NaCl | Test Begin: Date 11/4/2021 Time 12:20

Test Organism: *Ceriodaphnia dubia* | Stock Solution: 20 g/L in DI (ASTM Type I) water | Test End: Date 11/6/2021 Time 12:45

Source: In-House culture | Reagent Log ID #: 1B091-05 | *Dilution Water (Recon MH) ID#: 5430

ID#: Cd 3902 | Designed Test Temperature: 20 ± 1 °C | Dilution Water Hardness (as $CaCO_3$): 90

Age: < 24 hours | Dilution Water Alkalinity (as $CaCO_3$): 60

Feeding: none

		0 hr	24 hr	48 hr
Test Chamber Size: 30 ml	Technician	BC	dm	dm
Volume per Replicate: 25 ml	Time	1225	1523	1245
	Therm. ID #	251	250	252

Toxicant Concentration (g/L)	Test Chamber Number	Number of Live Organisms			Dissolved Oxygen (mg/l)			pH			Temperature (°C)			Conductivity (µS)		
		0	24	48	0	24	48	0	24	48	0	24	48	0	24	48
Control	A	5	5	4	8.1		8.0	8.2		7.7	19.4	19.5	19.5	321		329
	B	5	5	5												
1.0	A	5	5	5	8.3		8.3	8.1		7.6	19.4	19.7	19.6	2230		2200
	B	5	5	5												
1.5	A	5	5	5	8.3		8.4	8.1		7.6	19.3	19.7	19.6	3330		3180
	B	5	5	5												
2.0	A	5	5	5	8.4		8.5	8.0		7.7	19.3	19.8	19.6	4230		4230
	B	5	5	5												
3.0	A	5	3	3	8.4		8.5	8.0		7.7	19.3	19.8	19.6	6040		5730
	B	4	3	3												
4.0	A	5	0	—	8.4	8.2	—	7.9	7.8	—	19.3	19.7	—	7820	7440	—
	B	5	0	—												
Test Acceptability Criteria (TAC) or test condition:		Survival in Controls: ≥ 90% (required TAC)			(@ 20°C): > 4.0 and < 9.1 (recommended)			pH: > 6.0 and < 9.0 (recommended)			Temperature + 1 °C (recommended)			(QA) none		

Note: If organisms are alive @ 24hrs, no DO, pH, or Cond. measurements to be taken in that test chamber to avoid injuring the organisms

We verify this data is true and correct.

*Dilution Water Code
Recon. - reconstituted water
MH - moderately hard

48 Hour LC_{50}: 3.03

Cusum Chart Limits: 1.64 to 3.04

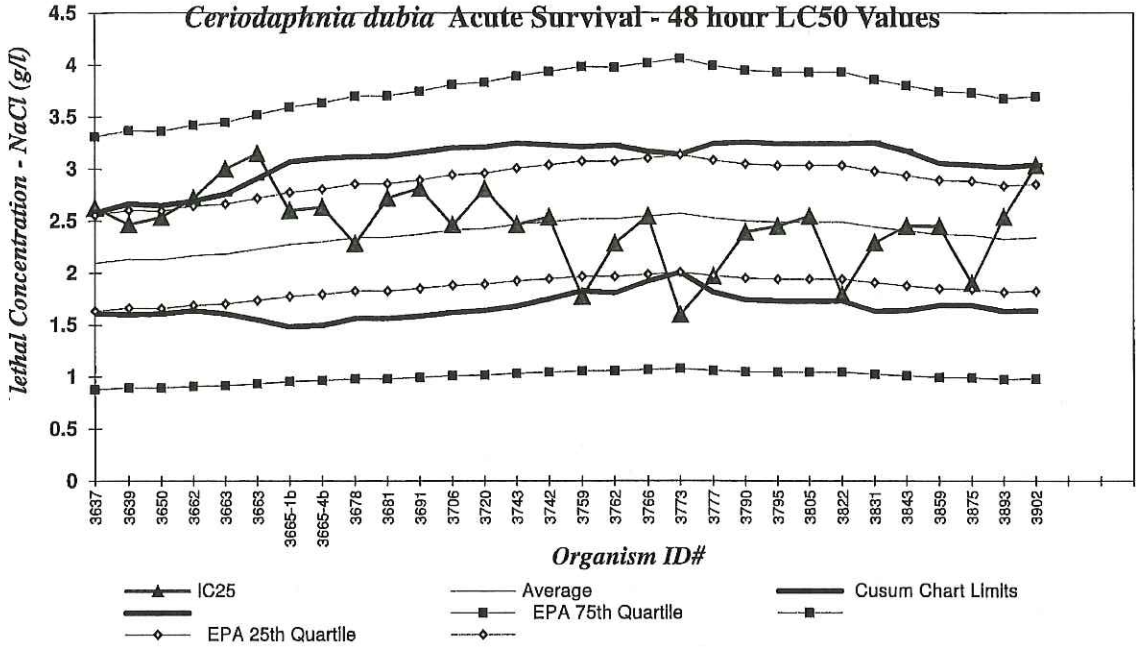
Statistical Method: Spearman Karber

Task Manager:

Project Manager: Alyssa Lampi

QA Officer: MB

REFERENCE TOXICANT CUMLATIVE SUMMARY (CUSUM) CHART



Ceriodaphnia dubia - ACUTE (EPA Test Method 2002.0)

SODIUM CHLORIDE (g/L)

Endpoint: 48 hour Survival

Stats Method: Probit, Spearman-Karber, Linear Interpolation

Test Conditions: Recon MH, 20 oC

From EPA 833-R-00-003:

10th Quartile CV (*control limit*) =	0.06
25th Quartile CV (*warning limit*) =	0.11
75th Quartile CV (warning *limit*) =	0.29
90th Quartile CV (*control limit*) =	0.34

Intralab CV is compared to EPA ***Warning limits*** *(25th and 75th CV's) and* ***Control limits*** *(10th and 90th CV's), If lab CV is outside EPA Control limits, the EPA Control limits are used to set Cusum chart limits.*

Event #	Cerio ID #	Test Start Date	LC50	Running Average	Running SD	Cusum Chart Limits AVG-2SD	Cusum Chart Limits AVG+2SD	Intralab CV
185	3777	01/12/21	**1.97**	2.5	0.36	**1.81**	**3.24**	0.15
185	3790	02/03/21	**2.39**	2.5	0.38	**1.74**	**3.26**	0.15
185	3795	03/03/21	**2.45**	2.5	0.38	**1.73**	**3.24**	0.15
185	3805	04/01/21	**2.54**	2.5	0.38	**1.73**	**3.24**	0.15
185	3822	05/11/21	**1.79**	2.5	0.38	**1.73**	**3.24**	0.17
185	3831	06/01/21	**2.29**	2.4	0.40	**1.63**	**3.25**	0.16
185	3843	07/07/21	**2.45**	2.4	0.38	**1.64**	**3.17**	0.14
185	3859	08/10/21	**2.45**	2.4	0.34	**1.69**	**3.05**	0.14
185	3875	09/21/21	**1.90**	2.4	0.34	**1.69**	**3.04**	0.15
185	3893	10/21/21	**2.54**	2.3	0.35	**1.63**	**3.02**	0.15
185	3902	11/04/21	**3.03**	2.3	0.35	**1.64**	**3.04**	0.16

REFERENCE TOXICANT DATA SHEET

Client: QA / QC
Test Organism: *Pimephales promelas*
Source: Aquatox
ID#: FHM 2193
Age: 4 Days
Feeding: none
Test Chamber Size: 800 ml
Volume per Replicate: 750 ml

Reference Toxican: NaCl
Stock Solution: 20 g/L in DI (ASTM Type I) water
Reagent Log ID #: 2B091-08
Designed Test Temperature: 20 ± 1 °C

Test Begin: Date 11/23/2021 Time 13:50
Test End: Date 11/25/2021 Time 08:30
*Dilution Water (Recon MH) ID#: 5457
Dilution Water Hardness (as $CaCO_3$): 59
Dilution Water Alkalinity (as $CaCO_3$): 55

	0 hr	24 hr	48 hr
Technician	TC	BC	MS
Time	1350	0950	0830
Therm. ID #	250	250	250

Toxicant Concentration (g/L)	Test Chamber Number	Number of Live Organisms			Dissolved Oxygen (mg/l)			pH			Temperature (°C)			Conductivity (µS)		
		0	24	48	0	24	48	0	24	48	0	24	48	0	24	48
Control	A	10	10	10	7.9	7.3	7.9	7.5	7.7	7.7	19.4	19.3	19.3	322 ~~372~~		345
4.0	A	10	10	10	8.0	7.6	7.9	7.5	7.5	7.5	19.3	19.1	19.2	7,540		7,590
6.0	A	10	10	10	8.3	7.8	7.5	7.8	7.5	7.5	19.3	19.1	19.3	10,950		11,210
8.0	A	10	6	5	8.3	7.9	7.9	7.5	7.5	7.5	19.3	19.2		14,310		14,410
10.0	A	10	0	—	8.3	8.0	—	7.7	7.5	—	19.3	19.1	—	17,560	17,800	
12.0	A	10	0	—	8.3	8.1	—	7.7	7.5	—	19.4	19.2	—	20,300	20,500	
Test Acceptability Criteria (TAC) or test condition:		Survival in Controls: ≥ 90% (required TAC)			(@ 20°C): > 4.0 and < 9.1 (recommended)			pH: > 6.0 and < 9.0 (recommended)			Temperature ± 1 °C (recommended)			(QA) none		

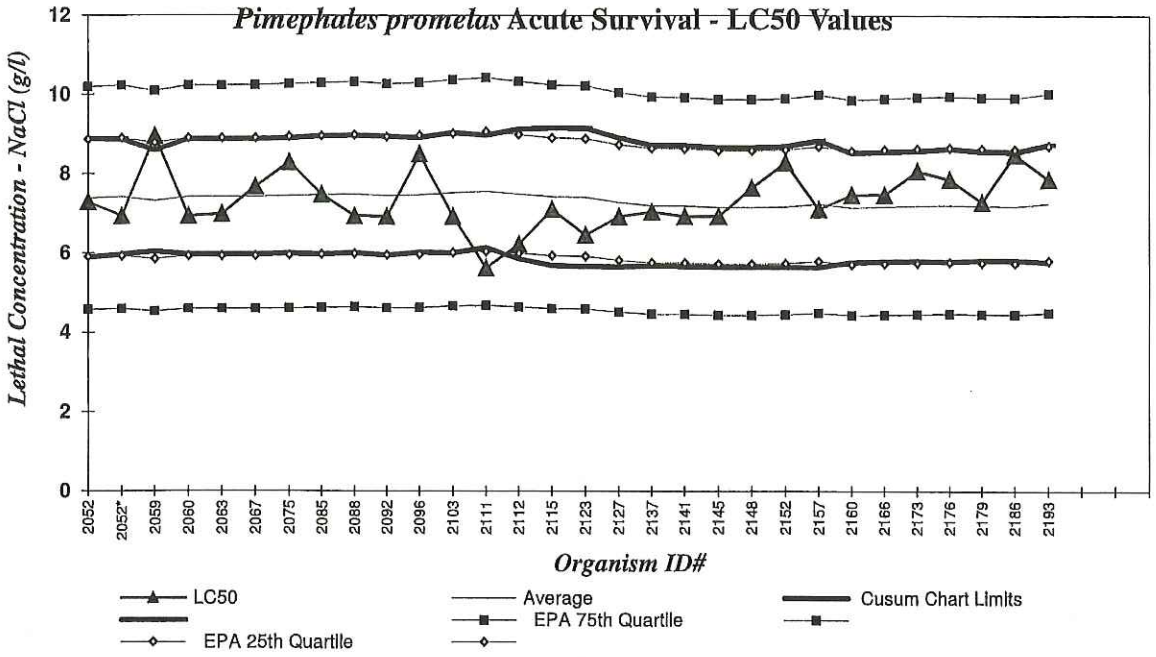
*Dilution Water Code
Recon. - reconstituted water
S - soft
MH - moderately hard
H - hard
Art. Sea - Artificial Sea Water

48 Hour LC_{50}: 7.9
Cusum Chart Limits: 5.8 to 8.7
Statistical Method: Spearman Karber

We verify this data is true and correct.
Task Manager
Project Manager: Alyssa Lampi
QA Officer

REFTOX - FHM acute (ASL 674-0220).xlsx
Doc Control ID: ASL674-0220

REFERENCE TOXICANT CUMLATIVE SUMMARY (CUSUM) CHART



Pimephales promelas - ACUTE (EPA Test Method 2000.0)

SODIUM CHLORIDE (g/L)

Organism age: 1 to 14 days

Endpoint: 48 hour Survival

Stats Method: Probit, Spearman-Karber, Linear Interpolation

Test Conditions: Recon MH, 20 oC

From EPA 833-R-00-003:

10th Quartile CV (*control limit*) = 0.08

25th Quartile CV (*warning limit*) = 0.10

75th Quartile CV (*warning limit*) = 0.19

90th Quartile CV (*control limit*) = 0.33

Intralab CV is compared to EPA ***Warning limits*** *(25th and 75th CV's) and* ***Control limits*** *(10th and 90th CV's), If lab CV is outside EPA Control limits, the EPA Control limits are used to set Cusum chart limits.*

Event #	FHM ID #	Test Start Date	LC50	Running Average	Running SD	Cusum Chart Limits AVG-2SD	Cusum Chart Limits AVG+2SD	Intralab CV
947	2137	12/8/2020	**7.0**	7.2	0.76	**5.7**	**8.7**	0.11
948	2141	1/6/2021	**6.9**	7.2	0.76	**5.7**	**8.7**	0.11
949	2145	2/2/2021	**6.9**	7.2	0.75	**5.6**	**8.7**	0.11
950	2148	3/3/2021	**7.6**	7.2	0.75	**5.6**	**8.7**	0.11
951	2152	4/1/2021	**8.3**	7.2	0.76	**5.6**	**8.7**	0.11
952	2157	5/11/2021	**7.1**	7.2	0.80	**5.6**	**8.8**	0.10
953	2160	6/1/2021	**7.5**	7.1	0.69	**5.8**	**8.5**	0.10
954	2166	7/7/2021	**7.5**	7.2	0.69	**5.8**	**8.6**	0.10
955	2173	8/10/2021	**8.1**	7.2	0.69	**5.8**	**8.6**	0.10
956	2176	8/25/2021	**7.9**	7.2	0.71	**5.8**	**8.6**	0.10
957	2179	9/21/2021	**7.3**	7.2	0.69	**5.8**	**8.6**	0.10
958	2186	10/21/2021	**8.5**	7.2	0.68	**5.8**	**8.6**	0.10
959	2193	11/23/2021	**7.9**	7.3	0.74	**5.8**	**8.7**	0.10
960								

Ceriodaphnia dubia
Survival and Reproduction
Test Data Summary

Client: QA / QC Test Start Date: 11-30-21

Sample Description: NaCl Initial Sample ID#: 2B 0803.05

Data summarized by: [illegible]

Percent or Concentration	Total Live Young Produced in First 3 Broods per Replicate										# Alive Adults	Total Live Young
	A	B	C	D	E	F	G	H	I	J		
Control	24/25	21	24	26	26	22	22	17	17	23	9	223
	AD?	AD? ✓	AD?	AD?	AD?	AD?	AD?	AD?	AD?	AD?		
0.25 g/L	25	14	22	24	22	19	25	13	21	13	10	198
	AD?	AD?	AD?	AD?	AD?	AD?	AD?	AD?	AD?	AD?		
0.50 g/L	19	22	19	20, 18, 19	11	12	19	20	13	19	8	173
	AD?	AD?	AD? ✓	AD? ✓	AD?	AD?	AD?	AD?	AD?	AD?		
1.0 g/L	18	18	19	17	19	15	17	17, 16	9	7	7	155
	AD?	AD?	AD? ✓	AD?	AD?	AD? ✓	AD?	AD?	AD?	AD? ✓		
1.5 g/L	NA → organism discarded accidentally on Day 4										NA	NA
	AD?	AD?	AD?	AD?	AD?	AD?	AD?	AD?	AD?	AD?		
2.0 g/L	0	0	0	0	3	0	0	0	0	0	1	3
	AD? ✓	AD? ✓	AD? ✓	AD? ✓	AD?	AD? ✓	AD? ✓	AD? ✓	AD? ✓	AD? ✓		
4.0 g/L	0	0	0	0	0	0	0	0	0	0	0	0
	AD? ✓	AD? ✓	AD? ✓	AD? ✓	AD? ✓	AD? ✓	AD? ✓	AD? ✓	AD? ✓	AD? ✓		

Test Organism Mortality (Adult dead) = AD? ✓

Test Organism identified as Male = AD? M

Test Organism Injured during test = AD? I

# of Alive Adults = Number of test organism alive at termination

Total Live Young = Total neonates produced in first 3 broods

Footnote: As per EPA-600-4-91-002 and EPA-821-R-02-013, *Ceriodaphnia dubia* test should be terminated when 60% of the surviving control organisms have produced their third brood, or at the end of eight days, whichever occurs first.

Also as per EPA-821-R-02-013 (13.10.9.1), "In this three-brood test, offspring from fourth or higher broods should not be counted and should not be included in the total number of neonates produced during the test."

Endpoint	Value	Cusum Chart Limits
Survival - EC_{25}	0.93	0.51 to 2.64
Reproduction - IC_{25}	0.64	0.25 to 1.26

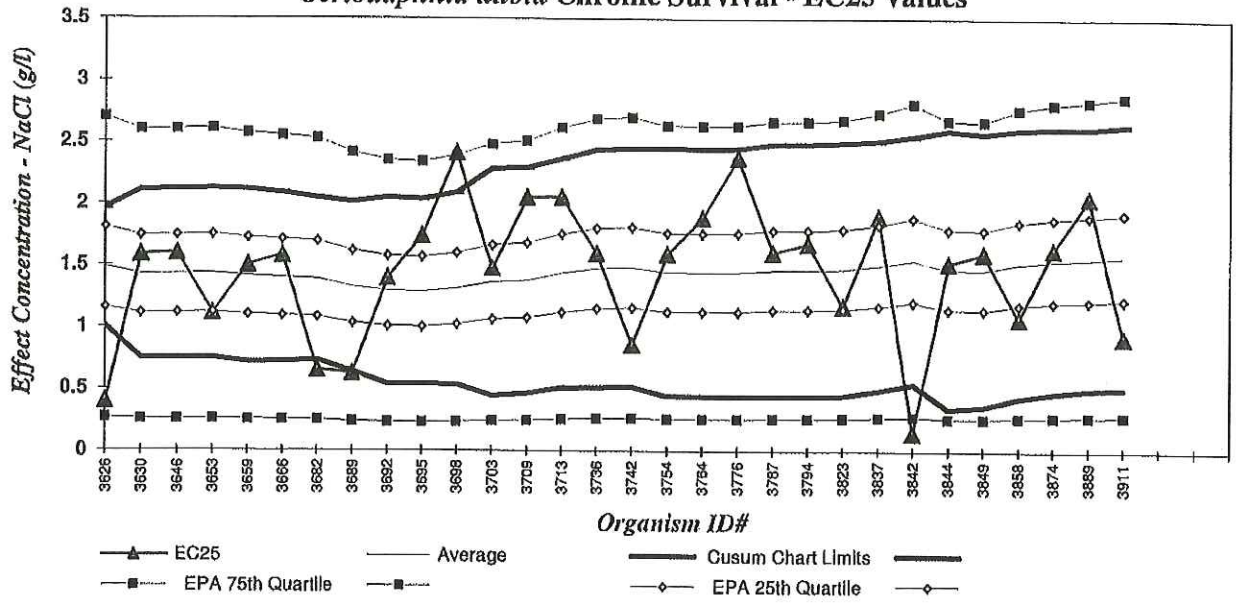
Task Manager: [signature]

Project Manager:

QA Officer: [signature]

REFERENCE TOXICANT CUMLATIVE SUMMARY (CUSUM) CHART

Ceriodaphnia dubia Chronic Survival - EC25 Values



Ceriodaphnia dubia - Chronic (EPA Test Method 1002.0)

SODIUM CHLORIDE (g/L)

Endpoint: Chronic Survival

Stats Method: Linear Interpolation

Test Conditions: Recon MH, 25 oC

From EPA 833-R-00-003:

10th Quartile CV (*control limit*) = 0.07

25th Quartile CV (*warning limit*) = 0.11

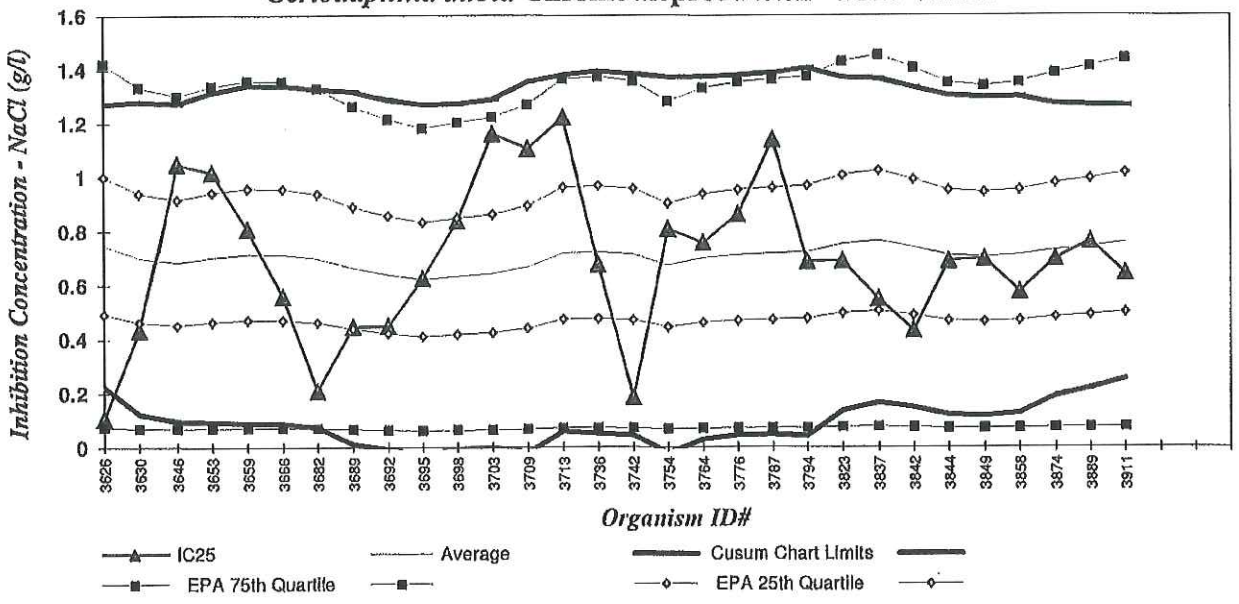
75th Quartile CV (warning *limit*) = 0.41

90th Quartile CV (*control limit*) = 0.81

Intralab CV is compared to EPA ***Warning limits*** *(25th and 75th CV's) and* ***Control limits*** *(10th and 90th CV's), If lab CV is outside EPA Control limits, the EPA Control limits are used to set Cusum chart limits.*

Event #	Cerio ID #	Test Start Date	EC25	Running Average	Running SD	Cusum Chart Limits AVG-2SD	Cusum Chart Limits AVG+2SD	Intralab CV
369	3814	04/24/21	< 0.25	1.46	0.51	0.44	2.48	0.33
370	3819	05/04/21	<0.25	1.46	0.51	0.44	2.48	0.32
371	3823	05/13/21	1.17	1.47	0.51	0.45	2.50	0.33
372	3837	06/22/21	1.90	1.50	0.50	0.49	2.51	0.33
373	3842	06/29/21	0.15	1.54	0.50	0.54	2.55	0.38
374	3844	07/13/21	1.52	1.47	0.56	0.34	2.60	0.34
375	3849	07/20/21	1.60	1.47	0.55	0.36	2.57	0.33
376	3858	08/10/21	1.08	1.52	0.54	0.43	2.60	0.35
377	3874	09/14/21	1.64	1.54	0.54	0.47	2.62	0.33
378	3889	10/14/21	2.06	1.56	0.53	0.50	2.61	0.34
379	3911	11/30/21	0.93	1.57	0.53	0.51	2.64	0.36
380								
381								
382								

REFERENCE TOXICANT CUMLATIVE SUMMARY (CUSUM) CHART
Ceriodaphnia dubia Chronic Reproduction - IC25 Values



Ceriodaphnia dubia - Chronic (EPA Test Method 1002.0)

SODIUM CHLORIDE (g/L)

Endpoint: Chronic Reproduction

Stats Method: Linear Interpolation

Test Conditions: Recon MH, 25 oC

From EPA 833-R-00-003:

10th Quartile CV (*control limit*) = 0.08

25th Quartile CV (*warning limit*) = 0.17

75th Quartile CV (warning *limit*) = 0.45

90th Quartile CV (*control limit*) = 0.62

*Intralab CV is compared to EPA **Warning limits** (25th and 75th CV's) and **Control limits** (10th and 90th CV's), If lab CV is outside EPA Control limits, the EPA Control limits are used to set Cusum chart limits.*

Event #	Cerio ID #	Test Start Date	IC25	Running Average	Running SD	Cusum Chart Limits AVG-2SD	Cusum Chart Limits AVG+2SD	Intralab CV
368	3811	04/20/21	**< 0.25**	0.72	0.34	**0.04**	**1.40**	0.40
369	3814	04/27/21	**<0.25**	0.72	0.34	**0.04**	**1.40**	0.41
370	3819	05/04/21	**<0.25**	0.72	0.34	**0.04**	**1.40**	0.42
371	3823	05/13/21	0.69	0.75	0.31	**0.13**	**1.37**	0.43
372	3837	06/22/21	0.55	0.76	0.30	**0.16**	**1.37**	0.43
373	3842	06/29/21	0.43	0.74	0.30	**0.15**	**1.33**	0.39
374	3844	07/13/21	0.69	0.71	0.30	**0.12**	**1.30**	0.37
375	3849	07/20/21	0.70	0.70	0.30	**0.11**	**1.29**	0.35
376	3858	08/10/21	0.58	0.71	0.29	**0.13**	**1.30**	0.36
377	3874	09/14/21	0.70	0.73	0.27	**0.19**	**1.27**	0.36
378	3889	10/14/21	0.76	0.74	0.26	**0.22**	**1.27**	0.34
379	3911	11/30/21	0.64	0.76	0.25	**0.25**	**1.26**	0.33
380								
381								

TestAmerica

FATHEAD MINNOW 7-DAY SURVIVAL AND WATER QUALITY DATA

Random Template Used: 6 conc. x 4 reps. # 1 | Waterbath/incubator Used: # 10 | Date Initiated 11/16/20 21 Time 15:55

Stock Sol. ID 2B 095 - 01 | Date Terminated 11/23/20 21 Time 10:25

Organism ID: FHM 2193 | Test Container Size: 800 ml | Solution Volume / rep: 500 ml

Client: QA / QC - RefTox | Sample Description: KCl (50 g/L stock)

Tech: Day 0 ~~ADL~~/KG Day 1 TC Day 2 ~~ADL~~ Day 3 ~~ADL~~ Day 4 KG Day 5 KG Day 6 TC Day 7 KG

Time: Day 0 1555 Day 1 0955 Day 2 1340 Day 3 1356 Day 4 1505 Day 5 1340 Day 6 1123 Day 7 1025

Conc. or Percent	Day	Number of Live Organisms A	B	C	D	Dissolved O_2 (mg/l) Pre	Post	pH Pre	Post	Temp. (°C) Pre	Therm. ID#	Conductivity (µS) Post (daily)
Control	0	10	10	10	10		7.0		7.3	Post: 24.1	252	314
	1	10	10	10	10	7.4	8.0	7.7	8.1	(23.3)	252	319
	2	10	10	10	10 ✓	6.9	7.4	7.5	7.8	(23.5)	252	330
	3	10	10	10	10	6.8	7.9	7.10	7.9	24.1	252	328
	4	10	10	10	10	7.0	7.9	7.4	7.6	24.0	252	306
	5	10 ✓	10	10	10	6.8	8.1	7.3	7.8	(23.7)	252	304
	6	10 ✓	10	10	10	6.5	7.9	7.5	8.0	24.0	252	303
	7	10	10	10	10	6.6		7.5		23.9	252	
0.25 g/L	0	10	10	10	10		7.4		7.4	Post: 24.0		800
	1	10	10	10	10	7.5	8.2	7.6	8.1	(23.8)		795
	2	10	10	10 ✓	10	7.1	8.0	7.4	7.4	(23.8)		804
	3	10	10	10 ✓	10	7.0	8.0	7.5	8.0	24.2		763
	4	10	10	10	10	7.1	7.5	7.4	7.7	24.1		766
	5	10	10	10	10	6.8	8.4	7.2	7.9	(23.7)		760
	6	10	10	10	10	6.4	8.0	7.4	8.0	24.1		761
	7	10	10	10	10	6.6		7.6		(23.9)		
0.50 g/L	0	10	10	10	10		7.9		7.8	Post: 24.0		1330
	1	10	10	10	10	7.5	8.2	7.6	8.1	24.0		1234
	2	10	10	10	10	7.1	8.2	7.4	7.9	(23.8)		1268
	3	10	10	10	10	7.1	8.1	7.10	8.0	24.3		1231
	4	10	10	10	10	7.0	7.8	7.4	7.8	24.0		1220
	5	10	9	10	10	6.2	8.5	7.3	7.9	(23.7)		1210
	6	10	9	10	10	6.3	8.1	7.4	8.0	24.0		1235
	7	9	9	10	10	6.3		7.6		23.8		
1.0 g/L	0	10	10	10	10		7.9		7.8	Post: 24.0		2450
	1	2	2	1	2	7.4	8.3	7.7	8.1	(23.6)		2140
	2	1	2	1	2	6.9	8.3	7.4	7.9	(23.5)		2140
	3	1	2	1	2	7.1	8.2	7.7	8.0	24.1		2160
	4	1	2	1	2	7.0	8.0	7.6	7.9	24.0		2140
	5	1	1	0	2	6.6	8.5	7.5	7.9	(23.7)		2140
	6	1	1	1	0	6.5	8.1	7.5	8.0	24.2		2120
	7	1	1	1	0	6.3		7.8		23.8		
2.0 g/L	0	10	10	10	10		8.0		8.0	Post: 24.0		4440
	1	0	0	0	0	7.5	8.4	7.7	8.1	(23.8)		3850
	2											
	3											
	4											
	5											
	6											
	7											
4.0 g/L	0	10	10	10	10		8.1		8.0	Post: 24.1		8370
	1	0	0	0	0	7.5	8.5	7.7	8.1	24.0		7150
	2											
	3											
	4											
	5											
	6											
	7											

✓ Indicates one organism inadvertently poured off during solution renewal, replaced into container.

"M" = organism missing, start count reduced. "Inj" = organism injured, remove from stats.

"F" = fungus noted on dead organisms.

Pre =Pre-renewal solutions. Post =Post-renewal solutions.

Day 0 Temperatures = Post-renewals

Therm ID# = Thermometer ID used for all measurements that day.

(23.8) = Temp. out of recommended range

Endpoint

Survival - EC_{25}	0.60
Growth - IC_{25}	0.54

Cusum Chart Limits

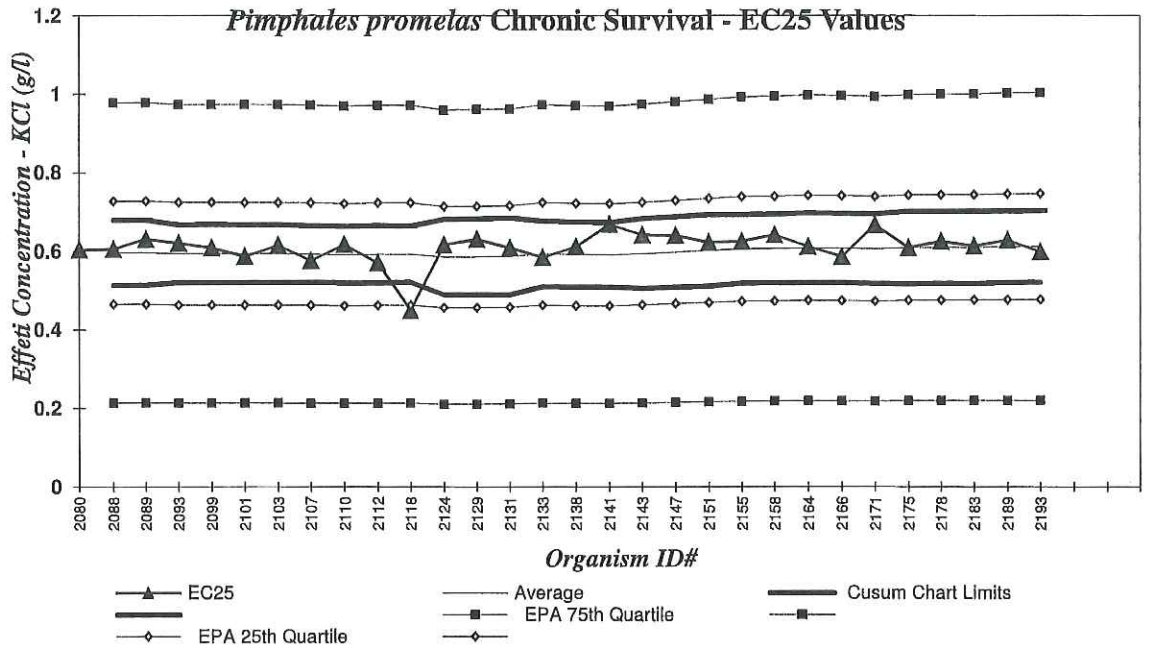
Survival - EC_{25}	0.52 to 0.70
Growth - IC_{25}	0.44 to 0.71

Task Manager Kendall Dyke

Project Manager

QA Officer

REFERENCE TOXICANT CUMLATIVE SUMMARY (CUSUM) CHART



Pimephales promelas **- Chronic (EPA Test Method 1000.0)**

POTASSIUM CHLORIDE (g/L)

Endpoint: Chronic Survival

Stats Method: Linear Interpolation

Test Conditions: Recon MH, 25 oC

From EPA 833-R-00-003:

10th Quartile CV (*control limit*) = 0.03

25th Quartile CV (*warning limit*) = 0.11

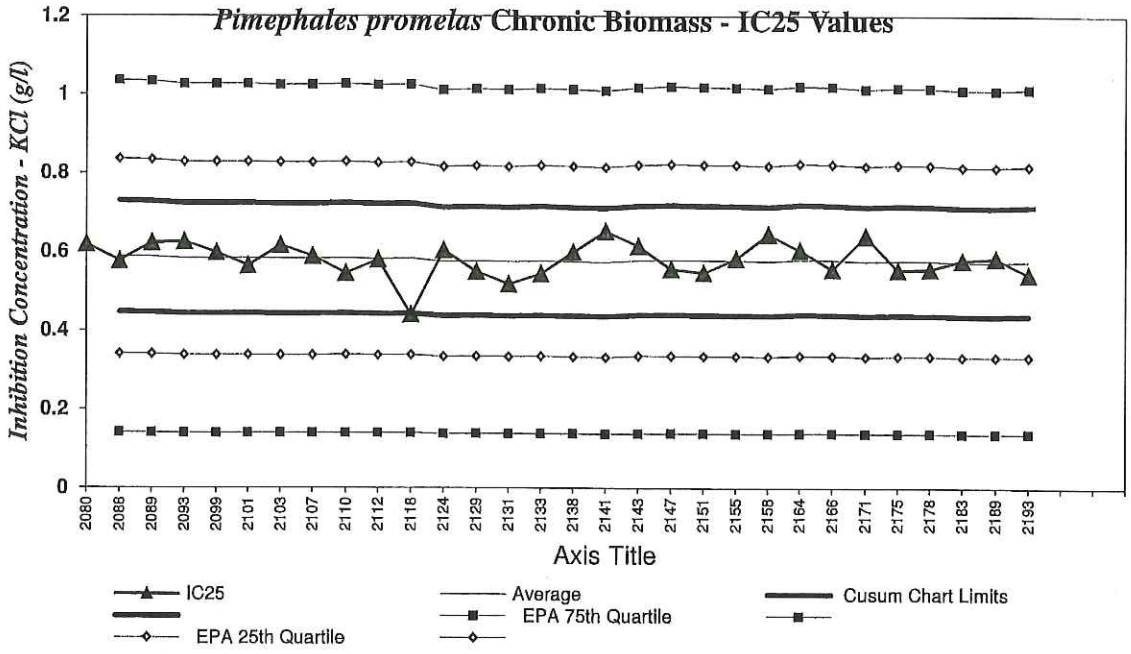
75th Quartile CV (*warning limit*) = 0.32

90th Quartile CV (*control limit*) = 0.52

Intralab CV is compared to EPA ***Warning limits*** *(25th and 75th CV's) and* ***Control limits*** *(10th and 90th CV's), If lab CV is outside EPA Control limits, the EPA Control limits are used to set Cusum chart limits.*

Event #	FHM ID #	Test Start Date	EC25	Running Average	Running SD	Cusum Chart Limits AVG-2SD	Cusum Chart Limits AVG+2SD	Intralab CV
64	2133	10/27/2020	**0.58**	0.6	0.04	**0.51**	**0.68**	0.07
65	2138	12/3/2020	**0.61**	0.6	0.04	**0.51**	**0.67**	0.07
66	2141	12/29/2020	**0.67**	0.6	0.04	**0.51**	**0.67**	0.07
67	2143	1/12/2021	**0.64**	0.6	0.04	**0.51**	**0.68**	0.08
68	2147	2/2/2021	**0.64**	0.6	0.04	**0.51**	**0.69**	0.08
69	2151	3/23/2021	**0.62**	0.6	0.05	**0.51**	**0.69**	0.07
70	2155	4/15/2021	**0.63**	0.6	0.04	**0.52**	**0.69**	0.07
71	2158	5/11/2021	**0.64**	0.6	0.04	**0.52**	**0.69**	0.07
72	2164	6/22/2021	**0.61**	0.6	0.04	**0.52**	**0.70**	0.07
73	2166	7/1/2021	**0.59**	0.6	0.04	**0.52**	**0.70**	0.07
74	2171	7/20/2021	**0.67**	0.6	0.04	**0.52**	**0.69**	0.08
75	2175	8/17/2021	**0.61**	0.6	0.05	**0.52**	**0.70**	0.08
76	2178	9/9/2021	**0.63**	0.6	0.05	**0.52**	**0.70**	0.08
77	2183	9/28/2021	**0.61**	0.6	0.05	**0.52**	**0.70**	0.07
78	2189	11/2/2021	**0.63**	0.6	0.05	**0.52**	**0.70**	0.07
79	2193	11/16/2021	**0.60**	0.6	0.05	**0.52**	**0.70**	0.07

REFERENCE TOXICANT CUMLATIVE SUMMARY (CUSUM) CHART



Pimephales promelas **- Chronic (EPA Test Method 1000.0)**

POTASSIUM CHLORIDE (g/L)

Endpoint: Chronic Growth (Biomass)

Stats Method: Linear Interpolation

Test Conditions: Recon MH, 25 oC

From EPA 833-R-00-003:

10th Quartile CV (*control limit*) =	0.12
25th Quartile CV (*warning limit*) =	0.21
75th Quartile CV (*warning limit*) =	0.38
90th Quartile CV (*control limit*) =	0.45

Intralab CV is compared to EPA ***Warning limits*** *(25th and 75th CV's) and* ***Control limits*** *(10th and 90th CV's), If lab CV is outside EPA Control limits, the EPA Control limits are used to set Cusum chart limits.*

Event #	FHM ID #	Test Start Date	IC25	Running Average	Running SD	Cusum Chart Limits AVG-2SD	Cusum Chart Limits AVG+2SD	Intralab CV
67	2143	1/12/2021	**0.62**	0.58	0.05	**0.44**	**0.72**	0.08
68	2147	2/2/2021	**0.56**	0.58	0.05	**0.44**	**0.72**	0.08
69	2151	3/23/2021	**0.55**	0.58	0.05	**0.44**	**0.72**	0.08
70	2155	4/15/2021	**0.58**	0.58	0.05	**0.44**	**0.72**	0.08
71	2158	5/11/2021	**0.65**	0.58	0.05	**0.44**	**0.72**	0.08
72	2164	6/22/2021	**0.60**	0.58	0.05	**0.44**	**0.72**	0.08
73	2166	7/1/2021	**0.56**	0.58	0.05	**0.44**	**0.72**	0.08
74	2171	7/20/2021	**0.64**	0.58	0.05	**0.44**	**0.71**	0.09
75	2175	8/17/2021	**0.55**	0.58	0.05	**0.44**	**0.72**	0.09
76	2178	9/9/2021	**0.56**	0.58	0.05	**0.44**	**0.72**	0.09
77	2183	9/28/2021	**0.58**	0.57	0.05	**0.44**	**0.71**	0.09
78	2189	11/2/2021	**0.58**	0.57	0.05	**0.44**	**0.71**	0.08
79	2193	11/16/2021	**0.54**	0.58	0.05	**0.44**	**0.71**	0.09

TestAmerica

GREEN ALGAE (*Selenastrum capricornutum*) TEST CONDITIONS

Client: QA / QC

Sample Description: NaCl Reagent Log #: 280EB-05

Test Start Date: 11/9/21 Time: 1538 Initials: TC

Test End Date: 11-13-21 Time: 1350 Initials: ABL

TEST CONDITIONS AT INITIATION:

Species ID#: SC1050 Dilution Water ID #: 9447

Age: 4 days Note: includes EDTA

INOCULUM (Axenic Culture)		Culture Density = Mean # of Cells/Field x 250,000	
# Cells	# Fields		Culture Density
509	250		
MEAN	2.04	x 250,000 =	510,000

Filtration	None
Note: 50 g/L NaCl stock based off of DI water (0.2 um filtered)	

Test Vol. / Replicate	50 mls
No. of Reps	4
Nutrient Dosage	
1 ml per L in Dilution water only. NaCl stock not nutrient dosed	

Test Start Density	x	Test Volume	/	Culture Density	=	Inoculum Volume
10,000	x	50 ml	/	510,000	=	0.98 ml

Confirming Counts			
	# Cells	# Fields	Cell Conc.x10^6 (cells/ml)
Flask #1	9	250	0.005
Flask #2	9	250	0.005
Flask #3	7	250	0.007

Light Intensity at Test Initiation (foot-candles)		
Location #1	Location #2	Location #3
869	374	385

Technician	0 hr	TC	24 hr	ABL	48 hr	ABL	72 hr	ABL	96 hr	ABL
Time	0 hr	1323	24 hr	1306	48 hr	0939	72 hr	1356	96 hr	1350
Thermometer ID:	0 hr	# 264	24 hr	# 264	48 hr	# 264	72 hr	# 264	96 hr	# 264

Test Concen. (g/L)	D.O. (mg/L)	pH					Temperature (°C)					Conductivity (umohs/cm)	Hard.	Alk.
	0 hr	0 hr	24	48	72	96	0 hr	24	48	72	96	0 hr	0 hr	0 hr
Control	6.2	7.5	6.9	6.9	7.8	9.1	25.2	24.7	24.8	24.8	25.0	95.5	15	10
0.25	6.7	7.4	6.9	6.9	7.9	9.2	25.2	24.7	24.7	24.8	25.0	611	17	11
0.50	6.6	7.4	6.9	7.2	7.9	9.1	25.0	24.5	24.7	24.5	25.0	1146		
1.0	6.6	7.3	7.0	7.2	7.9	8.6	24.8	24.7	24.6	24.6	25.0	2170	17	11
2.0	6.5	7.3	7.0	7.2	7.7	8.2	24.8	24.5	24.6	24.5	25.0	4130		
4.0	6.7	7.3	7.0	7.2	7.5	7.9	24.6	24.5	24.7	24.5	25.0	7870	17	11

Task Manager

Project Manager Alyssa Lamps

QA Officer

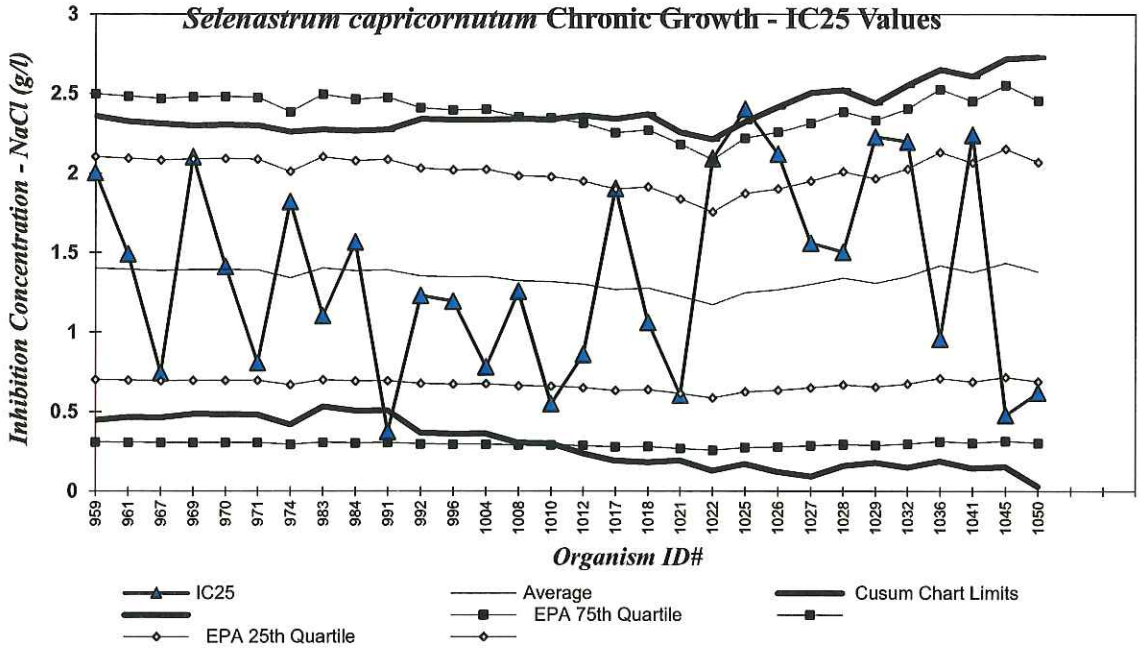
Endpoint : Growth

IC25 : 0.62

Cusum Chart Limits : 0.03 to 2.73

Comments:

REFERENCE TOXICANT CUMLATIVE SUMMARY (CUSUM) CHART



Selenastrum capricornutum **- Green Algae - Chronic (EPA Test Method 1003.0)**

SODIUM CHLORIDE (g/L)

Endpoint: Chronic Growth

Stats Method: Linear Interpolation

Test Conditions: Recon MH, 25 oC

From EPA 833-R-00-003:

10th Quartile CV (*control limit*) =	0.02
25th Quartile CV (*warning limit*) =	0.25
75th Quartile CV (*warning limit*) =	0.39
90th Quartile CV (*control limit*) =	0.51

As per EPA 833-R-00-003, section B.2.1, the quartiles listed above are from just a few labs (6) and therefore not to be considered typical or representative. Cusum limits are based on ASL data only.

Event #	Algae ID #	Test Start Date	IC25	Running Average	Running SD	Cusum Chart Limits AVG-2SD	Cusum Chart Limits AVG+2SD	Intralab CV
216	1022	4/13/2021	**2.09**	1.17	0.52	**0.13**	**2.21**	0.43
217	1025	4/28/2021	**2.40**	1.25	0.54	**0.17**	**2.32**	0.45
218	1026	5/15/2021	**2.12**	1.27	0.57	**0.12**	**2.41**	0.46
219	1027	5/18/2021	**1.56**	1.30	0.60	**0.09**	**2.51**	0.44
220	1028	5/27/2021	**1.51**	1.34	0.59	**0.16**	**2.52**	0.43
221	1029	6/8/2021	**2.23**	1.31	0.56	**0.18**	**2.44**	0.44
222	1032	7/8/2021	**2.20**	1.35	0.60	**0.15**	**2.55**	0.43
223	1036	7/30/2021	**0.96**	1.42	0.62	**0.19**	**2.65**	0.45
224	1041	8/26/2021	**2.24**	1.38	0.62	**0.15**	**2.61**	0.45
225	1045	10/14/2021	**0.48**	1.43	0.64	**0.15**	**2.72**	0.49
226	1050	11/9/2021	**0.62**	1.38	0.67	**0.03**	**2.73**	0.47
227								
228								
229								
230								

APPENDIX C

CHAIN OF CUSTODY

eurofins | Environment Testing TestAmerica

Sample Receipt Record

Batch Number: B92360-01 Date Received: 11/9/21

Client/Project: Woodland Received By: TL

Were custody seals intact?	☒ Yes	☐ No	☐ N/A
Packing Material:	☐ Ice	☒ Blue Ice	☐ Box
Temp OK? (≤ 6°C) Therm ID: 109 Expires: 12/9/2021 Observed: 1.7 / 1.6 °C, Actual Temp: 1.5 / 2.2 °C	☒ Yes	☐ No	☐ N/A
If sample is noted @ ≤ 0.0 °C, is the sample frozen or partially frozen?	☐ Yes	☐ No	☒ N/A
Was a Chain of Custody (CoC) Provided?	☑ Yes	☐ No	☐ N/A
Was the CoC correctly filled out? (If No, document below)	☒ Yes	☐ No	☐ N/A
Were the sample containers in good condition (not broken or leaking)?	☒ Yes	☐ No	☐ N/A
Are all samples within 36 hours of collection?	☒ Yes	☐ No	☐ N/A

Method of Shipment: ☐ Hand Delivered, ☒ FedEx, ☐ UPS, ☐ Greyhound, ☐ Other: _____ ☐ N/A

Doc Control ID: ASL993-1119

CHAIN OF CUSTODY RECORD - FOR AQUATIC TOXICITY TESTING

eurofins | Environment Testing TestAmerica

Client: City of Woodland NPDES# WA0020401

Address: 755 Sandalwood Rd Woodland WA 98674

Contact Person: Derrek Amburgey

Phone: 360-225-7007

PO# 37314

Composite Sample Information

Samples/Hour N/A Volume/Sample N/A

Total Hours 24 Total Volume 20L

Initiated: Date 11-7-21 Time 9AM

Ended: Date 11-8-21 Time 9AM

Chilled During Collection Yes

Ship Samples to:

Eurofins TestAmerica
Attention: Aquatic Toxicology Laboratory
1100 NE Circle Blvd. Suite 310
Corvallis, OR 97330
Phone: 541-243-6137

Analysis Required / Comments

Sample ID	Date	Time	Sample Type Comp.	Sample Type Grab	# of Containers	Lab ID#	Fathead Acute	Fathead Chronic	Cerio Acute	Cerio Chronic	Daphnia Acute	Trout Acute	SHM Acute	SHM Chronic	MB Acute	MB Chronic	MYS Acute	MYS Chronic	Algae Chronic	CA Haz Waste	WA Haz Waste	Daphnia Chronic	Concentration and/or Comments
EFF	11-7-21	9AM	X		2	B923600	X	X			X								X			X	

Project ID: Q21-05391 | Prepared By: Brett Muckey

Qty	Description
1	Algae chronic, definitive (5 concentration) bioassay
1	Concurrent Algae chronic Reference Toxicant test
1	Ceriodaphnia dubia acute, definitive (5 conc.), non-renewal, 48 hr, bioassay
1	Ceriodaphnia dubia chronic, definitive (5 conc.), bioassay
1	Fathead minnow acute, definitive (5 conc.), renewal (@ 48 hr), 96 hr duration, bioassay
1	Fathead minnow chronic, definitive (5 conc.), bioassay

Sampled By & Title (Please sign and print name) Derrek Amburgey		Date/Time 11-7-21 9AM	Relinquished By (Please sign and print name) Bob Fowler	Date/Time 11-8-21 9AM
Received By (Please sign and print name) IGY Courier		Date/Time 11/9/21 1010	Relinquished By (Please sign and print name)	Date/Time
Received By (Please sign and print name)		Date/Time	Relinquished By (Please sign and print name)	Date/Time
Received By (Please sign and print name)		Date/Time	Shipped Via UPS___ Bus___ Fed-Ex___ Hand___ Other___	Shipping # COC_Bioassay
Work Authorized By (Please sign and print name)		Remarks		Doc Control ID: ASL612-0519

eurofins | Environment Testing TestAmerica

Sample Receipt Record

Batch Number: B5936-02 Date Received: 11/11/21

Client/Project: Woodland Received By: [illegible]

Were custody seals intact? ☑ Yes ☐ No ☐ N/A

Packing Material: ☐ Ice ☒ Blue Ice ☐ Box

Temp OK? (≤ 6°C) Therm ID: TH169 Expires: 3/9/2021 Observed: 2.6 / 1.4 °C, Actual Temp: 3.0 / 1.8 °C ☑ Yes ☐ No ☐ N/A

If sample is noted @ ≤ 0.0 °C, is the sample frozen or partially frozen? ☐ Yes ☒ No ☐ N/A

Was a Chain of Custody (CoC) Provided? ☑ Yes ☐ No ☐ N/A

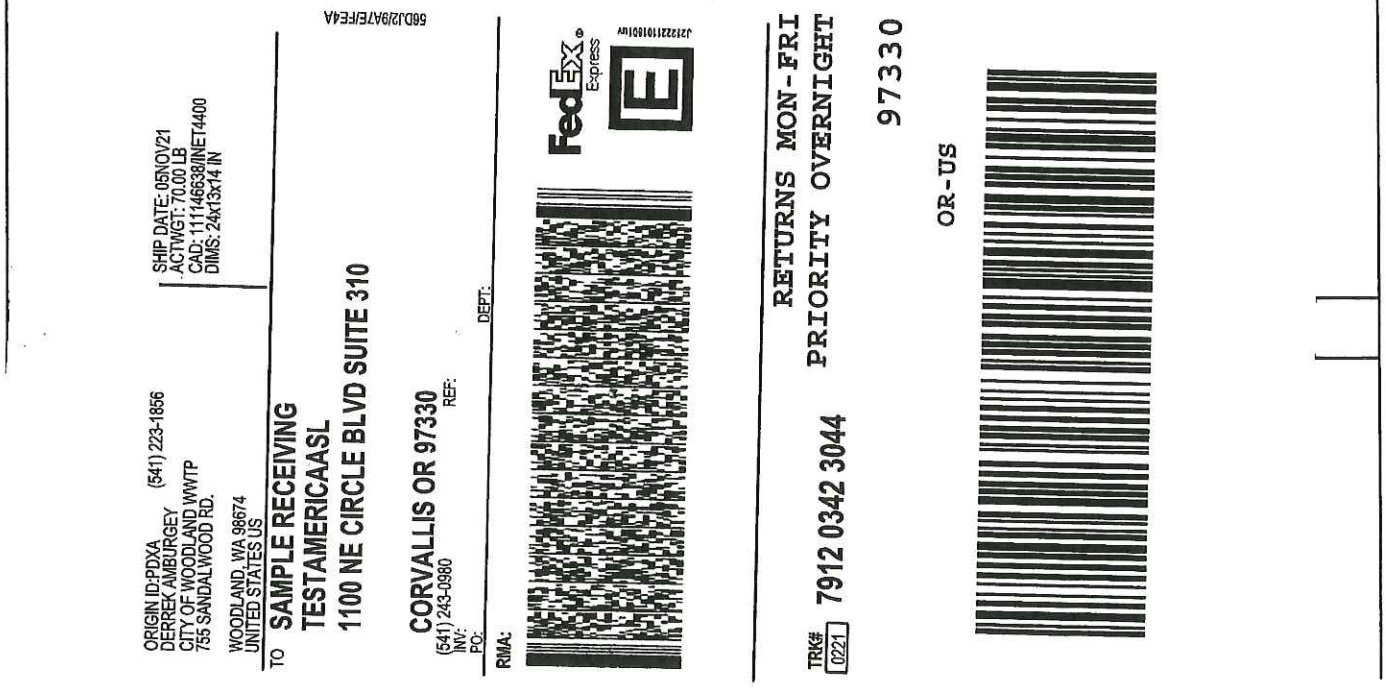
Was the CoC correctly filled out? (If No, document below) ☑ Yes ☐ No ☐ N/A

Were the sample containers in good condition (not broken or leaking)? ☑ Yes ☐ No ☐ N/A

Are all samples within 36 hours of collection? ☑ Yes ☐ No ☐ N/A

Method of Shipment: ☐ Hand Delivered, ☑ FedEx, ☐ UPS, ☐ Greyhound, ☐ Other: _____ ☐ N/A

Sample Exception Report (The following exceptions were noted)



ation
1119

CHAIN OF CUSTODY RECORD - FOR AQUATIC TOXICITY TESTING

eurofins | Environment Testing TestAmerica

Client: City of Woodland NPDES# WA0020401

Address: 755 Sandalwood Rd Woodland WA 98674

Contact Person: Derrek Amburgey

Phone: 360-225-7007

PO# 37314

Composite Sample Information

Samples/Hour N/A Volume/Sample N/A

Total Hours 24 Total Volume 20L

Initiated: Date 11-9-21 Time 10AM

Ended: Date 11-10-21 Time 10AM

Chilled During Collection Yes

Ship Samples to:

Eurofins TestAmerica
Attention: Aquatic Toxicology Laboratory
1100 NE Circle Blvd. Suite 310
Corvallis, OR 97330
Phone: 541-243-6137

Analysis Required / Comments

Sample ID	Date	Time	Sample Type: Comp.	Sample Type: Grab	# of Containers	Lab ID#	Fathead Acute	Fathead Chronic	Cerio Acute	Cerio Chronic	Daphnia Acute	Trout Acute	SHM Acute	SHM Chronic	MB Acute	MB Chronic	MYS Acute	MYS Chronic	Algae Chronic	CA Haz Waste	WA Haz Waste	Daphnia Chronic	Concentration and/or Comments
EFF	11-9-21	10AM	X		2	B523603	X	X			X								X			X	

Project ID: Q21-05391 | Prepared By: Brett Muckey

Qty	Description
1	Algae chronic, definitive (5 concentration) bioassay
1	Concurrent Algae chronic Reference Toxicant test
1	Ceriodaphnia dubia acute, definitive (5 conc.), non-renewal, 48 hr, bioassay
1	Ceriodaphnia dubia chronic, definitive (5 conc.), bioassay
1	Fathead minnow acute, definitive (5 conc.), renewal (@ 48 hr), 96 hr duration, bioassay
1	Fathead minnow chronic, definitive (5 conc.), bioassay

Sampled By & Title (Please sign and print name) Derrek Amburgey	Date/Time 11-9-21 10AM	Relinquished By (Please sign and print name) Bob Fowler	Date/Time 11-10-21 9:45
Received By (Please sign and print name) Alyssa Lamp	Date/Time 11/11/21 1225	Relinquished By (Please sign and print name)	Date/Time
Received By (Please sign and print name)	Date/Time	Relinquished By (Please sign and print name)	Date/Time
Received By (Please sign and print name)	Date/Time	Shipped Via UPS___ Bus___ Fed-Ex___ Hand___ Other___	Shipping # COC_Bioassay
Work Authorized By (Please sign and print name)	Remarks		Doc Control ID: ASL612-0519

eurofins | Environment Testing TestAmerica

Sample Receipt Record

Batch Number: B5236-03 Date Received: 11-13-21

Client/Project: Woodland Received By: KG

Were custody seals intact? ☒ Yes ☐ No ☐ N/A

Packing Material: ☒ Ice ☐ Blue Ice ☐ Box

Temp OK? (≤ 6°C) Therm ID: 169 Expires: 12 / 09 /2021 Observed: 2.8 / 3.0 °C, Actual Temp: 1.7 / 1.9 °C ☒ Yes ☐ No ☐ N/A

If sample is noted @ ≤ 0.0 °C, is the sample frozen or partially frozen? ☐ Yes ☐ No ☒ N/A

Was a Chain of Custody (CoC) Provided? ☒ Yes ☐ No ☐ N/A

Was the CoC correctly filled out? (If No, document below) ☒ Yes ☐ No ☐ N/A

Were the sample containers in good condition (not broken or leaking)? ☒ Yes ☐ No ☐ N/A

Are all samples within 36 hours of collection? ☒ Yes ~~☒ No~~ ☐ N/A

R06 MB 12/11/21

Method of Shipment: ☐ Hand Delivered, ☒ FedEx, ☐ UPS, ☐ Greyhound, ☐ Other: _____ ☐ N/A

Sample Exception Report (The following exceptions were noted)

TRK# 7912 0342 4051

Composite sample was started 11-11-21 and stated it ended on 11-11-21, but I believe this to be a typo.

Confirmed sample date with client, see attached email. MB 12/11/21

Client was notified on: Client contact:

Resolution to Exception:

CHAIN OF CUSTODY RECORD - FOR AQUATIC TOXICITY TESTING

eurofins | Environment Testing TestAmerica

Client: City of Woodlands NPDES# WA0020401

Address: 755 Sandalwood Rd Woodland WA 98674

Contact Person: Derrek Amburgey

Phone: 360-225-7007

PO# 37314

Composite Sample Information

Samples/Hour N/A Volume/Sample N/A

Total Hours 24 Total Volume 20L

Initiated: Date 11-11-21 Time 9AM

Ended: Date 11-11-21 Time 9AM

Chilled During Collection Yes

Ship Samples to:

Eurofins TestAmerica
Attention: Aquatic Toxicology Laboratory
1100 NE Circle Blvd. Suite 310
Corvallis, OR 97330
Phone: 541-243-6137

Analysis Required / Comments

Sample ID	Date	Time	Sample Type: Comp.	Sample Type: Grab	# of Containers	Lab ID#	Fathead Acute	Fathead Chronic	Cerio Acute	Cerio Chronic	Daphnia Acute	Trout Acute	SHM Acute	SHM Chronic	MB Acute	MB Chronic	MYS Acute	MYS Chronic	Algae Chronic	CA Haz Waste	WA Haz Waste	Daphnia Chronic	Concentration and/or Comments
EFF	11-11-21	9AM	X		2	BS236-03	X	X			X								X			X	

Project ID: Q21-05391 | Prepared By: Brett Muckey

Qty	Description
1	Algae chronic, definitive (5 concentration) bioassay
1	Concurrent Algae chronic Reference Toxicant test
1	Ceriodaphnia dubia acute, definitive (5 conc.), non-renewal, 48 hr, bioassay
1	Ceriodaphnia dubia chronic, definitive (5 conc.), bioassay
1	Fathead minnow acute, definitive (5 conc.), renewal (@ 48 hr), 96 hr duration, bioassay
1	Fathead minnow chronic, definitive (5 conc.), bioassay

Sampled By & Title (Please sign and print name) Derrek Amburgey	Date/Time 11-11-21 9AM	Relinquished By (Please sign and print name) Bob Fowler	Date/Time 11-12-21 9:45 am
Received By (Please sign and print name) Kendal Gile	Date/Time 11-13-21 11:00	Relinquished By (Please sign and print name)	Date/Time
Received By (Please sign and print name)	Date/Time	Relinquished By (Please sign and print name)	Date/Time
Received By (Please sign and print name)	Date/Time	Shipped Via UPS Bus Fed-Ex Hand Other	Shipping # COC_Bioassay
Work Authorized By (Please sign and print name)	Remarks		Doc Control ID: ASL612-0519

Bennett, Michelle

From: Derrek Amburgey <AmburgeyD@ci.woodland.wa.us>
Sent: Saturday, December 11, 2021 11:28 AM
To: Bennett, Michelle
Subject: Re: Sample Question for Bioassay

EXTERNAL EMAIL*

Yes the 2nd date should read 11/12/21.
Thanks, Derrek

Get Outlook for Android

From: Bennett, Michelle <michelle.bennett@Eurofinset.com>
Sent: Saturday, December 11, 2021 11:00:53 AM
To: Derrek Amburgey <AmburgeyD@ci.woodland.wa.us>
Subject: Sample Question for Bioassay

Hi Derrek,
I am not sure if the lab has reached out to you (Alyssa Lampi is out on PTO), but the COC lists your composite sample as 11/11/21 09:00 to 11/11/21 09:00. I am assuming this was a typo and the second date should say 11/12/21, correct? I want to make sure any deviations are noted correctly, but I don't believe the sample was past the 36 hour holdtime if this is a typo on the COC. I am writing up your report and should have it out to you next week.

Thanks
Michelle

Michelle Bennett
Analyst III/ QA Coordinator

Phone (cell): 541-760-3031

E-mail: michelle.bennett@Eurofinset.com

Confidentiality Notice: The information contained in this message is intended only for the use of the addressee, and may be confidential and/or privileged. If the reader of this message is not the intended recipient, or the employee or agent responsible to deliver it to the intended recipient, you are hereby notified that any dissemination, distribution or copying of this communication is strictly prohibited. If you have received this communication in error, please notify the sender immediately.

Please note: In order to continue to provide critical testing services, **Eurofins Environment Testing laboratories in the US are maintaining our courier services and continue to sample, analyze and report all test data as usual.** The situation around COVID-19 continues to be fluid and we are continuing to follow local and government mandates as applicable. For up-to-date business information, visit our website and follow us on Facebook and LinkedIn.

Links to use:

Website: https://www.eurofinsus.com/environment-testing/

eurofins | Environment Testing TestAmerica

Sample Receipt Record

Batch Number: B5236-04 Date Received: 11-16-21

Client/Project: Woodland Received By: KG

Were custody seals intact? ☒ Yes ☐ No ☐ N/A

Packing Material: ☒ Ice ☐ Blue Ice ☐ Box

Temp OK? (≤ 6°C) Therm ID: TH109 Expires: 12/9 /2021 Observed: 2.2 2.6 °C, Actual Temp: 1.2 1.6 °C ☒ Yes ☐ No ☐ N/A

If sample is noted @ ≤ 0.0 °C, is the sample frozen or partially frozen? ☐ Yes ☐ No ☒ N/A

Was a Chain of Custody (CoC) Provided? ☒ Yes ☐ No ☐ N/A

Was the CoC correctly filled out? (If No, document below) ☒ Yes ☐ No ☐ N/A

Were the sample containers in good condition (not broken or leaking)? ☒ Yes ☐ No ☐ N/A

Are all samples within 36 hours of collection? ☒ Yes ☐ No ☐ N/A

Method of Shipment: ☐ Hand Delivered, ☒ FedEx, ☐ UPS, ☐ Greyhound, ☐ Other: _____ ☐ N/A

Sample Exception Report (The following exceptions were noted)

TN# 7912 0446 4485

Client was notified on: Client contact:

Resolution to Exception:

CHAIN OF CUSTODY RECORD - FOR AQUATIC TOXICITY TESTING

eurofins | Environment Testing TestAmerica

Client: City of Woodland NPDES# WA0020401

Address: 755 Sandalwood Rd Woodland WA 98674

Contact Person: Derrek Amburgey

Phone: 360-225-7007

PO# 37314

Composite Sample Information

Samples/Hour N/A Volume/Sample N/A

Total Hours 24 Total Volume 20L

Initiated: Date 11-14-21 Time 10AM

Ended: Date 11-15-21 Time 10AM

Chilled During Collection Yes

Ship Samples to:

Eurofins TestAmerica
Attention: Aquatic Toxicology Laboratory
1100 NE Circle Blvd. Suite 310
Corvallis, OR 97330
Phone: 541-243-6137

Analysis Required / Comments

Sample ID	Date	Time	Sample Type Comp.	Sample Type Grab	# of Containers	Lab ID#	Fathead Acute	Fathead Chronic	Cerio Acute	Cerio Chronic	Daphnia Acute	Trout Acute	SHM Acute	SHM Chronic	MB Acute	MB Chronic	MYS Acute	MYS Chronic	Algae Chronic	CA Haz Waste	WA Haz Waste	Daphnia Chronic	Concentration and/or Comments
EFF	11-14-21	10AM	X		2	B5236-04	X	X			X								X			X	

Project ID: Q21-05391 | Prepared By: Brett Muckey

Qty	Description
1	Algae chronic, definitive (5 concentration) bioassay
1	Concurrent Algae chronic Reference Toxicant test
1	Ceriodaphnia dubia acute, definitive (5 conc.), non-renewal, 48 hr, bioassay
1	Ceriodaphnia dubia chronic, definitive (5 conc.), bioassay
1	Fathead minnow acute, definitive (5 conc.), renewal (@ 48 hr), 96 hr duration, bioassay
1	Fathead minnow chronic, definitive (5 conc.), bioassay

Sampled By & Title (Please sign and print name) Derrek Amburgey		Date/Time 11-14-21 10AM	Relinquished By (Please sign and print name) Bob Fowler	Date/Time 11-15-21
Received By (Please sign and print name) Kendal Gile		Date/Time 11-16-21 11:20	Relinquished By (Please sign and print name)	Date/Time
Received By (Please sign and print name)		Date/Time	Relinquished By (Please sign and print name)	Date/Time
Received By (Please sign and print name)		Date/Time	Shipped Via UPS___ Bus___ Fed-Ex___ Hand___ Other___	Shipping # COC_Bioassay
Work Authorized By (Please sign and print name)		Remarks		Doc Control ID: ASL612-0519

Most recent five years of sludge monitoring data for pollutants listed in 40 Code of Federal Regulations (CFR) 503.13, tables 1 and 3.

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	Woodland, City of	**Service Request:**	K1710266
Project:	Digester Biosolids	**Date Collected:**	09/26/17 07:05
Sample Matrix:	Biosolids Solids	**Date Received:**	09/26/17 10:00
Sample Name:	Digester Biosolids 1	**Basis:**	Dry
Lab Code:	K1710266-001		

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	6020A	**5.3**	mg/Kg	3.0	5	10/13/17 14:25	10/11/17	
Cadmium	6020A	**0.98**	mg/Kg	0.12	5	10/13/17 14:25	10/11/17	
Chromium	6020A	**18.9**	mg/Kg	1.2	5	10/13/17 14:25	10/11/17	
Copper	6020A	**537**	mg/Kg	0.59	5	10/13/17 14:25	10/11/17	
Lead	6020A	**14.1**	mg/Kg	0.30	5	10/13/17 14:25	10/11/17	
Mercury	7471B	**0.70**	mg/Kg	0.18	1	10/04/17 10:53	10/04/17	
Molybdenum	6020A	**6.97**	mg/Kg	0.30	5	10/13/17 14:25	10/11/17	
Nickel	6020A	**19.5**	mg/Kg	1.2	5	10/13/17 14:25	10/11/17	
Selenium	6020A	**6.1**	mg/Kg	5.9	5	10/13/17 14:25	10/11/17	
Zinc	6020A	**659**	mg/Kg	3.0	5	10/13/17 14:25	10/11/17	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	Woodland, City of	**Service Request:**	K1806460
Project:	Digester Biosolids/City of Woodland	**Date Collected:**	07/11/18 07:00
Sample Matrix:	Biosolids Solids	**Date Received:**	07/11/18 09:00
Sample Name:	Digester Biosolids 7/11	**Basis:**	Dry
Lab Code:	K1806460-001		

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	6020A	ND U	mg/Kg	10	5	07/20/18 07:09	07/17/18	
Cadmium	6020A	**0.78**	mg/Kg	0.41	5	07/20/18 07:09	07/17/18	
Chromium	6020A	**20.5**	mg/Kg	4.1	5	07/25/18 08:12	07/17/18	
Copper	6020A	**359**	mg/Kg	2.1	5	07/20/18 07:09	07/17/18	
Lead	6020A	**11.4**	mg/Kg	1.0	5	07/20/18 07:09	07/17/18	
Mercury	7471B	**0.45**	mg/Kg	0.15	1	07/18/18 11:12	07/17/18	
Molybdenum	6020A	**6.0**	mg/Kg	1.0	5	07/20/18 07:09	07/17/18	
Nickel	6020A	**19.9**	mg/Kg	4.1	5	07/20/18 07:09	07/17/18	
Selenium	6020A	ND U	mg/Kg	21	5	07/20/18 07:09	07/17/18	
Zinc	6020A	**548**	mg/Kg	10	5	07/20/18 07:09	07/17/18	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	Woodland, City of	**Service Request:**	K1903788
Project:	Digester Biosolids	**Date Collected:**	04/30/19 07:30
Sample Matrix:	Biosolids Solids	**Date Received:**	04/30/19 08:05
Sample Name:	Digester Biosolids	**Basis:**	Dry
Lab Code:	K1903788-001		

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	6020A	**4.2**	mg/Kg	2.5	5	05/06/19 15:27	05/02/19	
Cadmium	6020A	**0.711**	mg/Kg	0.099	5	05/06/19 15:27	05/02/19	
Chromium	6020A	**15.9**	mg/Kg	2.0	5	05/06/19 15:27	05/02/19	
Copper	6020A	**323**	mg/Kg	0.49	5	05/06/19 15:27	05/02/19	
Lead	6020A	**11.9**	mg/Kg	0.25	5	05/06/19 15:27	05/02/19	
Mercury	7471B	**0.338**	mg/Kg	0.093	1	05/07/19 10:06	05/06/19	
Molybdenum	6020A	**6.62**	mg/Kg	0.25	5	05/06/19 15:27	05/02/19	
Nickel	6020A	**16.3**	mg/Kg	0.99	5	05/06/19 15:27	05/02/19	
Selenium	6020A	**5.1**	mg/Kg	4.9	5	05/06/19 15:27	05/02/19	
Zinc	6020A	**542**	mg/Kg	2.5	5	05/06/19 15:27	05/02/19	

Client:	Woodland, City of	**Service Request:**	K1900447
Project:	Digester Biosolids	**Date Collected:**	01/16/19 07:00
Sample Matrix:	Biosolids Solids	**Date Received:**	01/16/19 11:25
Sample Name:	Digester Biosolids	**Basis:**	Dry
Lab Code:	K1900447-001		

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	6020A	**5.1**	mg/Kg	4.1	5	01/30/19 14:47	01/28/19	
Cadmium	6020A	**0.81**	mg/Kg	0.16	5	01/30/19 14:47	01/28/19	
Chromium	6020A	**17.9**	mg/Kg	1.6	5	01/30/19 14:47	01/28/19	
Copper	6020A	**369**	mg/Kg	0.81	5	01/30/19 14:47	01/28/19	
Lead	6020A	**15.6**	mg/Kg	0.41	5	01/30/19 14:47	01/28/19	
Mercury	7471B	ND U	mg/Kg	0.76	1	01/18/19 11:00	01/17/19	
Molybdenum	6020A	**6.64**	mg/Kg	0.41	5	01/30/19 14:47	01/28/19	
Nickel	6020A	**17.8**	mg/Kg	1.6	5	01/30/19 14:47	01/28/19	
Selenium	6020A	ND U	mg/Kg	8.1	5	01/30/19 14:47	01/28/19	
Zinc	6020A	**622**	mg/Kg	4.1	5	01/30/19 14:47	01/28/19	

Client:	Woodland, City of	**Service Request:**	K2002624
Project:	Digester Biosolids	**Date Collected:**	03/26/20 12:45
Sample Matrix:	Biosolids Solids	**Date Received:**	03/26/20 12:15
Sample Name:	Digester Biosolids 1	**Basis:**	Dry
Lab Code:	K2002624-001		

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	6020A	**4.9**	mg/Kg	2.4	5	04/02/20 09:58	04/01/20	
Cadmium	6020A	**0.947**	mg/Kg	0.094	5	04/02/20 09:58	04/01/20	
Chromium	6020A	**106**	mg/Kg	0.94	5	04/02/20 09:58	04/01/20	
Copper	6020A	**358**	mg/Kg	0.47	5	04/02/20 12:28	04/01/20	
Lead	6020A	**11.7**	mg/Kg	0.24	5	04/02/20 09:58	04/01/20	
Mercury	7471B	**0.48**	mg/Kg	0.10	1	03/31/20 09:48	03/30/20	
Molybdenum	6020A	**17.3**	mg/Kg	0.24	5	04/02/20 09:58	04/01/20	
Nickel	6020A	**68.8**	mg/Kg	0.94	5	04/02/20 09:58	04/01/20	
Selenium	6020A	**5.3**	mg/Kg	4.7	5	04/02/20 12:28	04/01/20	
Zinc	6020A	**722**	mg/Kg	2.4	5	04/02/20 09:58	04/01/20	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	Woodland, City of	**Service Request:**	K2005917
Project:	Digester Biosolids	**Date Collected:**	07/15/20 08:00
Sample Matrix:	Biosolids Solids	**Date Received:**	07/15/20 10:35
Sample Name:	Digester Biosolids	**Basis:**	Dry
Lab Code:	K2005917-001		

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	6020A	ND U	mg/Kg	9.5	5	07/24/20 11:55	07/22/20	
Cadmium	6020A	**0.85**	mg/Kg	0.38	5	07/24/20 11:55	07/22/20	
Chromium	6020A	**75.6**	mg/Kg	3.8	5	07/24/20 11:55	07/22/20	
Copper	6020A	**319**	mg/Kg	1.9	5	07/24/20 11:55	07/22/20	
Lead	6020A	**10.2**	mg/Kg	0.95	5	07/24/20 11:55	07/22/20	
Mercury	7471B	ND U	mg/Kg	0.95	1	07/23/20 08:32	07/22/20	
Molybdenum	6020A	**13.6**	mg/Kg	0.95	5	07/24/20 11:55	07/22/20	
Nickel	6020A	**49.6**	mg/Kg	3.8	5	07/24/20 11:55	07/22/20	
Selenium	6020A	ND U	mg/Kg	19	5	07/24/20 11:55	07/22/20	
Zinc	6020A	**662**	mg/Kg	9.5	5	07/24/20 11:55	07/22/20	

Client:	Woodland, City of	**Service Request:**	K2100020
Project:	Digester Biosolids	**Date Collected:**	01/04/21 08:00
Sample Matrix:	Biosolids Solids	**Date Received:**	01/04/21 10:40
Sample Name:	Digester Biosolids	**Basis:**	Dry
Lab Code:	K2100020-001		

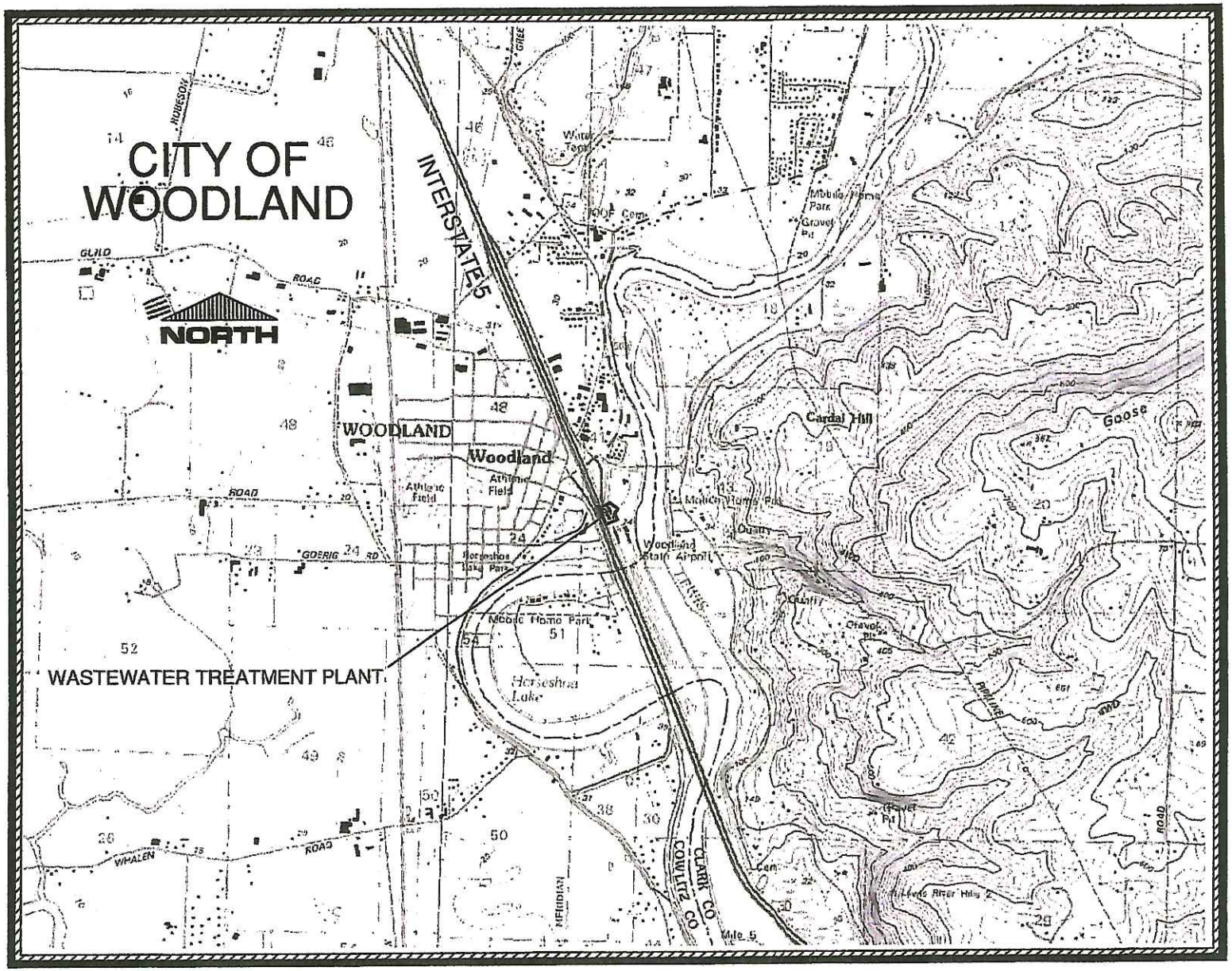
Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	6020A	**4.4**	mg/Kg	1.7	5	01/13/21 14:19	01/06/21	
Cadmium	6020A	**0.738**	mg/Kg	0.066	5	01/13/21 14:19	01/06/21	
Chromium	6020A	**74.2**	mg/Kg	0.66	5	01/13/21 14:19	01/06/21	
Copper	6020A	**365**	mg/Kg	0.33	5	01/13/21 14:19	01/06/21	
Lead	6020A	**11.6**	mg/Kg	0.17	5	01/13/21 14:19	01/06/21	
Mercury	7471B	**0.37**	mg/Kg	0.11	1	01/13/21 11:53	01/11/21	
Molybdenum	6020A	**12.2**	mg/Kg	0.17	5	01/13/21 14:19	01/06/21	
Nickel	6020A	**46.4**	mg/Kg	0.66	5	01/13/21 14:19	01/06/21	
Selenium	6020A	**5.3**	mg/Kg	3.3	5	01/13/21 14:19	01/06/21	
Zinc	6020A	**584**	mg/Kg	1.7	5	01/13/21 14:19	01/06/21	

TOPOGRAPHIC MAP

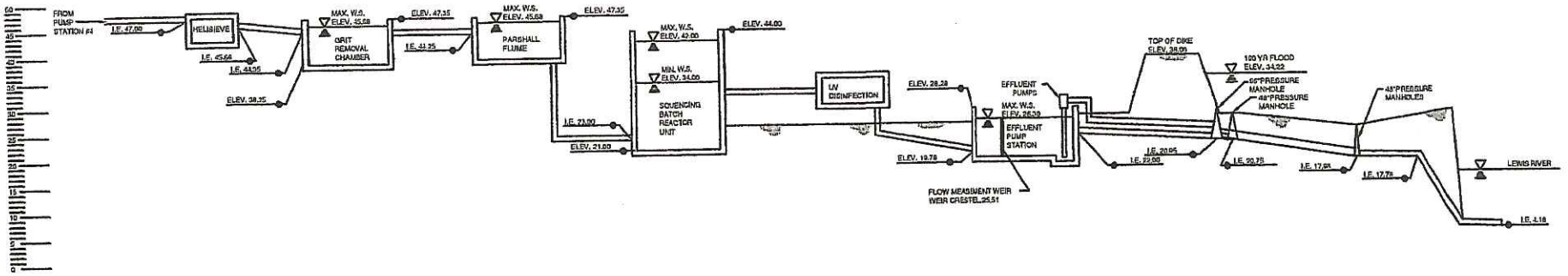
PROCESS FLOW DIAGRAM

PLANT SCHEMATIC



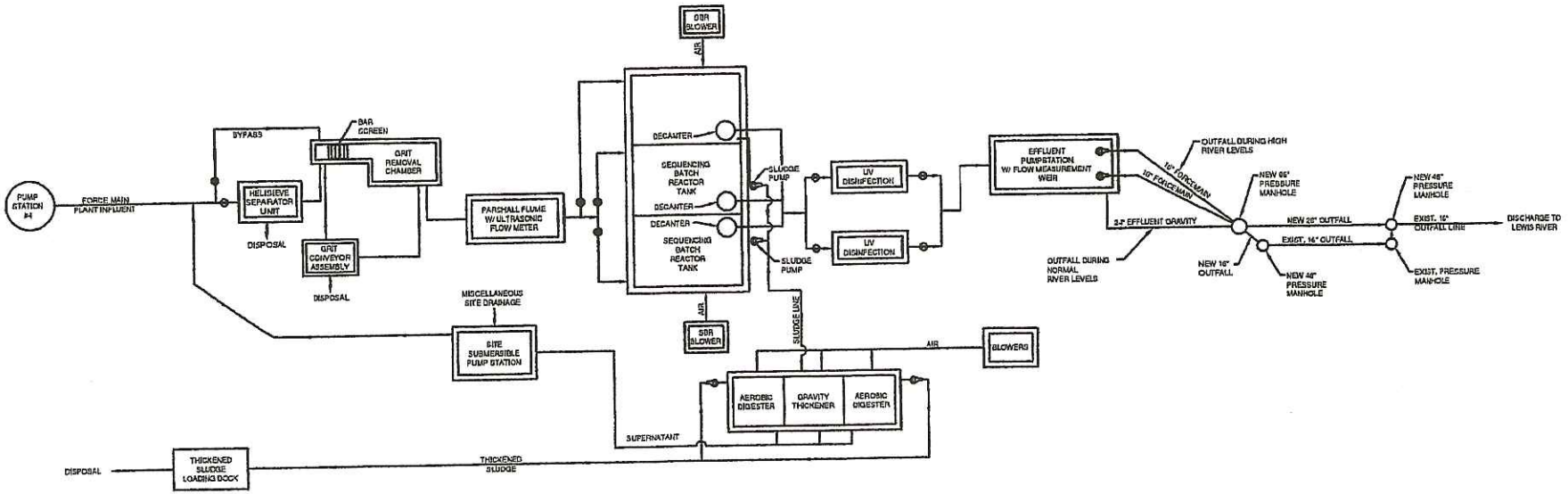
Contour Map

Scale: 1" = 2000'



WWTP Hydraulic Profile

N.T.S.



WWTP Flow Schematic

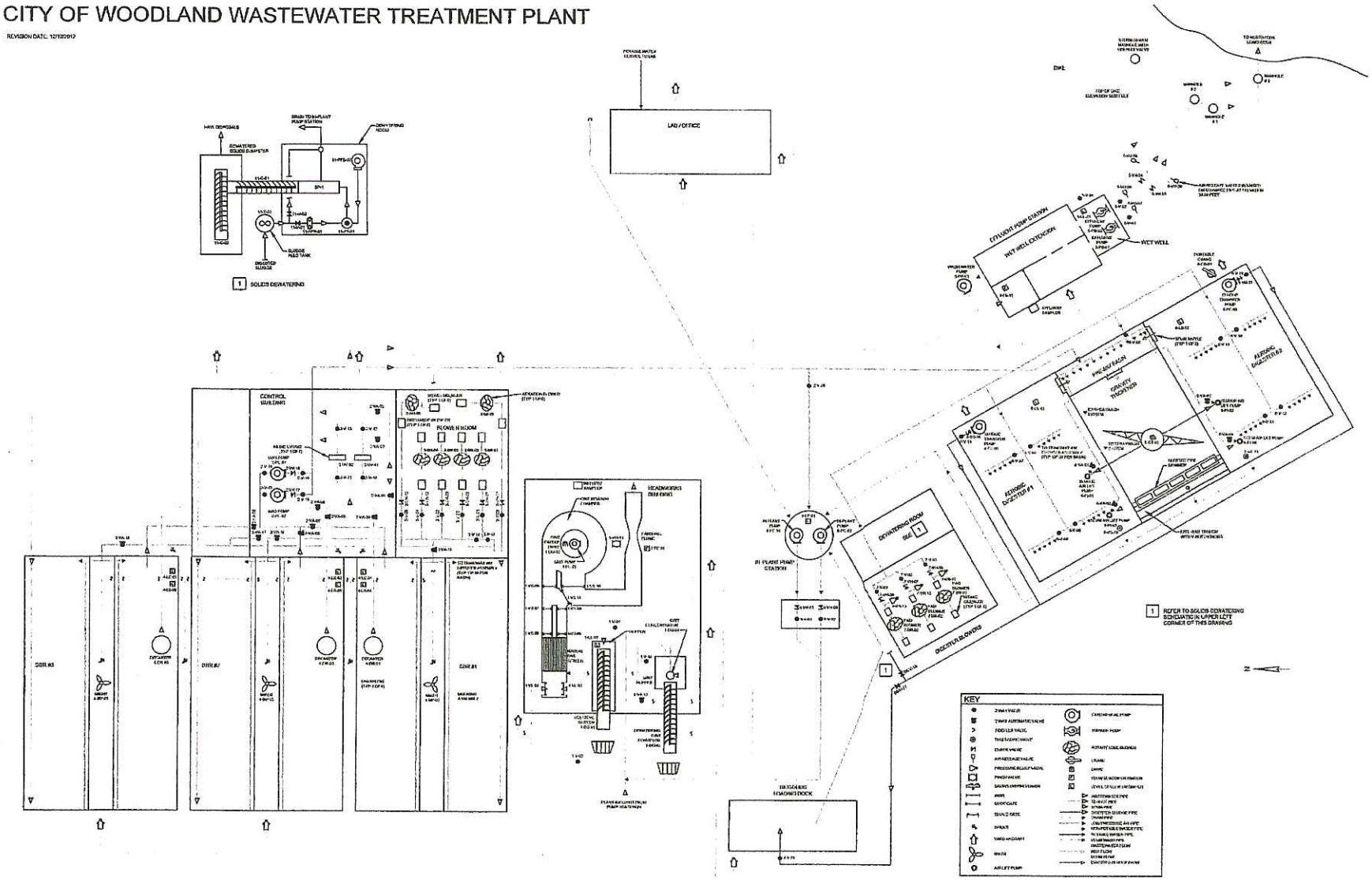
N.T.S.

GIBBS & OLSON INC.
Engineers • Planners • Surveyors
LONGVIEW • OLYMPIA
WASHINGTON

City of Woodland
NPDES Permit Application

CITY OF WOODLAND WASTEWATER TREATMENT PLANT

REVISION DATE: 12/12/2012



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City of Woodland
Wastewater Treatment Plant
Plant Schematic