REPORT OF STRESSOR/SOURCE IDENTIFICATION STUDIES IN DRY CREEK AND GRAYSON CREEK PART A

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CONTRA COSTA CLEAN WATER PROGRAM



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List of Acronyms

ADH Environmental

AMEC, Inc.

ARC Armand Ruby Consulting

ASTM American Society for Testing and Materials

BASMAA Bay Area Stormwater Management Agencies Association

BSA Bovine Serum Albumin
°C Degrees Celsius
CAL Caltest Laboratories

CCCWP Contra Costa Clean Water Program

CVRWQCB Central Valley Regional Water Quality Control Board

DO Dissolved oxygen
DQO Data quality objective
EC Electrical conductivity
EDD Electronic Data Deliverable

EOA, Inc.,

EPA U.S. Environmental Protection Agency

MDL Method Detection Limit
mg/kg Milligrams per kilogram
mg/L Milligrams per liter
MRP Municipal Regional Permit
mS/cm Microsiemens per centimeter

ng/L Nanograms per liter

NPDES National Pollution Discharge Elimination System

LC₅₀ Lethal Concentration to at least 50 percent of the population

LCS Laboratory control sample

LCSD Laboratory control sample duplicate

MS Matrix spike

MSD Matrix spike duplicate PBO Piperonyl butoxide

PEC Probable Effects Concentration

PER Pacific EcoRisk
PR Percent recovery

QAPP Quality Assurance Project Plan
QA/QC Quality Assurance/Quality Control
QPF Quantity of Precipitation Forecast
RMC Regional Monitoring Coalition

RLs Reporting Limits

RPD Relative percent difference

SFBRWQCB San Francisco Bay Regional Water Quality Control Board

SM Standard Methods

SOPs Standard Operating Procedures SSID Stressor/Source Identification

SWAMP Storm Water Ambient Monitoring Program

TEC Threshold Effects Concentration
TIE Toxicity Identification Evaluation

TU Toxic Unit

USGS United States Geological Survey

 $\begin{array}{cc} ng/g & Nanogram \; per \; gram \\ \mu g/L & Microgram \; per \; liter \end{array}$

WY Water Year



1.0 Introduction

The Contra Costa Clean Water Program (CCCWP) is responsible for complying with two National Pollutant Discharge Elimination System (NPDES) permits for urban stormwater discharges:

- Order No. R2-2009-0074, the Municipal Regional Permit (MRP), issued by the San Francisco Bay Regional Water Quality Control Board (SFBRWQCB), Region 2
- Order No. R5-2010-0102 (Central Valley Permit), issued by the Central Valley Regional Water Quality Control Board (CVRWQCB), Region 5

To promote a coordinated countywide program of water quality management, the two permits have nearly identical provisions.

CCCWP entered into a regional collaborative with other Bay Area Stormwater Management Agencies Association (BASMAA) members, known as the Regional Monitoring Coalition (RMC), to plan and conduct Creek Status Monitoring required by provision C.8.c of the permits, to evaluate the monitoring results, and to perform related follow-up studies. The RMC also works cooperatively with staff of both the SFBRWQCB and the CVRWQCB to implement the coordinated monitoring. The Creek Status Monitoring conducted by CCCWP includes monitoring in both West County (Region 2) and East County (Region 5) jurisdictions.

Provision C.8.d.i of both permits (see Appendix A) requires follow-up monitoring projects when creek status monitoring conducted per Provision C.8.c produces results that exceed triggers defined in permit Table 8.1. The follow-up actions may include Stressor/Source Identification (SSID) Studies. MRP Attachment H and Central Valley Permit Attachment D (see Appendix B) also require Permittees to "Identify cause(s) of impacts and spatial extent" when sediment toxicity, chemistry, and bioassessment results meet certain thresholds. Per MRP Provision C.8.d.i, when the creek status monitoring is performed under a regional collaborative (such as the RMC), a maximum of ten SSID studies must be initiated during the permit term; two of those studies must be related to toxicity. By agreement within the RMC, Contra Costa Permittees are responsible for two SSID Studies during the permit term. The Central Valley Permit also caps the SSID studies required of East County Permittees' obligations under both permits.

CCCWP's Creek Status Monitoring triggered exceedances under NPDES permit Provision C.8.c, Table 8.1 and Attachment H/D, for water and sediment toxicity parameters in both Water Year (WY) 2012 and WY 2013. Both Dry Creek (site 544R00025; Region 5) and Grayson Creek (site 207R00011; Region 2) exhibited water toxicity to *Hyalella azteca* (*H. azteca*) in creek samples collected during wet weather in WY 2012. Retests confirmed water toxicity to *H. azteca* in wet weather samples collected from both creeks in WY 2013. Other test species were not adversely affected in the water toxicity testing. In July 2012, sediment toxicity testing also revealed toxicity to *H. azteca* in sediment samples from both creeks.

In addition to the toxicity testing results, sediment chemistry testing of the dry weather samples in WY 2012 indicated elevated levels of sediment contaminants, including pyrethroid pesticides, in both creeks. Bioassessment monitoring of Dry Creek and Grayson Creek in spring, 2012 also yielded benthic macroinvertebrate index of biological integrity (IBI) scores in the "Very Low" range for both creeks. Taken together, the WY 2012 sediment toxicity, chemistry, and bioassessment results triggered follow-up



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actions required in NPDES permit Attachment H/D for Dry Creek and Grayson Creek. See Appendix C for a summary of the pertinent WY 2012 and WY 2013 creek status monitoring results.

A recent statewide survey also provides extensive evidence linking the presence of pyrethroid pesticides to aquatic toxicity in both waters and sediments of urban creeks throughout the state of California (Ruby, 2013). That report cites numerous instances where toxicity to *H. Azteca* co-occurs with elevated pyrethroid pesticide concentrations in both water and sediment samples, and references several toxicity identification evaluation studies (TIEs) in which the observed toxicity was found to be likely attributable to the presence of pyrethroid pesticide contamination. Pyrethroids were commonly found in water and sediment samples from urban creeks, typically at levels sufficient to cause toxicity in water and sediment samples. Fipronil, an increasingly common replacement for pyrethroid pesticides, was also frequently found in urban creek water and sediment samples, at potentially toxic levels.

To address the CCCWP WY 2012 and 2013 creek status monitoring results, and in fulfillment of permit requirements pertaining to SSID studies as described above, CCCWP developed a Stressor/Source ID Study Concept Plan (see Appendix D). The Concept Plan includes four parts, corresponding to the four steps required per permit provision C.8.d.i. for SSID Studies. Provision C.8.d.i requires SSID projects to include the following first step:

"(1) Conduct a site specific study (or non-site specific if the problem is wide-spread) in a stepwise process to identify and isolate the cause(s) of the trigger stressor/source. This study should follow guidance for Toxicity Reduction Evaluations (TRE) or Toxicity Identification Evaluations (TIE)."

Part A of the CCCWP SSID studies, described in this report, involve site-specific studies and TIEs to identify the trigger/stressor as required by permit provision C.8.d.i., and also address causes of sediment quality impacts and spatial extent as required by permit Attachment H/D. As described in the SSID Concept Plan (Appendix D), subsequent phases of the SSID studies will involve identification of potential sources of the pollutant(s) or stressor(s) (Part B), identification and evaluation of potential abatement measures (Part C), and evaluation of the effectiveness of the implemented abatement measures (Part D).

The CCCWP Part A SSID investigations focus on current-use pesticides (pyrethroids and possibly fipronil) as the probable causes of the water and sediment toxicity based on the following factors:

- *H. azteca* is the common affected organism in the water and sediment toxicity at both Contra Costa County creek sites (per WY 2012 and 2013 data, see Appendix C)
- The presence of elevated levels of pyrethroids in sediment samples from those creeks (per WY 2012 data, see Appendix C)
- The preponderance of other evidence linking *H. azteca* toxicity to the presence of pyrethroid pesticides in urban surface waters (Ruby, 2013)

Toxicity SSID studies first require positive identification of the stressor(s). Although pyrethroid pesticides are targeted due to their use in residential areas, and it is presumed that the stressors in the subject creeks are pesticides, additional water and sediment chemistry and toxicity testing are necessary to confirm this supposition. In particular, it is necessary to determine which pesticides are causing toxicity, and whether there are spatial patterns that may pinpoint more specific source areas or land uses.



The SSID Part A studies were conducted by CCCWP during 2014 to evaluate and investigate the extent and causes of the observed creek toxicity to *H. azteca* in Dry Creek and Grayson Creek watersheds. Dry Creek is located in Eastern Contra Costa County in the City of Brentwood (Water Board Region 5). Grayson Creek is in Central Contra Costa County in the City of Pleasant Hill (Water Board Region 2).

The SSID Part A studies involved both wet weather monitoring for aquatic (water column) chemistry and toxicity, and dry weather monitoring for sediment chemistry and toxicity. These projects serve both to fulfill the requirements of MRP Table H-1 and Central Valley Permit Table D-1 with respect to follow-up actions pertinent to the sediment triad results, and also the requirements to conduct the SSID toxicity studies called for in Provision C.8.d.i. in both Regional Permits. This report provides the methods and results of Part A of the two SSID studies, and an analysis of the results.



2.0 SSID Studies – Overview

CCCWP performed the Part A SSID studies during 2014 in the Dry Creek and Grayson Creek watersheds, involving the following parameters:

- Two wet weather monitoring events in each creek, at sites upstream and downstream of the WY 2012 and 2013 Creek Status Monitoring sites in each watershed, with analysis of water samples for pyrethroid pesticides, fipronil and degradates, organochlorine pesticides, organic carbon and suspended sediment, plus field parameters, and toxicity testing for acute and chronic effects on *H. Azteca*.
- One dry weather monitoring event in each creek, at the same set of upstream and downstream sites in each watershed, with analysis of sediment samples for pyrethroid pesticides, fipronil and degradates, organochlorine pesticides, organic carbon and percent solids, plus field parameters, and toxicity testing for acute and chronic effects on *H. Azteca*.

An overview of the area covered by the SSID studies is provided in Figure 1. The Part A SSID Work Plan is included as Appendix E to this report.



Figure 1. SSID Study Area



2.1 Study Objectives

The SSID studies are expected to be performed in four parts over four years. The goals of Part A of the SSID studies are to:

- Identify the causes of the observed water and sediment toxicity to *H. azteca* in Dry Creek and Grayson Creek (i.e., the stressor[s])
- Identify temporal (seasonal) and spatial patterns in toxicity and stressors, and better characterize the spatial extent of sediment toxicity impacts

2.2 Study Personnel

The CCCWP provides contract administration as needed to ensure compliance with the Permit requirements and ensure the work is performed to professional standards of quality. Personnel involved with the SSID study, their respective roles and responsibilities are listed in Table 1.

Table 1. Personnel Names, Affiliation, and Responsibilities					
Name	Affiliation	Responsibility			
Janet O'Hara	SFBRWQCB	Regulatory Agency			
Lucile Paquette	CCCWP	Program Coordinator			
Kristine Corneillie	LWA	Technical Advisor			
Armand Ruby	ARC	Toxicity Identification Evaluations			
Alessandro Hnatt	ADH	Project Manager			
Peter Wilde	ADH	Quality Assurance Manager			
Kevin Lewis	ADH	Field Sampling			
Calvin Sandlin	ADH	Field Sampling			

2.3 Monitoring Locations

The WY 2012 Creek Status toxicity sampling locations on Dry Creek and Grayson Creek are shown in Figures 2 and 3, respectively. The original site identification numbers are Site 544R00025 in Dry Creek and Site 207R00011 in Grayson Creek. For these SSID studies, two additional sites were selected for monitoring in each creek: one upstream ("US") and one downstream ("DS") of each of the previously-monitored sites to better characterize spatial extent of the toxicity impacts at those sites. The upstream and downstream sites were selected in coordination with the CCCWP Program Coordinator, and reconnaissance of these selected sites was performed in the 2013-2014 winter season in conjunction with CCCWP Creek Status bioassessment site reconnaissance. The following subsections provide brief descriptions of the target watersheds. Locations of upstream and downstream SSID monitoring sites for Dry Creek and Grayson Creek are also shown in Figures 2 and 3, respectively, and are detailed in Table 2.



2.3.1 Dry Creek

Dry Creek is a tributary to Marsh Creek in eastern Contra Costa County in the City of Brentwood. The creek channel in this area has undergone hydromodification due to urbanization and is mostly conveyed through underground pipeline. The reach sampled in this study is one of the reaches where the creek is above-ground. The creek flows through a culvert from the Brentwood Golf Club west of Arlington Way (upstream sampling site), approximately 350 meters along Crescent Drive (south of Balfour Drive), in a grassed flood control channel. It then enters another culvert just downstream of the downstream sampling location, and flows under Creekside Park to its confluence at Marsh Creek. This reach receives runoff from the neighboring urban development as well as from the golf course. The WY 2012 and 2013 creek status sampling location (Site 544R00025) was approximately halfway between the upstream and downstream SSID sampling sites, as shown in Figure 2.



Figure 2. Dry Creek Monitoring Locations, Brentwood, CA

2.3.2 Grayson Creek

Grayson Creek is a tributary to Walnut Creek in central Contra Costa County in the City of Pleasant Hill. Grayson Creek and the two tributaries sampled in this watershed are concrete flood control channels surrounded by residential land use. The upstream sampling location is sited approximately 30 meters up Tributary to Grayson Creek from the confluence with Grayson Creek, immediately upstream of the walking bridge between Mercury Way and Vineyard Court. This tributary drains a parcel of agricultural land to the northwest as well as residential areas. The downstream sampling location is located on East



Branch of Grayson Creek, upstream of the confluence with Grayson Creek, at the terminus of Ardith Drive. During WY 2012 and 2013, the creek status monitoring site (Site 207R00011) was located in the concrete channel where it crosses the Contra Costa Canal Trail in Pleasant Hill (see Figure 3).



Figure 3. Grayson Creek Monitoring Locations, Pleasant Hill, CA

Table 2. CCCWP Part A SSID Study Monitoring Site Location Descriptions for WY 2014						
Creek Name / SSID Study Site	Site Code*	Latitude	Longitude	Monitoring Site Access		
Dry Creek / Downstream	544R00025DS /544MSH062	37.923034	-121.714538	Public access. Park on road next to creek. Monitoring site is located upstream of culvert at Claremont Way.		
Dry Creek / Upstream	544R00025US /544MSH065	37.921722	-121.721855	Public access. Park on road next to creek. Monitoring site is located upstream of culvert at Arlington Way.		
Grayson Creek/ Downstream	207R00011DS /207WAL060	37.954271	-122.07869	Enter through Flood Control Corp yard. Sampling location is at the bottom of the channel access ramp. DO NOT ENTER CHANNEL DURING STORM SEASON		
Grayson Creek/ Upstream	207R00011US /207WAL078	37.95141	-122.08396	Enter Flood Control access gate from walking bridge between Mercury Way and Vineyard Court, above channel. Monitoring location is upstream of the bridge. Storm season sampling requires use of sampling pole and transfer container from the top of the channel bank.		

^{*}Site codes are shown as original (as submitted to lab)/new (as assigned by SFBRWQCB).



3.0 Field Monitoring Methods

In 2014, monitoring was performed at two sites for each of the two SSID projects (upstream and downstream sites in Dry Creek and Grayson Creek) during two wet weather events, with analysis for water chemistry and toxicity, and at the same four sites during one dry weather event, with analysis for sediment chemistry and toxicity. Monitoring preparation and logistics, laboratory arrangements, weather tracking, mobilization, sample collection, field measurements, sample delivery and shipping, and demobilization followed standard CCCWP and RMC protocols. The following subsections describe the field sampling methods employed for the collection of wet weather water samples and dry weather bedded sediment samples. Sample collection followed protocols described in the RMC Quality Assurance Project Plan (QAPP; EOA et al., 2012) and Standard Operating Procedures (SOPs; EOA et al., 2014a).

To minimize upstream influence on downstream water quality, in each creek and for every monitoring event, the downstream site was always sampled prior to collection of samples at the upstream monitoring site. Additionally, all sampling was conducted during daylight hours in the interest of health and safety.

3.1 Wet Weather (Stormwater) Sample Collection

Wet weather aquatic toxicity and chemistry sample collection techniques and health and safety considerations adhered to all relevant protocols specified in the RMC's SOP FS-2, *Manual Collection of Water Samples for Chemical Analysis, Bacteriological Analysis, and Toxicity Testing* (EOA et al., 2014a).

The characteristics of the monitored wet weather events for the SSID Part projects are shown in Table 3.

Table 3. Monitored Storm Events							
Stream/Stations	Event Date	Total Rainfall (in)	Maximum Intensity (in/hr)	Start of Rainfall	End of Rainfall	Duration of Rainfall (hours)	Antecedent Dry Period (days)
Dry Creek 544MSH065 and 544 MSH062 ¹	02/06/14	0.53	0.17	020/5/14 23:00	02/06/14 08:20	9.3	3.2
	02/28/14	1.08	0.56	02/28/14 01:45	02/28/14 15:30	13.8	1.2
Grayson Creek 207WAL078 and 207WAL060 ²	02/28/14	1.22	0.28	02/28/14 01:40	02/28/14 16:22	14.7	1.1
	03/26/14	0.47	0.16	03/26/14 06:45	03/26/14 20:19	13.6	20.3

Explanation:

Weather statistics from station KCABRENT7 (37.933N, -121.721W):

 $\underline{http://www.wunderground.com/personal-weather-station/dashboard?ID=KCABRENT7}$

 $\underline{\text{http://www.wunderground.com/personal-weather-station/dashboard?ID=KCAPLEAS20}}$

3.2 Sediment Sample Collection

Bedded sediment toxicity and chemistry sampling collection techniques, and health and safety considerations for this SSID Study adhered to all relevant protocols specified in the RMC's SOP FS-6,



² Weather statistics from station KCAPLEAS20 (37.945N, -122.082W):

Collection of Bedded Sediment Samples for Chemistry Analysis and Toxicity (EOA et al., 2014a). In accordance with the MRP and Central Valley Permits, dry season sampling was conducted on July 22nd, during the prescribed July – September timeframe.

3.3 Field Water Quality Measurements and Observations

Field water quality measurements and associated equipment preparation and calibration were performed in conformance with all relevant water and sediment toxicity and chemistry monitoring protocols specified in the RMC's SOP FS-3, *Manual Field Measurements* (EOA et al., 2014a).

Water quality measurements were performed using a YSI 556 handheld multi-parameter probe to measure temperature, pH, dissolved oxygen (DO) and specific conductance. Measurements of these parameters as well as the field crew names, standard observations of water quality (e.g., odor, clarity, color, etc.), and site information (e.g., GPS coordinates, stream width and depth, approximate flow rate, etc.) were recorded on a SWAMP field data sheet during all sampling events.

3.4 Sample Handling and Chain of Custody Procedure

Sample containers and handling adhered to all relevant protocols specified in the RMC's FS-9, *Sample Container*, *Handling*, *and Chain of Custody Procedures* (EOA et al., 2014a). A summary of the respective analytes or tests, sample volumes, containers, and preservatives is presented for wet weather water sample collection and dry-season bedded sediment sample collection in Tables 4 and 5, respectively.

Table 4. Containers and Handling for Wet Weather Aquatic Toxicity and Chemistry Samples					
Sample/Test	Container	Handling Requirements			
Pyrethroid pesticides	2 @ 1 L amber glass	Place on wet ice, cool to <6° C, 7 day hold time			
Fipronil and degradates	1 @ 2 L amber glass	Place on wet ice, cool to <6° C, 7 day hold time ¹			
Organochlorine pesticides	1 @ 2 L amber glass	Place on wet ice, cool to <6° C, 7 day hold time			
Total Organic Carbon	3 @ 40 ml x VOA	HCL, place on wet ice, cool to <6° C, 28 day hold time			
Suspended Sediment Concentration	1 @ 250 ml HDPE	Place on wet ice, cool to <6° C, 7 day hold time			
Aquatic toxicity	10 @ 3.75 L amber glass	Place on wet ice, cool to <6° C, 36 hour hold time			

Explanation:



¹ Holding time for Fipronil is 7 days, but certain degradates are 3 days.

Table 5. Containers and Handling for Dry Season Bedded Sediment Toxicity and Chemistry Samples						
Sample/Test	Container	Handling Requirements				
Pyrethroid pesticides, Fipronil and degradates	1 @ 8 ounces amber glass ¹	Place on wet ice, cool to <6° C, 14 day ² hold time				
Organochlorine pesticides	1 @ 8 ounces clear or amber glass soil jar. ¹	Place on wet ice, cool to <6° C, 14 day hold time				
Percent Solids	1 @ 8 ounces clear soil jar.	Place on wet ice, cool to <6° C, 7 day hold time				
Total Organic Carbon	1 @ 8 ounce clear soil jar	Place on wet ice, cool to <6° C, 28 day hold time				
Sediment toxicity	3 @ 4 L³ amber glass	Place on wet ice, cool to <6° C, 14 day hold time				

Explanation:



 $^{^{1}}$ 2 jars recommended for back-up 2 1 year if frozen 3 The 10-day *Hyalella azteca* sediment toxicity test requires a total of 2 L of sediment. This does not account for additional volume for a follow-up request or for TIEs. The total for TIEs is dependent on the number of treatments, and can be as much as an additional 2-10 L. In summation, the volume should be ≥ 3 gallons (~ 12 L on the high end) to cover all possibilities.

4.0 Testing and Analytical Methods

Monitoring was performed at each of the four sites for water chemistry and toxicity during two wet weather events, and during one dry weather event for sediment chemistry and toxicity.

Constituents for water quality analysis included:

- Field parameters [DO, specific conductance, pH, Temperature]
- Pyrethroid pesticides
- Fipronil and degradates
- Organochlorine pesticides
- Total organic carbon
- Suspended sediment concentration
- *Hyalella azteca* chronic toxicity

Constituents for sediment quality analysis included:

- Field parameters (DO, specific conductance, pH, Temperature) in overlying water
- Pyrethroid pesticides
- Fipronil and degradates
- Organochlorine pesticides
- Percent solids
- Total organic carbon
- *Hyalella azteca* chronic toxicity

4.1 Wet Weather (Stormwater) Aquatic Analytical Methods and Tests

Analytical methods and tests, method detection limits (MDLs) and reporting limits (RLs) for the 2014 CCCWP SSID Study wet weather monitoring are presented in Table 6. Field water quality parameters were measured in the field. Laboratory chemical analyses were performed by Caltest Analytical Laboratory in Napa. Toxicity testing was performed by Pacific EcoRisk in Fairfield, using *H. azteca* as the test species.

Table 6. Analytical Constituents, Methods, MDLs and RLs or Test Type for CCCWP SSID Study Wet Weather Aquatic Monitoring						
Method Detection Limit or Analyte Analytical Method Test Duration Or Test Type						
Water Quality Parameters						
Dissolved Oxygen	YSI 556 field meter	0.01 mg/L	0 - 50 mg/L			
Conductivity	YSI 556 field meter	0.001 mS/cm	0 – 200 mS/cm			
pH	YSI 556 field meter	0.01 units	0.00 – 14.00 units			
Temperature	YSI 556 field meter	-5 - 45°C	0.1°C			
Total Organic Carbon SM20-5310 B 0.50 mg/L 1 mg/L						
Suspended Sediment Concentration ASTM D 3977-97 B-Filtration 2 mg/L 3 mg/L						



Table 6. Analytical Constituents, Methods, MDLs and RLs or Test Type for CCCWP SSID Study Wet Weather Aquatic Monitoring				
Analyte	Analytical Method	Method Detection Limit or Test Duration	Reporting Limit Or Test Type	
Pyrethroid Pesticides			J.F	
Allethrin	EPA 8270Mod (NCI SIM)	0.1 ng/L	1.5 ng/L	
Bifenthrin	EPA 8270Mod (NCI SIM)	0.1 ng/L	1.5 ng/L	
Cyfluthrin	EPA 8270Mod (NCI SIM)	0.2 ng/L	1.5 ng/L	
Cypermethrin	EPA 8270Mod (NCI SIM)	0.3 ng/L	1.5 ng/L	
Deltamethrin: Tralomethrin	EPA 8270Mod (NCI SIM)	0.2 ng/L	3.0 ng/L	
Esfenvalerate: Fenvalerate	EPA 8270Mod (NCI SIM)	0.2 ng/L	3.0 ng/L	
Fenpropathrin	EPA 8270Mod (NCI SIM	0.3 ng/L	1.5 ng/L	
Lambda-Cyhalothrin	EPA 8270Mod (NCI SIM)	0.2 ng/L	1.5 ng/L	
Tau-Fluvalinate	EPA 8270Mod (NCI SIM)	0.2 ng/L	1.5 ng/L	
Tetramethrin	EPA 8270Mod (NCI SIM)	0.2 ng/L	1.5 ng/L	
Permethrin	EPA 8270Mod (NCI SIM)	2 ng/L	15 ng/L	
Fipronil (Degradates Listed Below)	EPA 8270Mod (NCI SIM)	0.002 μg/L	0.01 μg/L	
Fipronil Desulfinyl	EPA 8270Mod (NCI SIM)	0.002 μg/L	0.01 μg/L	
Fipronil Sulfide	EPA 8270Mod (NCI SIM)	0.002 μg/L	0.01 μg/L	
Fipronil Sulfone	EPA 8270Mod (NCI SIM)	0.002 μg/L	0.01 μg/L	
Organochlorine Pesticides	'			
Aldrin	EPA 608	0.0040 µg/L	0.05 μg/L	
alpha-BHC	EPA 608	0.0050 μg/L	0.010 μg/L	
beta-BHC	EPA 608	0.0040 μg/L	0.005 μg/L	
delta-BHC	EPA 608	0.0040 μg/L	0.005 μg/L	
gamma-BHC (Lindane)	EPA 608	0.0040 μg/L	0.010 μg/L	
Chlordane	EPA 608	0.020 μg/L	0.010 μg/L	
4,4'-DDD	EPA 608	0.0040 μg/L	0.010 μg/L	
4,4'-DDE	EPA 608	0.0040 μg/L	0.010 μg/L	
4,4'-DDT	EPA 608	0.0040 μg/L	0.010 μg/L	
Dieldrin	EPA 608	0.0040 μg/L	0.010 μg/L	
Endosulfan I	EPA 608	0.0050 μg/L	0.010 μg/L	
Endosulfan II	EPA 608	0.0050 μg/L	0.010 μg/L	
Endosulfan sulfate	EPA 608	0.0050 μg/L	0.010 μg/L	
Endrin	EPA 608	0.0050 μg/L	0.010 μg/L	
Endrin aldehyde	EPA 608	0.0050 μg/L	0.010 μg/L	
Endrin ketone	EPA 608	0.0050 μg/L	0.010 μg/L	
Heptachlor	EPA 608	0.0050 μg/L	0.010 μg/L	
Heptachlor epoxide	EPA 608	0.0040 μg/L	0.010 μg/L	
Methoxychlor	EPA 608	0.0050 μg/L	0.01 µg/L	
Toxaphene	EPA 608	0.30 μg/L	0.5 μg/L	



Table 6. Analytical Constituents, Methods, MDLs and RLs or Test Type for CCCWP SSID Study Wet Weather Aquatic Monitoring						
Method Detection Limit or Reporting Limit Analyte Analytical Method Test Duration Or Test Type						
Aquatic Toxicity	EPA/600/R-99/064	10-day	Survival			

Explanation:

mg/L	Milligram per liter	ng/L	Nanograms per liter
mS/cm	Microsiemens per centimeter	μg/L	Microgram per liter
°C	Degrees Celsius	SM	Standard Methods
	•		

EPA U.S. Environmental Protection Agency ASTM American Society for Testing and Materials

4.2 Dry Season Bedded Sediment Analytical Methods and Tests

Analytical constituent methods and tests, MDLs and RLs, or test type for the CCCWP SSID Study dry season bedded sediment toxicity monitoring are presented in Table 7. Field water quality parameters were measured in the field. Laboratory chemical analyses were performed by Caltest Analytical Laboratory in Napa. Toxicity testing was performed by Pacific EcoRisk in Fairfield, using *H. azteca* as the test species.

Table 7. Analytical Constituents, Methods, MDLs and RLs or Test Type for CCCWP SSID Study Dry Season Bedded Sediment Monitoring					
Analyte	Analytical Method	Method Detection Limit or Test Duration	Reporting Limit or Test Type		
Water Quality Parameters					
Dissolved Oxygen	YSI 556 field meter	0.01 mg/L	0 - 50 mg/L		
Conductivity	YSI 556 field meter	0.001 mS/cm	0-200 mS/cm		
рН	YSI 556 field meter	0.01 units	0.00 – 14.00 units		
Temperature	YSI 556 field meter	-5 – 45°C	0.1°C		
Total Organic Carbon	SM20-5310 B	0.30 mg/kg	1 mg/kg		
Percent Solids	EPA 9060	0.5 mg/kg	1 mg/kg		
Pyrethroid Pesticides					
Allethrin	EPA 8270Mod (NCI SIM)	0.05 ng/g	0.33 ng/g		
Bifenthrin	EPA 8270Mod (NCI SIM)	0.1 ng/g	0.33 ng/g		
Cyfluthrin	EPA 8270Mod (NCI SIM)	0.11 ng/g	0.33 ng/g		
Cypermethrin	EPA 8270Mod (NCI SIM)	0.1 ng/g	0.33 ng/g		
Deltamethrin: Tralomethrin	EPA 8270Mod (NCI SIM)	0.12 ng/g	0.33 ng/g		
Esfenvalerate: Fenvalerate	EPA 8270Mod (NCI SIM)	0.13 ng/g	0.33 ng/g		
Fenpropathrin	EPA 8270Mod (NCI SIM	0.07 ng/g	0.33 ng/g		
Lambda-Cyhalothrin	EPA 8270Mod (NCI SIM)	0.06 ng/g	0.33 ng/g		
Tau-Fluvalinate	EPA 8270Mod (NCI SIM)	0.04 ng/g	0.33 ng/g		
Tetramethrin	EPA 8270Mod (NCI SIM)	0.06 ng/g	0.33 ng/g		
Permethrin	EPA 8270Mod (NCI SIM)	0.11 ng/g	0.33 ng/g		



Analytical Constituents, Methods, MDLs and RLs or Test Type for CCCWP SSID Study Dry Table 7. **Season Bedded Sediment Monitoring Method Detection** Limit or Reporting Limit or Test Duration Test Type Analyte **Analytical Method** Fipronil (Degradates Listed Below) EPA 8270Mod (NCI SIM) 0.1 ng/g0.33 ng/g Fipronil Desulfinyl EPA 8270Mod (NCI SIM) 0.1 ng/g0.33 ng/gFipronil Sulfide EPA 8270Mod (NCI SIM) 0.1 ng/g0.33 ng/g Fipronil Sulfone EPA 8270Mod (NCI SIM) 0.1 ng/g0.33 ng/g**Organochlorine Pesticides**¹ Aldrin EPA 8081 0.9 ng/g2 ng/g alpha-HCH EPA 8081 0.9 ng/g2 ng/g beta-HCH EPA 8081 0.9 ng/g2 ng/gdelta-HHC EPA 8081 0.7 ng/g2 ng/ggamma-HCH EPA 8081 0.7 ng/g2 ng/gcis-Chlordane EPA 8081 1 ng/g 2 ng/g trans-Chlordane EPA 8081 1 ng/g 2 ng/g4,4'-DDD EPA 8081 0.8 ng/g2 ng/g2, 4'-DDD EPA 8081 2 ng/g 2 ng/g 4,4'-DDE EPA 8081 1.2 ng/g2 ng/g2, 4'-DDE EPA 8081 2 ng/g2 ng/g4,4'-DDT EPA 8081 1 ng/g 2 ng/g 2, 4'-DDT EPA 8081 2 ng/g 2 ng/gDieldrin EPA 8081 1.2 ng/g 2 ng/gEndosulfan I EPA 8081 0.9 ng/g2 ng/g Endosulfan II EPA 8081 0.7 ng/g10 ng/gEndosulfan sulfate EPA 8081 0.9 ng/g10 ng/gEndrin EPA 8081 1 ng/g 2 ng/gEndrin aldehyde EPA 8081 0.9 ng/g2 ng/gEndrin ketone EPA 8081 0.9 ng/g2 ng/gHeptachlor EPA 8081 0.6 ng/g2 ng/gEPA 8081 Heptachlorepoxide 1.1 ng/g 2 ng/g Methoxychlor EPA 8081 0.9 ng/g2 ng/g Toxaphene EPA 8081 20 ng/g40 ng/g EPA 8081 Mirex 0.5 ng/g20 ng/g**Sediment Toxicity** EPA/600/R-99/064 Survival 10-day

Explanation:



¹ Does not include all analytes listed in Storm Water Ambient Monitoring Program QAPP (SWAMP 2008)

mg/kg = Milligram per kilogram

ng/g = Nanogram per gram

4.3 Reference Toxicant Tests

Per the RMC Creek Status Monitoring Program QAPP (EOA et al., 2012), reference toxicant tests:

... must be conducted monthly for species that are raised within a laboratory. Reference Toxicant Tests must be conducted per analytical batch for species from commercial supplier settings. Reference Toxicant Tests must be conducted concurrently for test species or broodstocks that are field collected.

H. azteca are purchased by Pacific EcoRisk (PER) from commercial suppliers and therefore require reference toxicant tests per analytical batch.

4.4 Toxicity Identification Evaluations

One targeted toxicity identification evaluation (TIE) was performed at Pacific EcoRisk laboratory on a toxic sample for each matrix: water (wet weather) and sediment (dry weather). TIEs were conducted upon discovery of statistically-significant toxicity in water and sediment samples. For the water sample, the targeted TIE included testing of the Baseline Sample (100%), a PBO Treatment (in both 50% dilution and 100% sample) with sample spiking, a Carboxylesterase Treatment (100% sample) with sample spiking, and a Bovine Serum Albumin (BSA) Treatment (100% sample) with sample spiking. For the sediment sample, the targeted TIE included testing of the Baseline Sample (100%), an aeration control sample, a PBO Treatment (100% sample) with sample spiking.



5.0 Data Quality Objectives and Quality Assurance / Quality Control

The data quality objective (DQO) process is implemented through a Quality Assurance/Quality Control (QA/QC) program. The elements of the QA/QC program including required levels of precision and accuracy, and tolerable levels of error are presented in detail in the RMC QAPP (EOA et al., 2012).

A summary of the QA/QC results for the 2014 SSID monitoring is provided in Appendix F.



6.0 Results

Summaries of the chemistry results for detected chemical constituents and toxicity testing results are provided in Table 8 for water samples and Table 9 for sediment samples. The full tables of analytes are provided in Appendix G, and laboratory reports are provided in Appendix H. Field measurements are summarized in Appendix I.

Because the effects of pyrethroid pesticides in sediments have been shown to be mitigated by the presence of organic carbon in the sediment, the Pyrethroid results are also shown normalized per gram of organic carbon, as $\mu g/g$ of organic carbon.



Table 8. Resul	lts for Det	ected Co	nstituents	, Wet We	ather Wa	ter Sampl	les		
	Dry Creek Upstream 544MSHO65		Dry Creek Downstream 544MSHO62		Tributary of Grayson Creek Upstream 207WAL078		East Branch of Grayson Creek Downstream 207WAL060		Mean Concentration ⁴
	Sample Collection Date								
	02/06/14	02/28/14	02/06/14	02/28/14	02/28/14	03/26/14	02/28/14	03/26/14	
Fipronil and Degrad	lates (ng/L)								
Fipronil	6.2	4.5	ND	4.3	19	15	23	12	11
Fipronil Desulfinyl	2.2	2.2	ND	1.9	2.9	6.5	2.2	3.5	2.7
Fipronil Sulfide	0.5 ^J	ND	ND	ND	1.3 ^J	1.4 ^J	1.6	2.6	1.0
Fipronil Sulfone	3.8	5.5	0.8^{J}	5.2	14	11	9.5	6.8	7.1
Organochlorine Pest	ticides (µg/	L)							
None detected									
Pyrethroid Pesticides	s (ng/L)			1	I		I		
Bifenthrin	5.3	8.5	5.9	8.6	7.3	11	6.5	4.2	7.2
Cyfluthrin	0.7 ^J	1.5 ^J	0.7 ^J	1.7	ND	1.1 ^J	6.4	0.9 ^J	1.6
Cypermethrin	ND	ND	ND	ND	ND	ND	ND	0.7 ^J	0.19
Deltamethrin: Tralomethrin	ND	ND	ND	ND	4.7	ND	ND	ND	.70
Lambda- Cyhalothrin	0.386 ^{BJ}	ND	0.394 ^{BJ}	ND	ND	1.1 ^J	ND	ND	0.31
Permethrin	ND	ND	ND	ND	ND	ND	ND	12 ^J	1.6
Suspended Sediment Conc. (mg/L)	7.5	13	9.4	37	37	13	173	14	38
Total Organic Carbon (mg/L)	16	14	15	15	11	11	10	13	13
Hyalella Toxicity									
Average Percent Survival ¹	12	6	18 ²	18	48	0^3	48	0^3	

Explanation:

- ND Non-detect; indicates analytical result has not been detected
- Reflects estimated analytical result value detected below the Reporting Limit (RL) and above the Method Detecting Limit (MDL). The J flag is equivalent to the DNQ Estimated Concentration flag.
- B Indicates the analyte has been detected in the blank associated with the sample.

 All results significantly lower than control samples averages. Samples deemed toxic are shaded.
- ² TIE indicated that toxicity was persistent; results are consistent with Type I and Type II pyrethroids.
- ³ Complete mortality after 48 hours.
- ⁴ Mean concentration calculated by substituting 1/2 MDL for ND data points.



	Dry Creek Upstream 544MSH065	Dry Creek Downstream 544MSH062	Tributary of Grayson Creek Upstream 207WAL078	East Branch of Grayson Creek Downstream 207WAL060	Mean Concentration ⁴
	07/22/14	07/22/14	07/22/14	07/22/14	
Fipronil and Degradates (µg/kg)					
Fipronil Desulfinyl	0.56	0.27 ^J	ND	ND	0.24
Fipronil Sulfone	3	ND	ND	0.14 ^J	0.81
Organochlorine pesticides (mg/kg)					
2,4'-DDD	0.012	0.034	ND	ND	0.012
2,4'-DDE	0.0058	0.019	ND	ND	0.0068
4,4'-DDD	0.0036	0.023	ND	ND	0.0069
4,4'-DDE	0.028	0.076	ND	ND	0.026
Pyrethroid pesticides (µg/kg)					
Bifenthrin	99	40	5.6	3.6	37
Cyfluthrin	6.2	3.4	0.8	0.41	2.7
Cypermethrin	0.30^{J}	0.35	0.28 ^J	0.21 ^J	0.29
Lambda-Cyhalothrin	0.37	0.24 ^J	ND	ND	0.17
Permethrin	6	9.4	1.9	2.3	4.9
Total Organic Carbon (%)	4.6	1.9	3.6	1	2.8
Pyrethroid pesticides (µg/g organic ca	rbon)				
Bifenthrin	2.2	2.1	0.16	0.36	1.2
Cyfluthrin	0.13	0.18	0.022	0.041	0.094
Cypermethrin	0.0065	0.018	0.0078	0.021	0.013
Lambda-Cyhalothrin	0.0080	0.013	ND	ND	0.0062
Permethrin	0.13	0.49	0.053	0.23	0.23
Hyalella Toxicity					
Average Percent Survival	3.75 1,3	48.8 1	97.1 ²	90 ²	
Average Weight (mg/individual)	0.00625 1	0.0352 1	0.06992	0.0875	

Explanation:

ND Non-detect; indicates analytical result has not been detected

² Result was significantly higher than control sample average.



Estimated analytical result value detected below the Reporting Limit (RL) and above the Method Detecting Limit (MDL). The J flag is equivalent to the DNQ Estimated Concentration flag.

Result was significantly lower than control sample average. Samples deemed toxic are shaded.

³ TIE indicated baseline toxicity was persistent; addition of PBO increased toxicity; addition of carboxylesterase removed most of toxicity. Weight of evidence suggests toxicity was likely due to pyrethroid pesticides. 4 Mean concentration calculated by substituting 1/2 MDL for ND data points.

7.0 Data Analysis

As hypothesized in the SSID Conceptual Work Plan (Appendix D), current-use pesticides were commonly detected in both water and sediment samples of both creeks:

- Fipronil and three of its common degradate compounds were detected in most of the water samples
- Six pyrethroids were detected at least once in the set of eight water samples; bifenthrin (8 of 8 samples) and cyfluthrin (7 of 8 samples) were detected in nearly all of the samples.
- Two fipronil degradates were detected, each in two of the four sediment samples.
- Four pyrethroids (bifenthrin, cyfluthrin, cypermethrin, and permethrin) were detected in all four of the sediment samples.
- Four DDT breakdown products were detected in both the upstream and downstream sediment samples from Dry Creek.

Toxicity was observed to the test species *Hyalella azteca* in all eight of the water samples, and in both of the Dry Creek sediment samples. Toxicity testing results for the Grayson Creek sediment samples were anomalous.

The concentrations of pyrethroid pesticides measured were sufficient to account for the toxicity observed in all eight toxic water samples and the two (Dry Creek) toxic sediment samples (see detail below and in Appendix J).

TIE analyses performed on one toxic wet weather water sample and one toxic dry weather sediment sample provided evidentiary support for the idea that pyrethroid pesticides were likely to be the principal cause of the observed toxicity in both water and sediment samples.

7.1 Spatial and Temporal Analysis

The NPDES permits (Attachment H/MRP, Attachment D/Central Valley Permit) require the Permittees to further investigate sediment quality/toxicity issues and "Identify cause(s) of impacts and spatial extent." The water and sediment quality data were both evaluated for potential evidence of spatial differences. Because there were three wet weather aquatic monitoring events (two per site), it is also possible to investigate to a limited degree the temporal variability in the water chemistry data. Wet weather water quality and dry weather sediment quality are discussed separately below.

7.1.1 Water Quality

Table 10 shows the results of spatial and temporal comparisons for the water chemistry data. Given that the comparisons involved sample sizes ("n") consisting of from two to four data points, these data are not sufficiently numerous to permit statistical analysis, and the analysis should be considered to provide only indications of possible differences or trends.

Across the board, pesticide concentrations were higher on average in Grayson Creek than in Dry Creek. Suspended sediment concentrations also were substantially higher on average in Grayson Creek, indicating that flows, streambed scour, and sediment mobilization may have been higher in Grayson Creek, leading to higher water column pollutant concentrations.



No clear or consistent patterns are observed in either the upstream/downstream spatial comparisons, or the three-event temporal comparisons for the 2014 SSID study water quality data.

Table 10. Spatial and Temporal Analysis of Wet Weather Water Quality Data									
	Dry Creek (mean)	Grayson Creek (mean)	Upstream (mean)	Downstream (mean)	02/06/14 (mean)	02/28/14 (mean)	03/26/14 (mean)		
	n=4	n=4	n=4	n=4	n=2	n=4	n=2		
Fipronil and Degradates (ng/L)									
Fipronil	3.8	17	11	10	3.2	13	14		
Fipronil Desulfinyl	1.6	3.8	3.5	2.0	1.2	2.3	5.0		
Fipronil Sulfide	0.3	1.7	0.9	1.2	0.38	0.85	2.0		
Fipronil Sulfone	3.8	10	8.6	5.6	2.3	8.6	8.9		
Pyrethroid pesticides (ng/L)						1			
Bifenthrin	7.1	7.3	8.0	6.3	5.6	7.7	7.6		
Cyfluthrin	1.2	2.1	0.85	2.4	0.70	2.4	1.0		
Cypermethrin	0.10	0.28	0.13	0.25	0.10	0.10	0.45		
Deltamethrin:Tralomethrin	0.10	1.3	1.3	0.13	0.10	1.3	0.20		
Lambda-Cyhalothrin	0.25	0.38	0.42	0.20	0.39	0.10	0.65		
Permethrin	0.10	3.1	0.13	3.1	0.10	0.10	6.1		
Suspended Sediment Conc. (mg/L)	17	59	18	58	8.5	65	14		
Total Organic Carbon (mg/L)	15	11	13	13	16	13	12		

Mean concentrations were calculated by substituting 1/2 MDL for ND data points.

For the wet weather (water matrix) toxicity testing results, as shown in Table 8, there are no clear or consistent patterns in comparisons of Dry Creek vs. Grayson Creek watersheds, upstream vs. downstream sites, or in comparisons of results for the three monitored events. The Grayson Creek samples collected on 3/26/2014 exhibited the highest degree of toxicity, with 0% survival (complete mortality to all test organisms) within three days.

7.1.2 Sediment Quality

For the sediment data, there was only one dry-weather monitoring event during 2014, and therefore limited data analysis can be performed. Visual inspection of the results shown in Table 8 provides no clear indication of substantial or consistent differences between upstream and downstream sites on either of the two creeks studied.

7.1.2.1 DDT Metabolites

However, there are notable differences in the sediment chemistry between the two creek watersheds, principally with respect to detections of four DDT metabolites (breakdown products): 2,4'-DDD, 2,4'-DDE, 4,4'-DDD, and 4,4'-DDE. These four compounds were detected in both the upstream and downstream samples from Dry Creek, and there were no detections in the Grayson Creek watershed



samples. Use of DDT, an organochlorine pesticide, has been banned in the United States for over 40 years, but as a persistent organic pollutant, DDT and its breakdown products tend to persist in sediments near areas of prior use. For all four detected compounds, the concentrations were substantially higher in the Dry Creek downstream samples vs. upstream samples.

7.2 Toxic Unit Equivalents

Pyrethroid pesticides are generally toxic to the most sensitive aquatic arthropods (including *H. azteca*) at extremely low levels – generally at concentrations in the single-digit (or lower) nanograms per liter (ng/L) (parts per trillion) range. Toxicity studies typically identify the LC50, the concentration that is lethal on average to 50% of the test organisms, and/or the EC50, the concentration at which a sub-lethal effect is observed on average to 50% of the test organisms.

Chemical mixtures are often evaluated with respect to their potential to cause toxicity by determination of the toxic unit (TU) equivalents for specific compounds. One TU equivalent is the amount of a specific compound expected to produce a toxic effect in a specific organism in a specific matrix (water or sediment). The TU equivalents for known contaminants in a given sample are typically then summed to provide a TU equivalent sum for the sample. This is often done for a specific class of contaminants, such as pyrethroid pesticides, where there may exist toxicological data indicating the toxic levels of the specific contaminants as derived in laboratory studies.

The published water and sediment toxicity *H. azteca* LC50 values (see Ruby, 2013) were used for comparisons to the measured SSID Part A pyrethroids data and to calculate TU equivalents for those pyrethroids for which published LC50 values are available, based on detected pyrethroid concentrations.

USEPA has not developed recommended water quality criteria for the protection of aquatic life for pyrethroids (or for many other current-use pesticides, including fipronil), as it has for other common water pollutants. Therefore other, non-regulatory data are used as comparison values to evaluate the data compiled for this report and calculate TU equivalents. The available comparison values include water quality criteria values developed by UC Davis, as well as USEPA Aquatic Life Benchmark values (see Ruby, 2013 for discussion of available comparison values). For Lambda-Cyhalothrin, the UC Davis acute water column criterion was used, and for Deltamethrin:Tralomethrin, the average of the deltamethrin and tralomethrin USEPA benchmarks was used, due to lack of published water column *H. azteca* LC50s for those compounds.

As sediment toxicity to *H. azteca* is mitigated by the presence of organic carbon in the sediments, the literature sediment LC50s are derived as pyrethroid concentration per unit organic carbon ($\mu g/g$ organic carbon). The raw pyrethroid sediment concentrations were therefore converted to those units ($\mu g/g$ organic carbon) prior to computation of the TU equivalents for the sediment samples.

Because pyrethroid toxicity is generally considered to be additive (c.f., Trimble et al., 2009), the actual insitu toxicity estimated from chemistry results must account for the mixtures of pyrethroids and other pesticides found.

The toxic unit equivalents attributable to each detected pyrethroid pesticide and the sums of the calculated TU equivalents for each sample for the detected pyrethroids are shown in Table 11 for the water samples and Table 12 for sediment samples.



When the TU equivalents are summed, each of the toxic water and sediment samples exhibit a sum of TU equivalents greater than 1.0, indicating that the measured pyrethroid concentrations were sufficient to cause the toxicity observed. It is notable that the two sediment samples from Grayson Creek watershed were the only samples with pyrethroid TU equivalents less than 1.0, and those were also the only two samples that were not acutely toxic to *H. azteca*.

Table 11. Calculation of Pyrethroid Toxic Unit Equivalents for Wet Weather Water Quality Data									
LC50 or Other Criterion* (ng/L)		Dry Creek Upstream 544MSH065		Dry Creek Downstream 544MSH062		Tributary of Grayson Creek Upstream 207WAL078		East Branch of Grayson Creek Downstream 207WAL060	
	Sample Collection Date								
		02/6/14	02/28/14	02/06/14	02/28/14	02/28/14	03/26/14	02/28/14	03/26/14
Pyrethroid Pesticides: TU Equivalents									
Bifenthrin	7.5	0.7	1.1	0.8	1.1	1.0	1.5	0.9	0.6
Cyfluthrin	2.4	0.3	0.6	0.3	0.7		0.5	2.7	0.4
Cypermethrin	2.5								0.3
Deltamethrin:Tralomethrin	4.3					1.1			
Lambda-Cyhalothrin	1.0	0.4		0.4			1.1		0.2
Permethrin	21.1								0.6
Sum (Pyrethroid TUs)		1.4	1.8	1.5	1.9	2.1	3.0	3.5	2.0

^{*} Toxic Unit Equivalents (TUs) are calculated as ratios of measured pyrethroid concentrations to literature *Hyalella azteca* LC50 values, except for Lambda-Cyhalothrin, for which the UC Davis acute criterion was used, and Deltamethrin:Tralomethrin, for which the average of the deltamethrin and tralomethrin USEPA benchmarks were used, due to lack of published water column *Hyalella azteca* LC50s for those compounds. See: http://www.tdcenvironmental.com/resources/Pyrethroids-Aquatic-Tox-Summary.pdf for associated references.

Calculations are based on detected pyrethroids only.

Values in **Bold** indicate TU equivalent sum is greater than 1.0.



Table 12. Calculation of Pyrethroid Toxic Unit Equivalents for Dry Weather Sediment Quality Data									
	LC50 (µg/g Organic Carbon) LC50 Dry Creek Dry Creek Downstream Downstream Downstream 544MSH065 Tributary of Grayson Creek Upstream 207WAL078				E. Branch of Grayson Creek Downstream 207WAL060				
Sample Collection Date									
		07/22/14	07/22/14	07/22/14	07/22/14				
Pyrethroid Pesticides: TU Equivalents									
Bifenthrin	0.52	4.1	4.0	0.30	0.69				
Cyfluthrin	1.08	0.12	0.17	0.021	0.038				
Cypermethrin	0.38	0.017	0.048	0.020	0.055				
Lambda-Cyhalothrin	0.45	0.018	0.028	0.002	0.007				
Permethrin	10.83	0.012	0.046	0.005	0.021				
Sum (Pyrethroid TUs)		4.3	4.3	0.3	0.8				

Toxic Unit Equivalents (TUs) are calculated as ratios of measured pyrethroid concentrations to literature *Hyalella azteca* LC50 values. See: http://www.tdcenvironmental.com/resources/Pyrethroids-Aquatic-Tox-Summary.pdf for associated references.

Calculations are based on detected pyrethroids only.

Values in **Bold** indicate TU equivalent sum is greater than 1.0

7.3 Toxicity Identification Evaluations (TIEs)

The results of the TIEs for both water and sediment samples indicated that the most likely causes of the observed water and sediment toxicity are pyrethroid pesticides. The full TIE laboratory reports are included in Appendix J.

For the water sample TIE testing, the addition of PBO (a pyrethroid synergist) substantially increased the toxicity of the samples, the addition of carboxylesterase, which reduces pyrethroid toxicity, removed the statistically significant toxicity, and BSA, which has less effect on pyrethroids, had a minor effect on the measured toxicity levels. For the sediment TIE testing, the addition of PBO (a pyrethroid synergist) increased the toxicity of the samples, and the addition of carboxylesterase, which reduces pyrethroid toxicity, removed the statistically significant toxicity.

Taken together with the chemistry results and the toxic unit equivalents calculations as described above, the TIE test results confirm that pyrethroid pesticides are the most likely causes of the observed toxicity in the 2014 SSID water and sediment samples.



8.0 Conclusions

The analysis of data generated in the monitoring study conducted for Part A of the CCCWP SSID study provided the following conclusions:

- Current-use pesticides were commonly detected in both water and sediment samples of both creeks, including fipronil and its common degradate compounds, as well as several pyrethroid pesticides.
- Four DDT breakdown products (variants of DDE and DDD) were detected in both the upstream and downstream sediment samples from Dry Creek.
- Toxicity was observed to the test species *Hyalella azteca* in all eight of the 2014 SSID Study water samples (upstream and downstream samples for two wet weather events in both Dry Creek and Grayson Creek watersheds), and in both of the Dry Creek sediment samples. Toxicity testing results for the Grayson Creek sediment samples were anomalous.
- The concentrations of pyrethroid pesticides measured were sufficient to account for the toxicity observed in all eight toxic water samples (upstream and downstream samples for two wet weather events in both Dry Creek and Grayson Creek watersheds) and the two (Dry Creek) toxic sediment samples.
- TIE analyses performed on one toxic wet weather water sample and one toxic dry weather sediment sample provided evidentiary support for the idea that pyrethroid pesticides were likely to be the principal cause of the observed toxicity in both water and sediment samples.



9.0 References

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Appendix A. Permit Provision C.8.d.i., Monitoring Projects (Stressor/Source Identification)



- v. Status Monitoring Results When Status Monitoring produces results such as those described in the final column of Table 8.1, Permittees shall conduct Monitoring Project(s) as described in C.8.d.i.
- **C.8.d. Monitoring Projects** Permittees shall conduct the Monitoring Projects listed below.
 - i. Stressor/Source Identification When Status results trigger a follow-up action as indicated in Table 8.1, Permittees shall take the following actions, as also required by Provision C.1. If the trigger stressor or source is already known, proceed directly to step 2. The first follow-up action shall be initiated as soon as possible, and no later than the second fiscal year after the sampling event that triggered the Monitoring Project.
 - (1) Conduct a site specific study (or non-site specific if the problem is wide-spread) in a stepwise process to identify and isolate the cause(s) of the trigger stressor/source. This study should follow guidance for Toxicity Reduction Evaluations (TRE)⁴⁰ or Toxicity Identification Evaluations (TIE).⁴¹ A TRE, as adapted for urban stormwater data, allows Permittees to use other sources of information (such as industrial facility stormwater monitoring reports) in attempting to determine the trigger cause, potentially eliminating the need for a TIE. If a TRE does not result in identification of the stressor/source, Permittees shall conduct a TIE.
 - (2) Identify and evaluate the effectiveness of options for controlling the cause(s) of the trigger stressor/source.
 - (3) Implement one or more controls.
 - (4) Confirm the reduction of the cause(s) of trigger stressor/source.
 - (5) Stressor/Source Identification Project Cap: Permittees who conduct this monitoring through a regional collaborative shall be required to initiate no more than ten Stressor/Source Identification projects during the Permit term in total, and at least two must be toxicity follow-ups, unless monitoring results do not indicate the presence of toxicity. If conducted through a stormwater countywide program, the Santa Clara and Alameda

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⁴⁰ USEPA. August 1999. *Toxicity Reduction Evaluation Guidance for Municipal Wastewater Treatment Plants*. EPA/833B-99/002. Office of Wastewater Management, Washington, D.C.

Select TIE methods from the following references after conferring with SWAMP personnel: For sediment: (1) Ho KT, Burgess R., Mount D, Norberg-King T, Hockett, RS. 2007. Sediment toxicity identification evaluation: interstitial and whole methods for freshwater and marine sediments. USEPA, Atlantic Ecology Division/Mid-Continental Ecology Division, Office of Research and Development, Narragansett, RI, or (2) Anderson, BS, Hunt, JW, Phillips, BM, Tjeerdema, RS. 2007. Navigating the TMDL Process: Sediment Toxicity. Final Report- 02-WSM-2. Water Environment Research Federation. 181 pp. For water column: (1) USEPA. 1991. Methods for aquatic toxicity identification evaluations. Phase I Toxicity Characterization Procedures. EPA 600/6-91/003. Office of Research and Development, Washington, DC., (2) USEPA. 1993. Methods for aquatic toxicity identification evaluations. Phase II Toxicity Identification Procedures for Samples Exhibiting Acute and Chronic Toxicity. EPA 600/R-92/080. Office of Research and Development, Washington, DC., or (3) USEPA. 1996. Marine Toxicity Identification Evaluation (TIE), Phase I Guidance Document. EPA/600/R-95/054. Office of Research and Development, Washington, DC.

Permittees each shall be required to initiate no more than five (two for toxicity); the Contra Costa and San Mateo Permittees each shall be required to initiate no more than three (one for toxicity); and the Fairfield-Suisun and Vallejo Permittees each shall be required to initiate no more than one Stressor/Source Identification project(s) during the Permit term.

- (6) As long as Permittees have complied with the procedures set forth above, they do not have to repeat the same procedure for continuing or recurring exceedances of the same receiving water limitations unless directed to do so by the Water Board.
- ii. BMP Effectiveness Investigation Investigate the effectiveness of one BMP for stormwater treatment or hydrograph modification control. Permittees who do this project through a regional collaborative are required to initiate no more than one BMP Effectiveness Investigation during the Permit term. If conducted through a stormwater countywide program, the Santa Clara, Alameda, Contra Costa, and San Mateo Permittees shall be required to initiate one BMP Effectiveness Investigation each, and the Fairfield-Suisun and Vallejo Permittees shall be exempt from this requirement. The BMP(s) used to fulfill requirements of C.3.b.iii., C.11.e. and C.12.e. may be used to fulfill this requirement, provided the BMP Effectiveness Investigation includes the range of pollutants generally found in urban runoff. The BMP Effectiveness Investigation will not trigger a Stressor/Source Identification Project. Data from this Monitoring Project need not be SWAMP-comparable.
- **iii. Geomorphic Project** This monitoring is intended to answer the questions: How and where can our creeks be restored or protected to cost-effectively reduce the impacts of pollutants, increased flow rates, and increased flow durations of urban runoff?

Permittees shall select a waterbody/reach, preferably one that contains significant fish and wildlife resources, and conduct one of the following projects within each county, except that only one such project must be completed within the collective Fairfield-Suisun and Vallejo Permittees' jurisdictions:

- (1) Gather geomorphic data to support the efforts of a local watershed partnership⁴² to improve creek conditions; or
- (2) Inventory locations for potential retrofit projects in which decentralized, landscape-based stormwater retention units can be installed; or
- (3) Conduct a geomorphic study which will help in development of regional curves which help estimate equilibrium channel conditions for different-sized drainages. Select a waterbody/reach that is not undergoing changing land use. Collect and report the following data:
 - Formally surveyed channel dimensions (profile), planform, and crosssections. Cross-sections shall include the topmost floodplain terrace and

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⁴² A list of local watershed partnerships may be obtained from Water Board staff.

- iv. Status Monitoring Location One location in Marsh Creek (Marsh Creek Reservoir to San Joaquin River, partly in Delta Waterways, western portion)
- v. Status Monitoring Results When Status Monitoring produces results such as those described in the final column of Table 8.1, Permittees shall conduct Monitoring Project(s) as described in C.8.c.i.

C.8.d. Monitoring Projects – Permittees shall conduct the Monitoring Projects listed below.

- i. Stressor/Source Identification When Status results trigger a follow-up action as indicated in Table 8.1, Permittees shall take the following actions, as also required by Provision C.1. If the trigger stressor or source is already known, proceed directly to step 2. The first follow-up action shall be initiated as soon as possible, and no later than the second fiscal year after the sampling event that triggered the Monitoring Project.
 - (1) Conduct a site specific study (or non-site specific if the problem is wide-spread) in a stepwise process to identify and isolate the cause(s) of the trigger stressor/source. This study should follow guidance for Toxicity Reduction Evaluations (TRE)³⁹ or Toxicity Identification Evaluations (TIE).⁴⁰ A TRE, as adapted for urban stormwater data, allows Permittees to use other sources of information (such as industrial facility stormwater monitoring reports) in attempting to determine the trigger cause, potentially eliminating the need for a TIE. If a TRE does not result in identification of the stressor/source, Permittees shall conduct a TIE.
 - (2) Identify and evaluate the effectiveness of options for controlling the cause(s) of the trigger stressor/source.
 - (3) Implement one or more controls.
 - (4) Confirm the reduction of the cause(s) of trigger stressor/source.
 - (5) Stressor/Source Identification Project Cap: Permittees who conduct this monitoring through a regional collaborative shall be required to initiate no

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USEPA. August 1999. *Toxicity Reduction Evaluation Guidance for Municipal Wastewater Treatment Plants*. EPA/833B-99/002. Office of Wastewater Management, Washington, D.C.

Select TIE methods from the following references after conferring with SWAMP personnel: For sediment: (1) Ho KT, Burgess R., Mount D, Norberg-King T, Hockett, RS. 2007. Sediment toxicity identification evaluation: interstitial and whole methods for freshwater and marine sediments. USEPA, Atlantic Ecology Division/Mid-Continental Ecology Division, Office of Research and Development, Narragansett, RI, or (2) Anderson, BS, Hunt, JW, Phillips, BM, Tjeerdema, RS. 2007. Navigating the TMDL Process: Sediment Toxicity. Final Report- 02-WSM-2. Water Environment Research Federation. 181 pp. For water column: (1) USEPA. 1991. Methods for aquatic toxicity identification evaluations. Phase I Toxicity Characterization Procedures. EPA 600/6-91/003. Office of Research and Development, Washington, DC., (2) USEPA. 1993. Methods for aquatic toxicity identification evaluations. Phase II Toxicity Identification Procedures for Samples Exhibiting Acute and Chronic Toxicity. EPA 600/R-92/080. Office of Research and Development, Washington, DC., or (3) USEPA. 1996. Marine Toxicity Identification Evaluation (TIE), Phase I Guidance Document. EPA/600/R-95/054. Office of Research and Development, Washington, DC.

- more than one Stressor/Source Identification project during the Permit term.
- (6) As long as Permittees have complied with the procedures set forth above, they do not have to repeat the same procedure for continuing or recurring exceedances of the same receiving water limitations unless directed to do so by the Central Valley Water Board.
- ii. BMP Effectiveness Investigation Investigate the effectiveness of one BMP for stormwater treatment or hydrograph modification control. Permittees who do this project through a regional collaborative are required to initiate no more than one BMP Effectiveness Investigation during the Permit term. If conducted through a stormwater countywide program, the East Contra Costa Permittees in the Central Valley Water Board Region shall be required to participate in one BMP Effectiveness Investigation. The BMP(s) used to fulfill requirements of C.3.b.iii. (Green Street Pilot Project) may be used to fulfill this requirement, provided the BMP Effectiveness Investigation includes the range of pollutants generally found in urban runoff. The BMP Effectiveness Investigation will not trigger a Stressor/Source Identification Project. Data from this Monitoring Project need not be SWAMP-comparable.
- **iii. Geomorphic Project** This monitoring is intended to answer the questions: How and where can our creeks be restored or protected to cost-effectively reduce the impacts of pollutants, increased flow rates, and increased flow durations of urban runoff?

Permittees shall select a waterbody/reach, preferably one that contains significant fish and wildlife resources, and conduct one of the following projects within the county:

- (1) Gather geomorphic data to support the efforts of a local watershed partnership⁴¹ to improve creek conditions; or
- (2) Inventory locations for potential retrofit projects in which decentralized, landscape-based stormwater retention units can be installed; or
- (3) Conduct a geomorphic study which will help in development of regional curves which help estimate equilibrium channel conditions for different-sized drainages. Select a waterbody/reach that is not undergoing changing land use. Collect and report the following data:
 - Formally surveyed channel dimensions (profile), planform, and crosssections. Cross-sections shall include the topmost floodplain terrace and be marked by a permanent, protruding (not flush with ground) monument.
 - Contributing drainage area.
 - Best available information on bankfull discharges and width and depth of channel formed by bankfull discharges.

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⁴¹ A list of local watershed partnerships may be obtained from Central Valley Water Board staff.

Appendix B.

Permit Attachment H/D: Status and Long-Term Monitoring Follow-Up Analysis and Actions for Biological Assessment, Bedded Sediment Toxicity, and Bedded Sediment Pollutants



ATTACHMENT H

Provision C.8.
Status and Long-Term Monitoring
Follow-up Analysis and Actions

Status and Long-Term Monitoring Follow-up Analysis and Actions for Biological Assessment, Bedded Sediment Toxicity, and Bedded Sediment Pollutants

When results from Biological Assessment, Bedded Sediment Toxicity, and/or Bedded Sediment Pollutants monitoring indicate impacts at a monitoring location, Permittees shall evaluate the extent and cause(s) of impacts to determine the potential role of urban runoff as indicated in Table H-1.

Table H-1. Sediment Triad Approach to Determining Follow-Up Actions

Chemistry Results ¹⁶¹	Toxicity Results ¹⁶²	Bioassessment Results ¹⁶³	Action
No chemicals exceed Threshold Effect Concentrations (TEC), mean Probable Effects Concentrations (PEC) quotient < 0.5 and pyrethroids < 1.0 Toxicity Unit (TU) ¹⁶⁴	No Toxicity	No indications of alterations	No action necessary
No chemicals exceed TECs, mean PEC quotient < 0.5 and pyrethroids< 1.0 TU	Toxicity	No indications of alterations	 (1) Take confirmatory sample for toxicity. (2) If toxicity repeated, attempt to identify cause and spatial extent. (3) Where impacts are under Permittee's control, take management actions to minimize upstream sources causing toxicity; initiate no later than the second fiscal year following the sampling event.

TEC and PEC are found in MacDonald, D.D., G.G. Ingersoll, and T.A. Berger. 2000. Development and Evaluation of Consensus-based Sediment Quality Guidelines for Freshwater Ecosystems. *Archives of Environ. Contamination and Toxicology* 39(1):20–31.

Toxicity is exhibited when Hyallela survival statistically different than and < 20 percent of control.

Alterations are exhibited if metrics indicate substantially degraded community.

¹⁶⁴ Toxicity Units (TU) are calculated as follows: TU = Actual concentration (organic carbon normalized) ÷ Reported *H. azteca* LC₅₀ concentration (organic concentration normalized). Weston, D.P., R.W. Holmes, J. You, and M.J. Lydy, 2005. Aquatic Toxicity Due to Residential Use of Pyrethroid Insecticides. *Environ. Science and Technology* 39(24):9778–9784.

Chemistry Results ¹⁶¹	Toxicity Results ¹⁶²	Bioassessment Results ¹⁶³	Action
No chemicals exceed TECs, mean PEC quotient < 0.5 and pyrethroids< 1.0 TU	No Toxicity	Indications of alterations	Identify the most probable cause(s) of the alterations in biological community. Where impacts are under Permittee's control, take management actions to minimize the impacts causing physical habitat disturbance; initiate no later than the second fiscal year following the sampling event.
No chemicals exceed TECs, mean PEC quotient < 0.5 and pyrethroids< 1.0 TU	Toxicity	Indications of alterations	 (1) Identify cause(s) of impacts and spatial extent. (2) Where impacts are under Permittee's control, take management actions to minimize impacts; initiate no later than the second fiscal year following the sampling event.
3 or more chemicals exceed PECs, the mean PEC quotient is > 0.5, or pyrethroids > 1.0 TU	No Toxicity	Indications of alterations	 (1) Identify cause of impacts. (2) Where impacts are under Permittee's control, take management actions to minimize the impacts caused by urban runoff; initiate no later than the second fiscal year following the sampling event.
3 or more chemicals exceed PECs, the mean PEC quotient is > 0.5, or pyrethroids > 1.0 TU	Toxicity	No indications of alterations	 Take confirmatory sample for toxicity. If toxicity repeated, attempt to identify cause and spatial extent. Where impacts are under Permittee's control, take management actions to minimize upstream sources; initiate no later than the second fiscal year following the sampling event.
3 or more chemicals exceed PECs, the mean PEC quotient is > 0.5, or pyrethroids > 1.0 TU	No Toxicity	No Indications of alterations	If PEC exceedance is Hg or PCBs, address under TMDLs
3 or more chemicals exceed PECs, the mean PEC quotient is > 0.5, or pyrethroids > 1.0 TU	Toxicity	Indications of alterations	 (1) Identify cause(s) of impacts and spatial extent. (2) Where impacts are under Permittee's control, take management actions to address impacts.

ATTACHMENT D

Provision C.8.
Status and Long-Term Monitoring
Follow-up Analysis and Actions

Attachment D Page D-1

Status and Long-Term Monitoring Follow-up Analysis and Actions for Biological Assessment, Bedded Sediment Toxicity, and Bedded Sediment Pollutants

When results from Biological Assessment, Bedded Sediment Toxicity, and/or Bedded Sediment Pollutants monitoring indicate impacts at a monitoring location, Permittees shall evaluate the extent and cause(s) of impacts to determine the potential role of urban runoff as indicated in Table D-1.

Table D-1. Sediment Triad Approach to Determining Follow-Up Actions

Chemistry Results ¹¹³	Toxicity Results ¹¹⁴	Bioassessment Results ¹¹⁵	Action
No chemicals exceed Threshold Effect Concentrations (TEC), mean Probable Effects Concentrations (PEC) quotient < 0.5 and pyrethroids < 1.0 Toxicity Unit (TU) ¹¹⁶	No Toxicity	No indications of alterations	No action necessary
No chemicals exceed TECs, mean PEC quotient < 0.5 and pyrethroids< 1.0 TU	Toxicity	No indications of alterations	 Take confirmatory sample for toxicity. If toxicity repeated, attempt to identify cause and spatial extent. Where impacts are under Permittee's control, take management actions to minimize upstream sources causing toxicity; initiate no later than the second fiscal year following the sampling event.

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TEC and PEC are found in MacDonald, D.D., G.G. Ingersoll, and T.A. Berger. 2000. Development and Evaluation of Consensus-based Sediment Quality Guidelines for Freshwater Ecosystems. *Archives of Environ. Contamination and Toxicology* 39(1):20–31.

Toxicity is exhibited when *Hyallela* survival statistically different than and < 20 percent of control.

Alterations are exhibited if metrics indicate substantially degraded community.

¹¹⁶ Toxicity Units (TU) are calculated as follows: TU = Actual concentration (organic carbon normalized) ÷ Reported *H. azteca* LC₅₀ concentration (organic concentration normalized). Weston, D.P., R.W. Holmes, J. You, and M.J. Lydy, 2005. Aquatic Toxicity Due to Residential Use of Pyrethroid Insecticides. *Environ. Science and Technology* 39(24):9778–9784.

Chemistry Results ¹¹³	Toxicity Results ¹¹⁴	Bioassessment Results ¹¹⁵	Action
No chemicals exceed TECs, mean PEC quotient < 0.5 and pyrethroids< 1.0 TU	No Toxicity	Indications of alterations	Identify the most probable cause(s) of the alterations in biological community. Where impacts are under Permittee's control, take management actions to minimize the impacts causing physical habitat disturbance; initiate no later than the second fiscal year following the sampling event.
No chemicals exceed TECs, mean PEC quotient < 0.5 and pyrethroids< 1.0 TU	Toxicity	Indications of alterations	 (1) Identify cause(s) of impacts and spatial extent. (2) Where impacts are under Permittee's control, take management actions to minimize impacts; initiate no later than the second fiscal year following the sampling event.
3 or more chemicals exceed PECs, the mean PEC quotient is > 0.5, or pyrethroids > 1.0 TU	No Toxicity	Indications of alterations	 (1) Identify cause of impacts. (2) Where impacts are under Permittee's control, take management actions to minimize the impacts caused by urban runoff; initiate no later than the second fiscal year following the sampling event.
3 or more chemicals exceed PECs, the mean PEC quotient is > 0.5, or pyrethroids > 1.0 TU	Toxicity	No indications of alterations	 Take confirmatory sample for toxicity. If toxicity repeated, attempt to identify cause and spatial extent. Where impacts are under Permittee's control, take management actions to minimize upstream sources; initiate no later than the second fiscal year following the sampling event.
3 or more chemicals exceed PECs, the mean PEC quotient is > 0.5, or pyrethroids > 1.0 TU	No Toxicity	No Indications of alterations	If PEC exceedance is Hg or PCBs, address under TMDLs
3 or more chemicals exceed PECs, the mean PEC quotient is > 0.5, or pyrethroids > 1.0 TU	Toxicity	Indications of alterations	 (1) Identify cause(s) of impacts and spatial extent. (2) Where impacts are under Permittee's control, take management actions to address impacts.

Attachment D Page D-3

Appendix C.

Summary of Creek Status Monitoring in Dry Creek and Grayson Creek, Water Years 2012 and 2013



Samples were collected from Grayson Creek and Dry Creek, sites 207R00011 and 544R00025, respectively, during the Creek Status Monitoring for WY 2012 in Contra Costa County, as part of the RMC regional monitoring. Results relevant to the SSID Part A Study are summarized in the tables below.

The WY 2012 wet weather water samples were both toxic to *H. azteca* (Table C-1)

Table C-1.	C-1. Comparison between laboratory control and receiving water sample toxicity results (<i>H. azteca</i>) for RMC samples collected in WY 2012 wet season, in the context of MRP trigger criteria					
County/ Program	Test Initiation Date	Species Tested	Treatment/ Sample ID	10-Day Mean % Survival	Comparison to MRP Table 8.1 Trigger Criteria	
	3/15/12		Lab Control	100	NA	
CCCWD	3/15/12	II. antona	207R00011 Grayson Creek	32*	<50% of Control	
CCCWP	CCCWP 3/15/12	H. azteca	Lab Control	94	NA	
	3/15/12		544R00025 Dry Creek	0*	<50% of Control	

^{*} The response at this test treatment was significantly less than the Lab Control at p < 0.05.

Because these samples exceeded permit Table 8.1 trigger criteria, re-testing of these samples was required.

For the retests following up on 2012 triggers, samples from both sites were retested with *H. azteca*, the species exhibiting a toxic response, and both sites again showed an acute toxic response (Table C-2). The two samples identified with significant toxicity, 207R00011 and 544R00025, both again met MRP triggers.

Table C-2.	Table C-2. Comparison between laboratory control and receiving water sample toxicity results (<i>H. azteca</i>) for RMC samples retested in WY 2013 wet season, in the context of MRP trigger criteria						
County/ Program	Test Initiation Date (Time)	Species Tested	Treatment/ Sample ID	10-Day Mean % Survival	Comparison to MRP Table 8.1 Trigger Criteria		
	3/6/13		Lab Control	100	NA		
CCCWP	3/6/13	H. azteca	207R00011 Grayson Creek	4*	< 50% of control		
CCCWP	4/4/13	п. адеса	Lab Control	100	NA		
	4/4/13		544R00025 Dry Creek	20*	< 50% of control		

^{*} The response at this test treatment was significantly less than the Lab Control at p < 0.05.



During WY 2012 dry weather monitoring, the sediment samples from both creeks also were toxic to *H. azteca* (Table C-3).

Table C-3.	Detailed sediment toxicity results for dry-season samples exhibiting significant toxicity to <i>H. azteca</i> for sampling conducted in WY 2012					
County/ Program	Test Initiation Date	Treatment/ Sample ID	Mean % Survival	Mean Dry Weight (mg)	Comparison to MRP Tables 8.1 and H-1 Trigger Criteria	
	7/28/12	Lab Control	96.3	0.23	NA	
CCCWP	7/28/12	207R00011 Grayson Creek	43.8*	0.09	More than 20% < Control	
CCCWP	7/28/12	Lab Control	96.3	0.23	NA	
	7/28/12	544R00025 Dry Creek	60*	0.23	More than 20% < Control	

^{*} The response at this test treatment was significantly less than the Lab Control treatment response at p < 0.05.

Pyrethroid toxic unit equivalents were calculated for the WY 2012 dry weather sediment chemistry samples, and both creeks exhibited sum of TU equivalents > 1.0 (Table C-4), indicating likelihood of toxic conditions.

Table C-4. Calculated pyrethroid toxic unit equivalents, 2012 sediment chemistry data					
Pyrethroid	LC50 (ng/g dw)	CCCWP 207R00011 Grayson Creek (2012)	CCCWP 544R00025 Dry Creek (2012)		
Bifenthrin	0.52	1.469	3.302		
Cyfluthrin	1.08	0.302	0.043		
Cypermethrin	0.38	0.163	0.112		
Deltamethrin	0.79	0.092	0.064		
Esfenvalerate	1.54	0.051	0.036		
Lambda-Cyhalothrin	0.45	0.081	0.056		
Permethrin	10.83	0.012	0.009		
Sum of Toxic Unit Equivalents Per Site		2.17	3.62		

Yellow highlighted cells indicate sites where the sum of pyrethroid TU equivalents is > 1.0 Values in **Bold** indicate individual pyrethroid TUs > 1.0.



The analysis of sediment triad data (bioassessment, sediment chemistry, sediment toxicity) from WY 2012 monitoring indicated that follow-up investigation would be needed (Table C-5).

Table C-5	Table C-5. Summary of sediment quality triad evaluation results, WY 2012 data							
Agency/ Program	Water Body	Site ID	B-IBI Condition Category	Sediment Toxicity	# TEC Quotients ≥ 1.0:	Mean PEC Quotient	Sum of TU Equiv.	Next Step Per MRP Table H-1
CCCWP	Grayson Creek	207R00011	Very Poor	Yes	10	0.14	2.17	С
CCCWP	Dry Creek	544R00025	Very Poor	Yes	11	0.51	3.62	С

Yellow highlighted cells indicate results above MRP trigger threshold

Key to Next Steps:

Action Code	Exceeds Bioassessment/ Toxicity/ Chemistry Threshold	Next Step Per MRP Table H-1
A	Yes/No/Yes	(1) Identify cause of impacts.
		(2) Where impacts are under Permittee's control, take management actions to minimize the impacts caused by urban runoff; initiate no later than the second fiscal year following the sampling event.
В	No/No/Yes	If PEC exceedance is Hg or PCBs, address under TMDLs.
C	Yes/Yes/Yes	(1) Identify cause(s) of impacts and spatial extent.
		(2) Where impacts are under Permittee's control, take management actions to address impacts.
D	No/Yes/Yes	(1) Take confirmatory sample for toxicity.
		(2) If toxicity repeated, attempt to dentify cause and spatial extent.
		(3) Where impacts are under Permittee's control, take management actions to minimize upstream sources.



Appendix D. CCCWP SSID Study Concept Plan



DRAFT CONTRA COSTA CLEAN WATER PROGRAM STRESSOR / SOURCE ID STUDY CONCEPT PLAN



Submitted to: Contra Costa Clean Water Program 255 Glacier Drive Martinez, California 94553

Submitted by:



AMEC Environment & Infrastructure, Inc. San Diego, California

And

Armand Ruby Consulting

May 2013

AMEC Project No. 5025133001

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ACRONYMS AND ABBREVIATIONS

BASMAA	Bay Area Stormwater Management Agencies Association
ВМІ	Benthic Macroinvertebrate Index
ВМР	Best Management Practice
CASQA	California Association of Stormwater Quality Agencies
CCCWP	Contra Costa Clean Water Program
Central Valley Permit	California Regional Water Quality Control Board Central Valley Region, East Contra Costa County Municipal NPDES Permit Waste Discharge Requirements, Order No. R5-2010-0102.
CVRWQCB	California Regional Water Quality Control Board, Central Valley Region
DPR	California Department of Pesticide Regulation
FY	Fiscal Year
IPM	Integrated Pesticide Management
LID	Low Impact Development
MRP	California Regional Water Quality Control Board San Francisco Bay Region Municipal Regional Stormwater NPDES Permit, Order No. R2-2009-0074, adopted October 14, 2009, revised November 28, 2011
MS4	Municipal Separate Storm Sewer System
NPDES	National Pollutant Discharge Elimination System
PEC	Probable Effects Concentration
RMC	Regional Monitoring Coalition
RWQCB	Regional Water Quality Control Board
SFBRWQCB	Regional Water Quality Control Board, San Francisco Bay Region
SSID	Source/Stressor Identification
TEC	Threshold Effect Concentration
TIEs	Toxicity Identification Evaluations
TU	Toxicity Unit
USEPA	United States Environmental Protection Agency
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1.0 PROBLEM STATEMENT

Provision C.8.d.i of the Municipal Regional Permit (MRP), and a parallel provision in the Central Valley Permit, require that when Creek Status Monitoring conducted through Provision C.8.c produces measurements that exceed triggers defined in the respective permits, follow-up actions are required. The follow-up actions may include Stressor / Source ID (SSID) Studies. The MRP establishes a cap on the number of SSID studies, when the monitoring is performed under a regional collaborative, no more than two SSID Studies need to be initiated by CCCWP during the permit term. The Central Valley Permit also caps the SSID studies required of East County permittees (Antioch, Brentwood, Oakley, Unicorporated County, and the Flood Control District) to one such study during the permit term. Both permits allow for and encourage Creek Status Monitoring and SSID studies to be conducted regionally.

CCCWP has participated in a regional collaborative with Bay Area Stormwater Management Agencies (BASMAA) members, known as the Regional Monitoring Coalition (RMC), to design the Creek Status monitoring approach and to select SSID Studies. CCCWP also worked with staff of both the San Francisco Bay Regional Water Quality Control Board (SFBRWQCB) and the Central Valley Regional Water Quality Control Board (CVRWQCB) during permit negotiations to implement coordinated monitoring requirements. As a result, the Creek Status Monitoring conducted through the BASMAA program includes monitoring locations in East County jurisdictions. SSID studies at the two selected sites will fulfill CCCWP's requirement to conduct SSID studies for both permits for the permit term expiring in 2014 (MRP) and 2015 (Central Valley Permit).

The two selected SSID Studies in Contra Costa County are investigations of water and sediment toxicity to the indicator organism *Hyalella azteca* in samples collected from Dry Creek and Grayson Creek. Dry Creek is a tributary to Marsh Creek in eastern Contra Costa County; Grayson Creek is a tributary to Walnut Creek in central Contra Costa County. The evidence for toxicity and other monitoring results that triggered a SSID study is summarized in Table 1. During wet weather, toxicity to *Hyalella azteca* was observed in both Grayson Creek and Dry Creek. Significant toxicity to other test organisms (water fleas, green algae, and fathead minnows) was not observed. During dry weather, significant water column toxicity to *Hyalella Azteca* was not observed, but sediment toxicity was. In lower Marsh Creek, downstream of Dry Creek, wet weather toxicity to *Hyalella azteca* was observed for the two storms monitored during the 2012 monitoring year.

In addition to toxicity, sediment chemistry results and benthic macroinvertebrate index (BMI) scores from the 2012 RMC monitoring make the selected locations favorable locations for the RMC to consider as places to conduct toxicity-related SSID studies. The two locations have the highest concentrations of pollutant chemicals in sediments relative to thresholds of concern compared to all other Bay Area Creek Status locations sampled thus far (Figure 1). Detailed analysis of the data indicates that pyrethroid pesticides are likely, but not confirmed, causes of observed toxicity.

The goals of this SSID study is to determine what are causes of observed toxicity, identify potential sources, propose abatement measures, and evaluate the effectiveness of the abatement measures.

Table 1.

Details of Creek Status Monitoring Results Triggering Toxicity SSID Studies

Location	Date	Event / Media	Negative Observations	Benign Observations	
	March 2012	Wet Weather / Water Toxicity	Significant reductions in survival of <i>Hyalella azteca</i>	No significant toxicity to other test organisms observed	
Grayson Creek	July 2012	Dry Weather / Water Toxicity		No significant toxicity to Hyallell azteca or any other test organism observed	
		Dry Weather / Water Toxicity		Ammonia, nitrate, chloride triggers not exceeded	
		Dry Weather / Sediment Toxicity	Significant reductions in survival of <i>Hyalella azteca</i>		
		Dry Weather / Sediment Chemistry	Second highest concentration of sediment contaminants of all Creek Status stations in the Region		
	Spring 2012	ВМІ	Very Poor		
Dry Creek	March 2012	Wet Weather / Water Toxicity	Significant reductions in survival of <i>Hyalella azteca</i>	No toxicity to other test organisms observed	
	July 2012	Dry Weather / Water Toxicity		No significant toxicity to Hyallell azteca or any other test organism observed	
		Dry Weather / Water Toxicity		Ammonia, nitrate, chloride triggers not exceeded	
		Dry Weather / Sediment Toxicity	Significant reductions in survival of <i>Hyalella azteca</i>		
		Dry Weather / Sediment Chemistry	Highest concentration of sediment contaminants of all Creek Status stations in the Region		
	Spring 2012	ВМІ	Very Poor		
Lower Marsh Creek (below Dry Creek)	January 2012 and February 2012	Wet Weather / Water Toxicity	Significant reductions in survival of <i>Hyalella azteca</i>	No significant toxicity to other test organisms observed	

Agency/ Program	Waterbody	Site ID	B-IBI Condition Category	Sediment Toxicity	# TEC Quotients > 1.0:	Mean PEC Quotient	Sum of TU Equiv.	Next Step per MRP Table H-1
ACCWP	Castro Valley	204R00047	Poor	No	16	0.57	2.38	Α
ACCWP	Dublin Creek	204R00084	Very Poor	No	12	0.18	1.06	Α
ACCWP	Arroyo Mocho	204R00100	Very Poor	No	4	0.16	3.16	Α
CCCWP	Grayson	207R00011	Very Poor	Yes	17	0.28	3.16	С
CCCWP	Dry	544R00025	Very Poor	Yes	19	0.72	4.40	С
SCVURPPP	Los Gatos	205R00026	Poor	No	12	0.21	0.41	Α
SCVURPPP	Upper Penitencia	205R00035	Poor	No	1	0.07	1.36	Α
SCVURPPP	Coyote	205R00042	Very Poor	No	6	0.20	0.22	Α
SMCWPPP	Milagra	202R00087	Good	No	12	0.46	1.26	В
SMCWPPP	Corte Madera	205R00088	Good	No	9	0.13	0.23	В

Action Code	Exceeds Bioassessment/ Toxicity/ Chemistry Threshold	Next Step per MRP Table H-1
Α	Yes/No/Yes	(1) Identify cause of impacts.(2) Where impacts are under Permittee's control, take management actions to minimize the impacts caused by urban runoff; initiate no later than the second fiscal year following the sampling event.
В	No/No/Yes	If PEC exceedance is Hg or PCBs, address under TMDLs.
С	Yes/Yes/Yes	(1) Identify cause(s) of impacts and spatial extent.(2) Where impacts are under Permittee's control, take management actions to address impacts.

Figure 1. Summary of Sediment Quality Triad Analysis Results, Monitoring Year 2012 Regional Monitoring Coalition Data.

Notes: Yellow Highlights Indicate Trigger Exeedances. Figure from BASMAA (2013).

- Additional notes: The terms TEC Quotient (Threshold Effect Quotient), PEC Quotient (Probable Effects Quotient) are defined in an established and accepted sediment quality guidelines publication (Macdonald, 2000) as follows:
- Threshold Effect Concentration (TEC): Represents the concentration below which adverse effects are expected to occur only rarely.
- **TEC Quotient**: ratio of measured concentration to TEC; a TEC Quotient > 1 indicates potential for effects, albeit infrequently. The sixth column in Figure 1 above indicates the number of different pollutants in sediments that have measured TEC quotients exceeding 1.
- **Probable Effects Concentration (PEC)**: Represents the concentration above which adverse effects are expected to occur frequently.
- **PEC Quotient**: ratio of measured concentration to PEC; a higher PEC Quotients indicate greater potential for effects. The mean PEC quotients help evaluate the additive effect of multiple toxicants.
- The Pyrethroid Toxicity Unit Equivalent (TU Equiv.) The seventh column indicates the concentration relative to the lethal concentration that causes fifty percent mortality, based on literature data.

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2.0 STUDY LOCATIONS

A map of Grayson Creek is presented in Figure 2. The area in Grayson Creek where toxicity to *Hyalella* was observed is provided in Figure 3. A map of Dry Creek is presented in Figure 4. The area in Dry Creek where toxicity was observed is provided in Figure 5. Toxicity to *Hyalella* was also observed in Marsh Creek, downstream of the Dry Creek confluence. Land uses common to both watersheds include suburban residential, agricultural, golf courses, and additional impervious and pervious areas including light commercial and public facilities such as schools and athletic fields.

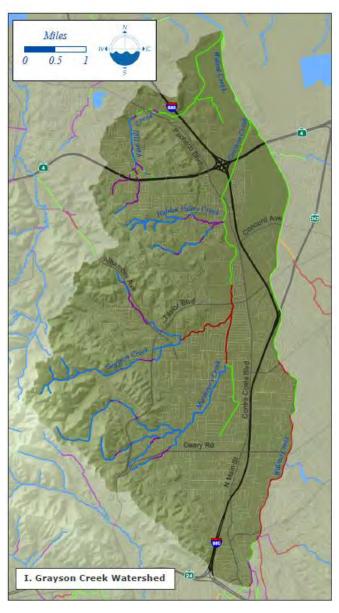


Figure 2. Locator Map of the Grayson Creek Watershed

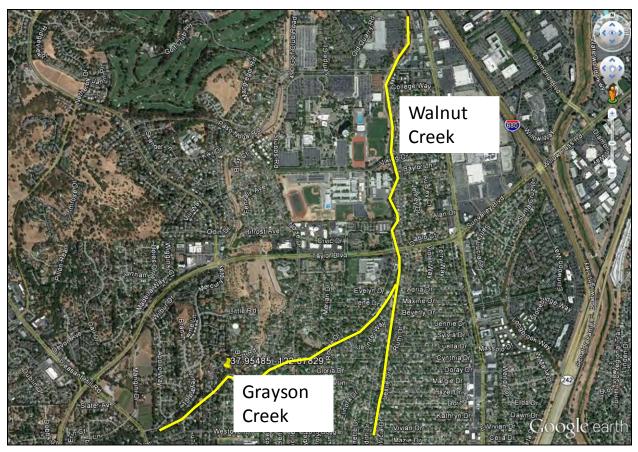


Figure 3. Google Earth View of Lower Grayson Creek in Vicinity of Detected Toxicity

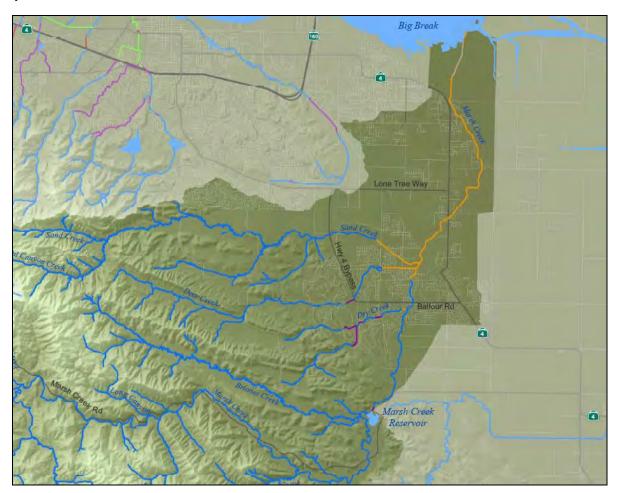


Figure 4. Locator Map of the Dry Creek Watershed

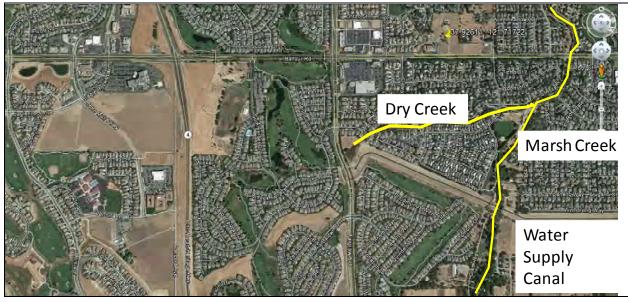


Figure 5. Google Earth View of Lower Grayson Creek in Vicinity of Detected Toxicity

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3.0 APPROACH OUTLINE

MRP Provision C.8.d.i requires four steps for SSID projects; the four parts of the study approach outlined below encompass those four required steps

Part A:

Toxicity studies first require positive identification of the stressor(s). It is presumed in these cases that the stressors are pesticides; however, additional water and sediment chemistry and toxicity testing are necessary to confirm this. In particular, determination of which pesticides are causing toxicity, and whether there are spatial patterns that may pinpoint more specific source areas or land uses. This work would involve data review, initial watershed assessments, reconnaissance using Google Earth, and site visits prior to the chemistry and toxicity testing. The work performed during the site visits would be conducted as part of the required Stream Surveys for labor efficiency. Monitoring would involve instream toxicity testing as well as toxicity identification evaluations(TIEs), as needed. This work is anticipated for Fiscal Year (FY) 2013 – 2014.

Part B:

After confirming the stressors, sources need to be identified. Presuming that pesticide applications are determined to be the source(s) for the pesticides identified as stressors in Part A, the assessment would attempt to characterize the relative magnitudes of sources attributable to the following: Contra Costa County professional Pest Control Operators vs. homeowners, spatial and temporal characteristics of pesticide applications, the role of impervious surfaces, and any potential contribution from different land uses such as agriculture or golf courses. These activities are anticipated for FY 2014 - 2015.

Part C:

The next step is to identify controls to address the sources of the stressors identified in Parts A and B. CCCWP would coordinate with California Association of Stormwater Quality Agencies (CASQA) efforts to lobby the. California Department of Pesticide Regulation (DPR), as well as federal (United States Environmental Protection Agency (USEPA)) efforts to control pesticide use. CCCWP would also support public education and municipal adoption of Integrated Pesticide Management (IPM) methods and related programs such as Our Water Our World. If specific source areas are identified, public education and outreach may be targeted at those source areas. These activities are anticipated for FY 2015 - 2016.

Part D:

Step 4 would include testing and analyzing effectiveness of controls. This would involve additional sample collection to determine whether conditions have improved following implementation of control measures. In order to give the program a few years to work, it is anticipated that follow-up assessments would begin in FY 2018 – 2019.

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4.0 REFERENCES

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Appendix E. CCCWP SSID Part A Work Plan



Work Plan

Draft

CONTRA COSTA CLEAN WATER PROGRAM CREEK STATUS MONITORING PART A

STRESSOR/SOURCE IDENTIFICATION IN DRY CREEK AND GRAYSON CREEK

January – September 2014



Submitted to:



255 Glacier Drive Martinez, CA 94553

Submitted By:



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List of Acronyms

ADH ADH Environmental ARC Armand Ruby Consultants

AMEC, Inc.

ASTM American Society for Testing and Materials

BASMAA Bay Area Stormwater Management Agencies Association

BSA Bovine serum albumin °C Degrees Celsius

CCCWP Contra Costa Clean Water Program

CVRWQCB Central Valley Regional Water Quality Control Board

DQO Data quality objective DO Dissolved oxygen EC Electrical conductivity

EOA EOA, Inc.,

EPA U.S. Environmental Protection Agency

MDL Method detection limit
mg/kg Milligrams per kilogram
mg/L Milligrams per liter
MRP Municipal Regional Permit
mS/cm Microsiemens per centimeter

ng/L Nanograms per liter

NPDES National Pollution Discharge Elimination System

LC₅₀ Lethal concentration to at least 50 percent of the population

PBO Piperonly butioxide

PEC Probable effects concentration

PER Pacific EcoRisk

QAPP Quality Assurance Project Plan
QA/QC Quality Assurance/Quality Control
QPF Quantity of precipitation forecast
RMC Regional Monitoring Coalition

RLs Reporting limits

SFBRWQCB San Francisco Bay Regional Water Quality Control Board

SM Standard Methods

SOPs Standard operating procedures SSID Stressor/source identification

SWAMP Storm Water Ambient Monitoring Program

TEC Threshold effects concentration TIE Toxicity identification evaluation

TU Toxic unit

 $\begin{array}{ll} ng/g & Nanogram \; per \; gram \\ \mu g/L & Microgram \; per \; liter \end{array}$

WY Water year



1.0 Introduction

The Contra Costa Clean Water Program (CCCWP) is governed under two National Pollution Discharge Elimination System (NPDES) stormwater permits: the Municipal Regional Permit (MRP) issued by the SFBRWQCB (2009) and the Central Valley Permit issued by the CVRWQCB (2010). The CCCWP participated in a regional collaborative with Bay Area Stormwater Management Agencies Association (BASMAA) members, known as the Regional Monitoring Coalition (RMC), to design and conduct the Creek Status monitoring required by the permits, evaluate the monitoring results, and perform related studies. CCCWP also worked with staff of both the San Francisco Bay Regional Water Quality Control Board (SFBRWQCB) and the Central Valley Regional Water Quality Control Board (CVRWQCB) to implement coordinated monitoring requirements. The Creek Status Monitoring conducted by CCCWP includes monitoring locations in both West County and East County jurisdictions.

Provision C.8.d.i of the MRP and a parallel provision in the Central Valley Permit require follow-up actions ("monitoring projects") when Creek Status Monitoring conducted through Provision C.8.c produces measurements that exceed triggers defined in the permits. The follow-up actions may include Stressor/Source Identification (SSID) Studies. The MRP establishes a cap on the number of SSID studies, such that when the monitoring is performed under a regional collaborative (such as the RMC), no more than two SSID Studies need to be initiated by CCCWP during the permit term. The Central Valley Permit also caps the SSID studies required of East County permittees to one such study during the permit term. Both permits allow for and encourage Creek Status Monitoring and SSID studies to be conducted regionally.

Exceedances were triggered for water and sediment toxicity parameters under Provision C.8.c, Table 8.1 of the MRP in CCCWP's Creek Status Monitoring in both water year (WY) 2012 and WY 2013. Both Dry Creek (site 544R00025) and Grayson Creek (site 207R00011) exhibited water toxicity to *Hyalella azteca* (*H. azteca*) in samples collected during wet weather in WY 2012, with confirmed retests for water toxicity to *H. azteca* in wet weather samples collected in WY 2013. Given that *H. azteca* is the common affected organism in the water and sediment toxicity at both sites, and given the preponderance of evidence linking *H. azteca* toxicity to the presence of pyrethroid pesticides in urban surface waters, this SSID investigation will focus on pyrethroid pesticides as the probable cause of the water and sediment toxicity as detailed in the SSID Draft Scope of Work¹ (ARC, 2013).

Toxicity studies first require positive identification of the stressor(s). Although pyrethroid pesticides are targeted due to their use in residential areas, and it is presumed in these cases that the stressors are pesticides; additional water and sediment chemistry and toxicity testing are necessary to confirm this supposition. In particular, it is necessary to determine which pesticides are causing toxicity, and whether there are spatial patterns that may pinpoint more specific source areas or land uses.

Two SSID studies will be conducted to evaluate and investigate this problem, one each in Dry Creek and Grayson Creek. Dry Creek is located in Eastern Contra Costa County in the City of Brentwood. Grayson Creek is in Central Contra Costa County in the City of Pleasant Hill.

¹ Relevant portions or sections of the SSID Draft Scope of Work have been incorporated into this Work Plan as appropriate.



3

1.1 Objectives

The SSID studies are expected to be performed in four parts over four years. The goals of Part A of the SSID studies are to:

- 1) Identify the causes of the observed water and sediment toxicity to *H. azteca* in Dry Creek and Grayson Creek (i.e., the stressor(s)); and
- 2) Identify temporal (seasonal) and spatial patterns in toxicity, and better characterize the spatial extent of sediment impacts.

Subsequent phases of the SSID studies will involve identification of potential sources of the pollutant(s) or stressor(s), identification and evaluation of potential abatement measures, and evaluation of the effectiveness of the implemented abatement measures. These projects will serve to fulfill the requirements of MRP Table H-1 with respect to follow-up actions pertinent to the sediment triad, as well as CCCWP's requirements to conduct two SSID studies per MRP Provision C.8.d.i.

1.2 Responsible Agency

The CCCWP will provide contract administration as needed to ensure compliance with the contractual agreement and ensure the work is performed to professional standards of quality.

1.3 Personnel

Personnel involved with the SSID Study, their respective roles and responsibilities are listed in Table 1.

	-		
Name	Affiliation	Responsibility	
Jan O'Hara	SFBRWQCB	Regulatory Agency	
Lucile Paquette	CCCWP	Program Coordinator	
Dr. Khalil Abusaba	AMEC	Technical Advisor	
Armand Ruby	ARC	Toxicity Identification Evaluations	
Alessandro Hnatt	ADH	Project Manager	
Peter Wilde	ADH	Quality Assurance Manager	
Kevin Lewis	ADH	Field Sampling	
Calvin Sandlin	ADH	Field Sampling	

Table 1. Personnel Names, Affiliation, and Responsibilities

The following sections briefly describe the monitoring sites, field sampling methods, laboratory analytical testing and chemical analyses methods, data quality objectives, quality assurance/quality control (QA/QC) approach, and data analytical approach for Part A of the SSID projects to be performed in Dry Creek and Grayson Creek.



2.0 Monitoring Site and Sampling Area Description

The WY 2012 Creek Status Dry Creek and Grayson Creek toxicity sampling locations are shown on Figures 1 and 2, respectively. For these SSID studies, two additional sites were selected for monitoring in each creek; one each upstream and downstream of the previously-monitored sites (site 544R00025 in Dry Creek and site 207R00011 in Grayson Creek) to better characterize spatial extent of the toxicity impacts. The upstream and downstream sampling sites were selected in coordination with the CCCWP Program Coordinator, and reconnaissance of these selected sites was performed in the 2013-14 winter season in conjunction with CCCWP Creek Status bioassessment site reconnaissance. The following subsections provide brief descriptions of the localized creek watershed, habitat and physical surroundings. Locations of upstream and downstream SSID monitoring sites for Dry Creek and Grayson Creek are shown in Figures 1 and 2, respectively, and are detailed in Table 2.

2.1 Dry Creek

Dry Creek is a tributary to Marsh Creek in eastern Contra Costa County in the City of Brentwood, California (Figure 1). The creek channel in this area has undergone tremendous hydromodification due to urbanization. The reach that has been and will be sampled as part of this study is one of the reaches where the creek is above-ground. At the upstream end of the reach, west of Arlington Way, water is conveyed through a culvert from the Brentwood Golf Club and surrounding neighborhoods into the engineered flood control channel. The creek flows along Crescent Drive receiving runoff from the neighboring urban development south of Balfour Drive where it reaches a culvert. The downstream site is approximately 350 meters upstream of that culvert, after which it flows underneath Creekside Park until its confluence at Marsh Creek.

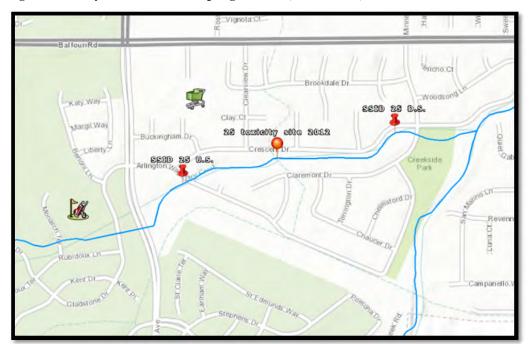


Figure 1. Dry Creek Site 25 sampling locations, Brentwood, CA



2.2 Grayson Creek

Grayson Creek is a tributary to Walnut Creek in central Contra Costa County in the City of Pleasant Hill (Figure 2). The upstream sampling location for this site is located about 30 meters up tributary to Grayson Creek, between Mercury Way and Vineyard Court. The downstream sampling location is located on East Branch of Grayson Creek, just upstream of the Grayson Creek/East Branch Grayson Creek confluence, at the terminus of Ardith Drive. Both Grayson Creek and Tributary to Grayson Creek are concrete flood control channels. Diazinon is a known pollutant of concern in Grayson Creek Watershed. Water and sediment toxicity sampling were conducted in the concrete channel where it crosses the Contra Costa Canal Trail in Pleasant Hill.

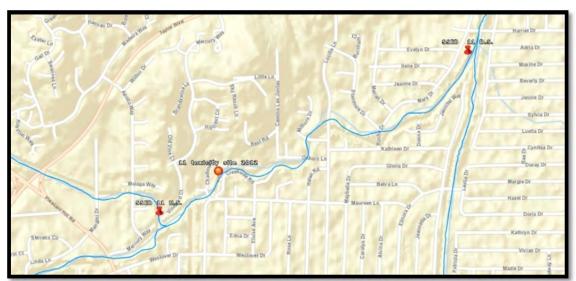


Figure 2. Grayson Creek Site 11 sampling locations, Pleasant Hill, CA

Table 2. Contra Costa County SSID Site Locations for WY 2013 - 2014

Creek Name / SSID Study Site	Site Code*	Latitude	Longitude	Monitoring Site Access
Dry Creek / Downstream	544R00025DS	37.923034	-121.714538	Public Access, park on road next to creek. Monitoring site is located upstream of drop structure at Claremont Way.
Dry Creek / Upstream	544R00025US	37.921722	-121.721855	Public Access, park on road next to creek. Monitoring site is located upstream of culvert at Arlington Way
Grayson Creek/ Downstream	207R00011DS	37.954271	-122.07869	Flood Control Channel, at CC Canal Trail. Monitoring site is located above channel, over fence; requires use of sampling pole and transfer container.
Grayson Creek/ Downstream	207R00011US	37.95141	-122.08396	Flood Control Channel between Mercury Way and Vineyard Court. Monitoring location is on other side of flood control access gate; require use of sampling pole and transfer container from above channel.

^{*}Site codes will change when SWRCB designates new codes.



3.0 Field Monitoring Methods

Monitoring will be performed at each of the four sites during two wet weather events for water chemistry and toxicity, and at each of the same four sites during one dry weather event for sediment chemistry and toxicity. Monitoring preparation and logistics, laboratory arrangements, weather tracking, mobilization, sample collection and field measurements, sample delivery/shipping, demobilization and travel to monitoring sites shall be included as needed. The following subsections describe the field sampling methods that will be employed for the collection of stormwater and dry weather bedded sediment samples for chemical analyses and toxicity testing as well as site observations and water quality measurements taken during all sampling. Sampling methods and procedures will follow the RMC Quality Assurance Project Plan (QAPP; EOA et al., 2012) and Standard Operating Procedures (SOPs; EOA et al., 2014a).

3.1 Stormwater Sampling

Stormwater aquatic toxicity and chemistry sample collection techniques and health and safety considerations will adhere to all relevant protocols specified in the RMC's SOP FS-2, *Manual Collection of Water Samples for Chemical Analysis*, *Bacteriological Analysis*, *and Toxicity Testing* (EOA et al., 2014a).

As feasible, ADH Environmental (ADH) will also adhere to RMC guidance in selection of storm events to monitor:

Recommended protocols: a) track storms that are likely to produce runoff; 0.5" Quantity of Precipitation Forecast (QPF) is good rule of thumb; b) when feasible observe 72 hour antecedent dry period (i.e., <0.1" rain in prior 72 hours); c) collect sample on rising limb of hydrograph, near peak flow; d) coordinate sample collection when possible to sample multiple sites during same event; e) coordinate events with labs in advance.

Due to the abnormally low precipitation experienced during the WY 2013 - 2014, ADH, in communication with the CCCWP Program Coordinator, may elect to sample a precipitation event that does not fully meet all above criteria, or may sample fewer sites in any given event, depending on distribution of rainfall across target sampling sites. Every attempt will be made to coordinate sampling efforts with other RMC participants' toxicity sampling efforts. To minimize upstream influence on downstream water quality, the downstream site will always be sampled prior to collection of samples at the upstream monitoring site. Additionally, all sampling will be conducted during daylight hours in the interest of health and safety.

3.2 Sediment Sampling

Bedded sediment toxicity and chemistry sampling collection techniques, and health and safety considerations for this SSID Study will adhere to all relevant protocols specified in the RMC's SOP FS-6, *Collection of Bedded Sediment Samples for Chemistry Analysis and Toxicity* (EOA et al., 2014a). In accordance with the MRP and Central Valley Permit, sampling will be conducted during dry weather in the July – September timeframe.

Every attempt will be made to coordinate the sampling efforts with other CCCWP and RMC participant's dry season Creek Status toxicity sampling efforts however priority will be given to what individual site logistics and conditions require. However, due to the abnormally low precipitation experienced during the



WY 2013, ADH, in communication with the CCCWP Program Coordinator, may elect to sample independent of the RMC participant's WY 2014 Creek Status sampling efforts.. To minimize upstream influence on downstream water and sediment quality, the downstream site will always be sampled prior to collection of samples at the upstream monitoring site. Additionally, all sampling will be conducted during daylight hours in the interest of health and safety.

3.3 Field Water Quality Measurements and Observations

Field water quality measurements methods and procedures and health and safety considerations for this SSID Study will be performed in conjunction with all water and sediment toxicity and chemistry monitoring, and will adhere to all relevant protocols specified in the RMC's SOP FS-3, *Manual Field Measurements* (EOA et al., 2014a).

Water quality measurements will be performed using a YSI 556 handheld multiparameter probe to measure temperature, pH, dissolved oxygen and specific conductance. Measurements of these parameters as well as the field crew names, standard observations of water quality (e.g., odor, clarity, color, etc.), site information (e.g., GIS coordinates, stream width and depth, approximate flow rate, etc.) will be recorded on a SWAMP field data sheet during all sampling events.

3.4 Sample Handling and Chain of Custody Procedure

Sample containers and handling will adhere to all relevant protocols specified in the RMC's FS-9, *Sample Container, Handling, and Chain of Custody Procedures* (EOA et al., 2014a). A summary of the respective analytes or tests, sample volumes, containers, and preservatives are presented for stormwater aquatic toxicity and dry season bedded sediment monitoring in Tables 3 and 4, respectively.

Table 3. Containers and Handling for CCCWP SSID Aquatic Toxicity Monitoring

Sample/Test	Container	Handling Requirements			
Pyrethroid pesticides	1 @ 2 L amber glass	Place on wet ice, cool to <6° C, 7 day hold time			
Fipronil and degradates 1 @ 2 L amber glass		Place on wet ice, cool to <6° C, 7 day hold time ¹			
Organochlorine pesticides 1 @ 2 L amber glass		Place on wet ice, cool to <6° C, 7 day hold time			
Total Organic Carbon	3 @ 40 ml x VOA	HCL, place on wet ice, cool to <6° C, 28 day hold time			
Suspended Sediment Concentration	1 @ 250ml HDPE	Place on wet ice, cool to <6° C, 7 day hold time			
Aquatic toxicity	2 @ 1L amber glass	Place on wet ice, cool to <6° C, 36 hour hold time			

Explanation:

1. Firpronil's holding time is 7 days, but certain degradates are 3 days.

Table 4. Containers and Handling for CCCWP SSID Dry Season Bedded Sediment Toxicity Monitoring

Sample/Test	Sample/Test Container		
Pyrethroid pesticides, Fipronil and degradates	1 @ 8 ounces amber glass ¹	Place on wet ice, cool to <6° C, 14 day ² hold time	
Organochlorine pesticides	1 @ 8 ounces clear or amber glass soil jar. ¹	Place on wet ice, cool to <6° C, 14 day hold time	



Sample/Test	Container	Handling Requirements
Percent Solids	1 @ 8 ounces clear soil jar.	Place on wet ice, cool to <6° C, 7 day hold time
Total Organic Carbon	1 @ 8 ounces clear soil jar.	Place on wet ice, cool to <6° C, 28 day hold time
Sediment toxicity	3 @ 4L ³ amber glass	Place on wet ice, cool to <6° C, 14 day hold time

Explanation:

- 1. 2 jars recommended for back-up
- 2. 1 year if frozen
- 3. The 10-day *Hyalella azteca* sediment toxicity test requires a total of 2-L of sediment. This does not account for additional volume for a follow-up request or for TIEs. The total for TIEs is dependent on the number of treatments, and can be as much as an additional 2-10 L. In summation, the volume should be ≥ 3 gallons (~12 L on the high end) to cover all possibilities.

3.5 Sample Labeling

The sample ID labeling system used for the RMC Creek Status Monitoring is described in the SOP FS-11, *Site and Sample ID Naming Conventions* (EOA et al., 2014a) and will be used with a modification to accommodate the upstream and downstream monitoring sites as summarized below:

XXXXXXXXYY

Where:

XXXXXXXXX = Nine digit site code

YY = US (for upstream) or DS (for downstream)

4.0 Testing and Analyses

Monitoring will be performed at each of the four sites during two wet weather events for water chemistry and toxicity, and at each of the same four sites once during dry weather for sediment chemistry and toxicity.

Constituents for water quality monitoring will include:

- Field parameters [dissolved oxygen (DO), electrical conductivity (EC), pH, Temperature]
- Pyrethroid pesticides
- Fipronil and degradates
- Organochlorine pesticides
- Total organic carbon
- Suspended sediment concentration
- *Hyalella azteca* chronic toxicity

Constituents for sediment quality monitoring will include:

- Field parameters (DO, EC, pH, Temperature) in overlying water
- Pyrethroid pesticides
- Fipronil and degradates
- Organochlorine pesticides
- Percent solids



- Total organic carbon
- *Hyalella azteca* chronic toxicity

4.1 Stormwater Aquatic Analytical Methods and Tests

Analytical methods and tests, method detection limits (MDLs) and reporting limits (RLs), or test type for the CCCWP SSID Study stormwater aquatic monitoring are presented in Table 5.

Table 5. Analytical Constituent and Toxicity Testing Methods, MDLs, and RLs or Test Type for CCCWP SSID Study Stormwater Aquatic Monitoring

Analyte	Analytical Method	Method Detection Limit or Test Duration	Reporting Limit or Test Type	
Water Quality Parameters				
Dissolved Oxygen	Field Meter	0.01 mg/L	0 - 50 mg/L	
Conductivity	Field Meter	0.001 mS/cm	0 – 200 mS/cm	
pН	Field Meter	0.01 units	0.00 – 14.00 units	
Temperature	Field Meter	-5 – 45°C	0.1°C	
Total Organic Carbon	SM20-5310 B	0.50 mg/L	1 mg/L	
Suspended Sediment Concentration	ASTM D 3977-97 B-Filtration	2 mg/L	3 mg/L	
Pyrethroid pesticides				
Allethrin	EPA 8270Mod (NCI SIM)	0.1 ng/L	1.5 ng/L	
Bifenthrin	EPA 8270Mod (NCI SIM)	0.1 ng/L	1.5 ng/L	
Cyfluthrin	EPA 8270Mod (NCI SIM)	0.2 ng/L	1.5 ng/L	
Cypermethrin	EPA 8270Mod (NCI SIM)	0.3 ng/L	1.5 ng/L	
Deltamethrin: Tralomethrin	EPA 8270Mod (NCI SIM)	0.2 ng/L	3.0 ng/L	
Esfenvalerate: Fenvalerate	EPA 8270Mod (NCI SIM)	0.2 ng/L	3.0 ng/L	
Fenpropathrin	EPA 8270Mod (NCI SIM	0.3 ng/L	1.5 ng/L	
Lambda-Cyhalothrin	EPA 8270Mod (NCI SIM)	0.2 ng/L	1.5 ng/L	
Tau-Fluvalinate	EPA 8270Mod (NCI SIM)	0.2 ng/L	1.5 ng/L	
Tetramethrin	EPA 8270Mod (NCI SIM)	0.2 ng/L	1.5 ng/L	
Permethrin	EPA 8270Mod (NCI SIM)	2 ng/L	15 ng/L	
Fipronil (Degradates Listed Below)	EPA 8270Mod (NCI SIM)	0.002 μg/L	0.01 μg/L	
Fipronil Desulfinyl	EPA 8270Mod (NCI SIM)	0.002 μg/L	0.01 μg/L	
Fipronil Sulfide	EPA 8270Mod (NCI SIM)	0.002 µg/L	0.01 μg/L	
Fipronil Sulfone	EPA 8270Mod (NCI SIM)	0.002 μg/L	0.01 μg/L	
Organochlorine pesticides				
Aldrin	EPA 608	0.0040 µg/L	0.05 μg/L	
alpha-BHC	EPA 608	0.0050 μg/L	0.010 μg/L	
beta-BHC	EPA 608	0.0040 μg/L	0.005 μg/L	
delta-BHC	EPA 608	0.0040 μg/L	0.005 μg/L	
gamma-BHC (Lindane)	EPA 608	0.0040 μg/L	0.010 μg/L	
Chlordane	EPA 608	0.020 µg/L	0.010 μg/L	



Analyte	Analytical Method	Method Detection Limit or Test Duration	Reporting Limit or Test Type
4,4'-DDD	EPA 608	0.0040 μg/L	0.010 μg/L
4,4'-DDE	EPA 608	0.0040 μg/L	0.010 μg/L
4,4'-DDT	EPA 608	0.0040 μg/L	0.010 μg/L
Dieldrin	EPA 608	0.0040 μg/L	0.010 μg/L
Endosulfan I	EPA 608	0.0050 μg/L	0.010 μg/L
Endosulfan II	EPA 608	0.0050 μg/L	0.010 μg/L
Endosulfan sulfate	EPA 608	0.0050 μg/L	0.010 μg/L
Endrin	EPA 608	0.0050 μg/L	0.010 μg/L
Endrin aldehyde	EPA 608	0.0050 μg/L	0.010 μg/L
Endrin ketone	EPA 608	0.0050 μg/L	0.010 μg/L
Heptachlor	EPA 608	0.0050 μg/L	0.010 μg/L
Heptachlor epoxide	EPA 608	0.0040 μg/L	0.010 μg/L
Methoxychlor	EPA 608	0.0050 μg/L	0.01 μg/L
Toxaphane	EPA 608	0.30 μg/L	0.5 μg/L
Aquatic Toxicity	EPA/600/R-99/064	10-day	Survival

Explanation:

 $\begin{array}{lll} mg/L &= Milligram \ per \ liter & ng/L &= Nanograms \ per \ liter \\ mS/cm &= Microsiemens \ per \ centimeter & \mu g/L &= Microgram \ per \ liter \\ ^{\circ}C &= Degrees \ Celsius & SM &= Standard \ Methods \\ \end{array}$

EPA = U.S. Environmental Protection Agency ASTM = American Society for Testing and Materials

4.2 Dry Season Bedded Sediment Analytical Methods and Tests

Analytical methods and tests, MDLs and RLs, or test type for the CCCWP SSID Study dry season bedded sediment toxicity monitoring is presented in Table 6.

Table 6. Analytical Constituent and Toxicity Testing Methods, MDLs and RLs or Test Type for CCCWP SSID Dry Season Bedded Sediment Monitoring

Analyte	Analytical Method	Method Detection Limit or Test Duration	Reporting Limit or Test Type
Water Quality Parameters			
Dissolved Oxygen	Field Meter	0.01 mg/L	0 - 50 mg/L
Conductivity	Field Meter	0.001 mS/cm	0 – 200 mS/cm
рН	Field Meter	0.01 units	0.00 – 14.00 units
Temperature	Field Meter	-5 – 45°C	0.1°C
Total Organic Carbon	EPA 9060	0.30 mg/kg	1 mg/kg
Percent Solids	SM20-2540B	0.5 mg/kg	1 mg/kg
Pyrethroid pesticides			



		Method Detection Limit or	Reporting Limit	
Analyte	Analytical Method	Test Duration	Test Type	
Allethrin	EPA 8270Mod (NCI SIM)	0.05 ng/g	0.33 ng/g	
Bifenthrin	EPA 8270Mod (NCI SIM)	0.1 ng/g	0.33 ng/g	
Cyfluthrin	EPA 8270Mod (NCI SIM)	0.11 ng/g	0.33 ng/g	
Cypermethrin	EPA 8270Mod (NCI SIM)	0.1 ng/g	0.33 ng/g	
Deltamethrin: Tralomethrin	EPA 8270Mod (NCI SIM)	0.12 ng/g	0.33 ng/g	
Esfenvalerate: Fenvalerate	EPA 8270Mod (NCI SIM)	0.13 ng/g	0.33 ng/g	
Fenpropathrin	EPA 8270Mod (NCI SIM	0.07 ng/g	0.33 ng/g	
Lambda-Cyhalothrin	EPA 8270Mod (NCI SIM)	0.06 ng/g	0.33 ng/g	
Tau-Fluvalinate	EPA 8270Mod (NCI SIM)	0.04 ng/g	0.33 ng/g	
Tetramethrin	EPA 8270Mod (NCI SIM)	0.06 ng/g	0.33 ng/g	
Permethrin	EPA 8270Mod (NCI SIM)	0.11 ng/g	0.33 ng/g	
Fipronil (Degradates Listed Below)	EPA 8270Mod (NCI SIM)	0.1 ng/g	0.33 ng/g	
Fipronil Desulfinyl	EPA 8270Mod (NCI SIM)	0.1 ng/g	0.33 ng/g	
Fipronil Sulfide	EPA 8270Mod (NCI SIM)	0.1 ng/g	0.33 ng/g	
Fipronil Sulfone	EPA 8270Mod (NCI SIM)	0.1 ng/g	0.33 ng/g	
Organochlorine pesticides ¹	<u> </u>		•	
Aldrin	EPA 8081	0.9 ng/g	2 ng/g	
alpha-HCH	EPA 8081	0.9 ng/g	2 ng/g	
beta-HCH	EPA 8081	0.9 ng/g	2 ng/g	
delta-HHC	EPA 8081	0.7 ng/g	2 ng/g	
gamma-HCH	EPA 8081	0.7 ng/g	2 ng/g	
cis-Chlordane	EPA 8081	1 ng/g	2 ng/g	
trans-Chlordane	EPA 8081	1 ng/g	2 ng/g	
4,4'-DDD	EPA 8081	0.8 ng/g	2 ng/g	
2, 4'-DDD	EPA 8081	2 ng/g	2 ng/g	
4,4'-DDE	EPA 8081	1.2 ng/g	2 ng/g	
2, 4'-DDE	EPA 8081	2 ng/g	2 ng/g	
4,4'-DDT	EPA 8081	1 ng/g	2 ng/g	
2, 4'-DDT	EPA 8081	2 ng/g	2 ng/g	
Dieldrin	EPA 8081	1.2 ng/g	2 ng/g	
Endosulfan I	EPA 8081	0.9 ng/g	2 ng/g	
Endosulfan II	EPA 8081	0.7 ng/g	10 ng/g	
Endosulfan sulfate	EPA 8081	0.9 ng/g	10 ng/g	
Endrin	EPA 8081	1 ng/g	2 ng/g	
Endrin aldehyde	EPA 8081	0.9 ng/g	2 ng/g	
Endrin ketone	EPA 8081	0.9 ng/g	2 ng/g	



Analyte	Analytical Method	Method Detection Limit or Test Duration	Reporting Limit or Test Type
Heptachlor	EPA 8081	0.6 ng/g	2 ng/g
Heptachlorepoxide	EPA 8081	1.1 ng/g	2 ng/g
Methoxychlor	EPA 8081	0.9 ng/g	2 ng/g
Toxaphene	EPA 8081	20 ng/g	40 ng/g
Mirex	EPA 8081	0.5 ng/g	20 ng/g
Sediment Toxicity	EPA/600/R-99/064	10-day	Survival

Explanation:

1. Does not include all analytes listed in Storm Water Ambient Monitoring Program QAPP (SWAMP 2008).

mg/kg = Milligram per kilogram ng/g = Nanogram per gram

4.3 Reference Toxicant Tests

Per the RMC Creek Status Monitoring Program QAPP (EOA et al., 2012), reference toxicant tests:

... must be conducted monthly for species that are raised within a laboratory. Reference Toxicant Tests must be conducted per analytical batch for species from commercial supplier settings. Reference Toxicant Tests must be conducted concurrently for test species or broodstocks that are field collected.

H. azteca are purchased by Pacific EcoRisk (PER) from commercial suppliers and therefore require reference toxicant tests per analytical batch. Whenever feasible, cooperating RMC programs will attempt to coordinate sampling in order to share the costs of reference toxicant testing among programs sampling the same event.

4.4 Toxicity Identification Evaluations

One targeted toxicity identification evaluation (TIE) is planned for each matrix: water (wet weather) and sediment (dry weather). TIEs will be conducted contingent upon discovery of statistically-significant toxicity in water and sediment samples. The targeted TIEs will include testing of the Baseline Sample (100%), a PBO Treatment (in both 50% dilution and 100% sample) with sample spiking, a Carboxylesterase Treatment (100% sample) with sample spiking, and a Bovine Serum Albumin (BSA) Treatment (100% sample) with sample spiking; these specifications may be modified upon further discussion with toxicity laboratory personnel.

4.5 Contacts

Laboratory contact information for toxicity testing and analytical chemistry is shown in Table 7.



Laboratory	Contact	Phone		
Pacific EcoRisk	Stephen Clark	(707) 207-7766		
Pacific EcoRisk	Eddie Kalombo	(707) 207-7760 Ext. 794		
Catest Analytical	Todd Albertson	(707) 258-4000		

Table 7. Laboratory Contact Information for 2014 CCCWP SSID Study

5.0 Data Quality Objectives and Quality Assurance / Quality Control Approach

The data quality objective (DQO) process is implemented through a Quality Assurance/Quality Control (QA/QC) program. The elements of the QA/QC program including required levels of precision and accuracy, and tolerable levels of error are presented in detail in the RMC QAPP (EOA et al., 2012).

6.0 Data Analysis and Reporting

After all data have been received, a brief draft report summarizing the monitoring performed and data analysis, listed below, will be produced. The report will perform the following data analysis tasks:

- Evaluate, summarize, and compare SSID Study toxicity test results to corresponding water and sediment chemistry results, and assess in relation to TIE results.
- Calculate toxic unit (TU) equivalents for all pyrethroids and any other detected pesticides for which LC₅₀ (lethal concentration to at least 50 percent of the population) values are available.
- Calculate threshold effects concentration (TEC) and probable effects concentration (PEC) quotients for monitored constituents that are listed in Macdonald et al., 2000.
- Assess TU equivalents, TEC quotients and PEC quotients per MRP Table H-1 criteria.
- Compile current project chemistry and toxicity testing data together with prior 2012/2013 data for evaluation of spatial and temporal differences/patterns; present results of these comparisons graphically.

7.0 References

- ARC, 2013. Draft Scope of Work For Stressor/Source Identification Studies, Part A Contra Costa County Creek Status. December 2013.
- CVRWQCB, 2010. California Regional Water Quality Control Board Central Valley Stormwater NPDES Waste Discharge Requirements Order R5-2010-0102 NPDES Permit No. CAS083313. September 23, 2010.
- EOA, AMS, and ARC, 2012. BASMAA Regional Monitoring Coalition Creek Status Monitoring Program Quality Assurance Project Plan. Prepared for Bay Area Stormwater Management Agencies Association. Version 1, February 1, 2012.



- EOA, AMS, and ARC, 2014a. *BASMAA Regional Monitoring Coalition Creek Status Monitoring Program Standard Operating Procedures*. Prepared for Bay Area Stormwater Management Agencies Association. Final Version 2, January 2014.
- EOA, AMS, and ARC, 2014b. BASMAA Regional Monitoring Coalition Creek Status Monitoring Program Quality Assurance Project Plan. Prepared for Bay Area Stormwater Management Agencies Association. Final Version 2, January 2014.
- Macdonald et al., 2000. Development and Evaluation of Consensus-Based Sediment Quality Guidelines for Freshwater Ecosystems. 13 January 200.
- SFRWQCB, 2009. California Regional Water Quality Control Board San Francisco Bay Region Municipal Regional Stormwater NPDES Permit, Order R2-2009-0074 NPDES Permit No. CAS612008. October 14, 2009.
- SWAMP, 2008. Storm Water Ambient Monitoring Program Quality Assurance Project Plan. Prepared for The State of California's Storm Water Ambient Monitoring Program. Version 1.0. September 1, 2008.



Appendix F. SSID Monitoring - Quality Assurance / Quality Control Results



Quality Assurance / Quality Control

Quality Assurance/Quality Control (QA/QC) analyses included required levels of precision and accuracy, and tolerable levels of error are presented in detail in the RMC QAPP (EOA et al., 2012) for chemical and toxicological analyses. This comprehensive and rigorous suite of Laboratory QA/QC procedures were ultimately successfully conducted in accord with Surface Water Ambient Monitoring Program (SWAMP, 2008).

Caltest Laboratories (CAL) performed all chemical analyses and Pacific EcoRisk (PER) performed all toxicology analyses for the CCCWP SSID Project in accordance with their quality assurance programs. These laboratories performed all appropriate internal QA/QC measures in order to provide information needed to assess analytical precision and accuracy, and serve as a check on laboratory procedures.

CAL and PER provided, as a result of this work, signed laboratory reports and accompanying electronic deliverables (EDDs). These reports and EDDs were initially compared by ADH personnel experienced in data review and verification to check completeness (all required samples were analyzed), agreement (values in one matched values in another), if project reporting limit (RL) goals were met, and if all toxicology required conditions were met. This initial screening produced satisfactory results.

Field QA/QC

No field QA/QC samples were taken or analyzed for this program. This was due to its small size and consequent budgetary constraints.

Field Determination of Conductivity, pH, and Temperature

Temperature, conductivity and pH were determined in the field at the time of collection with a YSI field meter. This instrument was calibrated per the manufacturer's specifications within 24 hours of use. Documentation of calibration is included on the field log sheets associated with each monitoring event (Appendix I).

Laboratory QA/QC

Following is a list of Laboratory QA/QC analyses performed by CAL in conjunction with the CCCWP SSID project samples they analyzed:

- Method Blank Samples
- Laboratory Duplicate Samples (Replicate Samples)
- Laboratory Control Sample/Laboratory Control Sample Duplicates (LCS/LCSD)
- Matrix Spike/Matrix Spike Duplicates (MS/MSD)
- Surrogates

Overall, results of all laboratory QA/QC procedures show that, with several exceptions, there were no significant exceedances of control parameters, all analyses were performed under adequately controlled conditions, the data quality was not affected, and the reported results are acceptable for interpretation These results illustrate that the integrity of the data integrity is strong, as detailed below.



Method Blank Samples

Laboratory blank samples were analyzed to assess the possibility of sample contamination introduced through analysis of samples by the analytical laboratory.

No analytes were detected in any method blank samples except for a single one associated with the February 6, 2014 sampling in which a low level of contamination was found for the pyrethroid λ -Cyhalothrin. This method blank sample for method SW846 8270 Mod (GCMS-NCI-SIM) analysis result was below the RL. As such, this level was an estimate as were the two associated batched field sample results that were also below the RL but of the same order of magnitude as the method blank result. Laboratory contamination of the two field samples almost certainly occurred. λ -Cyhalothrin was not detected in three other method blank samples associated with later season samplings.

Given the single low-level instance of contamination, the laboratory analytical procedures are deemed to have been of sufficiently high quality.

Laboratory Duplicates

Laboratory duplicates (also referred to as split samples) are field samples split and analyzed by the laboratory. They provide a measure of data precision (reproducibility) attributable to laboratory analytical procedures.

A single laboratory duplicate sample was performed for Percent Solids during the dry weather sampling. This sample had a result that was identical to the result of the associated field sample, indicating good precision for this analyte.

Matrix Spike and Laboratory Control Samples

MSs and LCSs are laboratory-created samples made by adding a known concentration of an inpurity (i.e., spiking) to either field sample water (MS) or to laboratory water known to be free of the impurity (LCS). These manufactured samples are then analyzed for the impurity in question, and the amount recovered compared to the spiked amount determines the percent recovery (PR) of the analyte in the spiked sample, which is used as measure of accuracy. For both kinds of samples, PR is calculated as the ratio of the recovered amount to the spike amount, expressed as a percent. There are some slight quantitative differences between MS and LCS PR calculations - details are available in RMC QAPP (EOA et al., 2012).

Matrix spike duplicates (MSD) and laboratory control sample duplicates (LCSD) were analyzed as a measure of precision. This is calculated as the relative percent difference (RPD), which is the ratio of the absolute value of the difference of the main laboratory QA sample and its associated duplicate to their average, expressed as a percentage.

All PRs and RPDs for project LCS/LCSD samples were within control limits set either by the laboratory and/or the analytical method.

All PRs and RPDs for project MS/MSD samples were also within control limits set either by the laboratory and/or the analytical method, with these exceptions:

1. The PR (68%) of Bifenthrin for an MS sample with Lab ID 564487 was barely outside of acceptable control limits (70-165%). The LCS and LCSD sample PRs in the same sample batch



- (3357) were in control as well as the RPD for the pair. Additionally, the RPD of the MS/MSD pair of the batch were within acceptance limits, indicating that the analytical batch was in control and the data results of its associated field samples are acceptable. This analytical batch was comprised of aquatic chemistry samples taken on February 6, 2014.
- 2. The PRs of Allethrin for an MS sample (35%) with Lab ID 594647 paired with an MSD sample (36%) with Lab ID 594648 were outside of acceptable control limits (50-185%). These low PRs were due to possible matrix influences in the QA/QC samples. However, The LCS and LCSD sample PRs in the same sample batch (3515) were in control as well as the RPD for the pair. Additionally, the RPD of the MS/MSD pair of the batch was within acceptance limits. Due to these results, the analytical batch was accepted as in control and the data results of its associated field samples are acceptable. This analytical batch was comprised of sediment chemistry samples taken on July 23, 2014.
- 3. The PR (255%) of Cyfluthrin for an MSD sample with Lab ID 594648 was outside of acceptable control limits (50-150%). Additionally, the RPD (77%) from the associated MS sample with Lab ID 594647 was above the acceptable control limit (30%). The LCS and LCSD sample PRs in the same sample batch (3515) were in control as well as the RPD for the pair. Additionally, Cyfluthrin was not found in a method blank from the same sample batch. Based on these latter results, the results the batch-associated field samples are acceptable. This analytical batch was comprised of sediment chemistry samples taken on July 23, 2014.
- 4. The PRs for Fipronil, Fipronil Desulfinyl, Fipronil Sulfide, and Fipronil Sulfone for the MS sample with Lab ID 594647 paired with an MSD sample with Lab ID 594648 were not determined due to matrix interferences concealing added spike concentration. The LCS and LCSD sample PRs in the same sample batch (3515) were in control as well as the RPD for the pair. Additionally, none of these analytes were found in a method blank from the same sample batch. Based on these latter results, the results the batch-associated field samples are acceptable. This analytical batch was comprised of sediment chemistry samples taken on July 23, 2014.
- 5. The PRs for Kepone for the MS sample with Lab ID 598129 paired with an MSD sample with Lab ID 598130 were not determined due to matrix interferences concealing added spike concentration. The LCS and LCSD sample PRs in the same sample batch (2176) were in control as well as the RPD for the pair. Additionally, this analyte was not found in a method blank from the same sample batch. Based on these latter results, the results the batch-associated field samples are acceptable. This analytical batch was comprised of sediment chemistry samples taken on July 23, 2014.

Three of the five exceptions listed above were due a single MS/MSD sample pair, indicating only three MS/MSD pairs were out of some control limits for a few analytes. Given these estimates of accuracy and precision, and with all of the field sample results being acceptable, all analyses were performed under adequately controlled conditions.

Surrogate Spikes

Surrogate spikes are pure organic compounds that are similar to the analytes of interest in chemical composition, extraction, and chromatography, but which are not normally found in environmental



samples. Surrogate spikes are added to every sample (including QA/QC samples) and their PR is used to examine the overall efficiency of the method from sample preparation through extraction and analysis.

Surrogate spike method blank, LCS/LCSD, and MS/MSD samples were analyzed for Decachlorobiphenyl, Esfenvalerate-d6;#1, Esfenvalerate-d6;#2, and Tetrachloro-m-xylene. All PRs were within acceptable QA/QC limits, except for those listed in Table F-1.

Table F-1. Surrogate Spike QA/QC Samples Failing to Meet Percent Recovery Control Limits								
Analyte	Lab Number	Sample Type ¹	Date Received	Percent Recovery	PR Control Limits (%)			
Decachlorobiphenyl	598129	MS	7/22/2014	5.3	10-200			
Decacinorooiphenyi	598130	MSD	7/22/2014	4.5	10-200			
	564487	Matrix QC (MS)	2/7/2014	65	70-130			
Esfenvalerate-d6;#1	564488	Matrix QC (MSD)	2/7/2014	67	70-130			
	574094	MB	3/26/2014	68	70-130			
	564487	Matrix QC (MS)	2/7/2014	64	70-130			
Esfenvalerate-d6;#2	564488	Matrix QC (MSD)	2/7/2014 68		70-130			
	574094	MB	3/26/2014	68	70-130			
	594791	MB	7/22/2014	39	64-114			
	594792	LCS	7/22/2014	50	64-114			
Tetrachloro-m-xylene	594793	LCSD	7/22/2014	51	64-114			
	598129 MS		7/22/2014	750	10-200			
	598130	MSD	7/22/2014	750	10-200			

¹ MB = method blank; MS = matrix spike; MSD = matrix spike duplicate; LCS = laboratory control sample; LCSD = laboratory control duplicate sample

Toxicity

Four QA/QC measures were assessed by PER during the toxicity testing on *Hyallela azteca*:

- Maintenance of acceptable test conditions
- Negative Control testing
- Positive Control (reference toxicant) testing
- Concentration Response Relationship assessment

Maintenance of Acceptable Test Conditions

All test conditions (e.g., pH, D.O., temperature, etc.) were within acceptable limits for these tests, except for the July 22, 2014 sediment toxicity test. During that test, as the dissolved oxygen measurements were below the QA/QC limit of 2.5 mg/L immediately prior to test initiation, all of the samples except for the 544MSH062 sample were aerated during testing. All analyses were performed according to laboratory Standard Operating Procedures.



Negative Control Testing

The responses at the Lab Control treatments were acceptable.

Positive Control (reference toxicant) Testing

The February 6, 2014 reference toxicant toxicity test suggests that these organisms may have been slightly less sensitive to toxicant stress than is typical and that the survival responses in the accompanying stormwater tests should be interpreted judiciously.

The February 26, March 26, and July 22, 2014 reference toxicant test results were consistent with the "typical response" range established by the reference toxicant test database for this species, indicating that these organisms were responding to toxic stress in a typical fashion at those times.

Concentration Response Relationships

The concentration-response relationships for the reference toxicant tests were evaluated as per EPA guidelines (EPA-821-B-00-004), and were determined to be acceptable.

Sample Holding Times

The sample holding time refers to the maximum amount of time that can elapse between sample collection and sample analysis before the resulting data is considered to possibly be compromised. The holding time is driven by the properties of the constituent and how a sample is preserved and stored prior to analysis. Holding times were met for all constituents for all samples submitted to the laboratory, except in one case.

The organochlorine pesticide kepone sampled from sediment at the four stations on July 22, 2014 was also flagged by CAL as out of holding time. The samples for this analyte were delivered to the lab and extracted within 14 days as specified by the EPA method SW846 8081. After these samples were analyzed, the laboratory QA/QC sample results for kepone did not meet CAL QAQC criteria, and the kepone sample results were rejected. The original sample was reextracted and reanalyzed by CAL again after the 14 day holding time had elapsed in order to provide the most complete results, which were non-detected for all four stations. As a result, the July 22, 2014 kepone results were flagged as out of holding time by CAL.

References

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- SWAMP, 2008. SWAMP Quality Assurance Project Plan, Version 1.0. Prepared for the California State Water Resources Control Board by the Surface Water Ambient Monitoring Program Quality Assurance Team. September 1, 2008.



- SWAMP, 2013. *Quality Control and Sample Handling Guidelines*, Updated appendices to the SWAMP, 2008, Quality Assurance Project Plan, http://www.waterboards.ca.gov/water_issues/programs/swamp/mqo.shtml, April, 2013.
- USGS, 2009. Hladik, M., Orlando J., and Kuivila, K., *Collection of Pyrethroids in Water and Sediment Matrices: Development and Validation of a Standard Operating Procedure*, Scientific Investigations Report 2009–5012, U.S. Department of the Interior, U.S. Geological Survey, 2009.



Table F-2:	Table F-2: CCCWP SSID Study – Aquatic Chemistry QA/QC Samples										
Lab Number	Sample Description ¹	Date Received	Analyte Group ²	Analyte Name	Result	MDL	Reporting Limit	Units	Expected Result	Percent Recovery	Relative Percent Difference
564956	MB for HBN 508653 [SPR/6308]	2/7/2014	FIP	Fipronil	ND	0.5	1.5	ng/L			
564957	LCS for HBN 508653 [SPR/6308]	2/7/2014	FIP	Fipronil	14		1.5	ng/L	20	70	
564958	LCSD for HBN 508653 [SPR/6308]	2/7/2014	FIP	Fipronil	14		1.5	ng/L	20	70	0
570428	MB for HBN 510076 [SPR/6351]	3/4/2014	FIP	Fipronil	ND	0.5	1.5	ng/L			
570429	LCS for HBN 510076 [SPR/6351]	3/4/2014	FIP	Fipronil	18		1.5	ng/L	20	90	
570430	LCSD for HBN 510076 [SPR/6351]	3/4/2014	FIP	Fipronil	15		1.5	ng/L	20	75	16
574094	MB for HBN 511606 [SPR/6382]	3/26/2014	FIP	Fipronil	ND	0.5	1.5	ng/L			
574095	LCS for HBN 511606 [SPR/6382]	3/26/2014	FIP	Fipronil	16		1.5	ng/L	20	80	
574096	LCSD for HBN 511606 [SPR/6382]	3/26/2014	FIP	Fipronil	16		1.5	ng/L	20	80	0
564956	MB for HBN 508653 [SPR/6308]	2/7/2014	FIP	Fipronil Desulfinyl	ND	0.5	1.5	ng/L			
564957	LCS for HBN 508653 [SPR/6308]	2/7/2014	FIP	Fipronil Desulfinyl	15		1.5	ng/L	20	75	
564958	LCSD for HBN 508653 [SPR/6308]	2/7/2014	FIP	Fipronil Desulfinyl	16		1.5	ng/L	20	80	6.5
570428	MB for HBN 510076 [SPR/6351]	3/4/2014	FIP	Fipronil Desulfinyl	ND	0.5	1.5	ng/L			
570429	LCS for HBN 510076 [SPR/6351]	3/4/2014	FIP	Fipronil Desulfinyl	18		1.5	ng/L	20	90	
570430	LCSD for HBN 510076 [SPR/6351]	3/4/2014	FIP	Fipronil Desulfinyl	16		1.5	ng/L	20	80	10
574094	MB for HBN 511606 [SPR/6382]	3/26/2014	FIP	Fipronil Desulfinyl	ND	0.5	1.5	ng/L			
574095	LCS for HBN 511606 [SPR/6382]	3/26/2014	FIP	Fipronil Desulfinyl	16		1.5	ng/L	20	80	
574096	LCSD for HBN 511606 [SPR/6382]	3/26/2014	FIP	Fipronil Desulfinyl	15		1.5	ng/L	20	75	6.5
564956	MB for HBN 508653 [SPR/6308]	2/7/2014	FIP	Fipronil Sulfide	ND	0.5	1.5	ng/L			
564957	LCS for HBN 508653 [SPR/6308]	2/7/2014	FIP	Fipronil Sulfide	14		1.5	ng/L	20	70	
564958	LCSD for HBN 508653 [SPR/6308]	2/7/2014	FIP	Fipronil Sulfide	16		1.5	ng/L	20	80	13
570428	MB for HBN 510076 [SPR/6351]	3/4/2014	FIP	Fipronil Sulfide	ND	0.5	1.5	ng/L			
570429	LCS for HBN 510076 [SPR/6351]	3/4/2014	FIP	Fipronil Sulfide	17		1.5	ng/L	20	85	
570430	LCSD for HBN 510076 [SPR/6351]	3/4/2014	FIP	Fipronil Sulfide	15		1.5	ng/L	20	75	13
574094	MB for HBN 511606 [SPR/6382]	3/26/2014	FIP	Fipronil Sulfide	ND	0.5	1.5	ng/L			
574095	LCS for HBN 511606 [SPR/6382]	3/26/2014	FIP	Fipronil Sulfide	17		1.5	ng/L	20	85	



Table F-2:	: CCCWP SSID Study – Aqua	tic Chemist	ry QA/QC	Samples							
Lab Number	Sample Description ¹	Date Received	Analyte Group ²	Analyte Name	Result	MDL	Reporting Limit	Units	Expected Result	Percent Recovery	Relative Percent Difference
574096	LCSD for HBN 511606 [SPR/6382]	3/26/2014	FIP	Fipronil Sulfide	16		1.5	ng/L	20	80	6.1
564956	MB for HBN 508653 [SPR/6308]	2/7/2014	FIP	Fipronil Sulfone	ND	0.5	1.5	ng/L			
564957	LCS for HBN 508653 [SPR/6308]	2/7/2014	FIP	Fipronil Sulfone	14		1.5	ng/L	20	70	
564958	LCSD for HBN 508653 [SPR/6308]	2/7/2014	FIP	Fipronil Sulfone	14		1.5	ng/L	20	70	0
570428	MB for HBN 510076 [SPR/6351]	3/4/2014	FIP	Fipronil Sulfone	ND	0.5	1.5	ng/L			
570429	LCS for HBN 510076 [SPR/6351]	3/4/2014	FIP	Fipronil Sulfone	16		1.5	ng/L	20	80	
570430	LCSD for HBN 510076 [SPR/6351]	3/4/2014	FIP	Fipronil Sulfone	15		1.5	ng/L	20	75	7.7
574094	MB for HBN 511606 [SPR/6382]	3/26/2014	FIP	Fipronil Sulfone	ND	0.5	1.5	ng/L			
574095	LCS for HBN 511606 [SPR/6382]	3/26/2014	FIP	Fipronil Sulfone	16		1.5	ng/L	20	80	
574096	LCSD for HBN 511606 [SPR/6382]	3/26/2014	FIP	Fipronil Sulfone	14		1.5	ng/L	20	70	13
565093	MB for HBN 508664 [SPR/6309]	2/7/2014	OP	4,4'-DDD	ND	0.004	0.1	μg/L			
565094	LCS for HBN 508664 [SPR/6309]	2/7/2014	OP	4,4'-DDD	0.21		0.1	μg/L	0.2	105	
565095	LCSD for HBN 508664 [SPR/6309]	2/7/2014	OP	4,4'-DDD	0.2		0.1	μg/L	0.2	100	4.9
570101	MB for HBN 510007 [SPR/6346]	3/1/2014	OP	4,4'-DDD	ND	0.004	0.1	μg/L			
570102	LCS for HBN 510007 [SPR/6346]	3/1/2014	OP	4,4'-DDD	0.16		0.1	μg/L	0.2	80	
570103	LCSD for HBN 510007 [SPR/6346]	3/1/2014	OP	4,4'-DDD	0.17		0.1	μg/L	0.2	85	6.1
574847	MB for HBN 511879 [SPR/6386]	3/26/2014	OP	4,4'-DDD	ND	0.004	0.1	μg/L			
574848	LCS for HBN 511879 [SPR/6386]	3/26/2014	OP	4,4'-DDD	0.15		0.1	μg/L	0.2	75	
574849	LCSD for HBN 511879 [SPR/6386]	3/26/2014	OP	4,4'-DDD	0.16		0.1	μg/L	0.2	80	6.5
565093	MB for HBN 508664 [SPR/6309]	2/7/2014	OP	4,4'-DDE	ND	0.003	0.1	μg/L			
565094	LCS for HBN 508664 [SPR/6309]	2/7/2014	OP	4,4'-DDE	0.19		0.1	μg/L	0.2	95	
565095	LCSD for HBN 508664 [SPR/6309]	2/7/2014	OP	4,4'-DDE	0.18		0.1	μg/L	0.2	90	5.4
570101	MB for HBN 510007 [SPR/6346]	3/1/2014	OP	4,4'-DDE	ND	0.003	0.1	μg/L			
570102	LCS for HBN 510007 [SPR/6346]	3/1/2014	OP	4,4'-DDE	0.16		0.1	μg/L	0.2	80	
570103	LCSD for HBN 510007 [SPR/6346]	3/1/2014	OP	4,4'-DDE	0.16		0.1	μg/L	0.2	80	0
574847	MB for HBN 511879 [SPR/6386]	3/26/2014	OP	4,4'-DDE	ND	0.003	0.1	μg/L			



Table F-2:	: CCCWP SSID Study – Aqua	tic Chemist	ry QA/QC	Samples							
Lab Number	Sample Description ¹	Date Received	Analyte Group ²	Analyte Name	Result	MDL	Reporting Limit	Units	Expected Result	Percent Recovery	Relative Percent Difference
574848	LCS for HBN 511879 [SPR/6386]	3/26/2014	OP	4,4'-DDE	0.15		0.1	μg/L	0.2	75	
574849	LCSD for HBN 511879 [SPR/6386]	3/26/2014	OP	4,4'-DDE	0.15		0.1	μg/L	0.2	75	0
565093	MB for HBN 508664 [SPR/6309]	2/7/2014	OP	4,4'-DDT	ND	0.004	0.1	μg/L			
565094	LCS for HBN 508664 [SPR/6309]	2/7/2014	OP	4,4'-DDT	0.22		0.1	μg/L	0.2	110	
565095	LCSD for HBN 508664 [SPR/6309]	2/7/2014	OP	4,4'-DDT	0.2		0.1	μg/L	0.2	100	9.5
570101	MB for HBN 510007 [SPR/6346]	3/1/2014	OP	4,4'-DDT	ND	0.004	0.1	μg/L			
570102	LCS for HBN 510007 [SPR/6346]	3/1/2014	OP	4,4'-DDT	0.19		0.1	μg/L	0.2	95	
570103	LCSD for HBN 510007 [SPR/6346]	3/1/2014	OP	4,4'-DDT	0.19		0.1	μg/L	0.2	95	0
574847	MB for HBN 511879 [SPR/6386]	3/26/2014	OP	4,4'-DDT	ND	0.004	0.1	μg/L			
574848	LCS for HBN 511879 [SPR/6386]	3/26/2014	OP	4,4'-DDT	0.16		0.1	μg/L	0.2	80	
574849	LCSD for HBN 511879 [SPR/6386]	3/26/2014	OP	4,4'-DDT	0.17		0.1	μg/L	0.2	85	6.1
565093	MB for HBN 508664 [SPR/6309]	2/7/2014	OP	Aldrin	ND	0.004	0.05	μg/L			
565094	LCS for HBN 508664 [SPR/6309]	2/7/2014	OP	Aldrin	0.19		0.05	μg/L	0.2	95	
565095	LCSD for HBN 508664 [SPR/6309]	2/7/2014	OP	Aldrin	0.18		0.05	μg/L	0.2	90	5.4
570101	MB for HBN 510007 [SPR/6346]	3/1/2014	OP	Aldrin	ND	0.004	0.05	μg/L			
570102	LCS for HBN 510007 [SPR/6346]	3/1/2014	OP	Aldrin	0.15		0.05	μg/L	0.2	75	
570103	LCSD for HBN 510007 [SPR/6346]	3/1/2014	OP	Aldrin	0.16		0.05	μg/L	0.2	80	6.5
574847	MB for HBN 511879 [SPR/6386]	3/26/2014	OP	Aldrin	ND	0.004	0.05	μg/L			
574848	LCS for HBN 511879 [SPR/6386]	3/26/2014	OP	Aldrin	0.14		0.05	μg/L	0.2	70	
574849	LCSD for HBN 511879 [SPR/6386]	3/26/2014	OP	Aldrin	0.15		0.05	μg/L	0.2	75	6.9
565093	MB for HBN 508664 [SPR/6309]	2/7/2014	OP	alpha-BHC	ND	0.005	0.05	μg/L			
565094	LCS for HBN 508664 [SPR/6309]	2/7/2014	OP	alpha-BHC	0.19		0.05	μg/L	0.2	95	
565095	LCSD for HBN 508664 [SPR/6309]	2/7/2014	OP	alpha-BHC	0.19		0.05	μg/L	0.2	95	0
570101	MB for HBN 510007 [SPR/6346]	3/1/2014	OP	alpha-BHC	ND	0.005	0.05	μg/L			
570102	LCS for HBN 510007 [SPR/6346]	3/1/2014	OP	alpha-BHC	0.16		0.05	μg/L	0.2	80	
570103	LCSD for HBN 510007 [SPR/6346]	3/1/2014	OP	alpha-BHC	0.16		0.05	μg/L	0.2	80	0



Table F-2:	Table F-2: CCCWP SSID Study – Aquatic Chemistry QA/QC Samples												
Lab Number	Sample Description ¹	Date Received	Analyte Group ²	Analyte Name	Result	MDL	Reporting Limit	Units	Expected Result	Percent Recovery	Relative Percent Difference		
574847	MB for HBN 511879 [SPR/6386]	3/26/2014	OP	alpha-BHC	ND	0.005	0.05	μg/L					
574848	LCS for HBN 511879 [SPR/6386]	3/26/2014	OP	alpha-BHC	0.14		0.05	μg/L	0.2	70			
574849	LCSD for HBN 511879 [SPR/6386]	3/26/2014	OP	alpha-BHC	0.16		0.05	μg/L	0.2	80	13		
565093	MB for HBN 508664 [SPR/6309]	2/7/2014	OP	beta-BHC	ND	0.004	0.05	μg/L					
565094	LCS for HBN 508664 [SPR/6309]	2/7/2014	OP	beta-BHC	0.18		0.05	μg/L	0.2	90			
565095	LCSD for HBN 508664 [SPR/6309]	2/7/2014	OP	beta-BHC	0.15		0.05	μg/L	0.2	75	18		
570101	MB for HBN 510007 [SPR/6346]	3/1/2014	OP	beta-BHC	ND	0.004	0.05	μg/L					
570102	LCS for HBN 510007 [SPR/6346]	3/1/2014	OP	beta-BHC	0.14		0.05	μg/L	0.2	70			
570103	LCSD for HBN 510007 [SPR/6346]	3/1/2014	OP	beta-BHC	0.15		0.05	μg/L	0.2	75	6.9		
574847	MB for HBN 511879 [SPR/6386]	3/26/2014	OP	beta-BHC	ND	0.004	0.05	μg/L					
574848	LCS for HBN 511879 [SPR/6386]	3/26/2014	OP	beta-BHC	0.14		0.05	μg/L	0.2	70			
574849	LCSD for HBN 511879 [SPR/6386]	3/26/2014	OP	beta-BHC	0.15		0.05	μg/L	0.2	75	6.9		
565093	MB for HBN 508664 [SPR/6309]	2/7/2014	OP	Chlordane	ND	0.02	0.5	μg/L					
570101	MB for HBN 510007 [SPR/6346]	3/1/2014	OP	Chlordane	ND	0.02	0.5	μg/L					
574847	MB for HBN 511879 [SPR/6386]	3/26/2014	OP	Chlordane	ND	0.02	0.5	μg/L					
565093	MB for HBN 508664 [SPR/6309]	2/7/2014	OP	delta-BHC	ND	0.004	0.05	μg/L					
565094	LCS for HBN 508664 [SPR/6309]	2/7/2014	OP	delta-BHC	0.18		0.05	μg/L	0.2	90			
565095	LCSD for HBN 508664 [SPR/6309]	2/7/2014	OP	delta-BHC	0.17		0.05	μg/L	0.2	85	5.7		
570101	MB for HBN 510007 [SPR/6346]	3/1/2014	OP	delta-BHC	ND	0.004	0.05	μg/L					
570102	LCS for HBN 510007 [SPR/6346]	3/1/2014	OP	delta-BHC	0.14		0.05	μg/L	0.2	70			
570103	LCSD for HBN 510007 [SPR/6346]	3/1/2014	OP	delta-BHC	0.15		0.05	μg/L	0.2	75	6.9		
574847	MB for HBN 511879 [SPR/6386]	3/26/2014	OP	delta-BHC	ND	0.004	0.05	μg/L					
574848	LCS for HBN 511879 [SPR/6386]	3/26/2014	OP	delta-BHC	0.12		0.05	μg/L	0.2	60			
574849	LCSD for HBN 511879 [SPR/6386]	3/26/2014	OP	delta-BHC	0.13		0.05	μg/L	0.2	65	8		
565093	MB for HBN 508664 [SPR/6309]	2/7/2014	OP	Dieldrin	ND	0.004	0.1	μg/L					
565094	LCS for HBN 508664 [SPR/6309]	2/7/2014	OP	Dieldrin	0.22		0.1	μg/L	0.2	110			



Table F-2:	Table F-2: CCCWP SSID Study – Aquatic Chemistry QA/QC Samples												
Lab Number	Sample Description ¹	Date Received	Analyte Group ²	Analyte Name	Result	MDL	Reporting Limit	Units	Expected Result	Percent Recovery	Relative Percent Difference		
565095	LCSD for HBN 508664 [SPR/6309]	2/7/2014	OP	Dieldrin	0.2		0.1	μg/L	0.2	100	9.5		
570101	MB for HBN 510007 [SPR/6346]	3/1/2014	OP	Dieldrin	ND	0.004	0.1	μg/L					
570102	LCS for HBN 510007 [SPR/6346]	3/1/2014	OP	Dieldrin	0.17		0.1	μg/L	0.2	85			
570103	LCSD for HBN 510007 [SPR/6346]	3/1/2014	OP	Dieldrin	0.17		0.1	μg/L	0.2	85	0		
574847	MB for HBN 511879 [SPR/6386]	3/26/2014	OP	Dieldrin	ND	0.004	0.1	μg/L					
574848	LCS for HBN 511879 [SPR/6386]	3/26/2014	OP	Dieldrin	0.16		0.1	μg/L	0.2	80			
574849	LCSD for HBN 511879 [SPR/6386]	3/26/2014	OP	Dieldrin	0.17		0.1	μg/L	0.2	85	6.1		
565093	MB for HBN 508664 [SPR/6309]	2/7/2014	OP	Endosulfan I	ND	0.004	0.05	μg/L					
565094	LCS for HBN 508664 [SPR/6309]	2/7/2014	OP	Endosulfan I	0.2		0.05	μg/L	0.2	98			
565095	LCSD for HBN 508664 [SPR/6309]	2/7/2014	OP	Endosulfan I	0.18		0.05	μg/L	0.2	90	8		
570101	MB for HBN 510007 [SPR/6346]	3/1/2014	OP	Endosulfan I	ND	0.004	0.05	μg/L					
570102	LCS for HBN 510007 [SPR/6346]	3/1/2014	OP	Endosulfan I	0.16		0.05	μg/L	0.2	80			
570103	LCSD for HBN 510007 [SPR/6346]	3/1/2014	OP	Endosulfan I	0.17		0.05	μg/L	0.2	85	6.1		
574847	MB for HBN 511879 [SPR/6386]	3/26/2014	OP	Endosulfan I	ND	0.004	0.05	μg/L					
574848	LCS for HBN 511879 [SPR/6386]	3/26/2014	OP	Endosulfan I	0.15		0.05	μg/L	0.2	75			
574849	LCSD for HBN 511879 [SPR/6386]	3/26/2014	OP	Endosulfan I	0.16		0.05	μg/L	0.2	80	6.5		
565093	MB for HBN 508664 [SPR/6309]	2/7/2014	OP	Endosulfan II	ND	0.005	0.1	μg/L					
565094	LCS for HBN 508664 [SPR/6309]	2/7/2014	OP	Endosulfan II	0.19		0.1	μg/L	0.2	95			
565095	LCSD for HBN 508664 [SPR/6309]	2/7/2014	OP	Endosulfan II	0.18		0.1	μg/L	0.2	90	5.4		
570101	MB for HBN 510007 [SPR/6346]	3/1/2014	OP	Endosulfan II	ND	0.005	0.1	μg/L					
570102	LCS for HBN 510007 [SPR/6346]	3/1/2014	OP	Endosulfan II	0.17		0.1	μg/L	0.2	85			
570103	LCSD for HBN 510007 [SPR/6346]	3/1/2014	OP	Endosulfan II	0.17		0.1	μg/L	0.2	85	0		
574847	MB for HBN 511879 [SPR/6386]	3/26/2014	OP	Endosulfan II	ND	0.005	0.1	μg/L					
574848	LCS for HBN 511879 [SPR/6386]	3/26/2014	OP	Endosulfan II	0.16		0.1	μg/L	0.2	80			
574849	LCSD for HBN 511879 [SPR/6386]	3/26/2014	OP	Endosulfan II	0.17		0.1	μg/L	0.2	85	6.1		
565093	MB for HBN 508664 [SPR/6309]	2/7/2014	OP	Endosulfan sulfate	ND	0.005	0.1	μg/L					



Table F-2:	: CCCWP SSID Study – Aqua	tic Chemist	ry QA/QC	Samples							
Lab Number	Sample Description ¹	Date Received	Analyte Group ²	Analyte Name	Result	MDL	Reporting Limit	Units	Expected Result	Percent Recovery	Relative Percent Difference
565094	LCS for HBN 508664 [SPR/6309]	2/7/2014	OP	Endosulfan sulfate	0.22		0.1	μg/L	0.2	110	
565095	LCSD for HBN 508664 [SPR/6309]	2/7/2014	OP	Endosulfan sulfate	0.2		0.1	μg/L	0.2	100	9.5
570101	MB for HBN 510007 [SPR/6346]	3/1/2014	OP	Endosulfan sulfate	ND	0.005	0.1	μg/L			
570102	LCS for HBN 510007 [SPR/6346]	3/1/2014	OP	Endosulfan sulfate	0.18		0.1	μg/L	0.2	90	
570103	LCSD for HBN 510007 [SPR/6346]	3/1/2014	OP	Endosulfan sulfate	0.18		0.1	μg/L	0.2	90	0
574847	MB for HBN 511879 [SPR/6386]	3/26/2014	OP	Endosulfan sulfate	ND	0.005	0.1	μg/L			
574848	LCS for HBN 511879 [SPR/6386]	3/26/2014	OP	Endosulfan sulfate	0.16		0.1	μg/L	0.2	80	
574849	LCSD for HBN 511879 [SPR/6386]	3/26/2014	OP	Endosulfan sulfate	0.18		0.1	μg/L	0.2	90	12
565093	MB for HBN 508664 [SPR/6309]	2/7/2014	OP	Endrin	ND	0.005	0.1	μg/L			
565094	LCS for HBN 508664 [SPR/6309]	2/7/2014	OP	Endrin	0.18		0.1	μg/L	0.2	90	
565095	LCSD for HBN 508664 [SPR/6309]	2/7/2014	OP	Endrin	0.17		0.1	μg/L	0.2	85	5.7
570101	MB for HBN 510007 [SPR/6346]	3/1/2014	OP	Endrin	ND	0.005	0.1	μg/L			
570102	LCS for HBN 510007 [SPR/6346]	3/1/2014	OP	Endrin	0.14		0.1	μg/L	0.2	70	
570103	LCSD for HBN 510007 [SPR/6346]	3/1/2014	OP	Endrin	0.14		0.1	μg/L	0.2	70	0
574847	MB for HBN 511879 [SPR/6386]	3/26/2014	OP	Endrin	ND	0.005	0.1	μg/L			
574848	LCS for HBN 511879 [SPR/6386]	3/26/2014	OP	Endrin	0.15		0.1	μg/L	0.2	75	
574849	LCSD for HBN 511879 [SPR/6386]	3/26/2014	OP	Endrin	0.16		0.1	μg/L	0.2	80	6.5
565093	MB for HBN 508664 [SPR/6309]	2/7/2014	OP	Endrin aldehyde	ND	0.005	0.05	μg/L			
565094	LCS for HBN 508664 [SPR/6309]	2/7/2014	OP	Endrin aldehyde	0.21		0.05	μg/L	0.2	105	
565095	LCSD for HBN 508664 [SPR/6309]	2/7/2014	OP	Endrin aldehyde	0.2		0.05	μg/L	0.2	100	4.9
570101	MB for HBN 510007 [SPR/6346]	3/1/2014	OP	Endrin aldehyde	ND	0.005	0.05	μg/L			
570102	LCS for HBN 510007 [SPR/6346]	3/1/2014	OP	Endrin aldehyde	0.18		0.05	μg/L	0.2	90	
570103	LCSD for HBN 510007 [SPR/6346]	3/1/2014	OP	Endrin aldehyde	0.19		0.05	μg/L	0.2	95	5.4
574847	MB for HBN 511879 [SPR/6386]	3/26/2014	OP	Endrin aldehyde	ND	0.005	0.05	μg/L			
574848	LCS for HBN 511879 [SPR/6386]	3/26/2014	OP	Endrin aldehyde	0.18		0.05	μg/L	0.2	90	
574849	LCSD for HBN 511879 [SPR/6386]	3/26/2014	OP	Endrin aldehyde	0.2		0.05	μg/L	0.2	100	11



Table F-2:	: CCCWP SSID Study – Aqua	tic Chemist	ry QA/QC	Samples							
Lab Number	Sample Description ¹	Date Received	Analyte Group ²	Analyte Name	Result	MDL	Reporting Limit	Units	Expected Result	Percent Recovery	Relative Percent Difference
565093	MB for HBN 508664 [SPR/6309]	2/7/2014	OP	Endrin ketone	ND	0.005	0.1	μg/L			
565094	LCS for HBN 508664 [SPR/6309]	2/7/2014	OP	Endrin ketone	0.21		0.1	μg/L	0.2	105	
565095	LCSD for HBN 508664 [SPR/6309]	2/7/2014	OP	Endrin ketone	0.2		0.1	μg/L	0.2	100	4.9
570101	MB for HBN 510007 [SPR/6346]	3/1/2014	OP	Endrin ketone	ND	0.005	0.1	μg/L			
570102	LCS for HBN 510007 [SPR/6346]	3/1/2014	OP	Endrin ketone	0.18		0.1	μg/L	0.2	90	
570103	LCSD for HBN 510007 [SPR/6346]	3/1/2014	OP	Endrin ketone	0.18		0.1	μg/L	0.2	90	0
574847	MB for HBN 511879 [SPR/6386]	3/26/2014	OP	Endrin ketone	ND	0.005	0.1	μg/L			
574848	LCS for HBN 511879 [SPR/6386]	3/26/2014	OP	Endrin ketone	0.16		0.1	μg/L	0.2	80	
574849	LCSD for HBN 511879 [SPR/6386]	3/26/2014	OP	Endrin ketone	0.17		0.1	μg/L	0.2	85	6.1
565093	MB for HBN 508664 [SPR/6309]	2/7/2014	OP	gamma-BHC (Lindane)	ND	0.004	0.05	μg/L			
565094	LCS for HBN 508664 [SPR/6309]	2/7/2014	OP	gamma-BHC (Lindane)	0.18		0.05	μg/L	0.2	90	
565095	LCSD for HBN 508664 [SPR/6309]	2/7/2014	OP	gamma-BHC (Lindane)	0.15		0.05	μg/L	0.2	75	18
570101	MB for HBN 510007 [SPR/6346]	3/1/2014	OP	gamma-BHC (Lindane)	ND	0.004	0.05	μg/L			
570102	LCS for HBN 510007 [SPR/6346]	3/1/2014	OP	gamma-BHC (Lindane)	0.16		0.05	μg/L	0.2	80	
570103	LCSD for HBN 510007 [SPR/6346]	3/1/2014	OP	gamma-BHC (Lindane)	0.16		0.05	μg/L	0.2	80	0
574847	MB for HBN 511879 [SPR/6386]	3/26/2014	OP	gamma-BHC (Lindane)	ND	0.004	0.05	μg/L			
574848	LCS for HBN 511879 [SPR/6386]	3/26/2014	OP	gamma-BHC (Lindane)	0.14		0.05	μg/L	0.2	70	
574849	LCSD for HBN 511879 [SPR/6386]	3/26/2014	OP	gamma-BHC (Lindane)	0.15		0.05	μg/L	0.2	75	6.9
565093	MB for HBN 508664 [SPR/6309]	2/7/2014	OP	Heptachlor	ND	0.005	0.05	μg/L			
565094	LCS for HBN 508664 [SPR/6309]	2/7/2014	OP	Heptachlor	0.2		0.05	μg/L	0.2	100	
565095	LCSD for HBN 508664 [SPR/6309]	2/7/2014	OP	Heptachlor	0.18		0.05	μg/L	0.2	90	11
570101	MB for HBN 510007 [SPR/6346]	3/1/2014	OP	Heptachlor	ND	0.005	0.05	μg/L			
570102	LCS for HBN 510007 [SPR/6346]	3/1/2014	OP	Heptachlor	0.16		0.05	μg/L	0.2	80	
570103	LCSD for HBN 510007 [SPR/6346]	3/1/2014	OP	Heptachlor	0.16		0.05	μg/L	0.2	80	0
574847	MB for HBN 511879 [SPR/6386]	3/26/2014	OP	Heptachlor	ND	0.005	0.05	μg/L			
574848	LCS for HBN 511879 [SPR/6386]	3/26/2014	OP	Heptachlor	0.14		0.05	μg/L	0.2	70	



Table F-2:	Table F-2: CCCWP SSID Study – Aquatic Chemistry QA/QC Samples												
Lab Number	Sample Description ¹	Date Received	Analyte Group ²	Analyte Name	Result	MDL	Reporting Limit	Units	Expected Result	Percent Recovery	Relative Percent Difference		
574849	LCSD for HBN 511879 [SPR/6386]	3/26/2014	OP	Heptachlor	0.15		0.05	μg/L	0.2	75	6.9		
565093	MB for HBN 508664 [SPR/6309]	2/7/2014	OP	Heptachlor epoxide	ND	0.004	0.05	μg/L					
565094	LCS for HBN 508664 [SPR/6309]	2/7/2014	OP	Heptachlor epoxide	0.2		0.05	μg/L	0.2	100			
565095	LCSD for HBN 508664 [SPR/6309]	2/7/2014	OP	Heptachlor epoxide	0.19		0.05	μg/L	0.2	95	5.1		
570101	MB for HBN 510007 [SPR/6346]	3/1/2014	OP	Heptachlor epoxide	ND	0.004	0.05	μg/L					
570102	LCS for HBN 510007 [SPR/6346]	3/1/2014	OP	Heptachlor epoxide	0.16		0.05	μg/L	0.2	80			
570103	LCSD for HBN 510007 [SPR/6346]	3/1/2014	OP	Heptachlor epoxide	0.17		0.05	μg/L	0.2	85	6.1		
574847	MB for HBN 511879 [SPR/6386]	3/26/2014	OP	Heptachlor epoxide	ND	0.004	0.05	μg/L					
574848	LCS for HBN 511879 [SPR/6386]	3/26/2014	OP	Heptachlor epoxide	0.15		0.05	μg/L	0.2	75			
574849	LCSD for HBN 511879 [SPR/6386]	3/26/2014	OP	Heptachlor epoxide	0.17		0.05	μg/L	0.2	85	13		
565093	MB for HBN 508664 [SPR/6309]	2/7/2014	OP	Methoxychlor	ND	0.005	0.5	μg/L					
565094	LCS for HBN 508664 [SPR/6309]	2/7/2014	OP	Methoxychlor	0.22		0.5	μg/L	0.2	110			
565095	LCSD for HBN 508664 [SPR/6309]	2/7/2014	OP	Methoxychlor	0.2		0.5	μg/L	0.2	100	9.5		
570101	MB for HBN 510007 [SPR/6346]	3/1/2014	OP	Methoxychlor	ND	0.005	0.5	μg/L					
570102	LCS for HBN 510007 [SPR/6346]	3/1/2014	OP	Methoxychlor	0.18		0.5	μg/L	0.2	90			
570103	LCSD for HBN 510007 [SPR/6346]	3/1/2014	OP	Methoxychlor	0.18		0.5	μg/L	0.2	90	0		
574847	MB for HBN 511879 [SPR/6386]	3/26/2014	OP	Methoxychlor	ND	0.005	0.5	μg/L					
574848	LCS for HBN 511879 [SPR/6386]	3/26/2014	OP	Methoxychlor	0.15		0.5	μg/L	0.2	75			
574849	LCSD for HBN 511879 [SPR/6386]	3/26/2014	OP	Methoxychlor	0.17		0.5	μg/L	0.2	85	13		
565093	MB for HBN 508664 [SPR/6309]	2/7/2014	OP	Toxaphene	ND	0.3	1	μg/L					
570101	MB for HBN 510007 [SPR/6346]	3/1/2014	OP	Toxaphene	ND	0.3	1	μg/L					
574847	MB for HBN 511879 [SPR/6386]	3/26/2014	OP	Toxaphene	ND	0.3	1	μg/L					
564069	MB for HBN 508501 [SPR/6300]	2/7/2014	PYR	Allethrin	ND	0.1	1.5	ng/L					
564070	LCS for HBN 508501 [SPR/6300]	2/7/2014	PYR	Allethrin	13		1.5	ng/L	20	65			
564071	LCSD for HBN 508501 [SPR/6300]	2/7/2014	PYR	Allethrin	14		1.5	ng/L	20	70	6.6		
564487	Matrix QC (MS)	2/7/2014	PYR	Allethrin	14		1.5	ng/L	21	68			



Table F-2:	CCCWP SSID Study – Aqua	tic Chemist	ry QA/QC	Samples							
Lab Number	Sample Description ¹	Date Received	Analyte Group ²	Analyte Name	Result	MDL	Reporting Limit	Units	Expected Result	Percent Recovery	Relative Percent Difference
564488	Matrix QC (MSD)	2/7/2014	PYR	Allethrin	15		1.5	ng/L	21	73	6.9
P020494001	Matrix QC (ORIG)	2/7/2014	PYR	Allethrin	ND	0.1	1.5	ng/L			
570428	MB for HBN 510076 [SPR/6351]	3/4/2014	PYR	Allethrin	ND	0.1	1.5	ng/L			
570429	LCS for HBN 510076 [SPR/6351]	3/4/2014	PYR	Allethrin	16		1.5	ng/L	20	80	
570430	LCSD for HBN 510076 [SPR/6351]	3/4/2014	PYR	Allethrin	16		1.5	ng/L	20	80	1.9
574094	MB for HBN 511606 [SPR/6382]	3/26/2014	PYR	Allethrin	ND	0.1	1.5	ng/L			
574095	LCS for HBN 511606 [SPR/6382]	3/26/2014	PYR	Allethrin	18		1.5	ng/L	20	90	
574096	LCSD for HBN 511606 [SPR/6382]	3/26/2014	PYR	Allethrin	19		1.5	ng/L	20	95	5.4
564069	MB for HBN 508501 [SPR/6300]	2/7/2014	PYR	Bifenthrin	ND	0.1	1.5	ng/L			
564070	LCS for HBN 508501 [SPR/6300]	2/7/2014	PYR	Bifenthrin	18		1.5	ng/L	20	90	
564071	LCSD for HBN 508501 [SPR/6300]	2/7/2014	PYR	Bifenthrin	18		1.5	ng/L	20	90	1.1
564487	Matrix QC (MS)	2/7/2014	PYR	Bifenthrin	17		1.5	ng/L	24.1	68	
564488	Matrix QC (MSD)	2/7/2014	PYR	Bifenthrin	18		1.5	ng/L	24.1	72	5.7
P020494001	Matrix QC (ORIG)	2/7/2014	PYR	Bifenthrin	3.1	0.1	1.5	ng/L			
570428	MB for HBN 510076 [SPR/6351]	3/4/2014	PYR	Bifenthrin	ND	0.1	1.5	ng/L			
570429	LCS for HBN 510076 [SPR/6351]	3/4/2014	PYR	Bifenthrin	18		1.5	ng/L	20	90	
570430	LCSD for HBN 510076 [SPR/6351]	3/4/2014	PYR	Bifenthrin	17		1.5	ng/L	20	85	3.5
574094	MB for HBN 511606 [SPR/6382]	3/26/2014	PYR	Bifenthrin	ND	0.1	1.5	ng/L			
574095	LCS for HBN 511606 [SPR/6382]	3/26/2014	PYR	Bifenthrin	18		1.5	ng/L	20	90	
574096	LCSD for HBN 511606 [SPR/6382]	3/26/2014	PYR	Bifenthrin	19		1.5	ng/L	20	95	5.4
564069	MB for HBN 508501 [SPR/6300]	2/7/2014	PYR	Cyfluthrin	ND	0.2	1.5	ng/L			
564070	LCS for HBN 508501 [SPR/6300]	2/7/2014	PYR	Cyfluthrin	16		1.5	ng/L	20	80	
564071	LCSD for HBN 508501 [SPR/6300]	2/7/2014	PYR	Cyfluthrin	17		1.5	ng/L	20	85	3.6
564487	Matrix QC (MS)	2/7/2014	PYR	Cyfluthrin	14		1.5	ng/L	21.3	66	
564488	Matrix QC (MSD)	2/7/2014	PYR	Cyfluthrin	15		1.5	ng/L	21.3	71	6.9
P020494001	Matrix QC (ORIG)	2/7/2014	PYR	Cyfluthrin	0.3 J	0.2	1.5	ng/L			



Table F-2:	Table F-2: CCCWP SSID Study – Aquatic Chemistry QA/QC Samples												
Lab Number	Sample Description ¹	Date Received	Analyte Group ²	Analyte Name	Result	MDL	Reporting Limit	Units	Expected Result	Percent Recovery	Relative Percent Difference		
570428	MB for HBN 510076 [SPR/6351]	3/4/2014	PYR	Cyfluthrin	ND	0.2	1.5	ng/L					
570429	LCS for HBN 510076 [SPR/6351]	3/4/2014	PYR	Cyfluthrin	18		1.5	ng/L	20	90			
570430	LCSD for HBN 510076 [SPR/6351]	3/4/2014	PYR	Cyfluthrin	17		1.5	ng/L	20	85	6.3		
574094	MB for HBN 511606 [SPR/6382]	3/26/2014	PYR	Cyfluthrin	ND	0.2	1.5	ng/L					
574095	LCS for HBN 511606 [SPR/6382]	3/26/2014	PYR	Cyfluthrin	17		1.5	ng/L	20	85			
574096	LCSD for HBN 511606 [SPR/6382]	3/26/2014	PYR	Cyfluthrin	18		1.5	ng/L	20	90	5.7		
564069	MB for HBN 508501 [SPR/6300]	2/7/2014	PYR	Cypermethrin	ND	0.2	1.5	ng/L					
564070	LCS for HBN 508501 [SPR/6300]	2/7/2014	PYR	Cypermethrin	17		1.5	ng/L	20	85			
564071	LCSD for HBN 508501 [SPR/6300]	2/7/2014	PYR	Cypermethrin	18		1.5	ng/L	20	90	4		
564487	Matrix QC (MS)	2/7/2014	PYR	Cypermethrin	14		1.5	ng/L	21.6	65			
564488	Matrix QC (MSD)	2/7/2014	PYR	Cypermethrin	15		1.5	ng/L	21.6	70	6.9		
P020494001	Matrix QC (ORIG)	2/7/2014	PYR	Cypermethrin	0.6 J	0.2	1.5	ng/L					
570428	MB for HBN 510076 [SPR/6351]	3/4/2014	PYR	Cypermethrin	ND	0.2	1.5	ng/L					
570429	LCS for HBN 510076 [SPR/6351]	3/4/2014	PYR	Cypermethrin	19		1.5	ng/L	20	95			
570430	LCSD for HBN 510076 [SPR/6351]	3/4/2014	PYR	Cypermethrin	18		1.5	ng/L	20	90	5.9		
574094	MB for HBN 511606 [SPR/6382]	3/26/2014	PYR	Cypermethrin	ND	0.2	1.5	ng/L					
574095	LCS for HBN 511606 [SPR/6382]	3/26/2014	PYR	Cypermethrin	18		1.5	ng/L	20	90			
574096	LCSD for HBN 511606 [SPR/6382]	3/26/2014	PYR	Cypermethrin	19		1.5	ng/L	20	95	5.4		
564069	MB for HBN 508501 [SPR/6300]	2/7/2014	PYR	Deltamethrin:Tralomethrin	ND	0.2	3	ng/L					
564070	LCS for HBN 508501 [SPR/6300]	2/7/2014	PYR	Deltamethrin:Tralomethrin	28		3	ng/L	40	70			
564071	LCSD for HBN 508501 [SPR/6300]	2/7/2014	PYR	Deltamethrin:Tralomethrin	28		3	ng/L	40	70	1.4		
564487	Matrix QC (MS)	2/7/2014	PYR	Deltamethrin:Tralomethrin	21		3	ng/L	41	51			
564488	Matrix QC (MSD)	2/7/2014	PYR	Deltamethrin:Tralomethrin	22		3	ng/L	41	53	4.7		
P020494001	Matrix QC (ORIG)	2/7/2014	PYR	Deltamethrin:Tralomethrin	ND	0.2	3	ng/L					
570428	MB for HBN 510076 [SPR/6351]	3/4/2014	PYR	Deltamethrin:Tralomethrin	ND	0.2	3	ng/L					
570429	LCS for HBN 510076 [SPR/6351]	3/4/2014	PYR	Deltamethrin:Tralomethrin	33		3	ng/L	40	83			



Table F-2:	able F-2: CCCWP SSID Study – Aquatic Chemistry QA/QC Samples												
Lab Number	Sample Description ¹	Date Received	Analyte Group ²	Analyte Name	Result	MDL	Reporting Limit	Units	Expected Result	Percent Recovery	Relative Percent Difference		
570430	LCSD for HBN 510076 [SPR/6351]	3/4/2014	PYR	Deltamethrin:Tralomethrin	32		3	ng/L	40	80	3.1		
574094	MB for HBN 511606 [SPR/6382]	3/26/2014	PYR	Deltamethrin:Tralomethrin	ND	0.2	3	ng/L					
574095	LCS for HBN 511606 [SPR/6382]	3/26/2014	PYR	Deltamethrin:Tralomethrin	31		3	ng/L	40	78			
574096	LCSD for HBN 511606 [SPR/6382]	3/26/2014	PYR	Deltamethrin:Tralomethrin	33		3	ng/L	40	83	6.3		
564069	MB for HBN 508501 [SPR/6300]	2/7/2014	PYR	Esfenvalerate:Fenvalerate	ND	0.2	3	ng/L					
564070	LCS for HBN 508501 [SPR/6300]	2/7/2014	PYR	Esfenvalerate:Fenvalerate	31		3	ng/L	40	78			
564071	LCSD for HBN 508501 [SPR/6300]	2/7/2014	PYR	Esfenvalerate:Fenvalerate	32		3	ng/L	40	80	4.1		
564487	Matrix QC (MS)	2/7/2014	PYR	Esfenvalerate:Fenvalerate	24		3	ng/L	41	58			
564488	Matrix QC (MSD)	2/7/2014	PYR	Esfenvalerate:Fenvalerate	26		3	ng/L	41	63	8		
P020494001	Matrix QC (ORIG)	2/7/2014	PYR	Esfenvalerate:Fenvalerate	ND	0.2	3	ng/L					
570428	MB for HBN 510076 [SPR/6351]	3/4/2014	PYR	Esfenvalerate:Fenvalerate	ND	0.2	3	ng/L					
570429	LCS for HBN 510076 [SPR/6351]	3/4/2014	PYR	Esfenvalerate:Fenvalerate	34		3	ng/L	40	85			
570430	LCSD for HBN 510076 [SPR/6351]	3/4/2014	PYR	Esfenvalerate:Fenvalerate	32		3	ng/L	40	80	7.2		
574094	MB for HBN 511606 [SPR/6382]	3/26/2014	PYR	Esfenvalerate:Fenvalerate	ND	0.2	3	ng/L					
574095	LCS for HBN 511606 [SPR/6382]	3/26/2014	PYR	Esfenvalerate:Fenvalerate	34		3	ng/L	40	85			
574096	LCSD for HBN 511606 [SPR/6382]	3/26/2014	PYR	Esfenvalerate:Fenvalerate	35		3	ng/L	40	88	2.9		
564069	MB for HBN 508501 [SPR/6300]	2/7/2014	PYR	Fenpropathrin	ND	0.2	1.5	ng/L					
564070	LCS for HBN 508501 [SPR/6300]	2/7/2014	PYR	Fenpropathrin	20		1.5	ng/L	20	100			
564071	LCSD for HBN 508501 [SPR/6300]	2/7/2014	PYR	Fenpropathrin	20		1.5	ng/L	20	100	2		
564487	Matrix QC (MS)	2/7/2014	PYR	Fenpropathrin	15		1.5	ng/L	21	73			
564488	Matrix QC (MSD)	2/7/2014	PYR	Fenpropathrin	15		1.5	ng/L	21	73	0		
P020494001	Matrix QC (ORIG)	2/7/2014	PYR	Fenpropathrin	ND	0.2	1.5	ng/L					
570428	MB for HBN 510076 [SPR/6351]	3/4/2014	PYR	Fenpropathrin	ND	0.2	1.5	ng/L					
570429	LCS for HBN 510076 [SPR/6351]	3/4/2014	PYR	Fenpropathrin	27		1.5	ng/L	20	135			
570430	LCSD for HBN 510076 [SPR/6351]	3/4/2014	PYR	Fenpropathrin	21		1.5	ng/L	20	105	26		
574094	MB for HBN 511606 [SPR/6382]	3/26/2014	PYR	Fenpropathrin	ND	0.2	1.5	ng/L					



Table F-2:	Гable F-2: CCCWP SSID Study – Aquatic Chemistry QA/QC Samples												
Lab Number	Sample Description ¹	Date Received	Analyte Group ²	Analyte Name	Result	MDL	Reporting Limit	Units	Expected Result	Percent Recovery	Relative Percent Difference		
574095	LCS for HBN 511606 [SPR/6382]	3/26/2014	PYR	Fenpropathrin	21		1.5	ng/L	20	105			
574096	LCSD for HBN 511606 [SPR/6382]	3/26/2014	PYR	Fenpropathrin	23		1.5	ng/L	20	115	9.1		
564069	MB for HBN 508501 [SPR/6300]	2/7/2014	PYR	Lambda-Cyhalothrin	0.3 J	0.2	1.5	ng/L					
564070	LCS for HBN 508501 [SPR/6300]	2/7/2014	PYR	Lambda-Cyhalothrin	14		1.5	ng/L	20	70			
564071	LCSD for HBN 508501 [SPR/6300]	2/7/2014	PYR	Lambda-Cyhalothrin	15		1.5	ng/L	20	75	6.9		
564487	Matrix QC (MS)	2/7/2014	PYR	Lambda-Cyhalothrin	12		1.5	ng/L	21.5	56			
564488	Matrix QC (MSD)	2/7/2014	PYR	Lambda-Cyhalothrin	12		1.5	ng/L	21.5	56	0		
P020494001	Matrix QC (ORIG)	2/7/2014	PYR	Lambda-Cyhalothrin	0.5 J,B	0.2	1.5	ng/L					
570428	MB for HBN 510076 [SPR/6351]	3/4/2014	PYR	Lambda-Cyhalothrin	ND	0.2	1.5	ng/L					
570429	LCS for HBN 510076 [SPR/6351]	3/4/2014	PYR	Lambda-Cyhalothrin	20		1.5	ng/L	20	100			
570430	LCSD for HBN 510076 [SPR/6351]	3/4/2014	PYR	Lambda-Cyhalothrin	18		1.5	ng/L	20	90	8.5		
574094	MB for HBN 511606 [SPR/6382]	3/26/2014	PYR	Lambda-Cyhalothrin	ND	0.2	1.5	ng/L					
574095	LCS for HBN 511606 [SPR/6382]	3/26/2014	PYR	Lambda-Cyhalothrin	16		1.5	ng/L	20	80			
574096	LCSD for HBN 511606 [SPR/6382]	3/26/2014	PYR	Lambda-Cyhalothrin	17		1.5	ng/L	20	85	6.1		
564069	MB for HBN 508501 [SPR/6300]	2/7/2014	PYR	Permethrin	ND	2	15	ng/L					
564070	LCS for HBN 508501 [SPR/6300]	2/7/2014	PYR	Permethrin	85		15	ng/L	100	85			
564071	LCSD for HBN 508501 [SPR/6300]	2/7/2014	PYR	Permethrin	92		15	ng/L	100	92	7.9		
564487	Matrix QC (MS)	2/7/2014	PYR	Permethrin	69		15	ng/L	100	67			
564488	Matrix QC (MSD)	2/7/2014	PYR	Permethrin	73		15	ng/L	100	71	5.6		
P020494001	Matrix QC (ORIG)	2/7/2014	PYR	Permethrin	ND	2	15	ng/L					
570428	MB for HBN 510076 [SPR/6351]	3/4/2014	PYR	Permethrin	ND	2	15	ng/L					
570429	LCS for HBN 510076 [SPR/6351]	3/4/2014	PYR	Permethrin	110		15	ng/L	100	110			
570430	LCSD for HBN 510076 [SPR/6351]	3/4/2014	PYR	Permethrin	110		15	ng/L	100	110	0.9		
574094	MB for HBN 511606 [SPR/6382]	3/26/2014	PYR	Permethrin	ND	2	15	ng/L					
574095	LCS for HBN 511606 [SPR/6382]	3/26/2014	PYR	Permethrin	75		15	ng/L	100	75			
574096	LCSD for HBN 511606 [SPR/6382]	3/26/2014	PYR	Permethrin	84		15	ng/L	100	84	11		



Table F-2:	CCCWP SSID Study – Aqua	tic Chemist	ry QA/QC	Samples							
Lab Number	Sample Description ¹	Date Received	Analyte Group ²	Analyte Name	Result	MDL	Reporting Limit	Units	Expected Result	Percent Recovery	Relative Percent Difference
564069	MB for HBN 508501 [SPR/6300]	2/7/2014	PYR	Tau-Fluvalinate	ND	0.2	1.5	ng/L			
564070	LCS for HBN 508501 [SPR/6300]	2/7/2014	PYR	Tau-Fluvalinate	14		1.5	ng/L	20	70	
564071	LCSD for HBN 508501 [SPR/6300]	2/7/2014	PYR	Tau-Fluvalinate	15		1.5	ng/L	20	75	6.2
564487	Matrix QC (MS)	2/7/2014	PYR	Tau-Fluvalinate	12		1.5	ng/L	21	58	
564488	Matrix QC (MSD)	2/7/2014	PYR	Tau-Fluvalinate	12		1.5	ng/L	21	58	0
P020494001	Matrix QC (ORIG)	2/7/2014	PYR	Tau-Fluvalinate	ND	0.2	1.5	ng/L			
570428	MB for HBN 510076 [SPR/6351]	3/4/2014	PYR	Tau-Fluvalinate	ND	0.2	1.5	ng/L			
570429	LCS for HBN 510076 [SPR/6351]	3/4/2014	PYR	Tau-Fluvalinate	14		1.5	ng/L	20	70	
570430	LCSD for HBN 510076 [SPR/6351]	3/4/2014	PYR	Tau-Fluvalinate	13		1.5	ng/L	20	65	6
574094	MB for HBN 511606 [SPR/6382]	3/26/2014	PYR	Tau-Fluvalinate	ND	0.2	1.5	ng/L			
574095	LCS for HBN 511606 [SPR/6382]	3/26/2014	PYR	Tau-Fluvalinate	13		1.5	ng/L	20	65	
574096	LCSD for HBN 511606 [SPR/6382]	3/26/2014	PYR	Tau-Fluvalinate	13		1.5	ng/L	20	65	0
564069	MB for HBN 508501 [SPR/6300]	2/7/2014	PYR	Tetramethrin	ND	0.2	1.5	ng/L			
564070	LCS for HBN 508501 [SPR/6300]	2/7/2014	PYR	Tetramethrin	14		1.5	ng/L	20	70	
564071	LCSD for HBN 508501 [SPR/6300]	2/7/2014	PYR	Tetramethrin	12		1.5	ng/L	20	60	14
564487	Matrix QC (MS)	2/7/2014	PYR	Tetramethrin	15		1.5	ng/L	21	73	
564488	Matrix QC (MSD)	2/7/2014	PYR	Tetramethrin	15		1.5	ng/L	21	73	0
P020494001	Matrix QC (ORIG)	2/7/2014	PYR	Tetramethrin	ND	0.2	1.5	ng/L			
570428	MB for HBN 510076 [SPR/6351]	3/4/2014	PYR	Tetramethrin	ND	0.2	1.5	ng/L			
570429	LCS for HBN 510076 [SPR/6351]	3/4/2014	PYR	Tetramethrin	16		1.5	ng/L	20	80	
570430	LCSD for HBN 510076 [SPR/6351]	3/4/2014	PYR	Tetramethrin	15		1.5	ng/L	20	75	3.3
574094	MB for HBN 511606 [SPR/6382]	3/26/2014	PYR	Tetramethrin	ND	0.2	1.5	ng/L			
574095	LCS for HBN 511606 [SPR/6382]	3/26/2014	PYR	Tetramethrin	16		1.5	ng/L	20	80	
574096	LCSD for HBN 511606 [SPR/6382]	3/26/2014	PYR	Tetramethrin	16		1.5	ng/L	20	80	0
565093	MB for HBN 508664 [SPR/6309]	2/7/2014	SUR	Decachlorobiphenyl	93		30-190	%	0.2	93	
565094	LCS for HBN 508664 [SPR/6309]	2/7/2014	SUR	Decachlorobiphenyl	100		30-190	%	0.2	100	



Table F-2:	CCCWP SSID Study – Aqua	tic Chemist	ry QA/QC	Samples							
Lab Number	Sample Description ¹	Date Received	Analyte Group ²	Analyte Name	Result	MDL	Reporting Limit	Units	Expected Result	Percent Recovery	Relative Percent Difference
565095	LCSD for HBN 508664 [SPR/6309]	2/7/2014	SUR	Decachlorobiphenyl	95		30-190	%	0.2	95	5.1
570101	MB for HBN 510007 [SPR/6346]	3/1/2014	SUR	Decachlorobiphenyl	42		30-190	%	0.2	42	
570102	LCS for HBN 510007 [SPR/6346]	3/1/2014	SUR	Decachlorobiphenyl	49		30-190	%	0.2	49	
570103	LCSD for HBN 510007 [SPR/6346]	3/1/2014	SUR	Decachlorobiphenyl	46		30-190	%	0.2	46	7.4
574847	MB for HBN 511879 [SPR/6386]	3/26/2014	SUR	Decachlorobiphenyl	46		30-190	%	0.2	46	
574848	LCS for HBN 511879 [SPR/6386]	3/26/2014	SUR	Decachlorobiphenyl	49		30-190	%	0.2	49	
574849	LCSD for HBN 511879 [SPR/6386]	3/26/2014	SUR	Decachlorobiphenyl	55		30-190	%	0.2	55	13
564069	MB for HBN 508501 [SPR/6300]	2/7/2014	SUR	Esfenvalerate-d6;#1	94		70-130	%	10	94	
564070	LCS for HBN 508501 [SPR/6300]	2/7/2014	SUR	Esfenvalerate-d6;#1	93		70-130	%	10	93	
564071	LCSD for HBN 508501 [SPR/6300]	2/7/2014	SUR	Esfenvalerate-d6;#1	100		70-130	%	20	100	73
564487	Matrix QC (MS)	2/7/2014	SUR	Esfenvalerate-d6;#1	65		70-130	%	10	65	
564488	Matrix QC (MSD)	2/7/2014	SUR	Esfenvalerate-d6;#1	67		70-130	%	10	67	3.1
564956	MB for HBN 508653 [SPR/6308]	2/7/2014	SUR	Esfenvalerate-d6;#1	80		70-130	%	10	80	
564957	LCS for HBN 508653 [SPR/6308]	2/7/2014	SUR	Esfenvalerate-d6;#1	84		70-130	%	10	84	
564958	LCSD for HBN 508653 [SPR/6308]	2/7/2014	SUR	Esfenvalerate-d6;#1	89		70-130	%	10	89	5.8
570428	MB for HBN 510076 [SPR/6351]	3/4/2014	SUR	Esfenvalerate-d6;#1	90		70-130	%	10	90	
570429	LCS for HBN 510076 [SPR/6351]	3/4/2014	SUR	Esfenvalerate-d6;#1	85		70-130	%	10	85	
570430	LCSD for HBN 510076 [SPR/6351]	3/4/2014	SUR	Esfenvalerate-d6;#1	75		70-130	%	10	75	13
574094	MB for HBN 511606 [SPR/6382]	3/26/2014	SUR	Esfenvalerate-d6;#1	68		70-130	%	10	68	
574095	LCS for HBN 511606 [SPR/6382]	3/26/2014	SUR	Esfenvalerate-d6;#1	79		70-130	%	10	79	
574096	LCSD for HBN 511606 [SPR/6382]	3/26/2014	SUR	Esfenvalerate-d6;#1	80		70-130	%	10	80	1.3
564069	MB for HBN 508501 [SPR/6300]	2/7/2014	SUR	Esfenvalerate-d6;#2	89		70-130	%	10	89	
564070	LCS for HBN 508501 [SPR/6300]	2/7/2014	SUR	Esfenvalerate-d6;#2	88		70-130	%	10	88	
564071	LCSD for HBN 508501 [SPR/6300]	2/7/2014	SUR	Esfenvalerate-d6;#2	95		70-130	%	20	95	73
564487	Matrix QC (MS)	2/7/2014	SUR	Esfenvalerate-d6;#2	64		70-130	%	10	64	
564488	Matrix QC (MSD)	2/7/2014	SUR	Esfenvalerate-d6;#2	68		70-130	%	10	68	6



Table F-2:	Table F-2: CCCWP SSID Study – Aquatic Chemistry QA/QC Samples												
Lab Number	Sample Description ¹	Date Received	Analyte Group ²	Analyte Name	Result	MDL	Reporting Limit	Units	Expected Result	Percent Recovery	Relative Percent Difference		
564956	MB for HBN 508653 [SPR/6308]	2/7/2014	SUR	Esfenvalerate-d6;#2	81		70-130	%	10	81			
564957	LCS for HBN 508653 [SPR/6308]	2/7/2014	SUR	Esfenvalerate-d6;#2	83		70-130	%	10	83			
564958	LCSD for HBN 508653 [SPR/6308]	2/7/2014	SUR	Esfenvalerate-d6;#2	90		70-130	%	10	90	8.1		
570428	MB for HBN 510076 [SPR/6351]	3/4/2014	SUR	Esfenvalerate-d6;#2	87		70-130	%	10	87			
570429	LCS for HBN 510076 [SPR/6351]	3/4/2014	SUR	Esfenvalerate-d6;#2	85		70-130	%	10	85			
570430	LCSD for HBN 510076 [SPR/6351]	3/4/2014	SUR	Esfenvalerate-d6;#2	75		70-130	%	10	75	13		
574094	MB for HBN 511606 [SPR/6382]	3/26/2014	SUR	Esfenvalerate-d6;#2	68		70-130	%	10	68			
574095	LCS for HBN 511606 [SPR/6382]	3/26/2014	SUR	Esfenvalerate-d6;#2	79		70-130	%	10	79			
574096	LCSD for HBN 511606 [SPR/6382]	3/26/2014	SUR	Esfenvalerate-d6;#2	81		70-130	%	10	81	2.5		
565093	MB for HBN 508664 [SPR/6309]	2/7/2014	SUR	Tetrachloro-m-xylene	75		25-105	%	0.2	75			
565094	LCS for HBN 508664 [SPR/6309]	2/7/2014	SUR	Tetrachloro-m-xylene	80		25-105	%	0.2	80			
565095	LCSD for HBN 508664 [SPR/6309]	2/7/2014	SUR	Tetrachloro-m-xylene	75		25-105	%	0.2	75	6.5		
570101	MB for HBN 510007 [SPR/6346]	3/1/2014	SUR	Tetrachloro-m-xylene	78		25-105	%	0.2	78			
570102	LCS for HBN 510007 [SPR/6346]	3/1/2014	SUR	Tetrachloro-m-xylene	75		25-105	%	0.2	75			
570103	LCSD for HBN 510007 [SPR/6346]	3/1/2014	SUR	Tetrachloro-m-xylene	80		25-105	%	0.2	80	6.5		
574847	MB for HBN 511879 [SPR/6386]	3/26/2014	SUR	Tetrachloro-m-xylene	62		25-105	%	0.2	62			
574848	LCS for HBN 511879 [SPR/6386]	3/26/2014	SUR	Tetrachloro-m-xylene	65		25-105	%	0.2	65			
574849	LCSD for HBN 511879 [SPR/6386]	3/26/2014	SUR	Tetrachloro-m-xylene	70		25-105	%	0.2	70	7.4		
564892	MB for HBN 508630 [BIO/13477]	2/7/2014	PS	Sediment Concentration	ND	2	3	mg/L					
564893	LCS for HBN 508630 [BIO/13477]	2/7/2014	PS	Sediment Concentration	467		3	mg/L	500	93			
564894	LCSD for HBN 508630 [BIO/13477	2/7/2014	PS	Sediment Concentration	489		3	mg/L	500	98	4.6		
570093	MB for HBN 510004 [BIO/13574]	3/1/2014	PS	Sediment Concentration	ND	2	3	mg/L					
570094	LCS for HBN 510004 [BIO/13574]	3/1/2014	PS	Sediment Concentration	508		3	mg/L	500	102			
570095	LCSD for HBN 510004 [BIO/13574	3/1/2014	PS	Sediment Concentration	506		3	mg/L	500	101	0.4		
574708	MB for HBN 511837 [BIO/13669]	3/26/2014	PS	Sediment Concentration	ND	2	3	mg/L					
574709	LCS for HBN 511837 [BIO/13669]	3/26/2014	PS	Sediment Concentration	477		3	mg/L	500	95			



Table F-2: CCCWP SSID Study – Aquatic Chemistry QA/QC Samples												
Lab Number	Sample Description ¹	Date Received	Analyte Group ²	Analyte Name	Result	MDL	Reporting Limit	Units	Expected Result	Percent Recovery	Relative Percent Difference	
574762	LCSD for HBN 511837 [BIO/13669	4/1/2014	PS	Sediment Concentration	484		3	mg/L	500	97	1.5	
566585	MB for HBN 508976 [WET/7444]	2/6/2014	TOC	Total Organic Carbon	ND	0.3	1	mg/L				
566586	LCS for HBN 508976 [WET/7444]	2/6/2014	TOC	Total Organic Carbon	10		1	mg/L	10	100		
566657	Matrix QC (MS)	2/7/2014	TOC	Total Organic Carbon	28		1	mg/L	26	116		
566658	Matrix QC (MSD)	2/7/2014	TOC	Total Organic Carbon	28		1	mg/L	26	116	0	
566659	544MSH065-(566659MS)	2/7/2014	TOC	Total Organic Carbon	24		1	mg/L	26	84		
566660	544MSH065-(566659MSD)	2/7/2014	TOC	Total Organic Carbon	25		1	mg/L	26	94	4.1	
P020479022	Matrix QC (ORIG)	2/7/2014	TOC	Total Organic Carbon	16	0.3	0.5	mg/L				
571219	MB for HBN 510359 [WET/7502]	3/4/2014	TOC	Total Organic Carbon	ND	0.3	1	mg/L				
571220	LCS for HBN 510359 [WET/7502]	3/4/2014	TOC	Total Organic Carbon	10		1	mg/L	10	100		
571221	Matrix QC (MS)	3/4/2014	TOC	Total Organic Carbon	18		1	mg/L	18.1	99		
571222	Matrix QC (MSD)	3/4/2014	TOC	Total Organic Carbon	18		1	mg/L	18.1	99	0	
P030133001	Matrix QC (ORIG)	3/4/2014	TOC	Total Organic Carbon	8.1	0.3	1	mg/L				
574492	MB for HBN 511744 [WET/7533]	3/26/2014	TOC	Total Organic Carbon	ND	0.3	1	mg/L				
574493	LCS for HBN 511744 [WET/7533]	3/26/2014	TOC	Total Organic Carbon	10		1	mg/L	10	100		
574497	Matrix QC (MS)	3/26/2014	TOC	Total Organic Carbon	13		1	mg/L	13.6	94		
574498	Matrix QC (MSD)	3/26/2014	TOC	Total Organic Carbon	13		1	mg/L	13.6	94	0	
P031026001	Matrix QC (ORIG)	3/26/2014	TOC	Total Organic Carbon	3.6	0.3	1	mg/L				

Analyte detected below Reporting Limit. Result is an estimate.



Analyte detected in method blank.

¹MB = Method Blank, LCS = Laboratory Control Sample, LCSD = Laboratory Control Duplicate Sample, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Laboratory Duplicate, ORIG = Original Field Sample Result
² FIP = Fipronils, OP = Organochlorine Pesticides, PYR = Pyrethroid Pesticides, SUR = Surrogates, PS = Particle Size, TOC = Total Organic Carbon

Table F-3:	CCCWP SSID Study – Sedin	nent Chemi	stry QA/(QC Samples							
Lab Number	Sample Description ¹	Date Received	Analyte Group ²	Analyte Name	Result	MDL	Reporting Limit	Units	Expected Result	Percent Recovery	Relative Percent Difference
594644	MB for HBN 524523 [SPR/6555]	7/22/2014	FIP	Fipronil	ND	0.1	0.25	μg/kg			
594645	LCS for HBN 524523 [SPR/6555]	7/22/2014	FIP	Fipronil	2.2	0.5	1.2	μg/kg	2.5	89	
594646	LCSD for HBN 524523 [SPR/6555]	7/22/2014	FIP	Fipronil	2.6	0.5	1.2	μg/kg	2.5	104	16
594647	Matrix QC (MS)	7/24/2014	FIP	Fipronil	1.7	0.2	0.5	μg/kg			
594648	Matrix QC (MSD)	7/24/2014	FIP	Fipronil	1.4	0.2	0.5	μg/kg			15
594644	MB for HBN 524523 [SPR/6555]	7/22/2014	FIP	Fipronil Desulfinyl	ND	0.1	0.25	μg/kg			
594645	LCS for HBN 524523 [SPR/6555]	7/22/2014	FIP	Fipronil Desulfinyl	2.1	0.5	1.2	μg/kg	2.5	86	
594646	LCSD for HBN 524523 [SPR/6555]	7/22/2014	FIP	Fipronil Desulfinyl	2.6	0.5	1.2	μg/kg	2.5	104	19
594647	Matrix QC (MS)	7/24/2014	FIP	Fipronil Desulfinyl	1.9	0.2	0.5	μg/kg			
594648	Matrix QC (MSD)	7/24/2014	FIP	Fipronil Desulfinyl	1.7	0.2	0.5	μg/kg			12
594644	MB for HBN 524523 [SPR/6555]	7/22/2014	FIP	Fipronil Sulfide	ND	0.1	0.25	μg/kg			
594645	LCS for HBN 524523 [SPR/6555]	7/22/2014	FIP	Fipronil Sulfide	2.2	0.5	1.2	μg/kg	2.5	86	
594646	LCSD for HBN 524523 [SPR/6555]	7/22/2014	FIP	Fipronil Sulfide	2.6	0.5	1.2	μg/kg	2.5	105	20
594647	Matrix QC (MS)	7/24/2014	FIP	Fipronil Sulfide	1.8	0.2	0.5	μg/kg			
594648	Matrix QC (MSD)	7/24/2014	FIP	Fipronil Sulfide	1.5	0.2	0.5	μg/kg			15
594644	MB for HBN 524523 [SPR/6555]	7/22/2014	FIP	Fipronil Sulfone	ND	0.1	0.25	μg/kg			
594645	LCS for HBN 524523 [SPR/6555]	7/22/2014	FIP	Fipronil Sulfone	2.2	0.5	1.2	μg/kg	2.5	87	
594646	LCSD for HBN 524523 [SPR/6555]	7/22/2014	FIP	Fipronil Sulfone	2.7	0.5	1.2	μg/kg	2.5	106	20
594647	Matrix QC (MS)	7/24/2014	FIP	Fipronil Sulfone	2	0.2	0.5	μg/kg			
594648	Matrix QC (MSD)	7/24/2014	FIP	Fipronil Sulfone	1.9	0.2	0.5	μg/kg			8.7
594791	MB for HBN 524561 [SPR/6556]	7/22/2014	OP	2,4'-DDD	ND	0.002	0.002	mg/kg			
594791	MB for HBN 524561 [SPR/6556]	7/22/2014	OP	2,4'-DDE	ND	0.002	0.002	mg/kg			
594791	MB for HBN 524561 [SPR/6556]	7/22/2014	OP	2,4'-DDT	ND	0.002	0.002	mg/kg			
594791	MB for HBN 524561 [SPR/6556]	7/22/2014	OP	4,4'-DDD	ND	0.0008	0.002	mg/kg			
594791	MB for HBN 524561 [SPR/6556]	7/22/2014	OP	4,4'-DDE	ND	0.0012	0.002	mg/kg			
594791	MB for HBN 524561 [SPR/6556]	7/22/2014	OP	4,4'-DDT	ND	0.001	0.002	mg/kg			



Table F-3:	CCCWP SSID Study – Sedin	nent Chemi	istry QA/(QC Samples							
Lab Number	Sample Description ¹	Date Received	Analyte Group ²	Analyte Name	Result	MDL	Reporting Limit	Units	Expected Result	Percent Recovery	Relative Percent Difference
594792	LCS for HBN 524561 [SPR/6556]	7/22/2014	OP	4,4'-DDT	0.0093	0.001	0.002	mg/kg	0.013	70	
594793	LCSD for HBN 524561 [SPR/6556]	7/22/2014	OP	4,4'-DDT	0.0092	0.001	0.002	mg/kg	0.013	69	0.9
594794	Matrix QC (MS)	7/24/2014	OP	4,4'-DDT	0.0081	0.001	0.002	mg/kg	0.013	61	
594795	Matrix QC (MSD)	7/24/2014	OP	4,4'-DDT	0.0075	0.001	0.002	mg/kg	0.013	56	7.4
P070963003	Matrix QC (ORIG)	7/24/2014	OP	4,4'-DDT	ND	0.42	3	ng/g			
594791	MB for HBN 524561 [SPR/6556]	7/22/2014	OP	Aldrin	ND	0.0009	0.002	mg/kg			
594792	LCS for HBN 524561 [SPR/6556]	7/22/2014	OP	Aldrin	0.0098	0.0009	0.002	mg/kg	0.013	73	
594793	LCSD for HBN 524561 [SPR/6556]	7/22/2014	OP	Aldrin	0.009	0.0009	0.002	mg/kg	0.013	68	7.9
594794	Matrix QC (MS)	7/24/2014	OP	Aldrin	0.012	0.0009	0.002	mg/kg	0.013	93	
594795	Matrix QC (MSD)	7/24/2014	OP	Aldrin	0.012	0.0009	0.002	mg/kg	0.013	93	0
594791	MB for HBN 524561 [SPR/6556]	7/22/2014	OP	alpha-BHC	ND	0.0009	0.002	mg/kg			
594791	MB for HBN 524561 [SPR/6556]	7/22/2014	OP	alpha-Chlordane (cis)	ND	0.001	0.002	mg/kg			
594791	MB for HBN 524561 [SPR/6556]	7/22/2014	OP	beta-BHC	ND	0.0009	0.002	mg/kg			
594791	MB for HBN 524561 [SPR/6556]	7/22/2014	OP	Chlordane	ND	0.003	0.004	mg/kg			
594791	MB for HBN 524561 [SPR/6556]	7/22/2014	OP	delta-BHC	ND	0.0007	0.002	mg/kg			
594791	MB for HBN 524561 [SPR/6556]	7/22/2014	OP	Dieldrin	ND	0.0012	0.002	mg/kg			
594792	LCS for HBN 524561 [SPR/6556]	7/22/2014	OP	Dieldrin	0.01	0.0012	0.002	mg/kg	0.013	75	
594793	LCSD for HBN 524561 [SPR/6556]	7/22/2014	OP	Dieldrin	0.01	0.0012	0.002	mg/kg	0.013	76	1
594794	Matrix QC (MS)	7/24/2014	OP	Dieldrin	0.014	0.0012	0.002	mg/kg	0.013	101	
594795	Matrix QC (MSD)	7/24/2014	OP	Dieldrin	0.013	0.0012	0.002	mg/kg	0.013	101	0.7
P070963003	Matrix QC (ORIG)	7/24/2014	OP	Dieldrin	ND	0.74	3	ng/g			
594791	MB for HBN 524561 [SPR/6556]	7/22/2014	OP	Endosulfan I	ND	0.0009	0.002	mg/kg			
594791	MB for HBN 524561 [SPR/6556]	7/22/2014	OP	Endosulfan II	ND	0.0007	0.002	mg/kg			
594791	MB for HBN 524561 [SPR/6556]	7/22/2014	OP	Endosulfan sulfate	ND	0.0009	0.002	mg/kg			
594792	LCS for HBN 524561 [SPR/6556]	7/22/2014	OP	Endosulfan sulfate	0.01	0.0009	0.002	mg/kg	0.013	77	
594793	LCSD for HBN 524561 [SPR/6556]	7/22/2014	OP	Endosulfan sulfate	0.0099	0.0009	0.002	mg/kg	0.013	75	2.6



Table F-3:	CCCWP SSID Study – Sedin	nent Chemi	istry QA/(QC Samples							
Lab Number	Sample Description ¹	Date Received	Analyte Group ²	Analyte Name	Result	MDL	Reporting Limit	Units	Expected Result	Percent Recovery	Relative Percent Difference
594794	Matrix QC (MS)	7/24/2014	OP	Endosulfan sulfate	0.013	0.0009	0.002	mg/kg	0.013	99	
594795	Matrix QC (MSD)	7/24/2014	OP	Endosulfan sulfate	0.013	0.0009	0.002	mg/kg	0.013	95	4.7
594791	MB for HBN 524561 [SPR/6556]	7/22/2014	OP	Endrin	ND	0.001	0.002	mg/kg			
594792	LCS for HBN 524561 [SPR/6556]	7/22/2014	OP	Endrin	0.01	0.001	0.002	mg/kg	0.013	77	
594793	LCSD for HBN 524561 [SPR/6556]	7/22/2014	OP	Endrin	0.0099	0.001	0.002	mg/kg	0.013	74	3.2
594794	Matrix QC (MS)	7/24/2014	OP	Endrin	0.013	0.001	0.002	mg/kg	0.013	98	
594795	Matrix QC (MSD)	7/24/2014	OP	Endrin	0.013	0.001	0.002	mg/kg	0.013	95	3.1
P070963003	Matrix QC (ORIG)	7/24/2014	OP	Endrin	ND	0.78	3	ng/g			
594791	MB for HBN 524561 [SPR/6556]	7/22/2014	OP	Endrin aldehyde	ND	0.0009	0.002	mg/kg			
594791	MB for HBN 524561 [SPR/6556]	7/22/2014	OP	Endrin ketone	ND	0.0009	0.002	mg/kg			
594791	MB for HBN 524561 [SPR/6556]	7/22/2014	OP	gamma-BHC (Lindane)	ND	0.0007	0.002	mg/kg			
594792	LCS for HBN 524561 [SPR/6556]	7/22/2014	OP	gamma-BHC (Lindane)	0.009	0.0007	0.002	mg/kg	0.013	67	
594793	LCSD for HBN 524561 [SPR/6556]	7/22/2014	OP	gamma-BHC (Lindane)	0.0086	0.0007	0.002	mg/kg	0.013	64	4.4
594794	Matrix QC (MS)	7/24/2014	OP	gamma-BHC (Lindane)	0.0099	0.0007	0.002	mg/kg	0.013	75	
594795	Matrix QC (MSD)	7/24/2014	OP	gamma-BHC (Lindane)	0.01	0.0007	0.002	mg/kg	0.013	76	1.6
P070963003	Matrix QC (ORIG)	7/24/2014	OP	gamma-BHC (Lindane)	ND	0.68	6	ng/g			
594791	MB for HBN 524561 [SPR/6556]	7/22/2014	OP	gamma-Chlordane (trans)	ND	0.001	0.002	mg/kg			
594791	MB for HBN 524561 [SPR/6556]	7/22/2014	OP	Heptachlor	ND	0.0006	0.002	mg/kg			
594792	LCS for HBN 524561 [SPR/6556]	7/22/2014	OP	Heptachlor	0.0074	0.0006	0.002	mg/kg	0.013	55	
594793	LCSD for HBN 524561 [SPR/6556]	7/22/2014	OP	Heptachlor	0.0076	0.0006	0.002	mg/kg	0.013	57	2.7
594794	Matrix QC (MS)	7/24/2014	OP	Heptachlor	0.0072	0.0006	0.002	mg/kg	0.013	54	
594795	Matrix QC (MSD)	7/24/2014	OP	Heptachlor	0.0073	0.0006	0.002	mg/kg	0.013	55	2.2
594791	MB for HBN 524561 [SPR/6556]	7/22/2014	OP	Heptachlor epoxide	ND	0.0011	0.002	mg/kg			
598126	MB for HBN 525999 [SPR/6584]	7/22/2014	OP	Kepone	ND	0.009	0.02	mg/kg			
598127	LCS for HBN 525999 [SPR/6584]	7/22/2014	OP	Kepone	0.04	0.009	0.02	mg/kg	0.2	22	
598128	LCSD for HBN 525999 [SPR/6584]	7/22/2014	OP	Kepone	0.05	0.009	0.02	mg/kg	0.2	23	1.8



Table F-3:	Table F-3: CCCWP SSID Study – Sediment Chemistry QA/QC Samples											
Lab Number	Sample Description ¹	Date Received	Analyte Group ²	Analyte Name	Result	MDL	Reporting Limit	Units	Expected Result	Percent Recovery	Relative Percent Difference	
598129	207WAL060-(598129MS)	7/22/2014	OP	Kepone	0	0.009	0.02	mg/kg	0.01	0		
598130	207WAL060-(598130MSD)	7/22/2014	OP	Kepone	0	0.009	0.02	mg/kg	0.01	0	0	
594791	MB for HBN 524561 [SPR/6556]	7/22/2014	OP	Methoxychlor	ND	0.0009	0.002	mg/kg				
594792	LCS for HBN 524561 [SPR/6556]	7/22/2014	OP	Methoxychlor	0.0078	0.0009	0.002	mg/kg	0.013	59		
594793	LCSD for HBN 524561 [SPR/6556]	7/22/2014	OP	Methoxychlor	0.0073	0.0009	0.002	mg/kg	0.013	55	6.6	
594794	Matrix QC (MS)	7/24/2014	OP	Methoxychlor	0.0094	0.0009	0.002	mg/kg	0.013	70		
594795	Matrix QC (MSD)	7/24/2014	OP	Methoxychlor	0.0086	0.0009	0.002	mg/kg	0.013	64	8.8	
594791	MB for HBN 524561 [SPR/6556]	7/22/2014	OP	Mirex	ND	0.0005	0.02	mg/kg				
594791	MB for HBN 524561 [SPR/6556]	7/22/2014	OP	Toxaphene	ND	0.02	0.04	mg/kg				
594644	MB for HBN 524523 [SPR/6555]	7/22/2014	PYR	Allethrin	ND	0.05	0.25	μg/kg				
594645	LCS for HBN 524523 [SPR/6555]	7/22/2014	PYR	Allethrin	2.6	0.25	1.2	μg/kg	2.5	106		
594646	LCSD for HBN 524523 [SPR/6555]	7/22/2014	PYR	Allethrin	3	0.25	1.2	μg/kg	2.5	119	12	
594647	Matrix QC (MS)	7/24/2014	PYR	Allethrin	0.86	0.1	0.5	μg/kg	2.5	35		
594648	Matrix QC (MSD)	7/24/2014	PYR	Allethrin	0.89	0.1	0.5	μg/kg	2.5	36	3	
594644	MB for HBN 524523 [SPR/6555]	7/22/2014	PYR	Bifenthrin	ND	0.1	0.25	μg/kg				
594645	LCS for HBN 524523 [SPR/6555]	7/22/2014	PYR	Bifenthrin	2.6	0.5	1.2	μg/kg	2.5	104		
594646	LCSD for HBN 524523 [SPR/6555]	7/22/2014	PYR	Bifenthrin	2.7	0.5	1.2	μg/kg	2.5	108	3.4	
594647	Matrix QC (MS)	7/24/2014	PYR	Bifenthrin	3.3	0.2	0.5	μg/kg	2.86	119		
594648	Matrix QC (MSD)	7/24/2014	PYR	Bifenthrin	3.4	0.2	0.5	μg/kg	2.86	123	3.5	
P070925001	Matrix QC (ORIG)	7/24/2014	PYR	Bifenthrin	0.38	0.21	0.33	ng/g				
594644	MB for HBN 524523 [SPR/6555]	7/22/2014	PYR	Cyfluthrin	ND	0.11	0.25	μg/kg				
594645	LCS for HBN 524523 [SPR/6555]	7/22/2014	PYR	Cyfluthrin	2.8	0.55	1.2	μg/kg	2.5	113		
594646	LCSD for HBN 524523 [SPR/6555]	7/22/2014	PYR	Cyfluthrin	2.8	0.55	1.2	μg/kg	2.5	113	0.4	
594647	Matrix QC (MS)	7/24/2014	PYR	Cyfluthrin	2.8	0.22	0.5	μg/kg	2.5	113		
594648	Matrix QC (MSD)	7/24/2014	PYR	Cyfluthrin	6.4	0.22	0.5	μg/kg	2.5	255	77	
P070925001	Matrix QC (ORIG)	7/24/2014	PYR	Cyfluthrin	ND	0.19	0.33	ng/g				



Table F-3:	Table F-3: CCCWP SSID Study – Sediment Chemistry QA/QC Samples											
Lab Number	Sample Description ¹	Date Received	Analyte Group ²	Analyte Name	Result	MDL	Reporting Limit	Units	Expected Result	Percent Recovery	Relative Percent Difference	
594644	MB for HBN 524523 [SPR/6555]	7/22/2014	PYR	Cypermethrin	ND	0.1	0.25	μg/kg				
594645	LCS for HBN 524523 [SPR/6555]	7/22/2014	PYR	Cypermethrin	2.7	0.5	1.2	μg/kg	2.5	108		
594646	LCSD for HBN 524523 [SPR/6555]	7/22/2014	PYR	Cypermethrin	2.7	0.5	1.2	μg/kg	2.5	109	1.1	
594647	Matrix QC (MS)	7/24/2014	PYR	Cypermethrin	2.7	0.2	0.5	μg/kg	2.5	108		
594648	Matrix QC (MSD)	7/24/2014	PYR	Cypermethrin	2.7	0.2	0.5	μg/kg	2.5	110	1.5	
P070925001	Matrix QC (ORIG)	7/24/2014	PYR	Cypermethrin	ND	0.19	0.33	ng/g				
594644	MB for HBN 524523 [SPR/6555]	7/22/2014	PYR	Deltamethrin:Tralomethrin	ND	0.12	0.25	μg/kg				
594645	LCS for HBN 524523 [SPR/6555]	7/22/2014	PYR	Deltamethrin:Tralomethrin	5.6	0.6	1.2	μg/kg	5	112		
594646	LCSD for HBN 524523 [SPR/6555]	7/22/2014	PYR	Deltamethrin:Tralomethrin	4.6	0.6	1.2	μg/kg	5	92	19	
594647	Matrix QC (MS)	7/24/2014	PYR	Deltamethrin:Tralomethrin	6.4	0.24	0.5	μg/kg	5	127		
594648	Matrix QC (MSD)	7/24/2014	PYR	Deltamethrin:Tralomethrin	7.2	0.24	0.5	μg/kg	5	144	12	
P070925001	Matrix QC (ORIG)	7/24/2014	PYR	Deltamethrin:Tralomethrin	ND	0.29	0.41	ng/g				
594644	MB for HBN 524523 [SPR/6555]	7/22/2014	PYR	Esfenvalerate:Fenvalerate	ND	0.13	0.25	μg/kg				
594645	LCS for HBN 524523 [SPR/6555]	7/22/2014	PYR	Esfenvalerate:Fenvalerate	5.7	0.65	1.2	μg/kg	5	114		
594646	LCSD for HBN 524523 [SPR/6555]	7/22/2014	PYR	Esfenvalerate:Fenvalerate	5.3	0.65	1.2	μg/kg	5	107	6.5	
594647	Matrix QC (MS)	7/24/2014	PYR	Esfenvalerate:Fenvalerate	6	0.26	0.5	μg/kg	5	120		
594648	Matrix QC (MSD)	7/24/2014	PYR	Esfenvalerate:Fenvalerate	6.1	0.26	0.5	μg/kg	5	122	1.3	
P070925001	Matrix QC (ORIG)	7/24/2014	PYR	Esfenvalerate:Fenvalerate	ND	0.17	0.33	ng/g				
594644	MB for HBN 524523 [SPR/6555]	7/22/2014	PYR	Fenpropathrin	ND	0.07	0.25	μg/kg				
594645	LCS for HBN 524523 [SPR/6555]	7/22/2014	PYR	Fenpropathrin	2.6	0.35	1.2	μg/kg	2.5	103		
594646	LCSD for HBN 524523 [SPR/6555]	7/22/2014	PYR	Fenpropathrin	2.8	0.35	1.2	μg/kg	2.5	110	6.4	
594647	Matrix QC (MS)	7/24/2014	PYR	Fenpropathrin	2.6	0.14	0.5	μg/kg	2.5	104		
594648	Matrix QC (MSD)	7/24/2014	PYR	Fenpropathrin	2.6	0.14	0.5	μg/kg	2.5	105	1.2	
594644	MB for HBN 524523 [SPR/6555]	7/22/2014	PYR	Lambda-Cyhalothrin	ND	0.06	0.25	μg/kg				
594645	LCS for HBN 524523 [SPR/6555]	7/22/2014	PYR	Lambda-Cyhalothrin	2.4	0.3	1.2	μg/kg	2.5	96		
594646	LCSD for HBN 524523 [SPR/6555]	7/22/2014	PYR	Lambda-Cyhalothrin	2.7	0.3	1.2	μg/kg	2.5	107	11	



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Table F-3:	CCCWP SSID Study – Sedin	nent Chemi	istry QA/(QC Samples							
Lab Number	Sample Description ¹	Date Received	Analyte Group ²	Analyte Name	Result	MDL	Reporting Limit	Units	Expected Result	Percent Recovery	Relative Percent Difference
594647	Matrix QC (MS)	7/24/2014	PYR	Lambda-Cyhalothrin	1.4	0.12	0.5	μg/kg	2.5	55	
594648	Matrix QC (MSD)	7/24/2014	PYR	Lambda-Cyhalothrin	1.4	0.12	0.5	μg/kg	2.5	55	0.7
P070925001	Matrix QC (ORIG)	7/24/2014	PYR	Lambda-Cyhalothrin	ND	0.23	0.33	ng/g			
594644	MB for HBN 524523 [SPR/6555]	7/22/2014	PYR	Permethrin	ND	0.11	0.25	μg/kg			
594645	LCS for HBN 524523 [SPR/6555]	7/22/2014	PYR	Permethrin	72	0.55	1.2	μg/kg	50	144	
594646	LCSD for HBN 524523 [SPR/6555]	7/22/2014	PYR	Permethrin	68	0.55	1.2	μg/kg	50	137	4.7
594647	Matrix QC (MS)	7/24/2014	PYR	Permethrin	82	0.22	0.5	μg/kg	50.42	162	
594648	Matrix QC (MSD)	7/24/2014	PYR	Permethrin	81	0.22	0.5	μg/kg	50.42	160	1.2
594644	MB for HBN 524523 [SPR/6555]	7/22/2014	PYR	Tau-Fluvalinate	ND	0.04	0.25	μg/kg			
594645	LCS for HBN 524523 [SPR/6555]	7/22/2014	PYR	Tau-Fluvalinate	1.9	0.2	1.2	μg/kg	2.5	78	
594646	LCSD for HBN 524523 [SPR/6555]	7/22/2014	PYR	Tau-Fluvalinate	1.8	0.2	1.2	μg/kg	2.5	72	8
594647	Matrix QC (MS)	7/24/2014	PYR	Tau-Fluvalinate	1.2	0.08	0.5	μg/kg	2.5	49	
594648	Matrix QC (MSD)	7/24/2014	PYR	Tau-Fluvalinate	1.2	0.08	0.5	μg/kg	2.5	46	5.9
594644	MB for HBN 524523 [SPR/6555]	7/22/2014	PYR	Tetramethrin	ND	0.06	0.25	μg/kg			
594645	LCS for HBN 524523 [SPR/6555]	7/22/2014	PYR	Tetramethrin	2.3	0.3	1.2	μg/kg	2.5	91	
594646	LCSD for HBN 524523 [SPR/6555]	7/22/2014	PYR	Tetramethrin	2.5	0.3	1.2	μg/kg	2.5	100	9.6
594647	Matrix QC (MS)	7/24/2014	PYR	Tetramethrin	1.6	0.12	0.5	μg/kg	2.5	62	
594648	Matrix QC (MSD)	7/24/2014	PYR	Tetramethrin	2	0.12	0.5	μg/kg	2.5	80	25
594791	MB for HBN 524561 [SPR/6556]	7/22/2014	SUR	Decachlorobiphenyl	67		'45-188	%	0	67	
594792	LCS for HBN 524561 [SPR/6556]	7/22/2014	SUR	Decachlorobiphenyl	86		'45-188	%	0	86	
594793	LCSD for HBN 524561 [SPR/6556]	7/22/2014	SUR	Decachlorobiphenyl	76		'45-188	%	0	76	12
598126	MB for HBN 525999 [SPR/6584]	7/22/2014	SUR	Decachlorobiphenyl	110		'45-188	%	0	110	
598127	LCS for HBN 525999 [SPR/6584]	7/22/2014	SUR	Decachlorobiphenyl	118		'45-188	%	0	118	
598128	LCSD for HBN 525999 [SPR/6584]	7/22/2014	SUR	Decachlorobiphenyl	119		'45-188	%	0	119	0.6
598129	207WAL060(598129MS)	7/22/2014	SUR	Decachlorobiphenyl	5.3		'10-200	%	0	5.3	
598130	207WAL060(598130MSD)	7/22/2014	SUR	Decachlorobiphenyl	4.5		'10-200	%	0	4.5	15



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Table F-3:	CCCWP SSID Study – Sedin	nent Chemi	stry QA/Q	QC Samples							
Lab Number	Sample Description ¹	Date Received	Analyte Group ²	Analyte Name	Result	MDL	Reporting Limit	Units	Expected Result	Percent Recovery	Relative Percent Difference
594794	Matrix QC (MS)	7/24/2014	SUR	Decachlorobiphenyl	95		'10-200	%	0	95	
594795	Matrix QC (MSD)	7/24/2014	SUR	Decachlorobiphenyl	86		'10-200	%	0	86	10
594644	MB for HBN 524523 [SPR/6555]	7/22/2014	SUR	Esfenvalerate-d6;#1	81		'70-130	%	1.3	81	
594645	LCS for HBN 524523 [SPR/6555]	7/22/2014	SUR	Esfenvalerate-d6;#1	112		'70-130	%	1.3	112	
594646	LCSD for HBN 524523 [SPR/6555]	7/22/2014	SUR	Esfenvalerate-d6;#1	107		'70-130	%	1.3	107	4.4
594647	Matrix QC (MS)	7/24/2014	SUR	Esfenvalerate-d6;#1	113		'70-130	%	1.3	113	
594648	Matrix QC (MSD)	7/24/2014	SUR	Esfenvalerate-d6;#1	113		'70-130	%	1.3	113	0.7
594644	MB for HBN 524523 [SPR/6555]	7/22/2014	SUR	Esfenvalerate-d6;#2	78		'70-130	%	1.3	78	
594645	LCS for HBN 524523 [SPR/6555]	7/22/2014	SUR	Esfenvalerate-d6;#2	120		'70-130	%	1.3	120	
594646	LCSD for HBN 524523 [SPR/6555]	7/22/2014	SUR	Esfenvalerate-d6;#2	105		'70-130	%	1.3	105	13
594647	Matrix QC (MS)	7/24/2014	SUR	Esfenvalerate-d6;#2	125		'70-130	%	1.3	125	
594648	Matrix QC (MSD)	7/24/2014	SUR	Esfenvalerate-d6;#2	125		'70-130	%	1.3	125	0
594791	MB for HBN 524561 [SPR/6556]	7/22/2014	SUR	Tetrachloro-m-xylene	39		'64-114	%	0	39	
594792	LCS for HBN 524561 [SPR/6556]	7/22/2014	SUR	Tetrachloro-m-xylene	50		'64-114	%	0	50	
594793	LCSD for HBN 524561 [SPR/6556]	7/22/2014	SUR	Tetrachloro-m-xylene	51		'64-114	%	0	51	0.7
598126	MB for HBN 525999 [SPR/6584]	7/22/2014	SUR	Tetrachloro-m-xylene	83		'64-114	%	0	83	
598127	LCS for HBN 525999 [SPR/6584]	7/22/2014	SUR	Tetrachloro-m-xylene	88		'64-114	%	0	88	
598128	LCSD for HBN 525999 [SPR/6584]	7/22/2014	SUR	Tetrachloro-m-xylene	95		'64-114	%	0	95	8.2
598129	207WAL060(598129MS)	7/22/2014	SUR	Tetrachloro-m-xylene	750		'10-200	%	0	750	
598130	207WAL060(598130MSD)	7/22/2014	SUR	Tetrachloro-m-xylene	750		'10-200	%	0	750	0
594794	Matrix QC (MS)	7/24/2014	SUR	Tetrachloro-m-xylene	59		'10-200	%	0	59	
594795	Matrix QC (MSD)	7/24/2014	SUR	Tetrachloro-m-xylene	56		'10-200	%	0	56	4.8
594819	MB for HBN 524575 [WGR/5525]	7/22/2014	PS	Solids, Percent	ND	0.1	0.1	%			
594820	Matrix QC (DUP)	7/30/2014	PS	Solids, Percent	8.8	0.1	0.1	%			0
P070024013	Matrix QC (ORIG)	7/30/2014	PS	Solids, Percent	8.8	0.1	0.1	%			
600437	MB for HBN 527207 [SUB/1666]	7/22/2014	TOC	Total Organic Carbon	ND	0.01	0.1	%			



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1	Table F-3: CCCWP SSID Study – Sediment Chemistry QA/QC Samples												
	Lab Number	Sample Description ¹	Date Received	Analyte Group ²	Analyte Name	Result	MDL	Reporting Limit	Units	Expected Result	Percent Recovery	Relative Percent Difference	
	600438	LCS for HBN 527207 [SUB/1666]	7/22/2014	TOC	Total Organic Carbon	9.3	0.01	0.1	%	10	93		

¹MB = Methoc Blank, LCS = Laboratory Control Sample, LCSD = Laboratory Control Duplicate Sample, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Laboratory Duplicate, ORIG = Original Field Sample Result

For Proposition Proposit



Appendix G. Laboratory Analytical Results Tables for SSID Samples



	Upst	Dry Creek Upstream 544MSH065		Creek stream SH062	Grayso (Upst	tary of n Creek ream) AL078	E. Branch of Grayson Creek (Downstream) 207WAL060	
				Sample Co	llection Dat	e		
	02/06/14	02/28/14	02/06/14	02/28/14	02/28/14	03/26/14	02/28/14	03/26/14
Fipronil and Degradates (ng/L)	1					I	I	ı
Fipronil	6.2	4.5	ND	4.3	19	15	23	12
Fipronil Desulfinyl	2.2	2.2	ND	1.9	2.9	6.5	2.2	3.5
Fipronil Sulfide	0.5 ^J	ND	ND	ND	1.3 ^J	1.4 ^J	1.6	2.6
Fipronil Sulfone	3.8	5.5	0.8^{J}	5.2	14	11	9.5	6.8
Organochlorine Pesticides (µg/L)	l					I.	I.	1
4,4'-DDD	ND	ND	ND	ND	ND	ND	ND	ND
4,4'-DDE	ND	ND	ND	ND	ND	ND	ND	ND
4,4'-DDT	ND	ND	ND	ND	ND	ND	ND	ND
Aldrin	ND	ND	ND	ND	ND	ND	ND	ND
alpha-BHC	ND	ND	ND	ND	ND	ND	ND	ND
beta-BHC	ND	ND	ND	ND	ND	ND	ND	ND
Chlordane	ND	ND	ND	ND	ND	ND	ND	ND
delta-BHC	ND	ND	ND	ND	ND	ND	ND	ND
Dieldrin	ND	ND	ND	ND	ND	ND	ND	ND
Endosulfan I	ND	ND	ND	ND	ND	ND	ND	ND
Endosulfan II	ND	ND	ND	ND	ND	ND	ND	ND
Endosulfan sulfate	ND	ND	ND	ND	ND	ND	ND	ND
Endrin	ND	ND	ND	ND	ND	ND	ND	ND
Endrin aldehyde	ND	ND	ND	ND	ND	ND	ND	ND
Endrin ketone	ND	ND	ND	ND	ND	ND	ND	ND
gamma-BHC (Lindane)	ND	ND	ND	ND	ND	ND	ND	ND
Heptachlor	ND	ND	ND	ND	ND	ND	ND ND	ND ND
1								
Heptachlor epoxide	ND	ND	ND	ND	ND	ND	ND	ND
Methoxychlor	ND	ND	ND	ND	ND	ND	ND	ND
Toxaphene	ND	ND	ND	ND	ND	ND	ND	ND
Pyrethroid Pesticides (ng/L)	5.2	0.5	5.0	9.6	7.2	1.1	(5	4.2
Bifenthrin	5.3 0.7 ^J	8.5 1.5 ^J	5.9 0.7 ^J	8.6	7.3	11 1.1 ^J	6.5	4.2 0.9 ^J
Cyfluthrin				1.7	ND		6.4	
Cypermethrin	ND	ND	ND	ND	ND	ND	ND	0.7 ^J
Deltamethrin: Tralomethrin	ND 0.20¢BJ	ND	ND 0.204BJ	ND	4.7	ND	ND	ND
Lambda-Cyhalothrin	0.386 ^{B,J}	ND	0.394 ^{B.J}	ND	ND	1.1 ^J	ND	ND
Permethrin	ND	ND	ND	ND	ND	ND	ND	12 ^J
Total Organic Carbon (mg/L)								
Sediment Concentration	7.5	13	9.4	37	37	13	173	14
Total Organic Carbon	16	14	15	15	11	11	10	13
Hyallela Toxicity						2		2
Average Percent Survival ¹	12	6	18 ²	18	48	0 3	48	0 3

ND

³ Complete mortality after 48 hours



Not Detected - indicates analytical result has not been detected at or above the MDL.

Reflects estimated analytical result value detected below the Reporting Limit (RL) and above the Method Detecting Limit (MDL).

The J flag is equivalent to the DNQ Estimated Concentration flag.

Indicates the analyte has been detected in the blank associated with the sample.

All results significantly lower than control sample averages. Samples deemed toxic are shaded.

TIE indicated that toxicity was persistent; results are consistent with Type I and Type II pyrethroids

	Dry Creek Upstream 544MSH065	Dry Creek Downstream 544MSH062	Tributary of Grayson Creek (Upstream) 207WAL078	E. Branch of Grayson Creek (Downstream) 207WAL060
	24411911002		ken on 7/22/2014	207 111111000
Fipronil and Degradates (µg/kg)		7111 Sumples tu	RCH OH 7/22/2014	
Fipronil	ND	ND	ND	ND
Fipronil Desulfinyl	0.56	0.27 ^J	ND	ND
Fipronil Sulfide	ND	ND	ND	ND
Fipronil Sulfone	3	ND	ND	0.14 ^J
Organochlorine Pesticides (mg/kg)		1		
2,4'-DDD	0.012	0.034	ND	ND
2,4'-DDE	0.0058	0.019	ND	ND
2,4'-DDT	ND	ND	ND	ND
4,4'-DDD	0.0036	0.023	ND	ND
4,4'-DDE	0.028	0.076	ND	ND
4,4'-DDT	ND	ND	ND	ND
Aldrin	ND	ND	ND	ND
alpha-BHC	ND	ND	ND	ND
alpha-Chlordane (cis)	ND	ND	ND	ND
beta-BHC	ND	ND	ND	ND
Chlordane	ND	ND	ND	ND
delta-BHC	ND	ND	ND	ND
Dieldrin	ND	ND	ND	ND
Endosulfan I	ND	ND	ND	ND
Endosulfan II	ND	ND	ND	ND
Endosulfan sulfate	ND	ND	ND	ND
Endrin	ND	ND	ND	ND
Endrin aldehyde	ND	ND	ND	ND
Endrin ketone	ND	ND	ND	ND
gamma-BHC (Lindane)	ND	ND	ND	ND
gamma-Chlordane (trans)	ND	ND	ND	ND
Heptachlor	ND	ND	ND	ND
Heptachlor epoxide	ND	ND	ND	ND
Kepone	ND ^H	ND H	ND ^H	ND ^H
Methoxychlor	ND	ND	ND	ND
Mirex	ND	ND	ND	ND
Toxaphene	ND	ND	ND	ND
Pyrethroid Pesticides (µg/kg)	1	1	1	ı
Allethrin	ND	ND	ND	ND
Bifenthrin	99	40	5.6	3.6
Cyfluthrin	6.2	3.4	0.8	0.41
Cypermethrin	0.30 ^J	0.35	0.28 ^J	0.21 ^J
Deltamethrin:Tralomethrin	ND	ND	ND	ND
Esfenvalerate:Fenvalerate	ND	ND	ND	ND



Table G-2: Sediment Chemistry an	nd Toxicity Result	ts		
	Dry Creek Upstream 544MSH065	Dry Creek Downstream 544MSH062	Tributary of Grayson Creek (Upstream) 207WAL078	E. Branch of Grayson Creek (Downstream) 207WAL060
		All samples tak	en on 7/22/2014	
Fenpropathrin	ND	ND	ND	ND
Lambda-Cyhalothrin	0.37	0.24 ^J	ND	ND
Permethrin	6	9.4	1.9	2.3
Tau-Fluvalinate	ND	ND	ND	ND
Tetramethrin	ND	ND	ND	ND
Total Organic Carbon (%)				
Solids	92	95	87	97
Total Organic Carbon	4.6	1.9	3.6	1
Hyallela Toxicity				
Average Percent Survival	3.75 1,3	48.8 1	97.1 ²	90°2
Average Weight (mg/individual)	0.00625 1	0.0352 1	0.0699 ²	0.0875

ND Not Detected - indicates analytical result has not been detected at or above the MDL.



J Reflects estimated analytical result value detected below the Reporting Limit (RL) and above the Method Detecting Limit (MDL). The J flag is equivalent to the DNQ Estimated Concentration flag.

H Analyzed out of holding time.

¹Result was significantly lower than control sample average. Samples deemed toxic are shaded.

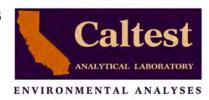
² Result was significantly higher than control sample average.

³ TIE indicated baseline toxicity was persistent; addition of PBO increased toxicity; addition of carboxylesterase removed most of toxicity. Weight of evidence suggest that toxicity was likely due to pyrethroid pesticides.

Appendix H. Laboratory Reports – SSID Samples



Alessandro Hnatt



Wednesday, March 05, 2014

Alessandro Hnatt ADH Environmental 3065 Porter Street, Suite 101 Soquel, CA 95073

RE: Lab Order: P020481 Collected By:

Project ID: CCCWP-SSID 030.001.0202 PO/Contract #:

Dear Alessandro Hnatt:

Enclosed are the analytical results for sample(s) received by the laboratory on Friday, February 07, 2014. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Enclosures

Project Manager: Todd Albertson



3/5/2014 10:36



SAMPLE SUMMARY

Lab Order: P020481

Project ID: CCCWP-SSID 030.001.0202

Lab ID	Sample ID	Matrix	Date Collected	Date Received
P020481001	544R00025DS-	Water	2/6/2014 13:20	2/7/2014 18:14
P020481002	544R00025US-	Water	2/6/2014 12:50	2/7/2014 18:14
P020481003	544R00025DS-	Water	2/6/2014 13:20	2/7/2014 18:14
P020481004	544R00025US	Water	2/6/2014 12:50	2/7/2014 18:14

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NARRATIVE

Lab Order: P020481

Project ID: CCCWP-SSID 030.001.0202

General Qualifiers and Notes

Caltest authorizes this report to be reproduced only in its entirety. Results are specific to the sample(s) as submitted and only to the parameter(s) reported.

Caltest certifies that all test results for wastewater and hazardous waste analyses meet all applicable NELAC requirements; all microbiology and drinking water testing meet applicable ELAP requirements, unless stated otherwise.

All analyses performed by EPA Methods or Standard Methods (SM) 20th Edition except where noted (SMOL=online edition).

Caltest collects samples in compliance with 40 CFR, EPA Methods, Cal. Title 22, and Standard Methods.

Dilution Factors (DF) reported greater than '1' have been used to adjust the result, Reporting Limit (RL), and Method Detection Limit (MDL).

All Solid, sludge, and/or biosolids data is reported in Wet Weight, unless otherwise specified.

Filtrations performed at Caltest for dissolved metals (excluding mercury) and/or pH analysis were not performed within the 15 minute holding time as specified by 40CFR 136.3 table II.

Results Qualifiers: Report fields may contain codes and non-numeric data correlating to one or more of the following definitions:

- ND Non Detect indicates analytical result has not been detected.
- RL Reporting Limit is the quantitation limit at which the laboratory is able to detect an analyte. An analyte not detected at or above the RL is reported as ND unless otherwise noted or qualified. For analyses pertaining to the State Implementation Plan of the California Toxics Rule, the Caltest Reporting Limit (RL) is equivalent to the Minimum Level (ML). A standard is always run at or below the ML. Where Reporting Limits are elevated due to dilution, the ML calibration criteria has been met.
- J reflects estimated analytical result value detected below the Reporting Limit (RL) and above the Method Detection Limit (MDL). The 'J' flag is equivalent to the DNQ Estimated Concentration flag.
- E indicates an estimated analytical result value.
- B indicates the analyte has been detected in the blank associated with the sample.
- NC means not able to be calculated for RPD or Spike Recoveries.
- SS compound is a Surrogate Spike used per laboratory quality assurance manual.

NOTE: This document represents a complete Analytical Report for the samples referenced herein and should be retained as a permanent record thereof.

Qualifiers and Compound Notes

- Analyte(s) reported as 'ND' means not detected at or above the listed Method Detection Limits (MDL).
- This sample was run at a 2X dilution with similar results and surrogates failing low therefore the 1X run was reported.
- 3 This analysis is not covered under Caltest's NELAP/CAL-ELAP Accreditations.
- 4 Due to matrix interferences present in the sample, surrogate recoveries failed to meet the QA/QC acceptance criteria.

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REPORT OF LABORATORY ANALYSIS

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NARRATIVE

Lab Order: P020481

Project ID: CCCWP-SSID 030.001.0202

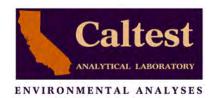
Qualifiers and Compound Notes

5 Ran 2x dilution with similar results.



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Lab Order: P020481

Project ID CCCWP-SSID 030.001.0202

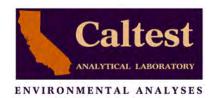
Lab ID:	P020481001	Dat	e Collected:	2/6/20	014 13:20		Matrix:	Water			
Sample ID:	544R00025DS-	Dat	e Received:	2/7/20)14 18:14						
Darameters		Popult Unito	D I		MDI	DE	Droporod	Datah	Analyzad	Potob	Ougl
Parameters		Result Units	R. L.		MDL	DF	Prepared	Batch	Analyzed	Batch	Qual
Total Organic Total Organic	c Carbon Analysis Carbon	Analytica 15 mg/L	Il Method:	SM20-53 1	10 B 0.30	1			Analyzed by: 02/19/14 23:53		
Lab ID:	P020481002	Dat	e Collected:	2/6/20)14 12:50		Matrix:	Water			
Sample ID:	544R00025US-	Dat	e Received:	2/7/20)14 18:14						
Parameters		Result Units	R. L.		MDL	DF	Prepared	Batch	Analyzed	Batch	Qual
Total Organic	Carbon Analysis	Analytica	l Method:	SM20-53	— 10 В				Analyzed by:	ATA	
Total Organic	-	16 mg/L		1	0.30	1			02/20/14 00:10	WET 7444	
Lab ID:	P020481003	Dat	e Collected:	2/6/20)14 13:20		Matrix:	Water			
Sample ID:	544R00025DS-	Dat	e Received:	2/7/20)14 18:14						
Parameters		Result Units	R. L.		MDL	DF	Prepared	Batch	Analyzed	Batch	Qual
Suspended S	Sediment Concentrate	tion Analytica	I Method:	ASTM D Filtration	3977-97 B-				Analyzed by:	UK	
Sediment Con	ncentration	9.4 mg/L		3	2	1			02/12/14 14:54	BIO 13477	3
	Pesticides & PCBs	Prep Met	hod:	EPA 608			Prep by:	EAB			
Analysis		Analytica	I Method:	EPA 608					Analyzed by:	NTA	
Aldrin		ND ug/L	0.	005	0.0040	1	02/12/14 00:00	SPR 6309	02/22/14 19:34	SMS 3366	1
alpha-BHC		ND ug/L	0.	010	0.0050	1	02/12/14 00:00	SPR 6309	02/22/14 19:34	SMS 3366	
beta-BHC		ND ug/L	0.	005	0.0040	1	02/12/14 00:00	SPR 6309	02/22/14 19:34	SMS 3366	
delta-BHC		ND ug/L	0.	005	0.0040	1	02/12/14 00:00	SPR 6309	02/22/14 19:34	SMS 3366	
gamma-BHC	(Lindane)	ND ug/L	0.	010	0.0040		02/12/14 00:00	SPR 6309	02/22/14 19:34		
Chlordane		ND ug/L		050	0.020		02/12/14 00:00	SPR 6309	02/22/14 19:34		
4,4'-DDD		ND ug/L		010	0.0040		02/12/14 00:00	SPR 6309	02/22/14 19:34		
4,4'-DDE		ND ug/L		010	0.0030		02/12/14 00:00	SPR 6309	02/22/14 19:34		
4,4'-DDT		ND ug/L		010	0.0040		02/12/14 00:00	SPR 6309	02/22/14 19:34		
Dieldrin		ND ug/L		010	0.0040		02/12/14 00:00	SPR 6309	02/22/14 19:34		
Endosulfan I		ND ug/L		010	0.0040	1			02/22/14 19:34		
Endosulfan II	.lf = t =	ND ug/L		010	0.0050		02/12/14 00:00		02/22/14 19:34		
Endosulfan su	uitate	ND ug/L		010	0.0050				02/22/14 19:34		
Endrin	, do	ND ug/L		010	0.0050		02/12/14 00:00		02/22/14 19:34		
Endrin aldehy		ND ug/L		010	0.0050		02/12/14 00:00		02/22/14 19:34		
Endrin ketone Heptachlor)	ND ug/L		010	0.0050		02/12/14 00:00		02/22/14 19:34		
Henrachior		ND ug/L	0.0	010	0.0050	- 1	02/12/14 00:00	SPR 6309	02/22/14 19:34	330b	

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REPORT OF LABORATORY ANALYSIS

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Lab Order: P020481

Project ID CCCWP-SSID 030.001.0202

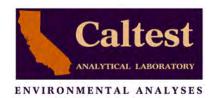
Lab ID: P020481003	Dat	e Collected:	2/6/2014 13:20		Matrix:	Water			
Sample ID: 544R00025DS-	Dat	e Received:	2/7/2014 18:14						
Parameters	Result Units	R. L.	MDL	DF	Prepared	Batch	Analyzed	Batch	Qual
Heptachlor epoxide	ND ug/L	0.010	0.0040	1	02/12/14 00:00	SPR 6309	02/22/14 19:34	SMS 3366	
Methoxychlor	ND ug/L	0.010	0.0050	1 (02/12/14 00:00	SPR 6309	02/22/14 19:34	SMS 3366	
PCB 1016	ND ug/L	0.10	0.050	1 (02/12/14 00:00	SPR 6309	02/22/14 19:34	SMS 3366	
PCB 1221	ND ug/L	0.10	0.050	1 (02/12/14 00:00	SPR 6309	02/22/14 19:34	SMS 3366	
PCB 1232	ND ug/L	0.10	0.050	1 (02/12/14 00:00	SPR 6309	02/22/14 19:34	SMS 3366	
PCB 1242	ND ug/L	0.10	0.040	1 (02/12/14 00:00	SPR 6309	02/22/14 19:34	SMS 3366	
PCB 1248	ND ug/L	0.10	0.050	1 (02/12/14 00:00	SPR 6309	02/22/14 19:34	SMS 3366	
PCB 1254	ND ug/L	0.10	0.050	1 (02/12/14 00:00	SPR 6309	02/22/14 19:34	SMS 3366	
PCB 1260	ND ug/L	0.10	0.050	1 (02/12/14 00:00	SPR 6309	02/22/14 19:34	SMS 3366	
Toxaphene	ND ug/L	0.5	0.30	1 (02/12/14 00:00	SPR 6309	02/22/14 19:34	SMS 3366	
Decachlorobiphenyl (SS)	63 %	10-195		1 (02/12/14 00:00	SPR 6309	02/22/14 19:34	SMS 3366	
Tetrachloro-m-xylene (SS)	55 %	25-105		1 (02/12/14 00:00	SPR 6309	02/22/14 19:34	SMS 3366	
Fipronil Analysis, Water	Prep Met	hod: SV	/846 3510C		Prep by:	ECB			
•	Analytica	I Method: SV	/846 8270 Mod (0	GCMS-			Analyzed by:	RLH	
			I-SIM)						
Fipronil	ND ng/L	1.5	0.5		02/12/14 18:03	SPR 6308	02/27/14 00:00	SMS 3373	1,2
Fipronil Desulfinyl	ND ng/L	1.5	0.5		02/12/14 18:03	SPR 6308	02/27/14 00:00	SMS 3373	
Fipronil Sulfide	ND ng/L	1.5	0.5		02/12/14 18:03	SPR 6308	02/27/14 00:00	SMS 3373	
Fipronil Sulfone	J0.8 ng/L	1.5	0.5		02/12/14 18:03	SPR 6308	02/27/14 00:00	SMS 3373	_
Esfenvalerate-d6;#1 (SS)	53 %	70-130			02/12/14 18:03	SPR 6308	02/27/14 00:00	SMS 3373	4
Esfenvalerate-d6;#2 (SS)	53 %	70-130		1 (02/12/14 18:03	SPR 6308	02/27/14 00:00	SMS 3373	4
Pyrethroids Analysis, NCI, Wate	r Prep Met	hod: SV	/846 3510C		Prep by:	MDT			
	Analytica		/846 8270 Mod (0 :I-SIM)	GCMS-			Analyzed by:	MDT	
Allethrin	ND ng/L	1.5	0.1	1 (02/09/14 12:32	SPR 6300	02/12/14 10:15	SMS 3357	1
Bifenthrin	5.9 ng/L	1.5	0.1	1 (02/09/14 12:32	SPR 6300	02/12/14 10:15	SMS 3357	
Cyfluthrin	J0.7 ng/L	1.5	0.2	1 (02/09/14 12:32	SPR 6300	02/12/14 10:15	SMS 3357	
Lambda-Cyhalothrin	BJ.394 ng/L	1.5	0.2	1 (02/09/14 12:32	SPR 6300	02/12/14 10:15	SMS 3357	
Cypermethrin	ND ng/L	1.5	0.2	1 (02/09/14 12:32	SPR 6300	02/12/14 10:15	SMS 3357	
Deltamethrin:Tralomethrin	ND ng/L	3.0	0.2	1 (02/09/14 12:32	SPR 6300	02/12/14 10:15	SMS 3357	
Esfenvalerate:Fenvalerate	ND ng/L	3.0	0.2	1 (02/09/14 12:32	SPR 6300	02/12/14 10:15	SMS 3357	
Fenpropathrin	ND ng/L	1.5	0.2	1 (02/09/14 12:32	SPR 6300	02/12/14 10:15	SMS 3357	
Tau-Fluvalinate	ND ng/L	1.5	0.2	1 (02/09/14 12:32	SPR 6300	02/12/14 10:15	SMS 3357	
Permethrin	ND ng/L	15	2	1 (02/09/14 12:32	SPR 6300	02/12/14 10:15	SMS 3357	
Tetramethrin	ND ng/L	1.5	0.2	1 (02/09/14 12:32	SPR 6300	02/12/14 10:15	SMS 3357	
Esfenvalerate-d6;#1 (SS)	49 %	70-130		1 (02/09/14 12:32	SPR 6300	02/12/14 10:15	SMS 3357	4,5
Esfenvalerate-d6;#2 (SS)	50 %	70-130			02/09/14 12:32	CDD COOO	02/12/14 10:15	SMS 3357	4,5

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Lab Order: P020481

Project ID CCCWP-SSID 030.001.0202

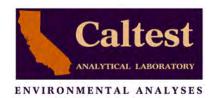
Lab ID:	P020481004		Date C	ollected:	2/6/2	014 12:50		Matrix:	Water			
Sample ID:	544R00025US		Date R	eceived:	2/7/2	014 18:14						
Parameters		Result	Units	R. L.		MDL	DF	Prepared	Batch	Analyzed	Batch	Qual
Suspended S	Sediment Concentra	tion	Analytical M	ethod:	ASTM D	3977-97 B-				Analyzed by:	UK	
Sediment Cor	ncentration	7.5	mg/L		3	2	1			02/12/14 14:54	BIO 13477	3
	Pesticides & PCBs		Prep Method	l:	EPA 608			Prep by:	EAB			
Analysis			Analytical M	ethod:	EPA 608					Analyzed by:	NTA	
Aldrin		ND	ug/L		005	0.0040	1	02/12/14 00:00	SPR 6309	02/22/14 20:02		1
alpha-BHC			ug/L)10	0.0050		02/12/14 00:00	SPR 6309	02/22/14 20:02	SMS 3366	•
beta-BHC			ug/L		005	0.0040		02/12/14 00:00	SPR 6309	02/22/14 20:02	SMS 3366	
delta-BHC			ug/L		005	0.0040		02/12/14 00:00	SPR 6309	02/22/14 20:02	SMS 3366	
gamma-BHC	(Lindane)		ug/L)10	0.0040		02/12/14 00:00	SPR 6309	02/22/14 20:02	SMS 3366	
Chlordane	(Lindano)		ug/L)50	0.020		02/12/14 00:00	SPR 6309	02/22/14 20:02	SMS 3366	
4.4'-DDD			ug/L)10	0.0040		02/12/14 00:00	SPR 6309	02/22/14 20:02	SMS 3366	
4,4'-DDE			ug/L)10	0.0030		02/12/14 00:00	SPR 6309	02/22/14 20:02	SMS 3366	
4,4'-DDT			ug/L)10	0.0040		02/12/14 00:00	SPR 6309	02/22/14 20:02	SMS 3366	
Dieldrin			ug/L)10	0.0040		02/12/14 00:00	SPR 6309	02/22/14 20:02	SMS 3366	
Endosulfan I			ug/L)10	0.0040		02/12/14 00:00	SPR 6309	02/22/14 20:02	SMS 3366	
Endosulfan II			ug/L)10	0.0050		02/12/14 00:00	SPR 6309	02/22/14 20:02	SMS 3366	
Endosulfan su	ılfate		ug/L)10	0.0050		02/12/14 00:00	SPR 6309	02/22/14 20:02	SMS 3366	
Endrin	mato		ug/L)10	0.0050		02/12/14 00:00	SPR 6309	02/22/14 20:02	SMS 3366	
Endrin aldehy	de		ug/L)10	0.0050		02/12/14 00:00	SPR 6309	02/22/14 20:02	SMS 3366	
Endrin ketone			ug/L)10	0.0050		02/12/14 00:00	SPR 6309	02/22/14 20:02	SMS 3366	
Heptachlor			ug/L)10	0.0050		02/12/14 00:00	SPR 6309	02/22/14 20:02	SMS 3366	
Heptachlor ep	ovide		ug/L)10	0.0030		02/12/14 00:00	SPR 6309	02/22/14 20:02	SMS 3366	
Methoxychlor	ONIGE		ug/L)10	0.0040		02/12/14 00:00	SPR 6309	02/22/14 20:02	SMS 3366	
PCB 1016			ug/L		.10	0.050		02/12/14 00:00	SPR 6309	02/22/14 20:02	SMS 3366	
PCB 1010			ug/L		.10	0.050		02/12/14 00:00	SPR 6309	02/22/14 20:02	SMS 3366	
PCB 1221			ug/L	_	.10	0.050		02/12/14 00:00	SPR 6309	02/22/14 20:02	SMS 3366	
PCB 1232 PCB 1242			ug/L ug/L		.10	0.030		02/12/14 00:00	SPR 6309	02/22/14 20:02	SMS 3366	
PCB 1242			ug/L	-	.10	0.040		02/12/14 00:00	SPR 6309	02/22/14 20:02	SMS 3366	
PCB 1246			ug/L	-	.10	0.050		02/12/14 00:00	SPR 6309	02/22/14 20:02	SMS 3366	
PCB 1254 PCB 1260			ū		.10	0.050			SPR 6309		SMS 3366	
			ug/L	-	. 10 0.5	0.050	1	02/12/14 00:00 02/12/14 00:00	SPR 6309	02/22/14 20:02 02/22/14 20:02	SMS 3366	
Toxaphene Decachlorobig	shenyl (SS)	63	ug/L %	10-1		0.30	-	02/12/14 00:00	SPR 6309	02/22/14 20:02	SMS 3366	
Tetrachloro-m		64		25-1				02/12/14 00:00	SPR 6309 SPR 6309	02/22/14 20:02		
		04				25400	'			02122114 20.02	OIVIO 3300	
Fipronil Anal	ysis, water		Prep Method		SW846		ON 40	Prep by:	FCR	A m a le 1 2	DIII	
			Analytical M	etnod:	SW846 8	3270 Mod (G)	CIVIS			Analyzed by:	KLH	
Fipronil		6.2	ng/L		1.5	0.5	1	02/12/14 18:03	SPR 6308	02/27/14 00:00	SMS 3373	1,2
Fipronil Desul	finad		ng/L		1.5	0.5		02/12/14 18:03		02/27/14 00:00		,

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REPORT OF LABORATORY ANALYSIS

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Lab Order: P020481

Project ID CCCWP-SSID 030.001.0202

Lab ID: P020481004		Date Collected:	2/6/2014 1	12:50	Matrix:	Water			
Sample ID: 544R00025US		Date Received:	2/7/2014 1	8:14					
Parameters	Result Uni	its R. L.	M	DL DF	Prepared	Batch	Analyzed	Batch	Qual
Fipronil Sulfide	J0.5 ng/		.5	0.5 1	02/12/14 18:03	SPR 6308	02/27/14 00:00	SMS 3373	
Fipronil Sulfone	3.8 ng/	L 1	.5	0.5 1	02/12/14 18:03	SPR 6308	02/27/14 00:00	SMS 3373	
Esfenvalerate-d6;#1 (SS)	49 %	70-13	30	1	02/12/14 18:03	SPR 6308	02/27/14 00:00	SMS 3373	4
Esfenvalerate-d6;#2 (SS)	50 %	70-13	30	1	02/12/14 18:03	SPR 6308	02/27/14 00:00	SMS 3373	4
Pyrethroids Analysis, NCI, Water	Pre	p Method:	SW846 35100	2	Prep by:	MDT			
	An	•	SW846 8270 NCI-SIM)	Mod (GCMS	S-		Analyzed by:	MDT	
Allethrin	ND ng/	L 1	.5	0.1 1	02/09/14 12:32	SPR 6300	02/12/14 10:49	SMS 3357	1
Bifenthrin	5.3 ng/	L 1	.5	0.1 1	02/09/14 12:32	SPR 6300	02/12/14 10:49	SMS 3357	
Cyfluthrin	J0.7 ng/	L 1	.5	0.2 1	02/09/14 12:32	SPR 6300	02/12/14 10:49	SMS 3357	
Lambda-Cyhalothrin	BJ.386 ng/	L 1	.5	0.2 1	02/09/14 12:32	SPR 6300	02/12/14 10:49	SMS 3357	
Cypermethrin	ND ng/	L 1	.5	0.2 1	02/09/14 12:32	SPR 6300	02/12/14 10:49	SMS 3357	
Deltamethrin:Tralomethrin	ND ng/	L 3	.0	0.2 1	02/09/14 12:32	SPR 6300	02/12/14 10:49	SMS 3357	
Esfenvalerate:Fenvalerate	ND ng/	L 3	.0	0.2 1	02/09/14 12:32	SPR 6300	02/12/14 10:49	SMS 3357	
Fenpropathrin	ND ng/	L 1	.5	0.2 1	02/09/14 12:32	SPR 6300	02/12/14 10:49	SMS 3357	
Tau-Fluvalinate	ND ng/	L 1	.5	0.2 1	02/09/14 12:32	SPR 6300	02/12/14 10:49	SMS 3357	
Permethrin	ND ng/	L ·	15	2 1	02/09/14 12:32	SPR 6300	02/12/14 10:49	SMS 3357	
Tetramethrin	ND ng/		.5	0.2 1	02/09/14 12:32	SPR 6300	02/12/14 10:49	SMS 3357	
Esfenvalerate-d6;#1 (SS)	47 %	70-13	30	1	02/09/14 12:32	SPR 6300	02/12/14 10:49	SMS 3357	4,5
Esfenvalerate-d6;#2 (SS)	47 %	70-13	30	1	02/09/14 12:32	SPR 6300	02/12/14 10:49	SMS 3357	4,5

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REPORT OF LABORATORY ANALYSIS



Lab Order: P020481

Project ID: CCCWP-SSID 030.001.0202

Analysis Description: Suspended Sediment Concentration QC Batch: BIO/13477

Analysis Method: ASTM D 3977-97 B-Filtration QC Batch Method: ASTM D 3977-97 B-Filtration

METHOD BLANK: 564892

ParameterBlank ResultReporting
LimitMDLUnitsQualifiersSediment ConcentrationND32mg/L

LABORATORY CONTROL SAMPLE & LCSD: 564893 564894

LCS Spike **LCSD** LCS LCSD % Rec Max **RPD RPD Qualifiers Parameter** Units Result Limit Conc. Result % Rec % Rec **Sediment Concentration** 500 467 489 98 80-120 4.6 20 mg/L 93

Analysis Description: Pyrethroids Analysis, NCI, Water QC Batch: SPR/6300

Analysis Method: SW846 8270 Mod (GCMS-NCI-SIM) QC Batch Method: SW846 3510C

METHOD BLANK: 564069

Parameter	Blank Result	Reporting Limit	MDL	Units	Qualifiers
Allethrin		1.5	0.1	ng/L	-
Bifenthrin	ND	1.5	0.1	ng/L	
Cyfluthrin	ND	1.5	0.2	ng/L	
Lambda-Cyhalothrin	J0.3	1.5	0.2	ng/L	6
Cypermethrin	ND	1.5	0.2	ng/L	
Deltamethrin:Tralomethrin	ND	3.0	0.2	ng/L	
Esfenvalerate:Fenvalerate	ND	3.0	0.2	ng/L	
Fenpropathrin	ND	1.5	0.2	ng/L	
Tau-Fluvalinate	ND	1.5	0.2	ng/L	
Permethrin	ND	15	2.0	ng/L	
Tetramethrin	ND	1.5	0.2	ng/L	
Esfenvalerate-d6;#1 (SS)	94	70-130		%	
Esfenvalerate-d6;#2 (SS)	89	70-130		%	

LABORATORY CONTROL SAMPLE & LCSD: 564070 564071

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limit	RPD	Max RPD Qualifiers
Allethrin	 ng/L	20	13	14	66	69	50-150	4.5	35
Bifenthrin	ng/L	20	18	18	89	90	70-165	0.6	35
Cyfluthrin	ng/L	20	16	17	82	86	55-140	4.8	30

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REPORT OF LABORATORY ANALYSIS

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Lab Order: P020481

Project ID: CCCWP-SSID 030.001.0202

Analysis Description:Pyrethroids Analysis, NCI, WaterQC Batch:SPR/6300Analysis Method:SW846 8270 Mod (GCMS-NCI-SIM)QC Batch Method:SW846 3510C

LABORATORY CONTROL SAMPLE & LCSD: 564070 564071

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limit	RPD	Max RPD Qualifiers
Lambda-Cyhalothrin	 ng/L	20	14	15	70	77	40-120	8.9	35
Cypermethrin	ng/L	20	17	18	87	90	50-130	4	30
Deltamethrin:Tralomethrin	ng/L	40	28	28	69	71	30-105	2.5	40
Esfenvalerate:Fenvalerate	ng/L	40	31	32	77	80	40-140	4.1	35
Fenpropathrin	ng/L	20	20	20	98	101	30-180	3	35
Tau-Fluvalinate	ng/L	20	14	15	71	75	30-100	5.5	40
Permethrin	ng/L	100	85	92	85	92	50-160	8	40
Tetramethrin	ng/L	20	14	12	69	61	45-140	12	50
Esfenvalerate-d6;#1 (SS)	%				93	98	70-130	71	
Esfenvalerate-d6;#2 (SS)	%				88	94	70-130	72	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 564487 564488

Parameter	Units	P020494001 Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Allethrin	ng/L		21	14	15	65	73	50-150	11	35	
Bifenthrin	ng/L	3.1	21	17	18	66	70	70-165	5.2	35	7
Cyfluthrin	ng/L	0.3	21	14	14	65	69	55-140	6.4	30	
Lambda-Cyhalothrin	ng/L	0.5	21	12	12	58	54	40-120	5.8	35	
Cypermethrin	ng/L	0.6	21	14	15	64	69	50-130	7.7	30	
Deltamethrin:Tralomethrin	ng/L	0	41	20	22	50	53	30-105	5.7	40	
Esfenvalerate:Fenvalerate	ng/L	0	41	24	26	59	63	40-140	6.8	35	
Fenpropathrin	ng/L	0	21	14	15	70	75	30-180	6	35	
Tau-Fluvalinate	ng/L	0	21	12	12	56	58	30-100	3.4	40	
Permethrin	ng/L	0	100	69	73	67	70	50-160	5.2	40	
Tetramethrin	ng/L	0	21	15	15	71	72	45-140	2	50	
Esfenvalerate-d6;#1 (SS)	%					65	67	70-130	3.1		4
Esfenvalerate-d6;#2 (SS)	%					64	68	70-130	6		4

Analysis Description:Chlorinated Pesticides & PCBs AnalysisQC Batch:SPR/6309Analysis Method:EPA 608QC Batch Method:EPA 608

METHOD BLANK: 565093

Parameter	Blank Result	Reporting Limit	MDL	Units	Qualifiers	
Aldrin alpha-BHC	ND ND	0.005 0.010	0.004 0.005	ug/L ug/L		

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REPORT OF LABORATORY ANALYSIS

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Lab Order: P020481

Project ID: CCCWP-SSID 030.001.0202

Analysis Description: Chlorinated Pesticides & PCBs Analysis QC Batch: SPR/6309

Analysis Method: EPA 608 QC Batch Method: EPA 608

Parameter	Blank Result	Reporting Limit	MDL	Units	Qualifiers
beta-BHC	ND	0.005	0.004	ug/L	
delta-BHC	ND	0.005	0.004	ug/L	
gamma-BHC (Lindane)	ND	0.010	0.004	ug/L	
Chlordane	ND	0.050	0.020	ug/L	
4,4'-DDD	ND	0.010	0.004	ug/L	
4,4'-DDE	ND	0.010	0.003	ug/L	
4,4'-DDT	ND	0.010	0.004	ug/L	
Dieldrin	ND	0.010	0.004	ug/L	
Endosulfan I	ND	0.010	0.004	ug/L	
Endosulfan II	ND	0.010	0.005	ug/L	
Endosulfan sulfate	ND	0.010	0.005	ug/L	
Endrin	ND	0.010	0.005	ug/L	
Endrin aldehyde	ND	0.010	0.005	ug/L	
Endrin ketone	ND	0.010	0.005	ug/L	
Heptachlor	ND	0.010	0.005	ug/L	
Heptachlor epoxide	ND	0.010	0.004	ug/L	
Methoxychlor	ND	0.010	0.005	ug/L	
PCB 1016	ND	0.10	0.050	ug/L	
PCB 1221	ND	0.10	0.050	ug/L	
PCB 1232	ND	0.10	0.050	ug/L	
PCB 1242	ND	0.10	0.040	ug/L	
PCB 1248	ND	0.10	0.050	ug/L	
PCB 1254	ND	0.10	0.050	ug/L	
PCB 1260	ND	0.10	0.050	ug/L	
Toxaphene	ND	0.5	0.3	ug/L	
Decachlorobiphenyl (SS)	93	30-190		%	
Tetrachloro-m-xylene (SS)	75	25-105		%	

LABORATORY CONTROL SAMPLE & LCSD: 565094 565095

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limit	RPD	Max RPD Qualifiers
Aldrin	 ug/L	0.2	0.19	.18	95	89	42-122	6	24
alpha-BHC	ug/L	0.2	0.19	.18	97	93	37-134	4.2	30
beta-BHC	ug/L	0.2	0.18	.15	91	76	17-147	18	30
delta-BHC	ug/L	0.2	0.18	.17	92	85	19-140	7.9	30
gamma-BHC (Lindane)	ug/L	0.2	0.18	.15	89	75	32-127	17	20
4,4'-DDD	ug/L	0.2	0.21	.2	107	100	31-141	6.8	30
4,4'-DDE	ug/L	0.2	0.19	.18	96	91	30-145	5.3	30
4,4'-DDT	ug/L	0.2	0.22	.2	108	100	25-160	7.7	19
Dieldrin	ug/L	0.2	0.22	.2	109	102	36-146	6.6	17

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Lab Order: P020481

Project ID: CCCWP-SSID 030.001.0202

Analysis Description:Chlorinated Pesticides & PCBs AnalysisQC Batch:SPR/6309

Analysis Method: EPA 608 QC Batch Method: EPA 608

LABORATORY CONTROL SAMPLE & LCSD: 565094 565095

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limit	RPD	Max RPD Qualifiers
Endosulfan I	 ug/L	0.2	0.2	.18	98	92	45-153	6.1	30
Endosulfan II	ug/L	0.2	0.19	.18	95	90	1-202	5.4	30
Endosulfan sulfate	ug/L	0.2	0.22	.2	108	101	26-144	6.2	30
Endrin	ug/L	0.2	0.18	.17	92	85	30-147	7.9	18
Endrin aldehyde	ug/L	0.2	0.21	.2	105	101	34-105	4.4	30
Endrin ketone	ug/L	0.2	0.21	.2	105	98	41-127	6.9	30
Heptachlor	ug/L	0.2	0.2	.18	100	91	34-111	8.9	23
Heptachlor epoxide	ug/L	0.2	0.2	.19	102	97	37-142	5.5	30
Methoxychlor	ug/L	0.2	0.22	.2	112	102	1-186	8.9	30
Decachlorobiphenyl (SS)	%				100	95	30-190	5.7	
Tetrachloro-m-xylene (SS)	%				79	75	25-105	5.9	

Analysis Description: Fipronil Analysis, Water QC Batch: SPR/6308

Analysis Method: SW846 8270 Mod (GCMS-NCI-SIM) QC Batch Method: SW846 3510C

METHOD BLANK: 564956

Parameter	Blank Result	Reporting Limit	MDL	Units	Qualifiers
Fipronil	ND	1.5	0.5	ng/L	1
Fipronil Desulfinyl	ND	1.5	0.5	ng/L	
Fipronil Sulfide	ND	1.5	0.5	ng/L	
Fipronil Sulfone	ND	1.5	0.5	ng/L	
Esfenvalerate-d6;#1 (SS)	80	70-130		%	
Esfenvalerate-d6;#2 (SS)	81	70-130		%	

LABORATORY CONTROL SAMPLE & LCSD: 564957 564958

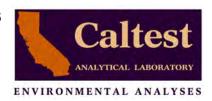
Parameter	Units	Spike Conc.	LCS Result	LCSD Result		LCSD % Rec	% Rec Limit	RPD	Max RPD Qualifiers
Fipronil	ng/L	20	14	14	68	71	50-150	4.3	35
Fipronil Desulfinyl	ng/L	20	15	16	75	79	50-150	5.2	35
Fipronil Sulfide	ng/L	20	14	16	72	78	50-150	8	35
Fipronil Sulfone	ng/L	20	14	14	68	71	50-150	3.6	35
Esfenvalerate-d6;#1 (SS)	%				84	89	70-130	5.8	
Esfenvalerate-d6;#2 (SS)	%				83	90	70-130	8.1	

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Lab Order: P020481

Project ID: CCCWP-SSID 030.001.0202

Analysis Description:Fipronil Analysis, WaterQC Batch:SPR/6308

Analysis Method: SW846 8270 Mod (GCMS-NCI-SIM) QC Batch Method: SW846 3510C

Analysis Description:Total Organic Carbon AnalysisQC Batch:WET/7444

Analysis Method: SM20-5310 B QC Batch Method: SM20-5310 B

METHOD BLANK: 566585

 Parameter
 Result Result
 Limit Limit Limit
 MDL MDL MDL
 Units Qualifiers

 Total Organic Carbon
 ND
 1
 0.3
 mg/L

LABORATORY CONTROL SAMPLE: 566586

Spike LCS LCS % Rec **Parameter** Units **Limits Qualifiers** Conc. Result % Rec **Total Organic Carbon** 10 10 101 80-120 mg/L

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 566657 566658

P020479022 Spike MS MSD MS MSD % Rec Max **Parameter** Limit RPD RPD Qualifiers **Units** Result Conc. Result Result % Rec % Rec **Total Organic Carbon** 16 10 28 28 113 112 80-120 0.4 20 mg/L

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 566659 566660

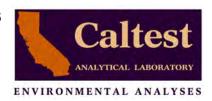
	P	020481002	Spike	MS	MSD	MS	MSD	% Rec		Max
Parameter	Units	Result	Conc.	Result	Result	% Rec	% Rec	Limit	RPD	RPD Qualifiers
Total Organic Carbon	mg/L	16	10	24	25	88	91	80-120	1.2	20



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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA QUALIFIERS

Lab Order: P020481

Project ID: CCCWP-SSID 030.001.0202

QUALITY CONTROL PARAMETER QUALIFIERS

Results Qualifiers: Report fields may contain codes and non-numeric data correlating to one or more of the following definitions:

NS - means not spiked and will not have recoveries reported for Analyte Spike Amounts

QC Codes Keys: These descriptors are used to help identify the specific QC samples and clarify the report.

MB - Method Blank

Method Blanks are reported to the same Method Detection Limits (MDLs) or Reporting Limits (RLs) as the analytical samples in the corresponding QC batch.

LCS/LCSD - Laboratory Control Spike / Laboratory Control Spike Duplicate

DUP - Duplicate of Original Sample Matrix

MS/MSD - Matrix Spike / Matrix Spike Duplicate

RPD - Relative Percent Difference

%Recovery - Spike Recovery stated as a percentage

- 1 Analyte(s) reported as 'ND' means not detected at or above the listed Method Detection Limits (MDL).
- Due to matrix interferences present in the sample, surrogate recoveries failed to meet the QA/QC acceptance criteria.
- 6 Contaminant was detected in the Method Blank.
- Matrix Spike recovery(ies) outside control limits: LCS(LCSD) recoveries and RPD are in control. Possible Matrix interference in QC sample.



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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Lab Order: P020481

Project ID: CCCWP-SSID 030.001.0202

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
P020481003	544R00025DS-	ASTM D 3977-97 B- Filtration	BIO/13477	_	
P020481004	544R00025US	ASTM D 3977-97 B- Filtration	BIO/13477		
P020481003	544R00025DS-	SW846 3510C	SPR/6300	SW846 8270 Mod (GCMS-NCI-SIM)	SMS/3357
P020481004	544R00025US	SW846 3510C	SPR/6300	SW846 8270 Mod (GCMS-NCI-SIM)	SMS/3357
P020481003	544R00025DS-	SW846 3510C	SPR/6308	SW846 8270 Mod (GCMS-NCI-SIM)	SMS/3373
P020481004	544R00025US	SW846 3510C	SPR/6308	SW846 8270 Mod (GCMS-NCI-SIM)	SMS/3373
P020481003	544R00025DS-	EPA 608	SPR/6309	EPA 608	SMS/3366
P020481004	544R00025US	EPA 608	SPR/6309	EPA 608	SMS/3366
P020481001	544R00025DS-	SM20-5310 B	WET/7444		
P020481002	544R00025US-	SM20-5310 B	WET/7444		

Shalas

3/5/2014 10:41

3065 Porter St FOR LAB USE ONLY PHONE #: BILLING ADDRESS: CLIENT: By submittal of sample(s), client agrees to abide by the Terms and Conditions set forth on the reverse of this document. Samples: WC PIL: HNO SIL: HP CC: AA BD: BIO W/HNO 2/6/14/3:20 Storm DATE TIME CONTAINER SAMPLED SAMPLED MATRIX AMOUNT/TYPE DH Environmental Caltest ANALYTICAL LABORATORY RELINQUISHED BY PT VSV Same WC H,SO 13-50 HSO 13:20 A 05:61 05:6 2:50 3:20 3:20 12:50 05.tl MICRO 10 FAX PHONE VOA MARC MET NaOH Soquel VOA BIO SAMPLE CHAIN 1885 N. KELLY ROAD • NAPA, CA 94558 • (707) 258-4000 • Fax (707) 226-1001 • www.caltestlabs.com OF CUSTODY カイナ ME DATE/TIME HG 11C4 ICR 150 Ice PHESERVATIVE S.F. CR 0 7 SAMPLER (PRINT & SIGN NAME): 100 VSV 6 de COMMENTS 544 12000 25 US-544 R00025 DS-544 ROOD 25 DS -544 RODD as US SAMPLE IDENTIFICATION SITE CCCWP- 55 Alessan vo STATE: TEMP: 6 RECEIVED BY റ് HNAH. SEALED: Y M8KED 030,001 z CLIENT LAB# RELINQUISHED BY 922 COMP. INTACT: Y / N 2020 X × V × or fire the constant of game delaction of the pesticid X × PAGE X X CONTAINER TYPES: AL = Amber Liter; AHL = 500 ml DW = Drinking Water; SL = Soil, Sludge, Solid; FP = Free Product MATRIX: W = Aqueous Nondrinking Water, Digested Metals 40 mL.VOA; OTC = Other Type Container (Plastic); SJ = Soil Jar; B4 = 4 oz. BACT; BT = Brass Tube; VOA = Amber; PT = Pint (Plastic); QT=Quart (Plastic); HG = Half Gallon ML = Low R.L.s. Aqueous Nondrinking Water, Digested Metals: X X DATE/TIME ANALYSESOREQUESTED LAB ORDER # DUE DATE REMARKS RUSH STANDARD TURN-AROUND

RECEIVED BY

WHITE - LABORATORY

YELLOW - CLIENT COPY TO ACCOMPANY FINAL REPORT

PINK - CLIENT COPY AS RECEIPT

REV. 4/12



Wednesday, April 16, 2014

Alessandro Hnatt ADH Environmental 3065 Porter Street, Suite 101 Soquel, CA 95073

Lab Order: P030135 Re

> Project ID: Contra Costa Clean Water Progr

Collected By: CLIENT

PO/Contract #:

Dear Alessandro Hnatt:

Enclosed are the analytical results for sample(s) received by the laboratory on Tuesday, March 04, 2014. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Enclosures

Project Manager: Todd Albertson



ENVIRONMENTAL ANALYSES

SAMPLE SUMMARY

Lab Order: P030135

4/16/2014 16:05

Project ID: Contra Costa Clean Water Progr

Lab ID	Sample ID	<u>Matrix</u>	Date Collected	Date Received
P030135001	544R00025US-W-02	Water	02/28/2014 10:00	02/28/2014 10:00
P030135002	544R00025DS-W-02	Water	02/28/2014 09:30	02/28/2014 09:30
P030135003	207R00011DS-W-01	Water	02/28/2014 08:45	02/28/2014 08:45
P030135004	207R00011US-W-01	Water	02/28/2014 09:55	02/28/2014 09:55



NARRATIVE

Lab Order: P030135

Project ID: Contra Costa Clean Water Progr

General Qualifiers and Notes

Caltest authorizes this report to be reproduced only in its entirety. Results are specific to the sample(s) as submitted and only to the parameter(s) reported.

Caltest certifies that all test results for wastewater and hazardous waste analyses meet all applicable NELAC requirements; all microbiology and drinking water testing meet applicable ELAP requirements, unless stated otherwise.

All analyses performed by EPA Methods or Standard Methods (SM) 20th Edition except where noted (SMOL=online edition).

Caltest collects samples in compliance with 40 CFR, EPA Methods, Cal. Title 22, and Standard Methods.

Dilution Factors (DF) reported greater than '1' have been used to adjust the result, Reporting Limit (RL), and Method Detection Limit (MDL).

All Solid, sludge, and/or biosolids data is reported in Wet Weight, unless otherwise specified.

Filtrations performed at Caltest for dissolved metals (excluding mercury) and/or pH analysis were not performed within the 15 minute holding time as specified by 40CFR 136.3 table II.

Results Qualifiers: Report fields may contain codes and non-numeric data correlating to one or more of the following definitions:

ND - Non Detect - indicates analytical result has not been detected.

RL - Reporting Limit is the quantitation limit at which the laboratory is able to detect an analyte. An analyte not detected at or above the RL is reported as ND unless otherwise noted or qualified. For analyses pertaining to the State Implementation Plan of the California Toxics Rule, the Caltest Reporting Limit (RL) is equivalent to the Minimum Level (ML). A standard is always run at or below the ML. Where Reporting Limits are elevated due to dilution, the ML calibration criteria has been met.

- J reflects estimated analytical result value detected below the Reporting Limit (RL) and above the Method Detection Limit (MDL). The 'J' flag is equivalent to the DNQ Estimated Concentration flag.
- E indicates an estimated analytical result value.
- B indicates the analyte has been detected in the blank associated with the sample.
- NC means not able to be calculated for RPD or Spike Recoveries.
- SS compound is a Surrogate Spike used per laboratory quality assurance manual.

NOTE: This document represents a complete Analytical Report for the samples referenced herein and should be retained as a permanent record thereof.

Qualifiers and Compound Notes

1	Reporting Limits may be elevated due to limited sample volume.

- 2 Analyte(s) reported as 'ND' means not detected at or above the listed Method Detection Limits (MDL).
- The sample was diluted and analyzed in attempt to minimize the matrix interferences. The dilution yielded similar results as the 1X run therefore the 1X run was reported.
- 4 This analysis is not covered under Caltest's NELAP/CAL-ELAP Accreditations.
- 5 Due to matrix interferences present in the sample, surrogate recoveries failed to meet the QA/QC acceptance criteria.
- 6 Surrogates did not meet Caltest internal acceptance criteria. The sample passes all pertinent method criteria.

REPORT OF LABORATORY ANALYSIS

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Lab Order: P030135

Project ID: Contra Costa Clean Water Progr

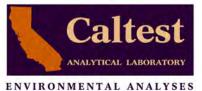
Lab ID	P030135001	Date Collected	2/28/2014 10:00:00 AM	Matrix Water

Lab ID P030135001 Sample ID 544R00025US-W-02	Date Collect		014 10:00:00 14 12:21:00 P		Water			
Sample ID 544R00025US-W-02	Date Receive	eu 3/4/20	14 12.21.00 F	rivi				
Parameters	Result Units	R. L.	MDL	DF Prepared	Prepared	Analyzed	Prepared	Qua
Suspended Sediment Concentration	Analytical Metho	od: ASTM	D 3977-97 B	-Filtration		Analyzed by:	CFG	
Sediment Concentration	13 mg/L	3	2	1		03/06/14 09:38	BIO 13574	4
Chlorinated Pesticides & PCBs	Prep Method:	EPA 6	08	Prep by:	EAB			
Analysis	Analytical Metho	od: EPA 6	O8			Analyzed by:	NTA	
Aldrin	ND ug/L	0.006	0.0050	1 03/06/14 00:00	SPR 6346	03/19/14 01:49	SMS 3391	2,1
alpha-BHC	ND ug/L	0.010	0.0062	1 03/06/14 00:00	SPR 6346	03/19/14 01:49	SMS 3391	_,.
beta-BHC	ND ug/L	0.006	0.0050	1 03/06/14 00:00	SPR 6346	03/19/14 01:49	SMS 3391	
delta-BHC	ND ug/L	0.006	0.0050	1 03/06/14 00:00	SPR 6346	03/19/14 01:49	SMS 3391	
gamma-BHC (Lindane)	ND ug/L	0.010	0.0050	1 03/06/14 00:00	SPR 6346	03/19/14 01:49	SMS 3391	
Chlordane	ND ug/L	0.062	0.025	1 03/06/14 00:00	SPR 6346	03/19/14 01:49	SMS 3391	
4,4'-DDD	ND ug/L	0.010	0.0050	1 03/06/14 00:00	SPR 6346	03/19/14 01:49	SMS 3391	
4,4'-DDE	ND ug/L	0.010	0.0038	1 03/06/14 00:00	SPR 6346	03/19/14 01:49	SMS 3391	
4,4'-DDT	ND ug/L	0.010	0.0050	1 03/06/14 00:00	SPR 6346	03/19/14 01:49	SMS 3391	
Dieldrin	ND ug/L	0.010	0.0050	1 03/06/14 00:00	SPR 6346	03/19/14 01:49	SMS 3391	
Endosulfan I	ND ug/L	0.010	0.0050	1 03/06/14 00:00	SPR 6346	03/19/14 01:49	SMS 3391	
Endosulfan II	ND ug/L	0.010	0.0062	1 03/06/14 00:00	SPR 6346	03/19/14 01:49	SMS 3391	
Endosulfan sulfate	ND ug/L	0.010	0.0062	1 03/06/14 00:00	SPR 6346	03/19/14 01:49	SMS 3391	
Endrin	ND ug/L	0.010	0.0062	1 03/06/14 00:00	SPR 6346	03/19/14 01:49	SMS 3391	
Endrin aldehyde	ND ug/L	0.010	0.0062	1 03/06/14 00:00	SPR 6346	03/19/14 01:49	SMS 3391	
Endrin ketone	ND ug/L	0.010	0.0062	1 03/06/14 00:00	SPR 6346	03/19/14 01:49	SMS 3391	
Heptachlor	ND ug/L	0.010	0.0062	1 03/06/14 00:00	SPR 6346	03/19/14 01:49	SMS 3391	
Heptachlor epoxide	ND ug/L	0.010	0.0050	1 03/06/14 00:00	SPR 6346	03/19/14 01:49	SMS 3391	
Methoxychlor	ND ug/L	0.010	0.0062	1 03/06/14 00:00	SPR 6346	03/19/14 01:49	SMS 3391	
PCB 1016	ND ug/L	0.12	0.062	1 03/06/14 00:00	SPR 6346	03/19/14 01:49	SMS 3391	
PCB 1221	ND ug/L	0.12	0.062	1 03/06/14 00:00	SPR 6346	03/19/14 01:49	SMS 3391	
PCB 1232	ND ug/L	0.12	0.062	1 03/06/14 00:00	SPR 6346	03/19/14 01:49	SMS 3391	
PCB 1242	ND ug/L	0.12	0.052	1 03/06/14 00:00	SPR 6346	03/19/14 01:49	SMS 3391	
PCB 1248	ND ug/L	0.12	0.062	1 03/06/14 00:00	SPR 6346	03/19/14 01:49	SMS 3391	
PCB 1254	ND ug/L	0.12	0.062	1 03/06/14 00:00	SPR 6346	03/19/14 01:49	SMS 3391	
PCB 1260	ND ug/L	0.12	0.062	1 03/06/14 00:00	SPR 6346	03/19/14 01:49	SMS 3391	
Toxaphene	ND ug/L	0.6	0.38	1 03/06/14 00:00	SPR 6346	03/19/14 01:49	SMS 3391	
Decachlorobiphenyl (SS)	41 %	10-195	0.00	1 03/06/14 00:00	SPR 6346	03/19/14 01:49	SMS 3391	
Tetrachloro-m-xylene (SS)	100 %	25-105		1 03/06/14 00:00	SPR 6346	03/19/14 01:49	SMS 3391	
Pyrethroids+Fipronil Analysis,NCI,Water	Prep Method:	SW84	6 3510C	Prep by:	EAB			
·· • • · · · · · · · · · · · · · · · ·	Analytical Metho	od: SW84	6 8270 Mod			Analyzed by:	RLH	
Allethrin	ND ng/L	1.5	0.1	1 03/07/14 00:00	SPR 6351	04/03/14 08:37	SMS 3410	2,3
Bifenthrin	8.5 ng/L	1.5	0.1	1 03/07/14 00:00	SPR 6351	04/03/14 08:37	SMS 3410	,
Cyfluthrin	J1.5 ng/L	1.5	0.2	1 03/07/14 00:00	SPR 6351	04/03/14 08:37	SMS 3410	
Lambda-Cyhalothrin	ND ng/L	1.5	0.2	1 03/07/14 00:00	SPR 6351	04/03/14 08:37	SMS 3410	
Cypermethrin	ND ng/L	1.5	0.2	1 03/07/14 00:00	SPR 6351	04/03/14 08:37	SMS 3410	
Deltamethrin:Tralomethrin	ND ng/L	3.0	0.2	1 03/07/14 00:00	SPR 6351	04/03/14 08:37	SMS 3410	
Esfenvalerate:Fenvalerate	ND ng/L	3.0	0.2	1 03/07/14 00:00	SPR 6351	04/03/14 08:37	SMS 3410	
Fenpropathrin	ND ng/L	1.5	0.2	1 03/07/14 00:00	SPR 6351	04/03/14 08:37	SMS 3410	

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REPORT OF LABORATORY ANALYSIS

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Lab Order: P030135

Project ID: Contra Costa Clean Water Progr

Lab ID P030135001	Date Collec		014 10:00:00		Water			
Sample ID 544R00025US-W-02	Date Recei	ved 3/4/20 ⁻	14 12:21:00 F	PM				
Parameters	Result Units	R. L.	MDL	DF Prepared	Prepared	Analyzed	Prepared	Qual
Fipronil	4.5 ng/L	1.5	0.5	1 03/07/14 00:00	SPR 6351	04/03/14 08:37	SMS 3410	·
Fipronil Desulfinyl	2.2 ng/L	1.5	0.5	1 03/07/14 00:00	SPR 6351	04/03/14 08:37	SMS 3410	
Fipronil Sulfide	ND ng/L	1.5	0.5	1 03/07/14 00:00	SPR 6351	04/03/14 08:37	SMS 3410	
Fipronil Sulfone	5.5 ng/L	1.5	0.5	1 03/07/14 00:00	SPR 6351	04/03/14 08:37	SMS 3410	
Tau-Fluvalinate	ND ng/L	1.5	0.2	1 03/07/14 00:00	SPR 6351	04/03/14 08:37	SMS 3410	
Permethrin	ND ng/L	15	2	1 03/07/14 00:00	SPR 6351	04/03/14 08:37	SMS 3410	
Tetramethrin	ND ng/L	1.5	0.2	1 03/07/14 00:00	SPR 6351	04/03/14 08:37	SMS 3410	
Esfenvalerate-d6;#1 (SS)	68 %	70-130		1 03/07/14 00:00	SPR 6351	04/03/14 08:37	SMS 3410	5
Esfenvalerate-d6;#2 (SS)	67 %	70-130		1 03/07/14 00:00	SPR 6351	04/03/14 08:37	SMS 3410	5
Total Organic Carbon Analysis	Analytical Met	hod: SM20-	5310 B			Analyzed by:	NP	
Total Organic Carbon	14 mg/L	1	0.30	1		03/12/14 18:34	WET 7502	
Lab ID	Data Callar	0/00/0	24.4.0.20.00.4	NA Matrice	\\/atau			
Lab ID P030135002	Date Collec		014 9:30:00 A		Water			
Sample ID 544R00025DS-W-02	Date Recei	ved 3/4/20°	14 12:21:00 F	PM .				
Parameters	Result Units	R. L.	MDL	DF Prepared	Prepared	Analyzed	Prepared	Qual
Suspended Sediment Concentrati	ion Analytical Met	hod: ASTM	D 3977-97 B	-Filtration	<u> </u>	Analyzed by:	CFG	
Sediment Concentration	37 mg/L	3	2	1		03/06/14 09:38	BIO 13574	4
Chlorinated Pesticides & PCBs Analysis	Prep Method:	EPA 60	08	Prep by:	EAB			
Analysis	Analytical Met	hod: EPA 60	08			Analyzed by:	NTA	
Aldrin	ND ug/L	0.005	0.0040	1 03/06/14 00:00	SPR 6346	03/19/14 02:16	SMS 3391	2
alpha-BHC	ND ug/L	0.010	0.0050	1 03/06/14 00:00	SPR 6346	03/19/14 02:16	SMS 3391	
beta-BHC	ND ug/L	0.005	0.0040	1 03/06/14 00:00	SPR 6346	03/19/14 02:16	SMS 3391	
delta-BHC	ND ug/L	0.005	0.0040	1 03/06/14 00:00	SPR 6346	03/19/14 02:16	SMS 3391	
gamma-BHC (Lindane)	ND ug/L	0.010	0.0040	1 03/06/14 00:00	SPR 6346	03/19/14 02:16	SMS 3391	
Chlordane	ND ug/L	0.050	0.020	1 03/06/14 00:00	SPR 6346	03/19/14 02:16	SMS 3391	
4,4'-DDD	ND ug/L	0.010	0.0040	1 03/06/14 00:00	SPR 6346	03/19/14 02:16	SMS 3391	
4,4'-DDE	ND ug/L	0.010	0.0030	1 03/06/14 00:00	SPR 6346	03/19/14 02:16	SMS 3391	
4,4'-DDT				1 00/00/14 00.00				
1,1 001	ND ug/L	0.010	0.0040	1 03/06/14 00:00	SPR 6346	03/19/14 02:16	SMS 3391	
Dieldrin	ND ug/L ND ug/L	0.010 0.010			SPR 6346 SPR 6346	03/19/14 02:16 03/19/14 02:16	SMS 3391 SMS 3391	
	-		0.0040	1 03/06/14 00:00				
Dieldrin	ND ug/L	0.010	0.0040 0.0040	1 03/06/14 00:00 1 03/06/14 00:00	SPR 6346	03/19/14 02:16	SMS 3391	
Dieldrin Endosulfan I	ND ug/L ND ug/L	0.010 0.010	0.0040 0.0040 0.0040	1 03/06/14 00:00 1 03/06/14 00:00 1 03/06/14 00:00	SPR 6346 SPR 6346	03/19/14 02:16 03/19/14 02:16	SMS 3391 SMS 3391	
Dieldrin Endosulfan I Endosulfan II	ND ug/L ND ug/L ND ug/L	0.010 0.010 0.010	0.0040 0.0040 0.0040 0.0050	1 03/06/14 00:00 1 03/06/14 00:00 1 03/06/14 00:00 1 03/06/14 00:00	SPR 6346 SPR 6346 SPR 6346	03/19/14 02:16 03/19/14 02:16 03/19/14 02:16	SMS 3391 SMS 3391 SMS 3391	
Dieldrin Endosulfan I Endosulfan II Endosulfan sulfate	ND ug/L ND ug/L ND ug/L ND ug/L	0.010 0.010 0.010 0.010	0.0040 0.0040 0.0040 0.0050 0.0050	1 03/06/14 00:00 1 03/06/14 00:00 1 03/06/14 00:00 1 03/06/14 00:00 1 03/06/14 00:00	SPR 6346 SPR 6346 SPR 6346 SPR 6346	03/19/14 02:16 03/19/14 02:16 03/19/14 02:16 03/19/14 02:16	SMS 3391 SMS 3391 SMS 3391 SMS 3391	
Dieldrin Endosulfan I Endosulfan II Endosulfan sulfate Endrin	ND ug/L ND ug/L ND ug/L ND ug/L ND ug/L	0.010 0.010 0.010 0.010 0.010	0.0040 0.0040 0.0040 0.0050 0.0050	1 03/06/14 00:00 1 03/06/14 00:00 1 03/06/14 00:00 1 03/06/14 00:00 1 03/06/14 00:00 1 03/06/14 00:00	SPR 6346 SPR 6346 SPR 6346 SPR 6346 SPR 6346	03/19/14 02:16 03/19/14 02:16 03/19/14 02:16 03/19/14 02:16 03/19/14 02:16	SMS 3391 SMS 3391 SMS 3391 SMS 3391 SMS 3391	
Dieldrin Endosulfan I Endosulfan II Endosulfan sulfate Endrin Endrin aldehyde	ND ug/L ND ug/L ND ug/L ND ug/L ND ug/L ND ug/L	0.010 0.010 0.010 0.010 0.010 0.010	0.0040 0.0040 0.0040 0.0050 0.0050 0.0050 0.0050	1 03/06/14 00:00 1 03/06/14 00:00 1 03/06/14 00:00 1 03/06/14 00:00 1 03/06/14 00:00 1 03/06/14 00:00 1 03/06/14 00:00	SPR 6346 SPR 6346 SPR 6346 SPR 6346 SPR 6346 SPR 6346	03/19/14 02:16 03/19/14 02:16 03/19/14 02:16 03/19/14 02:16 03/19/14 02:16 03/19/14 02:16	SMS 3391 SMS 3391 SMS 3391 SMS 3391 SMS 3391 SMS 3391	
Dieldrin Endosulfan I Endosulfan II Endosulfan sulfate Endrin Endrin aldehyde Endrin ketone	ND ug/L ND ug/L ND ug/L ND ug/L ND ug/L ND ug/L ND ug/L	0.010 0.010 0.010 0.010 0.010 0.010 0.010	0.0040 0.0040 0.0040 0.0050 0.0050 0.0050 0.0050	1 03/06/14 00:00 1 03/06/14 00:00	SPR 6346 SPR 6346 SPR 6346 SPR 6346 SPR 6346 SPR 6346 SPR 6346	03/19/14 02:16 03/19/14 02:16 03/19/14 02:16 03/19/14 02:16 03/19/14 02:16 03/19/14 02:16	SMS 3391 SMS 3391 SMS 3391 SMS 3391 SMS 3391 SMS 3391 SMS 3391	
Dieldrin Endosulfan I Endosulfan II Endosulfan sulfate Endrin Endrin aldehyde Endrin ketone Heptachlor	ND ug/L ND ug/L ND ug/L ND ug/L ND ug/L ND ug/L ND ug/L ND ug/L	0.010 0.010 0.010 0.010 0.010 0.010 0.010 0.010	0.0040 0.0040 0.0040 0.0050 0.0050 0.0050 0.0050 0.0050	1 03/06/14 00:00 1 03/06/14 00:00	SPR 6346 SPR 6346 SPR 6346 SPR 6346 SPR 6346 SPR 6346 SPR 6346 SPR 6346	03/19/14 02:16 03/19/14 02:16 03/19/14 02:16 03/19/14 02:16 03/19/14 02:16 03/19/14 02:16 03/19/14 02:16	SMS 3391 SMS 3391 SMS 3391 SMS 3391 SMS 3391 SMS 3391 SMS 3391 SMS 3391	
Dieldrin Endosulfan I Endosulfan II Endosulfan sulfate Endrin Endrin aldehyde Endrin ketone Heptachlor Heptachlor epoxide	ND ug/L	0.010 0.010 0.010 0.010 0.010 0.010 0.010 0.010	0.0040 0.0040 0.0040 0.0050 0.0050 0.0050 0.0050 0.0050 0.0050	1 03/06/14 00:00 1 03/06/14 00:00	SPR 6346 SPR 6346 SPR 6346 SPR 6346 SPR 6346 SPR 6346 SPR 6346 SPR 6346 SPR 6346	03/19/14 02:16 03/19/14 02:16 03/19/14 02:16 03/19/14 02:16 03/19/14 02:16 03/19/14 02:16 03/19/14 02:16 03/19/14 02:16	SMS 3391 SMS 3391 SMS 3391 SMS 3391 SMS 3391 SMS 3391 SMS 3391 SMS 3391 SMS 3391	
Dieldrin Endosulfan I Endosulfan II Endosulfan sulfate Endrin Endrin aldehyde Endrin ketone Heptachlor Heptachlor epoxide Methoxychlor	ND ug/L	0.010 0.010 0.010 0.010 0.010 0.010 0.010 0.010 0.010	0.0040 0.0040 0.0040 0.0050 0.0050 0.0050 0.0050 0.0050 0.0050	1 03/06/14 00:00 1 03/06/14 00:00	SPR 6346 SPR 6346 SPR 6346 SPR 6346 SPR 6346 SPR 6346 SPR 6346 SPR 6346 SPR 6346 SPR 6346	03/19/14 02:16 03/19/14 02:16 03/19/14 02:16 03/19/14 02:16 03/19/14 02:16 03/19/14 02:16 03/19/14 02:16 03/19/14 02:16 03/19/14 02:16	SMS 3391 SMS 3391 SMS 3391 SMS 3391 SMS 3391 SMS 3391 SMS 3391 SMS 3391 SMS 3391 SMS 3391	

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REPORT OF LABORATORY ANALYSIS

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Lab Order: P030135

Project ID: Contra Costa Clean Water Progr

Lab ID P030135002	Date Collected	2/28/2	014 9:30:00 AN	И Matrix	Water			
Sample ID 544R00025DS-W-02	Date Received	3/4/20	14 12:21:00 PM	Л				
Parameters	Result Units	R. L.	MDL	DF Prepared	Prepared	Analyzed	Prepared	Qual
PCB 1242	ND ug/L	0.10	0.040	1 03/06/14 00:00	SPR 6346	03/19/14 02:16	SMS 3391	_
PCB 1248	ND ug/L	0.10	0.050	1 03/06/14 00:00	SPR 6346	03/19/14 02:16	SMS 3391	
PCB 1254	ND ug/L	0.10	0.050	1 03/06/14 00:00	SPR 6346	03/19/14 02:16	SMS 3391	
PCB 1260	ND ug/L	0.10	0.050	1 03/06/14 00:00	SPR 6346	03/19/14 02:16	SMS 3391	
Toxaphene	ND ug/L	0.5	0.30	1 03/06/14 00:00	SPR 6346	03/19/14 02:16	SMS 3391	
Decachlorobiphenyl (SS)	=	0-195		1 03/06/14 00:00	SPR 6346	03/19/14 02:16	SMS 3391	
Tetrachloro-m-xylene (SS)		25-105		1 03/06/14 00:00	SPR 6346	03/19/14 02:16	SMS 3391	
Pyrethroids+Fipronil Analysis,NCI,Water	Prep Method:	SW84	6 3510C	Prep by:	EAB			
, ,	Analytical Method:	SW84	6 8270 Mod			Analyzed by:	RLH	
Allethrin	ND ng/L	1.5	0.1	1 03/07/14 00:00	SPR 6351	04/03/14 10:23	SMS 3410	2,3
Bifenthrin	8.6 ng/L	1.5	0.1	1 03/07/14 00:00	SPR 6351	04/03/14 10:23	SMS 3410	
Cyfluthrin	1.7 ng/L	1.5	0.2	1 03/07/14 00:00	SPR 6351	04/03/14 10:23	SMS 3410	
Lambda-Cyhalothrin	ND ng/L	1.5	0.2	1 03/07/14 00:00	SPR 6351	04/03/14 10:23	SMS 3410	
Cypermethrin	ND ng/L	1.5	0.2	1 03/07/14 00:00	SPR 6351	04/03/14 10:23	SMS 3410	
Deltamethrin:Tralomethrin	ND ng/L	3.0	0.2	1 03/07/14 00:00	SPR 6351	04/03/14 10:23	SMS 3410	
Esfenvalerate:Fenvalerate	ND ng/L	3.0	0.2	1 03/07/14 00:00	SPR 6351	04/03/14 10:23	SMS 3410	
Fenpropathrin	ND ng/L	1.5	0.2	1 03/07/14 00:00	SPR 6351	04/03/14 10:23	SMS 3410	
Fipronil	4.3 ng/L	1.5	0.5	1 03/07/14 00:00	SPR 6351	04/03/14 10:23	SMS 3410	
Fipronil Desulfinyl	1.9 ng/L	1.5	0.5	1 03/07/14 00:00	SPR 6351	04/03/14 10:23	SMS 3410	
Fipronil Sulfide	ND ng/L	1.5	0.5	1 03/07/14 00:00	SPR 6351	04/03/14 10:23	SMS 3410	
Fipronil Sulfone	5.2 ng/L	1.5	0.5	1 03/07/14 00:00	SPR 6351	04/03/14 10:23	SMS 3410	
Tau-Fluvalinate	ND ng/L	1.5	0.2	1 03/07/14 00:00	SPR 6351	04/03/14 10:23	SMS 3410	
Permethrin	ND ng/L	1.5	2	1 03/07/14 00:00	SPR 6351	04/03/14 10:23	SMS 3410	
Tetramethrin	ND ng/L	1.5	0.2	1 03/07/14 00:00	SPR 6351	04/03/14 10:23	SMS 3410	
	-	70-130	0.2	1 03/07/14 00:00	SPR 6351	04/03/14 10:23	SMS 3410	5
Esfenvalerate-d6;#1 (SS) Esfenvalerate-d6;#2 (SS)		'0-130 '0-130		1 03/07/14 00:00	SPR 6351	04/03/14 10:23	SMS 3410	5
Total Organic Carbon Analysis	Analytical Method:	SM20	-5310 B			Analyzed by:	NP	
Total Organic Carbon	15 mg/L	1	0.30	1		03/12/14 18:51	WET 7502	
Lab ID P030135003	Date Collected	2/28/2	014 8:45:00 AN	// Matrix	Water			
Sample ID 207R00011DS-W-01	Date Received	3/4/20	14 12:21:00 PN	Л				
Parameters	Result Units	R. L.	MDL	DF Prepared	Prepared	Analyzed	Prepared	Qual
Suspended Sediment Concentration	Analytical Method:	ASTM	D 3977-97 B-F	iltration		Analyzed by:	CFG	
Sediment Concentration	173 mg/L	3	2	1		03/06/14 09:38	BIO 13574	4
Chlorinated Pesticides & PCBs Analysis	Prep Method:	EPA 6	08	Prep by:	EAB			
-	Analytical Method:	EPA 6	08			Analyzed by:	NTA	
Aldrin	ND ug/L	0.005	0.0040	1 03/06/14 00:00	SPR 6346	03/19/14 02:44	SMS 3391	2
alpha-BHC	ND ug/L	0.010	0.0050	1 03/06/14 00:00	SPR 6346	03/19/14 02:44	SMS 3391	
beta-BHC	ND ug/L	0.005	0.0040	1 03/06/14 00:00	SPR 6346	03/19/14 02:44	SMS 3391	
delta-BHC	ND ug/L	0.005	0.0040	1 03/06/14 00:00	SPR 6346	03/19/14 02:44	SMS 3391	
4/16/2014 16:05	REPOR	T OF L	ABORATOR	RY ANALYSIS			Page 6 of 15	



Lab Order: P030135

Project ID: Contra Costa Clean Water Progr

Lab ID P030135003	Date Collecte	ed 2/28/2	2014 8:45:00 AN	l Matrix	Water			
Sample ID 207R00011DS-W-01	Date Receive	ed 3/4/20	014 12:21:00 PM	1				
Parameters	Result Units	R. L.	MDL	DF Prepared	Prepared	Analyzed	Prepared	Qua
gamma-BHC (Lindane)	ND ug/L	0.010	0.0040	1 03/06/14 00:00	SPR 6346	03/19/14 02:44	SMS 3391	
Chlordane	ND ug/L	0.050	0.020	1 03/06/14 00:00	SPR 6346	03/19/14 02:44	SMS 3391	
4,4'-DDD	ND ug/L	0.010	0.0040	1 03/06/14 00:00	SPR 6346	03/19/14 02:44	SMS 3391	
4,4'-DDE	ND ug/L	0.010	0.0030	1 03/06/14 00:00	SPR 6346	03/19/14 02:44	SMS 3391	
4,4'-DDT	ND ug/L	0.010	0.0040	1 03/06/14 00:00	SPR 6346	03/19/14 02:44	SMS 3391	
Dieldrin	ND ug/L	0.010	0.0040	1 03/06/14 00:00	SPR 6346	03/19/14 02:44	SMS 3391	
Endosulfan I	ND ug/L	0.010	0.0040	1 03/06/14 00:00	SPR 6346	03/19/14 02:44	SMS 3391	
Endosulfan II	ND ug/L	0.010	0.0050	1 03/06/14 00:00	SPR 6346	03/19/14 02:44	SMS 3391	
Endosulfan sulfate	ND ug/L	0.010	0.0050	1 03/06/14 00:00	SPR 6346	03/19/14 02:44	SMS 3391	
Endrin	ND ug/L	0.010	0.0050	1 03/06/14 00:00	SPR 6346	03/19/14 02:44	SMS 3391	
Endrin aldehyde	ND ug/L	0.010	0.0050	1 03/06/14 00:00	SPR 6346	03/19/14 02:44	SMS 3391	
Endrin ketone	ND ug/L	0.010	0.0050	1 03/06/14 00:00	SPR 6346	03/19/14 02:44	SMS 3391	
Heptachlor	ND ug/L	0.010	0.0050	1 03/06/14 00:00	SPR 6346	03/19/14 02:44	SMS 3391	
Heptachlor epoxide	ND ug/L	0.010	0.0040	1 03/06/14 00:00	SPR 6346	03/19/14 02:44	SMS 3391	
Methoxychlor	ND ug/L	0.010	0.0050	1 03/06/14 00:00	SPR 6346	03/19/14 02:44	SMS 3391	
PCB 1016	-	0.10	0.050	1 03/06/14 00:00	SPR 6346	03/19/14 02:44	SMS 3391	
PCB 1221	ND ug/L ND ug/L	0.10	0.050	1 03/06/14 00:00	SPR 6346	03/19/14 02:44	SMS 3391	
PCB 1232	-							
	ND ug/L	0.10	0.050	1 03/06/14 00:00	SPR 6346	03/19/14 02:44	SMS 3391	
PCB 1242	ND ug/L	0.10	0.040	1 03/06/14 00:00	SPR 6346	03/19/14 02:44	SMS 3391	
PCB 1248	ND ug/L	0.10	0.050	1 03/06/14 00:00	SPR 6346	03/19/14 02:44	SMS 3391	
PCB 1254	ND ug/L	0.10	0.050	1 03/06/14 00:00	SPR 6346	03/19/14 02:44	SMS 3391	
PCB 1260	ND ug/L	0.10	0.050	1 03/06/14 00:00	SPR 6346	03/19/14 02:44	SMS 3391	
Toxaphene	ND ug/L	0.5	0.30	1 03/06/14 00:00	SPR 6346	03/19/14 02:44	SMS 3391	
Decachlorobiphenyl (SS)	36 %	10-195		1 03/06/14 00:00	SPR 6346	03/19/14 02:44	SMS 3391	
Tetrachloro-m-xylene (SS)	114 %	25-105		1 03/06/14 00:00	SPR 6346	03/19/14 02:44	SMS 3391	6
Pyrethroids+Fipronil Analysis,NCI,Water	Prep Method:	SW84	46 3510C	Prep by:	EAB			
., ., .,	Analytical Metho	d: SW84	46 8270 Mod			Analyzed by:	RLH	
Allethrin	ND ng/L	1.5	0.1	1 03/07/14 00:00	SPR 6351	04/03/14 12:09	SMS 3410	2,3
Bifenthrin	6.5 ng/L	1.5	0.1	1 03/07/14 00:00	SPR 6351	04/03/14 12:09	SMS 3410	
Cyfluthrin	6.4 ng/L	1.5	0.2	1 03/07/14 00:00	SPR 6351	04/03/14 12:09	SMS 3410	
Lambda-Cyhalothrin	ND ng/L	1.5	0.2	1 03/07/14 00:00	SPR 6351	04/03/14 12:09	SMS 3410	
Cypermethrin	ND ng/L	1.5	0.2	1 03/07/14 00:00	SPR 6351	04/03/14 12:09	SMS 3410	
Deltamethrin:Tralomethrin	ND ng/L	3.0	0.2	1 03/07/14 00:00	SPR 6351	04/03/14 12:09	SMS 3410	
Esfenvalerate:Fenvalerate	ND ng/L	3.0	0.2	1 03/07/14 00:00	SPR 6351	04/03/14 12:09	SMS 3410	
Fenpropathrin	ND ng/L	1.5	0.2	1 03/07/14 00:00	SPR 6351	04/03/14 12:09	SMS 3410	
Fipronil	23 ng/L	1.5	0.5	1 03/07/14 00:00	SPR 6351	04/03/14 12:09	SMS 3410	
Fipronil Desulfinyl	2.2 ng/L	1.5	0.5	1 03/07/14 00:00	SPR 6351	04/03/14 12:09	SMS 3410	
Fipronil Sulfide	1.6 ng/L	1.5	0.5	1 03/07/14 00:00	SPR 6351	04/03/14 12:09	SMS 3410	
Fipronil Sulfone	9.5 ng/L	1.5	0.5	1 03/07/14 00:00	SPR 6351	04/03/14 12:09	SMS 3410	
Tau-Fluvalinate	ND ng/L	1.5	0.2	1 03/07/14 00:00	SPR 6351	04/03/14 12:09	SMS 3410	
Permethrin	ND ng/L	1.5	2	1 03/07/14 00:00	SPR 6351	04/03/14 12:09	SMS 3410	
Tetramethrin	ND ng/L	1.5	0.2	1 03/07/14 00:00	SPR 6351	04/03/14 12:09	SMS 3410	
Esfenvalerate-d6;#1 (SS)	-	70-130	0.2					E
Estenvalerate do:#1 (SS)	62 %	70-130		1 03/07/14 00:00	SPR 6351	04/03/14 12:09	SMS 3410	5

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Esfenvalerate-d6;#2 (SS)

63 %

REPORT OF LABORATORY ANALYSIS

1 03/07/14 00:00

SPR 6351

04/03/14 12:09

70-130

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SMS 3410



Lab Order: P030135

Project ID: Contra Costa Clean Water Progr

Lab ID	P030135003	Date Collecte		2014 8:45:00		Water			
Sample ID	207R00011DS-W-01	Date Receive	d 3/4/20	14 12:21:00	PM .				
Parameters		Result Units	R. L.	MDL	DF Prepared	Prepared	Analyzed	Prepared	Qua
Total Organic	nic Carbon Analysis Carbon	Analytical Metho	d: SM20	-5310 B 0.30	1		Analyzed by: 03/12/14 19:04	NP WET 7502	
Lab ID	P030135004	Date Collecte	d 2/28/2	2014 9:55:00	AM Matrix	water (
Sample ID	207R00011US-W-01	Date Receive	d 3/4/20	14 12:21:00	PM				
Parameters		Result Units	R. L.	MDL	DF Prepared	Prepared	Analyzed	Prepared	Qua
Suspended	Sediment Concentration	n Analytical Metho	d: ASTN	I D 3977-97 E	3-Filtration		Analyzed by:	CFG	
Sediment Cor	ncentration	37 mg/L	3	2	1		03/06/14 09:38	BIO 13574	4
Chlorinated Analysis	l Pesticides & PCBs	Prep Method:	EPA 6	808	Prep by:	EAB			
Allalysis		Analytical Metho	d: EPA 6	808			Analyzed by:	NTA	
Aldrin		ND ug/L	0.005	0.0040	1 03/06/14 00:00	SPR 6346	03/19/14 03:11	SMS 3391	2
alpha-BHC		ND ug/L	0.010	0.0050	1 03/06/14 00:00	SPR 6346	03/19/14 03:11	SMS 3391	
beta-BHC		ND ug/L	0.005	0.0040	1 03/06/14 00:00	SPR 6346	03/19/14 03:11	SMS 3391	
delta-BHC		ND ug/L	0.005	0.0040	1 03/06/14 00:00	SPR 6346	03/19/14 03:11	SMS 3391	
gamma-BHC	(Lindane)	ND ug/L	0.010	0.0040	1 03/06/14 00:00	SPR 6346	03/19/14 03:11	SMS 3391	
Chlordane		ND ug/L	0.050	0.020	1 03/06/14 00:00	SPR 6346	03/19/14 03:11	SMS 3391	
4,4'-DDD		ND ug/L	0.010	0.0040	1 03/06/14 00:00	SPR 6346	03/19/14 03:11	SMS 3391	
4,4'-DDE		ND ug/L	0.010	0.0030	1 03/06/14 00:00	SPR 6346	03/19/14 03:11	SMS 3391	
4,4'-DDT		ND ug/L	0.010	0.0040	1 03/06/14 00:00	SPR 6346	03/19/14 03:11	SMS 3391	
Dieldrin		ND ug/L	0.010	0.0040	1 03/06/14 00:00	SPR 6346	03/19/14 03:11	SMS 3391	
Endosulfan I		ND ug/L	0.010	0.0040	1 03/06/14 00:00	SPR 6346	03/19/14 03:11	SMS 3391	
Endosulfan II		ND ug/L	0.010	0.0050	1 03/06/14 00:00	SPR 6346	03/19/14 03:11	SMS 3391	
Endosulfan su	ulfate	ND ug/L	0.010	0.0050	1 03/06/14 00:00	SPR 6346	03/19/14 03:11	SMS 3391	
Endrin		ND ug/L	0.010	0.0050	1 03/06/14 00:00	SPR 6346	03/19/14 03:11	SMS 3391	
Endrin aldehy		ND ug/L	0.010	0.0050	1 03/06/14 00:00	SPR 6346	03/19/14 03:11	SMS 3391	
Endrin ketone)	ND ug/L	0.010	0.0050	1 03/06/14 00:00	SPR 6346	03/19/14 03:11	SMS 3391	
Heptachlor		ND ug/L	0.010	0.0050	1 03/06/14 00:00	SPR 6346	03/19/14 03:11	SMS 3391	
Heptachlor ep		ND ug/L	0.010	0.0040	1 03/06/14 00:00	SPR 6346	03/19/14 03:11	SMS 3391	
Methoxychlor		ND ug/L	0.010	0.0050	1 03/06/14 00:00	SPR 6346	03/19/14 03:11	SMS 3391	
PCB 1016		ND ug/L	0.10	0.050	1 03/06/14 00:00	SPR 6346	03/19/14 03:11	SMS 3391	
PCB 1221		ND ug/L	0.10	0.050	1 03/06/14 00:00	SPR 6346	03/19/14 03:11	SMS 3391	
PCB 1232		ND ug/L	0.10	0.050	1 03/06/14 00:00	SPR 6346	03/19/14 03:11	SMS 3391	
PCB 1242		ND ug/L	0.10	0.040	1 03/06/14 00:00	SPR 6346	03/19/14 03:11	SMS 3391	
PCB 1248		ND ug/L	0.10	0.050	1 03/06/14 00:00	SPR 6346	03/19/14 03:11	SMS 3391	
PCB 1254		ND ug/L	0.10	0.050	1 03/06/14 00:00	SPR 6346	03/19/14 03:11	SMS 3391	
PCB 1260		ND ug/L	0.10	0.050 0.30	1 03/06/14 00:00 1 03/06/14 00:00	SPR 6346	03/19/14 03:11 03/19/14 03:11	SMS 3391 SMS 3391	
Toxaphene Decachlorobin	nhenyl (SS)	ND ug/L 39 %	0.5 10-195	0.30	1 03/06/14 00:00	SPR 6346 SPR 6346	03/19/14 03:11	SMS 3391	
Tetrachloro-m	, , ,	95 %	25-105		1 03/06/14 00:00	SPR 6346	03/19/14 03:11	SMS 3391	
Pyrethroids Analysis,NO	s+Fipronil	Prep Method:		6 3510C	Prep by:	EAB	33/10/14 00:11	SC 0001	

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2/28/2014 9:55:00 AM

Lab Order: P030135

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P030135004

Lab ID

Project ID: Contra Costa Clean Water Progr

Matrix

Water

Sample ID 207R00011US-W-01 Date Received 3/4/2014 12:21:00 PM

Date Collected

Sample ID 20/R0001105-W-01	Date Red	ceivea 3/4/201	4 12:21:00 F	'IVI				
Parameters	Result Units	R. L.	MDL	DF Prepared	Prepared	Analyzed	Prepared	Qual
	Analytical M	ethod: SW846	8270 Mod		_	Analyzed by:	RLH	
Allethrin	ND ng/L	1.5	0.1	1 03/07/14 00:00	SPR 6351	04/03/14 13:54	SMS 3410	2
Bifenthrin	7.3 ng/L	1.5	0.1	1 03/07/14 00:00	SPR 6351	04/03/14 13:54	SMS 3410	
Cyfluthrin	ND ng/L	1.5	0.2	1 03/07/14 00:00	SPR 6351	04/03/14 13:54	SMS 3410	
Lambda-Cyhalothrin	ND ng/L	1.5	0.2	1 03/07/14 00:00	SPR 6351	04/03/14 13:54	SMS 3410	
Cypermethrin	ND ng/L	1.5	0.2	1 03/07/14 00:00	SPR 6351	04/03/14 13:54	SMS 3410	
Deltamethrin:Tralomethrin	4.7 ng/L	3.0	0.2	1 03/07/14 00:00	SPR 6351	04/03/14 13:54	SMS 3410	
Esfenvalerate:Fenvalerate	ND ng/L	3.0	0.2	1 03/07/14 00:00	SPR 6351	04/03/14 13:54	SMS 3410	
Fenpropathrin	ND ng/L	1.5	0.2	1 03/07/14 00:00	SPR 6351	04/03/14 13:54	SMS 3410	
Fipronil	19 ng/L	1.5	0.5	1 03/07/14 00:00	SPR 6351	04/03/14 13:54	SMS 3410	
Fipronil Desulfinyl	2.9 ng/L	1.5	0.5	1 03/07/14 00:00	SPR 6351	04/03/14 13:54	SMS 3410	
Fipronil Sulfide	J1.3 ng/L	1.5	0.5	1 03/07/14 00:00	SPR 6351	04/03/14 13:54	SMS 3410	
Fipronil Sulfone	14 ng/L	1.5	0.5	1 03/07/14 00:00	SPR 6351	04/03/14 13:54	SMS 3410	
Tau-Fluvalinate	ND ng/L	1.5	0.2	1 03/07/14 00:00	SPR 6351	04/03/14 13:54	SMS 3410	
Permethrin	ND ng/L	15	2	1 03/07/14 00:00	SPR 6351	04/03/14 13:54	SMS 3410	
Tetramethrin	ND ng/L	1.5	0.2	1 03/07/14 00:00	SPR 6351	04/03/14 13:54	SMS 3410	
Esfenvalerate-d6;#1 (SS)	71 %	70-130		1 03/07/14 00:00	SPR 6351	04/03/14 13:54	SMS 3410	
Esfenvalerate-d6;#2 (SS)	71 %	70-130		1 03/07/14 00:00	SPR 6351	04/03/14 13:54	SMS 3410	
Total Organic Carbon Analysis	Analytical M	ethod: SM20-	5310 B			Analyzed by:	NP	
Total Organic Carbon	11 mg/L	1	0.30	1		03/12/14 19:18	WET 7502	



Lab Order: P030135

Project ID: Contra Costa Clean Water Progr

Analysis Description: Suspended Sediment Concentration QC Batch: BIO/13574

QC Batch Method: **Analysis Method:** ASTM D 3977-97 B-Filtration ASTM D 3977-97 B-Filtration

METHOD BLANK: 570093

Blank Reporting **Parameter** Result Limit MDL Units Qualifiers Sediment Concentration ND 3 2 mg/L

LABORATORY CONTROL SAMPLE & LCSD: 570094 570095

Spike LCS **LCSD** LCS **LCSD** % REC Max **Parameter** Units % Rec **RPD RPD Qualifier** Conc. Result Result % Rec Limits **Sediment Concentration** mg/L 500 508 506 102 101 80-120 0.3 20

Analysis Description: Chlorinated Pesticides & PCBs Analysis QC Batch: SPR/6346 QC Batch Method: **Analysis Method: EPA 608 EPA 608**

METHOD BLANK: 570101

Parameter	Result	Reporting Limit	MDL	Units	Qualifiers
Aldrin	ND	0.050	0.004	ug/L	
alpha-BHC	ND	0.050	0.005	ug/L	
beta-BHC	ND	0.050	0.004	ug/L	
delta-BHC	ND	0.050	0.004	ug/L	
gamma-BHC (Lindane)	ND	0.050	0.004	ug/L	
Chlordane	ND	0.50	0.020	ug/L	
4,4'-DDD	ND	0.10	0.004	ug/L	
4,4'-DDE	ND	0.10	0.003	ug/L	
4,4'-DDT	ND	0.10	0.004	ug/L	
Dieldrin	ND	0.10	0.004	ug/L	
Endosulfan I	ND	0.050	0.004	ug/L	
Endosulfan II	ND	0.10	0.005	ug/L	
Endosulfan sulfate	ND	0.10	0.005	ug/L	
Endrin	ND	0.10	0.005	ug/L	
Endrin aldehyde	ND	0.050	0.005	ug/L	
Endrin ketone	ND	0.10	0.005	ug/L	
Heptachlor	ND	0.050	0.005	ug/L	
Heptachlor epoxide	ND	0.050	0.004	ug/L	
Methoxychlor	ND	0.50	0.005	ug/L	
PCB 1016	ND	0.10	0.050	ug/L	
PCB 1221	ND	0.10	0.050	ug/L	
PCB 1232	ND	0.10	0.050	ug/L	
PCB 1242	ND	0.10	0.040	ug/L	
PCB 1248	ND	0.10	0.050	ug/L	
PCB 1254	ND	0.10	0.050	ug/L	
PCB 1260	ND	0.10	0.050	ug/L	

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ENVIRONMENTAL ANALYSES

QUALITY CONTROL DATA

Lab Order: P030135

Project ID: Contra Costa Clean Water Progr

Analysis Description: Chlorinated Pesticides & PCBs Analysis QC Batch: SPR/6346

Analysis Method: EPA 608 QC Batch Method: EPA 608

Parameter	Blank Result	Reporting Limit	MDL	Units	Qualifiers
Toxaphene	ND	1.0	0.3	ug/L	
Decachlorobiphenyl (SS)	42	30-190		%	
Tetrachloro-m-xylene (SS)	78	25-105		%	

LABORATORY CONTROL SAMPLE & LCSD: 570102 570103

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% REC Limits	RPD	Max RPD Qualifier	
										_
Aldrin	ug/L	0.2	0.15	0.16	77	81	42-122	5.1	24	
alpha-BHC	ug/L	0.2	0.16	0.16	79	82	37-134	3.1	30	
beta-BHC	ug/L	0.2	0.14	0.15	71	75	17-147	4.8	30	
delta-BHC	ug/L	0.2	0.14	0.14	70	73	19-140	4.2	30	
gamma-BHC (Lindane)	ug/L	0.2	0.16	0.16	78	81	32-127	3.8	20	
4,4'-DDD	ug/L	0.2	0.16	0.17	82	84	31-141	3	30	
4,4'-DDE	ug/L	0.2	0.16	0.16	79	81	30-145	2.5	30	
4,4'-DDT	ug/L	0.2	0.18	0.19	93	93	25-160	0.5	19	
Dieldrin	ug/L	0.2	0.17	0.17	85	87	36-146	2.3	17	
Endosulfan I	ug/L	0.2	0.16	0.17	82	85	45-153	3.3	30	
Endosulfan II	ug/L	0.2	0.17	0.17	87	86	1-202	0.6	30	
Endosulfan sulfate	ug/L	0.2	0.18	0.18	91	90	26-144	1.1	30	
Endrin	ug/L	0.2	0.14	0.14	69	69	30-147	0.7	18	
Endrin aldehyde	ug/L	0.2	0.18	0.18	92	93	34-105	1.1	30	
Endrin ketone	ug/L	0.2	0.18	0.18	90	89	41-127	0.6	30	
Heptachlor	ug/L	0.2	0.16	0.16	78	80	34-111	2.5	23	
Heptachlor epoxide	ug/L	0.2	0.16	0.17	81	83	37-142	2.4	30	
Methoxychlor	ug/L	0.2	0.18	0.18	90	90	1-186	0	30	
Decachlorobiphenyl (SS)	%				49	46	30-190	7		
Tetrachloro-m-xylene (SS)	%				77	80	25-105	4.5		

Analysis Description:Pyrethroids+Fipronil Analysis,NCI,WaterQC Batch:SPR/6351Analysis Method:SW846 8270 Mod (GCMS-NCI-SIM)QC Batch Method:SW846 3510C

METHOD BLANK: 570428

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Parameter	Blank Result	Reporting Limit	MDL	Units	Qualifiers
Allethrin	ND	1.5	0.1	ng/L	2
Bifenthrin	ND	1.5	0.1	ng/L	
Cyfluthrin	ND	1.5	0.2	ng/L	
Lambda-Cyhalothrin	ND	1.5	0.2	ng/L	
Cypermethrin	ND	1.5	0.2	ng/L	
Deltamethrin:Tralomethrin	ND	3.0	0.2	ng/L	
Esfenvalerate:Fenvalerate	ND	3.0	0.2	ng/L	

REPORT OF LABORATORY ANALYSIS

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ENVIRONMENTAL ANALYSES

QUALITY CONTROL DATA

Lab Order: P030135

Project ID: Contra Costa Clean Water Progr

Analysis Description:Pyrethroids+Fipronil Analysis,NCI,WaterQC Batch:SPR/6351Analysis Method:SW846 8270 Mod (GCMS-NCI-SIM)QC Batch Method:SW846 3510C

Parameter	Blank Result	Reporting Limit	MDL	Units	Qualifiers
Fenpropathrin	ND ND	1.5	0.2	ng/L	_
Fipronil	ND	1.5	0.5	ng/L	
Fipronil Desulfinyl	ND	1.5	0.5	ng/L	
Fipronil Sulfide	ND	1.5	0.5	ng/L	
Fipronil Sulfone	ND	1.5	0.5	ng/L	
Tau-Fluvalinate	ND	1.5	0.2	ng/L	
Permethrin	ND	15	2.0	ng/L	
Tetramethrin	ND	1.5	0.2	ng/L	
Esfenvalerate-d6;#1 (SS)	90	70-130		%	
Esfenvalerate-d6;#2 (SS)	87	70-130		%	

LABORATORY CONTROL SAMPLE & LCSD: 570429 570430

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% REC Limits	RPD	Max RPD Qualifier
Allethrin	 ng/L	20	 16			80	50-150	2.5	35
Bifenthrin	ng/L	20	18	17	88	84	70-165	4.7	35
Cyfluthrin	ng/L	20	18	17	91	84	55-140	7.4	30
Lambda-Cyhalothrin	ng/L	20	20	18	98	89	40-120	9.6	35
Cypermethrin	ng/L	20	19	18	96	89	50-130	7.6	30
Deltamethrin:Tralomethrin	ng/L	40	33	32	83	81	30-105	2.5	40
Esfenvalerate:Fenvalerate	ng/L	40	34	32	86	81	40-140	6.6	35
Fenpropathrin	ng/L	20	27	20	137	103	30-180	29	35
Fipronil	ng/L	20	18	15	88	76	50-150	15	35
Fipronil Desulfinyl	ng/L	20	18	16	89	80	50-150	10	35
Fipronil Sulfide	ng/L	20	17	15	85	76	50-150	11	35
Fipronil Sulfone	ng/L	20	16	15	81	77	50-150	5.7	35
Tau-Fluvalinate	ng/L	20	14	13	69	63	30-100	9.1	40
Permethrin	ng/L	100	110	110	111	108	50-160	2.7	40
Tetramethrin	ng/L	20	16	15	78	76	45-140	2	50
Esfenvalerate-d6;#1 (SS)	%				85	75	70-130	12	
Esfenvalerate-d6;#2 (SS)	%				86	75	70-130	13	

Analysis Description:Total Organic Carbon AnalysisQC Batch:WET/7502Analysis Method:SM20-5310 BQC Batch Method:SM20-5310 B

METHOD BLANK: 571219

4/16/2014 16:05

ParameterResultLimitMDLUnitsQualifiersTotal Organic CarbonND10.3mg/L

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Lab Order: P030135

4/16/2014 16:05

Project ID: Contra Costa Clean Water Progr

Analysis Description:Total Organic Carbon AnalysisQC Batch:WET/7502

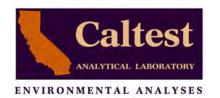
Analysis Method: SM20-5310 B QC Batch Method: SM20-5310 B

LABORATORY CONTROL SAMPLE: 571220

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% REC Limits Qualifier
Total Organic Carbon	mg/L	10	10	101	80-120

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 571221 571222

	P	030133001	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Result	Result	% Rec	% Rec	Limit	RPD	RPD Qualifiers	
Total Organic Carbon	mg/L	8.1	10	18	18	95	95	80-120	0.1	20	



QUALITY CONTROL DATA QUALIFIERS

Lab Order: P030135

Project ID: Contra Costa Clean Water Progr

QUALITY CONTROL PARAMETER QUALIFIERS

Results Qualifiers: Report fields may contain codes and non-numeric data correlating to one or more of the following definitions:

NS - means not spiked and will not have recoveries reported for Analyte Spike Amounts

QC Codes Keys: These descriptors are used to help identify the specific QC samples and clarify the report.

MB - Method Blank

Method Blanks are reported to the same Method Detection Limits (MDLs) or Reporting Limits (RLs) as the analytical samples in the corresponding QC batch.

LCS/LCSD - Laboratory Control Spike / Laboratory Control Spike Duplicate

DUP - Duplicate of Original Sample Matrix

MS/MSD - Matrix Spike / Matrix Spike Duplicate

RPD - Relative Percent Difference

%Recovery - Spike Recovery stated as a percentage

2 Analyte(s) reported as 'ND' means not detected at or above the listed Method Detection Limits (MDL).



ENVIRONMENTAL ANALYSES

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Lab Order: P030135

4/16/2014 16:05

Project ID: Contra Costa Clean Water Progr

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
P030135001	544R00025US-W-02	ASTM D 3977-97	BIO/13574		
P030135002	544R00025DS-W-02	ASTM D 3977-97	BIO/13574		
P030135003	207R00011DS-W-01	ASTM D 3977-97	BIO/13574		
P030135004	207R00011US-W-01	ASTM D 3977-97	BIO/13574		
P030135001	544R00025US-W-02	EPA 608	SPR/6346	EPA 608	SMS/3391
P030135002	544R00025DS-W-02	EPA 608	SPR/6346	EPA 608	SMS/3391
P030135003	207R00011DS-W-01	EPA 608	SPR/6346	EPA 608	SMS/3391
P030135004	207R00011US-W-01	EPA 608	SPR/6346	EPA 608	SMS/3391
P030135001	544R00025US-W-02	SW846 3510C	SPR/6351	SW846 8270 Mod	SMS/3410
P030135002	544R00025DS-W-02	SW846 3510C	SPR/6351	SW846 8270 Mod	SMS/3410
P030135003	207R00011DS-W-01	SW846 3510C	SPR/6351	SW846 8270 Mod	SMS/3410
P030135004	207R00011US-W-01	SW846 3510C	SPR/6351	SW846 8270 Mod	SMS/3410
P030135001	544R00025US-W-02	SM20-5310 B	WET/7502		
P030135002	544R00025DS-W-02	SM20-5310 B	WET/7502		
P030135003	207R00011DS-W-01	SM20-5310 B	WET/7502		
P030135004	207R00011US-W-01	SM20-5310 B	WET/7502		

Caltest

1885 N. KELLY ROAD NAPA, CA 94558 (707) 258-4000 FAX (707) 226-1001

CHAIN OF CUSTODY

Samples WC LICEO BIO BA SU VOA LO VOA TELE CONTRACTOR VOA	RELINQUISHED BY DATE/TIME RECEIVED BY RELIN	Strmwtr HDPE <6C	2 x 1L AG 2 x 1L AG 2 x 1L AG 3 x 40ml <6	2.26:W 1000 Strmwtr 2 x 1L AG <6C 5 Hy R00025 VS-W-02 Strmwtr 2 x 1L AG <6C Strmwtr 3 x 40ml <6C, HCI Strmwtr 250 ml <6C	Sandro Hnatt	ANALYTICAL LABORATORY CCCWP-SSID / 030.001.0202 REPORT ATTN: Allessandro Hnatt
Digested Metals; FE = Low R.L.s, Aqueous Nondrinking Water, Digested Metals; DW = Drinking Water, SL = Soil Sludge, Solid; FFP = Drinking Water, SL = Soil Sludge, Solid; FFP = Drinking Water, SL = Soil Sludge, Solid; FFP = Drinking Water, SL = Amber Liter, AHL = 500 ml Amber; PT = Pint (Plastic); QT = Quart (Plastic); HG = Half Gallion (Plastic); SJ = Soil Jar;	INQUISHED BY DATE/TIME	Grab		Grab x x x X Y (Lack) Ox Grab x x x X (Lack) Dox Grab x x X (Lack) Dox Grab x X (Lack)	95073 TURNAROUND TIME X STANDARD Pyrethroids Pesticides Fipronil Degradates TOC SSC PUEDATE: REMARKS	ANALYSES REQUESTED

ANALYTICAL LABORATORY Caltest

1885 N. KELLY ROAD NAPA, CA 94558 (707) 258-4000 FAX (707) 226-1001

PAGE

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CHAIN OF CUSTODY

FOR LAB USE ONLY PIL 8 CLIENT: 831-477-2003 same as above 3065 Porter St., Suite 101, Soquel ADH Environmental CALTEST LAB# W/HNO. ONH SAMPLED BIO WC H-82.7 품 3 RELINQUISHED BY S 130 MICRO H.SO. SAMPLED 00 WC. P SV 55 831-477-0895 FAX PHONE NUMBER H,SO Strmwtr 3 x 40ml Strmwtr Strmwtr 2 x 1L AG Strmwtr 2 x 1L AG Strmwtr Strmwtr Strmwtr 2 x 1L AG Strmwtr 2 x 1L AG SAMPLE MATRIX* 0 S BIO B 3 x 40ml CONTAINER TYPE/ AMOUNT** 工工 250 ml HDPE 250 ml HDPE NaOH é 3 VOA DATE/TIME CCCWP-SSID / 030.001.0202 PROJECT NAME / PROJECT NUMBER HOBN SAMPLER (PRINT & SIGN NAME): S PRESERVATIVE <6C, HCI 6C, HCI **<6C** <6C 66 60 60 **60** Alessandro Hnatt VOA 프 PHO SAMPLE IDENTIFICATION / SITE 207R00011US-W-01 207R00011US-W-01 207R00011DS-W-01 207R00011US-W-01 207R00011US-W-01 207R00011DS-W-01 207R00011DS-W-01 207R00011DS-W-01 Y/N TEMP: CA Alessandro Hnatt ATTN COMMENTS: SEALED: CLIENT LAB# RELINQUISHED BY NIA GRAB 95073 INTACT: Grab Grab Grab Grab Grab Grab Grab Grab NIA × Organochlorine Pesticides × × Pyrethroids Pesticides × × × Fipronil ANALYSES REQUESTED × × Degradates × × TOC × × SSC DATE/TIME "MATRIX: AQ = Aqueous Nondrinking Water,
Digested Metals; FE = Low R.L.s, Aqueous
Nondrinking Water, Digested Metals; DW =
Drinking Water, SL = Soil Sluudge, Soild; FP =
"CONTAINER TYPES: AL = Amber Liter, AHL =
500 ml Amber, PT = Pint (Plastic); OT = Quart
(Plastic); HG = Half Gallon (Plastic); SJ = Soil Jar,
B4 = 4qz. BACT; BT = Brass Tube; VOA = 40mL
VOA; OTC - Other Type Container LAB ORDER # DUE DATE: Frecoot Ment will Lab past Fild 643 유 TURN-AROUND TIME X STANDARD RECEIVED BY REMARKS RUSH × 8 d YELLOW - CLIENT COPY TO ACCOMPANY FINAL REPORT. PINK - CLIENT COPY AS RECEIPT



Wednesday, April 16, 2014

Alessandro Hnatt ADH Environmental 3065 Porter Street, Suite 101 Soquel, CA 95073

Lab Order: P031034 Re

> CCCWP-SSID/030.001.0202 Project ID:

Collected By:

CLIENT

PO/Contract #:

Dear Alessandro Hnatt:

Enclosed are the analytical results for sample(s) received by the laboratory on Wednesday, March 26, 2014. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Enclosures

Project Manager: Todd Albertson



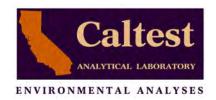
ENVIRONMENTAL ANALYSES SAMPLE SUMMARY

Lab Order: P031034

4/16/2014 13:29

Project ID: CCCWP-SSID/030.001.0202

Lab ID	Sample ID	<u>Matrix</u>	Date Collected	Date Received
P031034001	207R00011DS-W-02	Water	03/26/2014 14:00	03/26/2014 14:00
P031034002	207R00011US-W-02	Water	03/26/2014 12:40	03/26/2014 12:40



NARRATIVE

Lab Order: P031034

Project ID: CCCWP-SSID/030.001.0202

General Qualifiers and Notes

Caltest authorizes this report to be reproduced only in its entirety. Results are specific to the sample(s) as submitted and only to the parameter(s) reported.

Caltest certifies that all test results for wastewater and hazardous waste analyses meet all applicable NELAC requirements; all microbiology and drinking water testing meet applicable ELAP requirements, unless stated otherwise.

All analyses performed by EPA Methods or Standard Methods (SM) 20th Edition except where noted (SMOL=online edition).

Caltest collects samples in compliance with 40 CFR, EPA Methods, Cal. Title 22, and Standard Methods.

Dilution Factors (DF) reported greater than '1' have been used to adjust the result, Reporting Limit (RL), and Method Detection Limit (MDL).

All Solid, sludge, and/or biosolids data is reported in Wet Weight, unless otherwise specified.

Filtrations performed at Caltest for dissolved metals (excluding mercury) and/or pH analysis were not performed within the 15 minute holding time as specified by 40CFR 136.3 table II.

Results Qualifiers: Report fields may contain codes and non-numeric data correlating to one or more of the following definitions:

ND - Non Detect - indicates analytical result has not been detected.

RL - Reporting Limit is the quantitation limit at which the laboratory is able to detect an analyte. An analyte not detected at or above the RL is reported as ND unless otherwise noted or qualified. For analyses pertaining to the State Implementation Plan of the California Toxics Rule, the Caltest Reporting Limit (RL) is equivalent to the Minimum Level (ML). A standard is always run at or below the ML. Where Reporting Limits are elevated due to dilution, the ML calibration criteria has been met.

- J reflects estimated analytical result value detected below the Reporting Limit (RL) and above the Method Detection Limit (MDL). The 'J' flag is equivalent to the DNQ Estimated Concentration flag.
- E indicates an estimated analytical result value.
- B indicates the analyte has been detected in the blank associated with the sample.
- NC means not able to be calculated for RPD or Spike Recoveries.
- SS compound is a Surrogate Spike used per laboratory quality assurance manual.

NOTE: This document represents a complete Analytical Report for the samples referenced herein and should be retained as a permanent record thereof.

Qualifiers and Compound Notes

1	nalyte(s) reported as 'ND' means not detected at or above the listed Method Detection Limits (MDL).

- 2 Sample diluted due to a high concentration of non-target analyte(s), resulting in increased reporting limits.
- 3 This analysis is not covered under Caltest's NELAP/CAL-ELAP Accreditations.
- 4 Due to matrix interferences present in the sample, surrogate recoveries failed to meet the QA/QC acceptance criteria.
- 5 Reporting Limits may be elevated due to limited sample volume.



ANALYTICAL RESULTS

Lab Order: P031034

Project ID: CCCWP-SSID/030.001.0202

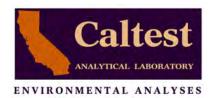
Lab ID P031034001 **Date Collected** 3/26/2014 2:00:00 PM Matrix Water

Sample ID 207R00011DS-W-02	Date Receive	ed 3/26/201	4 3:18:00 F	PM				
Parameters I	Result Units	R. L.	MDL	DF Prepared	Prepared	Analyzed	Prepared	Qual
Suspended Sediment Concentration	Analytical Metho	od: ASTM D	3977-97 B	-Filtration		Analyzed by:	CFG	
Sediment Concentration	14 mg/L	3	2	1		04/01/14 09:41	BIO 13669	3
Chlorinated Pesticides & PCBs Analysis	Prep Method:	EPA 608		Prep by:	NTA			
	Analytical Metho	d: EPA 608				Analyzed by:	NTA	
Aldrin	ND ug/L	0.005	0.0040	1 04/02/14 00:00	SPR 6386	04/09/14 22:45	SMS 3412	1
alpha-BHC	ND ug/L	0.010	0.0050	1 04/02/14 00:00	SPR 6386	04/09/14 22:45	SMS 3412	
beta-BHC	ND ug/L	0.005	0.0040	1 04/02/14 00:00	SPR 6386	04/09/14 22:45	SMS 3412	
delta-BHC	ND ug/L	0.005	0.0040	1 04/02/14 00:00	SPR 6386	04/09/14 22:45	SMS 3412	
gamma-BHC (Lindane)	ND ug/L	0.010	0.0040	1 04/02/14 00:00	SPR 6386	04/09/14 22:45	SMS 3412	
Chlordane	ND ug/L	0.050	0.020	1 04/02/14 00:00	SPR 6386	04/09/14 22:45	SMS 3412	
4,4'-DDD	ND ug/L	0.010	0.0040	1 04/02/14 00:00	SPR 6386	04/09/14 22:45	SMS 3412	
4,4'-DDE	ND ug/L	0.010	0.0030	1 04/02/14 00:00	SPR 6386	04/09/14 22:45	SMS 3412	
4,4'-DDT	ND ug/L	0.010	0.0040	1 04/02/14 00:00	SPR 6386	04/09/14 22:45	SMS 3412	
Dieldrin	ND ug/L	0.010	0.0040	1 04/02/14 00:00	SPR 6386	04/09/14 22:45	SMS 3412	
Endosulfan I	ND ug/L	0.010	0.0040	1 04/02/14 00:00	SPR 6386	04/09/14 22:45	SMS 3412	
Endosulfan II	ND ug/L	0.010	0.0050	1 04/02/14 00:00	SPR 6386	04/09/14 22:45	SMS 3412	
Endosulfan sulfate	ND ug/L	0.010	0.0050	1 04/02/14 00:00	SPR 6386	04/09/14 22:45	SMS 3412	
Endrin	ND ug/L	0.010	0.0050	1 04/02/14 00:00	SPR 6386	04/09/14 22:45	SMS 3412	
Endrin aldehyde	ND ug/L	0.010	0.0050	1 04/02/14 00:00	SPR 6386	04/09/14 22:45	SMS 3412	
Endrin ketone	ND ug/L	0.010	0.0050	1 04/02/14 00:00	SPR 6386	04/09/14 22:45	SMS 3412	
Heptachlor	ND ug/L	0.010	0.0050	1 04/02/14 00:00	SPR 6386	04/09/14 22:45	SMS 3412	
Heptachlor epoxide	ND ug/L	0.010	0.0040	1 04/02/14 00:00	SPR 6386	04/09/14 22:45	SMS 3412	
Methoxychlor	ND ug/L	0.010	0.0050	1 04/02/14 00:00	SPR 6386	04/09/14 22:45	SMS 3412	
PCB 1016	ND ug/L	0.10	0.050	1 04/02/14 00:00	SPR 6386	04/09/14 22:45	SMS 3412	
PCB 1221	ND ug/L	0.10	0.050	1 04/02/14 00:00	SPR 6386	04/09/14 22:45	SMS 3412	
PCB 1232	ND ug/L	0.10	0.050	1 04/02/14 00:00	SPR 6386	04/09/14 22:45	SMS 3412	
PCB 1242	ND ug/L	0.10	0.040	1 04/02/14 00:00	SPR 6386	04/09/14 22:45	SMS 3412	
PCB 1248	ND ug/L	0.10	0.050	1 04/02/14 00:00	SPR 6386	04/09/14 22:45	SMS 3412	
PCB 1254	ND ug/L	0.10	0.050	1 04/02/14 00:00	SPR 6386	04/09/14 22:45	SMS 3412	
PCB 1260	ND ug/L	0.10	0.050	1 04/02/14 00:00	SPR 6386	04/09/14 22:45	SMS 3412	
Toxaphene	ND ug/L	0.5	0.30	1 04/02/14 00:00	SPR 6386	04/09/14 22:45	SMS 3412	
Decachlorobiphenyl (SS)	59 %	10-195	0.00	1 04/02/14 00:00	SPR 6386	04/09/14 22:45	SMS 3412	
Tetrachloro-m-xylene (SS)	62 %	25-105		1 04/02/14 00:00	SPR 6386	04/09/14 22:45	SMS 3412	
Pyrethroids+Fipronil Analysis,NCI,Water	Prep Method:	SW846	3510C	Prep by:	EAB			
	Analytical Metho	d: SW846 8	3270 Mod			Analyzed by:	RLH	
Allethrin	ND ng/L	1.5	0.2	2 03/28/14 00:00	SPR 6382	04/13/14 06:25	SMS 3416	1,2
Bifenthrin	4.2 ng/L	1.5	0.2	2 03/28/14 00:00	SPR 6382	04/13/14 06:25	SMS 3416	•
Cyfluthrin	J0.9 ng/L	1.5	0.4	2 03/28/14 00:00	SPR 6382	04/13/14 06:25	SMS 3416	
Lambda-Cyhalothrin	ND ng/L	1.5	0.4	2 03/28/14 00:00	SPR 6382	04/13/14 06:25	SMS 3416	
Cypermethrin	J0.7 ng/L	1.5	0.4	2 03/28/14 00:00	SPR 6382	04/13/14 06:25	SMS 3416	
Deltamethrin:Tralomethrin	ND ng/L	3.0	0.4	2 03/28/14 00:00	SPR 6382	04/13/14 06:25	SMS 3416	
Esfenvalerate:Fenvalerate	ND ng/L	3.0	0.4	2 03/28/14 00:00	SPR 6382	04/13/14 06:25	SMS 3416	
Fenpropathrin	ND ng/L	1.5	0.4	2 03/28/14 00:00	SPR 6382	04/13/14 06:25	SMS 3416	
	-							

4/16/2014 13:29

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Lab Order: P031034

Project ID: CCCWP-SSID/030.001.0202

Lab ID P031034001 Sample ID 207R00011DS-W-02	Date Collected Date Received		4 2:00:00 P 4 3:18:00 P		Water			
Parameters	Result Units	R. L.	MDL	DF Prepared	Prepared	Analyzed	Prepared	Qual
Fipronil	12 ng/L	2.0	1	2 03/28/14 00:00	SPR 6382	04/13/14 06:25	SMS 3416	
Fipronil Desulfinyl	3.5 ng/L	2.0	1	2 03/28/14 00:00	SPR 6382	04/13/14 06:25	SMS 3416	
Fipronil Sulfide	2.6 ng/L	2.0	1	2 03/28/14 00:00	SPR 6382	04/13/14 06:25	SMS 3416	
Fipronil Sulfone	6.8 ng/L	2.0	1	2 03/28/14 00:00	SPR 6382	04/13/14 06:25	SMS 3416	
Tau-Fluvalinate	ND ng/L	1.5	0.4	2 03/28/14 00:00	SPR 6382	04/13/14 06:25	SMS 3416	
Permethrin	J12 ng/L	20	4	2 03/28/14 00:00	SPR 6382	04/13/14 06:25	SMS 3416	
Tetramethrin	ND ng/L	1.5	0.4	2 03/28/14 00:00	SPR 6382	04/13/14 06:25	SMS 3416	
Esfenvalerate-d6;#1 (SS)	69 %	70-130		2 03/28/14 00:00	SPR 6382	04/13/14 06:25	SMS 3416	4
Esfenvalerate-d6;#2 (SS)	70 %	70-130		2 03/28/14 00:00	SPR 6382	04/13/14 06:25	SMS 3416	
Total Organic Carbon Analysis Total Organic Carbon	Analytical Method	d: SM20-53	310 B 0.30	1		Analyzed by: 04/01/14 00:50	NP WET 7533	
Lab ID P031034002 Sample ID 207R00011US-W-02	Date Collected		4 12:40:00 4 3:18:00 P		Water			
Sample 1D 207 K0001103-W-02	Date Received	J 3/26/201	14 3:16:00 P	IVI				
Parameters	Result Units	R. L.	MDL	DF Prepared	Prepared	Analyzed	Prepared	Qual
Suspended Sediment Concentration	on Analytical Method	d: ASTM D	3977-97 B-	Filtration		Analyzed by:	CFG	
Sediment Concentration	13 mg/L	3	2	1		04/01/14 09:41	BIO 13669	3
Chlorinated Pesticides & PCBs Analysis	Prep Method:	EPA 608	3	Prep by:	NTA			
•	Analytical Method	d: EPA 608	3			Analyzed by:	NTA	
Aldrin	ND ug/L	0.006	0.0049	1 04/02/14 00:00	SPR 6386	04/09/14 23:12	SMS 3412	1,5
alpha-BHC	ND ug/L	0.010	0.0061	1 04/02/14 00:00	SPR 6386	04/09/14 23:12	SMS 3412	
beta-BHC	ND ug/L	0.006	0.0049	1 04/02/14 00:00	SPR 6386	04/09/14 23:12	SMS 3412	
delta-BHC	ND ug/L	0.006	0.0049	1 04/02/14 00:00	SPR 6386	04/09/14 23:12	SMS 3412	
gamma-BHC (Lindane)	ND ug/L	0.010	0.0049	1 04/02/14 00:00	SPR 6386	04/09/14 23:12	SMS 3412	
Chlordane	ND ug/L	0.061	0.024	1 04/02/14 00:00	SPR 6386	04/09/14 23:12	SMS 3412	
4,4'-DDD	ND ug/L	0.010	0.0049	1 04/02/14 00:00	SPR 6386	04/09/14 23:12	SMS 3412	
4,4'-DDE	ND ug/L	0.010	0.0037	1 04/02/14 00:00	SPR 6386	04/09/14 23:12	SMS 3412	
4,4'-DDT	ND ug/L	0.010	0.0049	1 04/02/14 00:00	SPR 6386	04/09/14 23:12	SMS 3412	
Dieldrin	ND ug/L	0.010	0.0049	1 04/02/14 00:00	SPR 6386	04/09/14 23:12	SMS 3412	
Endosulfan I	ND ug/L	0.010	0.0049	1 04/02/14 00:00	SPR 6386	04/09/14 23:12	SMS 3412	
Endosulfan II	ND ug/L	0.010	0.0061	1 04/02/14 00:00	SPR 6386	04/09/14 23:12	SMS 3412	
Endosulfan sulfate	ND ug/L	0.010	0.0061	1 04/02/14 00:00	SPR 6386	04/09/14 23:12	SMS 3412	
Endrin	ND ug/L	0.010	0.0061	1 04/02/14 00:00	SPR 6386	04/09/14 23:12	SMS 3412	
Endrin aldehyde	ND ug/L	0.010	0.0061	1 04/02/14 00:00	SPR 6386	04/09/14 23:12	SMS 3412	
Endrin ketone	ND ug/L	0.010	0.0061	1 04/02/14 00:00	SPR 6386	04/09/14 23:12	SMS 3412	
Heptachlor	ND ug/L	0.010	0.0061	1 04/02/14 00:00	SPR 6386	04/09/14 23:12	SMS 3412	
Heptachlor epoxide	ND ug/L	0.010	0.0049	1 04/02/14 00:00	SPR 6386	04/09/14 23:12	SMS 3412	
Methoxychlor	ND ug/L	0.010	0.0061	1 04/02/14 00:00	SPR 6386	04/09/14 23:12	SMS 3412	
PCB 1016	ND ug/L	0.12	0.061	1 04/02/14 00:00	SPR 6386	04/09/14 23:12	SMS 3412	
PCB 1221	ND ug/L	0.12	0.061	1 04/02/14 00:00	SPR 6386	04/09/14 23:12	SMS 3412	
PCB 1232	ND ug/L	0.12	0.061	1 04/02/14 00:00	SPR 6386	04/09/14 23:12	SMS 3412	

4/16/2014 13:29

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Lab Order: P031034

4/16/2014 13:29

Project ID: CCCWP-SSID/030.001.0202

Lab ID P031034002	Date Collecte	d 3/26/	2014 12:40:00	PM Matrix	Water			
Sample ID 207R00011US-W-02	Date Receive	d 3/26/	2014 3:18:00 P	M				
Parameters	Result Units	R. L.	MDL	DF Prepared	Prepared	Analyzed	Prepared	Qual
PCB 1242	ND ug/L	0.12	0.049	1 04/02/14 00:00	SPR 6386	04/09/14 23:12	SMS 3412	
PCB 1248	ND ug/L	0.12	0.061	1 04/02/14 00:00	SPR 6386	04/09/14 23:12	SMS 3412	
PCB 1254	ND ug/L	0.12	0.061	1 04/02/14 00:00	SPR 6386	04/09/14 23:12	SMS 3412	
PCB 1260	ND ug/L	0.12	0.061	1 04/02/14 00:00	SPR 6386	04/09/14 23:12	SMS 3412	
Toxaphene	ND ug/L	0.6	0.37	1 04/02/14 00:00	SPR 6386	04/09/14 23:12	SMS 3412	
Decachlorobiphenyl (SS)	57 %	10-195		1 04/02/14 00:00	SPR 6386	04/09/14 23:12	SMS 3412	
Tetrachloro-m-xylene (SS)	63 %	25-105		1 04/02/14 00:00	SPR 6386	04/09/14 23:12	SMS 3412	
Pyrethroids+Fipronil	Prep Method:	SW8	46 3510C	Prep by:	EAB			
Analysis,NCI,Water	Amalustical Mathe	d- C///O	40 0070 Mad			A maluma d lave	DIII	
A Haraka aira	Analytical Metho		46 8270 Mod	0.00/00/44.00:00	CDD cooo	Analyzed by: 04/13/14 10:11	RLH	4.0
Allethrin Bifenthrin	ND ng/L	1.5	0.2 0.2	2 03/28/14 00:00	SPR 6382 SPR 6382		SMS 3416 SMS 3416	1,2
Cyfluthrin	11 ng/L	1.5 1.5	0.2	2 03/28/14 00:00 2 03/28/14 00:00	SPR 6382 SPR 6382	04/13/14 10:11 04/13/14 10:11	SMS 3416	
•	J1.1 ng/L J1.1 ng/L	1.5	0.4	2 03/28/14 00:00	SPR 6382 SPR 6382	04/13/14 10:11	SMS 3416	
Lambda-Cyhalothrin Cypermethrin	ND ng/L	1.5	0.4	2 03/28/14 00:00	SPR 6382 SPR 6382	04/13/14 10:11	SMS 3416	
Deltamethrin:Tralomethrin	ND ng/L	3.0	0.4	2 03/28/14 00:00	SPR 6382	04/13/14 10:11	SMS 3416	
Esfenvalerate:Fenvalerate	ND ng/L	3.0	0.4	2 03/28/14 00:00	SPR 6382	04/13/14 10:11	SMS 3416	
Fenpropathrin	ND ng/L	1.5	0.4	2 03/28/14 00:00	SPR 6382	04/13/14 10:11	SMS 3416	
Fipronil	15 ng/L	2.0	1	2 03/28/14 00:00	SPR 6382	04/13/14 10:11	SMS 3416	
Fipronil Desulfinyl	6.5 ng/L	2.0	1	2 03/28/14 00:00	SPR 6382	04/13/14 10:11	SMS 3416	
Fipronil Sulfide	J1.4 ng/L	2.0	1	2 03/28/14 00:00	SPR 6382	04/13/14 10:11	SMS 3416	
Fipronil Sulfone	11 ng/L	2.0	1	2 03/28/14 00:00	SPR 6382	04/13/14 10:11	SMS 3416	
Tau-Fluvalinate	ND ng/L	1.5	0.4	2 03/28/14 00:00	SPR 6382	04/13/14 10:11	SMS 3416	
Permethrin	ND ng/L	20	4	2 03/28/14 00:00	SPR 6382	04/13/14 10:11	SMS 3416	
Tetramethrin	ND ng/L	1.5	0.4	2 03/28/14 00:00	SPR 6382	04/13/14 10:11	SMS 3416	
Esfenvalerate-d6;#1 (SS)	75 %	70-130		2 03/28/14 00:00	SPR 6382	04/13/14 10:11	SMS 3416	
Esfenvalerate-d6;#2 (SS)	75 %	70-130		2 03/28/14 00:00	SPR 6382	04/13/14 10:11	SMS 3416	
Total Organic Carbon Analysis	Analytical Metho	d: SM2	0-5310 B			Analyzed by:	NP	
Total Organic Carbon	11 mg/L	1	0.30	1		04/01/14 01:04	WET 7533	



QUALITY CONTROL DATA

Lab Order: P031034

Project ID: CCCWP-SSID/030.001.0202

Analysis Description: Suspended Sediment Concentration QC Batch: BIO/13669

Analysis Method: ASTM D 3977-97 B-Filtration QC Batch Method: ASTM D 3977-97 B-Filtration

METHOD BLANK: 574708

ParameterBlank ResultReporting LimitMDLUnitsQualifiersSediment ConcentrationND32mg/L

LABORATORY CONTROL SAMPLE & LCSD: 574709 574762

Spike LCS **LCSD** LCS **LCSD** % REC Max % Rec **Parameter** Units Result **RPD RPD Qualifier** Conc. Result % Rec Limits **Sediment Concentration** mg/L 500 477 484 95 97 80-120 1.5 20

Analysis Description:Chlorinated Pesticides & PCBs AnalysisQC Batch:SPR/6386Analysis Method:EPA 608QC Batch Method:EPA 608

Analysis Method: EPA 606

METHOD BLANK: 574847

Parameter	Blank Result	Reporting Limit	MDL	Units	Qualifiers
				. —	
Aldrin	ND	0.050	0.004	ug/L	
alpha-BHC	ND	0.050	0.005	ug/L	
beta-BHC	ND	0.050	0.004	ug/L	
delta-BHC	ND	0.050	0.004	ug/L	
gamma-BHC (Lindane)	ND	0.050	0.004	ug/L	
Chlordane	ND	0.50	0.020	ug/L	
4,4'-DDD	ND	0.10	0.004	ug/L	
4,4'-DDE	ND	0.10	0.003	ug/L	
4,4'-DDT	ND	0.10	0.004	ug/L	
Dieldrin	ND	0.10	0.004	ug/L	
Endosulfan I	ND	0.050	0.004	ug/L	
Endosulfan II	ND	0.10	0.005	ug/L	
Endosulfan sulfate	ND	0.10	0.005	ug/L	
Endrin	ND	0.10	0.005	ug/L	
Endrin aldehyde	ND	0.050	0.005	ug/L	
Endrin ketone	ND	0.10	0.005	ug/L	
Heptachlor	ND	0.050	0.005	ug/L	
Heptachlor epoxide	ND	0.050	0.004	ug/L	
Methoxychlor	ND	0.50	0.005	ug/L	
PCB 1016	ND	0.10	0.050	ug/L	
PCB 1221	ND	0.10	0.050	ug/L	
PCB 1232	ND	0.10	0.050	ug/L	
PCB 1242	ND	0.10	0.040	ug/L	
PCB 1248	ND	0.10	0.050	ug/L	
PCB 1254	ND	0.10	0.050	ug/L	
PCB 1260	ND	0.10	0.050	ug/L	

4/16/2014 13:29

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Lab Order: P031034

Project ID: CCCWP-SSID/030.001.0202

Analysis Description: Chlorinated Pesticides & PCBs Analysis QC Batch: SPR/6386

Analysis Method: EPA 608 QC Batch Method: EPA 608

Parameter	Blank Result	Reporting Limit	MDL	Units	Qualifiers
Toxaphene	ND	1.0	0.3	ug/L	
Decachlorobiphenyl (SS)	46	30-190		%	
Tetrachloro-m-xylene (SS)	62	25-105		%	

LABORATORY CONTROL SAMPLE & LCSD: 574848 574849

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% REC Limits	RPD	Max RPD Qualifier
Aldria									
Aldrin	ug/L	0.2	0.14	0.15	68	74	42-122	8.5	24
alpha-BHC	ug/L	0.2	0.14	0.16	71	79	37-134	11	30
beta-BHC	ug/L	0.2	0.14	0.15	68	74	17-147	9.2	30
delta-BHC	ug/L	0.2	0.12	0.13	62	67	19-140	7.8	30
gamma-BHC (Lindane)	ug/L	0.2	0.14	0.15	70	76	32-127	8.9	20
4,4'-DDD	ug/L	0.2	0.15	0.16	76	81	31-141	5.8	30
4,4'-DDE	ug/L	0.2	0.14	0.15	73	77	30-145	6	30
4,4'-DDT	ug/L	0.2	0.16	0.17	78	85	25-160	8.6	19
Dieldrin	ug/L	0.2	0.16	0.17	79	85	36-146	8	17
Endosulfan I	ug/L	0.2	0.15	0.16	76	82	45-153	7.9	30
Endosulfan II	ug/L	0.2	0.16	0.17	78	84	1-202	7.5	30
Endosulfan sulfate	ug/L	0.2	0.16	0.18	81	90	26-144	11	30
Endrin	ug/L	0.2	0.15	0.16	75	80	30-147	7.1	18
Endrin aldehyde	ug/L	0.2	0.18	0.2	92	99	34-105	6.8	30
Endrin ketone	ug/L	0.2	0.16	0.17	79	86	41-127	8.5	30
Heptachlor	ug/L	0.2	0.14	0.15	71	77	34-111	8.8	23
Heptachlor epoxide	ug/L	0.2	0.15	0.17	77	83	37-142	8.2	30
Methoxychlor	ug/L	0.2	0.15	0.17	76	83	1-186	9.5	30
Decachlorobiphenyl (SS)	%				48	54	30-190	11	
Tetrachloro-m-xylene (SS)	%				63	69	25-105	9.9	

Analysis Description:Pyrethroids+Fipronil Analysis,NCI,WaterQC Batch:SPR/6382Analysis Method:SW846 8270 Mod (GCMS-NCI-SIM)QC Batch Method:SW846 3510C

METHOD BLANK: 574094

4/16/2014 13:29

Parameter	Blank Result	Reporting Limit	MDL	Units	Qualifiers
Allethrin	ND ND	1.5	0.1	ng/L	1
Bifenthrin	ND	1.5	0.1	ng/L	
Cyfluthrin	ND	1.5	0.2	ng/L	
Lambda-Cyhalothrin	ND	1.5	0.2	ng/L	
Cypermethrin	ND	1.5	0.2	ng/L	
Deltamethrin:Tralomethrin	ND	3.0	0.2	ng/L	
Esfenvalerate:Fenvalerate	ND	3.0	0.2	ng/L	

REPORT OF LABORATORY ANALYSIS

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ENVIRONMENTAL ANALYSES

QUALITY CONTROL DATA

Lab Order: P031034

Project ID: CCCWP-SSID/030.001.0202

Analysis Description:Pyrethroids+Fipronil Analysis,NCI,WaterQC Batch:SPR/6382Analysis Method:SW846 8270 Mod (GCMS-NCI-SIM)QC Batch Method:SW846 3510C

Parameter	Blank Result	Reporting Limit	MDL	Units	Qualifiers
- Fenpropathrin	ND	1.5	0.2	ng/L	-
Fipronil	ND	1.5	0.5	ng/L	
Fipronil Desulfinyl	ND	1.5	0.5	ng/L	
Fipronil Sulfide	ND	1.5	0.5	ng/L	
Fipronil Sulfone	ND	1.5	0.5	ng/L	
Tau-Fluvalinate	ND	1.5	0.2	ng/L	
Permethrin	ND	15	2.0	ng/L	
Tetramethrin	ND	1.5	0.2	ng/L	
Esfenvalerate-d6;#1 (SS)	68	70-130		%	6,
Esfenvalerate-d6;#2 (SS)	68	70-130		%	6,,

LABORATORY CONTROL SAMPLE & LCSD: 574095 574096

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% REC Limits	RPD	Max RPD Qualifier
Allethrin	ng/L	20				94	50-150		35
Bifenthrin	ng/L	20	18	19	91	93	70-165	2.2	35
Cyfluthrin	ng/L	20	17	18	84	92	55-140	9.7	30
Lambda-Cyhalothrin	ng/L	20	16	17	78	85	40-120	9.2	35
Cypermethrin	ng/L	20	18	19	92	96	50-130	4.3	30
Deltamethrin:Tralomethrin	ng/L	40	31	33	78	83	30-105	5.9	40
Esfenvalerate:Fenvalerate	ng/L	40	34	35	84	88	40-140	4.1	35
Fenpropathrin	ng/L	20	21	23	106	114	30-180	7.3	35
Fipronil	ng/L	20	16	16	79	78	50-150	1.9	35
Fipronil Desulfinyl	ng/L	20	16	15	82	77	50-150	6.9	35
Fipronil Sulfide	ng/L	20	17	16	85	80	50-150	6.7	35
Fipronil Sulfone	ng/L	20	16	14	81	71	50-150	13	35
Tau-Fluvalinate	ng/L	20	13	13	64	65	30-100	1.6	40
Permethrin	ng/L	100	75	84	75	84	50-160	12	40
Tetramethrin	ng/L	20	16	16	82	81	45-140	0.6	50
Esfenvalerate-d6;#1 (SS)	%				79	80	70-130	1.9	
Esfenvalerate-d6;#2 (SS)	%				79	81	70-130	2.9	

Analysis Description:Total Organic Carbon AnalysisQC Batch:WET/7533Analysis Method:SM20-5310 BQC Batch Method:SM20-5310 B

METHOD BLANK: 574492

4/16/2014 13:29

ParameterResultReporting
ResultMDLUnitsQualifiersTotal Organic CarbonND10.3mg/L

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Lab Order: P031034

4/16/2014 13:29

Project ID: CCCWP-SSID/030.001.0202

Analysis Description:Total Organic Carbon AnalysisQC Batch:WET/7533

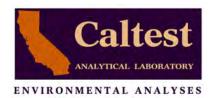
Analysis Method: SM20-5310 B QC Batch Method: SM20-5310 B

LABORATORY CONTROL SAMPLE: 574493

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% REC Limits Qualifier
Total Organic Carbon	mg/L	10	10	101	80-120

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 574497 574498

	ı	P031026001	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Result	Result	% Rec	% Rec	Limit	RPD	RPD Qualifiers	
Total Organic Carbon	mg/L	3.6	10	13	13	93	93	80-120	0.1	20	



QUALITY CONTROL DATA QUALIFIERS

Lab Order: P031034

Project ID: CCCWP-SSID/030.001.0202

QUALITY CONTROL PARAMETER QUALIFIERS

Results Qualifiers: Report fields may contain codes and non-numeric data correlating to one or more of the following definitions:

NS - means not spiked and will not have recoveries reported for Analyte Spike Amounts

QC Codes Keys: These descriptors are used to help identify the specific QC samples and clarify the report.

MB - Method Blank

Method Blanks are reported to the same Method Detection Limits (MDLs) or Reporting Limits (RLs) as the analytical samples in the corresponding QC batch.

LCS/LCSD - Laboratory Control Spike / Laboratory Control Spike Duplicate

DUP - Duplicate of Original Sample Matrix

MS/MSD - Matrix Spike / Matrix Spike Duplicate

RPD - Relative Percent Difference

%Recovery - Spike Recovery stated as a percentage

- 1 Analyte(s) reported as 'ND' means not detected at or above the listed Method Detection Limits (MDL).
- 6 Surrogate recoveries were not within QC Acceptance Criteria.



ENVIRONMENTAL ANALYSES

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Lab Order: P031034

4/16/2014 13:29

Project ID: CCCWP-SSID/030.001.0202

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
P031034001	207R00011DS-W-02	ASTM D 3977-97	BIO/13669		
P031034002	207R00011US-W-02	ASTM D 3977-97	BIO/13669		
P031034001	207R00011DS-W-02	SW846 3510C	SPR/6382	SW846 8270 Mod	SMS/3416
P031034002	207R00011US-W-02	SW846 3510C	SPR/6382	SW846 8270 Mod	SMS/3416
P031034001	207R00011DS-W-02	EPA 608	SPR/6386	EPA 608	SMS/3412
P031034002	207R00011US-W-02	EPA 608	SPR/6386	EPA 608	SMS/3412
P031034001	207R00011DS-W-02	SM20-5310 B	WET/7533		
P031034002	207R00011US-W-02	SM20-5310 B	WET/7533		

ANALYTICAL LABORATORY Caltest

> 1885 N. KELLY ROAD NAPA, CA 94558 (707) 258-4000 FAX (707) 226-1001 CHAIN OF CUSTODY

PAGE

OF

ADH Environmental CLIENT: same as above 3065 Porter St., Suite 101, Soquel CALTEST LAB# 831-477-2003 Samples: W/HNO, 3-26-14 HNO SAMPLED BIO WC 픙 3 2 RELINQUISHED BY H2504 MICRO SAMPLED WC VS PT 7:47 1 831-477-0895 FAX PHONE NUMBER: H-SO. Strmwtr 2 x 1L AG Strmwtr 2 x 1L AG Strmwtr 2 x 1L AG Strmwtr Strmwtr Strmwtr Strmwtr Strmwtr 2 x 1L AG MATRIX* WOA BIO 9 3 J³ 3 x 40ml 3 x 40ml CONTAINER TYPE/ AMOUNT** 250 ml HDPE 250 ml HDPE NaOH VOA A 13 DATE/TIME CCCWP-SSID / 030.001.0202 PROJECT NAME / PROJECT NUMBER: NaOH SAMPLER (PRINT & SIGN NAME) VS PRESERVATIVE <6C, HCI <6C, HCI **^6C** <6C **^6C ^6C 60** <6C Alessandro Hnatt VOA 된 SAMPLE IDENTIFICATION / SITE PH? RACENED BY 207R00011US-W-02 207R00011DS-W-01 207R00011US-W-01 207R00011US-W-01 207R00011US-W-01 207R00011DS-W-02 207R00011DS-W-02 207R00011DS-W-01 X TEMP: CA ATTN: Alessandro Hnatt COMMENTS: SEALED: CLIENT LAB# RELINQUISHED BY NIA GRAB Grab 95073 INTACT: Grab Grab Grab Grab Grab Grab Grab NIA × × Organochlorine Pesticides × Pyrethroids Pesticides × P.O. NUMBER × Fipronil ANALYSES REQUESTED × × Degradates × × TOC × × SSC DATE/TIME (Plastic); HG = Half Gallon (Plastic); SJ = Soil Jar; B4 = 4oz. BACT; BT = Brass Tube; VOA = 40mL VOA; OTC - Other Type Container **CONTAINER TYPES: AL = Amber Liter, AHL 500 ml Amber; PT = Pint (Plastic); QT = Quart *MATRIX: AQ = Aqueous Nondrinking Water,
Digested Metals; FE = Low R.L.s, Aqueous
Nondrinking Water, Digested Metals; DW =
Drinking Water, SL = Soil Sludge, Solid; FP = LAB ORDER # D DUE DATE: 유 TURN-AROUND TIME X STANDARD Type Container RECEIVED BY REMARKS RUSH Z 00

FOR LAB USE ONLY

9

1885 N. KELLY ROAD NAPA, CA 94558 CHAIN OF CUSTODY (707) 258-4000 FAX (707) 226-1001

CLIENT: MAILING ADDRESS CALTEST LAB # 831-477-2003 same as above ADH Environmental 3065 Porter St., Suite 101, Soquel Samples 1000 BIO WC DATE 3 KING K 2 MICRO TIME WC PT SV 14 00 Kg 831-477-0895 FAX PHONE NUMBER Strmwtr 3 x 40m Strmwtr 2 x 1L AG Strmwtr Strmwtr 2 x 1L AG Strmwtr 2 x 1L AG Strmwtr Strmwtr Strmwtr 2 x 1L AG SAMPLE MATRO: NON 810 9 ķ VOA 250 ml HDPE 3 x 40m 250 ml HDPE MacH VOA À VOA 13 DATE/TIVE CCCWP-SSID / 030.001.0202 NeOH SAMPLER [PRINT & SIGN NAME]: S <6C, HCI PRESERVATIVE <6C, HCI <6C **29** <6C <6C 29× <6C Alessandro Hnatt VOA 100 75 SAMPLE IDENTIFICATION / SITE RACENED BY 207R00011US-W-07 207R00011US-W-01 207R00011US-W-04 207R00011US-W-0% 207R00011DS-W-01 207R00011DS-W-02 207R00011DS-W-02 207R00011DS-W-01 YIN TEMP CA Alessandro Hnatt STATE ATTN MENTS: SEALED: CLENT OTEN RELINGUISHED BY MA GRAB BUTACT Grab Grab Grab Grab Grab Grab Grab Grab 95073 N. × × Organochlorine Pesticides Pyrethroids Pesticides 20 × × Fipronil ANALYSES REQUESTED × Degradates × × TOC × SSC DATEITIME "CONTAINER TYPES: AL = Ariber Liber, AHL = 500 mt Ariber; PT = Pint (Plastic), OT = Quart (Plastic); HG = Half Gallon (Plastic), SL = Sos Jar BAC; EAC; BLE = Blass Tube; VOA = 40mL (VOA, OTC - Other Type Contained "MATRIX: AD = Aquedus Nondrinking Water, Digested Metals; FE = Low R.L.s. Aquedus Nondrinking Water, Digested Metals; DW = Drinung Water; St. = Soil Sludge, Soild., FP = 22 70 TURN-AROUND THE X STANDARD RECENTED BY REMARKS RUSH ď, 0

FOR LAB USE ONLY



Alessandro D. Hnatt ADH Environmental 3065 Porter Street, Suite 101 Soquel, CA 95073 April 10, 2014

Alessandro:

I have enclosed one copy of our report "Evaluation of the Toxicity of Contra Costa Clean Water Program Stormwater Samples" for the samples that were collected February 26 and 28, 2014. The results of this testing are summarized below.

Toxicity summary for CCCWP stormwater samples.									
	Toxicity relative to the Lab Control treatment?								
Sample Station	Selenastrum capricornutum	Ceriodaphnia dubia Survival Reproduction		Hyalella azteca	Fathead	Minnow			
	Growth			Survival	Survival	Growth			
206R00551	no	no	no	no	no	no			
207R00843	no	no	no	Yes	Yes	no			
207R00011US				Yes					
207R00011DS				Yes					
544R00025US				Yes					
544R00025DS				Yes					

Chronic Toxicity of CCCWP Stormwater to Selenastrum capricornutum

There was <u>no</u> significant reduction in algal growth in the CCCWP stormwater samples.

Chronic Toxicity of CCCWP Stormwater to Ceriodaphnia dubia

There was <u>no</u> significant reduction in *C. dubia* survival or reproduction in the CCCWP stormwater samples.

Toxicity of CCCWP Stormwater to Hyalella azteca

There was <u>no</u> significant reduction in survival in the 206R00551 stormwater sample. However, there were significant reductions in *H. azteca* survival in the remaining CCCWP stormwater samples.

Chronic Toxicity of CCCWP Stormwater to Fathead Minnows

There was <u>no</u> significant reduction in fathead minnow survival or growth in the 206R00551 stormwater sample. There was a significant reduction in fathead minnow survival in the 207R00843 stormwater sample. However, pathogen-related mortality (PRM) was observed in both stormwater samples. It is our best professional judgment that the observations of PRM are not associated with or indicative of stormwater toxicity (indeed, had the stormwater been toxic, the pathogens might have been killed or otherwise impaired before the fish were [e.g., toxicants are often used as therapeutic treatments for control of pathogens in fish cultures]).

If you have any questions regarding the performance and interpretation of these tests, feel free to contact my colleague Eddie Kalombo or myself at (707) 207-7760.

Sincerely,

Stephen L. Clark Vice President/Special Projects Director



Pacific EcoRisk is accredited in accordance with NELAP (ORELAP ID 4043). Pacific EcoRisk certifies that the test results reported herein conform to the most current NELAP requirements for parameters for which accreditation is required and available. Any exceptions to NELAP requirements are noted, where applicable, in the body of the report. This report shall not be reproduced, except in full, without the written consent of Pacific EcoRisk. This testing was performed under Lab Order 19397.



Evaluation of the Toxicity of Contra Costa Clean Water Program Stormwater Samples

Samples collected February 26 and 28, 2014

Prepared For:

ADH Environmental 3065 Porter Street, Suite 101 Soquel, CA 95073

Prepared By:

Pacific EcoRisk 2250 Cordelia Road Fairfield, CA 94534

April 2014



Evaluation of the Toxicity of Contra Costa Clean Water Program Stormwater Samples

Samples collected February 26 and 28, 2014

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1. INTRODUCTION

Under contract to ADH Environmental, and in support of the Bay Area Stormwater Management Agencies Association (BASMAA) Regional Monitoring Coalition ongoing monitoring efforts, Pacific EcoRisk (PER) has been contracted to evaluate the chronic toxicity of stormwater samples collected for the Contra Costa Clean Water Program (CCCWP). This evaluation consist of performing the following US EPA and modified-EPA short-term chronic toxicity tests:

- 96-hour algal growth test with the green alga Selenastrum capricornutum;
- 3-brood (6-8 day) survival and reproduction test with the crustacean Ceriodaphnia dubia;
- 10-day survival test with the freshwater amphipod Hyalella azteca; and
- 7-day survival and growth test with larval fathead minnows (*Pimephales promelas*).

These toxicity tests were conducted on stormwater samples collected on February 26 and 28, 2014. In order to assess the sensitivity of the test organisms to toxic stress, reference toxicant tests were also performed. This report describes the performance and results of these tests.

2. TOXICITY TEST PROCEDURES

The methods used in conducting the testing with *S. capricornutum*, *C. dubia*, and fathead minnows followed the guidelines established by the EPA manual "Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, Fourth Edition" (EPA-821-R-02-013).

Testing with *H. azteca* followed the SWAMP test protocol, which is based on a modification of the US EPA guidelines, "Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated Contaminants with Freshwater Invertebrates" (EPA/600/R-99/064).

2.1 Sample Receipt and Handling

On February 26 and 28, ADH collected stormwater samples into appropriately-cleaned containers, which were transported, on ice and under chain-of-custody, to the PER testing laboratory in Fairfield, CA. Upon receipt at the testing laboratory, aliquots of each sample were collected for analysis of initial water quality characteristics (Table 1), with the remainder of each sample being stored at 0-6°C except when being used to prepare test solutions.

The chain-of-custody records for the collection and delivery of these stormwater samples are provided as Appendix A.

	Table 1. Initial water quality characteristics of the CCCWP stormwater samples.										
Date Sample Received	Sample ID	Temp (°C)	pН	D.O. (mg/L)	Alkalinity (mg/L)	Hardness (mg/L)	Conductivity (µS/cm)	Total Ammonia (mg/L N)			
2/27/14	206R00551	0.4	7.46	10.4	226	304	907	<1.0			
2/27/14	207R00843	0.6	7.63	10.7	83	104	283	<1.0			
2/28/14	207R00011US-W-01	8.5	7.87	9.9	59	92	323	<1.0			
2/28/14	207R00011DS-W-01	8.2	7.98	9.6	37	64	186	<1.0			
2/28/14	544R00025US-W-02	4.3	7.87	9.8	76	244	1153	<1.0			
2/28/14	544R00025DS-W-02	10.7	7.87	9.5	72	229	1080	<1.0			

2.2 Algal Growth Toxicity Testing with Selenastrum capricornutum

The short-term chronic toxicity algal test consists of exposing *Selenastrum capricornutum* to the stormwater samples for ~ 96-hrs, after which the effects on cell growth are evaluated. The specific procedures used in this test are described below.

The Lab Control water for this test consisted of Type 1 Lab Water (reverse-osmosis, de-ionized water). The stormwater sample was tested at the 100% concentration only. The Lab Control water and the stormwater sample were filtered (using sterile 0.45 µm filters) and then spiked with nutrients (without any added EDTA) before use in this test, as per testing guidelines. "New" water quality characteristics (pH, dissolved oxygen [D.O.], and conductivity) were measured on the resulting test solutions prior to use in the test.

There were 4 replicates at each test treatment, each replicate consisting of a 250-mL glass Erlenmeyer flask containing 100 mL of test solution. Each flask was inoculated to an initial algal cell density of 10,000 cells/mL from a laboratory culture of *S. capricornutum* that is maintained in log growth phase. These flasks were loosely-capped and randomly positioned within a temperature-controlled room at 25°C, under continuous cool-white fluorescent illumination.

Each day, the temperature and pH were measured and recorded from one randomly-selected replicate at each treatment; each replicate flask was gently shaken in the three times daily and repositioned within the temperature-controlled room.

After 96 (±2) hrs exposure, the flasks were removed from the temperature-controlled room and the algal cell density in each was determined by spectrophotometric analysis. The resulting cell density data were analyzed to evaluate any growth impairment, or toxicity, caused by the stormwater sample; all statistical analyses were performed using CETIS® statistical software (TidePool Scientific, McKinleyville, CA).

2.2.1 Reference Toxicant Testing of the Selenastrum capricornutum

In order to assess the sensitivity of the *S. capricornutum* to toxic stress, a monthly reference toxicant test was performed. The reference toxicant test was performed similarly to the stormwater tests except that test solutions consisted of Lab Control water spiked with NaCl at concentrations of 0.125, 0.25, 0.5, 1, 2, and 4 g/L. The resulting test response data were statistically analyzed to determine key dose-response point estimates (e.g., IC50); all statistical analyses were made using the CETIS® software. These response endpoints were then compared to the typical response range established by the mean \pm 2 SD of the point estimates generated by the most recent previous reference toxicant tests performed by this lab.

2.3 Survival and Reproduction Toxicity Testing with Ceriodaphnia dubia

The short-term chronic *C. dubia* test consists of exposing individual females to the stormwater samples for the length of time it takes for the Lab Control treatment females to produce 3 broods (typically 6-8 days), after which effects on survival and reproduction are evaluated. The specific procedures used in this test are described below.

The Lab Control water for this test consisted of modified EPA synthetic moderately-hard water. The stormwater sample was tested at the 100% concentration only. For each treatment, a 200 mL aliquot of test solution was amended with the alga *Selenastrum capricornutum* and Yeast-Cerophyll®-Trout (YCT) to provide food for the test organisms. "New" water quality characteristics (pH, D.O., and conductivity) were measured on these food-amended test solutions prior to use in this test.

There were 10 replicates at each test treatment, each replicate consisting of 15 mL of test solution in a 30-mL plastic cup. These "3-brood" tests were initiated by allocating one neonate (<24 hours old, and within 8 hours of age) *C. dubia*, obtained from in-house laboratory cultures, into each replicate cup. The replicate cups were placed into a temperature-controlled room at 25°C, under cool-white fluorescent lighting on a 16L:8D photoperiod.

Each day of the test, fresh test solutions and a "new" set of replicate cups were prepared, as before. "New" water quality characteristics (pH, D.O., and conductivity) were measured on these solutions prior to use in the tests. The test replicate cups were removed from the temperature-controlled room and then each replicate was examined, with surviving "original" individual organisms being transferred to the corresponding new replicate cup; the new replicate cups, now carrying *C. dubia* in fresh media, were then returned to the temperature-controlled room. Each old replicate cup was carefully examined to determine the number of neonate offspring produced by each original organism, after which the "old" water quality characteristics (pH, D.O., and conductivity) were measured for the old test solution from one randomly-selected replicate at each treatment.

After it was determined that \geq 60% of the *C. dubia* in the Lab Control treatments had produced their third brood of offspring, the accompanying stormwater sample test was terminated. The resulting survival and reproduction (number of offspring) data were analyzed to evaluate any impairments caused by the stormwater sample; all statistical analyses were performed using the CETIS® statistical software.

2.3.1 Reference Toxicant Testing of the Ceriodaphnia dubia

In order to assess the sensitivity of the C. dubia test organisms to toxic stress, a monthly reference toxicant test was performed. The reference toxicant test was performed similarly to the stormwater tests, except that test solutions consisted of the Lab Control water spiked with NaCl at concentrations of 500, 1000, 1500, 2000, and 2500 mg/L. The resulting test response data were statistically analyzed to determine key dose-response point estimates (e.g., IC50); all statistical analyses were made using the CETIS® software. These response endpoints were then compared to the typical response range established by the mean \pm 2 SD of the point estimates generated by the most recent previous reference toxicant tests performed by this lab.

2.4 Survival Toxicity Testing of Stormwater Samples with Hyalella azteca

This test consists of exposing the amphipods to the stormwater samples for 10 days, after which effects on survival are evaluated. The specific procedures used in this testing are described below.

The *H. azteca* used in this testing were obtained from a commercial supplier (Chesapeake Cultures, VA). Upon receipt at the PER laboratory, the organisms were maintained at 23°C in aerated aquaria containing Standard Artificial Medium (SAM-5S) water (Borgmann 1996) prior to their use in this test. During this pre-test period, the organisms were fed the alga *Selenastrum capricornutum* and YCT amended with *Spirulina*.

The Lab Control water for these tests consisted of SAM-5S water. The stormwater samples were tested at the 100% concentration only. "New" water quality characteristics (pH, D.O., and conductivity) were measured on the test solutions prior to use in these tests.

There were 5 replicates for each test treatment, each replicate consisting a 250-mL glass beaker containing 100 mL of test solution. These tests were initiated by allocating 10 *H. azteca*, into each replicate, followed by the addition of 1.5 mL of *Spirulina* amended YCT. The replicate beakers were placed into a temperature-controlled room at 23°C, under cool-white fluorescent lighting on a 16L:8D photoperiod.

Each day of the tests, each replicate beaker was examined and the number of surviving organisms determined; 'old' water quality characteristics were measured in one randomly-selected beaker at each test treatment at this time. On Days 2, 4, 6, and 8 of the test, the organisms were fed 1.5 mL of *Spirulina* amended YCT in each test chamber.

On Day 5 of the 10-day tests, fresh test solutions were prepared and characterized, as before. Each replicate was examined, with any dead animals, uneaten food, wastes, and other detritus being removed. The number of live organisms in each replicate was determined and then approximately 80% of the test media in each beaker was carefully poured out and replaced with fresh test solution. "Old" water quality characteristics (pH, D.O., and conductivity) were measured on the old test solution that had been discarded from one randomly-selected replicate at each treatment.

After 10 days of exposure, the tests were terminated and the number of live organisms in each replicate was recorded. The resulting survival data were analyzed to evaluate any impairment due to the stormwater samples; all statistical analyses were performed using CETIS® statistical software.

2.4.1 Reference Toxicant Testing of the Hyalella azteca

In order to assess the sensitivity of the H. azteca test organisms to toxic stress, a reference toxicant test was performed. The reference toxicant test was performed similarly to the stormwater tests, except that test solutions consisted of Control water spiked with KCl at test concentrations of 0, 0.1, 0.2, 0.4, 0.8 and 1.6 g/L, and the test was performed for 96 hours. The resulting survival data were statistically analyzed to determine key dose-response point estimates (e.g., EC50); all statistical analyses were made using the CETIS® software. This response endpoint was then compared to the 'typical response' range established by the mean \pm 2 SD of the point estimates generated by the 20 most recent previous reference toxicant tests performed by this lab.

2.5 Survival and Growth Toxicity Testing with Larval Fathead Minnows

The short-term chronic fathead minnow test consists of exposing larval fish to the stormwater for 7 days, after which effects on survival and growth are evaluated. The specific procedures used in this testing are described below.

The larval fathead minnows used in this test were obtained from a commercial supplier (Aquatox, Hot Springs, AR). Upon receipt at the testing lab, the larval fish were maintained in aerated tanks of EPA moderately-hard water at 25°C, and were fed brine shrimp nauplii *ad libitum*.

The Lab Water Control/dilution water for this test consisted of EPA synthetic moderately-hard water. The stormwater samples were tested at the 100% concentration only. "New" water quality characteristics (pH, D.O., and conductivity) were measured on these test solutions prior to use in the tests.

There were 4 replicates for each test treatment, each replicate consisting of 400 mL of test solution in a 600-mL glass beaker. The test was initiated by randomly allocating 10 larval fathead minnows (<48 hrs old) into each replicate. These replicate beakers were placed in a temperature-controlled room at 25°C, under cool-white fluorescent lighting on a 16L:8D photoperiod. The test fish were fed brine shrimp nauplii twice daily.

Each day of the test, fresh test solutions were prepared for each treatment, and water quality characteristics were determined as before. The beakers containing the fathead minnows were examined, with any dead animals, uneaten food, wastes, and other detritus being removed. The number of live fish in each replicate was determined and then approximately 80% of the old test media in each beaker was carefully poured out and replaced with fresh test solution. "Old" water quality characteristics (pH, D.O., and conductivity) were measured on the old test water that had been discarded from one randomly selected replicate at each treatment.

After 7 days exposure, the tests were terminated and the number of live fish in each replicate beaker was recorded. The fish from each replicate were then carefully euthanized in methanol, rinsed in de-ionized water, and transferred to a pre-dried and pre-tared weighing pan. These fish were then dried at 100°C for >24 hrs and re-weighed to determine the total weight of fish in each replicate. The total weight was then divided by the initial number of fish per replicate (n=10) to determine the "biomass value". The resulting survival and growth data were analyzed to evaluate any impairment(s) caused by the stormwater sample; all statistical analyses were performed using the CETIS® statistical software.

2.5.1 Reference Toxicant Testing of the Fathead Minnows

In order to assess the sensitivity of the fish to toxic stress, a reference toxicant test was performed. The reference toxicant test was performed similarly to the stormwater tests, except that test solutions consisted of "Lab Control" media spiked with NaCl at test concentrations of 0.75, 1.5, 3, 6, and 9 g/L. The resulting test response data were analyzed to determine key doseresponse point estimates (e.g., EC50); all statistical analyses were made using the CETIS® software. These response endpoints were then compared to the 'typical response' range established by the mean \pm 2 SD of the point estimates generated by the 20 most recent previous reference toxicant tests performed by this lab.

3. RESULTS

3.1 Effects of the CCCWP Stormwater on Selenastrum capricornutum

The results for this test are summarized below in Table 2. There was \underline{no} significant reduction in algal growth in the CCCWP stormwater samples.

The test data and summary of statistical analyses for this test are presented in Appendix B.

Table 2. Effects of CCCWP stormwater on Selenastrum capricornutum.							
Test Initiation Date (Time) Treatment/Sample ID Mean Algal Cell Density (cells/mL x 10 ⁶)							
	Lab Control	2.83					
2/27/24 (1715)	206R00551	7.19					
	207R00843	7.01					

3.2 Effects of the CCCWP Stormwater on Ceriodaphnia dubia

The results for this test are summarized below in Table 3. There was <u>no</u> significant reduction in *Ceriodaphnia dubia* survival or reproduction in the CCCWP stormwater samples.

The test data and summary of statistical analyses for this test are presented in Appendix C.

Table 3. Effects of CCCWP stormwater on Ceriodaphnia dubia.								
Test Initiation Date (Time)	Treatment/Sample ID	Mean	Mean Reproduction					
Test initiation Date (Time)	Treatment/Sample 1D	% Survival	(# neonates/female)					
	Lab Control	100	31.3					
2/27/14 (1600)	206R00551	100	28.9					
	207R00843	90	29.1					

3.3 Effects of the CCCWP Stormwater on Hyalella azteca

The results for these tests are summarized below in Table 4. There was <u>no</u> significant reduction in survival in the 206R00551 stormwater sample. However, there were significant reductions in *H. azteca* survival in the remaining CCCWP stormwater samples. The test data and summary of statistical analyses for these tests are presented in Appendix D.

Table 4. Effects of CCCWP stormwater on Hyalella azteca.			
Test Initiation Date (Time)	Treatment/Sample ID	10-Day Mean % Survival	
2/27/14 (1800)	Lab Control	98	
	206R00551	94	
	207R00843	64*	
2/28/14 (1750)	Lab Control	96	
	207R00011US	48*	
	207R00011DS	48*	
	544R00025US	18*	
	544R00025DS	6*	

^{*} The response at this test treatment was significantly less than the Lab Control treatment response at p < 0.05.

3.4 Effects of the CCCWP Stormwater on Fathead Minnows

The results for this test are summarized below in Table 5. There was <u>no</u> significant reduction in fathead minnow survival or growth in the 206R00551 stormwater sample. There was a significant reduction in fathead minnow survival in the 207R00843 stormwater sample. However, pathogen-related mortality (PRM) was observed in both stormwater samples. It is our best professional judgment that the observations of PRM are not associated with or indicative of stormwater toxicity (indeed, had the stormwater been toxic, the pathogens might have been killed or otherwise impaired before the fish were [e.g., toxicants are often used as therapeutic treatments for control of pathogens in fish cultures]). The test data and summary of statistical analyses for this test are presented in Appendix E.

Table 5. Effects of CCCWP stormwater on fathead minnows ("Standard" test method).				
Test Initiation Date (Time)	Treatment/Sample ID	Mean	Mean Biomass	
		% Survival	Value (mg)	
2/27/14 (1700)	Lab Control	100	0.72	
	206R00551	92.5ª	0.73	
	207R00843	57.5*a	0.59	

^{*} The response at this test treatment was significantly less than the Lab Control treatment response at p < 0.05. a - PRM was observed in multiple replicates for this stormwater sample.



3.4.1 Pathogen Related Mortality (PRM) Evaluation

Per contractual requirements ADH Environmental, PER has agreed to include all observations leading identification PRM. This evaluation consisted of performing tasks:

- 1. Provide a brief narrative describing the observations leading to the determination that PRM interference had occurred.
 - On March 1, 2 and 3, PRM was observed in test replicate B and C the 206R00551 stormwater sample, and all test replicates of the 207R00843 stormwater sample.
- 2. Provide "Comments and Observations" sheets with daily records completed by PER identifying PRM in treatments (i.e., stormwater sample ID) and replicates, as well as the number(s) of affected fish.
 - The Comments and Observation sheet is provided in Appendix J.
- 3. Provide photographs of representative fish from each affected water sample identified by treatment, replicate, and date.



Figure 1: Photo of PRM affected fish in Replicate B of 206R00551. Observed on March 2, 2014.



Figure 2: Photo of PRM affected fish in Replicate D of 207R00843. Observed on March 1, 2014.

4. Provide a photograph of a non-pathogenic fish from a replicate affected by PRM, identified by treatment, replicate, and date.



Figure 3: Photo of non-pathogenic fish in Replicate B of 206R00551. Taken at test termination, March 6, 2014.

5. Provide a photograph of a fish from a lab control treatment documenting the absence of PRM in the Lab Control treatment, identified by treatment, replicate, and date.



Figure 4: Photo of Control fish in Replicate A. Taken at test termination, March 6, 2014.

6. Provide a photograph of a lab control beaker showing the water in a lab control replicate and a photograph of a replicate beaker affected by PRM prior to test termination.

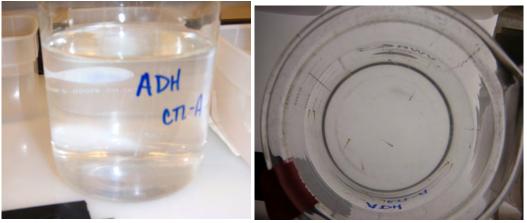


Figure 5: Photo of Lab Control Replicate A. Taken at test termination, March 6, 2014.



Figure 6: Photo of non-pathogen affected (Rep A & D) of 206R00551 stormwater sample.



Figure 7: Photo of pathogen affected (Rep B &C) of 207R00843 stormwater sample.

- 7. Provide a discussion of the calculated CV for the PRM-affected sample(s).
 - The EPA testing manual indicates a CV of >40% "*may be*" an indication of pathogen interference. However it is worth noting that there is no mandate that CV **must be** >40% in order to characterize mortalities as related to pathogen interference.
 - The supporting documentation (pictures and test observations) clearly indicates that PRM was present in the 206R00551 and 207R00843 stormwater samples.
 - The survival CV was 10.4% and the growth CV was 13.0% for the affected 206R00551 stormwater sample. Although though test CVs for the affected sample were not >40%, the photo documentation clearly supports the presence of PRM.
 - The survival CV was 57.5% and the growth CV was 38.4% for the affected 207R00843 stormwater sample.
- 8. Provide documentation that the presence of PRM was not a reflection of poor laboratory.
 - As is clearly evident, PRM accounted for all mortality observed in the 206R00551 and 207R00843 stormwater samples. There was 100% survival at the Lab water control treatment and 92.5% survival in the 206R00551 and 57.5% survival in the 207R00843 stormwater sample. The absence of PRM in the Laboratory Control treatment eliminates the fish source, husbandry, etc., as causes of PRM.
 - Pacific EcoRisk adheres to good laboratory practices when performing aquatic toxicity tests, as per guidance found in Section 11.3.4.3 of the EPA testing manual (USEPA, 2002). Our test change procedures requires that:
 - All test equipment, glassware, and pipettes are kept dry and clean during the duration of the test.
 - o For all stormwater samples, staff use of separate glassware, pipettes, and siphons for each test replicate in order to minimize cross-contamination from an affected test replicate into a non-affected replicate.
 - o Prior of each test renewal, care was taken to properly clean test chambers by removing excess food, dead fish larvae, and other debris.

In conclusion, PRM was present in the 206R00551 and 207R00843 stormwater samples and was not present in the Laboratory Control treatment, as is supported by photo documentation. It is important to note that PRM was present in the 206R00551 stormwater sample even though the test CV was much less than 40%. The observed PRM was not related to the source of the test organisms (i.e., PRM was not observed in the Lab Control treatment) or laboratory practices (i.e., all good laboratory practices were followed).

4. AQUATIC TOXICITY DATA QUALITY CONTROL

Four QC measures were assessed during the toxicity testing:

- Maintenance of acceptable test conditions;
- Negative Control testing;
- Positive Control (reference toxicant) testing; and
- Concentration Response Relationship assessment.

4.1 Maintenance of Acceptable Test Conditions

All test conditions (pH, D.O., temperature, etc.) were within acceptable limits for these tests. All analyses were performed according to laboratory Standard Operating Procedures.

4.2 Negative Control Testing

The responses at the Lab Control treatments were acceptable.

4.3 Positive Control Testing

4.3.1 Reference Toxicant Toxicity to Selenastrum capricornutum

The results of this test are summarized below in Table 6. The IC50 for this test was consistent with the "typical response" range established by the reference toxicant test database for this species, indicating that these organisms were responding to toxic stress in a typical fashion. The test data and summary of statistical analyses for this test are presented in Appendix F.

Table 6. Reference toxicant testing: Effects of N	VaCl on Selenastrum capricornutum growth.
NaCl Treatment (g/L)	Mean Algal Cell Density (cells/mL x 10 ⁶)
Lab Control	3.12
0.125	2.87*
0.25	2.93*
0.5	2.75*
1	2.49*
2	1.98*
4	0.48*
Summary of	Statistics
IC25 =	2.6 g/L NaCl
"Typical response" range (mean ± 2 SD)	1.0 – 3.2 g/L NaCl

^{*} Significantly less than the Lab Control treatment response at p < 0.05.



4.3.2 Reference Toxicant Toxicity to Ceriodaphnia dubia

The results of this test are summarized below in Table 7. The EC50 and IC50 for this test were both consistent with the "typical response" ranges established by reference toxicant test database for this species, indicating that these organisms were responding to toxic stress in a typical fashion. The test data and the summary of statistical analyses for this test are presented in Appendix G.

Table 7. Reference toxicant testing: Effects of NaCl on Ceriodaphnia dubia.								
NaCl Treatment (mg/L)	Mean	Reproduction						
Naci Heatment (mg/L)	% Survival	(# neonates/female)						
Lab Water Control	90	22.9						
500	80	18.2						
1000	100	24.6						
1500	80	8.2*						
2000	60	0.2*						
2500	10*	-						
Summary of Key Statistics								
Survival EC50 or Reproduction IC50 =	2120 mg/L NaCl	1380 mg/L NaCl						
"Typical response" range (mean ± 2 SD)	1708 – 2142 mg/L NaCl	1333 – 1792 mg/L NaCl						

^{*} The response at this test treatment was significantly less than the Lab Control treatment response at p < 0.05.

4.3.3 Reference Toxicant Toxicity to Hyalella azteca

The results of this test are presented in Table 8. The EC50 for this test was consistent with the "typical response" range established by the reference toxicant test database for this species, indicating that these organisms were responding to toxic stress in a typical fashion. The test data and summary of statistical analyses for this test are presented in Appendix H.

Table 8. Reference toxicant testing: En	ffects of KCl on <i>Hyalella azteca</i> survival.
KCl Treatment (g/L)	Mean% Survival
Control	100
0.1	100
0.2	100
0.4	100
0.8	10*
1.6	0*
Summary	of Statistics
EC50 =	0.61 g/L KCl
"Typical response" range (mean ±2 SD)	0.25 – 0.62 g/L KCl

^{*} The response at this test treatment was significantly less than the Lab Control treatment response at p < 0.05.



4.3.4 Reference Toxicant Toxicity to Fathead Minnows

The results of this test are summarized below in Table 9. The EC50 and IC50 for this test were both consistent with the "typical response" ranges established by the reference toxicant test database for this species, indicating that these organisms were responding to toxic stress in a typical fashion. The test data and summary of statistical analyses for this test are presented in Appendix I.

Table 9. Reference toxicant testing: Effects of NaCl on fathead minnows.								
NaCl Treatment (gm/L)	Mean % Survival	Mean Biomass Value (mg)						
Lab Control	100	0.73						
0.75	92.5	0.72						
1.5	90	0.65*						
3	37.5*	0.24						
6	47.5*	0.24						
9	0*	-						
Sumn	nary of Statistics							
Survival EC50 or Growth IC50 =	3.3 g/L NaCl	2.5 g/L NaCl						
"Typical response" range (mean ±2 SD)	2.6 – 6.1 g/L NaCl	2.1 – 4.8 g/L NaCl						

^{*} The response at this test treatment was significantly less than the Lab Control treatment response at p < 0.05.

4.4 Concentration Response Relationships

The concentration-response relationships for the reference toxicant tests were evaluated as per EPA guidelines (EPA-821-B-00-004), and were determined to be acceptable.

5. SUMMARY & CONCLUSIONS

Chronic Toxicity of CCCWP Stormwater to Selenastrum capricornutum

There was **no** significant reduction in algal growth in the CCCWP stormwater samples.

Chronic Toxicity of CCCWP Stormwater to Ceriodaphnia dubia

There was <u>no</u> significant reduction in *C. dubia* survival or reproduction in the CCCWP stormwater samples.

Chronic Toxicity of CCCWP Stormwater to Hyalella azteca

There was <u>no</u> significant reduction in survival in the 206R00551 stormwater sample. However, there were significant reductions in *H. azteca* survival in the remaining CCCWP stormwater samples

Chronic Toxicity of CCCWP Stormwater to Fathead Minnows

There was <u>no</u> significant reduction in fathead minnow survival or growth in the 206R00551 stormwater sample. There was a significant reduction in fathead minnow survival in the 207R00843 stormwater sample. However, pathogen-related mortality (PRM) was observed in both stormwater samples. It is our best professional judgment that the observations of PRM are not associated with or indicative of stormwater toxicity (indeed, had the stormwater been toxic, the pathogens might have been killed or otherwise impaired before the fish were [e.g., toxicants are often used as therapeutic treatments for control of pathogens in fish cultures]).

Appendix A

Chain-of-Custody Records for the Collection and Delivery of the CCCWP Stormwater Samples

CHAIN-OF-CUSTODY RECORD

Pacific EcoRisk

2250 Cordelia Rd., Fairfield, CA 94534
(707) 207-7760 FAX (707) 207-7916

Client Name:	: ADH Environmental						REQUESTED ANALYSIS									
Client Address:	3065 Por	ter Street	t, Suite 101						~	_						
	Soquel, 0	CA 95073		· · · · · · · · · · · · · · · · · · ·		E	nia	Se	je ce	g (ecc						
Phone:	831 477-	831 477-2003 FAX :							az az	azi (t)						
Project Manager:	Alessand	Alessandro Hnatt							<i>lell</i> (c)	lella nen						
Project Name:	CCCWP	- Creek S	Status			Se	Chronic Ceriodaphnia dubia	Chronic Pimephales promelas	-√s §	<i>Hyalella (</i> sediment)						
Project # / P.O. Number:	030.001.	0100				Chronic Selenastrum	onic	roni	ay /	10-day <i>Hyalella azteca</i> (sediment)						
Client Sample ID	Sample	Sample	Sample	Cor	ntainer	Ş	Š	ပ်	10-day <i>Hyalella azteca</i> (water)	0				re l		
4	Date	Time	Matrix*	Number	Type				<u> </u>	<u> </u>						
1 206R00551	07-26-14		STRMW		10 x 1 ga AG	х	Х	х	х							
2 207R00843	02-26-14	17:45	STRMW		10 x 1 ga AG	х	X	х	Х	ļ		<u> </u>				
3			*	,		<u> </u>	1									
4						_	-	-	_							
5	 	 		<u> </u>		_	-	· ·		-						
6						-	+	<u> </u>			-					
В								1		-	-	<u> </u>				_
9								<u> </u>		-						
							1	<u> </u>					1			
2																
Samples collected by:	Kevin	Lewis,	Eric Dha	kni ADI	A Environment	1		DE 10.30				341714			PIE	
Comments/Special Instruction	on:		3000	RELÍNQUI	SHED BY:				REC	EIVE	D BY	′ :				
Contract # 030 0	വിവില)		Signature	lamo	Pin	***	>	Sign	ature	e: -	ra	egr			
346		Print: C							Prin	t: Y	·KI	nac	liga	evg	,	
CCCWP - Creek S	Organization: AD#					• ,	,		Orga	aniza	tion:	PI	R		_	
1							e: [[11	Date	: 2	127	fug	/ T	ime:	16	//
		RELINQUISHED BY:							REC	EIVE	D BY	':				
	Signature:								Sign	ature): 					
		Print:							Print	t:						
				Organizat	ion:				Orga	ıniza	tion:					
				Date:	1	Tim	e:		Date	:			Т	ime:		

CHAIN-OF-CUSTODY RECORD

Pacific EcoRisk 2250 Cordelia Rd., Fairfield, CA 94534 (707) 207-7760 FAX (707) 207-7916

	Client Name:	: ADH Environmental								REQ	UES	TED A	ANAL	YSIS			
	Client Address:	3065 Por	ter Stree	t, Suite 101	1												
1		Soquel, C	CA 95073	3			15	nia	Se	tecs	tece						
	Phone:	831 477-	2003		astr.	lapt	s	3 97	3 az								
	Project Manager:	Alessand	Alessandro Hnatt						ime	lelle Iter)	<i>ilell</i> e						
	Project Name:	CCCWP	- SSID				Sign	हैं है	c Pi	Hya We	<i>Hyalella</i> sediment)						
	Project # / P.O. Number:	030.001.	0202				Chronic Selenastrum	Chronic Ceriodaphnia dubia	Chronic Pimephales promelas	10-day <i>Hyalella azteca</i> (water)	10-day <i>Hyalella azteca</i> (sediment)	1					
	Client Sample ID	Sample	Sample	Sample		ntainer	ਹੁੰ	년 년	ည်	5	70						
		Date	Time	Matrix*	Number	Туре	_								Щ		
1	207R00011DS-W-01	2-28014		STRMW	10	3.7L glass	<u> </u>			X					\sqcup		
2	207R00011US-W-01	2.28-14	0955	STRMW	10	3.7L glass	_	<u> </u>		Х		ļ			\longmapsto		
3 4	-	 	 _	 	,		\vdash	 		-		_			├		\vdash
5				 	1	-	+	+	1				-		├	-	\vdash
6			 				+-	+									
7							 	† · · · ·									
8																	
9	,																
10	5		<u> </u>	 '													
12	#		<u> </u>														
	Samples collected by:				·				Lygie		8,0		SEE.				
	Comments/Special Instruction	on:				ISHED BY:						D BY					
					Signature	1/	d		-	<u> </u>		L	rgi	<u>ب ارو</u>	_		
				!	Print: 🖔 🗘		long	\sim		Prin	- '		ia	diz	zev	9	
					Organizati	110	14					tion:		ENG	<u> </u>		
				!	Date: 7.1		Tim	e:	43				-14	′ Т	ime:	114	<u> </u>
					RELINQUI	ISHED BY:	-			REC	EIVE	D BY	/ :				
		Signature:									ature	e:					
					Print:					Prin	t:						
				!	Organizat	ion:				Orga	aniza	tion:					
				ļ	Date:		Tim	e:		Date): :			T	ime:		

CHAIN-OF-CUSTODY RECORD

Pacific EcoRisk 2250 Cordelia Rd., Fairfield, CA 94534 (707) 207-7760 FAX (707) 207-7916

Client Name:	ADI	1 En	VITONN	lotos.						REQ	UEST	ΓED /	ANAL	YSIS.			
Client Address:			7	4.20		Г		Т				- "		18			
				·		Ę	nia		လ	lella	eca						175
Phone:			FAX:			Str	abh	1	nal.	E Za	azt t)						100
Project Manager:			·			eng	in de	ġ.	nep elas	val/ wat	Hyalella (sediment)				1		
Project Name:	CCCW	P-55	I			Se .	Ö	dub	I O	į į	ya gin	3					
Project # / P.O. Number:			,020	٠. ٢	· · · · · · · · · · · · · · · · · · ·	Chronic Selenastrum	capricornutum Chronic Ceriodaphnia	dubia	Cnronic <i>Pimepnales</i> promelas	y Zte	10-day <i>Hyalella azteca</i> (sediment)			190			
Client Servel ID	**********		Sample	************	ntainer	Ę	漢	Š		ф Ч	Ö				1	1	- 4
Client Sample ID	Date	Time	Matrix*	Number	Туре	Ĭ.				₽.	-						
1544R0002505-W-02	2-28-14		STRMW	10	1 gall. amber					х				· · · · · ·			20
544R00025US-W-02	2-28-14	1000	STRMW	Ma	Isal umber					X							
3			_	AW	· U					,							
1																	
5				·	· · · · · · · · · · · · · · · · · · ·	_		\perp									
5	-					<u> </u>		4									
3						<u> </u>	-	4									
		,				├	+	4									
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2	,					-	+	+									
Samples collected by:				<u> </u>						V iii							
Comments/Special Instruction	n:			RELINQU	ISHED BY:					REC	EIVE	D BY	7:				
Note - Fathead minnow testing	is to be p	erformed	using the			1/2	nsc	-			ature			-/1/	10.0	///	21
standard EPA protocol (i.e., 4 r	eplicates)				dam Was				-	Prin		1	/11		<u> </u>	W/	7/(
to t & 020.0	01 07	Δ.		Organizat		107	Cou	LV			anizat	tion:	P-	<u>M</u>			
Contract # 030.0 551D Study	0 (% 0 2	102		Date: 2-	28-14	Tin	ne: l	52	0		: 2			V2-	ime:	152	1/2
SSID Study	ta	5K 2	ч		SHED BY:						EIVE					700	
1 3312 31349			J	Signature	:					Sigr	nature			-			
				Print:						Prin			_				
1				Organizat	ion:					Org	aniza	tion:					
				Date:		Tin				Date				T	ime:		
*Example Matrix Codes: (<u>FW</u>	= Freshw	ater); (S	<u>W</u> = Saltwa	ater); (<u>WW</u>	= Wastewater	·); (S	TRN	ΛW	= S	orm	vater)	; (SI	ED ≐	Sedin	nent);	or ot	her

Appendix B

Test Data and Summary of Statistics for the Evaluation of the Chronic Toxicity of the CCCWP Stormwater to Selenastrum capricornutum



CETIS Summary Report

Report Date:

12 Mar-14 12:14 (p 1 of 1)

Test Code:

ADH_0227_SC_C1 | 02-3497-5955

						169	L Code.	ADI1_0221_	_3C_C1 [1	UZ-3 4 31-333
Algai Growth	Test						•		Pac	ific EcoRisk
Batch ID: Start Date: Ending Date: Duration:	01-1997-4859 27 Feb-14 17:15 03 Mar-14 16:00 95h	Test Type: Protocol: Species: Source:	EPA-821-R-	02-013 (2002) n capricornutun	n		ient: i	Cassy Glover Not Applicable Not Applicable		
Sample Code	Sample ID	Samp	ie Date F	Receive Date	Sample /	Age Clie	nt Name		Project	
LABQA 207R00843 206R00551	09-8486-0532 14-6517-7241 08-4072-0786	26 Fel	o-14 17:45 2	7 Feb-14 17:15 7 Feb-14 16:11 7 Feb-14 16:11	1 23h (0.6 °	C)	ł Environ	mental, Inc.	19397	
Sample Code	Material Type	Samp	le Source		Station L	ocation		Latitude	Lo	ngitude
LABQA	Lab Water	ADH E	nvironmenta	ıl, inc.	LABQA			-		-
207R00843	Ambient Water	ADH E	nvironmenta	al, Inc.	207R0084	43				
206R00551	Ambient Water	ADH E	nvironmenta	ıl, Inc.	206R005					
96h Cell Densi	ty-without EDTA Sun	nmary					10			
Sample Code	Cour	nt Mean	95% L0	CL 95% UCL	Min	Max	Std Er	r Std Dev	CV%	%Effect
LABQA	4	2.83E-	6 2.75E+	6 2.91E+6	2.63E+6	3.10E+6	1.03E+	5 2.05E+5	7.26%	0.0%
207R00843	4	7.01E-	+6 6.88E+	6 7.14E+6	6.51E+6	7.29E+6	1.73E+	·5 3.46E+5	4.93%	-148.0%
206R00551	4	7.19E-	6 7.09E+	6 7.28E+6	6.86E+6	7.43E+6	1.31E+	·5 2.62E+5	3.64%	-154.0%
96h Cell Densi	ty-without EDTA Deta	ıll						<u> </u>		
Sample Code	Rep	1 Rep 2	Rep 3	Rep 4						
LABQA	2.63	E+6 3.10E+	-6 2.72E+	6 2.87E+6		54 -			-	
207R00843	7.298	E+6 7.17E+	-6 7.08E+	6 6.51E+6						
206R00551	6.86	E+6 7.36E+	-6 7.09E+	6 7.43E+6						
				•						

Report Date:

12 Mar-14 12:14 (p 2 of 2)

Test Code:

ADH 0227 SC C1 I 02-3497-5955

					iest	oodo.			12-0401-00
Test Test					N.			Pac	ific EcoRis
03-6506-0778 Eı	ndpoint: 96i	n Cell Densit	y-without EI	OTA	CET	S Version:	CETISv1	.8.5	10
12 Mar-14 12:13 A	nalysis: Par	rametric-Two	Sample		Offic	ial Results	: Yes		
n Zeta	Alt Hyp	Trials	Seed	•	PMSD	Test Resu	uit		
NA	C > T	NA	NA		11.4%				
t Two-Sample Test									
vs Sample Code	Test Stat	Critical	MSD DF	P-Value	P-Type	Decision(α:5%)		
206R00551	-26.2	1.94	3E+05 6	1.0000	CDF				
<u></u>									
Sum Squares	Mean Squ	ıa re	DF	F Stat	P-Value	Decision(α:5%)		
3.793205E+13	3.793205	E+13	1	686	<0.0001	Significan	t Effect		
3.319E+11	55316670	000	6						
3.826395E+13			7						
lests .					6:		-		
Test		Test Stat		P-Value	Decision(α:1%)			
Variance Ratio F		1.62	47.5	0.7009	Equal Var	iances			-
Shapiro-Wilk W No	rmality	0.939	0.645	0.6025	Normal Di	stribution			
y-without EDTA Summa	ary		•						
Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
		3 EVE +6	3 16E±6	2800000	2 62 5 4 6		4.005.5	7 26%	0.0%
4	2.83E+6	2.50€+0	3. TOE TO	2000000	2.03ET0	3.10E+6	1.03E+5	7.2070	
4	2.83E+6 7.19E+6	6.77E+6	7.60E+6	7230000	6.86E+6	3.10E+6 7.43E+6	1.03E+5 1.31E+5	3.64%	-154.0%
				7230000					
				7230000					
				7230000 3.0E+05 2.5E+05					
			7.60E+6	7230000 3,0E+05 2,5E+05 2,0E+05 1,5E+05					
			7.60E+6	7230000 3,0E+05 2,5E+05 2,0E+05 1,5E+05					
				7230000 3,0E+05 2,5E+05 2,0E+05 1,5E+05					
			7.60E+6	3.0E+05					
			7.60E+6	3,0E+05					
			7.60E+6	1.0E+05 - 2.5E+05 - 1.0E+05 - 1.0E+05					
		6.77E+6	7.60E+6	3.0E+05					
		6.77E+6	7.60E+6	1.0E+05 - 2.5E+05 - 1.0E+05 - 1.0E+05					
	03-6506-0778 En 12 Mar-14 12:13 An Xeta NA 1 Two-Sample Test vs Sample Code 206R00551 Sum Squares 3.793205E+13 3.319E+11 3.826395E+13 Test Variance Ratio F Shapiro-Wilk W No y-without EDTA Summa Count	12 Mar-14 12:13	12 Mar-14 12:13	Date	Date	Sum Squares Mean Square DF F Stat P-Value 3.793205E+13 3.826395E+13 55316670000 6 3.826395E+13 Test Test Stat Critical P-Value Decision(Variance Ratio F Shapiro-Wilk W Normality 0.939 0.645 0.6025 Normal Display. Decision(y-without EDTA Summary Count Mean 95% LCL 95% UCL Median Min Min CETI Cetical Min Min Min CETI Min CETI C	Sum Squares Mean Square DF F Stat P-Value Decision	CETIS Version: CETIS V1	Sum Squares Mean Square DF F Stat Stat

206R00551

-1.0

Selenastrum capricornutum Algal Toxicity Test Data Sheet

Client:	ADH / CCCWP	Material:	206R	R00551
Test Start Date:	2/27/14	Test ID #:	55486	Project #: 19397
Test End Date: _	3/3/14	Control/Diluent:	Lab water w/o EDTA	Location: TR6/RU/S

			<u></u>		•
Test Treatment	Temp (°C)	рН	D.O. (mg/L)	Conductivity (µS/cm)	Sign-Off
Lab Water Control	25.3	7.59	8.1	94.6	Date: 2/27/14
100%	as.3	7.69	D .1	961	Sample ID#: 3420S
					Test Solution Prep: ドア
					New WQ:
					Inoculation Time: 1715
Meter ID	AGO!	pH19	RDOY	Enoy	Innoculation Signoff:
Lab Water Control	25.0	7.91			Date: 2-28-14
100%	25.0	8.32			WQ Time: 0845
Meter ID	62 A	PH19			WQ Signoff: AFF
Lab Water Control	2512.0	7-9-18.20			Date: 03/01/14
100%	1 25-RO	M. 8-3-18:49			WQ Time: 1000
Meter ID	62A	PHIPPIN			WQ Signoff:
Lab Water Control	25.7	8.98			Date: 03/04/4
100%	15.4	8.89			WQ Time: 1000
Meter ID	62 A	१४१९			WQ Signoff:
Lab Water Control	24.0	9.54	11.4	96.5	Date: 3-3-14
100%	26.0	9.55	20.7	771	WQ Time: 0850
Meter ID	62AS	PH16	PDOY	6009	WQ Signoff:

Initial Count:10,000 cells/mL	Termination Time: 1600	Enumerating PO

Treatment		Mean Cell Density						
rreatment	Rep A		Rep C		Rep D	(cells/mL x 10 ⁶)		
Lab Water Control	2,63	3.10	2-72	2	87	2.3	3 2 82	
100%	6.86	7.36	7.09	7,	7.43		7.19	
This datasheet has been reviewed for completeness and consistency with Test Acceptability Criteria and/or other issues of concern.			Control Mean Density (cells/mL x 10°)	% CV	Date:	Time:	Signoff:	
			2-83	7.26	33.13	1630	Pa	

Initial Test Conditions	Alkalinity	Hardness	Light Intensity (ftc)	
Initial Test Conditions	231	319	373.6	

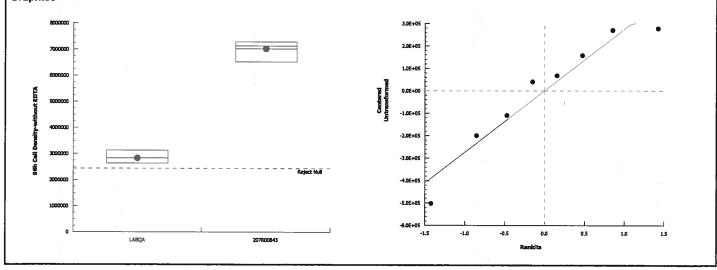
Report Date:

12 Mar-14 12:14 (p 1 of 2)

st Code:

ADH 0227 SC C1 | 02-3497-5955

- 1						1631	Code:	ADI 1_0221_		02-3497-59
Algal Growth Tes	st								Pac	ific EcoRis
Analysis ID: 07-7504-2489 Endpoint: 96h Cell Density-without ED Analyzed: 12 Mar-14 12:13 Analysis: Parametric-Two Sample		ATC		IS Version: ial Results		.8.5				
				-						
Data Transform	Zeta	Alt Hyp	Trials	Seed		PMSD	Test Res	ult		
Untransformed	NA	C > T	NA	NA		13.8%				
Equal Variance t	Two-Sample Test						8	-		
Sample Code v	s Sample Code	Test Stat	Critical	MSD DF	P-Value	P-Type	Decision	(a:5%)		
LABQA	207R00843	-20.8	1.94	4E+05 6	1.0000	CDF	Non-Sign	ificant Effect	t	
ANOVA Table			-							
Source	Sum Squares	Mean Squ	uare	DF	F Stat	P-Value	Decision	(a:5%)		
Between	3.498661E+13	3.498661	E+13	1	432	<0.0001	Significant Effect			
Error	4.85475E+11	80912500	000	6						
Total	3.547209E+13			7						
Distributional Te	sts	···				<u> </u>		•		
Attribute	Test		Test Stat	Critical	P-Value	Decision	(α:1%)			
Variances	Variance Ratio F		2.83	47.5	0.4149	Equal Var	iances			1
Distribution	Shapiro-Wilk W	Normality	0.922	0.645	0.4456	Normal Di	stribution			
96h Cell Density-	without EDTA Sum	mary				50				
Sample Code	Coun	t Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
LABQA	4	2.83E+6	2.50E+6	3.16E+6	2800000	2.63E+6	3.10E+6	1.03E+5	7.26%	0.0%
207R00843	4	7.01E+6	6.46E+6	7.56E+6	7130000	6.51E+6	7.29E+6	1.73E+5	4.93%	-148.0%
Graphics										· · · · · ·
1 1										
8000000 F					3.0E+05 F				• /	•



Selenastrum capricornutum Algal Toxicity Test Data Sheet

Client:	ADH / CCCWP	Material:	207R	00843	
Test Start Date:	2/27/14	Test ID #:	55490	Project #: 19397	
Test End Date:	3/3/14	Control/Diluent:	Lab water w/o EDTA	Location: TRG/RU/S	5/

Test Treatment	Temp (°C)	pН	D.O. (mg/L)	Conductivity (µS/cm)	Sign-Off
Lab Water Control	05 37.59	7.59	8.1	94.6	Date: 2/27/14
100%	25.3	7-65	10.3	<i>35</i> 0	Sample ID#: 34206
					Test Solution Prep:
					New WQ:
					Inoculation Time: 1715
Meter ID	(Lap	DH19	RDOY	BOOH	Innoculation Signoff:
Lab Water Control	25.0	7.11			Date: 2-28-14
100%	25.0	8.14			WQ Time: 0850
Meter ID	62A	PH 19			WQ Signoff:
Lab Water Control	25.0	8.20			Date: 03/01/14
100%	25.0	8.32			WQ Time: 1000
Meter ID	624	9415			WQ Signoff:
Lab Water Control	25.7	8.98			Date: 03/62/44
100%	25.7	9.16			WQ Time: \DOO
Meter ID	62A	Pm9			WQ Signoff:
Lab Water Control	26.0	10:02 9.56	11.6	96.5	Date: 3-3-14
100%	26.0	10.02	18.3	9 4.5 352	WQ Time: 0850
Meter ID	G2W	PHIV	POOY	8109	WQ Signoff: ARE

Initial Count: 10,000 cells/mL Termination Time: 1600	Enumerating Scientist:	PA	
---	------------------------	----	--

Treatment		Mean Cell Density						
Treatment	Rep A	Rep B	Rep C		Rep D	(cells/mL x 10 ⁶)		
Lab Water Control	263	3.10	272	2	82	2-8	3 2 83	
100%	7.29	7.17	7.08	65	6.57			
This datasheet has been reviewed for completeness and consistency with Test Acceptability Criteria and/or other issues of			Control Mean Density (cells/mL x 10°)	% CV	Date:	Time:	Signoff:	
	concern.		283	7.26	33.14	1630	Pa	

Initial Test Conditions	Alkalinity	Hardness	Light Intensity (ftc)
	93	113	373.6

Appendix C

Test Data and Summary of Statistics for the Evaluation of the Chronic Toxicity of the CCCWP Stormwater to Ceriodaphnia dubia



CETIS Summary Report

Report Date:

12 Mar-14 10:51 (p 1 of 1)

Test Code: ADH_0227_CD_C1 | 03-0011-7960

							Test Cod	e:	ADH_0227_	CD_C1 C	3-0011-7960
Ceriodaphnia	Survival and Reprod	uction Test				· · · · · · · · · · · · · · · · · · ·				Paci	fic EcoRisk
Batch ID:	10-6010-4569	Test Type:	Reproduction	n-Survival (7d)			Analyst:	Ca	ssy Glover		
Start Date:	27 Feb-14 16:00	Protocol:	EPA-821-R-0	02-013 (2002)			Diluent:	No	Applicable		
Ending Date:	05 Mar-14 17:00	Species:	Ceriodaphnia	a dubia			Brine:	No	Applicable		
Duration:	6d 1h	Source:	In-House Cu	lture			Age:	1			
Sample Code	Sample ID	Samp	le Date R	eceive Date	Sample	Age	Client Na	me		Project	
LABQA	07-1612-1969	27 Fe	b-14 16:00 27	7 Feb-14 16:00	NA (25.	.5 °C)	ADH Envi	ronme	ental, Inc.	19397	
207R00843	14-6517-7241	26 Fe	b-14 17:45 27	7 Feb-14 16:11	22h (0.6	6 °C)					
206R00551	08-4072-0786	26 Fe	b-14 15:20 27	7 Feb-14 16:11	25h (0.4	4 °C)					
Sample Code	Material Type	Samp	le Source		Station	Locatio	n		Latitude	Lor	ngitude
LABQA	Lab Water	ADH I	Environmenta	l, Inc.	LABQA						,
207R00843	Ambient Water	r ADH i	Environmental	l, Inc.	207R00	843					
206R00551	Ambient Water	r ADH I	Environmental	, Inc.	206R00)551			-		
Reproduction	Summary					·-··					
Sample Code	Cou		95% LC	L 95% UCL	Min	Max	Sto	l Err	Std Dev	CV%	%Effect
LABQA	10	31.3	30.1	32.5	28	37	. 1.0	4	3.3	10.5%	0.0%
207R00843	10	29.1	27.1	31.1	16	34	1.7		5.47	18.8%	7.03%
206R00551	10	28.9	27.7	30.1	23	33	1.0	5	3.31	11.5%	7.67%
Survival Sumn	nary										
Sample Code	Cour		95% LC	L 95% UCL	Min	Max	Sto	Err	Std Dev	CV%	%Effect
LABQA	10	1	1	1	1	1	. 0		0	0.0%	0.0%
207R00843	10	0.9	0.782	1	0	1	0.1		0.316	35.1%	10.0%
206R00551	10	1	1	1	1	- 1 -	0		0	0.0%	0.0%
Reproduction	Detail										
Sample Code	Rep			Rep 4	Rep 5	Rep	6 Re	7	Rep 8	Rep 9	Rep 10
LABQA	29	29	34	30	28	30	32		36	37	28
207R00843	27	33	26	34	33	16	34		31	29	28
206R00551	23	31	29	31	32	30	33		29	24	27
Survival Detail											
Sample Code	Rep	1 Rep 2	Rep 3	Rep 4	Rep 5	Rep	6 Re	7	Rep 8	Rep 9	Rep 10
LABQA	1	1	1	1	1	1	1		1	1	1.
207R00843	1	1	1	1	1	0	· · · 1		1	1	. 1
206R00551	1	1	1	1	1	1	1		1	1	. 1
Survival Binon	nials										
Sample Code	Rep	1 Rep 2	Rep 3	Rep 4	Rep 5	Rep	6 Rej	7	Rep 8	Rep 9	Rep 10
LABQA	1/1	1/1	1/1	1/1	1/1	1/1	. 1/1		1/1	1/1	1/1
207R00843	1/1	1/1	1/1	1/1	1/1	0/1	1/1		1/1	1/1	1/1
206R00551	1/1	1/1	1/1	1/1	1/1	1/1	1/1		1/1	1/1	1/1

Report Date:

12 Mar-14 10:51 (p 2 of 2)

Test Code:

ADH_0227_CD_C1 | 03-0011-7960

Ceriodaphnia	Sur	ival and R	eprodu	ction Test								Pacific EcoRis
Analysis ID: Analyzed:		9071-7117 Mar-14 10:		Endpoint: Analysis:			tingency Ta	ble		S Version: ial Results:	CETISv1.8.5 Yes	27
Data Transfo	rm		Zeta	Alt H	ур	Trials	Seed			Test Resul	t	
Untransforme	d			C > T	•	NA	NA					
Fisher Exact	Test											
Sample	vs	Sample		Test S	Stat	P-Value	P-Type	Decision	(α:5%)			
_ABQA		206R005	51	1		1.0000	Exact	Non-Sign	ificant Effect			
Data Summai	ry			· · · · · · · · · · · · · · · · · · ·				-				
Sample Code)		NR	R		NR + R	Prop NR	Prop R	%Effect			
.ABQA	Lab	Water	10	0		10	1	0	0.0%			
06R00551			10	0		10	1	0	0.0%			
3raphics												
1.0		•			•							
0.9												
0.8												
0.7												
0.6												
Į												
Ş 0.4												
0.3												
0.2												
0.1												
0.1												
0.0		LVBÖV		206	6A00551							

Report Date:

12 Mar-14 10:51 (p 1 of 2)

Test Code:

ADH_0227_CD_C1 | 03-0011-7960

Pacific EcoRisk

02-5680-4343 Analysis ID: Analyzed:

12 Mar-14 10:51

Endpoint: Reproduction

Analysis: Parametric-Two Sample

CETIS Version: CETISv1.8.5

Officia	Results:	Yes

Data Transform	Zeta	Alt Hyp	ınaıs	Seea	PMSD	lest Result	
Untransformed	NA	C > T	NA	NA	8.2%		
Foual Variance t Two-Sample	e Test		<u> </u>				

Sample Code	vs	Sample Code	Test Sta	t Critical	MSD	DF P-Value	P-Type	Decision(a:5%)	
LABQA		206R00551	1.62	1.73	2.57	18 0.0611	CDF	Non-Significant Effect	

ANOVA Table

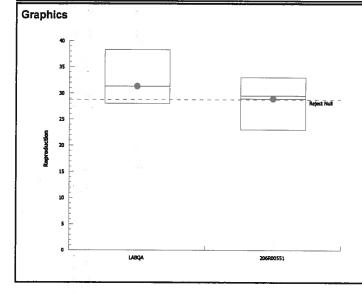
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(a:5%)
Between	28.8	28.8	1	2.63	0.1221	Non-Significant Effect
Error	197	10.94444	18			
Total	225.8		19			

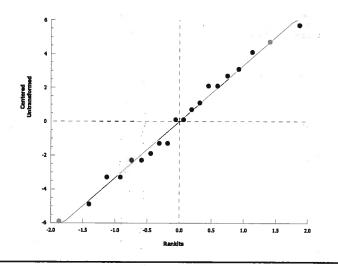
Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)	
Variances	Variance Ratio F	1.01	6.54	0.9905	Equal Variances	
Distribution	Shapiro-Wilk W Normality	0.98	0.866	0.9391	Normal Distribution	

Reproduction Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
LABQA	10	31.3	28.9	33.7	30	28	37	1.04	10.5%	0.0%
206R00551	10	28.9	26.5	31.3	29.5	23	33	1.05	11.5%	7.67%





Short-Term Chronic 3-Brood Ceriodaphnia dubia Survival & Reproduction Test Data

	Client:			ADH/C				N	laterial:			06R005				Те	st Date:	2-27-14
Pro	ect#:	19	397		Test 1D:	554	487		Random	ization:		.4.3					Water:	
	Day	pH		D.O.		Cond. (µS/cm)	Temp (°C)					rvival / R	· -		1			SIGN-OFF
		New 7.81	Old	New 7.8	Old	349		A	В	C	D	Е	F	G	н	1	1	Date: 2/27/14 New WQ: SM Test Init. SM
	0	SPO1				281st	25.5	0	0	0	0	0	0	0	0	0	0	Sol'n Prep: SM Time: 1600
1	1	8.04		8.3	8.1	349	05.2	0	0	0	0	0	0	စ	0	0	0	Date: 2 28 14 New WQ: 14 Counts (18 Sol'n Prep: 19 Old WQ: 14 Time: 17 S
1	2	7, 97	8.08	8.2	8.2	351	25.7	0	O	O	0	0	0	0	0	0	0	Date: 3/1/4 New WQ: CO Counts COS Sol'n Prep: S Old WQ: C Time: 12.60
l E	3	7.92	8-14	8,5	73	350	25.9	4	6	5	3	5	6	7	6	7	5	Date: 31214 New WQ: D. M. S. Counts: Sol'n Prep: GJD Old WQ: Pup Time: 1600
Lab Water Control	4	7,90	7.97	8.4	7.9	350	25.7	૪	7	0	0	フ	7	8	11	0	10	Date: 73 117 New WQ: CO Counts: Time 1650
Water	5		7.97	8.0	8.2	338	25.5	0	0	13	12	0	0	0	0	14	0	Date: 3-4-14 New WQ: 15 Counts:
Lab	6		i						2	17	 		17			<u> </u>	13	Date: 3-5-14 New WQ: Counts:
1	7		7.73		0.1	1 241	25.7	13	9	' '	15	16	1/	17	19	16	5	Sol'n Prep: Old WQ: Time: 1 700 Date: New WQ: Counts:
																		Sol'n Prep: Old WQ: Time: Date: New WQ: Counts:
İ	8	::::::::::::::::::::::::::::::::::::::	2000000000	88888888	200000000	******												Sol'n Prep: Old WQ: Time:
n nun nun n							Total=	29	29	34	30	28		32	36	37 .	28	Mean Neonates/Female = 31.3
	Day	New P	Old	D. New	O. Old	Cond. (µS/cm)		Α	В	С	Survival D	/ Reprod	uction F	G	н	I	J	SAMPLE ID
	0	8.01		9.7		ore i		0	٥	0	٥	0	0	0		0	0	34205
			♥ 37		77	881					-				0)	
1	1	7.95		0,01		902		0	0	0	0	0	9	0	0	0	0	34205
	2			8.8	7.3	871		0	0	0	0	0	0	0	0	0	0	34205
	3	7.93	8:32	9.8	7.	832		A)S	2004 2008	£5°	765 265	6	5	E.	<u></u> ,‰ ⁷	3.5	23	34205
%001	4	7.92	8.27	9.0	7.7	893		3	H	9	9	11	11	12	9	7	10	34205
0	5	8.30	8.35	9.3	8.1	889		3	0	0	0	0	0	0	4	0	0	34205
	6		8.18			968		14	16	14	17	15	14	15	7	13	14	
	7		0.10		<u> </u>	100		- /	*	' 1			-	ر ،				
	8																	
	, ,						Total	22	21	76	21	20	2	20	20	211	77	24.0
							Total=	23	31	29	31	32	<u>30</u>	33	29	24	27	Mean Neonates/Female = 28.9

Report Date:

12 Mar-14 10:51 (p 1 of 2)

Test Code:

ADH_0227_CD_C1 | 03-0011-7960

Ceriodaphnia S	urvival and	Reprodu	uction Test							Pacific EcoRisi
•	15-9148-365 12 Mar-14 10		Endpoint: Sur Analysis: Sin		ntingency Ta	ble		TIS Version: icial Results:	CETISv1.8.5 Yes	
Data Transform		Zeta	Alt Hyp	Trials	Seed			Test Resu	lt	
Untransformed	L 3		C>T	NA	NA					
Fisher Exact Te	st									
Sample v	s Sample	,	Test Stat	P-Value	P-Type	Decision	n(a:5%)			
LABQA	207R00	843	0.5	0.5000	Exact		nificant Effe	ct		22
Data Summary								<u></u>		
Sample Code		NR	R	NR+R	Prop NR	Prop R	%Effect			
	ab Water	10	0	10	1	0	0.0%			
207R00843		9	1	10	0.9	0.1	10.0%	ï		1 1
Graphics			"							
1.0	•									
0.9	-									
TE TE										
0.0										
0.7										
0.6										
J 0.5										
§										
0.4										
0.3										
0.2								708		
0.1										
٠		2		1						(2.5)
V.0	LABQA		207R20843							

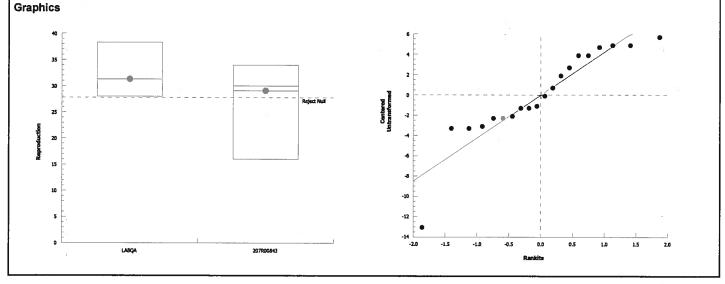
Report Date:

12 Mar-14 10:51 (p 2 of 2)

Test Code:

ADH_0227_CD_C1 | 03-0011-7960

Ceriodaphnia Surv	vival and Reprodu	uction Test							Paci	fic EcoRisk
Analysis ID: 10-	5914-5607	Endpoint:	Reproduction			CET	IS Version:	CETISV	1.8.5	
Analyzed: 12	Mar-14 10:51	Analysis:	Parametric-Two	Sample		Offic	ial Results	: Yes		
Data Transform	Zeta	Alt Hy	p Trials	Seed	·	PMSD	Test Res	ult		
Untransformed	NA	C>T	NA	NA		11.2%				
Equal Variance t T	wo-Sample Test									
Sample Code vs	Sample Code	Test S	tat Critical	MSD DF	P-Value	P-Type	Decision	(a:5%)		
LABQA	207R00843	1.09	1.73	3.5 18	0.1452	CDF	Non-Sign	ificant Effec	:t	
ANOVA Table						*				
Source	Sum Squares	Mean	Square	DF	F Stat	P-Value	Decision	(a:5%)		
Between	24.2	24.2		1	1.19	0.2903	Non-Sign	ificant Effec	t	-
Error	367	20.388	889	18						
Total	391.2			19						
Distributional Test	s	·								
Attribute	Test		Test Stat	Critical	P-Value	Decision	(α:1%)			
Variances	Variance Ratio I	F	2.74	6.54	0.1492	Equal Var	iances			
Distribution	Shapiro-Wilk W	Normality	0.878	0.866	0.0160	Normal D	istribution			
Reproduction Sum	mary									
Sample Code	Cour	nt Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
LABQA	10	31.3	28.9	33.7	30	28	37	1.04	10.5%	0.0%
207R00843	10	29.1	25.2	33	30	16	34	1.73	18.8%	7.03%





Short-Term Chronic 3-Brood Ceriodaphnia dubia Survival & Reproduction Test Data

(Client: ADH / C				CCCWP			M	laterial:		20	7R0084	13		Test Date:			2-27-14
Pro	ject #:	193	397		Test ID:	554	491	I	Random	ization:	K).4 <u>.3</u>			-	Control	Water:	Modified EPAMH
	Day				T	Cond.	Temp (°C)				,	rvival / R						SIGN-OFF
		New	Old	New	Old	(µS/cm)	•	Α	В	С	D	Е	F	G	Н	I	J	
	0	7.81		7.8		349	25.5	0	0	0	0	0	0	0	0	0	0	Sol'n Prep: Sr
	1	804	7.96	83	8.1	349	25.2	0	0	P	0	0	0	0	0	0	0	Date: 2 28 14 New WQ: LH Counts CS Sol'n Prep: CD Old WQ: TkA Time: 72 5
	2	7.97	8.08	8.2	8.2	351	25.7	0	0	0	0	0	0	0	0	0	0	Date: 31114 New WQ: CO Counts Cotto
frol	3	7.92	8.14	8.5	7.3	350	25.9	S	4	5	3	5	6	7	6	7	5	Date: 312114 New WQ: P.M.S. County Sol'n Prep: COD Old WQ: Time: 1600
r Con	4	7.40	7.97	8.4	7.9	350	25.7	જ	7	۵	0	7	7	%	11	٥	2	Date: 3)114 New WQ: C Counts Sol'n Prep: Old WQ: Time: 1650
Lab Water Control	5	8.14	7.97	8.6	8.2	338	25.5	0	0	12	12	0	0	0	0	14	0	Date: 5-4-14 New W. Counts Sol'n Prep Sil Old WQ: Time I Coo
Lal	6	1	7.73	ı	8.1	371	25.9	15	19	7	15	19	7	17	19	4	13	Date: 3-5-14 New WQ: Counts: Sol'n Prep: Old WQ: Time 700
	7												٠			-		Date: New WQ: Counts. Sol'n Prep: Old WQ: Time:
	8																	Date: New WQ: Counts:
							Total=	29	29	34	30	28	3n	32	36	37	28	71.7
	Day	р	::::::::::::::::::::::::::::::::::::::	D.	.O.	Cond.			- 1			/ Reprod		ــــــــــــــــــــــــــــــــــــــ	000	<u> </u>	20	
		New	Old	New	Old	(µS/cm)		Α	В	С	D	E	F	G	Н	Ī	J	SAMPLE ID
	0	7.75		10.4		272		0	0	0	0	0	0	0	0	0	0	34206
	ı	7.72	7.94	W.6	7.9	307		0	0	0	0	0	0	0	0	Q	Q	34206
	2	7.69	7.97	10.60	7.1	278		0	0	O	0	0	0	0	0	0	0	34206
	3	7.67	8.03	10.8	7.4	288		₩ 5	4	725	3,4	5	35	7	56	Y	453	34206
100%	4	7.64	7.84	8.9	7.6	280		O	11 4	5	10	II	10		9	8	9	34206
º	5	8.65	8.00	8	8.2	285		8	٥	Ó	0	O	×/0	0	Ó	0	Ó	34206
	6		7.99	-	8.1	336		14	18	14	18	17	·	16	14	17	16	
	7																	
	8												-					
							Total=	27	33	عد	34	33	416	34	31	29	28	Mean Neonates/Female =

Appendix D

Test Data and Summary of Statistics for the Evaluation of the Chronic Toxicity of the CCCWP Stormwater to *Hyalella azteca*



CETIS Summary Report

Report Date:

11 Mar-14 16:19 (p 1 of 1)

Test Code:

ADH_0227_HA_C1 | 06-3972-8324

Hyalella Survi	val and Growth Test							VOLUM		Pacif	ic EcoRisk
Batch ID: Start Date:	01-9938-1231 27 Feb-14 18:00	Test Type: Protocol:	Survival-Gro	owth (10 day)			Analyst: Diluent:		ssy Glover		
	09 Mar-14 09:20						Brine:		Applicable		
Ending Date: Duration:	9d 15h	Species: Source:	Hyalella azt	eca e Cultures, Inc.				9	Applicable		
Duration.	30 1011	Jouice.	Onesapean	e Cultures, Inc.			Age:	-			
Sample Code	Sample ID			Receive Date	Sample		Client Na	me		Project	-
LABQA	11-0836-4836			27 Feb-14 18:00	•	•	ADH Envi	ronme	ntal, Inc.	19397	_
207R00843	14-6517-7241	26 Fe	b-14 17:45 2	27 Feb-14 16:11	24h (0.6	°C)					g.
206R00551	08-4072-0786	26 Fe	b-14 15:20 2	7 Feb-14 16:11	27h (0.4	°C)				_	
Sample Code	Material Type	Samp	le Source		Station	Locatio	n		Latitude	Lor	gitude
LABQA	Sediment	ADH	Environment	al, Inc.	LABQA		1.2				
207R00843	Ambient Water	ADH	Environment	al, Inc.	207R00	843	= 9				
206R00551	Ambient Water	ADH	Environment	al, Inc.	206R00	551					
Survival Rate	Summary			· · · ·	''a		1		· · · · · · · · · · · · · · · · · · ·		
Sample Code	Cou	nt Mean	95% L	CL 95% UCL	Min	Max	Std	Err	Std Dev	CV%	%Effect
LABQA	5	0.98	0.963	0.997	0.9	1	0.0	2	0.0447	4.56%	0.0%
207R00843	5	0.64	0.572	0.708	0.4	0.9	0.0	812	0.182	28.4%	34.7%
206R00551	5	0.94	0.907	0.973	0.8	1	0.0	4	0.0894	9.52%	4.08%
Survival Rate	Detail										
Sample Code	Rep	1 Rep 2	Rep 3	Rep 4	Rep 5						
LABQA	1	0.9	1	1	1						
207R00843	0.4	0.6	0.7	0.6	0.9						
206R00551	0.9	0.8	· 1	1	1						
Survival Rate	Binomials										
Sample Code	Rep	1 Rep 2	Rep 3	Rep 4	Rep 5						
LABQA	10/10	9/10	10/10	10/10	10/10						
207R00843	4/10	6/10	7/10	6/10	9/10						
206R00551	9/10	8/10	10/10	10/10	10/10						

Analyst: QA:SNV

Report Date:

11 Mar-14 16:19 (p 2 of 2)

Test Code:

ADH 0227 HA C1 | 06-3972-8324

Analyzed: 11 Mar-14 16:19 Analysis: Parametric-Two Sample								Test	Code:	ADH_0227_	_HA_C1 0	6-3972-832
Analyzed: 11 Mar-14 16:19	Hyalella Survi	val and Grow	vth Test						,		Paci	fic EcoRis
Sample Code Vas Sample Code Test Stat Critical MSD DF P-Value P-Type Decision(α:5%)	Analysis ID: Analyzed:			•		Sample					1.8.5	- :
Angular (Corrected) NA C > T NA NA 8.11%	Data Transfori	n	Zeta	Alt Hyp	Trials	Seed	-	PMSD	Test Re	sult		
Sample Code Vs Sample Code Test Stat Critical MsD DF P-Value P-Type Decision(a:5%)	Angular (Corre	cted)	NA			NA						
ABQA 208R00551 0.876 1.86 0.129 8 0.2034 CDF Non-Significant Effect NOVA Table Source Sum Squares Mean Square DF F Stat P-Value Decision(α:5%) Selween 0.009294413 1 0.009294413 1 0.767 0.4068 Non-Significant Effect F Stat 0.1062709 9 0.01212205 8 0.01062709 9 0.01212205 8 0.01062709 9 0.01062709 9 0.00969765 0.01212205 8 0.01062709 9 0.00969765 0	Equal Varianc	e t Two-Sam	ple Test									
ABQA 206R00551 0.876 1.86 0.129 8 0.2034 CDF Non-Significant Effect NOVA Table Source Sum Squares Mean Square 0.009294413 0.009294413 1 0.767 0.4068 Non-Significant Effect F Stat P-Value Decision(c:5%) Serveen 0.009294413 0.0121206 8 Fotal 0.1062709 9 Distributional Tests Attribute Test Test Test Stat Critical P-Value Decision(c:1%) Shapiro-Wilk W Normality 0.829 0.741 0.0324 Normal Distribution Shapiro-Wilk W Normality 0.829 0.741 0.0324 Normal Distribution Survival Rate Summary Sample Code Count Mean 95% LCL 95% UCL Median Min Max Std Err CV% %Effect ABQA 5 0.98 0.924 1 1 0.9 1 0.02 4.56% 0.0% 0.06R00551 5 0.94 0.829 1 1 0.8 1 0.04 9.52% 4.08% Nangular (Corrected) Transformed Summary Sample Code Count Mean 95% LCL 95% UCL Median Min Max Std Err CV% %Effect ABQA 5 1.38 1.29 1.47 1.41 1.25 1.41 0.0326 5.28% 0.0% 0.06R00551 5 1.32 1.15 1.49 1.41 1.11 1.41 0.0615 10.4% 4.42% Sample Code Count Mean 95% LCL 95% UCL Median Min Max Std Err CV% %Effect ABQA 5 1.38 1.29 1.47 1.41 1.25 1.41 0.0326 5.28% 0.0% 0.06R00551 5 1.32 1.15 1.49 1.41 1.11 1.41 0.0615 10.4% 4.42% Sample Code Count Mean 95% LCL 95% UCL Median Min Max Std Err CV% %Effect ABQA 5 1.38 1.29 1.47 1.41 1.25 1.41 0.0326 5.28% 0.0% 0.06R00551 5 1.32 1.15 1.49 1.41 1.11 1.41 0.0615 10.4% 4.42% Sample Code Count Mean 95% LCL 95% UCL Median Min Max Std Err CV% %Effect ABQA 5 1.38 1.29 1.47 1.41 1.25 1.41 0.0615 10.4% 4.42% Sample Code Count Mean 95% LCL 95% UCL Median Min Max Std Err CV% %Effect ABQA 5 1.38 1.29 1.47 1.41 1.25 1.41 0.0615 10.4% 4.42% Sample Code Count Mean 95% LCL 95% UCL Median Min Max Std Err CV% %Effect ABQA 5 1.38 1.29 1.47 1.41 1.11 1.41 0.0615 10.4% 4.42%	Sample Code	vs Sampi	le Code	Test Sta	t Critical	MSD DF	P-Value	P-Type	Decisio	n(α:5%)		
Source Sum Squares Mean Square DF F Stat P-Value Decision(a:5%)	LABQA	206R0	0551	0.876	1.86	0.129 8	0.2034				t	
Setween 0.009294413	ANOVA Table	-										, .
Setween 0.009294413	Source	Sum S	quares	Mean So	quare	DF	F Stat	P-Value	Decision	n(α:5%)		
Second S	Between					1	0.767	0.4068			t	
Distributional Tests Test Stat Critical P-Value Decision(α:1%)	Error	0.09697	765	0.01212	206	8						
Test Test Stat Critical P-Value Decision(α:1%)	Total	0.10627	709			9						
Variances Variance Ratio F Shapiro-Wilk W Normality 0.829 0.741 0.0324 Normal Distribution Survival Rate Summary Sample Code Count Mean 95% LCL 95% UCL Median Min Max Std Err CV% %Effect ABOA 5 0.98 0.924 1 1 0.99 1 0.02 4.56% 0.0% 0.06R00551 5 0.94 0.829 1 1 0.8 1 0.04 9.52% 4.08% Angular (Corrected) Transformed Summary Sample Code Count Mean 95% LCL 95% UCL Median Min Max Std Err CV% %Effect ABOA 5 1.38 1.29 1.47 1.41 1.25 1.41 0.0326 5.28% 0.0% 0.06R00551 5 1.32 1.15 1.49 1.41 1.11 1.41 0.0615 10.4% 4.42% Simplics	Distributional	Tests					•					
Distribution Shapiro-Wilk W Normality 0.829 0.741 0.0324 Normal Distribution	Attribute	Test			Test Stat	Critical	P-Value	Decision	(a:1%)			
Survival Rate Summary Sample Code	/ariances	Varian	ce Ratio F		3.56	23.2	0.2460	Equal Va	riances			
Sample Code	Distribution	Shapir	o-Wilk W Nor	mality	0.829	0.741	0.0324	Normal D	istribution			
ABQA 5 0.98 0.924 1 1 0.99 1 0.02 4.56% 0.0% 0.06R00551 5 0.94 0.829 1 1 0.8 1 0.04 9.52% 4.08% Ingular (Corrected) Transformed Summary Sample Code	Survival Rate	Summary							-			
1	Sample Code		Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
Angular (Corrected) Transformed Summary Sample Code	_ABQA		5	0.98	0.924	1	1	0.9	1	0.02	4.56%	0.0%
Sample Code	206R00551		5	0.94	0.829	1	1	0.8	,1	0.04	9.52%	4.08%
ABQA 5 1.38 1.29 1.47 1.41 1.25 1.41 0.0326 5.28% 0.0% 0.06R00551 5 1.32 1.15 1.49 1.41 1.11 1.41 0.0615 10.4% 4.42% Graphics Refer Table 1.29 1.47 1.41 1.25 1.41 0.0326 5.28% 0.0% 0.0% 0.06R00551 0.4% 4.42% 0.06R00551 0.4% 0.4% 0.06R00551 0.4% 0.06R00551 0.4% 0.06R00551 0.4% 0.06R00551 0.4% 0.06R00551 0.4% 0.06R005	Ingular (Corre	cted) Transf	ormed Sumr	nary								
006R00551 5 1.32 1.15 1.49 1.41 1.11 1.41 0.0615 10.4% 4.42% Sraphics Resear Nation 0.15 0.20 0.20 0.20 0.20 0.20 0.20 0.20 0.2	Sample Code		Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
1.0 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0	_ABQA		5	1.38	1.29	1.47	1.41	1.25	1.41	0.0326	5.28%	0.0%
0.15 0.25 0.25 0.25 0.25 0.25 0.20 0.25 0.25	206R00551		5	1.32	1.15	1.49	1.41	1.11	1.41	0.0615	10.4%	4.42%
0.5 Reject Real 0.10 0.15 0.1	Graphics											
0.5 0.5 0.05 0.05 0.05 0.05 0.05 0.05 0	1.0 E	-					0.15 F		!			
0.7 0.4 0.5 0.05	0.9				Reject Null		0.10		 	• 4	_	
0.7	0.8								1			
0.6 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5	0.7								•	• 6		
0.5	4.7					B	£ 0.00		ا اور وا	<i></i>	- -	
0.3 0.3	- A0					8	ð		. /			
0.3	2 0.5 2 0.5						-0.05					
0.3	E 0.4						-0.10	/	/-			
-0.15								/.	 			
	0.3						-0.15	/	 			
	0.2								I I			

10 Day Acute Hyalella azteca Toxicity Test Data

Client:		ADH / CCCWP		Organism Log#:	7993 Age:	9 days
l'est Material:		206R00551		Organism Supplier:	Chesapeake	Cultures
Test ID#:	55488	Project #:	19397	Control/Diluent:	SAM-5 Hyalel	lla Water
Test Date:		2127114		Control Water Batch:	92	

Lab Control 23.1 7.91 9.0 410 10 10 10 10 10 10	1800 18/14 1040
Meter ID 43A 5HB 2004 ECOH Initiation Time Initiation Signal 10 9 10 10 10 Date 2/2 2/3 10 10 10 10 10 10 10 1	1800 1800 18/14 1040 1040 1040 1040 1040 1040 1040 1040 1040 1040 1040 1040 1040
Meter ID 43A 5HM 2004 ECOH Initiation Time	1800 1800 18/14 1040 1040 1040 1040 1040 1040 1040 1040 1040 1040 1040 1040 1040
Meter ID 4/3A 9H9 2004 E(0) Initiation Time	1800 18/14 1040
Lab Control 23.1	18/14 1040 "MK MA MA 1/14 905
100% 23.1 7.9 10 10 10 10 10 Count Time	1046 "MK MA 1/14 905
Meter ID 43n 10 10 10 10 10 10 10 1	MA 1114 905
Lab Control 23.2	11 ALL
100% 23.2	11 ALL
Meter ID 43A 4064 7.5 10 0 10 10 10 10 10 10	
Lab Control 23, \ 7.5 10 9 10 10 Date: 35 Count Time: 1007 02 1 1007 03 10 03 03	15
Lab Control 23,	<u>~</u> МУ
	0925
	5045 5045
Meter ID	3/14
Lab Control 23.0	1600
100% Z3.0 7.S 10 9 10 10 10 Old WQ C	-:TN
Meter ID 47A Fred DOM	
Lab Control 23.0 7.99 7-73 8.7 6.8 413 10 9 10 10 10 Sample ID	3-4-14 34205
100% 23.0 8.07 8.19 9.0 5.8 894 9 9 10 10 10 First Solution	3-4-14 3-4205 1Prep: SM
Meter ID 43A PHI6 Ph 19 RD07 MO9 ECO6	° 1615
Renewal Sign	
Lab Control 23.0 7.3 10 9 10 10 10 Date 315.	114
1907 73 0 10 10 10 Count Signor	are Are
Meter ID 43A Food GT	D
Lab Control 23.1 6.7 10 9 10 10 10 Count Time	6.14
1007 23.1 5.7 9 9 10 10 10 Count Signal	Pe
Meter ID 430- RDD7	
Lab Control 22.9 [0 9 10 10 10 0 Count Time	7/14 1405
1007 22.9 6.3 9 8 10 10 10 Count Signol	ع ع
Meter ID 43A POO7	20 と
	8-14 1330
12.5 Count Signot	معتر ۱۱
Meter ID 43A PDOT	
Lab Control 22.9 7.63 6.8 443 10 9 10 10 10 Termination	
100% 22.9 7.89 5.9 907 9 8 10 10 10 Termination Cold WG C	Signoff:
Meter ID	· 1 ·

Report Date:

11 Mar-14 16:19 (p 1 of 2)

Test Code:

ADH_0227_HA_C1 | 06-3972-8324

											
Hyalella	a Surviv	al and Growth Test								Paci	fic EcoRisk
Analysis		00-2680-1465	Endpoint: S					'IS Version		1.8.5	
Analyze	ed:	11 Mar-14 16:19	Analysis: P	arametric-Two	Sample		Offic	cial Result	s: Yes		
Data Tra			Alt Hyp	Trials	Seed		PMSD	Test Res	sult		
Angular	(Correc	ted) NA	C>T	NA	NA		11.5%				
Equal V	/ariance	t Two-Sample Test					•				
Sample	Code	vs Sample Code	Test Sta	at Critical	MSD DF	P-Value	P-Type	Decisio	າ(α:5%)		
LABQA		207R00843	4.51	1.86	0.181 8	0.0010	CDF	Significa	nt Effect		
ANOVA	Table										-
Source		Sum Squares	Mean So	quare	DF	F Stat	P-Value	Decisio	η(α:5%)		
Between	n	0.4840151	0.48401		1	20.3	0.0020		nt Effect		
Error		0.1903557	0.02379	446	8	_					
Total		0.6743708			9						
Distribu	ıtiona T	Tests						•			:
Attribute	e	Test		Test Stat	Critical	P-Value	Decision	(α:1%)			
Variance		Variance Ratio F		7.96	23.2	0.0692	Equal Va	riances			
Distribut	tion	Shapiro-Wilk W	Normality	0.895	0.741	0.1905	Normal D	istribution			
Surviva	l Rate S	Summary									
Sample	Code	Coun	t Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
LABQA		5	0.98	0.924	1	1	0.9	1	0.02	4.56%	0.0%
207R008	843	5	0.64	0.414	0.866	0.6	0.4	0.9	0.0812	28.4%	34.7%
Angular	(Corre	cted) Transformed Su	ımmary								
Sample	Code	Coun	t Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
LABQA		5	1.38	1.29	1.47	1.41	1.25	1.41	0.0326	5.28%	0.0%
207R008	843	5	0.939	0.684	1.19	0.886	0.685	1.25	0.092	21.9%	31.9%
Graphic	s						-				
1	10 E					0.4 -		+			
								ŧ			
	F .		-			[1			
	0.9			Reject Null	-	0.3	5			•	/
0	F .			Reject Null	-	0.3	94	. (•	/
0	0.9			Reject Null		0.2		. 1		•	
0	0.9			Reject Muli	- -	0.2		. 1		•	
0	0.8			Reject Nati	Centernal	0.2			, , ,	•	
0	0.8			Reject Null	Control	0.2 - 980 0.1 -			• • •	•	
arvival Rata o	0.8			Reject Null	Cembered	0.2 - 980 0.1 -	· · · · · · · · · · · · · · · · · · ·		• • •	•	
Survival Rabs	0.5			Reject Null	Centernal	0.2		•	, (
Survival Rats 0 0	0.5			Reject Null	Certifornal	0.2 - 0.1 - 0.0			• • •	,	
Survival Rath	0.9			Reject Nat	Centered	0.2			.	•	
Survival Rets	0.9			Reject Null	Centered	0.2			• • •	•	

10 Day Acute Hyalella azteca Toxicity Test Data

Client:		ADH / CCCWP		Organism Log#:	7993	Age: 9 dars
Test Material:		207R00843		Organism Supplier:	Chesapeake	Cultures
Test ID#:	55492	Project #:	19397	Control/Diluent:	SAM-	5 Hyalella Water
Test Date:		2117114		Control Water Batch:	9:	Z

Treatment	Temp (°C)	p	Н		(mg/L)	Conductivity			ive Organi			SIGN-OFF
	remp (C)	new	old	new	old	(μS/cm)	A	В	С	D	E	Date: 2/27/14
Lab Control	23:1	7-91		9.0		410	10	10	10	10		Sample ID 342 04 Test Solution Prep.
100%	25.1	8.04		12.0		299	10	10	10	10	10	New WQ
Meter ID	43 <i>A</i>	pH19		QD04		Eco4						Initiation Time.
Lab Control	23.1				8.3		10	9	10	10	10	Date: 2/28/14 Count Time: 1040
100%	23.1				7.7		10	10	10	10	10	Count Signoff: MK
Meter ID	43 A				12007							
Lab Control	23.2				7.2		10	9	10	10	10	Count Time: 905
100%	23.2				7.2		10	10	10	9	2	Count Signoff: Old WQ:
Meter ID	43A				2004							Feed:
Lab Control	23.)				7.5		10	9	10	10	10	Date: 3/2/19 Count Time: 6925
100%	23.1				7.8		8	10	10	10	10	Count Signoff: AA Old WQ: FOUR
Meter ID	U3A				₽D07							Date: 3/3//
Lab Control	23.0				7.7		10	9	10	10	10	Date: 3/3/4 Count Time: /600 Count Signoff: A
100%	23.0				7.6		6	10	10	8	10	Old WQ: CFD
Meter ID	43A				12009							Date: 3-4-M
Lab Control	23.0	7.99	743	8.7	6.8	413	10	9	10	10	10	Sample ID: 34206
100% Meter ID	23.0 43A	8.03 PH16	8.08 1419	9.0 AD07	6.0	276 Eco6	4	T 10	8	7	(0	New WQ: CP Renewal Time: 1615
												Renewal Signoff:
Lab Control	23.0				7.3		10	9	10	lo	10	Date: 3/5/14 Count Time: 1/00
100%	23.0				7.0		4	10	7	6	10	Count Signoff: C5D
Meter ID	43A				PP07				•			Feed: 63 D
Lab Control	231				6.7		10	9	10	10	10	Date: 3.6.1 1
100%	23.1				6.3		4	10	7	6	10	Count Signoff: Old WQ:
Meter ID	430				R057							
Lab Control	22.9				6.9		10	9	10	10	10	Date: 3 7 / 4 Count Time: 1405
100%	22.9				7.1		4	8	7	6	10	Count Signoff: 20
Meter ID	43A				2007							Feed: Z
Lab Control	22.5				4,9		10	9	10	10	10	Date: 3-8-17 Count Time: 1330
100%	22.5				6.6		ч	8	7	6	9	Count Signoff:
Meter ID	43A				500 0							Date 2/4
Lab Control	22.9		7.63		6.8	443	10	9	10	10	10	Date: 3/9/14 Termination Time: 0920 Termination Signoff: UF
100%	22.9		7.85		6.7	313	4	6	7	6	9	Old WQ. CP
Meter ID	43A		PH21		ROOT	313 ECO4						

CETIS Summary Report

Report Date:

12 Mar-14 11:08 (p 1 of 1)

Test Code:

ADH_0228_HA_C2 | 12-0908-4952

Hyalella Survi	val and Growth Test									Paci	fic EcoRisk
Batch ID: Start Date: Ending Date: Duration:	02-1871-2871 28 Feb-14 17:50 10 Mar-14 10:15 9d 16h	Test Type: Protocol: Species: Source:	Survival-Grow GCML Hyalella azteo Chesapeake	a			Analy Dilue Brine Age:	nt: N	assy Glover ot Applicable ot Applicable		
Sample Code	Sample ID	Samp	le Date Re	ceive Date	Sample	Age	Client	t Name		Project	
LABQA	07-1122-1925		b-14 17:50 28		,	•	ADH I	Environm	ental, Inc.	19397	
207R00011US	12-4879-0307		b-14 09:55 28		•	•					
207R00011DS	19-7063-6676		b-14 08:45 28			-,					
544R00025US	00-0717-3326		b-14 10:00 28		•	•					
544R00025DS	15-1384-1621	28 Fe	b-14 09:30 28	Feb-14 15:20	8h (10.7	°C)					
Sample Code	Material Type	<u>-</u>	le Source		Station	Locatio	n		Latitude	Lo	ngitude
LABQA	Lab Control		Environmental,		LABQA						
207R00011US	Ambient Water		Environmental,		207R000	011US					
207R00011DS	Ambient Water		Environmental,		207R000						
544R00025US	Ambient Water		Environmental,		544R000						
544R00025DS	Ambient Water	ADH I	Environ m ental,	Inc.	544R002	25DS		,			
Survival Rate	Summary	-									
Sample Code	Cour	nt Mean	95% LCL	95% UCL	Min	Max		Std Err	Std Dev	CV%	%Effect
LABQA	5	0.96	0.94	0.98	0.9	1		0.0245	0.0548	5.71%	0.0%
207R00011US	5	0.48	0.463	0.497	0.4	0.5		0.02	0.0447	9.32%	50.0%
207R00011DS	5	0.48	0.364	0.596	0.1	0.8		0.139	0.311	64.9%	50.0%
544R00025US	5	0.18	0.139	0.221	0.1	0.3		0.049	0.11	60.9%	81.3%
544R00025DS	5	0.06	0.0395	0.0805	0	0.1		0.0245	0.0548	91.3%	93.8%
Survival Rate I	Detail										
Sample Code	Rep			Rep 4	Rep 5						
LABQA	, 1	1	1	0.9	0.9					,	
207R00011US	0.5	0.4	0.5	0.5	0.5						
207R00011DS	0.8	0.1	0.2	0.6	0.7						
544R00025US	0.3	0.3	0.1	0.1	0.1						
544R00025DS	0.1	0.1	0	0	0.1					·	
Survival Rate I	3inomials	_									
Sample Code	Rep 1	1 Rep 2	Rep 3	Rep 4	Rep 5						
LABQA	10/10	10/10	10/10	9/10	9/10						
207R00011US	5/10	4/10	5/10	5/10	5/10						
207R00011DS	8/10	1/10	2/10	6/10	7/10						
544R00025US	3/10	3/10	1/10	1/10	1/10						
544R00025DS	1/10	1/10	0/10	0/10	1/10						

Report Date:

12 Mar-14 11:07 (p 1 of 4)

Test Code:

ADH_0228_HA_C2 | 12-0908-4952

Hyalella Survival and Growth Test Analysis ID: 02-7452-7739 Endpoint: Survival Rate CETIS Version: CETISV1 Analyzed: 12 Mar-14 10:58 Analysis: Parametric-Two Sample Official Results: Yes Data Transform Zeta Alt Hyp Trials Seed PMSD Test Result Angular (Corrected) NA C > T NA NA 5.35%		ific EcoRis
Analyzed: 12 Mar-14 10:58 Analysis: Parametric-Two Sample Official Results: Yes Data Transform Zeta Alt Hyp Trials Seed PMSD Test Result	1.8.5	
Data Transform Zeta Alt Hyp Trials Seed PMSD Test Result		
Angular (Corrected) NA C > T NA NA 5.35%		
Equal Variance t Two-Sample Test		
Sample Code vs Sample Code Test Stat Critical MSD DF P-Value P-Type Decision(α:5%)		
LABQA 207R00011US 13 1.86 0.083 8 <0.0001 CDF Significant Effect		
ANOVA Table	-	
Source Sum Squares Mean Square DF F Stat P-Value Decision(α:5%)		
Between 0.8455464 0.8455464 1 169 <0.0001 Significant Effect		
Error 0.0399802 0.004997525 8		
Total 0.8855265 9		
Distributional Tests		
Attribute Test Test Stat Critical P-Value Decision(α:1%)		
Variances Variance Ratio F 3.93 23.2 0.2135 Equal Variances		47.60
Distribution Shapiro-Wilk W Normality 0.796 0.741 0.0128 Normal Distribution		
Survival Rate Summary		
Sample Code Count Mean 95% LCL 95% UCL Median Min Max Std Err	CV%	%Effect
LABQA 5 0.96 0.892 1 1 0.9 1 0.0245	5.71%	0.0%
207R00011US 5 0.48 0.424 0.536 0.5 0.4 0.5 0.02	9.32%	50.0%
Angular (Corrected) Transformed Summary		
Sample Code Count Mean 95% LCL 95% UCL Median Min Max Std Err	CV%	%Effect
LABQA 5 1.35 1.24 1.46 1.41 1.25 1.41 0.0399	6.63%	0.0%
207R00011US 5 0.765 0.709 0.821 0.785 0.685 0.785 0.0201	5.88%	43.2%
Graphics		
1.0		
Rejuct Null 0.075		
0.8 -	,	
9.7		
0.5 TO 0.025		
28 000		
10.000		1.5
on 0.4		
03 -		
0.050		
0.075		
0.1		#
0.00 -0.100 -0.5 0.0 0.5 1. LABQA 207R00011U5	1.0 1.5	2.0
Z//abd1t/s		

10 Day Acute Hyalella azteca Toxicity Test Data

Client:	-	ADH / CCCWP		Organism Log#:	7993 Age:	9-100
Test Material:	7016	207R00011US		Organism Supplier:	(Vesco	ecice
Test ID#:	55494	Project #:	19397	Control/Diluent:	SAM-5 Hyalella	Water
Test Date:		2/28/14		Control Water Batch:	92	

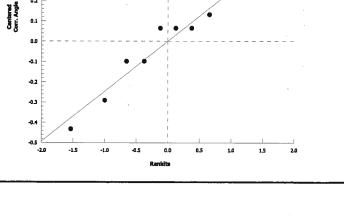
	Ť		ρΗ	D.O.	(mg/L)	Conductivity		#1	ive Organi	isms		
Treatment	Temp (°C)	new	old	new	old	(µS/cm)	Α_	В	C	D	E	SIGN-OFF
Lab Control	22.8	7.76		8.8		410	10	10	10	10	10	Date 2/28/14 Sample ID: 34220
100%	22.8	7.79		10.0		323	10	10	10	10	10	Test Solution Prep: WF New WQ
Meter ID	ΥЗA	рН9		L007		Ec06						Initiation Time: 756 Initiation Signoff: 77
Lab Control	23.2											Date: SILIA
	29.2				9.1		10	10	10	10	10	Count Time: 930 Count Signoff:
100% Meter ID	43A				8.7 R007		10	10	10	10	10	Old WQ:
Lab Control								<i>I</i> O	W	9	9	Date: 3/0/14
	23,1				1		10			-	-	Count Time: 1010 Count Signoff: 20
100% Meter ID	23.1 43#				7.4		10	9	10	9	9	Old WQ: FOUR
Lab Control	1.				2007							Date: 3/3//4
-	23.0				5-6		10	10	10	9	9	Count Time / 045 Count Signoff:
100% Meter ID	23.0 43A				5.4		/0	9	9	329	9	Old WQ:
Lab Control	22.9				5.7			10	//>	9	9	Date: 3/2/14 3/4/4
100%	_				:		10	70	10			Count Signoff 2006
Meter ID	229 4314				4.8 RP07		8		6	9	6	Old WQ: CP Feed:
Lab Control	23.0	7.81	7/7	8.8	7.8	467	10	10	10	9	9	Date 3/51/14
100%	i ·		7-64		-	' '	,	10		'	-	Sample fD: 34226 Test Solution Prep: 2
Meter ID	23.0 43.k	7.83	7-7-7 70H19	9.4 12007	7.5	344 E 104	0	4	5	9	6	New WQ: Age Renewal Time: 1445
												Renewal Signoff
Lab Control					4.9					0		Old WQ: Date: \$-6-P4
	23.0						10	10	10	9	9	Count Time: 0900 Count Signoff 511
100% Meter ID	23.0				4.8		6	Ч	5	රි	6	old WQ: SM
Lab Control	434				RD07							Date: 3/7/14
	22.9				6.5		10	10	10	9	9	Count Signoff: 2
100% Meter ID	22.9 43A				6.0 14007		5	4	5	6	5	on wo. Ce
Lab Control					1 -			10	10	9	9	Date: 8-8-14
	22.6				(۱۹)		10			-		Count Time: 1315 Count Signoff
100% Meter ID	43A				6.3		5	4	5	6	5	Old WQ: GG
Lab Control	22-8				6.3		(0	W	10	9	0	3/9/14 3/9/14
100%	228							ü		-		Count Signoff:
100%	1 JOUD				5.8				5		5	Old WQ: C p
Meter ID	421	99999										
Meter ID Lab Control	434)		0 01		RD07	и СІ	10	10	<i>(</i>	9	9	Date 5-10-14
Lab Control	22.9		8.01		7.6	45Y	10	10	10	9	9	Termination Time: 65 Termination Signoff:
	434)		8.01 7.73			440	10	4	5	5	5	

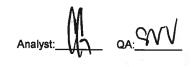
Report Date:

12 Mar-14 11:07 (p 2 of 4)

ADH 0228 HA C2 | 12-0908-4952

		•						Test	Code:	ADH_0228_	_HA_C2 1	2-0908-4952	
Hyalella Survi	val a	nd Growth Test									Paci	fic EcoRisk	
Analysis ID: Analyzed:		2142-4264 Mar-14 10:59	Endpoint: Analysis:	lpoint: Survival Rate lysis: Parametric-Two Sample				CETIS Version: CETISv1.8.5 Official Results: Yes					
Data Transfor	m	Zeta	Alt F	lyp -	Trials	Seed		PMSD	Test Res	ult		- <u>-</u>	
Angular (Corre	cted)	NA	C>1		NA	NA		21.4%			-		
Equal Varianc	e t T	wo-Sample Test											
Sample Code	vs	Sample Code	Test	Stat (Critical	MSD DF	P-Value	P-Type	Decision	(α:5%)			
LABQA		207R00011DS	3.74	•	1.86	0.294 8	0.0028	CDF	Significan	t Effect			
ANOVA Table		7					<u></u>	·					
Source		Sum Squares	Mear	Squa	re	DF	F Stat	P-Value	Decision	(α:5%)			
Between		0.8787426	0.878	7426		1	14	0.0057	Significan	t Effect		· · · · · · · · · · · · · · · · · · ·	
Error		0.5014169	0.062	67712		8							
Total		1.380159				9							
Distributional	Test	s											
Attribute		Test		1	Test Stat	Critical	P-Value	Decision	(α:1%)				
Variances		Variance Ratio I	F	14.7 23.2 0.0232			Equal Var	iances					
Distribution		Shapiro-Wilk W	Normality		0.959	0.741	0.7738	Normal Di	stribution				
Survival Rate	Sum	mary											
Sample Code		Cour	nt Mean	1 9	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect	
LABQA		5	0.96	(0.892	1	1	0.9	1	0.0245	5.71%	0.0%	
207R00011DS		5	0.48	(0.0933	0.867	0.6	0.1	0.8	0.139	64.9%	50.0%	
Angular (Corre	ected	l) Transformed S	ummary										
Sample Code		Cour	nt Mean	9	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect	
LABQA		5	1.35	1	1.24	1.46	1.41	1.25	1.41	0.0399	6.63%	0.0%	
207R00011DS		5	0.754		0.329	1.18	0.886	0.322	1.11	0.153	45.4%	44.0%	
Graphics													
1.0							0.5					,	
٠.							0.4						
E L							E				/•		
					Reject Null		0.3						
F					unifort seral		- a- t-				•		





LABQA

10 Day Acute Hyalella azteca Toxicity Test Data

Client:		ADH / CCCWP		Organism Log#:	7993	_ Age: _ 9-10 d	
Test Material:		207R00011DS		Organism Supplier:		<i>besapeake</i>	
Test ID#:	55495	Project #:	19397	Control/Diluent:	SAI	M-5 Hyalella Water	
Test Date:		2/28/14		Control Water Batch:		92	

			2150/1		Control Water Batch.										
Treatment	Temp (°C)	new	old old	D.O. new	(mg/L) old	Conductivity (µS/cm)	A	#L B	ive Organi C	sms D	SIGN-OFF				
Lab Control	22-8	7.76		8.8		410	10	10	10	10	10	Date: 2/28/14 Sample ID: 34219			
100%	22.8	7.70		10.1		187	10	ю	10	10	10	Sample ID: 34219 Test Solution Prep: MF New WQ			
Meter ID	43A	pH19		2007		E006						Initiation Time: 750 Initiation Signoff:			
Lab Castral	2											Date: 3 1 1 14 Count Time: 930			
Lab Control	23.2				4.1		10	10	10	10	(0	Count Time: 930 Count Signoff:			
100%	23.2				8.8		10	10	10	19	10	oid WQ: CP			
Meter ID Lab Control	434				RD07		//>		//	C)	9	Date: 3/2/// Count Time: / 0/0			
	23.1				7.5		10	10	10	9		Count Time: 1010 Count Signoff:			
100%	23.1				7.8		10	7	8	10	10	Old WQ: FOLK			
Meter ID Lab Control	43H 23.0				P-00≯							Feed: Date: 3/3/14 Count Time:			
					5.6		10	10	10	9	9	Count Time: 20 45			
100% Meter ID	23.0				5.5 RD08		10	2	8	10	10	Old WQ			
Lab Control	229				-		10	10	//\	9	9	Date: 3/4//9 Count Time: 0940			
	22.9				5.7		 	10	10			Count Signoff:			
100% Meter ID	92.9 43.A				5.3 RD07		10	2	5	9	10	Old WQ: CA Feed:			
Lab Control	23.0	7.81	7/7	8.8	7.8	407	10	10	10	9	q	Date 3/5/14			
100%	1	7 11	4.6+			188	10	10				Sample ID: 3/2/9 Test Solution Prep			
Meter ID	23.0 43A	Ptri4	7.64 DH19	95	7.4		10		Ч	9	10	New WQ: Des Renewal Time: 1445			
												Renewal Signoff SV			
Lab Control					u a		10			9		Date:			
	730				4.9		-	10	10		9	Count Time: 0900 Count Signoff: SM			
100%	23.0				5.1		10		4	9	9	Old WQ: 5M			
Meter ID Lab Control	43A				RD07		/ -			0	*****	Date: 3/7/14			
	22.9				6.5		10	10	10	9	17	1990			
100% Meter ID	22.9 43A				6.4		10	 	3	6	8	Count Signoff: 20			
Lab Control	22.6						10	10	10	9	9	Date 3/8// / Count Time: 12.6			
100%	22.6				(6)		├──	,			<u> </u>	Count Signoff:			
Meter ID	43A				6.4		9) 	3	6	8	Old WQ: GG Feed:			
Lab Control	228				6.3		<i>(</i> ()	10	10	0/	\mathcal{G}	Date: 2/9/14			
100%							a	1		-1		Count Time: 1015 Count Signoff: 42			
Meter ID	928 439				6.0 RD07			 	<u>م</u>	9	8	OIG M.G. C.D			
Lab Control	22.9		8.01		7.6	454	10	Ю	Ю	9	9	Date: 41653-10-/4			
100%	22.9				#		8	1	2	6	7	Termination Signoff:			
Meter ID	43A		780		6-8	209	<u> </u>	<i>'</i>	_	9		Old WOO			
	,				10000			41515161616	a a constituti di			***************************************			

Report Date:

12 Mar-14 11:07 (p 3 of 4)

Test Code:

ADH_0228_HA_C2 | 12-0908-4952

Hyalella Survi	val and Grow	th Test					lest	Code:	ADH_0226_		2-0908-495
Analysis ID:	18-7418-231	9 En	dpoint: Su	rvival Rate			CET	IS Version	n: CETISv	1.8.5	<u> </u>
Analyzed:	12 Mar-14 10	0:59 A n	alysis: No	nparametric-	Two Sampl	е	Offic	ial Resul	ts: Yes		
Data Transfor	m	Zeta	Alt Hyp	Trials	Seed		PMSD	Test Re	sult		
Angular (Corre	cted)	NA	C>T	NA	NA		8.96%				. !
Wilcoxon Ran	k Sum Two-S	ample Test									- 18
Sample Code	vs Sample	e Code	Test Stat	Critical	Ties DF	P-Value	P-Type	Decisio	n(α:5%)		
LABQA	544R00	0025US	15	NA	0 8	0.0040	Exact		ant Effect		
ANOVA Table								· · · · · · · · · · · · · · · · · · ·			*****
Source	Sum So	ıuares	Mean Sq	uare	DF	F Stat	P-Value	Decisio	n(a:5%)		
Between	2.12484	 	2.124849		1	152	<0.0001		int Effect		
Error	0.11167	94	0.013959	92	8			7			
Total	2.23652	9			9						
Distributional	Tests	-									
Attribute	Test			Test Stat	Critical	P-Value	Decision	(α:1%)	4		. '
Variances		e Ratio F		2.5	23.2	0.3957	Equal Var			-	
Distribution	Shapiro	o-Wilk W Nor	mality	0.781	0.741	0.0086	Non-norm	al Distribu	tion		·
Survival Rate	Summary							. 9			
Sample Code		Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
LABQA		5	0.96	0.892	1	1	0.9	1	0.0245	5.71%	0.0%
544R00025US		5	0.18	0.044	0.316	0.1	0.1	0.3	0.049	60.9%	81.3%
Angular (Corr	ected) Transfe	ormed Sumr	nary								
Sample Code		Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
LABQA		5	1.35	1.24	1.46	1.41	1.25	1.41	0.0399	6.63%	0.0%
544R00025US		5	0.425	0.25	0.6	0.322	0.322	0.58	0.0632	33.2%	68.5%
Graphics	,						1				
1.0 [\neg		,		0.16					
Ę	•					0.14		•	•		
0.9			*			0.12					
0.8	-					0.10				/	
0.7				Reject Null		0.08			/		
8.0					Center	§ 0.06	,	13.	• • /•		
					0	8 0.04 0.02					
Survival Rat						0.00			<u>/</u>		
₫ _{0.4}						-0.02		. /			
0.3			1			-0.04		. /			
						-0.06					
0.2			•			-0.08	. /	/			
0.1						-0.10	• •/	• • •			
مه ا					J	-0.12 -2.0	-1.5 -1.0	-0.5 0.	0 0.5 1	.0 1.5	2.0
	LABQA		544R0002	SUS				Rankita			

10 Day Acute Hyalella azteca Toxicity Test Data

Client:	ADH / CCCWP			Organism Log#:	7993	Age: 9-10d			
Test Material:	544R00025US			Organism Supplier:	Thesapeake				
Test ID#:	55552	Project #:	19397	Control/Diluent:	SAM	I-5 Hyalella Water			
Test Date:		2/28/14		Control Water Batch:		92			

			H6 8 8 410 10 10 10 10 10 10 Sample 15 34345 69 9 8 1117 10 10 10 10 10 10 Test Solution Prep 11 10 10 10 10 10 10 Test Solution Prep New WQ 14 11 10 10 10 10 10 10 Count Time 930 9.0 10 10 10 10 10 10 Odd WQ CP									
Treatment	Temp (°C)											
Lab Control	22.8	7.76		8.8		410	10	10	10	10	10	Sample ID 34245
100%	æ8	7.69				1117	10	10	10	10	10	
Meter ID	48 A	orli				EC06						Initiation Time 750
Lab Control	23.2				4 1		10		10	10	10	
100%	23.2							<u> </u>		 		Count Signoff:
Meter ID	434							/0			/	ON MG CP
Lab Control	23.1				7.5		10	10	10	9	9	Date 39/14 Count Time 16/0
100%	231				6.4		9	10	9	6	9	Count Signoff:
Meter ID	4317				P.007				<i>'</i>			Old WQ FOUR Feed:
Lab Control	230				5-6		10	10	10	9	9	Date 3/3/14 Count Time 1645
100%	23.0				4.8		4	9	9	5-	9	Count Signoff: Old WQ
Meter ID	43A				ZDO8							
Lab Control	229				5.7		10	10	10	9	9	Date 3/4/14 Count Time 0940
100%	229				3.1		4	6	5	3	4	Count Signoff Old WQ: C
Meter ID	43A				RBOT							Feed
Lab Control	23.0	7.87	7.67	8.8	7.8	407	10	10	10	9	9	Date 3/5/14 Sample 113/42/42
100%	23.0	7.71	7.6	9.4	6.9	1148	3	3	4	2	3	New WQ:
Meter ID	43A	only	pH19	PD01	(RD09	E COY						Renewal Time 1445 Renewal Signoff SVV
												Old WQ
Lab Control	23.0				4.9		10	10	10	219	9	Date
100%	23.0				3.9		3	3	3	2	3	Count Signoff SM Old WQ: SM
Meter ID	43A				RP07							Feed: SM
Lab Control	22.9				6.5		10	10	10	9	9_	Date: 3/7/14 Count Time: 1440
100%	22.9				6.2		3	3	3	2	3	Count Signoff Le
Meter ID	43A				1007						######	
Lab Control	22.6				6.7		10	10	10	9	9	Date: 3.8-14 Count Time: 1315
100%	22.6				6.2		3	3	3	2	2	Count Signoff: A
Meter ID	43A				LOUS							Peed Date: 3/9/1/9
Lab Control	22.8				6.3		10	10	<u> </u>	9	9	Count Time O S
100%	228				4.5		3	3	2	1		Old WQ CP
Meter ID	4349				RDOF							Date: 3-9-14
Lab Control	22.9		8-01		76	454	10	19	10	9	9	Termination Time 1015
100%	22.9		785		72	1145	3	_3	1	,		Termination Signoff SM
Meter ID	43.4		In Del		1409	reoq						

Report Date:

12 Mar-14 11:07 (p 4 of 4)

Test Code:

ADH_0228_HA_C2 | 12-0908-4952

							Test	Code:	ADH_0228_	_HA_C2 1	2-0908-495
Hyalella Surv	ival and Gro	owth Test								Paci	fic EcoRis
Analysis ID: Analyzed:	19-1235-0 12 Mar-14		indpoint: S nalysis: N	Survival Rate Ionparametric-	Two Sampl	e		IS Version ial Result		1.8.5	
Data Transfor	m	Zeta	Alt Hyp	Trials	Seed		PMSD	Test Re	suit		
Angular (Corre	cted)	NA	C > T	NA	NA		6.7%				
Wilcoxon Rar	ık Sum Two	-Sample Tes	t								
Sample Code	vs Sam	ple Code	Test Sta	at Critical	Ties DF	P-Value	P-Type	Decisio	n(α:5%)		
LABQA	544F	R00025DS	15	NA	8 0	0.0040	Exact	Significa	nt Effect		
NOVA Table						· · · · · ·				-	
Source	Sum	Squares	Mean S	quare	DF	F Stat	P-Value	Decisio	η(α:5%)		
Between	2.971	698	2.97169	8	1	373	<0.0001	Significa	nt Effect		·
Error	0.063	7424	0.00796	78	8						
Total	3.035	44			9						
Distributional	Tests										
Attribute	Test			Test Stat		P-Value	Decision				
/ariances		ance Ratio F		1	23.2	1.0000	Equal Vai				
Distribution	Shar	oiro-Wilk W N	ormality	0.64	0.741	0.0002	Non-norm	Non-normal Distribution			
Survival Rate	Summary										
Sample Code		Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
LABQA		5	0.96	0.892	1	1	0.9	1	0.0245	5.71%	0.0%
544R00025DS		5	0.06	0	0.128	0.1	0	0.1	0.0245	91.3%	93.8%
Angular (Corr	ected) Tran	sformed Sun	nmary								
Sample Code		Count	Mean	95% LCL			Min	Max	Std Err	CV%	%Effect
LABQA		5	1.35	1.24	1.46	1.41	1.25	1.41	0.0399	6.63%	0.0%
544R00025DS		5	0.257	0.146	0.367	0.322	0.159	0.322	0.0399	34.8%	81.0%
Graphics											
10 F						0.100 F		1		/	
- وه						0.075					
0.8						0.073		•	/	• •	
E				Reject Null	-	0.050		1			
0.7					Ī	8	,	!			
0.5					Centern	0.025					
2 0.5 -						0.000		·;	<i>_</i>		-
Survival Rati											
,						-0.025					
0.3						-0.050		/			
0.2						-0.075	/	·			
0.1						-0.0/5	/	, i			
					١	-0.100	-1.5 -1.0	-0.5 0			
						-2.0	-1.0	ر0 دید	v v.5 1	د.د بد	4.0

LABQA

10 Day Acute Hyalella azteca Toxicity Test Data

Client:		ADH / CCCWP		Organism Log#: 79	93 Age: 9-10 d
Test Material:		544R00025DS		Organism Supplier:	(hesapeake
Test ID#:	55553	Project #:	19397	Control/Diluent:	SAM-5 Hyalella Water
Test Date:		2/28/14		Control Water Batch:	92

	i i	w	100.677	5.0	(7)							
Treatment	Temp (°C)	new	oH old	new	(mg/L) old	Conductivity (µS/cm)	Α	# L	ive Organ	isms D	E	SIGN-OFF
Lab Control	228	3,76		8.8		410	10	10	10	10	O	Date: S/24/4 Sample ID: Sug, U, 3
100%	<i>3</i> 2.8	7,72		10.1		1073	10	10	10	10	10	Test Solution Prep. New WQ
Meter ID	43A	PH19		e107		ZC09						Initiation Time: 1750 Initiation Signoff:
Lab Control	23.2				n I		10	10	40	10	/n	Date: 3 1 1
100%	23.2				9.1		10		10	10	0	Count Signoff:
Meter ID	43A				8.6 RD07			10	10	10	10	Old WQ: CP
Lab Control	231						10	10	/0	9	9	Date: 3/2/ VY
<u> </u>	-				7.5		70		•		7	Count Time 1010 Count Signoff:
100% Meter ID	23.1				7.5 K-007			8	8	6	\mathcal{I}_{-}	Old WQ: ForB
Lab Control	43A											Date: 8/3/14
<u></u>	23.0				5.6		10	10	10	9	7	Count Time LOY Count Signoff:
100%	23.0				5.5		5	6	50	6	8	Count Signoff: Old WQ:
Meter ID	43A				7,006				//>			Date: 3/4/
Lab Control	229				5.7		IU	10	10	9	9	Count Time! 0446
100%	229				4.9		a	a	O	0	5	Old WQ: CP
Meter ID	43.5				RDOF							Date: 3/57/14
Lab Control	23.0	7.81	7.67	8.8	7.8	401	10	[0]	10	9	9	Sample 10.3 (12.43) Test Solution Prep.
100%	23.0	7.70	7.76	9.6	7.5	1083		l	_	_		New WQ:
Meter ID	43A	okly	DH19	POS	QV09	ç.04						Renewal Time: 1445
												Old WQ:
Lab Control	23.0				4,9		10	10	10	9	9	Date: \$ -6 - 14 Count Time: 6 460
100%	23.0				4.0		ı		~	_	ï	Count Signoff SA
Meter ID	434				RD67							Feed: SM
Lab Control	22.9				6.5		10	10	10	9	9	Date: 3/7/14 Count Time: 1446
100%	22.9				6.8			1	_	1	1	Count Signoff: 20
Meter ID	43A				1007							
Lab Control	226				6.7		10	2	2	9	9	Date 3-8-14 Count Time: 1315
100%	22.6				6.4		\	1	_	()	Count Signoff:
Meter ID	43A 928				FDOT							Feed:
Lab Control	228				6.3		W	10	10	9	9	Date: 319/14 Count Time: 1015
100%	228				5.7		1	1	_	1	١	Count Signoff.
Meter ID	43A				R007							
Lab Control	22.9		8-01		7-6	454	10	10	RO	9	9	Date: 2 -16 - pcf Termination Time: 16.15
100%	22,9		7-69		6.6	1114	1	[_	_	1	Termination Signoff: _SF7
Meter ID	434		Phai		100g	EL09						Old WOrley

Appendix E

Test Data and Summary of Statistics for the Evaluation of the Chronic Toxicity of the CCCWP Stormwater to Fathead Minnows

CETIS Summary Report

Report Date:

12 Mar-14 10:55 (p 1 of 1)

Test Code:

							rest Code:	ADH_022	/_PP_C1	15-6006-677
Chronic Larva	al Fish Survival and G	rowth Test							Pac	ific EcoRisi
Batch ID:	17-6115-7814	Test Type:	Growth-Surviv	/al (7d)			Analyst:	Cassy Glover		
Start Date:	27 Feb-14 17:00	Protocol:	EPA-821-R-0	2-013 (2002)			Diluent:	Not Applicable	•	
Ending Date:	06 Mar-14 08:00	Species:	Pimephales p	romelas			Brine:	Not Applicable	•	
Duration:	6d 15h	Source:	Aquatox, AR				Age:	1	-	
Sample Code	Sample ID			ceive Date	Sample		Client Nam	е	Project	
LABQA	14-0598-7522	27 Fe	b-14 17:00 27	Feb-14 17:00	NA (25.	1 °C)	ADH Enviro	nmental, Inc.	19397	-
207R00843	14-6517-7241	26 Fe	b-14 17:45 27	Feb-14 16:11	23h (0.6	6 °C)				
206R00551	08-4072-0786	26 Fe	b-14 15:20 27	Feb-14 16:11	26h (0.4	C)				
Sample Code	Material Type	Samp	le Source		Station	Location	1 ,	Latitude	e Lo	ngitude
LABQA	Lab Water	ADH	Environmental,	Inc.	LABQA					-
207R00843	Ambient Water	ADH	Environmental,	Inc.	207R00	843				
206R00551	Ambient Water	ADH	Environmental,	Inc.	206R00	551				
7d Survival Ra	ate Summary									
Sample Code					Min	Max	Std E			%Effect
LABQA	4	1	1	1	1	1	0	0	0.0%	0.0%
207R00843	4	0.575		0.698	0.2	0.9	0.165		57.5%	42.5%
206R00551	4	0.925	0.889	0.961	8.0	1 	0.047	79 0.0957	10.4%	7.5%
-	mass-mg Summary									
Sample Code	Coun		95% LCI		Min	Max	Std E			%Effect
LABQA	4	0.715	0.679	0.75	0.613	0.831			13.5%	0.0%
207R00843 206R00551	4	0.59	0.505	0.674	0.293	0.776			38.4%	17.5%
		0.733	0.698	0.768	0.656	0.865	0.047	75 0.0951	13.0%	-2.59%
	ght-mg Summary									
Sample Code	Coun		95% LCI		Min	Max	Std E			%Effect
LABQA	4	0.715	0.679	0.75	0.613	0.831			13.5%	0.0%
207R00843	4	1.15	1.04	1.26	0.84	1.46	0.148		25.6%	-61.3%
206R00551	4	0.797	0.754	0.841	0.672	0.924	0.058	0.117	14.7%	-11.6%
7d Survival Ra										
Sample Code	Rep 1		<u>-</u>	Rep 4						:
LABQA	. 1	1	1	1						
207R00843	0.4	0.8	0.9	0.2						
206R00551	1	0.8	0.9	1						
Mean Dry Bion	nass-mg Detail									
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4						
LABQA	0.613	0.663	0.751	0.831						
207R00843	0.534		0.756	0.293						
206R00551	0.672	0.739	0.656	0.865						
Mean Dry Weig	ght-mg Detail									
Sample Code	Rep 1	<u> </u>	Rep 3	Rep 4						
LABQA	0.613		0.751	0.831						
207R00843	1.34	0.97	0.84	1.46						
000000554	0.070	0.924	0.729	0.865						
206R00551	0.672	U.UZ-1								
		0.024								
206R00551 7d Survival Ra Sample Code				Rep 4						
7d Survival Ra	te Binomials			Rep 4 10/10						
7d Survival Ra Sample Code	ite Binomials Rep 1	Rep 2	Rep 3							



CETIS Analytical Report

Report Date:

12 Mar-14 10:55 (p 2 of 6)

Test Code:

Cilionic Lais	val Fish Surviv	al and Grow	th Toet							Paci	fic EcoRis
							· · ·		05710 4		IIC ECOKIS
Analysis ID: Analyzed:	08-0438-691 12 Mar-14 1			Survival Rat	-			IS Versior ial Result		.8.5	
Data Transfo		Zeta	Alt Hyp	Trials	Seed		PMSD	Test Re	sult		
Angular (Corr	rectea)	NA	C>T	NA	NA —————		8.82%	-	<u> </u>		
Equal Varian	nce t Two-Sam	ple Test									
Sample Code	e vs Samp	le Code	Test Stat	Critical	MSD DF	P-Value	P-Type	Decisio	n(α:5%)		
LABQA	206R0	0551	1.59	1.94	0.143 6	0.0813	CDF	Non-Sig	nificant Effect		
ANOVA Table	е										
Source	Sum S	quares	Mean Sq	uare	DF	F Stat	P-Value	Decisio	n(α:5%)		
Between	0.0273		0.027359		1	2.53	0.1625		nificant Effect		
Error	0.0647	8542	0.010797	57	6						
Total	0.0921	4444			7	5.5					
Distributiona	al Tests										
Attribute	Test			Test Stat	Critical	P-Value	Decision	(α:1%)			
/ariances	Mod L	evene Equalit	y of Variance	e 10.9	13.7	0.0165	Equal Var		· · · · · · · · · · · · · · · · · · ·		
/ariances		e Equality of \		16.3	13.7	0.0068	Unequal \	/ariances			
Distribution	Shapir	o-Wilk W No	mality	0.86	0.645	0.1195	Normal D	stribution			·
d Survival F	Rate Summary										
Sample Code	e	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
ABQA		4	1	1	1	1	1	1	0	0.0%	0.0%
		4	0.925	0.773	1	0.95	0.8	1	0.0479	10.4%	7.5%
206R00551		7	0.020								
	rected) Transi						.				
	rected) Trans				95% UCL	Median	Min	Max	Std Err	CV%	%Effect
	-	formed Sumi	mary	95% LCL 1.41	95% UCL 1.41	Median	Min 1.41	Max 1.41	Std Err	CV%	%Effect
Angular (Cor Sample Code ABQA	-	formed Sumi Count	mary Mean	95% LCL							
Angular (Cor Sample Code ABQA 206R00551	-	formed Sumi Count 4	mary Mean 1.41	95% LCL 1.41	1.41	1.41	1.41	1.41	0	0.0%	0.0%
Angular (Cor Sample Code ABQA 06R00551 Graphics	-	formed Sumi Count 4	mary Mean 1.41	95% LCL 1.41	1.41	1.41 1.33	1.41	1.41	0	0.0%	0.0%
Angular (Cor Sample Code ABQA 206R00551	-	formed Sumi Count 4	Mean 1.41 1.3	95% LCL 1.41 1.06	1.41	1.41	1.41	1.41	0	0.0%	0.0%
Angular (Cor Sample Code ABQA 206R00551 Graphics	-	formed Sumi Count 4	mary Mean 1.41	95% LCL 1.41 1.06	1.41	1.41 1.33	1.41	1.41	0	0.0%	0.0%
Angular (Cor Sample Code ABQA 006R00551 Graphics	-	formed Sumi Count 4	Mean 1.41 1.3	95% LCL 1.41 1.06	1.41	0.20	1.41	1.41	0	0.0%	0.0%
Angular (Cor Sample Code ABQA 006R00551 Graphics	-	formed Sumi Count 4	Mean 1.41 1.3	95% LCL 1.41 1.06	1.41 1.53	0.20	1.41	1.41	0	0.0% 11.3%	0.0% 8.28%
Angular (Cor Sample Code ABQA 06R00551 Graphics	-	formed Sumi Count 4	Mean 1.41 1.3	95% LCL 1.41 1.06	1.41 1.53	0.20	1.41	1.41	0	0.0% 11.3%	0.0% 8.28%
Angular (Corsample Code ABQA 006R00551	-	formed Sumi Count 4	Mean 1.41 1.3	95% LCL 1.41 1.06	1.41	0.20 0.15 0.10	1.41	1.41	0	0.0% 11.3%	0.0% 8.28%
Angular (Cor Sample Code ABQA 006R00551 Graphics	-	formed Sumi Count 4	Mean 1.41 1.3	95% LCL 1.41 1.06	1.41 1.53	0.20	1.41	1.41	0	0.0% 11.3%	0.0% 8.28%
Angular (Cor Sample Code ABQA 206R00551 Graphics	-	formed Sumi Count 4	Mean 1.41 1.3	95% LCL 1.41 1.06	1.41 1.53	0.20 0.15 0.10	1.41	1.41	0	0.0% 11.3%	0.0% 8.28%
Angular (Cor Sample Code ABQA 206R00551 Graphics	-	formed Sumi Count 4	Mean 1.41 1.3	95% LCL 1.41 1.06	1.41 1.53	0.20 0.15 0.10 0.15 0.15 0.15 0.15 0.15 0.1	1.41	1.41	0	0.0% 11.3%	0.0% 8.28%
Angular (Cor Sample Code ABQA 206R00551 Graphics	-	formed Sumi Count 4	Mean 1.41 1.3	95% LCL 1.41 1.06	1.41 1.53	0.20 0.15 0.15 0.10 0.00 0.00	1.41	1.41	0	0.0% 11.3%	0.0% 8.28%
Angular (Cor Sample Code ABQA 206R00551 Graphics	-	formed Sumi Count 4	Mean 1.41 1.3	95% LCL 1.41 1.06	1.41 1.53	0.20 0.15 0.10 0.15 0.15 0.15 0.15 0.15 0.1	1.41	1.41	0	0.0% 11.3%	0.0%
Angular (Cor Sample Code ABQA 206R00551 Graphics	-	formed Sumi Count 4	Mean 1.41 1.3	95% LCL 1.41 1.06	1.41 1.53	0.20 0.15 0.15 0.00 0.00	1.41	1.41	0	0.0% 11.3%	0.0%

CETIS Analytical Report

Report Date:

12 Mar-14 10:55 (p 3 of 6)

Test Code:

Chron	ic Larva	al Fish	h Survival	and Grow	th Test							Paci	fic EcoRis
naivs	is ID:	18-2	591-0104	En	dpoint: Me	an Dry Biom	ass-ma		CET	S Version	: CETISv1	8.5	•
nalyz		12 N	/ar-14 10:		•	rametric-Two	_			ial Results			
	ransfor			Zeta	Alt Hyp	Trials	Seed		PMSD	Test Res			
	sformed		1.00	NA	C > T	NA	NA		18.4%	16311/63			
									10.470				
-			wo-Sample										
	e Code	VS				Critical		P-Value	P-Type	Decision	· ,		
ABQ/	4		206R005	551	-0.273	1.94	0.132 6	0.6031	CDF	Non-Sign	ificant Effect		
NOV	A Table												
ource	е		Sum Squ	ares	Mean Sq	uare	DF	F Stat	P-Value	Decision	ı(a:5%)		
etwee	en		0.000684	4824	0.000684	4824	1	0.0747	0.7938	Non-Sign	ificant Effect		
rror			0.054968	49	0.009161	416	6						
Total			0.055652	98			7						
Distrib	utional	Tests											
ttribu	ite		Test			Test Stat		P-Value	Decision(α:1%)			* 1 * 1
ariano	ces		Variance	Ratio F		1.03	47.5	0.9826	Equal Var	iances			9.
							0.045	0.2004	Alexand D				
				Wilk W Nor	mality	0.903	0.645	0.3081	Normal Di	stribution			
Distribu	ution	mass-			mality	0.903	0.645	0.3061	Normal Di	stribution			
Distribu Mean I	ution	mass-	Shapiro-		mality Mean	0.903 95% LCL	95% UCL	Median	Min	stribution Max	Std Err	CV%	%Effect
Distribu Mean I Sampl	ution Dry Bion e Code	mass-	Shapiro-	nary	· · · · ·					-	Std Err 0.0482	CV%	%Effec
istribu flean I sampl ABQA	ution Dry Bior e Code	mass-	Shapiro-	nary Count	Mean	95% LCL	95% UCL	Median	Min	Max			
lean I lean I leample ABQA	ution Dry Bior e Code A 0551	mass-	Shapiro-	nary Count	Mean 0.715	95% LCL 0.561	95% UCL 0.868	Median 0.707	MIn 0.613	Max 0.831	0.0482	13.5%	0.0%
lean I Sample ABQA	ution Dry Bior e Code \ 0551 ics	mass-	Shapiro-	nary Count	Mean 0.715	95% LCL 0.561	95% UCL 0.868	Median 0.707 0.706	MIn 0.613	Max 0.831	0.0482	13.5%	0.0%
lean I lean I sample ABQA 06R00	ution Dry Bior e Code A 0551	mass-	Shapiro-	nary Count	Mean 0.715	95% LCL 0.561	95% UCL 0.868	Median 0.707 0.706	MIn 0.613	Max 0.831	0.0482	13.5%	0.0%
lean I lean I leample ABQA	ution Dry Bior e Code \ 0551 ics	mass-	Shapiro-	nary Count	Mean 0.715	95% LCL 0.561	95% UCL 0.868	Median 0.707 0.706	MIn 0.613	Max 0.831	0.0482	13.5%	0.0%
lean I lean I sample ABQA 06R00	ution Dry Bior e Code A 0551 ics	mass	Shapiro-	nary Count	Mean 0.715	95% LCL 0.561	95% UCL 0.868	Median 0.707 0.706	MIn 0.613	Max 0.831	0.0482	13.5%	0.0%
lean I Sample ABQA	oution Dry Bior e Code A 05551 ics	mass-	Shapiro-	nary Count	Mean 0.715	95% LCL 0.561	95% UCL 0.868 0.884	Median 0.707 0.706	MIn 0.613	Max 0.831	0.0482	13.5%	0.0%
lean I lean I leample ABQA	oution Dry Bior e Code A 05551 ics	mass-	Shapiro-	nary Count	Mean 0.715	95% LCL 0.561	95% UCL 0.868 0.884	Median 0.707 0.706	MIn 0.613	Max 0.831	0.0482	13.5%	0.0%
lean I lean I sample ABQA 06R00	Dry Bior e Code \(\) 0551	mass-	Shapiro-	nary Count	Mean 0.715	95% LCL 0.561 0.582	95% UCL 0.868 0.884	Median 0.707 0.706	MIn 0.613	Max 0.831	0.0482	13.5%	0.0%
lean I lean I sample ABQA 06R00	ottion Dry Bior e Code 05551 ics	mass-	Shapiro-	nary Count	Mean 0.715	95% LCL 0.561 0.582	95% UCL 0.868	0.707 0.706	MIn 0.613	Max 0.831	0.0482	13.5%	0.0%
eistribu dean I Gampl ABQA 06R00 Graphi	Dry Bior e Code \(\) 0551	mass-	Shapiro-	nary Count	Mean 0.715	95% LCL 0.561 0.582	95% UCL 0.868 0.884	0.707 0.706	MIn 0.613	Max 0.831	0.0482	13.5%	0.0%
lean I Sample ABQA	otion Dry Bior e Code 05551 ics	mass-	Shapiro-	nary Count	Mean 0.715	95% LCL 0.561 0.582	95% UCL 0.868 0.884	0.707 0.706	MIn 0.613	Max 0.831	0.0482	13.5%	0.0%
Mean I Sample ABQA 06R00	ution Dry Bior e Code A 0551 ics	mass-	Shapiro-	nary Count	Mean 0.715	95% LCL 0.561 0.582	95% UCL 0.868 0.884	0.707 0.706	MIn 0.613	Max 0.831	0.0482	13.5%	0.0%
Mean I Sample ABQA 06R00	otion Dry Bior e Code 05551 ics	mass-	Shapiro-	nary Count	Mean 0.715	95% LCL 0.561 0.582	95% UCL 0.868 0.884	0.707 0.706	MIn 0.613	Max 0.831	0.0482	13.5%	0.0%
Mean I Sample ABQA 06R00	ution Dry Bior e Code A 0551 ics 03 04 04 03 04 04 05 05 05 06 07 07 08 08 09 08 08 08 08 08 08 08	mass-	Shapiro-	nary Count	Mean 0.715	95% LCL 0.561 0.582	95% UCL 0.868 0.884	0.707 0.706	MIn 0.613	Max 0.831	0.0482	13.5%	0.0%
Mean I Sample ABQA 206R00	os o	mass-	Shapiro-	nary Count	Mean 0.715	95% LCL 0.561 0.582	95% UCL 0.868 0.884	0.707 0.706	MIn 0.613	Max 0.831	0.0482	13.5%	0.0%
Mean I Sample ABQA 206R00	ution Dry Bior e Code A 0551 ics 03 04 04 03 04 04 05 05 05 06 07 07 08 08 09 08 08 08 08 08 08 08	mass-	Shapiro-	nary Count	Mean 0.715	95% LCL 0.561 0.582	95% UCL 0.868 0.884	0.707 0.706	Min 0.613 0.656	Max 0.831	0.0482 0.0475	13.5%	0.0%

7 Day Chronic Fathead Minnow Toxicity Test Data

			, 100	Cintonic I dell	cua minimo v	Omicity	ACBE Data			
Client:	_	ADI	H/CCCV	VP	Org	anism Log#:_	7990	Age:	<48 hrs	
Test Material		20	06R00551		Organi	sm Supplier:	Agsslox			
Test ID#:		489	Project #:	19397	Cor	trol/Diluent:		EPA	АМН	
Test Date:	2/27	114_	Ra	ndomization: 4.6.2	Control	Water Batch: _	मुर्	127//	4-1666	
reatment	Temp	pH		D.O. (mg/L)	Conductivity (uS/cm)		# Live Organisms		SIGN-OFF	

Test Date	<u> 2/27</u>	7/14_	. R	landomization.	4.6.2	Control	Water Batch:		या वे	127/1	4- 1666
Test Treatment	Temp (°C)	new	old	D.O. new	(mg/L)	Conductivity (µS/cm)	A	# Live C	Organisms C	D	SIGN-OFF
Lab Control	25,(8.01		8.3		297	10	10	10	10	Date: 2/27//Y Test Solution Prep.
100%	25.1	7.80		11.4		908	10	10	10	10	Sample ID: 34205 Initiation Time: 1700
Meter ID	30 A	DH19		RD04		E004	New WQ:	IA			Initiation Signoff:
Lab Control	gs.2	7.98	7.85	8-2	7.6	297	10	10	10	10	Date: 2/28/14 Test Solution Prep: CO
100%	25.2	7.87	8.24	11-6	6.4	902	10	10	10	9	Sample ID: 34205 Renewal Time: 1456
Meter ID	30A	pH21	PH19	2007	P-007	EC06	New WQ		Old WO		Renewal Signoff:
Lab Control	25.7	8.17	7.83	86	7. a	307	10	10	10	10	Test Solution Prep. S S
100%	25.7	૧.વા	8.26	11.0	7.0	911	10	9	10	10	Sample ID: 34 205 Renewal Time: 1045
Meter ID	SOA	p416	PH19	RD09	RDOS	B006	New WQ:	\mathfrak{O}_{-}	Old WQ:	D	Renewal Signoff:
Lab Control	26.0	8.08	7.64	9.8	7.1	296	10	10	10	10	Test Solution Prep CDD
100%	X4.0	7.98	7.9	10.5	7.6	902	10	8	10	10	Sample ID: 34205 Renewal Time: <i>U 2-5</i>
Meter ID	304	PHZI	7421	P905	1008	2009	New WQ:	112	OI4 MÓ:	4	Renewal Signoff:
Lab Control	15.7	8.22	7.70	8.7	5.9	215	to	10	ιο	to	Date: 3/3//Y Test Solution Press AL
100%	25.7	7,91	7.95	10.4	5.5	899	10	8	9	10	Sample ID: 34205 Renewal Time: 1500
Meter ID	30A	0H2	2416	RD07	pour	ELO6	New WQ:	TM	old wo:	rp.	Renewal Signoff:
Lab Control	25.4	8.43	7.73	8-3	7-3	305	10	10	0.1	10	Date: 3-4-14 Test Solution Prep: 3M
100%	25.4	8.05	8.21	10.1	6.9	889	10	8	9	10	Sample ID: 3 4 26 5
Meter ID	30A	1419	1/1/19	MOA	1009	Eeoy	New WQ		Old MÓ	W	Renewal Signoff 8VV
Lab Control	25.3	8.03	7.71	8.4	8.1	30]	10	10	to	10	Date 315119 Test Solution Prep
100%	25.3	7.94	8.19	10.5	8.3	895	10	8	9	10	Sample IDS 4205 Renewal Time: 1115
Meter ID	30A	PHIL	9119	RD07	ROOM	5606	New WQ:	f F	Old M.C.	14	Renewal Signoff CP
Lab Control	16.5		1.42		7.1	309	10	10	٥)٠	10	Date. 3 . 6 . 14 Termination Time: • 800
100%	15.5		8.09		6.7	918	10	8	વ	e	Termination Signoff
Meter ID	30K		p#21		RAH	Coob			Old WQ:		

Fathead Minnow Dry Weight Data Sheet

Client:	ADH / CCCWP	Test ID #:	55489	Project #	19397	
Sampie ID:	206R00551	Tare Weight Date:	2 28 14	Sign-off:	2LM	_
Test Date:	2. 27. 14	Final Weight Date:	517/14	Sign-off:	am	_

Pan ID	Concentration Replicate	Initial Pan Weight (mg)	Final Pan Weight (mg)	Initial # of Organisms	Biomass Value (mg)
1	Lab Control A	157.42	163,55	10	0.613
2	В	180.78	187.41	- 10	0.663
3	С	152,31	ાદ૧.શ્	10	0,751
4	D	161.99	170,30	lo	0.831
5	100% A	175.53	182,25	10	0.672
6	В	175.41	181,80	10	0,789
7	С	159.01	165.57	ю	0.656
8	D	157.47	166.12	10	0.865
QA1		166.39	166.36		

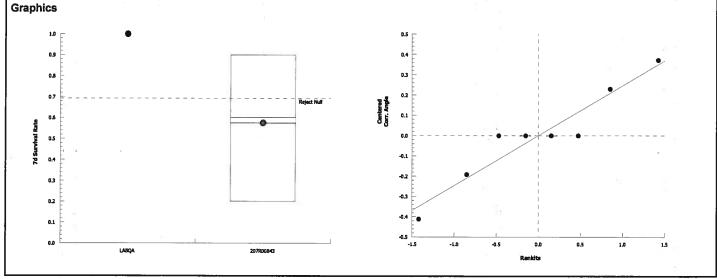
CETIS Analytical Report

Report Date:

12 Mar-14 10:55 (p 1 of 6)

Test Code:

Chronic Larval F	ish Survival and G	rowth Test							Paci	fic EcoRis
Analysis ID: 1	4-0465-2445	Endpoint: 7d	Survival Rat	е		CET	IS Version	n: CETISv1	1.8.5	
Analyzed: 1	2 Mar-14 10:54	Analysis: Pa	rametric-Two	Sample		Offic	ial Resul	ts: Yes		,
Data Transform	Zeta	Alt Hyp	Trials	Seed		PMSD	Test Re	sult		
Angular (Correcte	d) NA	C>T	NA	NA		30.8%				-
Unequal Varianc	e t Two-Sample Te	st	· · · · · · · · · · · · · · · · · · ·							
Sample Code v	s Sample Code	Test Stat	Critical	MSD DF	P-Value	P-Type	Decisio	n(α:5%)		
LABQA	207R00843	2.94	2.35	0.429 3	0.0303	CDF	Significa	ant Effect		
ANOVA Table	·		·········		· 					
Source	Sum Squares	Mean Sq	uare	DF	F Stat	P-Value	Decisio	n(α:5%)		
Between	0.5743257	0.574325	7	1	8.63	0.0260	Significa	ant Effect		
Error	0.3992156	0.066535	94	6			•			
Total	0.9735414			7	3					
Distributional Te	sts				· · · ·					
Attribute	Test		Test Stat	Critical	P-Value	Decision	(a:1%)			
Variances	Mod Levene Eq	uality of Varianc	e 30.3	13.7	0.0015	Unequal \	/ariances			-
Variances	Levene Equality	of Variance	31.7	13.7	0.0013	Unequal \				
Distribution	Shapiro-Wilk W	Normality	0.929	0.645	0.5026	Normal D	istribution			
7d Survival Rate	Summary									4 1
Sample Code	Cour	nt Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effec
LABQA	4	1	1	1	1	1	.1	0	0.0%	0.0%
207R00843	4	0.575	0.0493	1	0.6	0.2	0.9	0.165	57.5%	42.5%
Angular (Correct	ed) Transformed S	ummary					j.			
Sample Code	Cou	nt Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effec
Sample Code	4	1.41	1.41	1.41	1.41	1.41	1.41	0	0.0%	0.0%
LABQA	4	1.71								



CETIS Analytical Report

Report Date:

12 Mar-14 10:55 (p 4 of 6)

Test Code:

ADH_0227_PP_C1 | 15-6006-6778

:						Test	Code:	ADH_0227_	_PP_C1 1	5-6000-67
Chronic Larval	l Fish Survival and Grow	th Test					-		Paci	fic EcoRis
Analysis ID:	16-2171-3786 En	dpoint: Me	ean Dry Biom	ass-mg		CET	IS Versior	: CETISv1	1.8.5	
Analyzed:	12 Mar-14 10:54 An	alysis: Pa	rametric-Two	Sample		Offic	ial Result	s: Yes		
Data Transforn	n Zeta	Alt Hyp	Trials	Seed		PMSD	Test Re	sult		
Untransformed	NA	C > T	NA	NA		33.4%				-
Equal Variance	t Two-Sample Test									
Sample Code	vs Sample Code	Test Stat	Critical	MSD DF	P-Value	P-Type	Decisio	n(α:5%)		
_ABQA	207R00843	1.01	1.94	0.239 6	0.1747	CDF	Non-Sig	nificant Effec	t	
ANOVA Table										:
Source	Sum Squares	Mean Sq	uare	DF	F Stat	P-Value	Decisio	n(α:5%)		
Between	0.03112519	0.031125	·	1	1.03	0.3494		nificant Effec	t	
Error	0.1813561	0.030226	02	6						
Total	0.2124813			7	=					
Distributional 1	Tests .									
Attribute	Test		Test Stat	Critical	P-Value	Decision	(a:1%)			
/ariances	Variance Ratio F		5.51	47.5	0.1947	Equal Var	riances			
Distribution	Shapiro-Wilk W Nor	mality	0.936	0.645	0.5749	Normal D	istribution			
Mean Dry Biom	nass-mg Summary									-
Sample Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
_ABQA	4	0.715	0.561	0.868	0.707	0.613	0.831	0.0482	13.5%	0.0%
07R00843	4	0.59	0.23	0.95	0.645	0.293	0.776	0.113	38.4%	17.5%
3raphics							t t			
0.9					0.25 —					
-					0.20		 			· .
0.8					0.15		1		•/	•
0.7	•				0.10		. !	• /	/-	
Ē				-	v E					
2.0		•		Centered			l l	•		
5 0.5 L				8						
No.			Reject Null		-0.05		•/•		•	VIII 11
A 0.4					-0.10	•/				
ا ده 🕏					-0.15		. [
0.2					-0.20					
u.z					-0.25					

0.1

7 Day Chronic Fathead Minnow Toxicity Test Data

Client:	_AD	H/CCCWP		Organism Log#:_	7990	Age:	_<48 hrs
Test Material:	2	07R00843		Organism Supplier:	Aquatox		
Test ID#:	55493	Project #:	19397	Control/Diluent.		EF	AMH
Test Date:	2/27/14	Randor	nization: Y.6.2	Control Water Batch:		1666	

Trust Treatment	Test Da	ite: 4/4		. K	andomization:	1.6.6	Control	Water Batch:			1666	
Lab Control 25.5 7.92 11.4 280 10 10 10 10 10 10 10	Test Treatment					T T		A			D	SIGN-OFF
Moder ID 30 A 244 30	Lab Control	2s. '	4.01		4.3		297	10	10	10	10	2127114
Lab Control 25.2 1.98 1.98 8.2 7.6 2.97 10 10 10 10 10 10 10 1	100%	25.1	7.92		11.4		280		10	10	10	Initiation Time 1700
100% 25.7 1.10 1.20 2.70 2.79 1.0	Meter ID	30 A	PHIA		2704		FC04	New WQ	<u> </u>			Initiation Signoff CTD
Notice ID SOA PH21 PH19 RDO7 RDO7 ECO6 No. W. House Step Step Step Step Step Step Step Ste	Lab Control	Q5-Q	7.98	7.85	8.2	7.6	297	10	10	10	10	Test Solution Prep CO
Lab Control 25.7 8.71 7.83 8.6 7.2 307 10 10 10 10 10 10 10 10 10 10 10 10 10	100%	25.2	7.76	7.89	10.2	70		1	10	•		Renewal Time: 1450
100% 25.7 7.75 7.88 9.11.2 7.1 2.69 10 10 10 10 10 10 10 1	Meter ID	30 A	PH21	0419	RD07	R107	ELO0	New WQ:H		OII WO	1	I (//1 I
Meter ID So A OH 16 PH 19 1009 R008 ECO 6 New WO (D) OH WOOT D New Work Signed So M	Lab Control	25.7	11.8	7.83	8.6	7.2	307	10	10	10	10	Test Solution Prep SS
Lab Control 26.0 8.08 7.64 8.8 7.1 294 10 10 10 10 33214 10 10 10 10 10 10 10	100%	25.7	7.75	7.88						_		Renewal Time 1045
Lab Control 26.0 8.08 7.64 8.8 7.1 296 10 10 10 10 10 33214	Meter ID	30A	0416	PH19	1209	RDOS	BCO6	New WQ:	D	Old WOCJ	D	5/4
100% 26D 7.90 7.60 10. L 7.0 2.8 5 8 9 4	Lab Control	26.0	8.08	7.64				10		1 -	l -	
Lab Control 15.7 8.22 7.70 8.7 8.9 295 10 10 10 10 10 10 10 1	100%	260	7.90	7.60	10.6	7.0	281			/	4	34106 Renewal Time 1125
Lab Control 15.7 8.22 7.70 8.7 \$.9 295 10 10 10 10 10 10 10 1	Meter ID	300	PH21	1/21	POOS	POOR	8609	New WQ:	4	OIT MG:	HF-	1
100% 15.7 7.79 7.60 10.1 1.0 2.76 4 8 9 2 Renewal Time 1500	Lab Control	15.7	8.22	7.70	8.7	5.9	295			10	10	Test Solution Prep
Lab Control 25.4 8.43 7.43 8.3 7.3 3.05 10 10 10 10 10 10 5.42.06 25.4 7.88 7.43 9.7 7.0 281 4 8 9 2 Reneval time 11.20 Meter ID 324 M 19 1/19 1/19 1/19 1/19 1/19 1/19 1/19	100%	15.7	7,79	7.60	10.1	4.0	276		~	1 -	2	34300 Renewal Time 1500
Lab Control 25.4 8.43 7.43 8.3 7.3 3.05 10 10 10 10 10 Test Solution Prep 3.77 100% 25.4 7.88 7.43 9.7 7.0 2.81 4 8 9 2 Sample ID 3.42.66 Renewal Time 11.70 Meter ID 38A M 19 1/19 1/19 1/19 1/19 1/19 1/19 1/19	Meter ID	30R	P1121	phile	RD07	4004	E606	New WQ:	in	Old WQ:	HFF	- Bacc
100% 254 7.88 7.73 9.7 7.0 281 4 8 9 2 Reneval Time 1120 Meter ID 35A M 19 1019 1009 1009 1009 100 10 10 10 10 10 10 10 10 10 10 10 10	Lab Control	25.4	843	7.73	83	7:3	305	10	10	10	lΟ	Test Solution Prep
Lab Control 25.3 9.03 371 8.6 8.1 301 10 10 10 10 10 10	100%	254		1.43	94	70		1			2	Remewal Time 1120
Lab Control 25.3 9.03 10 8.6 8.1 301 10 10 10 10 10 10	Meter ID	3E)A	m 19	1919	14009	1009	Ee04	New WQ:	<u>u</u>	old WQ:	lu	24.6
100% 25.3 7.86 7.82 4.p. 8.3 276 4 8 9 2 Renewal Time 1115 Meter ID 30A DH 16 AHM POOT ROOM ECO6 New WQ APP Old WQ MAP Poot CP Lab Control 25.5 7.92 7.1 309 10 10 0 10 Termination Time 0 300 100% 15.5 78 7.2 7.2 7.1 4 8 9 2	Lab Control	25.3	9.03	7.71		8.1	301	10	10	10	10	Test Solution Press
Meter ID 30 A DH 16 PH POST PO	100%		7.84	7.00	4.p.0	8.3		<u> </u>	8	•	4	S9 106 Renewal Time 1115
Lab Control 25.5 7.92 7.1 309 10 10 10 10 Termination Signoff Bulk	Meter ID	30 A	DHIL	PHA	P007		र ८०७	New WQ	HP.	Olf MG: W	14	LY
100% 15.5 78 7.2 787 4 8 9 2	Lab Control	25.5		7.92		7.1	309	10	10	10		3.6.14 Termination Time 0 800
Meter ID 30 th OH2/ RAY Erab OId WO	100%	15.5					287	ધ				remination Signoll
	Meter ID	30Pc		DHZI		ROY	Erolo .			old wo.		

Fathead Minnow Dry Weight Data Sheet

Client:	ADH / CCCWP	Test ID #:	55493	Project #	19397
Sample ID:	207R00843	Tare Weight Date:	2 /28 / 14	Sign-off:	JLA
Test Date:	2, 27, 14	Final Weight Date:	317114	Sign-off:	MA

Pan ID	Concentration	Replicate	Initial Pan Weight (mg)	Final Pan Weight (mg)	Initial # of Organisms	Biomass Value (mg)
1	Lab Control	Α	172.50	163.55	10	0.613
2		В	142.59	187,41	10	0.663
3		С	146.67	159,82	10	0,751
4		D	148.36	170,30	10	0.831
9	100%	A	169.48	174.82	10	০, 534
10		В	162.66	170,42	10	0,776
11	<u> </u>	С	160,40	167,96	10	0,756
12		D	168.80	171.73	lo	0, 193
QA1			172.30	174,58		

Appendix F

Test Data and Summary of Statistics for the Reference Toxicant Evaluation of the Selenastrum capricornutum



CETIS Summary Report

Report Date: Test Code: 11 Mar-14 14:15 (p 1 of 1) 55554 | 05-3854-9335

									lest	Code:			22224 03	0-3854-933
Algal Growth	Test												Pacif	ic EcoRisk
Batch ID: Start Date: Ending Date: Duration:	02-1961-7457 27 Feb-14 15:45 03 Mar-14 15:15 95h	Prof Spe	Type: tocol: cies: rce:	EPA-821-R-02-013 (2002) Selenastrum capricornutum			Diluent: La		Labo Not	sy Glover oratory Wate Applicable	er			
Sample ID: Sample Date:	01-6567-6579 27 Feb-14 15:45 27 Feb-14 15:54 NA (25.1 °C)	Sou	e: erial: rce: ion:	Sod Ref	NaCl Sodium chloride Reference Toxicant In House				Clien Proje		Paci 2212	fic Ecorisk 24		
Comparison S	Summary													
Analysis ID	Endpoint		NOEL		LOEL	TOEL	PMSD	TU		Meth	od			
13-1183-7724	96h Cell Density	-without E	<0.12	5	0.125	NA	5.98%			Dunr	nett M	lultiple Com	parison Te	st
Point Estimat	e Summary								-					
Analysis ID	Endpoint		Level		g/L	95% LCL	95% UCL	TU		Meth	nod			
04-7067-6656		-without E	IC5		0.0882	0.043	0.524					erpolation (I	CPIN)	
	•		IC10		0.4	N/A	0.72							
			IC15		0.686	0.344	0.999							
			IC20		0.989	0.717	1.27							
			IC25		1.29	0.998	1.57							
			IC40		2.14	1.82	2.38							
			IC50		2.55	2.31	2.76							
96h Cell Dens	ity-without EDT	Summar	<i>y</i>		····									
C-g/L	Control Type	Count	Mean	1	95% LCL	95% UCL	Min	Max	(Std	Err	Std Dev	CV%	%Effect
0	Lab Water Contr		3.12E		3.07E+6	3.17E+6	2.93E+6)E+6	6.49	E+4	1.30E+5	4.15%	0.0%
0.125		4	2.87E		2.82E+6	2.92E+6	2.70E+6	3.01	IE+6	7.08	E+4	1.42E+5	4.94%	8.09%
0.25		4	2.93E	+6	2.90E+6	2.97E+6	2.80E+6	3.01	IE+6	4.85	E+4	9.71E+4	3.31%	6.08%
0.5		4	2.75E	+6	2.71E+6	2.79E+6	2.62E+6	2.87	7 E +6	5.12	E+4	1.02E+5	3.72%	11.9%
1		4	2.49E	+6	2.46E+6	2.52E+6	2.41E+6	2.59	9E+6	3.71	E+4	7.41E+4	2.97%	20.2%
2		4	1.98E	+6	1.93E+6	2.02E+6	1.80E+6	2.10)E+6	6.61	E+4	1.32E+5	6.7%	36.7%
4		4	4.84E	+5	4.68E+5	4.99E+5	4.36E+5	5.23	3E+5	2.05	E+4	4.10E+4	8.48%	84.5%
96h Cell Dens	sity-without EDTA	\ Detail	_	•	·									_
C-g/L	Control Type	Rep 1	Rep 2	2	Rep 3	Rep 4								13
0	Lab Water Contr	3.20E+6	3.16E		2.93E+6	3.20E+6								
0.125		2.70E+6	3.01E	+6	2.96E+6	2.81E+6								
0.25		2.80E+6	3.00E		3.01E+6	2.92E+6								
0.5		2.76E+6	2.62E		2.87E+6	2.75E+6								
1		2.49E+6	2.41E		2.59E+6	2.48E+6								
2		2.05E+6	2.10E		1.80E+6	1.95E+6								
17		Z.00E 10	2.100		1.002.0	1.552.15								

Analyst: QA: 205

5.12E+5 4.36E+5 5.23E+5 4.63E+5

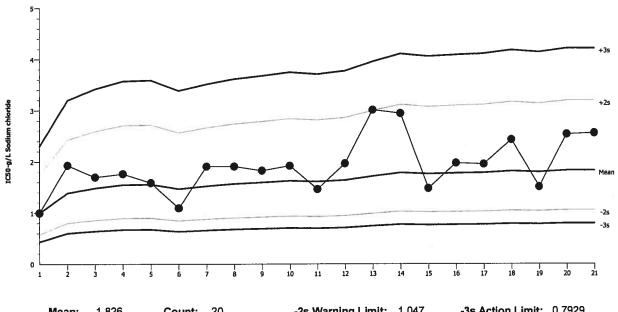
CETIS QC Plot

Pacific EcoRisk **Algal Growth Test** Organism: Selenastrum capricornutum (Green Material: Sodium chloride

Test Type: Cell Growth

Endpoint: 96h Cell Density-without EDTA Reference Toxicant-REF Protocol: EPA-821-R-02-013 (2002) Source:

Algal Growth Test



1.826 -3s Action Limit: 0.7929 20 -2s Warning Limit: 1.047 Mean: Count: +2s Warning Limit: 3.185 +3s Action Limit: 4.206 32.10% Sigma: NA CV:

Quality C	ontrol	Data
-----------	--------	------

	i cai	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
	2012	Nov	14	11:35	1	-0.8263	-2.166	(-)		19-3651-9449	02-4093-7643
			30	11:45	1.928	0.102	0.1953			06-8774-9598	00-2376-6641
		Dec	12	14:00	1.698	-0.128	-0.2613			21-1404-8287	09-6532-2652
	2013	Jan	9	14:50	1.764	-0.06267	-0.1256			20-3540-5103	02-4694-0562
		Feb	20	14:25	1.589	-0.2377	-0.5014			19-4816-2041	19-1093-3601
		Mar	6	17:00	1.096	-0.7307	-1.837			18-8696-2927	19-9405-0991
		Арг	18	14:30	1.908	0.08193	0.1578			04-8640-5545	13-1906-6299
		May	15	14:25	1.908	0.08199	0.1579			12-4530-9929	20-4208-0803
		Jun	12	16:30	1.825	-0.00114	-0.00224			03-8736-5752	05-2456-6169
0		Jul	10	16:30	1.919	0.09293	0.1785			00-7938-6478	19-4822-0015
1		Aug	14	12:07	1.46	-0.3658	-0.8038			03-5576-3584	12-8935-7956
2		Sep	11	11:26	1.962	0.1352	0.2568			11-1345-1076	05-7278-8891
3		Oct	9	14:32	3.006	1.18	1.792			13-2313-5960	13-5763-7826
4			9	14:32	2.939	1.113	1.711			11-7111-2371	05-1907-8644
5			24	16:25	1.477	-0.3496	-0.764			08-9082-3583	05-0631-1673
6		Nov	13	16:31	1.97	0.1437	0.2723			10-6527-3067	07-8249-1370
7		Dec	11	15:05	1.95	0.1238	0.2359			19-9359-6560	16-1399-8784
8	2014	Jan	15	15:03	2.426	0.5999	1.021			06-3179-4459	01-5918-9112
9		Feb	3	15:15	1.505	-0.3217	-0.6967			05-4911-8245	14-2525-8722
0			7	16:40	2.533	0.7066	1.176			12-2944-4902	10-9013-2498
1			27	15:45	2.555	0.7285	1.207			05-3854-9335	04-7067-6656

Selenastrum capricornutum Cell Density Enumeration Data

Client:	Reference Toxicant	Initial Count:	10,000 cells/mL	
Test Material:	NaCl	Enumerating Scientist:	PO-	
Test Start Date:	2 27 14 Start Time: 1545	Project #:	22131	
Test End Date:	2,23.19 End Time: 1575	Test ID #:	55636	

		Ce	ell Density (cells/mL x 10	⁶)	
Treatment	Rep A	Rep B	Rep C	Rep D	Mean
Lab Water Control	3.20	3.16	2.93	3.20	3.12
0.125	2.70	3.01	2.96	2.81	287
0.25	2.80	3.00	3.01	2.92	2.93
0.5	2.76	2.62	2.87	2.75	2.75
1	2.49	2,41	2.59	2.48	2,49
2	205	2.10	1.80	1.95	1.98
4	0.512	0.436	0.523	0.463	0.484
This datasheet has been reviewed for completeness and consistency with	Control Mean Density (cells/mL x 10 ⁶)	% CV	Date:	Time:	Signoff:
Test Acceptability Criteria and/or other issues of concern.	3.12	4.15	2 3.314	1537	P)

Selenastrum capricornutum Algal Toxicity Test Water Quality Data

Client:	Reference Toxican	t	Test ID #:	55554	Test [Date: 2/27/14
Test Material:	NaCl		Project #:	22124	Control/Dil	uent: Lab Water Without EDTA
teference Toxicant Test Treatment (g/L NaCl)	Temp (*C)	рН	D.O. (mg/L		etivity /cm)	Sign-Off
Lab Water Control	7.59 251	7.59	8.1	194	, 6 Date	2/27/14

l'est Material:	NaCi		Project #:		ol/Diluent: Lab water without EDTA
Reference Toxicant Test Treatment (g/L NaCl)	Temp (*C)	рН	D.O. (mg/L)	Conductivity (µS/cm)	Sign-Off
Lab Water Control	7.59 251	7.59	8.1	194.6	Date 2/27/14
0.125	25.1	7.59	8.9	W3 8 13 18	Test Solution Prep
0.25	QS.1	7.57	8.8	/ 11	New WQ: Tian
0.5	92.1	7.51	8.7	1075	Innoculation Time 1545
1	25.1	7.49	8-6	22404	Innoculation Signoff:
2	25.1	7.44	8.7	3960	Shelf ID +R6/R2/S1
4	as.1	7.39	87	3 960	
Meter ID:	USA	0H19	2004	EC04	
Lab Water Control	25.4	7.72			Date: 2-28-14
0.125	26.4	7.56			WQ Time 0930
0.25	26.4	7.53			WQ Signoff:
0.5	26.4	7.48			
1 .	25.4	7.41			
2	25.4	1.37			
, 4	25.4	7.28			
Meter ID:	65 A	DH19			
Lab Water Control	25.3	8.39			Date: 3-1-14
0.125	25.3	8.29			WQ Time: 0900
0.25	25-3	8.75			WQ Signoff:
0.5	25-3	8.25			
İ	75.3	8.12			
2	25.3	8.03			
4	25.3	7,74			
Meter ID:	65A	0H16			
Lab Water Control	24.8	9,55			Date: 3/2/14
0.125	74.8	9.42			WQ Time: 0400
0.25	24.8	9,29			WQ Signoff:
0.5	24.8	9.30			
1	74.8	4.0 1			
2	24.8	8.69			
4	24.8	7.69			
Meter ID:	654	0H19			
Lab Water Control	25.0	9-69	12.5	£ 95.0	Date: 3-3-14
0.125	25 W	9.46	12.0	367	Termination Time: \S55
0.25	250	9.50	12.2	621	Termination Signoff Po
0.5	25.0	9.40	12.1	1088	WQ Time: 0955
1 3	250	9.35	11.5	2285	WQ Signoff
2	2520	9107	11.0	3940	
4	250	8-44	me10-9,7	7510	
Meter ID:	65 A	PHIL	POUY	6009	
			Control of the Contro		

Initial Test Conditions										
Target: 8.000 g NaCl in 2 L		Alkalinity	Hardness	Light Intensity (ftc)						
Actual:	7	12	14	412.5						

Appendix G

Test Data and Summary of Statistics for the Reference Toxicant Evaluation of the *Ceriodaphnia dubia*



Report Date:

06 Mar-14 15:56 (p 1 of 2)

Test Code:

55555 | 06-7069-6201

Ceriodaphnia	Survival and Re	production T	est								Pacifi	c EcoRisk
Batch ID: Start Date: Ending Date: Duration:	17-2490-4388 27 Feb-14 14:20 05 Mar-14 14:40 6d 0h) Protoc	ol: s:	Reproduction-S EPA-821-R-02- Ceriodaphnia d In-House Cultu	013 (2002) ubia	, ,		Analyst: Diluent: Brine: Age:	Lab	sy Glover oratory Wat Applicable	er	
	16-7726-1869 27 Feb-14 14:20 27 Feb-14 14:20 NA (25.8 °C)		al: 	NaCl Sodium chloride Reference Toxid In House				Client: Project:	Pac 221	ific Ecorisk 25		
Comparison S	Summary								10.00			
Analysis ID	Endpoint	N	OEL	LOEL	TOEL	PMSD	TU	Me	thod			
19-4434-6354	Reproduction	10	000	1500	1225	40.2%		Ste	el Man	y-One Rank	Sum Test	
17-2587-0001	Survival	2	000	2500	2236	NA		Fisi	her Exa	act/Bonferro	ni-Holm Tes	st
Point Estimat	e Summary											
Analysis ID	Endpoint	L	evel	mg/L	95% LCL	95% UCL	TU	Me	thod			
12-4436-7470	Reproduction	IC	55	382	76.7	1060		Line	ear Inte	erpolation (I	CPIN)	
		IC	10	1030	153	1110						
		IC	15	1070	230	1170						
		IC	20	1120	307	1220						
		IC	25	1160	383	1280						
		IC	240	1290	1110	1460						
		IC	50	1380	1210	1560						
01-7956-2087	Survival	E	C5	1680	101	1960		Line	ear Re	gression (M	LE)	
		E	C10	1770	178	2020						
		E	C15	1830	260	2070						
		E	C20	1880	352	2110						
		E	C25	1930	455	2150						
		E	C40	2050	860	2280						
		E	C50	2120	1230	2420						
Reproduction	Summary	·-				_						
C-mg/L	Control Type		ean	95% LCL	95% UCL	Min	Max	s Std	Err	Std Dev	CV%	%Effect
0	Lab Water Contr		2.9	17.8	28	0	35	4.3	3	13.7	59.7%	0.0%
500			3.2	13.2	23.2	0	32	4.2	2	13.3	73.3%	20.5%
1000			4.6	22.9	26.3	19	34	1.4		4.43	18.0%	-7.42%
1500		10 8.		5.72	10.7	0	18	2.1		6.65	81.1%	64.2%
2000		10 0.		0.0426	0.357	0	1	0.13	33	0.422	211.0%	99.1%
2500		10 0		0	0	0	0	0		0		100.0%
Survival Sum	mary											
C-mg/L	Control Type		ean	95% LCL	95% UCL	Min	Max		Err	Std Dev	CV%	%Effect
0	Lab Water Contr			0.782	1	0	1	0.1		0.316	35.1%	0.0%
500		10 0.		0.643	0.957	0	1	0.13	33	0.422	52.7%	11.1%
1000		10 1		1	1	1	1	0		0	0.0%	-11.1%
1500		10 0.		0.643	0.957	0	1	0.13		0.422	52.7%	11.1%
2000		10 0.		0.407	0.793	0	1	0.10		0.516	86.1%	33.3%
2500		10 0.	1	0	0.218	0	1	0.1		0.316	316.0%	88.9%

Analyst: QA: QA: QA: QA

Report Date: Test Code: 06 Mar-14 15:56 (p 2 of 2) 55555 | 06-7069-6201

								t oode.			0 1000-020
Ceriodaph	nia Survival and Re	producti	on Test							Pacif	ic EcoRisi
Reproduct	on Detail										
C-mg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Lab Water Contr	32	27	29	0	32	10	35	1	32	31
500		15	29	26	0	0	29	0	24	27	32
1000		20	25	19	26	25	20	25	24	28	34
1500		12	0	15	14	18	0	6	8	9	0
2000		0	0	0	0	0	0	0	0	1	1
2500		0	0	0	0	0	0	0	0	0	0
Survival De	etail				-						
C-mg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Lab Water Contr	1	1	1	1	1	1	1	0	1	1
500		0	1	1	1	0	1	1	1	1	1
1000		1	1	1	1	1	1	1	1	1	1
1500		1	1	1	1	1	0	0	1	1	1
2000		0	1	0	1	0	0	1	1	1	1
2500		1	0	0	0	0	0	0	0	0	0
Survival Bi	nomials					·				· ·	·
C-mg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Lab Water Contr	1/1	1/1	1/1	1/1	1/1	1/1	1/1	0/1	1/1	1/1
500		0/1	1/1	1/1	1/1	0/1	1/1	1/1	1/1	1/1	1/1
1000		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
1500		1/1	1/1	1/1	1/1	1/1	0/1	0/1	1/1	1/1	1/1
2000		0/1	1/1	0/1	1/1	0/1	0/1	1/1	1/1	1/1	1/1
2500		1/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1

06 Mar-14 15:57 (1 of 1)

Ceriodaphnia Survival and Reproduction Test

Pacific EcoRisk

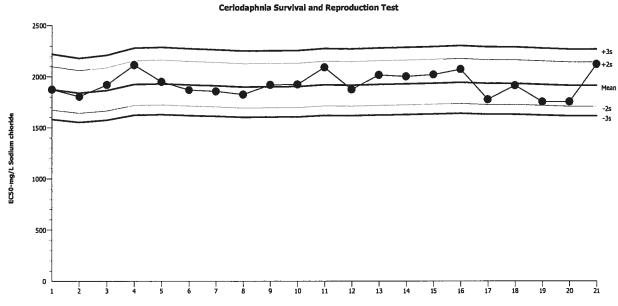
Test Type: Reproduction-Survival (7d)
Protocol: EPA-821-R-02-013 (2002)

Organism: Ceriodaphnia dubia (Water Flea)

Material: Sodium chloride

Endpoint: Survival

Source: Reference Toxicant-REF



 Mean:
 1912
 Count:
 20
 -2s Warning Limit:
 1708
 -3s Action Limit:
 1614

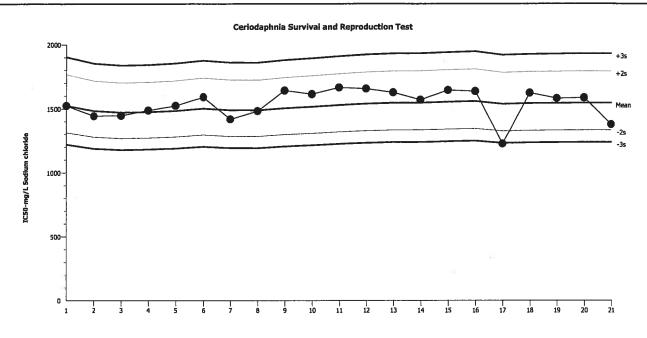
 Sigma:
 NA
 CV:
 5.82%
 +2s Warning Limit:
 2142
 +3s Action Limit:
 2266

Quali	ity Con	trol Data	а								
Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2013	Dec	3	11:15	1874	-38.52	-0.3598			12-5884-0560	21-4298-8538
2			4	16:05	1804	-107.9	-1.026			09-5622-2304	14-7350-4776
3			10	15:30	1918	6.18	0.05705			15-2935-9896	14-4880-2619
4			12	15:20	2113	200.5	1.763			14-8624-9987	17-8299-3643
5			17	15:19	1948	36.04	0.3302			02-9668-0960	17-7617-0085
6			27	11:30	1869	-43.46	-0.4065			12-5245-4230	15-7366-0270
7			28	11:00	1855	-57.24	-0.5373			12-0330-1397	15-7695-0801
8			31	15:00	1825	-87.22	-0.8254			09-7312-0881	18-4154-6303
9	2014	Jan	4	13:45	1918	6.18	0.05705			09-6104-7564	05-9919-1152
10			7	15:00	1923	11.21	0.1034			16-7246-6353	12-7662-2537
11			8	14:00	2091	178.5	1.578			01-9031-3368	18-5138-9208
12			14	14:15	1874	-38.52	-0.3598			09-8747-3748	16-6708-5060
13			15	14:45	2015	102.8	0.9259			08-6494-0499	17-9141-6278
14			18	13:30	2001	88.54	0.8003			17-1468-6197	11-6280-7655
15			21	14:30	2019	106.7	0.9602			00-6454-2258	07-5797-6910
16			23	12:00	2071	159	1.412			17-1293-4057	08-5501-2982
17		Feb	4	14:25	1776	-136.7	-1.311			07-2877-2070	10-6962-3923
18			5	14:40	1913	0.5345	0.004945			18-1807-5589	02-4863-0686
19			7	14:45	1753	-159.3	-1.538			20-3710-9112	04-8582-3441
20			11	15:55	1754	-158.2	-1.527			16-5289-2619	00-2481-8592
21			27	14:20	2121	208.4	1.829			06-7069-6201	01-7956-2087

Pacific EcoRisk Ceriodaphnia Survival and Reproduction Test

Organism: Ceriodaphnia dubia (Water Flea) Test Type: Reproduction-Survival (7d) Material: Sodium chloride

EPA-821-R-02-013 (2002) Endpoint: Reproduction Source: Reference Toxicant-REF Protocol:



1545 20 -2s Warning Limit: 1333 -3s Action Limit: 1238 Mean: Count: +3s Action Limit: 1930 Sigma: NA CV: 7.69% +2s Warning Limit:

Quali	ty Con	trol Data	а								
Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2013	Dec	3	11:15	1525	-20.83	-0.1833			12-5884-0560	15-0597-1397
2			4	16:05	1444	-101.5	-0.9173			09-5622-2304	14-3869-0648
3			10	15:30	1447	- 97.86	-0.8835			15-2935-9896	14-2020-4870
4			12	15:20	1487	-58.2	-0.5184			14-8624-9987	00-7585-2713
5			17	15:19	1525	-20.69	-0.1821			02-9668-0960	09-7177-9871
6			27	11:30	1591	45.78	0.3943			12-5245-4230	01-2027-4739
7			28	11:00	1418	-127	-1.158			12-0330-1397	17-0523-0865
8			31	15:00	1482	-62.92	-0.5613			09-7312-0881	13-4764-4425
9	2014	Jan	4	13:45	1643	97.33	0.8248			09-6104-7564	12-3234-0188
10			7	15:00	1614	68.68	0.5872			16-7246-6353	12-1079-9052
11			8	14:00	1665	120.1	1.011			01-9031-3368	13-9221-2159
12			14	14:15	1656	111.1	0.9372			09-8747-3748	14-9137 - 2943
13			15	14:45	1626	81.06	0.6904			08-6494-0499	11-1750-3693
14			18	13:30	1570	24.33	0.211			17-1468-6197	01-8126-0604
15			21	14:30	1644	99.02	0.8388			00-6454-2258	19-6243-3715
16			23	12:00	1636	90.65	0.7698			17-1293-4057	17-6505-0888
17		Feb	4	14:25	1225	-320.3	-3.137	(-)	(-)	07-2877-2070	21-4219-1483
18			5	14:40	1623	77.36	0.6597			18-1807-5589	21-1964-3214
19			7	14:45	1580	34.98	0.3023			20-3710-9112	02-2044-4977
20			11	15:55	1586	40.52	0.3495			16-5289-2619	03-9065-0204
21			27	14:20	1377	-168.4	-1.559			06-7069-6201	12-4436-7470

Short-Term Chronic 3-Brood Ceriodaphnia dubia Survival & Reproduction Test Data

(Client:			Refer	ence Tox	icant			M	laterial:		Sodiu	ım Ch	loride			Те	st Date:	2	27-14	
Pro	ject #:	22	25		Test ID:		555	55	F	Random	ization:		10.0	0.2		•	Control	Water:	Mo	dified EPAM	Н
	Day	p			.O.	Conductivi		Temp						Reproduct	,					SIGN-OFF	
		New	Old	New	Old	New	Old	(°C)	A	В	С	D	E	F	G	Н	I	J	Date: 2/27/		Test Init
	0	8.01		7.9		343		25. 8	0	0	0	0	0	0	0	0	0	0	Sol'n Prep CP	MA	Time 142
	1	7.93	8,20	8.0	7-8	350	366	25.1	Ø	0	0	0	0	0	Ø	0	0	0	Sol'n Prep	New WQ: C	Time 15/0
	2	7.99	8.06	8.1	7.4	351	358	25.7	O	0	0	0	0	0	G	G	٥	0	Sol'n Prep:	Old WQ: 🐴	15 Time 1145
trol	3	7.94	7.97	8.3	7.2	350	360	258	0	3	0	0	0	4	3	٥	٥	0	Date: Sol'n Prep:	YNew WQ: DA	
er Con	4	7.93	792	8.5	8.7	349	380	25.6	5	1	4	0	6	0	l	XI	5	3	Date:3/3//Sol'n Prep: CO	Old WQ:	
Lab Water Control	5	7.83	7.92	8.2	8.8			25.7	10	7	10	0	9	6	10	_	12	13	Date:3/4// Sol'n Prep	Old WQ:Co	
L	6	8.26	8.16	8.4	8.0	350	383	25.6	17	16	15	0	17	O	21	-	15	15	Date: 3/5// Sol'n Prep: CP	YNew WQ: AF	Counts &
	7															_			Date: Sol'n Prep:	New WQ: Old WQ:	Counts. Time
	8															-			Date:	Old WQ:	Counts Time
								Total≃	32	27	29	٥	32	10	35	X/I	32	31	Mean Neonates/Fe	male = 27.	9
	Day	p New	H Old	D. New	O.	Conductivi New	ty (µS/cm) Old	888888	Α	В	С	Surviva D	1 / Repro	duction F	G	Н	1	j	RT B	ATCH NUMBI	ER
	0	8.01		7.9		1368									_				CP ₄₋₂	122	
			0.1		- Q		<u> </u>		0	0	0	0	0	0	0	0	0	0			
		7.95			7.8	1363			-	D	0	0	0	0	0	0	<u> </u>	0	12		
	2	7.94	8.01	8.3	7.4	1388	1410		0	0	0	0	0	0	0	0	0	0	1Z	2	
	3	7.90	7.99	8.3	7.2	1343	1436		0	٥	۵	٥	1/6	0	0	٥	0	0	194		
500 mg/L	4	7,99	791	8.4	8.4	1314	1406		4	6	6	0	_	0	0	5	3	4	124	!	
500	5	7.85	7,9a	8.2	8.7	1318	1377		<u>X</u>	11	12	0	-	12	0	7	10	13	124		
	6	8.17	8.01	8.6	8.0	1300	1439		1	12	8	0	_	17	0	12	14	15	124		
	7									:			1								
	8				·								·								
<u> </u>								Total=	XC	29	26	0	%	29	0	24	27	32	Mean Neonates/Fer	nale = 18,2	

Short-Term Chronic 3-Brood Ceriodaphnia dubia Survival & Reproduction Test Data

C	Client:		Refe	rence Tox	icant			N	laterial:		Sodiu	ım Chl	loride			Te	st Date:	2-27-14
Pro	ject #:	22125		Test ID:		555	555		Random	ization:		10.	<u>ر</u> ک می	2		Control	Water:	Modified EPAMH
	Day	pН	E	0.0.	Conductivi	ity (μS/cm)	, cmp				Su	rvival / R	eproduc	tion				
	L	New Old	New	Old	New	Old	(*C)	Α	В	С	D	Е	F	G	Н	I	J	
	0	7.98	8.2	************	2306			Ô	0	0	0	0	0	0	0	0	0	
	ı	7.96 8.13	8.7	7.7			-0-0-0-0-0-0-0-0	0	D	10	D	0	0	0	0	0	0	
	2	7.91 80	3 8.4	7.4	2236	335°C		0	0	0	0	0	0	0	0	0	0	
	3	7.90 7.9	8 9.5	7.2				Ø	٥	0	0	Ð	0	0	٥	2	0	
1000 mg/L	_	7.96 7.89		I	2296	2515		0	5	7	4	3	1	3	4	0	8	
100	5	7.857.9	8.3	8.6	2300	2431		9		O	9	10	8	11	[1]	12	13	
	6	8.13 7.9	1 8.7	8.2	2 287	2605		11	9	12	13	12	11	11	9	14	13	
	7	01/00/00/01	9000000												2			
	8																	
202020202							Total=	20	25	19	7.6		20	25	24	28	39	Mean Neonates/Female = Z 4.6
	Day	pH New Old		Old	New	ity (µS/cm) Old		A	В	С	D	I / Repro	F	G	Н	1	J	
	0	7.96	8.3		3220			0	0	0	Ô	0	0		0	0	0	
	!	7.958.0	19113	7.7	3220	3410		0	0	0	0	0	0	0	0	0	0	
	2	7.88 8.0		1	3120	Ĭ	I SHEKKEKE	0	6	0	0	0	3/0	0	0	0	O	
	3		8 8.7	+	3240			٥	0	6	0	0	,	٥	٥	0	0	
1500 mg/L	4	7.94 7-8		8-2	3260	3460		3	0	0	3	2	1	2	0	1	0	
1500	5	7.84 7.91		I -	3 250	ı	E-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1	5	0	10	5	7	`	1/u	3	6.	0	
	6	8.10 7.9	8.9	8.3	3210	3510		Ÿ	0	5	6	9	-	_	5	Z	0	
	7					12							1					
	8												_					
							Total=	12	0	15	14	18	40	16	8	9	0	Mean Neonates/Female = 8/Z

Short-Term Chronic 3-Brood Ceriodaphnia dubia Survival & Reproduction Test Data

(Client:		Refe	rence Tox	icant			_ M	laterial:		Sodiu	ım Ch	oride			Te	st Date:	2-27-14
Pro	ect #:	22125	_	Test ID:		555	55	_ F	Random	ization:		10.0	<u>2 . م</u>			Control	Water:	Modified EPAMH
	Day	рН	D.O.		Conductiv	ity (μS/cm)					Su	rvival / R	.eproduct	ion				
		New Old	New	Old	New	Old	(°C)	Α	В	С	D	Е	F	G	Н	I	J	
	0	7.91	9.2		4170			0	0	0	0	0	0	0	0	0	0	
	I	7.94 8.08	9.4	7.8	4130	4390		0	0	0	0	0	0	0	0	٥	0	
		7.87 8.04			4110	4310		0	0	0	0	0	0	0	0	0	0	
	3	7.79 7.90	8.9	7.2	4100	4300		0	0	٥	0	0	٥	0	0	0	0	
2000 mg/L		7.94 7.86		8.1	4110	4510		0	0	×/0	0	0	×/0	0	0	1	1	
200	. 5	7.83 7.89	8.5		4180			1/0	0	_	0	1/0	•	0	0	0	O	
	6	8.047.97	9.1	8.4	4120	4640		_	0	-	0	_	1	0	0	0	0	
	7							-	-	_		_	1					
	8									-			1					
							Total=	1/2	ے	X/0		1/6	X/0	0	0		_1_	Mean Neonates/Female = 0. Z
	Day	pH New Old	New D	.O.	Conductivi New	ity (µS/cm) Old	*****	Α	В	С	Surviva D	I / Repro E	duction F	G	Н	ı	1	
	0									0					<u> </u>			
	\vdash	7.87	8.9		5000			0	0		0	0	0	0	0	0	0	
	I	7.92 8.18	(0.1	8.1	2040			0	40	4/0	7/0	0	0	0	40	1/0	0	
	2	7.84 7.99	9.1	7.4		5640		0	-	_	_	1/6	1/6	*/6	-	_	7/6	
	3	7.78 7.88		7.2	5040	5200		0	_	_	-	-	,)	-	_		
2500 mg/L		7.927-86				5310		0		-	_		,	*	-	-	•	
250	5	7.82 7.87	8.6	8.5	5140	5640		೦	_	-	-	-	1	-		-	_	
	6	8.04 7.93	9.6	8.6	4980	5670		6	-	^	~	-	-	J	-	~	-	
	7	******	+0000000		10000000				1	_	-	-	٦	•			,	
	8			v-10-10-10-10-10-10-10-10-10-10-10-10-10-					-	-	-	-		-	_	~	-	
							Total=	0	1/0	⅓ ⁄⁄	*/0	1/0	*/0	1/0	1/0	7/0	*/0	Mean Neonates/Female = 6,0

Appendix H

Test Data and Summary of Statistics for the Reference Toxicant Evaluation of the *Hyalella azteca*



CETIS Summary Report

Report Date: Test Code: 06 Mar-14 15:44 (p 1 of 1)

55556 | 00-8786-3488

									l est (soue:			22220 00	-8786-3488
Hyalella 96-h	Acute Survival T	est											Pacifi	c EcoRisk
Batch iD:	03-3671-5678	Tes	t Type:	Surviv	al (96h)				Analy	st:	Cass	y Glover	(2)	
Start Date:	27 Feb-14 18:10		tocoi:			012 (2002)			Dilue		SAM	-		
Ending Date:	03 Mar-14 16:30) Spe	cies:		lia azteca	•			Brine	:	Not A	Applicable		
Duration:	94h	So	ırce:	Chesa	apeake Cu	ıltures, Inc.			Age:		9			
Sample ID:	08-3593-4881	Co	de:	KCI					Client	t:	Refe	rence Toxic	cant	
Sample Date:	27 Feb-14 18:10	Ma	terial:	Potas:	sium chlo	ride			Proje	ct:	2212	.6		
Receive Date:	27 Feb-14 18:10	Soi	ırce:	Refere	ence Toxic	cant								
Sample Age:	NA (22.9 °C)	Sta	tion:	In Hou	ıse									
Comparison S	Summary													
Analysis !D	Endpoint		NOEL	. L	.OEL	TOEL	PMSD	TU		Meth	od			
17-1121-4972	96h Survival Rat	te	0.4	0).8	0.5657	NA			Fishe	r Exa	ct/Bonferro	ni-Holm T e:	st
Point Estimat	e Summary					-								
Analysis ID	Endpoint		Levei	g	ı/L	95% LCL	95% UCL	ΤU		Meth	od			
13-6064-7851	96h Survival Rat	te	EC50		.606	0.532	0.692			Spea	rman	-Kärber		
96h Survivai f	Rate Summary													
C-g/L	Control Type	Count	Mean	9	5% LCL	95% UCL	Min	Max	3	Std E	rr	Std Dev	CV%	%Effect
0	Lab Water Contr	10	1	1		1	1	1		0		0	0.0%	0.0%
0.1		10	1	1		1	1	1		0		0	0.0%	0.0%
0.2		10	1	1		1	1	1		0		0	0.0%	0.0%
0.4		10	1	1		1	1	1		0		0	0.0%	0.0%
0.8		10	0.1	0		0.218	0	1		0.1		0.316	316.0%	90.0%
1.6		10	0	0) 	0	0	0		0		0		100.0%
96h Survival F	Rate Detaii													
C-g/L	****	Rep 1	Rep 2		Rep 3	Rep 4	Rep 5	Rep	6	Rep	7	Rep 8	Rep 9	Rep 10
0	Lab Water Contr		1	1		1	1	1		1		1	1	1
0.1		1	1	1		1	1	1		1		1	1	1
0.2		1	1	1		1	1	1		1		1	1	1
0.4		1	1	1		1 "	1	1		1		1	1	: 1
0.8		0	0	1		0	0	0		0		0	0	0
1.6		0	0	0)	0	0	0		0		0	0	0
	Rate Binomials										() -			
C-g/L		Rep 1	Rep 2		Rep 3	Rep 4	Rep 5	Rep	6	Rep 7	7	Rep 8	Rep 9	Rep 10
0	Lab Water Contr		1/1		/1	1/1	1/1	1/1		1/1		1/1	1/1	1/1
0.1		1/1	1/1		/1	1/1	1/1	1/1		1/1		1/1	1/1	1/1
0.2		1/1	1/1		/1	1/1	1/1	1/1		1/1		1/1	1/1	1/1
0.4		1/1	1/1		/1	1/1	1/1	1/1		1/1		1/1	1/1	1/1
0.8		0/1	0/1		/1	0/1	0/1	0/1		0/1		0/1	0/1	0/1
1.6		0/1	0/1	0	/1	0/1	0/1	0/1		0/1		0/1	0/1	0/1

Analyst: Analyst: QA: SW

Hyaleila 96-h Acute Survival Test

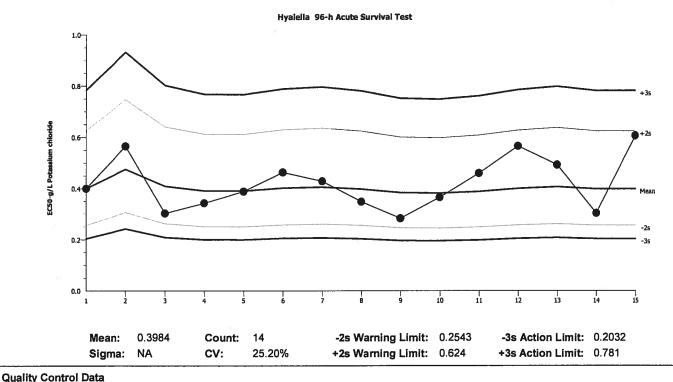
Test Type: Survival (96h)

Organism: Hyaleila azteca (Freshwater Amphip Protocol: EPA-821-R-02-012 (2002)

Endpoint: 96h Survival Rate

Pacific EcoRisk

Material: Potassium chloride
Source: Reference Toxicant-REF



Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID	
1	2013	Nov	6	15:40	0.4	0.00164	0.01831			15-7026-7439	19-7036-5835	
2			20	17:00	0.5657	0.1673	1.563			01-7958-1543	09-3590-7589	
3			21	16:55	0.3031	-0.09522	-1.217			17-4328-3485	11-7628-5959	
4		Dec	11	17:45	0.3429	-0.05549	-0.6685			06-4892-3798	02-7681-8091	
5	2014	Jan	22	15:30	0.3887	-0.00964	-0.1092			15-1323-9580	12-5039-1906	
6			23	12:20	0.4634	0.06507	0.6742			12-4927-8114	03-4534-5077	
7			24	13:50	0.4287	0.03035	0.3272			04-8256-1553	14-6784-2933	
В			29	12:45	0.3482	-0.05014	-0.5995			02-0910-9206	20-3009-8021	
9			30	13:00	0.2828	-0.1155	-1.526			07-7453-2234	19-6136-6595	
10			31	15:00	0.3651	-0.03323	-0.3881			07-3562-2451	09-8419-3354	
11		Feb	4	16:00	0.4595	0.06112	0.6361			07-2556-9878	06-3437-8862	
12			7	17:40	0.5657	0.1673	1.563			12-2780-2249	04-4756-7462	
13			15	17:00	0.4925	0.0941	0.945			20-0080-3088	01-2359-2306	
14			20	15:45	0.3031	-0.09522	-1.217			05-7047-7703	05-1521-5106	
15			27	18:10	0.6063	0.2079	1.872			00-8786-3488	13-6064-7851	

96 Hour Hyalella azteca Reference Toxicant Test Data

Client:	Reference Toxicant	Organism Log #:	7993 Age: 8-9 dan	15
Test Material:	Potassium Chloride	Organism Supplier:	Chesapeake cult	
Test ID#:	55556 Project # 22126	Control/Diluent:	SAM-5 <i>Hyalella</i> Water	
Test Date:	2/27/14 Randomization: 10-6-13	Control Water Batch:	92	10
Feeding T0	Time: 900 Initials: 05	Feeding T46	Time: <u>0945</u> Initials:	<u>/Ľ</u>

										# 1					
Treatment (g/L)	Temp	pН	D.O.	Conductivity						Anima		-			Sign-Off
	(°C)	P	(mg/L)	(μS/cm)	Α	В	С	D	Е	F	G	Н	I	J	
Control	229	8.26	9.0	407	1	1	1	1)	1			1	1	Test Solution Prep
0.1	22.9	8.14	8.6	600	(1	١		1	1	1	1	1	١	New WQ: MA
0.2	22.4	8.09	8.7	778		1_1_	1	1	1	1	1	١	1	1	Initiation Date: 2/27/14
0.4	22.9	8.03	8.7	1096		i			1	1		1	١	١	Initiation Time: 18 10
0.8	22.9	7.97	8.8	1850	1	1	١	1	1	1	1	1	1	1	Initiation Signoff:
1.6	22.9	7.84	8.7	3190	_	1	١	1	١	1	-	-	1		RT Batch #: 14
Meter ID	434	PHIA	12004	ECOY											
Control	२२ ४				1	1		1		1)	1	1	1	Count Date:
0.1	<i>9</i> 2 8							1	1		1	1	1	1	Count 11me: 1230
0.2	<i>2</i> 28											I	1	I	Count Signoff:
0.4	<i>B</i> 2 . 8				\ \ \ \	Ī	1	1	1	c33 86e	1	1		ı	
0.8	<i>2</i> 2.8				1	ı		ī	0	300	1	1	l	1	
1.6	22.8				Ó	0	C	0	0	0	0	0	0	0	
Meter ID	43A														
Control	23.1				1	ı	١)	1	1	1	1	1	١	Count Date: 3/1/14
0.1	23.1				\Box		1	ı		ı	1	Ti	1	١	Count Time: 0930
0.2	23.1					1	t	1	ı	1	1		1	1	Count Time: 09.30 Count Signoff:
0.4	23.1				1	1	1	1	1	1	1		l i	1	
0.8	23.1				0	0	1	0	-	0	0	O	П	0	
1.6	_				-	_	_	-	~	-	~	-	-	_	
Meter ID	43A														
Control	23.1				i	1	1	1	1	1	1	1	١	1	Count Date: 3/2/14
0.1	23.1				T	1	Ī	1	1	1	1	1	ī	l	Count Time: 0910
0.2	23.1				1	1	T	(1	1		1	1	1	Count Signoff: タッソ
0.4	23.1				1	1	ı	1	1	1	1	1	1		
0.8	23.1				_	_	1	_	_	-	_	-	1	_	
1.6					-	-	-	_	-	-	_	-	_	_	
Meter ID	43A														
Control	23.0	7.86	8.8	447	1	1	1	1	1	1	ŀ,	1	1	1	Termination Date: 3/3/14
0.1	23.0	7.80	8.8	691	T	1	1	1	I	1	Ī	Ī	1	1	Termination Date: 3/3/14 Termination Time: 1630 Termination Signoff: MF Old WQ: CJD
0.2	23.0	7.8a	8.7	964	T	1	ı	1	1	1	Ì	1	1	1	Termination Signoff:
0.4	23.0	7.84	8.7	1314	1	T	1	1	1	1	1	1	1	1	Old WQ: CJD
0.8	23.0	7.81	8.3	2197	_	-	1	-	-	<u> </u>	_	_	0	_	
1.6		7.74	8.1	3750	_	-	_	-	-	-	_	_	_	-	
Meter ID	43A	PHIS	ROOT	ECO6											
<u> </u>		, , , , , ,		, , , , , ,	أأنانا		1011111111111	110001010	311111111		44444			*******	

Appendix I

Test Data and Summary of Statistics for the Reference Toxicant Evaluation of the Fathead Minnow

CETIS Summary Report

Report Date: Test Code: 12 Mar-14 16:31 (p 1 of 2) 55557 | 00-5491-0321

								1000	40.		00001 0	30-3431-032
Chronic Lan	vai Fish Survival	and Gr	owth Test					-			Pac	ific EcoRisi
Batch ID: Start Date: Ending Date Duration:	10-3510-1967 27 Feb-14 17:0 66 Mar-14 08: 6d 15h	00 15	Test Type: Protocol: Species: Source:	Growth-Survive EPA-821-R-02 Pimephales pr Aquatox, AR	-013 (2002)			Analyst: Diluent: Brine: Age:	La	evi Vasquez iboratory Wai ot Applicable	ter	
Receive Date	12-9771-3014 : 27 Feb-14 17:0 e: 27 Feb-14 17:0 NA (25.1 °C)	00 00 :	Code: Material: Source: Station:	NaCI Sodium chlorid Reference Tox In House	-			Client: Project:		acific Ecorisk 1127		
Comparison	Summary											
Analysis ID	Endpoint		NOEL	LOEL	TOEL	PMSD	TU	M	ethod			
07-0393-4181	7d Survival Ra	te	1.5	3	2.121	13.0%				any-One Ran	k Sum Tes	t .
07-1700-5636	Mean Dry Bion	nass-mg	0.75	1.5	1.061	10.2%				Multiple Com		
Point Estima	te Summary		· · · · · · · · · · · · · · · · · · ·	·								
Analysis ID	Endpoint		Level	g/L	95% LCL	95% UCL	TU	Me	thod			
07-9451-9891	7d Survival Ra	te	EC5	0.772	0.377	1.16		Lir	near R	egression (M	LE)	
			EC10	1.06	0.59	1.5					,	
			EC15	1.31	0.795	1.79						
			EC20	1.56	1	2.06						
			EC25	1.8	1.22	2.35						
			EC40	2.61	1.95	3.33						
			EC50	3.25	2.52	4.21		- at				
00-1230-5703	Mean Dry Biom	ass-mg	IC5	1.04	0.444	1.86		Lir	ear in	terpolation (1	CPIN)	
			iC10	1.42	0.828	1.83					,	
			iC15	1.6	1.16	1.94						
			IC20	1.74	1.41	2.14						
			IC25	1.87	1.59	2.35						
			iC40	2.27	2.07	2.99						
			IC50	2.54	2.33	3.89						
7d Survival R	ate Summary											
C-g/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Sto	d Err	Std Dev	CV%	%Effect
)	Lab Water Conti	r 4	1	1	1	1	1	0		0	0.0%	0.0%
0.75		4	0.925	0.906	0.944	0.9	1	0.0	25	0.05	5.41%	7.5%
1.5		4	0.9	0.87	0.93	0.8	1	0.0	408	0.0816	9.07%	10.0%
3		4	0.375	0.292	0.458	0.2	0.7	0.1	11	0.222	59.1%	62.5%
6		4	0.475	0.456	0.494	0.4	0.5	0.0		0.05	10.5%	52.5%
9		4	0	0	0	0	0	0		0		100.0%
Mean Dry Bio	mass-mg Summ	ary										-
C-g/L	Control Type	Count		95% LCL	95% UCL	Min	Max	Sto	i Err	Std Dev	CV%	%Effect
)	Lab Water Contr	4	0.73	0.715	0.744	0.696	0.78	0.0	193	0.0387	5.3%	0.0%
).75		4	0.721	0.713	0.73	0.704	0.75	4 0.0	116	0.0231	3.2%	1.15%
1.5		4	0.649	0.622	0.675	0.579	0.718	0.0	352	0.0704	10.8%	11.1%
3		4	0.241	0.19	0.291	0.14	0.43	1 0.0	676	0.135	56.2%	67.0%
6 9		4	0.24	0.229	0.252	0.208	0.266	0.0	15	0.03	12.5%	67.0%
		4	0	0	0	0	0	0		0		100.0%

Report Date: Test Code: 12 Mar-14 16:31 (p 2 of 2) 55557 | 00-5491-0321

						rest oode.	00007 00-0431-0321
Chronic L	arval Fish Survival a	and Grow	th Test				Pacific EcoRisk
7d Surviva	al Rate Detail						
C-g/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4		
0	Lab Water Contr	1	1	1	1		
0.75		0.9	1	0.9	0.9		
1.5		8.0	0.9	0.9	1		
3		0.7	0.3	0.3	0.2		
6		0.4	0.5	0.5	0.5		
9		0	0	0	0		
Mean Dry	Biomass-mg Detail						
C-g/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4		
0	Lab Water Contr	0.696	0.717	0.721	0.786		
0.75		0.722	0.706	0.704	0.754		
1.5		0.598	0.579	0.7	0.718		
3		0.431	0.242	0.14	0.149		
6		0.208	0.222	0.266	0.266		
9		0	0	0	0		
7d Surviva	I Rate Binomials						
C-g/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4		
0	Lab Water Contr	10/10	10/10	10/10	9/9		
0.75		9/10	10/10	9/10	9/10		
1.5		8/10	9/10	9/10	10/10		
3		7/10	3/10	3/10	2/10		
6		4/10	5/10	5/10	5/10		
9		0/10	0/10	0/10	0/10		

Report Date:

12 Mar-14 16:32 (1 of 1)

Chronic Larval Fish Survival and Growth Test

Pacific EcoRisk

Test Type: Growth-Survival (7d)

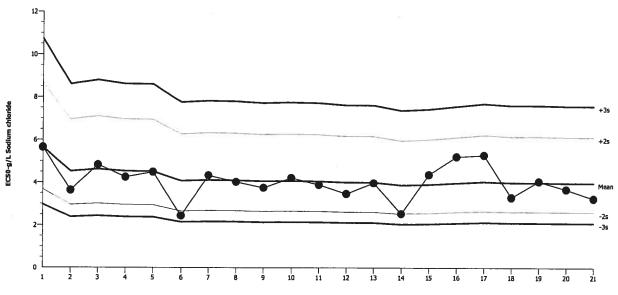
Organism: Pimephales promelas (Fathead Minn

Protocol: EPA-821-R-02-013 (2002) Endpoint: 7d Survival Rate Material: Sodium chloride

Source:

Reference Toxicant-REF





3.987 Mean: Count: 20 -2s Warning Limit: 2.598 -3s Action Limit: 2.097 Sigma: NA CV: 23.90% +2s Warning Limit: 6.118 +3s Action Limit: 7.578

Qualit	y Con	trol Data	a								
Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2013	Oct	1	16:40	5.646	1.66	1.626			15-8925-1363	13-7186-9661
2			2	15:30	3.632	-0.3544	-0.4348			10-0960-8572	00-5987-4084
3			8	15:05	4.833	0.8462	0.899			15-0374-2073	07-5438-7669
4			15	15:30	4.254	0.267	0.3028			20-5469-9563	16-9983-9699
5			17	15:10	4.496	0.5092	0.5614			09-9216-5569	17-2634-3422
3		Nov	5	15:35	2.437	-1.55	-2.299	(-)		14-2080-3139	10-0967-0697
7			7	14:00	4.335	0.3485	0.3914			14-5006-8214	19-9459-5987
3			12	15:30	4.026	0.03871	0.04513			16-1508-4402	15-0857-3987
9			19	16:40	3.751	-0.2363	-0.2853			10-1364-1127	10-8722-5568
10		Dec	3	16:00	4.221	0.2338	0.2661			16-2647-7149	00-2423-1163
11			10	18:30	3.892	-0.09524	-0.1129			15-5516-6346	16-6930-0253
2			17	17:20	3.464	-0.5229	-0.6567			14-4525-2754	01-4087-1734
13			31	17:00	3.974	-0.01307	-0.01533			17-4848-2922	19-9554-7447
4	2014	Jan	7	16:15	2.532	-1.455	-2.121	(-)		00-8911-3467	08-0589-7337
15			14	16:30	4.373	0.3863	0.432			06-8606-1268	14-0370-1802
16			21	14:35	5.214	1.227	1.254			02-6681-4000	00-1989-7275
17		Feb	4	15:30	5.283	1.297	1.315			03-2406-2742	20-9102-1057
8			7	17:00	3.301	-0.6855	-0.8813			07-1665-5566	03-0403-9044
19			11	15:45	4.06	0.07321	0.08499			08-6176-1319	13-6169-4175
20			18	16:00	3.68	-0.3064	-0.3735			06-6722-5517	14-1919-5029
21			27	17:00	3.254	-0.7332	-0.9492			00-5491-0321	07-9451-9891

Report Date:

12 Mar-14 16:33 (1 of 1)

Chronic Larval Fish Survival and Growth Test

Pacific EcoRisk

Test Type: Growth-Survival (7d)
Protocol: EPA-821-R-02-013 (2002)

Organism: Pimephales promelas (Fathead Minn

Endpoint: Mean Dry Biomass-mg

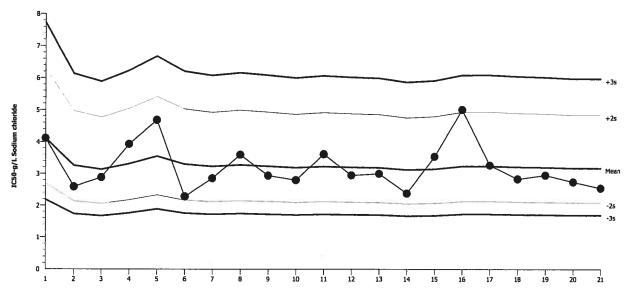
Material: So

Source:

Sodium chloride

Reference Toxicant-REF

Chronic Larval Fish Survival and Growth Test



 Mean:
 3.174
 Count:
 20
 -2s Warning Limit:
 2.084
 -3s Action Limit:
 1.688

 Sigma:
 NA
 CV:
 23.40%
 +2s Warning Limit:
 4.836
 +3s Action Limit:
 5.969

Qualit	y Con	trol Data	3								
Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2013	Oct	1	16:40	4.109	0.935	1.227			15-8925-1363	02-3852-0541
2			2	15:30	2.59	-0.5839	-0.9658			10-0960-8572	09-4900-2290
3			8	15:05	2.883	-0.2915	-0.4576			15-0374-2073	02-1681-8042
4			15	15:30	3.926	0.7523	1.01			20-5469-9563	17-1640-4628
5			17	15:10	4.682	1.508	1.846			09-9216-5569	10-6908-2283
6		Nov	5	15:35	2.284	-0.8903	-1.564			14-2080-3139	15-4499-5202
7			7	14:00	2.851	-0.3225	-0.5091			14-5006-8214	08-9769-4709
8			12	15:30	3.594	0.4195	0.5897			16-1508-4402	14-7453-1475
9			19	16:40	2.935	-0.2387	-0.3715			10-1364-1127	17-5976-0050
10		Dec	3	16:00	2.793	-0.3807	-0.6071			16-2647-7149	05-7650-2111
11			10	18:30	3.613	0.4391	0.6155			15-5516-6346	15-3099-3517
12			17	17:20	2.943	-0.2312	-0.3593			14-4525-2754	16-6836-6369
13			31	17:00	2.99	-0.1843	-0.2842			17-4848-2922	12-0714-0529
14	2014	Jan	7	16:15	2.376	-0.7979	-1.375			00-8911-3467	20-3219-7836
15			14	16:30	3.538	0.364	0.5158			06-8606-1268	05-1045-9218
16			21	14:35	5.006	1.832	2.165	(+)		02-6681-4000	05-4831-2782
17		Feb	4	15:30	3.267	0.0927	0.1368			03-2406-2742	01-0421-5918
18			7	17:00	2.829	-0.345	-0.5466			07-1665-5566	17-6292-1670
19			11	15:45	2.947	-0.2267	-0.352			08-6176-1319	04-0035-1288
20			18	16:00	2.737	-0.4373	-0.7043			06-6722-5517	08-4679-3575
21			27	17:00	2.543	-0.6313	-1.053			00-5491-0321	00-1230-5703

7 Day Chronic Fathead Minnow Reference Toxicant Test Data

Client:	Refe	rence Toxican	t	Organism Log#:	7990	Age:	< 48 hrs
Test Material:	Soc	dium Chloride		Organism Supplier:	Aquatox		
Test ID#:	55557	Project #:	22127	Control/Diluent:	ЕРАМН		
Test Date:	2/27/14	Randor	nization: 4.6.1	Control Water Batch:	1666		

Treatment	Temp	lq	н	D.O. (mg/L) Conductivity (µs/cm)				# Live O	rganisms	;	SIGN OFF	
(g/L)	(°C)	New	Old	New	Old	New	Old	A	В	С	D	SIGN-OFF
Control	25.1	8-11		8.2		298		10	10	10	10	Date 2/27/14
0.75	25.1	8.01		8.3		1940		10	10	10	10	Test Solution Prep と テ フ フ
1.5	25.1	7.97		8.3		3250		10	10	10	10	New WQ MA
3	25.1	7.75		8.5		5880		1.0	10	10	10	Initiation Time 1700
6	25.1	7.70		9.0		11040		10	10	10	10	Initiation Signoff CP
9	25.1	7.66		9.4		16050		10	10	10	10	RT Stock Batch #: 188 189
Meter ID	30A	PH19		12004		ELOY	12000		13 4			
Control	256	8.06	7.93	8.0	7.6	299	1103	10	10	0	10	Date 2.28.14
0.75	25.6	7.98	7.80	8.2	7.1	1115	1952	N)	10	P	10	Test Solution Prep
1.5	25.6	7.95	7.70	8.3	7.3	3180	3280	10	10	10	10	New WQ 35
3	25.6	7.90	7.64	8.4	7.4	5920	6030	10	10	D	a	Renewal Time
6	25-6	7.81	7.65	8.9	7.7	11080	11270	10	Ю	10	10	Renewal Signoff
9	25.6	7.76	7.61	9.2	7.9	16280	16270	0	0	0	0	old WQLH
Meter ID	300	p4 16	1419	ROOY	R007	£09	Eco9	8				RT Stock Batch #: /89
Control	25.7	8.16	7.96	1.5	7.0	299	315	10	10	10	10	Date 2/1/14
0.75	25.7	8.04	7·99	7.5	69	1861	1792	10	10	10	10	Test Soldion Prep
1.5	25.7	8.01	7.85	7.7	7.0	3320	3190	10	9	10	10	New WQ MA
3	25.7	7.95	7.83	7.5	7.2	6110	5920	10	9	10	9	Renewal Time
6	25.7	7.85	7.80	7.8	7.3	11190	11110	8	10	8	10	Renewal Signoff SS
9	25.7		_		-		_	-	_		_	old wo
Meter ID	3014	PHP	१४५	1200B	12004	EC04	ECOG		710			RT Stock Batch #:
Control	25.4	7.97	8.04	8.5	8.4	296	304	10	10	10	9	Date 3/2/14
0.75	25.9	7.91	7.89	8.7	8.0	1775		9	10	10	9	Test Solution Prep MF
1.5	25.9	7.88	7.82	8.7	7.9	3220	3330	9	9	9	10	New WQ D. M. S.
3	25.9	7.84	7.76	8.8	7.8		6210	10	9	10	9	Renewal Time 0 30
6	25.9	7.76	7.71	9.1	7.9		11340	8	10	7	9	CP
9				_	_	-	-	_		_		Old WQ CP
Meter ID	30 A	pHIS	PH16	2009	ROOS	EC08	EC04					RT Stock Batch #: 189

7 Day Chronic Fathead Minnow Reference Toxicant Test Data

Client:		Reference Toxicar	ıt	Organism Log#:_	7990	Age:	48 hrs
Test Material: _		Sodium Chloride		Organism Supplier:	Aquatox		
Test 1D#:	55557	Project #:	22127	Control/Diluent:	ЕРАМН		
Test Date:	2/27/14	Rando	mization: 4.6.1	Control Water Batch:	1666		

Treatment	Temp	Ι ,	оH	D.O.	(mg/L)	Conductiv	ity (μs/cm)		# Live C	rganisms		
(g/L)	(°C)	new	old	new	old	New	Old	A	В	С	D	SIGN-OFF
Control	25.4	8.23	7.81	3.6	7.0	299	304	10	10	10	9	Date 3/3/14
0.75	25.4	8.07	7.74	8.7	7.0	1847	1796	9	10	9	9	Test Solution Prep
1.5	25.4	7.45	7.67	8.9	7.0	3200	3240	9	9	9	10	New WQ
3	25.4	7.92	7.60	9.0	6.8	5880	5950	9	9	8	9	Renewal Time
6	25.4	7.81	7.58	9. 5	7.0		11180	8	10	7	8	Renewal Signoff
9	_		_		-	-	_	_	-	_	_	old WQ CP
Meter ID	39A	PH21	PHI6	RD07	RD04	Eco 6	FLU9			*		RT Stock Batch #: 9
Control	25.5	7.99	7.90	8.5	8.3	300	305	10	10	10	9	Date: 3/4/14
0.75	25.5	7.99	7.83	8.5	8.2	1875	1883	9	10	9	9	Test Solution Prep:
1.5	25.5	7.97	7.79	8.6	8.1	3140	3250	9	9	9	10	New WQ: CP
3	25.5	7.94	7.75	8.9	8.0	5840	5990	9	8	Ź	8	Renewal Time 1020
6	25.5	7.87	7.70	9.6	8.0	11110	11260	8	9	4	g	Renewal Signoff
9	_		_	-	~	_	-	_	_	_	-	Old WQ:
Meter ID	30A	PH16	pH16	RDOF	P108	EC06	ELO8					RT Stock Batch #: 189
Control	25.9	8.03	7.81	8.6	8-1	301	307	-10	10	10	9	Date: 3/5/14
0.75	25.9	7.91	7.71	8.5	8.2	1951	1897	9	10	9	9	Test Solution Prep
1.5	25.9	7.90	7.69	8.7	7.9	33 98	3170	9	9	9	10	New WQ ARE
3	25.9	7.86	7.66	8.9	8.0		5970	8	7	6	6	Renewal Time: 0945
6	25.9	7.81	7.62	9.3	7.8		11220	5	フ	6	5	Renewal Signoff
9	1	-	-	-	-	1	_	1	-	-	_	Old WQ
Meter ID	304	PH16	Ph21	PD07	PD09	EL04	Fc09					RT Stock Batch #
Control	25.4		770		7.8		310	10	10	10	9	Date 3/6/14
0.75	2S.Y		7.62		7-8		1971	9	10	9	C	Termination Time
1.5	2S.4	4000	7.60		7.8		3300	B	9	q	10	Termination Signoff CTD
3	25.4		7.57		7.7		6050	7	3	3	3	Old W9
6	25.4		7.53		7.9		11320	Ч	5	5	5	
9	-		-		-		-	-	-	_	_	
Meter ID	30A		anis		MD8		Eco3					

Fathead Minnow Dry Weight Data Sheet

Client:	Reference Toxicant	Test ID #:55557	Project #:	22127	_
Sample:	Sodium Chloride	Tare Weight Date: 3/2 //リ	Sign-off: 1	fous	
Test Date:	2, 21, 14	Final Weight Date: 3/8/14	Sign-off:	MA	

Pan ID	Concentration Replicat	Initial Pan Weight (mg)	Final Pan Weight (mg)	Initial # of Organisms	Biomass Value (mg)
1	Control A	173.2)	180.17	10	6.696
2	В	172.99	180.16	10	0.717
3	С	179.88	187.09	10	0.721
4	D	179.83	186.90	suct e q	0.786
5	0.75 A	182.03	189.25	10	0.714
6	В	189.77	196.83	10	0.706
7	С	181.66	188.70	10	0,704
8	D	189.05	196.59	10	0.754
9	1.5 A	181.93	187.91	. 10	0,598
10	В	174.65	180.44	10	0.579
11	С	180-81	183.187.81	(0	0,700
12	D	189.97	197.15	lo	6.718
13	3 A	182.27	186.58	(0	0,451
14	В	182.95	185.37	10	०, ६५६
15	С	177.45	178.85	10	0,140
16	D	174.87	176.36	lo	0.149
17	6 A	178.32	180.40	10	0.208
18	В	181.60	183.82	10	0.111
19	С	175.37	178.03	10	0.266
20	D	176.06	178.72	10	0.166
21	9 A	179.17		10	_
22	В	205.15	~	(0	_
23	С	709.70	-	10	-
24	D	19454	~	10	_
QAI		176.29	176.34		
QA2		185.83	185.80		
QA3		207-18	207.25		
Balance ID:		BALOI	BALOI		

Appendix J

Supplemental Data/Information Required to Document Observations of Pathogen-Related Mortality in the Chronic Fathead Minnow Test

Comments and Observations

Client:	KLI	2 ADH Test Date: 2127114
Sample Description:	Sto	Test ID #: 5548)
Species and Test Descripti		FHM Project #: 19399
Date	Initials	Description of Observation:
2/28114	CA	No fish present in pasacores 3
		sep D. Confirmed by KW
3/1/14	SM	0843D: Two mortalities, PRM observed.
7		OSSIB! One morfolity PRM observed
		OSEIA: One mortality ARM observed.
		0979D: One mortality, PRM observed.
3/2/14	42	PRM observed in all reps of 0843
		PRM observed in OSSI-B
		Pem observed in 0883-A
		all beakers changed, Photos Taken
		all beakers changed, Photos Taken
3.3.14	ELL	0845 - 3 TRM - 1 REC A 2 REP D
		0551- 1 PRM 1 REP C
		
		
		
		
O1 G.::1		

General Guidance:

- 1) All observations are to be recorded on this sheet and transcibed by a QA Officer onto the original test data sheet(s) at the completion of testing, if deemed necessary.
- 2) Record the Species and Test Description, Client, Sample Description, Test Date, Test ID #, and Project # of the test in the header..
- 3) Record the date of the observation, your initials, the treatment affected, and the test replicate affected for each entry.
- 4) Record observations in brief sentences. It is VERY IMPORTANT to also record any corrective actions taken.
- 5) Leave a blank line between entries.

Typical obversations that should be recorded: Conductivity verification, presence or absence of PRM when mortalities are observed, etc.

Example: 8/26/08

AB

New chem of 100% effluent > 10% different than previous day. Confirmed on second meter and confirmed conductivity of sample. New sample had >10% difference in conductivity than previous sample.



Alessandro D. Hnatt ADH Environmental 3065 Porter Street, Suite 101 Soquel, CA 95073 May 14, 2014

Alessandro:

I have enclosed one copy of our report "Evaluation of the Toxicity of Contra Costa Clean Water Program Stormwater Samples" for the samples that were collected March 26, 2014. The results of this testing are summarized below.

Hyalella azteca toxicity summary for CCCWP stormwater samples.									
Sample Station	Survival Toxicity relative to the Lab Control treatment?								
207R00011US	Yes (100% effect)								
207R00011DS	Yes (100% effect)								

Toxicity of CCCWP Stormwater to Hyalella azteca

There was complete mortality in both upstream (US) and downstream (DS) 207R00011 stormwater samples.

If you have any questions regarding the performance and interpretation of these tests, feel free to contact my colleague Eddie Kalombo or myself at (707) 207-7760.

Sincerely,

Stephen L. Clark
Vice President/Special Projects Director



Pacific EcoRisk is accredited in accordance with NELAP (ORELAP ID 4043). Pacific EcoRisk certifies that the test results reported herein conform to the most current NELAP requirements for parameters for which accreditation is required and available. Any exceptions to NELAP requirements are noted, where applicable, in the body of the report. This report shall not be reproduced, except in full, without the written consent of Pacific EcoRisk. This testing was performed under Lab Order 19397.

Evaluation of the Toxicity of Contra Costa Clean Water Program Stormwater Samples

Samples collected March 26, 2014

Prepared For:

ADH Environmental 3065 Porter Street, Suite 101 Soquel, CA 95073

Prepared By:

Pacific EcoRisk 2250 Cordelia Road Fairfield, CA 94534

May 2014



Evaluation of the Toxicity of Contra Costa Clean Water Program Stormwater Samples

Samples collected March 26, 2014

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Hyalella azteca

1. INTRODUCTION

Under contract to ADH Environmental, and in support of the Bay Area Stormwater Management Agencies Association (BASMAA) Regional Monitoring Coalition ongoing monitoring efforts, Pacific EcoRisk (PER) has been contracted to evaluate the toxicity of stormwater samples collected for the Contra Costa Clean Water Program (CCCWP). This evaluation consist of performing the following US EPA toxicity test:

• 10-day survival test with the freshwater amphipod *Hyalella azteca*.

This toxicity test was conducted on stormwater samples collected on March 26, 2014. In order to assess the sensitivity of the test organisms to toxic stress, a concurrent reference toxicant test was also performed. This report describes the performance and results of these tests.

2. TOXICITY TEST PROCEDURES

The method used in conducting testing with *H. azteca* followed a test protocol that is based on a modification of the US EPA guidelines, "Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated Contaminants with Freshwater Invertebrates" (EPA/600/R-99/064).

2.1 Sample Receipt and Handling

On March 26, ADH collected stormwater samples into appropriately-cleaned containers, which were transported, on ice and under chain-of-custody, to the PER testing laboratory in Fairfield, CA. Upon receipt at the testing laboratory, aliquots of each sample were collected for analysis of initial water quality characteristics (Table 1), with the remainder of each sample being stored at 0-6°C except when being used to prepare test solutions.

The chain-of-custody record for the collection and delivery of these stormwater samples is provided as Appendix A.

	Table 1. Initial water quality characteristics of the CCCWP stormwater samples.											
Date Sample Received	Sample ID	Temp (°C)	pН	D.O. (mg/L)	Alkalinity (mg/L)	Hardness (mg/L)	Conductivity (µS/cm)	Total Ammonia (mg/L N)				
3/26/14	207R00011US-W-02	5.3	7.79	10.0	72	108	425	<1.0				
3/26/14	207R00011DS-W-02	5.8	8.10	10.1	70	96	320	<1.0				

2.2 Survival Toxicity Testing of Stormwater Samples with Hyalella azteca

This test consists of exposing the amphipods to the stormwater samples for 10 days, after which effects on survival are evaluated. The specific procedures used in this testing are described below.

The *H. azteca* used in this testing were obtained from a commercial supplier (Chesapeake Cultures, VA). Upon receipt at the PER laboratory, the organisms were maintained at 23°C in aerated aquaria containing Standard Artificial Medium (SAM-5S) water (Borgmann 1996) prior to their use in this test. During this pre-test period, the organisms were fed the alga *Selenastrum capricornutum* and Yeast-Cerophyll®-Trout (YCT) food amended with *Spirulina*.

The Lab Control water for these tests consisted of SAM-5S water. The stormwater samples were tested at the 100% concentration only. "New" water quality characteristics (pH, D.O., and conductivity) were measured on the test solutions prior to use in these tests.

There were 5 replicates for each test treatment, each replicate consisting of a 250-mL glass beaker containing 100 mL of test solution. These tests were initiated by allocating ten 8-day old *H. azteca*, into each replicate, followed by the addition of 1.5 mL of *Spirulina* amended YCT. The replicate beakers were placed into a temperature-controlled room at 23°C, under cool-white fluorescent lighting on a 16L:8D photoperiod.

Each day of the tests, each replicate beaker was examined and the number of surviving organisms determined; 'old' water quality characteristics were measured in one randomly-selected beaker at each test treatment at this time. On Days 2, 4, 6, and 8 of the test, the organisms were fed 1.5 mL of *Spirulina* amended YCT in each test chamber.

On Day 5 of the 10-day tests, fresh test solutions were prepared and characterized, as before. Each replicate was examined, with any dead animals, uneaten food, wastes, and other detritus being removed. The number of live organisms in each replicate was determined and then approximately 80% of the test media in each beaker was carefully poured out and replaced with fresh test solution. "Old" water quality characteristics (pH, D.O., and conductivity) were measured on the old test solution that had been discarded from one randomly-selected replicate at each treatment.

After 10 days of exposure, the tests were terminated and the number of live organisms in each replicate was recorded. The resulting survival data were analyzed to evaluate any impairment due to the stormwater samples; all statistical analyses were performed using CETIS® statistical software (TidePool Scientific, McKinleyville, CA).

2.2.1 Reference Toxicant Testing of the Hyalella azteca

In order to assess the sensitivity of the H. azteca test organisms to toxic stress, a reference toxicant test was performed. The reference toxicant test was performed as a 96-hr waterborne exposure to Control water spiked with KCl at test concentrations of 0, 0.1, 0.2, 0.4, 0.8 and 1.6 g/L. The resulting survival data were statistically analyzed to determine key dose-response point estimates (e.g., EC50); all statistical analyses were made using the CETIS® software. This response endpoint was then compared to the 'typical response' range established by the mean \pm 2 SD of the point estimates generated by the 20 most recent previous reference toxicant tests performed by this lab.

3. RESULTS

3.1 Effects of the CCCWP Stormwater on Hyalella azteca

The results for these tests are summarized below in Table 2. There was complete mortality in both upstream (US) and downstream (DS) 207R00011 stormwater samples.

The test data and summary of statistical analyses for these tests are presented in Appendix B.

Table 2. Effects of CCCWP stormwater on <i>Hyalella azteca</i> .										
Test Initiation Date (Time)										
	Lab Control	98								
4/27/14 (1615)	207R00011US	0*								
	207R00011DS	0*								

^{*} The response at this test treatment was significantly less than the Lab Control treatment response at p < 0.05.

4. AQUATIC TOXICITY DATA QUALITY CONTROL

Four QC measures were assessed during the toxicity testing:

- Maintenance of acceptable test conditions;
- Negative Control testing;
- Positive Control (reference toxicant) testing; and
- Concentration Response Relationship assessment.

4.1 Maintenance of Acceptable Test Conditions

All test conditions (e.g., pH, D.O., temperature, etc.) were within acceptable limits for these tests. All analyses were performed according to laboratory Standard Operating Procedures.

4.2 Negative Control Testing

The responses at the Lab Control treatments were acceptable.

4.3 Positive Control Testing

4.3.1 Reference Toxicant Toxicity to Hyalella azteca

The results of this test are presented in Table 3. The EC50 for this test was consistent with the "typical response" range established by the reference toxicant test database for this species, indicating that these organisms were responding to toxic stress in a typical fashion.

The test data and summary of statistical analyses for this test are presented in Appendix C.

Table 3. Reference toxicant testing: Et	ffects of KCl on <i>Hyalella azteca</i> survival.							
KCl Treatment (g/L)	Mean% Survival							
Control	100							
0.1	100							
0.2	100							
0.4	40*							
0.8	0*							
1.6	0*							
Summary	of Statistics							
$EC_{50} = 0.37 \text{ g/L KCl}$								
"Typical response" range (mean ±2 SD)	0.26 – 0.66 g/L KCl							

^{*} The response at this test treatment was significantly less than the Lab Control treatment response at p < 0.05.

4.4 Concentration Response Relationships

The concentration-response relationship for the reference toxicant test was evaluated as per EPA guidelines (EPA-821-B-00-004), and determined to be acceptable.

5. SUMMARY & CONCLUSIONS

Toxicity of CCCWP Stormwater to Hyalella azteca

There was complete mortality in both upstream (US) and downstream (DS) 207R00011 stormwater samples.

Appendix A

Chain-of-Custody Record for the Collection and Delivery of the CCCWP Stormwater Samples



CHAIN-OF-CUSTODY RECORD

Pacific EcoRisk 2250 Cordelia Rd., Fairfield, CA 94534 (707) 207-7760 FAX (707) 207-7916

1				· · · — · ·													
	Client Name:									REQ	UES'	TED /	NAL	YSIS.			
	Client Address:	LA	017		f -					a	La Car						
		30	GS PR	onler	5+ se	Fle 101	E .	nia	es	llell	tece						
	Phone:			FAX:			astr	tapt	oha s	Hys iter)	a az						
	Project Manager:			t			le l	rioc	me	ival (wa	ielle ner						
	Project Name:	ecci	N 155	5 ID /	530. W	0/.0202	onic Selenastr capricornutum	10, 3	iic Pimep oromelas	Z S	Hyalella a						
	Project # / P.O. Number:		Marie -		•		Chronic Selenastrum capricornutum	Chronic Ceriodaphnia dubia	Chronic Pimephales promelas	10-day Survival <i>Hyalella</i> azteca (water)	10-day <i>Hyalella azteca</i> (sediment)						
	Client Sample ID	Sample	Sample	Sample	Co	ntainer	رة ا	흥	ပ်	p	0						
		Date	Time	Matrix*	Number	Туре]				l`						
1	2018001105-W-02		1,700	STRMW	10	1 gall. amber	 	ļ	ļ	X	<u> </u>						
3	207R000HU5-W-01	3-26-19	1240	STRING	1.0	Igal Andre	<u> </u>				ļ						
4	All the second s							<u> </u>			<u> </u>						
5		1					 	-									
6							 	 									-
7																	
8																	
9							<u> </u>										
10 12							<u> </u>										
12	Samples collected by:	L	L												310.00.00		
	Comments/Special Instruction				DELINOU	IOUED DV		47/6		D =0							
						ISHED BY:	7 0					D BY	:	0 /			
	Note - Fathead minnow testing standard EPA protocol (i.e., 4	reolicates	errormed 1	using the	Signature						atur	3 : ∕	2	my.			
	,	, 00,100,	•		Print: 4	1 1 1	318	GE	K.	Prin		JCl,	Cer	11 1	<i>flvl</i>	<u> </u>	
					Organizat				···			tion:	PE	<u> </u>	·····	7 3	
					Date: 국수		Tim	e: <i>lf, :</i>	60			126		/ T	ime:	166	20
						ISHED BY:						D BÝ	' :	······································			
					Signature	*					natur	e: 		***************************************			
					Print:					Prin							
					Organizat	tion:				 		tion:					
					Date:		Tim	e:		Date	e :			T	ime:		

^{*}Example Matrix Codes: (\underline{FW} = Freshwater); (\underline{SW} = Saltwater); (\underline{WW} = Wastewater); (\underline{STRMW} = Stormwater); (\underline{SED} = Sediment); or other

Appendix B

Test Data and Summary of Statistics for the Evaluation of the Toxicity of the CCCWP Stormwater Samples to Hyalella azteca

CETIS Summary Report

Report Date: 10 Apr-14 08:19 (p 1 of 1)
Test Code: ADH_0327_HA_C1 | 00-2342-2841

									Test Code:	: /	ADH_0327_	HA_C1 00)-2342-2841
Hyalella Surviva	al and	d Growth Test										Pacifi	c EcoRisk
		37-9939 ar-14 16:15	Test Type: Protocol:	Survival-G GCML	Frowth (1	0 day)			Analyst: Diluent:		ie Kalombo Applicable		
		г-14 08:30	Species:	Hyalelia a:	zteca				Brine:		Applicable		
_	9d 16		Source:	Chesapea		res, Inc.			Age: 8				
Sample Code		Sample ID	Samp	le Date	Receiv	e Date	Sample A	\ge	Client Name			Project	
ADH_0327_HA_	C1	20-7657-3526		ar-14 16:15	27 Mar-	14 16:15	NA (22.5	°C)	ADH Enviro	nmer	ntal, Inc.	19397	
207R00011US		09-8287-0810	26 Ma	ar-14 12:40	26 Mar-	-14 16:00	28h (5.3 °	C)	CCCWP				
207R00011DS		09-0740-7073	26 Ma	ar-14 14:00	26 Mar-	-14 16:00	26h (5.8 °	C)					
Sample Code		Material Type	Samp	le Source			Station L	ocatio	n		Latitude	Lon	gitude
ADH_0327_HA_	_C1	Lab Control	ADH I	Environmer	ntal, Inc.		LABQA						
207R00011US		Stormwater	ADH I	Environmer	ntal, Inc.		207R000	11US					
207R00011DS		Stormwater	ADH I	Environmer	ntal, Inc.		207R000	11DS					
Survival Rate S	umm	ary											
Sample Code		Cour	nt Mean	95%	LCL 9	5% UCL	Min	Max	Std	Err	Std Dev	CV%	%Effect
ADH_0327_HA_	_C1	5	0.98	0.963	3 0.	.997	0.9	1	0.02		0.0447	4.56%	0.0%
207R00011US		5	0	0	0		0	0	0		0		100.0%
207R00011DS		5	0	0	0		0	0	0		0		100.0%
Survival Rate D	etail												
Sample Code		Rep	1 Rep 2	Rep		ep 4	Rep 5						
ADH_0327_HA_	_C1	1	1	1	0.	.9	1						
207R00011US		0	0	0	0		0						
207R00011DS		0	0	0	0		0						
Survival Rate B	inom	ials											
Sample Code		Rep	1 Rep 2	Rep	3 R	ер 4	Rep 5						
ADH_0327_HA_	_C1	10/10	10/10	10/10	9/	/10	10/10				-		
207R00011US		0/10	0/10	0/10	0/	/10	0/10						
207R00011DS		0/10	0/10	0/10	0/	/10	0/10						

CETIS Analytical Report

Report Date:

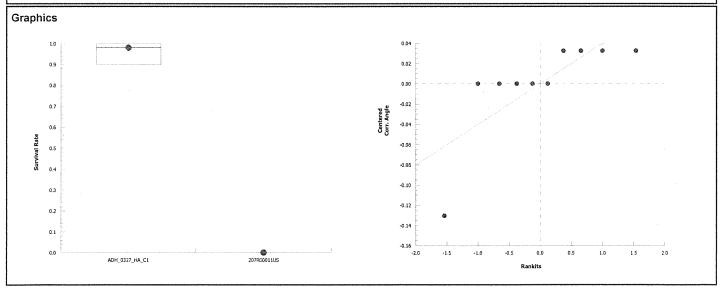
10 Apr-14 08:19 (p 1 of 2)

Test Code:

ADH_0327_HA_C1 | 00-2342-2841

Hyalella Survival a	nd Growth Test									Pacif	ic EcoRisk
	5696-1328 Apr-14 8:19		vival Rate parametric-	Two Sam	ple			S Version ial Results		.8.5	
Data Transform	Zeta	Alt Hyp	Trials	Seed			PMSD	Test Res	ult		
Angular (Corrected)	NA	C > T	NA	NA			4.3%				
Wilcoxon Rank Su	m Two-Sample T	est									
Sample Code vs	Sample Code	Test Stat	Critical	Ties D)F F	P-Value	P-Type	Decision	(α:5%)		
ADH_0327_HA_C1	207R00011US	15	NA	ع ٥	3 (0.0040	Exact	Significa	nt Effect		
ANOVA Table								•			
Source	Sum Squares	Mean Squ	are	DF	F	F Stat	P-Value	Decision	ι(α:5%)		
Between	3.724916	3.724916		1	-	1400	<0.0001	Significar	nt Effect		
Error	0.02124747	0.0026559	33	8							
Total	3.746164			9							
Distributional Test	5										
Attribute	Test		Test Stat	Critical	F	P-Value	Decision(α:1%)			
Variances	Mod Levene Eq	uality of Variance	1	13.7	(0.3559	Equal Var	iances			
Variances	Levene Equality	of Variance	7.11	11.3	(0.0285	Equal Var	iances			
Distribution	Shapiro-Wilk W	Normality	0.625	0.741	(0.0001	Non-norm	al Distribut	ion		
Survival Rate Sum	mary										
Sample Code	Cour	nt Mean	95% LCL	95% UC	LI	Median	Min	Max	Std Err	CV%	%Effect
ADH_0327_HA_C1	5	0.98	0.924	1	,	1	0.9	1	0.02	4.56%	0.0%
207R00011US	5	0	0	0	()	0	0	0		100.0%
	. =				-						

Angular (Corrected) Tran	sformed Sumr	nary								
Sample Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
ADH_0327_HA_C1	5	1.38	1.29	1.47	1.41	1.25	1.41	0.0326	5.28%	0.0%
207R00011US	5	0.159	0.159	0.159	0.159	0.159	0.159	0	0.0%	88.5%



10 Day Acute Hyalella azteca Toxicity Test Data

Client:		ADH / CCCWP	· · · · · · · · · · · · · · · · · · ·	Organism Log#:	8006	Age:	8 da US
Test Material:		207R00011US		Organism Supplier:	ABS		
Test ID#:	56062	Project #:	19397	Control/Diluent:	SA	M-5 Hyalella W	ater
Test Date:		3/27/14		Control Water Batch:		99	

Test Date.			1 <i>C 7 1</i>	DO (C1:		#1:	ua Organi	cm.c				
Treatment	Temp (°C)	new pl	old	D.O. (new	mg/L) old	Conductivity (μS/cm)	A	# LI B	ve Organi C	sms D	Е	SIGN-OFF		
Lab Control	<i>3</i> 9.5	7.70		8.2		411	10	10	10	10)0	Date 3		
100%	JJ:5	7.89		9.1		420	10	10	10	D	10	Test Solution Prep		
Meter ID	420	PH21		6007		Ee04						Initiation Time: 1015		
Lab Control	<i>72.5</i>				8.1		10	10	10	10	10	Date: 3/28/14		
	22.5				7.4		10	10	10	10		Count Time 1400 Count Signoff: 2		
Meter ID	434				2008		10	70	10			olawo: JG		
	22.7				7.9		10	A10	10	lo	10	Date: 3/29/14 Count Time: 1/40		
100%	22.7				7.3		9	5	4	5	4	Count Signoff M K Old WQ CJQ		
Meter ID	43A				8008							MK		
Lab Control	22.9				6.9		10	10	10	10	10	Date: 3/90/14 Count Time: 1/04		
100%	22.9				4.4		0	0	0	0	A	Count Signoff CP		
Meter ID	43A				2209									
Lab Control	23.1				0.7		10	10	10	10	10	Date: 3-31-14 Count Time: 1130 Count Signoff		
100%	23.17				_		_	-	-	-		Old WQ:		
Meter ID	43/A				12004							Date Life Life		
Lab Control	23.2	8.36	7.55	8.8	6.8	415	10	10	10	10	10	Sample ID:		
100%	_		-	_	_	_	_	_	_		_	Test Solution Prep		
Meter ID	43A	pH19	PH21	RD08	RDO 4	E006						Renewal Time 0930 Renewal Signoff 250		
												Old WQ: L e		
Lab Control	23.2				8.4		165	10	10	10	10	Date 4/2/4 Count Time 550 Count Signoff 4/1		
100%	_				_		_	_			-	Old WQ: 5		
Meter ID	434				2004									
Lab Control	23.2				5.4		10	10	10	10	10	Date 43/14 Count Time 09/5 Count Signoff		
100%					_		_	_				Count Signoff (2)		
Meter 1D	434				R008							Date: 4 1 1 1 1 4		
Lab Control	23.2				8.0		10	10	10	10	10	Count Time 322 Count Signoff 7		
100%					~		~	-		411111111111		Old WQ: DS		
Meter ID	43A				3009							Date 4/5/14		
Lab Control	23.3				3404		10	10	10	9	10	Count Time 10.25 Count Signoff: Le		
100%							_	-			**********	old WQ		
Meter ID	43A				ROOR							Date 4/2/14		
Lab Control	23.3		7.54		5.4	473	10	10	10	9	10	Termination Time 0830 Termination Signoff		
100%	_		_				-	-		-	-	old wo: 60		
Meter ID	43A		PH19		Ruoq	EC08								

CETIS Analytical Report

Report Date:

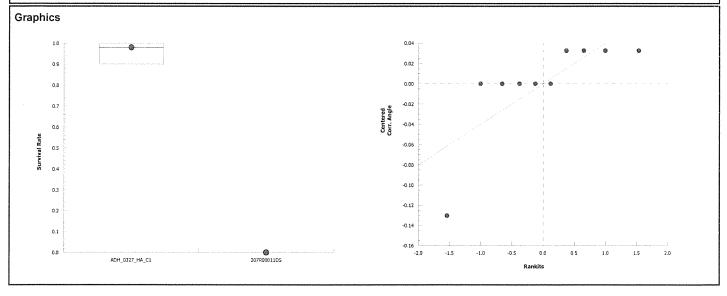
10 Apr-14 08:19 (p 2 of 2)

Test Code: ADH

ADH_0327_HA_C1 | 00-2342-2841

Hyalella Survival a	nd Growth Test								Paci	fic EcoRisl
	8870-9117 Apr-14 8:19		vival Rate parametric-	Two Sampl	9		S Version: ial Results	CETISv1 : Yes	.8.5	
Data Transform	Zeta	Alt Hyp	Trials	Seed		PMSD	Test Resu	ılt		
Angular (Corrected)	NA	C > T	NA	NA		4.3%				
Wilcoxon Rank Su	m Two-Sample T	est								
Sample Code vs	Sample Code	Test Stat	Critical	Ties DF	P-Value	P-Type	Decision(α:5%)		
ADH_0327_HA_C1	207R00011DS	15	NA	0 8	0.0040	Exact	Significan	t Effect		
ANOVA Table							······································			
Source	Sum Squares	Mean Squ	are	DF	F Stat	P-Value	Decision(α:5%)		
Between	3.724916	3.724916		1	1400	<0.0001	Significan	t Effect		······
Error	0.02124747	0.0026559	33	8						
Total	3.746164			9	ana ata					
Distributional Test	S									
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:1%)			
Variances	Mod Levene Eq	uality of Variance	1	13.7	0.3559	Equal Var	iances			
Variances	Levene Equality	of Variance	7.11	11.3	0.0285	Equal Var	iances			
Distribution	Shapiro-Wilk W	Normality	0.625	0.741	0.0001	Non-norm	al Distributio	on		
Survival Rate Sum	mary									
Sample Code	Cour	nt Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
ADH_0327_HA_C1	5	0.98	0.924	1	1	0.9	1	0.02	4.56%	0.0%
207R00011DS	5	0	0	0	0	0	0	0		100.0%

Angular (Corrected) Transformed Summary												
Sample Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect		
ADH_0327_HA_C1	5	1.38	1.29	1.47	1.41	1.25	1.41	0.0326	5.28%	0.0%		
207R00011DS	5	0.159	0.159	0.159	0.159	0.159	0.159	0	0.0%	88.5%		



10 Day Acute Hyalella azteca Toxicity Test Data

Client:		ADH / CCCWF		Organism Log#:	\$066 Age:	8 days
Test Material:		207R00011DS		Organism Supplier:	ABS	•
Test ID#:	56063	Project #:	19397	Control/Diluent:	SAM-5 Hyale	lia Water
Test Date:	3/2	27/14		Control Water Batch:	99	

Test Date.		3/2/									•	
Treatment	Temp (°C)	new pl	H old	D.O. (new	mg/L) old	Conductivity (µS/cm)	A	# Li B	ve Organi C	sms D	E	SIGN-OFF
Lab Control	22.5	7.76		8.2		411	16	O	10	10	10	Date 3/27/14 Sample D 34567
100%	æ3.5	7.95		9.6		319	lo	10	10	01	0	Test Solution Preparation New WQ:
Meter ID	ЦЗА	PHZ(RD07		EC04						Initiation Time: 1615 Initiation Signoff.
Lab Control	22.5				8-1		10	10	10	10	10	Date: 3/28/14
100%	22.5				7.3		10	10	10	10	10	Count Signoff: 2
Meter ID	439				POOB							
Lab Control	22.7				7.9		10	10	10	10	10	Date 3/29/14 Count Time 1(40
100%	22.7				7.3		10	8	9	10		Count Signoff AAL
Meter ID	43A				₽D0}							ON WO C3G
Lab Control	22.9				6.9		10	10	10	10	10	Date: 3/30//4 Count Time: 1/00
100%	22.9				7.0		0	0	0	٥	0	Count Signoff C
Meter ID	436FA				F209							
Lab Control	23.1				F.D		10	0	10	20	0	Date 3-31-14 Count Time 1130
100%	~						_	_			1	Count Signoff Old WQ
Meter ID	43A				2004							Feed:
Lab Control	23.2	8.36	7.55	8.8	6.8	415	10	lo	10	lo	10	Date Sample ID:
100%	_	_	_	*					_		_	Test Solution Prep
Meter ID	43A	P419	OHZI	R 708	epoy	Ecolo						Renewal Time 0930 Renewal Signoff こてり
												Old WQ: L
Lab Control	33. Q				8.4		10	10	10	10	10	Date 4/2/14 Count Time \$\$6 Count Signoff
100%	_						_			1000	_	Count Signoff
Meter ID	434				12004							Old WQ
Lab Control	23.9				5.4		10	10	10	(0)	10	Date 413/14 Count Time #15
100%	_				_		_	_				Count Signoff (7)
Meter ID	434				RDO8							
Lab Control	23.2				8.0		10	10	10	10	10	Count Time 1322
100%	_						_					Count Signoff 2
Meter ID	45/				inoc,							Feed.
Lab Control	23.3				3.9		10	10	10	9	10	Date 4/5/14 Count Time 1025
100%	-				colina-		_	_			, and the same	Count Signoff: L
Meter ID	434				ROOT							
Lab Control	23.3		7.54		5.4	473	10	10	10	9	10	Date: 4/6/14 Termination Time: 0830
100%	-		_			_	_	_	_	_		Termination Signoff Co
Meter ID	43 A		PH19		POOR	Ecob						

Appendix C

Test Data and Summary of Statistics for the Reference Toxicant Evaluation of the *Hyalella azteca*

CETIS Summary Report

Report Date:

02 Apr-14 11:17 (p 1 of 1)

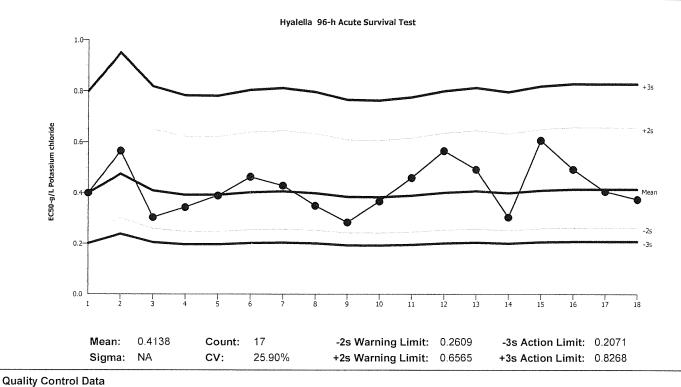
Test Code:

56010 | 08-8207-4257

												0-0201-423
Hyalella 96-	h Acute Survival	Test									Pacit	ic EcoRisi
Batch ID:	02-2070-1586		Test Type:	Survival (96h)				Analyst:	Stev	ri Vasquez		
Start Date:	27 Mar-14 13:0	0	Protocol:	EPA-821-R-02	-012 (2002)			Diluent:	SAN	1-5S		
Ending Date	: 31 Mar-14 13:4	5	Species:	Hyalella azteca	1			Brine:	Not.	Applicable		
Duration:	4d 1h		Source:	Aquatic Biosys	tems, CO			Age:	8	• •		
Sample ID:	13-5495-2751		Code:	KCI				Client:	Refe	erence Toxi	cant	
· -	: 27 Mar-14 13:0	0	Material:	Potassium chlo	oride			Project:	2224			
	e: 27 Mar-14 13:0		Source:	Reference Tox								
Sample Age:	NA (23 °C)		Station:	In House								
Comparison	Summary											
Analysis ID	Endpoint		NOEL	LOEL	TOEL	PMSD	TU	Meth	nod			
	96h Survival Ra	ite	0.2	0.4	0.2828	NA				act/Bonferro	ni-Holm Te	st
Point Estima	te Summary											
Analysis ID	Endpoint		Level	g/L	95% LCL	95% UCL	TU	Meth	od			
13-7765-3936	96h Survival Ra	te	EC50	0.373	0.301	0.463				-Kärber	1./1.1.1	
96h Survival	Rate Summary											
C-g/L	Control Type	Count	t Mean	95% LCL	95% UCL	Min	Max	Std E	≣rr	Std Dev	CV%	%Effect
0	Lab Water Contr	10	1	1	1	1	1	0		0	0.0%	0.0%
0.1		10	1	1	1	1	1	0		0	0.0%	0.0%
0.2		10	1	1	1	1	1	0		0	0.0%	0.0%
0.4		10	0.4	0.207	0.593	0	1	0.163	3	0.516	129.0%	60.0%
8.0		10	0	0	0	0	0	0		0		100.0%
1.6		10	0	0	0	0	0	0		0		100.0%
96h Survival	Rate Detail							***************************************				
C-g/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep	6 Rep	7	Rep 8	Rep 9	Rep 10
0	Lab Water Contr	1	1	1	1	1	1	1		1	1	1
0.1		1	1	1	1	1	1	1		1	1	1
												1
0.2		1	1	1	1	1	1	1		1	1	
		1 1	1 0	1 0	1 1	1 0	1 1	1 0		0	1 0	1
0.2 0.4 0.8		1 1 0	•	1 0 0	1 1 0	•	•				•	1
0.4		1 1 0 0	0		•	0	1	0		0	0	
0.4 0.8 1.6	Rate Binomials		0	0	0	0	1	0	the Market	0	0	1
0.4 0.8 1.6 96h Surviva l I C-g/L	Control Type	0 Rep 1	0	0	0	0	1	0 0	7	0	0	1
0.4 0.8 1.6 96h Survival I C-g/L		0 Rep 1	0	0	0 0	0	1 0 0	0 0	7	0 0	0 0 0	1 0 0
0.4 0.8 1.6 96h Survival I C-g/L 0	Control Type	0 Rep 1	0 0 0 Rep 2	0 0 Rep 3	0 0 Rep 4	0 0 0 0	1 0 0 Rep	0 0 0 0	7	0 0 0 Rep 8	0 0 0 0	1 0 0 0 Rep 10
0.4 0.8 1.6 96h Survival C-g/L 0 0.1	Control Type	0 Rep 1	0 0 0 0 Rep 2	0 0 Rep 3	0 0 Rep 4	0 0 0 0 Rep 5	1 0 0 Rep 0	0 0 0 0 0 Rep 1/1	7	0 0 0 Rep 8	0 0 0 0 Rep 9	1 0 0 Rep 10 1/1 1/1
0.4 0.8 1.6 96h Survival I C-g/L 0 0.1	Control Type	Rep 1 1/1 1/1	0 0 0 0 Rep 2 1/1	0 0 Rep 3 1/1 1/1	0 0 Rep 4 1/1 1/1	0 0 0 0 0	1 0 0 Rep 0 1/1 1/1	0 0 0 0 0 1/1 1/1 1/1	7	0 0 0 Rep 8 1/1 1/1	0 0 0 Rep 9 1/1 1/1	1 0 0 1/1 1/1 1/1
0.4 0.8 1.6	Control Type	Rep 1 1/1 1/1 1/1	0 0 0 0 Rep 2 1/1 1/1	0 0 Rep 3 1/1 1/1 1/1	0 0 Rep 4 1/1 1/1	0 0 0 0 Rep 5	1 0 0 1/1 1/1 1/1	0 0 0 0 0 86 Rep 1 1/1 1/1	7	0 0 0 Rep 8 1/1 1/1	0 0 0 Rep 9 1/1 1/1	1 0 0 Rep 10 1/1 1/1

Hyalella 96-h Acute Survival Test Pacific EcoRisk

Test Type:Survival (96h)Organism:Hyalella azteca (Freshwater AmphipoMaterial:Potassium chlorideProtocol:EPA-821-R-02-012 (2002)Endpoint:96h Survival RateSource:Reference Toxicant-REF

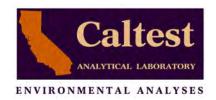


	•										
Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2013	Nov	6	15:40	0.4	-0.01383	-0.1473			15-7026-7439	19-7036-5835
2			20	17:00	0.5657	0.1519	1.355			01-7958-1543	09-3590-7589
3			21	16:55	0.3031	-0.1107	-1.349			17-4328-3485	11-7628-5959
4		Dec	11	17:45	0.3429	-0.07096	-0.8154			06-4892-3798	02-7681-8091
5	2014	Jan	22	15:30	0.3887	-0.02511	-0.2713			15-1323-9580	12-5039-1906
6			23	12:20	0.4634	0.0496	0.4907			12-4927-8114	03-4534-5077
7			24	13:50	0.4287	0.01488	0.1531			04-8256-1553	14-6784-2933
8			29	12:45	0.3482	-0.06561	-0.7482			02-0910-9206	20-3009-8021
9			30	13:00	0.2828	-0.131	-1.65			07-7453-2234	19-6136-6595
10			31	15:00	0.3651	-0.0487	-0.5427			07-3562-2451	09-8419-3354
11		Feb	4	16:00	0.4595	0.04565	0.4536			07-2556-9878	06-3437-8862
12			7	17:40	0.5657	0.1519	1.355			12-2780-2249	04-4756-7462
13			15	17:00	0.4925	0.07863	0.754			20-0080-3088	01-2359-2306
14			20	15:45	0.3031	-0.1107	-1.349			05-7047-7703	05-1521-5106
15			27	18:10	0.6063	0.1925	1.655			00-8786-3488	13-6064-7851
16			28	18:20	0.4925	0.07863	0.754			17-7114-0796	13-7617-1964
17		Mar	1	17:30	0.4048	-0.009021	-0.09554			13-0688-9437	00-6627-1218
18			27	13:00	0.3732	-0.04062	-0.4478			08-8207-4257	13-7765-3936

96 Hour *Hyalella azteca* Reference Toxicant Test Data

Client:	Re	ference Toxicar	nt	Organism Log #: _	8066	Age:	8days
Test Material:	Pot	assium Chloric	le	Organism Supplier: _		ABS	S
Project #_	22246	Test ID#:	N-22246-56010	Control/Diluent:		SAM	-5
Test Date:	3/27/14 1	Randomization:	10.6-13	Control Water Batch:	97		
Feeding To	Time: 1300	lnitials:	m	Feeding T46Time:	1245	Initials:	μ~

0.1	Temp (°C) 23.0	рН 7.93	D.O. (mg/L)	Conductivity (µS/cm)		r		#	Live	Anima	als				
Control 7 0.1 0.2	23.0		(mg/L)	(μS/cm)	1 .				·						Sign-off
0.1		792			Α	В	С	D	Е	F	G	Н	I	J	•
0.2	23.0	1.12	8.8	419	1	1	1	1	ı	1	l	1	ı	1	Test Solution Prep:
		7.93	8.9	671	١	1	1	1	l	١	١	١	1	l	New WQ: COD
0.4	23.0	7.94	9.0	810	1	١	١	١	ı	l	1	ı	1	1	Initiation Date: 3/27/14 Initiation Time: 1300
	23.0	7.94	9.2	1143	(1	١	1	1	1	1	1	1	1	Initiation Time: 1300
0.8	23.0	7.96	9.4	1875	1	1	ı	1	ı	ı	1	1	ı	١	Initiation Signoff: ACRT Batch #: [4
1.6	23.0	7.86	9.8	3310	1	1	(1	1	1	1	1	1	1	RT Batch #: 4
Meter ID 💪	84A	PH21	RDO9	EC06											
	23.2				ı	1	١	١	1	1	1	١	1	(Count Date: 3/28/14
0.1	23.2				ı	1	ı	1	ı	-	1	1	1	1	Count Time: 1145
0.2	23.2				1	ı	1	1	١	ı	١	١	1		Count Signoff: MM
0.4	23.2				ı	ı	١	١	ı	1	1	١	1	1	
0.8	23.2				0	O	Ò	O	1	0	٥	٥	0	0	
1.6	23.2				0	0	0	0	0	0	0	0	0	0	
Meter ID	84A														
Control 2	23.1				1	1	1	١	1	1	1	1	1	١	Count Time: 1245
0.1	23.1				ì	١	١	1	١	١	١	١	ì	1	Count Time: 1245
0.2	23.1				ı	١	١	ì	١	ı	1	1	1	1	Count Signoff: Au-
0.4	23.1				1	0	0	ı	1	1)	0	ī	1	
0.8	23.1				1	-	_	-	0		~	_	-	<u> </u>	
1.6	23.1				-	-	-	-	-	-	_	_	-	-	
Meter ID	84A														
Control 2	22.8				1	1	1	1	1	1	1	J	(1	Count Date: 3/30/14
	22.8				1		l	,	ſ	7	1	,	1	8	Count Time: 10 00
	22.8				1	1	1	J	1	1	1	1	l	1	Count Signoff: CP
·····	22.8				1	-	_	1	۵	ī	1	_	0	1	
	22.8				_			_	-	-	_	_	-	_	
1.6	22.8				-	-	_	-	_	-	-	_	_	_	
Meter ID	84 A														
	23.2	7.65	8.5	441	1	1	1	1	1)))))	Termination Date:
	23.2	7.70	8.4	703	1	1	ı	1	1	1	1	ī	i	7	Termination Time: 1345
	23.2	7.70	8.9	843	Ì	1	1	1	1	i	i		1	\Box	Termination Signoff:
	23.2	7.71	8.9	1167	i	_	-	1	-	1	0	<u> </u>	-	$\dot{7}$	Termination Time: 1345 Termination Signoff: MOId WQ: LS
0.8	-	7.76	8.6	1919	1	-	-	_			_	_	-		
1.6	_	7.73	8.5	3260		_	_	_	_	_	_			₹	
	34A	PHZI	RDO9	EC 06											





Tuesday, September 30, 2014

Alessandro Hnatt ADH Environmental 3065 Porter Street, Suite 101 Soquel, CA 95073

Re Lab Order: P070867

Project ID: CCCWP-SSID SEDIMENTS PO/Contract #: 030.001.0202

Dear Alessandro Hnatt:

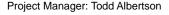
Enclosed are the analytical results for sample(s) received by the laboratory on Tuesday, July 22, 2014. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

Collected By:

KEVIN LEWIS

If you have any questions concerning this report, please feel free to contact me.

Enclosures





9/30/2014 12:36





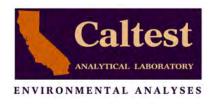
SAMPLE SUMMARY

Lab Order: P070867

Project ID: CCCWP-SSID SEDIMENTS

Lab ID	Sample ID	Matrix	Date Collected	Date Received
P070867001	544MSH065	Solid	07/22/2014 11:45	07/22/2014 17:54
P070867002	544MSH062	Solid	07/22/2014 10:15	07/22/2014 17:54
P070867003	207WAL078	Solid	07/22/2014 14:45	07/22/2014 17:54
P070867004	207WAL060	Solid	07/22/2014 11:45	07/22/2014 17:54
P070867005	544MSH065	Solid	07/22/2014 11:45	07/22/2014 17:54
P070867006	544MSH062	Solid	07/22/2014 10:15	07/22/2014 17:54
P070867007	207WAL078	Solid	07/22/2014 14:45	07/22/2014 17:54
P070867008	207WAL060	Solid	07/22/2014 11:45	07/22/2014 17:54

9/30/2014 12:36





NARRATIVE

Lab Order: P070867

Project ID: CCCWP-SSID SEDIMENTS

General Qualifiers and Notes

Caltest authorizes this report to be reproduced only in its entirety. Results are specific to the sample(s) as submitted and only to the parameter(s) reported.

Caltest certifies that all test results for wastewater and hazardous waste analyses meet all applicable NELAC requirements; all microbiology and drinking water testing meet applicable ELAP requirements, unless stated otherwise.

All analyses performed by EPA Methods or Standard Methods (SM) 20th Edition except where noted (SMOL=online edition).

Caltest collects samples in compliance with 40 CFR, EPA Methods, Cal. Title 22, and Standard Methods.

Dilution Factors (DF) reported greater than '1' have been used to adjust the result, Reporting Limit (RL), and Method Detection Limit (MDL).

All Solid, sludge, and/or biosolids data is reported in Wet Weight, unless otherwise specified.

Filtrations performed at Caltest for dissolved metals (excluding mercury) and/or pH analysis are not performed within the 15 minute holding time as specified by 40CFR 136.3 table II.

Results Qualifiers: Report fields may contain codes and non-numeric data correlating to one or more of the following definitions:

ND - Non Detect - indicates analytical result has not been detected.

RL - Reporting Limit is the quantitation limit at which the laboratory is able to detect an analyte. An analyte not detected at or above the RL is reported as ND unless otherwise noted or qualified. For analyses pertaining to the State Implementation Plan of the California Toxics Rule, the Caltest Reporting Limit (RL) is equivalent to the Minimum Level (ML). A standard is always run at or below the ML. Where Reporting Limits are elevated due to dilution, the ML calibration criteria has been met.

- J reflects estimated analytical result value detected below the Reporting Limit (RL) and above the Method Detection Limit (MDL). The 'J' flag is equivalent to the DNQ Estimated Concentration flag.
- E indicates an estimated analytical result value.
- B indicates the analyte has been detected in the blank associated with the sample.
- NC means not able to be calculated for RPD or Spike Recoveries.
- SS compound is a Surrogate Spike used per laboratory quality assurance manual.

NOTE: This document represents a complete Analytical Report for the samples referenced herein and should be retained as a permanent record thereof.

Workorder Notes

Revised to include complete list of 8081 compounds for sample P070867004.

Qualifiers and Compound Notes

- 1 Analyte(s) reported as 'ND' means not detected at or above the listed Method Detection Limits (MDL).
- 2 This sample was analyzed following Florisil column cleanup (EPA Method 3620B).
- 3 Due to severe matrix interferences this compounds result should be considered an estimated value. The sample was run at a 2X and 5X dilution with similar results.
- 4 Due to matrix interferences present in the sample, surrogate recoveries failed to meet the QA/QC acceptance criteria.
- 5 Analysis performed past regulatory holding time per client authorization.
- Due to severe matrix interferences all results should be considered estimated values. The sample was run at a 2X and 5X dilution with similar results.

9/30/2014 12:36

REPORT OF LABORATORY ANALYSIS

Page 3 of 18







Project ID: CCCWP-SSID SEDIMENTS

Qualifiers and Compound Notes

P070867

Lab Order:

Sample diluted to bring concentration of target analyte(s) within the working range of the instrument, resulting in increased reporting limits.



9/30/2014 12:36





Lab Order: P070867

Project ID: CCCWP-SSID SEDIMENTS
Solid results are reported on a dry weight basis.

 Lab ID
 P070867001
 Date Collected
 7/22/2014 11:45
 Matrix
 Solid

Sample ID 544MSH065 Date Received 7/22/2014 17:54 Results are expressed as dry weight values

Sample ID 544MSH065	Date Receiv	/ed 7/22/	2014 17:54	Results	s are express	ed as dry weight va	alues	
Parameters	Result Units	R. L.	MDL	DF Prepared	Batch	Analyzed	Batch	Qual
Chlorinated Pesticides Analysis	Prep Method:		46 3541	Prep by:	EAB	A maluma d luur	MDT	
Aldria	Analytical Meth		46 8081	1.07/20/14.00:00	CDD CEEC	Analyzed by:		0.4
Aldrin	ND mg/kg	0.0022	0.00097	1 07/30/14 00:00		08/14/14 18:56		2,1
alpha-BHC	ND mg/kg	0.0022	0.00097	1 07/30/14 00:00		08/14/14 18:56		
beta-BHC	ND mg/kg	0.0022	0.00097	1 07/30/14 00:00		08/14/14 18:56		
delta-BHC	ND mg/kg	0.0022	0.00076	1 07/30/14 00:00		08/14/14 18:56		
gamma-BHC (Lindane)	ND mg/kg	0.0022	0.00076	1 07/30/14 00:00		08/14/14 18:56		
alpha-Chlordane (cis)	ND mg/kg	0.0060	0.0011	1 07/30/14 00:00		08/14/14 18:56		
Chlordane	ND mg/kg	0.0043	0.0032	1 07/30/14 00:00		08/14/14 18:56		
gamma-Chlordane (trans)	ND mg/kg	0.0060	0.0011	1 07/30/14 00:00		08/14/14 18:56		
2,4'-DDD	0.012 mg/kg	0.0050	0.0022	1 07/30/14 00:00		08/11/14 17:59		
2,4'-DDE	0.0058 mg/kg	0.0050	0.0022	1 07/30/14 00:00		08/11/14 17:59		
2,4'-DDT	ND mg/kg	0.0050	0.0022	1 07/30/14 00:00		08/11/14 17:59		
4,4'-DDD	0.0036 mg/kg	0.0022	0.00086	1 07/30/14 00:00		08/14/14 18:56		
4,4'-DDE	0.028 mg/kg	0.0022	0.0013	1 07/30/14 00:00		08/14/14 18:56		
4,4'-DDT	ND mg/kg	0.0022	0.0011	1 07/30/14 00:00		08/14/14 18:56		
Dieldrin	ND mg/kg	0.0022	0.0013	1 07/30/14 00:00		08/14/14 18:56		
Endosulfan I	ND mg/kg	0.0022	0.00097	1 07/30/14 00:00		08/14/14 18:56		
Endosulfan II	ND mg/kg	0.0022	0.00076	1 07/30/14 00:00	SPR 6556	08/14/14 18:56	SEC 2174	
Endosulfan sulfate	ND mg/kg	0.0022	0.00097	1 07/30/14 00:00	SPR 6556	08/14/14 18:56	SEC 2174	
Endrin	ND mg/kg	0.0022	0.0011	1 07/30/14 00:00	SPR 6556	08/14/14 18:56	SEC 2174	
Endrin aldehyde	ND mg/kg	0.0022	0.00097	1 07/30/14 00:00	SPR 6556	08/14/14 18:56	SEC 2174	
Endrin ketone	ND mg/kg	0.0022	0.00097	1 07/30/14 00:00	SPR 6556	08/14/14 18:56	SEC 2174	
Heptachlor	ND mg/kg	0.0022	0.00065	1 07/30/14 00:00	SPR 6556	08/14/14 18:56	SEC 2174	
Heptachlor epoxide	ND mg/kg	0.0022	0.0012	1 07/30/14 00:00	SPR 6556	08/14/14 18:56	SEC 2174	
Kepone	ND mg/kg	0.03	0.0097	1 08/19/14 00:00	SPR 6584	09/05/14 05:46	SEC 2176	5
Methoxychlor	ND mg/kg	0.0022	0.00097	1 07/30/14 00:00	SPR 6556	08/14/14 18:56	SEC 2174	
Mirex	ND mg/kg	0.022	0.00054	1 07/30/14 00:00	SPR 6556	08/14/14 18:56	SEC 2174	
Toxaphene	ND mg/kg	0.04	0.022	1 07/30/14 00:00	SPR 6556	08/14/14 18:56	SEC 2174	
Decachlorobiphenyl (SS)	2.9 %	10-200		1 08/19/14 00:00	SPR 6584	09/05/14 05:46	SEC 2176	4
Decachlorobiphenyl (SS)	4.9 %	10-200		1 07/30/14 00:00	SPR 6556	08/14/14 18:56	SEC 2174	4
Tetrachloro-m-xylene (SS)	65 %	10-200		1 08/19/14 00:00	SPR 6584	09/05/14 05:46	SEC 2176	
Tetrachloro-m-xylene (SS)	43 %	10-200		1 07/30/14 00:00	SPR 6556	08/14/14 18:56		
Pyrethroids+Fipronil Analysis,NCI,Solid	Prep Method:	SW8	46 3540C Soxhle	t Prep by:	EAB			
• • •	Analytical Meth	od: SW8	46 8270 Mod			Analyzed by:	RLH	
Allethrin	ND ug/kg	0.33	0.054	1 07/29/14 00:00	SPR 6555	08/08/14 01:58	SMS 3515	1
Bifenthrin	99 ug/kg	0.33	0.11	1 07/29/14 00:00	SPR 6555	08/08/14 01:58	SMS 3515	3
Cyfluthrin	6.2 ug/kg	0.33	0.12	1 07/29/14 00:00		08/08/14 01:58		
Lambda-Cyhalothrin	0.37 ug/kg	0.33	0.065	1 07/29/14 00:00		08/08/14 01:58		3
Cypermethrin	J0.30 ug/kg	0.33	0.11	1 07/29/14 00:00		08/08/14 01:58		
Deltamethrin:Tralomethrin	ND ug/kg	0.33	0.13	1 07/29/14 00:00		08/08/14 01:58		
Esfenvalerate:Fenvalerate	ND ug/kg	0.33	0.14	1 07/29/14 00:00		08/08/14 01:58		
Fenpropathrin	ND ug/kg	0.33	0.076	1 07/29/14 00:00		08/08/14 01:58		
Fipronil	ND ug/kg	0.33	0.11	1 07/29/14 00:00		08/08/14 01:58		
	~5,1.9	3.00	V.11	=	3 0000	55, 55, 1151.00	55 00 10	

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REPORT OF LABORATORY ANALYSIS

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Lab Order: P070867

CCCWP-SSID SEDIMENTS Project ID: Solid results are reported on a dry weight basis.

Lab ID P070867001 Sample ID 544MSH065	Date Collected Date Received		/22/2014 11:45 /22/2014 17:54	Matrix Solid Results are expressed as dry weight values						
Parameters	Result Units	R. L	MDL	DF Prepared	Batch	Analyzed	Batch	Qual		
Fipronil Desulfinyl	0.56 ug/kg	0.33	3 0.11	1 07/29/14 00:00	SPR 6555	08/08/14 01:58	SMS 3515	3		
Fipronil Sulfide	ND ug/kg	0.33	3 0.11	1 07/29/14 00:00	SPR 6555	08/08/14 01:58	SMS 3515			
Fipronil Sulfone	3.0 ug/kg	0.33	3 0.11	1 07/29/14 00:00	SPR 6555	08/08/14 01:58	SMS 3515	3		
Tau-Fluvalinate	ND ug/kg	0.33	3 0.043	1 07/29/14 00:00	SPR 6555	08/08/14 01:58	SMS 3515			
Permethrin	6.0 ug/kg	0.33	3 0.12	1 07/29/14 00:00	SPR 6555	08/08/14 01:58	SMS 3515	3		
Tetramethrin	ND ug/kg	0.33	3 0.065	1 07/29/14 00:00	SPR 6555	08/08/14 01:58	SMS 3515			
Esfenvalerate-d6;#1 (SS)	• •	70-130)	1 07/29/14 00:00	SPR 6555	08/08/14 01:58	SMS 3515			
Esfenvalerate-d6;#2 (SS)	102 %	70-130)	1 07/29/14 00:00	SPR 6555	08/08/14 01:58	SMS 3515			
Dried Sediment as Extracted	Analytical Method	l: S	M20-2540 G			Analyzed by:	CFG			
Solids, Percent	92 %	0.	1 0.1	1		07/30/14 14:18	WGR 5525			
Lab ID P070867002	Date Collected	l 7/	22/2014 10:15	Matrix	Solid					
Sample ID 544MSH062	Date Received	l 7/	22/2014 17:54	Results	are express	ed as dry weight va	alues			

Parameters	Result Units	R. L.	MDL	DF Prepared	Batch	Analyzed	Batch	Qual
Chlorinated Pesticides Analysis	Prep Method:	SW8	46 3541	Prep by:	EAB		_	
	Analytical Meth	od: SW8	46 8081			Analyzed by:	MDT	
Aldrin	ND mg/kg	0.0021	0.00094	1 07/30/14 00:00	SPR 6556	08/11/14 18:20	SEC 2174	2,1
alpha-BHC	ND mg/kg	0.0021	0.00094	1 07/30/14 00:00	SPR 6556	08/11/14 18:20	SEC 2174	
beta-BHC	ND mg/kg	0.0021	0.00094	1 07/30/14 00:00	SPR 6556	08/11/14 18:20	SEC 2174	
delta-BHC	ND mg/kg	0.0021	0.00073	1 07/30/14 00:00	SPR 6556	08/11/14 18:20	SEC 2174	
gamma-BHC (Lindane)	ND mg/kg	0.0021	0.00073	1 07/30/14 00:00	SPR 6556	08/11/14 18:20	SEC 2174	
alpha-Chlordane (cis)	ND mg/kg	0.0060	0.0010	1 07/30/14 00:00	SPR 6556	08/11/14 18:20	SEC 2174	
Chlordane	ND mg/kg	0.0042	0.0031	1 07/30/14 00:00	SPR 6556	08/11/14 18:20	SEC 2174	
gamma-Chlordane (trans)	ND mg/kg	0.0060	0.0010	1 07/30/14 00:00	SPR 6556	08/11/14 18:20	SEC 2174	
2,4'-DDD	0.034 mg/kg	0.0050	0.0021	1 07/30/14 00:00	SPR 6556	08/11/14 18:20	SEC 2174	
2,4'-DDE	0.019 mg/kg	0.0050	0.0021	1 07/30/14 00:00	SPR 6556	08/11/14 18:20	SEC 2174	
2,4'-DDT	ND mg/kg	0.0050	0.0021	1 07/30/14 00:00	SPR 6556	08/11/14 18:20	SEC 2174	
4,4'-DDD	0.023 mg/kg	0.0021	0.00084	1 07/30/14 00:00	SPR 6556	08/11/14 18:20	SEC 2174	
4,4'-DDE	0.076 mg/kg	0.010	0.0063	5 07/30/14 00:00	SPR 6556	08/14/14 20:49	SEC 2174	7
4,4'-DDT	ND mg/kg	0.0021	0.0010	1 07/30/14 00:00	SPR 6556	08/11/14 18:20	SEC 2174	
Dieldrin	ND mg/kg	0.0021	0.0013	1 07/30/14 00:00	SPR 6556	08/11/14 18:20	SEC 2174	
Endosulfan I	ND mg/kg	0.0021	0.00094	1 07/30/14 00:00	SPR 6556	08/11/14 18:20	SEC 2174	
Endosulfan II	ND mg/kg	0.0021	0.00073	1 07/30/14 00:00	SPR 6556	08/11/14 18:20	SEC 2174	
Endosulfan sulfate	ND mg/kg	0.0021	0.00094	1 07/30/14 00:00	SPR 6556	08/11/14 18:20	SEC 2174	
Endrin	ND mg/kg	0.0021	0.0010	1 07/30/14 00:00	SPR 6556	08/11/14 18:20	SEC 2174	
Endrin aldehyde	ND mg/kg	0.0021	0.00094	1 07/30/14 00:00	SPR 6556	08/11/14 18:20	SEC 2174	
Endrin ketone	ND mg/kg	0.0021	0.00094	1 07/30/14 00:00	SPR 6556	08/11/14 18:20	SEC 2174	
Heptachlor	ND mg/kg	0.0021	0.00063	1 07/30/14 00:00	SPR 6556	08/11/14 18:20	SEC 2174	
Heptachlor epoxide	ND mg/kg	0.0021	0.0012	1 07/30/14 00:00	SPR 6556	08/11/14 18:20	SEC 2174	
Kepone	ND mg/kg	0.03	0.0094	1 08/19/14 00:00	SPR 6584	09/05/14 06:14	SEC 2176	5
Methoxychlor	ND mg/kg	0.0021	0.00094	1 07/30/14 00:00	SPR 6556	08/11/14 18:20	SEC 2174	
Mirex	ND mg/kg	0.021	0.00052	1 07/30/14 00:00	SPR 6556	08/11/14 18:20	SEC 2174	

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ND mg/kg

0.021 **REPORT OF LABORATORY ANALYSIS**

1 07/30/14 00:00 SPR 6556

0.04

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08/11/14 18:20 SEC 2174



Toxaphene





Lab Order: P070867

Project ID: CCCWP-SSID SEDIMENTS
Solid results are reported on a dry weight basis.

Lab ID P070867002	Date Colle		014 10:15	Matrix	Solid			
Sample ID 544MSH062	Date Rece	ived 7/22/2	014 17:54	Results	are expresse	ed as dry weight v	alues	
Parameters	Result Units	R. L.	MDL	DF Prepared	Batch	Analyzed	Batch	Qua
Decachlorobiphenyl (SS)	3.9 %	10-200	•	1 08/19/14 00:00	SPR 6584	09/05/14 06:14	SEC 2176	
Decachlorobiphenyl (SS)	16 %	10-200		1 07/30/14 00:00	SPR 6556	08/11/14 18:20	SEC 2174	
Tetrachloro-m-xylene (SS)	60 %	10-200		1 07/30/14 00:00	SPR 6556	08/11/14 18:20	SEC 2174	
Tetrachloro-m-xylene (SS)	66 %	10-200		1 08/19/14 00:00	SPR 6584	09/05/14 06:14	SEC 2176	
Pyrethroids+Fipronil Analysis,NCI,Solid	Prep Method:	SW84	6 3540C Soxhle	et Prep by:	EAB			
	Analytical Met	hod: SW84	6 8270 Mod			Analyzed by:	RLH	
Allethrin	ND ug/kg	0.33	0.052	1 07/29/14 00:00	SPR 6555	08/08/14 03:44	SMS 3515	1,
Bifenthrin	40 ug/kg	0.33	0.10	1 07/29/14 00:00	SPR 6555	08/08/14 03:44	SMS 3515	
Cyfluthrin	3.4 ug/kg	0.33	0.12	1 07/29/14 00:00	SPR 6555	08/08/14 03:44	SMS 3515	
Lambda-Cyhalothrin	J0.24 ug/kg	0.33	0.063	1 07/29/14 00:00	SPR 6555	08/08/14 03:44	SMS 3515	;
Cypermethrin	0.35 ug/kg	0.33	0.10	1 07/29/14 00:00	SPR 6555	08/08/14 03:44	SMS 3515	
Deltamethrin:Tralomethrin	ND ug/kg	0.33	0.13	1 07/29/14 00:00	SPR 6555	08/08/14 03:44	SMS 3515	
Esfenvalerate:Fenvalerate	ND ug/kg	0.33	0.14	1 07/29/14 00:00	SPR 6555	08/08/14 03:44	SMS 3515	
Fenpropathrin	ND ug/kg	0.33	0.073	1 07/29/14 00:00	SPR 6555	08/08/14 03:44	SMS 3515	
Fipronil	ND ug/kg	0.33	0.10	1 07/29/14 00:00	SPR 6555	08/08/14 03:44	SMS 3515	
Fipronil Desulfinyl	J0.27 ug/kg	0.33	0.10	1 07/29/14 00:00	SPR 6555	08/08/14 03:44	SMS 3515	
Fipronil Sulfide	ND ug/kg	0.33	0.10	1 07/29/14 00:00	SPR 6555	08/08/14 03:44	SMS 3515	
Fipronil Sulfone	ND ug/kg	0.33	0.10	1 07/29/14 00:00	SPR 6555	08/08/14 03:44	SMS 3515	
Tau-Fluvalinate	ND ug/kg	0.33	0.042	1 07/29/14 00:00	SPR 6555	08/08/14 03:44	SMS 3515	
Permethrin	9.4 ug/kg	0.33	0.12	1 07/29/14 00:00	SPR 6555	08/08/14 03:44	SMS 3515	
Tetramethrin	ND ug/kg	0.33	0.063	1 07/29/14 00:00	SPR 6555	08/08/14 03:44	SMS 3515	
Esfenvalerate-d6;#1 (SS)	103 %	70-130		1 07/29/14 00:00	SPR 6555	08/08/14 03:44	SMS 3515	
Esfenvalerate-d6;#2 (SS)	118 %	70-130		1 07/29/14 00:00	SPR 6555	08/08/14 03:44	SMS 3515	
Dried Sediment as Extracted	Analytical Met	hod: SM20	-2540 G			Analyzed by:	CFG	
Solids, Percent	95 %	0.1	0.1	1		07/30/14 14:18	WGR 5525	
Lab ID P070867003	Date Colle	cted 7/22/2	014 14:45	Matrix	Solid			
Sample ID 207WAL078	Date Rece	ived 7/22/2	014 17:54	Results	are expresse	ed as dry weight v	alues	
Parameters	Result Units	R. L.	MDL	DF Prepared	Batch	Analyzed	Batch	Qua
Chlorinated Pesticides Analysis	Prep Method:	SW84	6 3541	Prep by:	EAB			
•	Analytical Met		6 8081			Analyzed by:	MDT	
Aldrin	ND mg/kg	0.0023	0.0010	1 07/30/14 00:00	SPR 6556	08/11/14 18:41		2,
alpha-BHC	ND mg/kg	0.0023	0.0010	1 07/30/14 00:00		08/11/14 18:41		,
beta-BHC	ND mg/kg	0.0023	0.0010	1 07/30/14 00:00		08/11/14 18:41		
delta-BHC	ND mg/kg	0.0023	0.00081	1 07/30/14 00:00		08/11/14 18:41		
martine DLIC (Lindons)	ND mg/kg	0.0020	0.00001	4 07/00/11 00:00		00/11/11 10.11		

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gamma-BHC (Lindane)

gamma-Chlordane (trans)

alpha-Chlordane (cis)

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0.00081

0.0012

0.0035

0.0012

0.0023

0.0023

0.0023

0.0060

0.0046

0.0060

0.0050

0.0050

ND mg/kg

ND mg/kg

ND mg/kg

ND mg/kg

ND mg/kg

ND mg/kg

1 07/30/14 00:00 SPR 6556

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08/11/14 18:41 SEC 2174



Chlordane

2,4'-DDD

2,4'-DDE





Lab Order: P070867

Project ID: CCCWP-SSID SEDIMENTS
Solid results are reported on a dry weight basis.

Lab ID P070867003	Date Collec	ted 7/22/	2014 14:45	Matrix	Solid			
Sample ID 207WAL078	Date Receiv	ved 7/22/	2014 17:54	Results	s are expresse	ed as dry weight v	alues	
Parameters	Result Units	R. L.	MDL	DF Prepared	Batch	Analyzed	Batch	Qua
2,4'-DDT	ND mg/kg	0.0050	0.0023	1 07/30/14 00:00	SPR 6556	08/11/14 18:41	SEC 2174	
4,4'-DDD	ND mg/kg	0.0023	0.00092	1 07/30/14 00:00	SPR 6556	08/11/14 18:41	SEC 2174	
4,4'-DDE	ND mg/kg	0.0023	0.0014	1 07/30/14 00:00	SPR 6556	08/11/14 18:41	SEC 2174	
4,4'-DDT	ND mg/kg	0.0023	0.0012	1 07/30/14 00:00	SPR 6556	08/11/14 18:41	SEC 2174	
Dieldrin	ND mg/kg	0.0023	0.0014	1 07/30/14 00:00	SPR 6556	08/11/14 18:41	SEC 2174	
Endosulfan I	ND mg/kg	0.0023	0.0010	1 07/30/14 00:00	SPR 6556	08/11/14 18:41	SEC 2174	
Endosulfan II	ND mg/kg	0.0023	0.00081	1 07/30/14 00:00	SPR 6556	08/11/14 18:41	SEC 2174	
Endosulfan sulfate	ND mg/kg	0.0023	0.0010	1 07/30/14 00:00	SPR 6556	08/11/14 18:41	SEC 2174	
Endrin	ND mg/kg	0.0023	0.0012	1 07/30/14 00:00	SPR 6556	08/11/14 18:41	SEC 2174	
Endrin aldehyde	ND mg/kg	0.0023	0.0010	1 07/30/14 00:00	SPR 6556	08/11/14 18:41	SEC 2174	
Endrin ketone	ND mg/kg	0.0023	0.0010	1 07/30/14 00:00	SPR 6556	08/11/14 18:41	SEC 2174	
Heptachlor	ND mg/kg	0.0023	0.00069	1 07/30/14 00:00	SPR 6556	08/11/14 18:41	SEC 2174	
Heptachlor epoxide	ND mg/kg	0.0023	0.0013	1 07/30/14 00:00	SPR 6556	08/11/14 18:41	SEC 2174	
Kepone	ND mg/kg	0.03	0.010	1 08/19/14 00:00	SPR 6584	09/05/14 06:41	SEC 2176	Ę
Methoxychlor	ND mg/kg	0.0023	0.0010	1 07/30/14 00:00	SPR 6556	08/11/14 18:41	SEC 2174	
Mirex	ND mg/kg	0.023	0.00058	1 07/30/14 00:00	SPR 6556	08/11/14 18:41	SEC 2174	
Toxaphene	ND mg/kg	0.05	0.023	1 07/30/14 00:00	SPR 6556	08/11/14 18:41	SEC 2174	
Decachlorobiphenyl (SS)	9.5 %	10-200		1 08/19/14 00:00	SPR 6584	09/05/14 06:41	SEC 2176	4
Decachlorobiphenyl (SS)	12 %	10-200		1 07/30/14 00:00	SPR 6556	08/11/14 18:41	SEC 2174	
Tetrachloro-m-xylene (SS)	36 %	10-200		1 07/30/14 00:00	SPR 6556	08/11/14 18:41	SEC 2174	
Tetrachloro-m-xylene (SS)	33 %	10-200		1 08/19/14 00:00	SPR 6584	09/05/14 06:41	SEC 2176	
Pyrethroids+Fipronil Analysis,NCI,Solid	Prep Method:	SW8	46 3540C Sox	hlet Prep by:	EAB			
7 mary 5.5,1 to 1,00 ma	Analytical Meth	od: SW8	46 8270 Mod			Analyzed by:	RLH	
Allethrin	ND ug/kg	0.33	0.058	1 07/29/14 00:00	SPR 6555	08/08/14 05:32		
Bifenthrin	5.6 ug/kg	0.33	0.12	1 07/29/14 00:00		08/08/14 05:32		3
Cyfluthrin	0.80 ug/kg	0.33	0.13	1 07/29/14 00:00	SPR 6555	08/08/14 05:32	SMS 3515	3
Lambda-Cyhalothrin	ND ug/kg	0.33	0.069	1 07/29/14 00:00	SPR 6555	08/08/14 05:32	SMS 3515	
Cypermethrin	J0.28 ug/kg	0.33	0.12	1 07/29/14 00:00		08/08/14 05:32		3
Deltamethrin:Tralomethrin	ND ug/kg	0.33	0.14	1 07/29/14 00:00	SPR 6555	08/08/14 05:32	SMS 3515	
Esfenvalerate:Fenvalerate	ND ug/kg	0.33	0.15	1 07/29/14 00:00		08/08/14 05:32		
Fenpropathrin	ND ug/kg	0.33	0.081	1 07/29/14 00:00	SPR 6555	08/08/14 05:32		
Fipronil	ND ug/kg	0.33	0.12	1 07/29/14 00:00	SPR 6555	08/08/14 05:32		
Fipronil Desulfinyl	ND ug/kg	0.33	0.12	1 07/29/14 00:00		08/08/14 05:32		
Fipronil Sulfide	ND ug/kg	0.33	0.12	1 07/29/14 00:00		08/08/14 05:32		
Fipronil Sulfone	ND ug/kg	0.33	0.12	1 07/29/14 00:00		08/08/14 05:32		
Tau-Fluvalinate	ND ug/kg	0.33	0.046	1 07/29/14 00:00		08/08/14 05:32		
Permethrin	1.9 ug/kg	0.33	0.13	1 07/29/14 00:00		08/08/14 05:32		3
Tetramethrin	ND ug/kg	0.33	0.069	1 07/29/14 00:00		08/08/14 05:32		
Esfenvalerate-d6;#1 (SS)	97 %	70-130		1 07/29/14 00:00		08/08/14 05:32		
Esfenvalerate-d6;#2 (SS)	115 %	70-130		1 07/29/14 00:00		08/08/14 05:32		
Dried Sediment as Extracted	Analytical Meth	nod: SM2	0-2540 G			Analyzed by:	CFG	
Solids, Percent	87 %	0.1	0.1	1		07/30/14 14:18		

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Lab Order: P070867

Project ID: CCCWP-SSID SEDIMENTS
Solid results are reported on a dry weight basis.

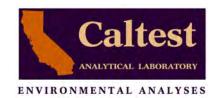
Lab ID P070867004	Date Collec	ted 7/22/	2014 11:45	Matrix	Solid			
Sample ID 207WAL060	Date Receiv	/ed 7/22/	2014 17:54	Result	s are express	ed as dry weight va	alues	
Parameters	Result Units	R. L.	MDL	DF Prepared	Batch	Analyzed	Batch	Qua
Chlorinated Pesticides Analysis	Prep Method:	SW8	46 3541	Prep by:	EAB			
	Analytical Meth	od: SW8	46 8081			Analyzed by:	MDT	
Aldrin	ND mg/kg	0.0021	0.00092	1 07/30/14 00:00	SPR 6556	08/11/14 19:02	SEC 2174	2,1
alpha-BHC	ND mg/kg	0.0021	0.00092	1 07/30/14 00:00	SPR 6556	08/11/14 19:02	SEC 2174	
beta-BHC	ND mg/kg	0.0021	0.00092	1 07/30/14 00:00	SPR 6556	08/11/14 19:02	SEC 2174	
delta-BHC	ND mg/kg	0.0021	0.00072	1 07/30/14 00:00	SPR 6556	08/11/14 19:02	SEC 2174	
gamma-BHC (Lindane)	ND mg/kg	0.0021	0.00072	1 07/30/14 00:00	SPR 6556	08/11/14 19:02	SEC 2174	
alpha-Chlordane (cis)	ND mg/kg	0.0060	0.0010	1 07/30/14 00:00	SPR 6556	08/11/14 19:02	SEC 2174	
Chlordane	ND mg/kg	0.0041	0.0031	1 07/30/14 00:00	SPR 6556	08/11/14 19:02	SEC 2174	
gamma-Chlordane (trans)	ND mg/kg	0.0060	0.0010	1 07/30/14 00:00	SPR 6556	08/11/14 19:02	SEC 2174	
2,4'-DDD	ND mg/kg	0.0050	0.0021	1 07/30/14 00:00	SPR 6556	08/11/14 19:02	SEC 2174	
2,4'-DDE	ND mg/kg	0.0050	0.0021	1 07/30/14 00:00	SPR 6556	08/11/14 19:02	SEC 2174	
2,4'-DDT	ND mg/kg	0.0050	0.0021	1 07/30/14 00:00	SPR 6556	08/11/14 19:02		
4,4'-DDD	ND mg/kg	0.0021	0.00082	1 07/30/14 00:00	SPR 6556	08/11/14 19:02	SEC 2174	
4,4'-DDE	ND mg/kg	0.0021	0.0012	1 07/30/14 00:00	SPR 6556	08/11/14 19:02		
4,4'-DDT	ND mg/kg	0.0021	0.0010	1 07/30/14 00:00	SPR 6556	08/11/14 19:02		
Dieldrin	ND mg/kg	0.0021	0.0012	1 07/30/14 00:00		08/11/14 19:02		
Endosulfan I	ND mg/kg	0.0021	0.00092	1 07/30/14 00:00		08/11/14 19:02		
Endosulfan II	ND mg/kg	0.0021	0.00072	1 07/30/14 00:00		08/11/14 19:02		
Endosulfan sulfate	ND mg/kg	0.0021	0.00092	1 07/30/14 00:00		08/11/14 19:02		
Endrin	ND mg/kg	0.0021	0.0010	1 07/30/14 00:00		08/11/14 19:02		
Endrin aldehyde	ND mg/kg	0.0021	0.00092	1 07/30/14 00:00		08/11/14 19:02		
Endrin ketone	ND mg/kg	0.0021	0.00092	1 07/30/14 00:00		08/11/14 19:02		
Heptachlor	ND mg/kg	0.0021	0.00062	1 07/30/14 00:00		08/11/14 19:02		
Heptachlor epoxide	ND mg/kg	0.0021	0.0001	1 07/30/14 00:00		08/11/14 19:02		
Kepone	ND mg/kg	0.0021	0.0092	1 08/19/14 00:00		09/05/14 07:09		5
Methoxychlor	ND mg/kg	0.0021	0.0092	1 07/30/14 00:00		08/11/14 19:02		
Mirex	ND mg/kg	0.0021	0.00052	1 07/30/14 00:00		08/11/14 19:02		
Toxaphene	ND mg/kg	0.021	0.0031	1 07/30/14 00:00		08/11/14 19:02		
Decachlorobiphenyl (SS)	4.6 %	10-200	0.021	1 08/19/14 00:00		09/05/14 07:09		4
Decachlorobiphenyl (SS)	7.3 %	10-200		1 07/30/14 00:00		08/11/14 19:02		4
Tetrachloro-m-xylene (SS)	20 %	10-200		1 07/30/14 00:00		08/11/14 19:02		4
Tetrachloro-m-xylene (SS)	915 %	10-200		1 08/19/14 00:00		09/05/14 07:09		4
Pyrethroids+Fipronil	Prep Method:		46 3540C Soxhle		EAB			
Analysis,NCI,Solid			40.0070.11				DIII	
A.H	Analytical Meth			4.07/00// 22	000	Analyzed by:		
Allethrin	ND ug/kg	0.33	0.051	1 07/29/14 00:00		08/08/14 07:19		1
Bifenthrin	3.6 ug/kg	0.33	0.10	1 07/29/14 00:00		08/08/14 07:19		3
Cyfluthrin	0.41 ug/kg	0.33	0.11	1 07/29/14 00:00		08/08/14 07:19		3
Lambda-Cyhalothrin	ND ug/kg	0.33	0.062	1 07/29/14 00:00		08/08/14 07:19		
Cypermethrin	J0.21 ug/kg	0.33	0.10	1 07/29/14 00:00		08/08/14 07:19		3
Deltamethrin:Tralomethrin	ND ug/kg	0.33	0.12	1 07/29/14 00:00		08/08/14 07:19		
Esfenvalerate:Fenvalerate	ND ug/kg	0.33	0.13	1 07/29/14 00:00	SPR 6555	08/08/14 07:19	SMS 3515	
Fenpropathrin	ND ug/kg	0.33	0.072	1 07/29/14 00:00		08/08/14 07:19	SMS 3515	
Fipronil	ND ug/kg	0.33	0.10	1 07/29/14 00:00	SPR 6555	08/08/14 07:19	SMS 3515	

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REPORT OF LABORATORY ANALYSIS

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Lab Order: P070867

Project ID: CCCWP-SSID SEDIMENTS
Solid results are reported on a dry weight basis.

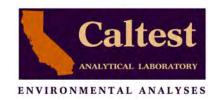
Lab ID P070867004	Date Collected	7/22/201	4 11:45	Matrix	Solid			
Sample ID 207WAL060	Date Received	7/22/201	4 17:54	Results	are express	ed as dry weight va	alues	
Parameters	Result Units	R. L.	MDL	DF Prepared	Batch	Analyzed	Batch	Qual
Fipronil Desulfinyl	ND ug/kg	0.33	0.10	1 07/29/14 00:00	SPR 6555	08/08/14 07:19	SMS 3515	·
Fipronil Sulfide	ND ug/kg	0.33	0.10	1 07/29/14 00:00	SPR 6555	08/08/14 07:19	SMS 3515	
Fipronil Sulfone	J0.14 ug/kg	0.33	0.10	1 07/29/14 00:00	SPR 6555	08/08/14 07:19	SMS 3515	3
Tau-Fluvalinate	ND ug/kg	0.33	0.041	1 07/29/14 00:00	SPR 6555	08/08/14 07:19	SMS 3515	
Permethrin	2.3 ug/kg	0.33	0.11	1 07/29/14 00:00	SPR 6555	08/08/14 07:19	SMS 3515	3
Tetramethrin	ND ug/kg	0.33	0.062	1 07/29/14 00:00	SPR 6555	08/08/14 07:19	SMS 3515	
Esfenvalerate-d6;#1 (SS)	0 0	0-130		1 07/29/14 00:00		08/08/14 07:19		
Esfenvalerate-d6;#2 (SS)		0-130		1 07/29/14 00:00		08/08/14 07:19		
Dried Sediment as Extracted	Analytical Method:	SM20-25	540 G			Analyzed by:	CFG	
Solids, Percent	97 %	0.1	0.1	1		07/30/14 14:18	WGR 5525	
1 1 ID - DOTOGOTOG	D . O	7/00/004	4 44 45		0 !!!			
Lab ID P070867005	Date Collected	7/22/201	_	Matrix	Solid			
Sample ID 544MSH065	Date Received	7/22/201	4 17:54	Results	are express	ed as dry weight va	alues	
Parameters	Result Units	R. L.	MDL	DF Prepared	Batch	Analyzed	Batch	Qual
Client provided Data	Analytical Method:	Client M	ethod	•	•	Analyzed by:	PJB	
Solids, Percent	25 %			1		07/22/14 11:45		
TOC SO by EPA 9060 - Ref.Lab	Analytical Method:	EPA 906	0			Analyzed by:		
Total Organic Carbon	4.6 %	0.40	0.040	1		08/06/14 13:00	SUB 1666	
Lab ID P070867006	Date Collected	7/22/201	4 10:15	Matrix	Solid			
Sample ID 544MSH062	Date Received	7/22/201				ed as dry weight va	alues	
Parameters	Result Units	R. L.	MDL	DF Prepared	Batch	Analyzed	Batch	Qual
Client provided Data	Analytical Method:	Client M	ethod			Analyzed by:	PJB	
Solids, Percent	52 %			1		07/22/14 10:15		
TOC SO by EPA 9060 - Ref.Lab	Analytical Method:	EPA 906	0			Analyzed by:	PJB	
Total Organic Carbon	1.9 %	0.19	0.019	1		08/06/14 13:00	SUB 1666	
Lab ID P070867007	Date Collected	7/22/201	4 14·45	Matrix	Solid			
Sample ID 207WAL078	Date Received	7/22/201				ed as dry weight va	alues	
Campio is a service and a serv	Date Necested	1722/201	1 17.01	rtodane	aro expressi	od do dry Wolgin Vo	ardoo	
Parameters	Result Units	R. L.	MDL	DF Prepared	Batch	Analyzed	Batch	Qual
Client provided Data	Analytical Method:	Client M	ethod			Analyzed by:	PJB	
Solids, Percent	40 %			1		07/22/14 14:45		
TOC SO by EPA 9060 - Ref.Lab	Analytical Method:	EPA 906	0			Analyzed by:	PJB	

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REPORT OF LABORATORY ANALYSIS

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Lab Order: P070867

Project ID: CCCWP-SSID SEDIMENTS
Solid results are reported on a dry weight basis.

Lab ID P070867008 Sample ID 207WAL060	Date Collect Date Recei		014 11:45 014 17:54	Mati Res		ssed as dry weight v	alues	
Parameters	Result Units	R. L.	MDL	DF Prepared	Batch	Analyzed	Batch	Qual
Client provided Data Solids, Percent	Analytical Met	hod: Client	Method	1	•	Analyzed by: 07/22/14 11:45		
TOC SO by EPA 9060 - Ref.Lab Total Organic Carbon	Analytical Met	hod: EPA 90 0.14	0.014	1		Analyzed by: 08/06/14 13:00		



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QUALITY CONTROL DATA

Lab Order: P070867

Project ID: CCCWP-SSID SEDIMENTS

Analysis Description: Pyrethroids+Fipronil Analysis,NCI,Solid QC Batch: SPR/6555

Analysis Method: SW846 8270 Mod (GCMS-NCI-SIM) QC Batch Method: SW846 3540C Soxhlet Extraction

METHOD BLANK: 594644

Parameter	Blank Result	Reporting Limit	MDL	Units	Qualifiers
Allethrin	ND ND	0.25	0.050	ug/kg	-
Bifenthrin	ND	0.25	0.10	ug/kg	1
Cyfluthrin	ND	0.25	0.11	ug/kg	
Lambda-Cyhalothrin	ND	0.25	0.060	ug/kg	
Cypermethrin	ND	0.25	0.10	ug/kg	
Deltamethrin:Tralomethrin	ND	0.25	0.12	ug/kg	
Esfenvalerate:Fenvalerate	ND	0.25	0.13	ug/kg	
Fenpropathrin	ND	0.25	0.070	ug/kg	
Fipronil	ND	0.25	0.10	ug/kg	
Fipronil Desulfinyl	ND	0.25	0.10	ug/kg	
Fipronil Sulfide	ND	0.25	0.10	ug/kg	
Fipronil Sulfone	ND	0.25	0.10	ug/kg	
Tau-Fluvalinate	ND	0.25	0.040	ug/kg	
Permethrin	ND	0.25	0.11	ug/kg	
Tetramethrin	ND	0.25	0.060	ug/kg	
Esfenvalerate-d6;#1 (SS)	81	70-130		%	
Esfenvalerate-d6;#2 (SS)	78	70-130		%	

LABORATORY CONTROL SAMPLE & LCSD: 594645 594646

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% REC Limits	RPD	Max RPD Qualifier
	Units				% Kec	% Kec			——— Qualifier
Allethrin	ug/kg	2.5	2.6	3	106	119	50-150	12	40
Bifenthrin	ug/kg	2.5	2.6	2.7	104	108	50-150	3.4	40 7
Cyfluthrin	ug/kg	2.5	2.8	2.8	113	113	50-150	0.4	30
Lambda-Cyhalothrin	ug/kg	2.5	2.4	2.7	96	107	50-150	11	30
Cypermethrin	ug/kg	2.5	2.7	2.7	108	109	50-150	1.1	30
Deltamethrin:Tralomethrin	ug/kg	5	5.6	4.6	112	92	50-150	19	30
Esfenvalerate:Fenvalerate	ug/kg	5	5.7	5.3	114	107	50-150	6.5	30
Fenpropathrin	ug/kg	2.5	2.6	2.8	103	110	50-200	6.4	40
Fipronil	ug/kg	2.5	2.2	2.6	89	104	50-150	16	35
Fipronil Desulfinyl	ug/kg	2.5	2.1	2.6	86	104	50-150	19	35
Fipronil Sulfide	ug/kg	2.5	2.2	2.6	86	105	50-150	20	35
Fipronil Sulfone	ug/kg	2.5	2.2	2.7	87	106	50-150	20	35
Tau-Fluvalinate	ug/kg	2.5	1.9	1.8	78	72	1-122	8	50
Permethrin	ug/kg	50	72	68	144	137	50-150	4.7	40
Tetramethrin	ug/kg	2.5	2.3	2.5	91	100	50-150	9.6	50
Esfenvalerate-d6;#1 (SS)	%				112	107	70-130	4.4	
Esfenvalerate-d6;#2 (SS)	%				120	105	70-130	13	

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QUALITY CONTROL DATA

Lab Order: P070867

Project ID: CCCWP-SSID SEDIMENTS

Analysis Description: Pyrethroids+Fipronil Analysis,NCI,Solid QC Batch: SPR/6555

Analysis Method: SW846 8270 Mod (GCMS-NCI-SIM) QC Batch Method: SW846 3540C Soxhlet Extraction

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 594647 594648

Parameter	Units	P070925001 Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD Qualifiers
Allethrin	ug/kg		2.5	0.86	0.89	35	36	50-185	3	40 10
Bifenthrin	ug/kg	0.36	2.5	3.3	3.4	119	123	25-200	3.5	40 8
Cyfluthrin	ug/kg	0	2.5	2.8	6.4	113	255	50-150	77	30 11
Lambda-Cyhalothrin	ug/kg	0	2.5	1.4	1.4	55	55	30-160	0.7	30
Cypermethrin	ug/kg	0	2.5	2.7	2.7	108	110	50-170	1.5	30
Deltamethrin:Tralomethrin	ug/kg	0	5	6.4	7.2	127	144	35-150	12	30
Esfenvalerate:Fenvalerate	ug/kg	0	5	6	6.1	120	122	50-175	1.3	30
Fenpropathrin	ug/kg	0	2.5	2.6	2.6	104	105	50-200	1.2	40
Fipronil	ug/kg			1.7	1.4				15	35
Fipronil Desulfinyl	ug/kg			1.9	1.7				12	35
Fipronil Sulfide	ug/kg			1.8	1.5				15	35
Fipronil Sulfone	ug/kg			2	1.9				8.7	35
Tau-Fluvalinate	ug/kg	0	2.5	1.2	1.2	49	46	30-150	5.9	50
Permethrin	ug/kg	0.42	50	82	81	162	160	40-200	1.2	40
Tetramethrin	ug/kg	0	2.5	1.6	2	62	80	30-150	25	50
Esfenvalerate-d6;#1 (SS)	%					113	113	70-130	0.7	
Esfenvalerate-d6;#2 (SS)	%					125	125	70-130	0	

Analysis Description:Chlorinated Pesticides AnalysisQC Batch:SPR/6556

Analysis Method: SW846 8081 QC Batch Method: SW846 3541

METHOD BLANK: 594791

Parameter	Blank Result	Reporting Limit	MDL	Units	Qualifiers
Aldrin	ND	0.0020	0.0009	mg/kg	
alpha-BHC	ND	0.0020	0.0009	mg/kg	
beta-BHC	ND	0.0020	0.0009	mg/kg	
delta-BHC	ND	0.0020	0.0007	mg/kg	
gamma-BHC (Lindane)	ND	0.0020	0.0007	mg/kg	
alpha-Chlordane (cis)	ND	0.0020	0.0010	mg/kg	
Chlordane	ND	0.0040	0.0030	mg/kg	
gamma-Chlordane (trans)	ND	0.0020	0.0010	mg/kg	
2,4'-DDD	ND	0.0020	0.0020	mg/kg	
2,4'-DDE	ND	0.0020	0.0020	mg/kg	
2,4'-DDT	ND	0.0020	0.0020	mg/kg	
4,4'-DDD	ND	0.0020	0.0008	mg/kg	
4,4'-DDE	ND	0.0020	0.0012	mg/kg	
4,4'-DDT	ND	0.0020	0.0010	mg/kg	
Dieldrin	ND	0.0020	0.0012	mg/kg	
Endosulfan I	ND	0.0020	0.0009	mg/kg	
Endosulfan II	ND	0.0020	0.0007	mg/kg	
Endosulfan sulfate	ND	0.0020	0.0009	mg/kg	
Endrin	ND	0.0020	0.0010	mg/kg	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Lab Order: P070867

Project ID: CCCWP-SSID SEDIMENTS

Analysis Description: Chlorinated Pesticides Analysis QC Batch: SPR/6556

Analysis Method: SW846 8081 QC Batch Method: SW846 3541

Parameter	Blank Result	Reporting Limit	MDL	Units	Qualifiers
Endrin aldehyde	ND	0.0020	0.0009	mg/kg	_
Endrin ketone	ND	0.0020	0.0009	mg/kg	
Heptachlor	ND	0.0020	0.0006	mg/kg	
Heptachlor epoxide	ND	0.0020	0.0011	mg/kg	
Methoxychlor	ND	0.0020	0.0009	mg/kg	
Mirex	ND	0.020	0.0005	mg/kg	
Toxaphene	ND	0.04	0.02	mg/kg	
Decachlorobiphenyl (SS)	67	45-188		%	
Tetrachloro-m-xylene (SS)	39	64-114		%	12

LABORATORY CONTROL SAMPLE & LCSD: 594792 594793

		Spike	LCS	LCSD	LCS	LCSD	% REC		Max
Parameter	Units	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD Qualifier
Aldrin	mg/kg	0.013	0.0098	0.009	73	68	67-109	7.9	60
gamma-BHC (Lindane)	mg/kg	0.013	0.009	0.0086	67	64	57-106	4.4	52
4,4'-DDT	mg/kg	0.013	0.0093	0.0092	70	69	52-139	0.9	59
Dieldrin	mg/kg	0.013	0.01	0.01	75	76	63-111	1	19
Endosulfan sulfate	mg/kg	0.013	0.01	0.0099	77	75	50-150	2.6	50
Endrin	mg/kg	0.013	0.01	0.0099	77	74	55-127	3.2	18
Heptachlor	mg/kg	0.013	0.0074	0.0076	55	57	52-149	2.7	98
Methoxychlor	mg/kg	0.013	0.0078	0.0073	59	55	50-150	6.6	50
Decachlorobiphenyl (SS)	%				86	76	45-188	12	
Tetrachloro-m-xylene (SS)	%				50	51	64-114	0.7	12

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 594794 594795

	PO	P070963003		070963003 Spike		MS	MSD	MS	MSD	MSD % Rec		Max		
Parameter	Units	Result	Conc.	Result	Result	% Rec	% Rec	Limit	RPD	RPD Qualifiers				
Aldrin	mg/kg	0	0.013	0.012	0.012	93	93	67-109	0	24				
gamma-BHC (Lindane)	mg/kg	0	0.013	0.0099	0.01	75	76	57-106	1.6	29				
4,4'-DDT	mg/kg	0	0.013	0.0081	0.0075	61	56	52-139	7.4	46				
Dieldrin	mg/kg	0	0.013	0.014	0.013	101	101	63-111	0.7	24				
Endosulfan sulfate	mg/kg	0	0.013	0.013	0.013	99	95	50-150	4.7	30				
Endrin	mg/kg	0	0.013	0.013	0.013	98	95	55-127	3.1	23				
Heptachlor	mg/kg	0	0.013	0.0072	0.0073	54	55	52-149	2.2	52				
Methoxychlor	mg/kg	0	0.013	0.0094	0.0086	70	64	50-150	8.8	30				
Decachlorobiphenyl (SS)	%					95	86	10-200	10					
Tetrachloro-m-xylene (SS)	%					59	56	10-200	4.8					



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QUALITY CONTROL DATA

Lab Order: P070867

Project ID: CCCWP-SSID SEDIMENTS

Analysis Description: Chlorinated Pesticides Analysis QC Batch: SPR/6584

Analysis Method: SW846 8081 QC Batch Method: SW846 3540

METHOD BLANK: 598126

Parameter	Blank Result	Reporting Limit	MDL	Units	Qualifiers
Kepone	ND	0.02	0.009	mg/kg	
Decachlorobiphenyl (SS)	110	45-188		%	
Tetrachloro-m-xylene (SS)	83	64-114		%	

LABORATORY CONTROL SAMPLE & LCSD: 598127 598128

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% REC Limits	RPD	Max RPD Qualifier
Kepone	mg/kg	0.2	0.04	0.05	22	23	10-200	1.8	50
Decachlorobiphenyl (SS)	%				118	119	45-188	0.6	
Tetrachloro-m-xylene (SS)	%				88	95	64-114	8.2	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 598129 598130

	PC	70867004	Spike	MS	MSD	MS	MSD	% Rec		Max
Parameter	Units	Result	Conc.	Result	Result	% Rec	% Rec	Limit	RPD	RPD Qualifiers
Kepone	mg/kg	0	0.01	0	0	RNC	RNC	10-200	0	50 13
Decachlorobiphenyl (SS)	%					5.3	4.5	10-200	15	
Tetrachloro-m-xylene (SS)	%					750	750	10-200	0	

Analysis Description:TOC SO by EPA 9060 - Ref.LabQC Batch:SUB/1666Analysis Method:EPA 9060QC Batch Method:EPA 9060

METHOD BLANK: 600437

Parameter	Blank Result	Reporting Limit	MDL	Units	Qualifiers	
Total Organic Carbon	ND	0.10	0.010	· %		

LABORATORY CONTROL SAMPLE: 600438

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% REC Limits Qualifier
Total Organic Carbon		10	9.3	93	75-125







QUALITY CONTROL DATA

Lab Order: P070867

Project ID: CCCWP-SSID SEDIMENTS

Analysis Description: Dried Sediment as Extracted QC Batch: WGR/5525

Analysis Method: SM20-2540 G QC Batch Method: SM20-2540 G

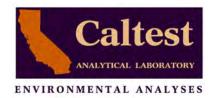
METHOD BLANK: 594819

Parameter	Blank Result	Reporting Limit	MDL	Units	Qualifiers	
Solids, Percent	ND	0.1	0.1	%		

SAMPLE DUPLICATE: 594820

Parameter	Units	P070024013 Result	DUP Result	RPD	Max RPD Qualifiers
Solids, Percent	 ~	8.8	8.8	0	20







QUALITY CONTROL DATA QUALIFIERS

Lab Order: P070867

Project ID: CCCWP-SSID SEDIMENTS

QUALITY CONTROL PARAMETER QUALIFIERS

Results Qualifiers: Report fields may contain codes and non-numeric data correlating to one or more of the following definitions:

NS - means not spiked and will not have recoveries reported for Analyte Spike Amounts

QC Codes Keys: These descriptors are used to help identify the specific QC samples and clarify the report.

MB - Method Blank

Method Blanks are reported to the same Method Detection Limits (MDLs) or Reporting Limits (RLs) as the analytical samples in the corresponding QC batch.

LCS/LCSD - Laboratory Control Spike / Laboratory Control Spike Duplicate

DUP - Duplicate of Original Sample Matrix

MS/MSD - Matrix Spike / Matrix Spike Duplicate

RPD - Relative Percent Difference

%Recovery - Spike Recovery stated as a percentage

- 1 Analyte(s) reported as 'ND' means not detected at or above the listed Method Detection Limits (MDL).
- 7 Sample diluted to bring concentration of target analyte(s) within the working range of the instrument, resulting in increased reporting limits.
- 8 Sample diluted due to a high concentration of non-target analyte(s), resulting in increased reporting limits.
- Low Matrix Spike recovery(ies) due to possible matrix interferences in the QC sample. QC batch accepted based on LCS and RPD results.
- 11 Matrix spike recovery(ies) and RPD outside control limit. Sample result accepted based on LCS and Method Blank.
- The data is acceptable when no more than one surrogate is outside the acceptance limits.
- RNC = Recovery Not Calculated. Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries were not calculated due to matrix interferences concealing the added spike concentration.







QUALITY CONTROL DATA CROSS REFERENCE TABLE

Lab Order: P070867

Project ID: CCCWP-SSID SEDIMENTS

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
P070867005	544MSH065	Client Method	CSV/1205		
P070867006	544MSH062	Client Method	CSV/1205		
P070867007	207WAL078	Client Method	CSV/1205		
P070867008	207WAL060	Client Method	CSV/1205		
P070867001	544MSH065	SW846 3541	SPR/6556	SW846 8081	SEC/2174
P070867002	544MSH062	SW846 3541	SPR/6556	SW846 8081	SEC/2174
P070867003	207WAL078	SW846 3541	SPR/6556	SW846 8081	SEC/2174
P070867004	207WAL060	SW846 3541	SPR/6556	SW846 8081	SEC/2174
P070867001	544MSH065	SW846 3540	SPR/6584	SW846 8081	SEC/2176
P070867002	544MSH062	SW846 3540	SPR/6584	SW846 8081	SEC/2176
P070867003	207WAL078	SW846 3540	SPR/6584	SW846 8081	SEC/2176
P070867004	207WAL060	SW846 3540	SPR/6584	SW846 8081	SEC/2176
P070867001	544MSH065	SW846 3540C Soxhlet	SPR/6555	SW846 8270 Mod	SMS/3515
P070867002	544MSH062	SW846 3540C Soxhlet	SPR/6555	SW846 8270 Mod	SMS/3515
P070867003	207WAL078	SW846 3540C Soxhlet	SPR/6555	SW846 8270 Mod	SMS/3515
P070867004	207WAL060	SW846 3540C Soxhlet	SPR/6555	SW846 8270 Mod	SMS/3515
P070867005	544MSH065	EPA 9060	SUB/1666		
P070867006	544MSH062	EPA 9060	SUB/1666		
P070867007	207WAL078	EPA 9060	SUB/1666		
P070867008	207WAL060	EPA 9060	SUB/1666		
P070867001	544MSH065	SM20-2540 G	WGR/5525		
P070867002	544MSH062	SM20-2540 G	WGR/5525		
P070867003	207WAL078	SM20-2540 G	WGR/5525		
P070867004	207WAL060	SM20-2540 G	WGR/5525		



LAI	1	E ON	1	4		1				3/	1	1	1.	7	1	1	1	CAL	CO P		BIL	ADI	CL		150
W/HNO	SIL: HP	CC: AA	BD: BIO	Samples: WC		Just 1	5	By submittal of sample(s), client agrees to abide by the Terms and Conditions set forth on the reverse of	Cell	4	0	8	7	w	9	n	7	CALTEST D	PHONE #: FAX PHONE: 831. 477. 2003 631. 477.		BILLING ADDRESS:	ADDRESS:	CLIENT:	1	
	PT	SV	WC	NC.		D Qu	RELING	ttal of sa		1			~				1 href-1	ATE MPLED S	7.200	N	SO65 DRESS:	1707	DOL	ANALYTIC	Callest
H ₂ SO ₂	QT	VOA		MICRO		Cally Cally	RELINQUISHED BY	ımple(s),		4		10015	10:15	K			13.45	TIME	S FAX	EMB.	701			AL LABOR	ILC
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(Plastic); S	Amber; PT	CONTAIL	ML = Low	MATRIX			DATE							×				150	ent	The sale	PES A	des	AN		
J = Soil Ja	= Pint (PI	NER TYP	R.L.s. Aqu	W = AGII			DATE/TIME												100	Fig	of the state of th	ades	ANSES	70	0+
(Plastic); SJ = Soil Jar; B4 = 4 oz. BACT; BT = Brass Tube; VOA =	Amber; PT = Pint (Plastic); QT=Quart (Plastic); HG = Half Gallon	DW = Drinking Water; SL = Soil, Sludge, Solid; FP = Free Product CONTAINER TYPES: AL = Amber Liter: AHL = 500 ml	ML = Low R.L.s, Aqueous Nondrinking Water, Digested Metals;	Bouls None															1	1	/	er bed		P.O. #	
(Plastic); SJ = Soil Jar; B4 = 4 oz. BACT; B	Quart (Pla	Sludge, S Amber Lit	frinking Wa	rinking Wa			RECE									-		REMARKS	DUE DATE:	\	1	1	E	001.0	10-
T = Brass	stic); HG =	olid; FP = F	iter, Diges	tor Dines			RECEIVED BY											SXS	TE	RUSH	STANDARD	TURN.	1	Coto	00
Tube; \	- Half Ga	ree Prod	ted Metal	tod Moto																	DARD	TURN-AROUND		-	7

FOR	LAE	B USI	E ON	LY					2	1	+	1	+	1	1	1	1.8	CA	O P	9	E W A	<u>ا</u>	
PIL: HNO	W/HNO,	SIL: HP	CC: AA	BD: BIO	Samples: WC	S		By submitt	mikel LGA	6	7	000	+	2		1	40	CALTEST DA	-114-168 # SHONE		3065 Pol	CLIENT:	
H,SO, NaOH	H,SO,NaOH	PTQT\	SVVOA_	WC MET	MICRO	Officer	RELINQUISHED BY	tal of sample(s), clier		1145	1145	1145	1145	1445	1445	2411	0777141418ed	DATE TIME SAMPLED SAMPLED MATRI	-2003 FAX PHONE	The	er 5+ 5	+DH Enviro	ANALYTICAL LABORATORY
HCL_	Ĭ	VOA			BIOMETSV_	£ 1.60-10	DATE/TIME	By submittal of sample(s), client agrees to abide by the		1×80=06 V	1 x 802 CG	2x80= AG	2x802 No	1×80206	1x802CG	2×802 AG	3x802A6 4°C	MATRIX AMOUNT/TYPE PRESERVATIVE	5180-tth	above	16 101 Sodine	onmental	OF CUSTODY
				COMMENTS	VOA TEMP: °C	\$ J.	E REQUIVED BY	the Terms and Conditions set forth on the reverse of		207 ROOO 11 DS	207R00011 DS-	JO7ROOU 11 05-	207900011DS	- 50 11 000A toc	207R00011V5-	207 R000 11US-	·C 201ROOONUS-	NATIVE SAMPLE IDENTIFICATION SITE	Tevin Lewis		e) CA 9	e,	ODY PROJECT #/ PROJECT NAME
					SEALED: Y/ N INTACT:		RELINQUISHED BY	on the reverse of this document.		104	- 03	02	4- 10	A +0	03	40	01 -3 Comp	V SITE CLIENT OF LAB # GRAB			5073	matt	OZ CCCWP-SS
	(Plas 40 m	Ambe	CON	ML=	Y_/N_			rt		×	×	×	X	×	×	*	×	KAND KN	ethro a no chi	13 Fix	Con./		S I O
	(Plastic); SJ = Soil Jar; B4 = 4 oz. BACT; I 40 mL.VOA; OTC = Other Type Container	er; PT = Pint (Plastic); QT=0	CONTAINER TYPES: Al - Amber liter: AHI - 500 ml	Low R.L.s, Aqueous Nond	RIX: W = Agueous Nondo		DATE/TIME											2		old old	action of the second	ANALYSES REQUE	P.O. #
	(Plastic); SJ = Soil Jar; B4 = 4 oz. BACT; BT = Brass Tube; VOA = 40 mL.VOA; OTC = Other Type Container	Amber; PT = Pint (Plastic); QT=Quart (Plastic); HG = Half Gallon	CONTAINER TYPES: AI - Ambert iter: AHI - 500 ml	ML = Low R.L.s, Aqueous Nondrinking Water, Digested Metals;	MATRIX: W = Aqueous Nondrinking Water, Digested Metals:		RECEIVED BY											REMARKS	DUE DATE:	□ RUSH	TIME	REQUESTED TURN-AROUND	00/0167

1885 N. KELLY ROAD • NAPA, CA 94558 • (707) 258-4000 • Fax (707) 226-1001 • www.caltestlabs.com

Appendix I. Field Measurements and Data Sheets



Table I-1.	Field Measuren	nents					
Event Date	Station ID	Station Name	Water Temperature (C)	pН	O ₂ (mg/l)	O ₂ (%)	Specific Conductivity (µS/cm)
02/06/14	544MSH065	Dry Creek - US	10.64	7.67	10.09	90.8	2.732
02/06/14	544MSH062	Dry Creek - DS	10.55	7.40	10.09	94.3	2.374
02/28/14	207WAL078	Grayson Creek - US	13.50	6.60	9.42	91.2	0.314
02/28/14	207WAL060	Grayson Creek - DS	12.80	7.82	NR	100.9	0.166
02/28/14	544MSH065	Dry Creek - US	13.10	7.84	7.67	NR	NR
02/28/14	544MSH062	Dry Creek - DS	13.10	7.90	8.20	NR	NR
03/26/14	207WAL078	Grayson Creek - US	14.90	7.80	10.66	101.0	0.410
03/26/14	207WAL060	Grayson Creek - DS	15.59	8.20	11.62	116.1	0.294
07/22/14	544MSH065	Dry Creek - US	22.45	7.61	3.75	44.0	1683
07/22/14	544MSH062	Dry Creek - DS	21.66	7.80	5.28	60.6	1592
07/22/14	207WAL078	Grayson Creek - US	25.76	8.46	12.17	NR	1637
07/22/14	207WAL060	Grayson Creek - DS	21.20	8.30	16.60	NR	1219

US = Upstream; DS = Downstream; NR = Not Recorded



		heet (Water		y & Discret	e Probe) -	EventType	=WQ	Entered in d-	base (initial/date	2)		Pg	of	Pgs
*StationCode	: 544 P	2000 2	5015	*Date (mm/dd	/yyyy): 02	105	114	*Group: CC	CWP - R	MC/A	DH	*Agency: (1CC WF	
*Funding: C	CCWP			ArrivalTime:		DepartureTin	1307		(1st sample):	17:3		*Protocol:	RMO	
*ProjectCode	: 030-0	01.020	02	*Personnel: L	~ Pagvett	e, B Haeger	*Purpose (circle		aterChem VaterTo	ox Nabitat Fiel	dMeas	*PurposeFa	ailure:	
*Location: Ba	ank Thalweg	Midchannel	penWater	*GPS/DGPS	Lat (dd	i.ddddd)	Long (de	dd.ddddd)	OCCUPATION	METHOD:	Walk-in	Bridge R/	/	Other
GPS Device:	I pito	NE		Target:	37.92	1507	-121.72	21746	STARTING BA	NK (facing o	downstre	am): (LB) / I	RB / NA	
Datum: NAD83		Accuracy (ft / m):	*Actual: -	カ		-		Section 1			ated, then -8	Per la company de la company d	
Habitat Ob	servations	(Collection	nMethod =	Habitat_ge	neric)	WADEABILITY:	BEAUFORT SCALE (see	1	DISTANCE FROM		STREA	n) HFDIW M	n): 2 M	
SITE	DDOR:	None Sulfides	,Sewage,Petr	oleum,Smoke,	Other	Y/N / Unk	attachment):	7	BANK (m): 1	m	WATER	R DEPTH (m): 30 C	n
SKY C	ODE:	Clear, Partly C	Cloudy, Overc	ast Fog. Smok	v. Hazv	WIND	W-D-E	AerialZipline, O	ther	blioge, ripes,		CATION (to sa		
OTHER PR	RESENCE:	Vascular Nonv		1		(from): SW	Ĭ	PHOTOS (RB & LB assigned	when facing	1: (RB	/LB/BB/U	S/DS/##)	
	SUBSTRATE:		~	-				1	nstream; RENAM e yyyy mm dd u		jes			
WATERO	CLARITY:			(>4" vis), Murk			ITATION:	9	rizzle, Rain, Sn		2: (RB	/LB/BB/U	S/DS/##)	
WATER	ODOR: (None Sulfides					PITATION (las		Unknown <1",					
WATER	COLOR:	Colorless Gre						No. <1 year,		7 1110110	3: (RB	/LB/BB/U	S/DS/##)	
OVERLANI	D RUNOFF (L		-	noderate / heav	y, unknown			9						-
OBSERVE	ED FLOW:					ol, Trickle (<	0.1cfs) 0.1-1	cfs 1-5cfs.	5-20cfs, 20-50	cfs. 50-200	cfs. >20	00cfs		
Field Meas	urements	(Sample Type	oe = FieldN	leasure; M	ethod = Fie	eld)				- 21	26	3/1/6		-
	DepthCollec (m)	Velocity (fps)	Air Temp (°C)	Water Temp (°C)	рН	O ₂ (mg/L)	O ₂ (%)	Conductivity (uS/cm)	Salinity (ppt)	Turbidity (ntu)				
SUBSURF/MID/ BOTTOM/REP	10 cm			10.64	7.67	10.04	90.8	2.732	+					
SUBSURF/MID/ BOTTOM/REP														
SUBSURF/MID/ BOTTOM/REP	1							-3						
Instrument:	45155	6					NO.							
Calib. Date:	26/14													
Samples T	aken (# of	containers	filled) - Me	thod=Wate	r_Grab	Field Dup YE	S / NO: (Sample	eType = Grab / Ir	ntegrated; LABEL_	ID = FieldQA;	create co	llection record	upon data ent	ry
SAMPLE TYP	E: Grab / In			LECTION DEV	7	Indiv-bottle (t	y hand, by po		Teflon tubing; h					
	(m)	Inorganies	Bacteria	CHIE	TSS SSC	TOC A	Tetal Hg	Mercure	Total Metals	Metals	Gregan	Fexicity	VO	3
Sub/Surface	10 cm											TOX		1
Sub/Surface			10									(ID x	Igal	1
COMMENTS		Pyre Fipro	nil + de	*1 gradat	es x1	8	95						Modified	d 02/10/11

Drganochlorine pest x1

SWAMP'F	llellelle)attatis	lheel (Wate)	r@hemiste	y & Distora	(e (Piralbie)) »	Eventilype	=\/\/(o)	Entered in d-	base (initial/da	te)		Pg	of	Das
*StationCod	e: 544P	1000 2	505	*Date (mm/do	//vvv): 00	106	114		CWP -		ABH	_	ROCK	Pgs
*Funding:	C CCOUP			ArrivalTime:		DepartureTim	ne: 13:50	*SampleTime		13:2		*Protocol:		1
*ProjectCod	e: 030.0	01,020	12		Paquette,			e applicable); W				*PurposeF		
*Location: E	Bank Thalweg	Midchannel	penWater	*GPS/DGPS	(Let)(di	Halalalala)	Leiner(d)	विक्षालाभवावावाव)	OCCUPATIO	N METHOD:	Walk-In			Other
GPS Device:	I.P.	HONE	- 4	161121515	37.923	005.	-121.7	14414w						
Datum: NAD8		Accuracy (ft / m		"Adduall:	1		=	11.37 00		nkofasample)				
Halbitatx@l	bsenvations	i((Gollantio	ilMetthodis	lilabilieti (gr	merilo))	-WADEABILITY:	BEAUFORT	5	DISTANCE		occopanopanopan		m): (, S	
SITE	ODOR:	None, Sulfides	,Sewage,Petr	oleum,Smoke,	Other	Y) N / Unk	SCALE (see attachment):	3	FROM BANK (m):	75		DEPTH (n		
SKY	CODE:	Clear, Partly C	Cloudy, Overca	st) Fog. Smo	v. Hazv	WIND a	N-E	AerialZipline, O	ther Julyap C	bridge, ripes,	LO	CATION (to s	sample): US/	os) w/
OTHER P	RESENCE:	Vascular, Nonv				(from): SV	7 1	Children .	RB & LB assigne				JS/DS/##)	
DOMINANT	SUBSTRATE:	Bedrock, Con						dow	nstream; RENAM	ME to	yes			
100000000000000000000000000000000000000	CLARITY:	Clear (see bot				*PRECIP	TATION:		rizzle, Rain, Sı	-	-	LB/BB/L	JS / DS / ##)	
WATER	RODOR:	None, Sulfides					PITATION (las		Unknown <1					
WATER	COLOR:	Colorless, Gre					OF FIRES:	No, of year,		, > 1 , NUITE	3: (RB /	LB/BB/L	JS / DS / ##)	
OVERLAN	D RUNOFF (L			noderate / hea	vy, unknown			(to, yi your,	-o years					
	ED FLOW:	NA, Dry Wate	erbody Bed,	No Obs Flow,	Isolated Po	ool, Trickle (<0).1cfs), (0.1-1	cfs) 1-5cfs.	5-20cfs. 20-5	Ocfs 50-200	cfs >20	Ocfs		
FieldiMea		(Sampleary	pe)⇔lflislidN	leasure; M	ethodi≡ilil	al(d))					510, -20	0010		
	DepthCollec (m)	Velocity (fps)	Air Temp (°C)	Water Temp (°C)	рН	O ₂ (mg/L)	O ₂ (%)	Conductivity (uS/cm)	Salinity (ppt)	Turbidity (ntu)				/ -
SUBSURF/MID/ BOTTOM/REP	21			10-55€	7.4	10.09	94.3	2.374	/	/			14	
SUBSURF/MID/ BOTTOM/REP														
SUBSURF/MID/ BOTTOM/REP				-										
Instrument:	USI 551	0		181										
Calib. Date:	2/6/14													
Samples i	laken (# of	@intelliters	fill(led)) «iMi	filmord =VWate	ir Grab	Field Dup YE	8 /(NO:)(Sample	eType = Grab / In	legrated; LABEL	_ID = FieldQA;	create col	lection record	d upon data ent	rv
SAMPLE TYP	E: Grab In			LECTION DE	/ICE:	Indiv bottle (b	y hand by po	le, by bucket);	Teflon tubing;	Kemmer, Pole	e & Beak	er; Other		_
	(m)	Inorganies-	-Bacteria	Chl a	TSS/SSC	TOC / DOC	Total Hig	Moreury	Total Motals	Metals	Organi cs /		100	S
Sub/Surface	6					NI					1	10	1	
Sub/Surface COMMENTS		Direcord	7								1 /2	41gax		
		pyrethr	5 Sp10	1									/	
	1	pyrethr Fipronil	+ degra	adates.	×									
							95						Modifie	d 02/10/11

Organochlorine post. ×1

1.	1992 N. KELL	LIKUAL	• NAPA, CA 94228 • (101) 428-400	o rax (/0	() 220-1	IUUI •	www.	cartes	tians.	com	IT LA	B UHDER#
Caltest	SAMPLE	CHA	IN					GE_		_OF	1	020478
ANALYTICAL LABORATORY	OF CUS	STOD	PROJECT #/PROJECT NAME	030,	100	,0	202				P.O. #	20.481
DIH Environ men	tal		Alessandro Hnatt.						AN	ALYSE	STREQUES	/ / /
3065 Porter St So	y: ique (CA		STATE: ZIP:						-/6	100/	30//	TURN-AROUN TIME
BILLING ADDRESS: Same	1						_	/	3	*/ a)	2//	☐ STANDARD ☐ RUSH
PHONE #: FAX PHONE		SAMPLER (PRINT & SIGN NAME):				26	3	2 3 T	5/0/	///01	UE DATE:
CALTEST DATE TIME SAMPLED MATRIX		RESERVATIVE	SAMPLE IDENTIFICATION SITE	CLIENT LAB#	COMP. or GRAB		1/3	XY	× 200	30	//	REMARKS
-1 2/6/14/3:20 Storm	16	100	544 R000 25 DS -	LAD#	9176	×						REMARKS
-2 1 12-50 Water	10		544 R00025 US-		1	χ				1		
-3 13:20		16	544 R00025 DS-				X					
13:20	1	Ce					X					
et 2 13:20		100						×				
12:50	1	(4		7					X.			
-4 12:50	1	ce	544 R000 a5 US	has			7					
1 12-50	10	ce		18/500	4		×					
12:50	T.	ce		2				×				
12:50	t	Ce	V	2	V				×			
By submittal of sample(s), client	agrees to abide	by the Te	erms and Conditions set forth on the rev	erse of this o	documer	nt.						
RELINQUISHED BY	DATE/		RECEIVED BY	RELIN	NQUISHED	BY			DATE	E/TIME		RECEIVED BY
English dut	2-7-14	6:12	NA									
			1 year									
Samples: WCBIC	DMET		/OA TEMP:°C SEALED: Y	_/ N	INTACT	r: Y_	/ N	M	ATRIX	(: W = A	queous Nondrir	nking Water, Digested Meta
BD: BIO WC MET		CON	MENTS					MI	L = Low	R.L.s. A	Aqueous Nondrin	nking Water, Digested Meta lludge, Solid; FP = Free Prod
CC: AA SV VOA VOA VOA VOA VOA VOA VOA VOA VOA VO)A											Amber Liter; AHL = 500 ml Quart (Plastic); HG = Half Ga
SIL: HP PT QT VO		- 1						-				
SIL: HP PT OT VO W/HNO, H,SO, NaOH PIL: HNO, H,SO, NaOH											= Other Type Co	BACT; BT = Brass Tube; VC ontainer

CHAIN-OF-CUSTODY RECORD

Pacific EcoRisk 2250 Cordelia Rd., Fairfield, CA 94534 (707) 207-7760 FAX (707) 207-7916

Client Name:	ADH	Envir	rohmen	ital.						REQ	UEST	TED /	ANAL'	YSIS		
Client Address:	3065 5090e	Porte	9507°	Suite		- 4	FUNT	Chronie Geriodaphnia dubia	nes.	azteca	10-day Hyalella azteca (sedimont)					
Phone:	83147	72003	FAX:	831477	08	95	tur.	dap.	E de	9 9	五五					
Project Manager:	Aless	andro	Hnat	1.			ale Diric	Dia Dia	Time	Hyalella (water)	Hyalella sedimont)					
Project Name:	CCCW						J.E	\$ B	10	E E	1					
Project # / P.O. Number:	030.0	01.00	202 (ta	ish ag)		Chronic Selemastrum capricornutum	ropi	-etrronic Primephales -prometas-	10-day Hyalella a (water)	神	1				
Client Comple ID	Sample	Sample	Sample	Coi	ntaine	er	ख	S	Φ	10	\$				1	
Client Sample ID	Date	Time	Matrix*	Number	TO STREET	Гуре						_			-	+
14100015 W			STRMW		-	II. amber	<u> </u>	×	×	×	1	-	-		-	-
544 ROOD 15PS - W-D	12-6-14	20.50		10	gal	amber				X			-	-	-	+
544R 00025US-W-0	12-6-14	20,50		10	gal	amber			-	X	-	-		-	-	+
																1
		15-11														-
								-	-		-	-	-		-	+
							-	-		-						+
							20020				cumple a	arma office				
Samples collected by:																
Comments/Special Instruction	on:			RELINQU	ISHE	D BY:				-	CEIV			_		_
Note - Fathead minnow testing			d using the	Signature	: KN	of Luw	R			-	natur					
standard EPA protocol (i.e., 4	replicates)		Print:	10	Stin C	econ			Pri	nt:	Ma	rlon	orv	ren	
Contract # 030.00 SSID Study	01:03	107		Organiza	tion:		A	PH	ماري	Org			: PE			
ccin Stude				Date:		7-14	Tim	ا ا اe: چ	10	Dat			7.10	ł T	ime: 17	140
Jain Jinay	-0.0			RELINQU	JISHE	D BY:				RE	CEIV		Y:			
,				Signature	e:					Sig	natu	re:				
				Print:						Pri						
				Organiza	tion:					Org	ganiz	ation	1:			
				Date:			Tin	ne:		Da	te:			T	ime:	

5510

207R00011USK

& Not wadeable in storm

SWAMP File	JidilData 8	heet (Wate)	(Ch e mistr	y & Discret	(e Probe) »	EventType	≑W@	Entered in d-l	base (initial/date	e)		Pg /	of / P
*StationCode:			4	*Date (mm/do		128	, 14	*Group: AD	-1	2013		*Agency: (COMP
*Funding:	CCINP.	5510		ArrivalTime:	~	DepartureTim	e: 10 30	SampleTime		095	5	*Protocol: R	
*ProjectCode:	030.	001.026	12	*Personnel: S		Ohman	1		aterChem WaterT	ox Habitat Fiel	dMeas	*PurposeFai	V
*Location: Ban	nk Thalweg	Midchannel C	penWater	*GPS/DGPS	Lati(di	kddiddid)	Long(di	(thatalalaa)	OCCUPATION	METHOD:	Walk-in ((
GPS Device:	LO CH	SH Plyu	W	Targeti	Assessment of the second		-/						
Datum: NAD83		Accuracy (ft/m):	'Actuall'	37.95	275	1/22.	08150	STARTING BA	CONTRACTOR OF THE PARTY OF THE	NAME OF TAXABLE PARTY.	ted then 88	NAME OF TAXABLE PARTY.
HabiltatxObs	telityatilonis	(Collection	iMethod⊫	The last contract of the last	merle)	WADEABILITY:	BEAUFORT	- 12 30	DISTANCE A		250000000000000000000000000000000000000	M WIDTH (m)	020000000000000000000000000000000000000
SITE OD	(1	******************	oleum,Smoke,		Y/ No/ Unk	SCALE (see	0	FROM Cha	I swi	70.00		-
010100		0				WIND	attachment):	THE DROMODIT	BANK (m):	billuge, ripes,	Concreteo		control, curvent,
SKY CO				ast, Fog, Smol	101	DIRECTION	Wa∯⊧E	AerialZipline, O	91100	+1415	SILM.	-	mple): US / DS /
OTHER PRE		-	7	heen,Foam,Tr		(from):	1		RB & LB assigned nstream; RENAM		1: (RB/	LB/BB/US	/ DS / ##)
DOMINANT SU	JBSTRATE:	Bedrock, Con	crete, Cobble	Gravel, Sand	Mud, Unk, O	ther DUC	(1)	StationCode	_yyyy_mm_dd_u	iniquecode);		0	
WATERCL	ARITY:	Clear (see bot	tom), Cloudy	(>4" vis) Murk	(y (<4" vis)	PRECIPI	TATION:	None, Fog, D	rizzle Rain Sn	ow	2: (RB /	LB LBB (US	LDS / ##)
WATERO	DDOR:	None Sulfides	s, Sewage, Pe	etroleum, Mixe	d, Other	PRECIP	ITATION (last	t 24 hrs):	Unknown, <1"	>1", None			3
			- /	1 Vivi	161		24	0	.5		3: (RB/	LB / BB / US	(DSV##)
WATERCO	OLOR:	Colorless, Gre	en, Yellow, B	rown +UV	017	EVIDENCE	OF FIRES: /	Ng, <1 year,	<5 years		1		
WATERCO				noderate / hea	-	EVIDENCE	OF FIRES:	(Ng, <1 year,	Syears		1		0
OVERLAND OBSERVED	RUNOFF (L	ast 24 hrs): NA, Dry Wate	none, light, o	noderate / hea	vy, unknown , Isolated Po	ool, Trickle (<0				ofs, 50-200		Ocfs	0
OVERLAND OBSERVED	RUNOFF (L D FLOW: Urements)	ast 24 hrs): NA, Dry Wate	none, light, o	noderate / hea	vy, unknown , Isolated Po	ool, Trickle (<0			5-20cfs, 20-50	ofs, 50-200		Ocfs	0
OVERLAND OBSERVED	RUNOFF (L	ast 24 hrs): NA, Dry Wate	none, light, o	noderate / hea	vy, unknown , Isolated Po	ool, Trickle (<0		cfs, 1-5cfs, (5-20cfs,) 20-50	Turbiditý		Ocfs	
OVERLAND OBSERVED IEIGIMEASU D SUBSURF/MID/	RUNOFF (L D FLOW: Urements: DepthCollec	ast 24 hrs): NA, Dry Wate (Sample ry	none, light, erbody Bed, pe)= F E d Air Temp	No Obs Flow Ne assure; M Water Temp (°C)	vy, unknown Isolated Po	ool, Trickle (<0).1cfs), 0.1-1	cfs, 1-5cfs, (5-20cfs,) 20-50			Ocfs	
OVERLAND OBSERVED IBID Measu DUBSURF/MID/ BOTTOM/REP UBSURF/MID/	RUNOFF (L D FLOW: Urements: DepthCollec	ast 24 hrs): NA, Dry Wate (Sample ry	none, light, erbody Bed, pe)= F E d Air Temp	No Obs Flow Measure M Water Temp	yy, unknown Isolated Po ethodisi File pH	O ₂ (mg/L)	O ₂ (%)	cfs, 1-5cfs, (5-20cfs,) 20-50	Turbiditý		Ocfs	
OVERLAND OBSERVED IBIO Measu BUBSURF/MID/ BOTTOM/REP SUBSURF/MID/ BOTTOM/REP SUBSURF/MID/ BOTTOM/REP	RUNOFF (L D FLOW: Urements: DepthCollec	ast 24 hrs): NA, Dry Wate (Sample ry	none, light, erbody Bed, pe)= F E d Air Temp	No Obs Flow Ne assure; M Water Temp (°C)	vy, unknown Isolated Po ethodia File pH	O ₂ (mg/L)	O ₂ (%)	cfs, 1-5cfs, (5-20cfs,) 20-50	Turbiditý		Ocfs	
OVERLAND OBSERVED IEIG Measu BUBSURF/MID/ BOTTOM/REP SUBSURF/MID/ BOTTOM/REP BUBSURF/MID/ BOTTOM/REP	RUNOFF (L D FLOW: Urements: DepthCollec	ast 24 hrs): NA, Dry Wate (Sample ry	none, light, erbody Bed, pe)= F E d Air Temp	No Obs Flow Ne assure; M Water Temp (°C)	yy, unknown Isolated Po ethodisi File pH	O ₂ (mg/L)	O ₂ (%)	cfs, 1-5cfs, (5-20cfs,) 20-50	Turbiditý		Ocfs	
OVERLAND OBSERVED IEID Measu SUBSURF/MID/ BOTTOM/REP SUBSURF/MID/ BOTTOM/REP SUBSURF/MID/ BOTTOM/REP Instrument:	RUNOFF (L D FLOW: Urements: DepthCollec	ast 24 hrs): NA, Dry Wate (Sample ry	none, light, erbody Bed, pe)= F E d Air Temp	No Obs Flow Ne assure; M Water Temp (°C)	yy, unknown Isolated Po ethodisi File pH	O ₂ (mg/L)	O ₂ (%)	cfs, 1-5cfs, (5-20cfs,) 20-50	Turbiditý		Ocfs	
OVERLAND OBSERVED ILEIU Measu SUBSURFIMIDI BOTTOM/REP SUBSURF/MIDI BOTTOM/REP SUBSURF/MIDI BOTTOM/REP Instrument:	RUNOFF (LD FLOW: Jrements) DepthCollec (m)	ast 24 hrs): NA, Dry Wate (Sample Ty) Velocity (fps)	none, light, or erbody Bed, permitted in the control of the contro	No Obs Flow Measures M Water Temp (°C)	yy, unknown Isolated Po ethodi = Fill pH	O ₂ (mg/L)	O ₂ (%)	Specific Conductivity (US/cm)	Salinity (ppt)	Turbidity (ntu)	cfs, >200		non data ante-
OVERLAND OBSERVED IIII Measu SUBSURF/MID/ BOTTOM/REP SUBSURF/MID/ BOTTOM/REP SUBSURF/MID/ BOTTOM/REP Instrument: Callb. Date: Samples:III	RUNOFF (LD FLOW: Irements: DepthCollec (m) IS 1 556	ast 24 hrs): NA, Dry Wate (Sample Ty) Velocity (fps)	none, light, or services and services are services and services and services and services and services and services and services and services and services and services and services are services and services and services and services are services and services and services are services and services and services are services and services and services are services and services and services are services and services are services and services are services and services are services and services are services and services are services and services are services and services are services and services are services and se	No Obs Flow Measures M Water Temp (°C)	yy, unknown Isolated Po ethodia Fill pH	O ₂ (mg/L) O ₃ (Mg/L) Fleld Dup YE	O ₂ (%)	Specific Conductivity (uS/cm) 3 +	Salinity (ppt)	Turbidity (ntu)	cfs, >200	ection record u	pon data entry
OVERLAND OBSERVED IBIDI Measu SUBSURF/MID/ BOTTOM/REP SUBSURF/MID/ BOTTOM/REP SUBSURF/MID/ BOTTOM/REP Instrument: Calib. Date: Gamples: Ia	RUNOFF (LD FLOW: Irements: DepthCollec (m)	ast 24 hrs): NA, Dry Wate (Sample Ty) Velocity (fps)	none, light, or services and services are services and services and services and services and services and services and services and services and services and services and services are services and services and services and services are services and services and services are services and services and services are services and services and services are services and services and services are services and services are services and services are services and services are services and services are services and services are services and services are services and services are services and services are services and se	No Obs Flow, Measure; M Water Temp (°C)	yy, unknown Isolated Po ethodia Fill pH	O ₂ (mg/L) O ₃ (Mg/L) Fleld Dup YE	O ₂ (%)	Specific Conductivity (us/cm) 3 Type = Grab / Ir le, by bucket); Dissolved	Salinity (ppt)	Turbidity (ntu)	create coll le & Beake	ection record u	pon data entry
OVERLAND OBSERVED DEBUTE OF THE PROPERTY OF TH	RUNOFF (LD FLOW: Jrements: DepthCollec (m) JS (55) Ken (# of DepthCollec	ast 24 hrs): NA, Dry Wate (Sample Ty Velocity (fps) Containers ntegrated	none, light, or serbody Bed, one in File Idl Air Temp (%)	No Obs Flow, Measure; M Water Temp (°C) 3 5 Sthod=Wate LECTION DE	yy, unknown Isolated Po ethod = IFII pH G Grab	Field Dup YE Indiv bottle (b)	0.1cfs), 0.1-1	Specific Conductivity (uS/cm) 3 +	Salinity (ppt) Salinity (ppt) tegrated; LABEL,	Turbidity (ntu) _ID = FieldQA; Kemmer; Pol	create coll le & Beake	ection record uer; Other	
OVERLAND OBSERVED FIGIU Measu SUBSURF/MID/ BOTTOM/REP SUBSURF/MID/ BOTTOM/REP Instrument: Calib. Date: Samples:Ila SAMPLE TYPE	RUNOFF (LD FLOW: Jrements: DepthCollec (m) JS (55) Ken (# of DepthCollec	ast 24 hrs): NA, Dry Wate (Sample Ty Velocity (fps) Containers ntegrated	none, light, or serbody Bed, one in File Idl Air Temp (%)	No Obs Flow, Measure; M Water Temp (°C) 3 5 Sthod=Wate LECTION DE	yy, unknown Isolated Po ethod = IFII pH G Grab	O ₂ (mg/L) O ₂ (mg/L) Field Dup YE indiv bottle (b	0.1cfs), 0.1-1	Specific Conductivity (us/cm) 3 Type = Grab / Ir le, by bucket); Dissolved	Salinity (ppt) Salinity (ppt) tegrated; LABEL,	Turbidity (ntu)	create coll le & Beake	ection record u	

channel 20' top width 8' bottom width

Tributary of Errayson

Pyrethro. J Poshicus, Fipipegravens (XZ)

E Branch Evayson 207RODOII DSA

SSID IIDS

SWAMPE	(e)(d)(Datia\S	heek (Water	(Chemils)	y & Disoret	e (Probe) «	Eventiliyee	=() /(0)	Entered in d-l	pase (initial/date	e)		Pg	of	Pgs
*StationCode	e:		/	*Date (mm/do	i/yyyy): 02	12.8	114	*Group: CCC				*Agency:	Cocwi	0
*Funding: (46	WP_		ArrivalTime: {		DepartureTim	ie:		(1st sample):	845		*Protocol:	Burr	
	e: 030 00			*Personnel:	Sandla	Mines			aterChem WaterT		dMeas	*PurposeF		
*Location: B	ank Thalweg	Midchannel O	penWater	*GPS/DGPS	Uati((dia	kalalalda)	Lang(di	विद्यावस्थात्त्वस्थ	OCCUPATION	METHOD:	Walk-in	Bridge R/	V	Other
GPS Device: \	-6 Ven	Lan Pho-	-	Targeti	3	· -		NIZI.	STARTING BA	ANK (facing d	ownstrea	m): (IB)	RR / NA	
Datum: NAD83		Accuracy (ft / m		'/Actual!	37.19	X 26	- 124,	00045	CONTRACTOR OF THE PARTY OF THE	ltof(Sample)	STATE FROM PARTY	THE PARTY OF THE P	VAVIORE TO THE OWNER.	
	oservations odor:	(Collection				WADEABILITY: Y N / Unk	BEAUFORT SCALE (see	0	DISTANCE FROM	***************************************	STREAM	M WIDTH (i	n): 2	20
		None Sulfides				WIND	attachment):	THEROMOEN	BANK (m): CATION: NORE,	Billage, Pipes,		DEPTH (m	econito, cur	en,
SKY	407.7	Clear, Partly C				DIRECTION	W4∯≯E	AerialZipline, O			LOC	CATION (to s	ample): US /	DS/W/
	RESENCE:	Vascular, Nonv				(from): NO	1 0		RB & LB assigned				S/DS/##)	
		Bedrock, Cond				ther NOT 1	K Stor		_yyyy_mm_dd_u	100		· LUFT		
WATERO	CLARITY:	Clear (see bot	tom), Cloudy	(>4) vis), Murk	y (<4" vis)	PRECIP	ITATION:	None, Fog, D	rizzle, Rain, Sn	ow	2: (RB /	LB / BB / Ú	S/DS/##)	
WATER	RODOR:	None Sulfides	, Sewage, Pe	etroleum, Mixe	d, Other	PRECIF	PITATION (las	124 hrs):	Unknown, <1"	>1", None			0	
	COLOR:	Colorless, Gre	en, Yellow, B	rown) +UZ	413	EVIDENCE	OF FIRES:	No/<1 year,	5 years		3: (RB /	LB/BB/U	S / DS / ##)	
	D RUNOFF (L		1	noderate / hear										
Charles and the same of the sa	ED FLOW:	NA, Dry Wate	erbody Bed,	No Obs Flow,	Isolated Po	ol, Trickle (<0).1cfs), 0.1-1	cfs, 1-5cfs, 6	5-20cfs, 20-50	ofs 50-200	cfs, >200	Ocfs		
INGIUNWEAS	DepthCollec	(Sampleny)			ethod = File	eld)		Specific						
	(m)	Velocity (fps)	Air Temp (°C)	Water Temp (°C)	pН	O ₂ (mg/L)	O ₂ (%)	Conductivity (uS/cm)	Salinity (ppt)	Turbidity (ntu)				
SUBSURF/MID/ BOTTOM/REP	0-3			1207	-7.82		100.9	0,166	-					
SUBSURF/MID/ BOTTOM/REP														
SUBSURF/MID/ BOTTOM/REP														
Instrument:	155 556													
Calib, Date:	2/27/14													
Samples 1	laken (#of	eontainers:	filled) = Mi	ilhod⊨Wate	or Grab	Field Dup YE	S / NO: (Sample	eType ≠ Grab / In	tegrated; LABEL	ID = FieldQA;	create colle	ection record	upon data ent	irv
SAMPLE TYP	E: Grab / In	ntegrated	COL	LECTION DE	/ICE:				Teflon tubing; I				aport data on	
	(m)	Inorganics	Bacteria	Chl a	TSS / SSC	TOC/DOC	Total Hg	Dissolved	Total Metals	Dissolved	Organi	Toxicity	,VO	As
Sub/Surface	03				1	123000				- AND AND AND AND AND AND AND AND AND AND	163	NOX	16al	
Sub/Surface COMMENTS:											2		-	
		Ifule	From	m Ar	4.14.	十十	c ch	anne	Ivan	~ 6			Modifie	ed 02/10/11

Pyrethron Pesticides (XZ)
Pyrethron Pesticides, Figion, 1, Desiadates (XZ)

1885 N. KELLY ROAD NAPA, CA 94558 (707) 258-4000 FAX (707) 226-1001

PAGE	OF	

	AN.	ALYI	TCAL L	ABORATO	DRY	CWP-SSID / 0		2					P.O. 1	NUMBE	R				LAB ORDER #	
ADH En	dronmo	ntal	in a			REPORT AT	dro Hnatt						A	NALYS	SES R	REQUE	STED			
MAILING ADD		IIIai				Alessan		TATE:	ZIP							-		11		
3065 Po		Suite	e 101,	Soquel			C	A		95073										TURN-AROUND TIME
SAME as								rrn: dessandro Hnat			cides	les								X STANDARD
HONE NUMB			FAX	PHONE NUMB	ER:	SAMPLER (PRINT &		uessaliulo miat	·	_	Pesticides	stick		s				×		T STANDARD
831-477-	2003		83	1-477-089	5						lorine F	oids Pe	Fipronil	Degradates	тос	SSC			DUE DATE:	RUSH
CALTEST LAB #	DATE SAMPLED	5.	TIME AMPLED	SAMPLE MATRIX*	CONTAINER TYPE/ AMOUNT**	PRESERVATIVE	SAMPLE ID	ENTIFICATION / SITE	CLIENT LAB #	COMP. or GRAB	Organochlorine	Pyrethroids Pesticides		ď						REMARKS
	2.28.0	08	345	Strmwtr	2 x 1L AG	<6C	207R0	0011DS-W-01		Grab	x									
	1		1	Strmwtr	2 x 1L AG	<6C	207R0	0011DS-W-01		Grab		x	x	x						
				Strmwtr	3 x 40ml VOA	<6C, HCI	207R0	0011DS-W-01		Grab					x					
		-		Strmwtr	250 ml HDPE	<6C	207R0	0011DS-W-01		Grab						x				
		00	955	Strmwtr	2 x 1L AG	<6C	207R0	0011US-W-01		Grab	x									
			i	Strmwtr	2 x 1L AG	<6C	207R0	0011US-W-01		Grab		x	x	x						
				Strmwtr	VOA	<6C, HCI	207R0	0011US-W-01		Grab					x					
				Strmwtr	250 ml HDPE	<6C	207R0	0011US-W-01		Grab	F					x				
	RELIN	QUISHE	DBY		DATE/T	WE	RECEIVED B	Y	RELIN	QUISHED B	4				_	DA.	E/TIME			RECENED BY
					1						_					-	7			
Samples:	WC.		ORO	BIO	*	sv voa	pHP Y/N TI	EMP: SEALED:	YIN	INTACT:	Y/N					III.			Digested Meta Nondrinking V	Q = Aqueous Nondrinking Water, als; FE = Low R.L.s, Aqueous Water, Digested Metals; DW =
CC:	AA		SV	VOA			The Villa		578 Your	Not The		STE STE		171	TE.	100	100	1	"CONTAINE	er; SL = Soil Sludge, Solid ; FP = R TYPES: AL = Amber Liter; AHL
SIL:	HP		PT	ОТ	VOA												2014		(Plastic); HG B4 = 4oz. BA	r; PT = Pint (Plastic); QT = Quart = Half Gallon (Plastic); SJ = Soil CT; BT = Brass Tube; VOA = 40m
W/HNO,	Tall	H	so,		NaOHI				S. TAIL		Ha.					M			VOA: OTC - 0	Other Type Container

CHAIN-OF-CUSTODY RECORD

Pacific EcoRisk 2250 Cordelia Rd., Fairfield, CA 94534 (707) 207-7760 FAX (707) 207-7916

Client Name:	ADH Env	ironment	al						REQ	UES1	TED A	NAL'	YSIS		
Client Address:	3065 Por	ter Street	t, Suite 101						0	0					
	Soquel, C	A 95073				mn.	nia	les	tec	tec					
Phone:	831 477-	2003	FAX:			astr	lapi	pha	3 92	a az				- 4	
Project Manager:	Alessand	ro Hnatt				Chronic Selenastrum	Chronic Ceriodaphnia	Chronic Pimephales	10-day <i>Hyalella azteca</i> (water)	10-day Hyalella azteca (sediment)					
Project Name:	CCCWP	- SSID				Se	Ce	CP	Hya (wa	Hya					
Project # / P.O. Number:	030.001.0	0202				onii o	onic	roni	lay	lay (s					
		***************************************	Sample	Cor	ntainer	ਲੁ	Chr	5	0	0					
Client Sample ID	Date	Time	Matrix*	Number	Туре				ľ	`					
207R00011DS-W-01	208014	0845	STRMW	10	3.7L glass				X						
207R00011US-W-01	2.28.14	0955	STRMW	10	3.7L glass				Х						
						-	-	-						-	
						+	-	-					\dashv	+	+
						+	-	+					-	+	+
						+	-		-				-	-	+
					7	+	+						-	-	+
									1111						
Samples collected by	127:	25	soll.												1.0
Comments/Special Instructi		2	40.1	RELINQU	ISHED BY:	(Inches			REC	EIVE	D BY	' :	0.000	Name of the last	TANK TRANSPORT
				Signature	L. 1 1 :	d			Sign	natur	TI	ree	1		
	_			Print: ()	CIVILIA	and	10		Prin		1. KI	ia		ieva	3
		<u>x</u> .		Organizat		(T)		-	Ora	aniza	tion:	PI	ZN	-	
				Date: 1.	116	Tim	ne: //	u 2	_			-14	Ti	me: I	142
					ISHED BY:	1111	16.	()	REC	FIVE	D B	1.	- "	1110.	2
				Signature					-	natur					
				Print:					Prir						
				Organiza:	tion:				-		tion:				
				Date:	tion.	Tin		-	Dat		idon.		T	ime:	
				Date:		110	ie.		Dat	C.			- 1	me.	

*Example Matrix Codes: (FW = Freshwater); (SW = Saltwater); (WW = Wastewater); (STRMW = Stormwater); (SED = Sediment); or other

SWAMP F	ield Data S	heet (Water	Chemisto	y & Discret	e Probe) -	EventType	=WQ	Entered in d-	base (initial/date	e) AW A	1.4	Pg	of	Pgs
*StationCode	:54412	00025-	45-W-02	*Date (mm/do	/уууу): 02	1128	114		CCWP-		1)		cccw	
	CCCW			ArrivalTime: (DepartureTim			(1st sample):			*Protocol:	RMC	
*ProjectCode	: 030.0	01.020	2	*Personnel:					aterChem WaterT		dMeas	*PurposeFa		
		(Midchannel) O	penWater	*GPS/DGPS	Lat (do	liddddd)	Long (de	id:ddddd)	OCCUPATION	METHOD	Walk-in	Bridge R/\	/	Other
GPS Device:	i Phone			Target:	39.92	157	121-	77174	STARTING BA	ANK (facing o	downstrea	m): (LB)/ F	RB / NA	
Datum: NAD83		Accuracy (ft / m):	*Actual:			-	10111	Output Control of the	t of Sample	Name and Address of the Owner, where	THE RESERVE THE PARTY OF THE PA	CONTRACTOR OF THE PARTY OF THE	
Habitat Ob	servations	(Collection	nMethod =	Habitat ge	neric)	WADEABILITY:	BEAUFORT	1	DISTANCE		000000000000000000000000000000000000000		n): 108	>
SITE	ODOR:	None,Sulfides	Sewage Petr	oleum,Smoke,	Other_	N / Unk	SCALE (see attachment):	1	FROM BANK (m):	M		DEPTH (m		
SKY	CODE	Clear Partly C				WIND	N W4 D E	AerialZipline, O	CATION. None,	onage, ripes,	Concrete	nanner, Grade	ample): US/D	S/W/
	RESENCE:	Vascular Nonv				(from):	***	PHOTOS (RB & LB assigned	when facing	-	LB /BB /U	_	
Land Street		Bedrock, Cond			_			Ves dow	nstream; RENAM	E to				
Fr	CLARITY:	Clear (see bot					TATION		e_yyyy_mm_dd_u		2: (RB/	LB /BB / U	S /(DS)(##)	
	RODOR:		-				ITATION:		rizzle, Rain, Sn		- 1		0	
	COLOR:	None, Sulfides	_	_	d, Other		PITATION (las		Unknown, <1"	, >1", None	3: (RBV	LB// BB /\U	S / DS / ##)	
		Colorless, Gre	.,		· ·	EVIDENCE	OF FIRES:	No <1 year,	<5 years		8			
	ED FLOW:	ast 24 hrs):												
Company of the last of the las	THE RESERVE TO STREET	(SampleTyp					0.1cfs), 0.1-1	cfs, (1-5cfs)	5-20cfs, 20-50	cfs, 50-200	cfs, >20	Ocfs		000000000000000000000000000000000000000
	DepthCollec (m)	Velocity (fps)	Air Temp (°C)	Water Temp (°C)	рН	O ₂ (mg/L)	O ₂ (%)	Specific Conductivity	Salinity (ppt)	Turbidity (ntu)				
SUBSURF/MID/ BOTTOM/REP	locm			13.12	7.84	7.67		(uS/cm)	-4	()				
SUBSURF/MID/ BOTTOM/REP														
SUBSURF/MID/ BOTTOM/REP														
Instrument:														
Calib. Date:														
		containers	filled) - Me	thod=Wate	r_Grab	Field Dup YE	S NO: (Sample	eType = Grab / I	ntegrated; LABEL	ID = FieldQA	create col	ection record	upon data entr	у
SAMPLE TYP	E: Grab / I	ntegrated	COL	LECTION DE	/ICE:	Indiv bottle (b	y hand by po		Teflon tubing;					
	DepthCollec (m)	Inorganics	-Bacteria-	Chl a	TS8 / SSC	TOC/DOC	Total Hg	Mercury	Total Metals	Wetals	Organi	Toxicity	VOA	S
Sub/Surface	0				1	1						109	AW	
Sub/Surface											. X	[aal	4	
that goe	Water i ately.	levels co	nsistant road.	Approprie	h sam	pling. Non the	le Rair LB le	. collect	ted up	stream am, so	fremples	n the		ert 102/10/1

collected pyrethroids, Fipronil + degradates, organochlorius pesticides

SWAMP FI	eld Data S	heet (Water	Chemistr	y & Discret	e Probe) -	EventType	=WQ	Entered in d-l	oase (initial/dat	e) AW.MA	2-29-14	Pg	of Pg
*StationCode	: 544 ROC	0025 DS-1	V-02	*Date (mm/dd	/yyyy): Ó2	128	12014		CWD-A			*Agency: (LCWD
*Funding: (ccup			ArrivalTime:	1:20 am	DepartureTin	ne: 9:50	*SampleTime	(1st sample)	930		*Protocol:	RMC
*ProjectCode	:030.00	01.0202		*Personnel:	MA, AL) =	*Purpose (circle	e applicable : W	aterChem Water1	ox Habitat Field	iMeas	*PurposeFa	
*Location: Ba	ank Thalweg	Midchannel O	penWater	*GPS/DGPS	Lat (do	kddddd)	Long (do	dd.ddddd)	OCCUPATION	N METHOD:	Walk-in	Bridge R/V	Ot
GPS Device:	i Phone			Targeti	37.927	005	-12/.7	14414	STARTING B	ANK (facing d	ownstrea	m): (LB)/ F	RB / NA
Datum: NAD83		Accuracy (ft / m		*Actual)			-		Color Color	nt of Sample (Personal Committee of the Committee of t	CONTRACTOR CONTRACTOR STATE OF A CONTRACTOR OF
Habitat Ob	servations	(Collection	nMethod =	Habitat_ge	neric)	WADEABILITY:	BEAUFORT	1	DISTANCE		STREAM	M WIDTH (m	116"
SITE	DDOR:	None, Sulfides,	Sewage Petr	oleum,Smoke,	Other	(Y) N / Unk	SCALE (see attachment):	· t	FROM BANK (m): 1	m	WATER	DEPTH (m)	: 16"
SKYC	ODE:	Clear, Partly C	loudy Overc	ast Fog Smol	су Нату	WIND	W.e. ► E	AerialZipline, O	CATION, None,	onuge, ripes,	Concretec	manner, Grade	mple): US / DS / V
OTHER PR		Vascular, Nonv				(from): 5	1	PHOTOS (F	RB & LB assigned	d when facing	1: (RB/	LB / BB /(US	S/ DS / ##)
		Bedrock, Cond				1	٥.	Yes dow	nstream; RENAN	IE to	,		
WATERO		Clear (see bot									2: (RB /	LB) BB / US	S /(DS), ##)
WATER		None, Sulfides					PITATION (las		rizzle, Rain, Sr				0
WATER	7145	Colorless, Gre	-	7	u, Other			No) <1 year,	Unknown, <1'	,>1°, None	3: (RB /	LB BB US	S / DS / ##)
		ast 24 hrs):			an Junknown	LVIDENCE	OF FIRES.	No, <1 year,	so years				
OBSERVE						al Table (a	04-61 044	. 0					
		NA, Dry Wate (SampleTyp	ne = Field!	Measure: M	ethod = Fi	alid)	U. ICIS), U.1-1	CIS,(1-5CIS,)	5-20cis, 20-50	octs, 50-2000	cts, >20	UCIS	
	DepthCollec (m)	Velocity (fps)	Air Temp (°C)	Water Temp (°C)	pН	O ₂ (mg/L)	O ₂ (%)	Specific Conductivity (uS/cm)	Salinity (ppt)	Turbidity (ntu)			
SUBSURF/MID/ BOTTOM/REP	10cm			13.1	7.9	8.2		ill Siem)					
SUBSURF/MID/ BOTTOM/REP				1									
SUBSURF/MID/ BOTTOM/REP													
Instrument:				1									
Calib. Date:													
Samples T	aken (# of	containers	filled) - Mi	ethod⊨Wate	or Grab	Field Dup YE	ES / NO) (Sample	eType = Grab / It	ntegrated; LABEL	_ID = FieldQA;	create coll	ection record	upon data entry
SAMPLE TYP	E: Grab / Ir	ntegrated	COL	LECTION DEV	VICE:				Teflon tubing;				
	DepthCollec (m)	Inorganics	Bacteria	Chl a	TSS / SSC	TOC/DOC	-Total Hg>	-Mercury	Total Metals	Lissolved Metals	Organi	Toxicity	VOAs
Sub/Surface	m la				1							10	
Sub/Surface											. X	I gal	
from th	No fai	n while	samp own str	lang. Wa earn, abo	ter leve ive the	l maint contre	aived I channe	el. sam	nt and ples put	width.	save in	mples t	alen ely. Modified 02/1

collected Pyrethroids, F. pronil + Dogradates, Organochlorine Pesticides

1885 N. KELLY ROAD NAPA, CA 94558 (707) 258-4000 FAX (707) 226-1001

PAGE	OF

1	(al	tes	st	(CHAIN O	FCUSTODY						,						PAGE UP
1	ANA	LYTICAL	LABORAT	ORY	CWP-SSID /		02					P.O. 1	NUMBE	R				LAB ORDER #	
	vironme	ntal			Alessa	אדה: Indro Hnatt							NAL Y	SES I	REQUE	STED			
	orter St., S	Suite 101,	Soquel				STATE: ZIP	r.	95073									,	URN-AROUND TIME
Same as	s above	FA	X PHONE NUME	RED-	SAMPLER (PRINT &	SCH HAND	Alessandro Hnatt			sticides	cides		70						X STANDARD
831-477			31-477-08		SAMPLES (FRIST)	S SIGH PARKEY.				rine Pe	is Pest	Fipronil	Degradates	TOC	SSC				RUSH
CALTEST LAB#	DATE SAMPLED	TIME SAMPLED	SAMPLE MATRIX*	CONTAINER TYPE/ AMOUNT **	PRESERVATIVE	SAMPLE	IDENTIFICATION / SITE	CLIENT LAB#	COMP or GRAB	Organochlorine Pesticides	Pyrethroids Pesticides	FIE	Deg	-	65			DUE DATE:	REMARKS
	2241	1000	Strmwti	2 x 1L AG	<6C	544R	000-25 US W-02		Grab	x					Н	+	-		
	1		Strmwti	2 x 1L AG	<6C		1		Grab		x	x	x			-	+	-	
			Strmwti	VOA	<6C, HCI				Grab					x					
	+		Strmwtr	HDPE	<6C		1		Grab						x				
	22514	0930	Strmwtr	2 x 1L AG	<6C	544R	0025 D5-W 12		Grab	×									
	+		Strmwtr	2 x 1L AG	<6C	_			Grab		×	x	x						
	1	.	Strmwtr	VOA	<6C, HCI				Grab					x					
			Strmwtr	HDPE	<6C				Grab						x	7-5			
31.2																			
	RELINO	JISHED BY		DATE/T	IME	RECEIVED	ву	RELINO	DUISHED BY				•		DAT	E/TIME			RECEIVED BY
				1											/	/			
Samples	WC	MICRO	810	AA	SV VOA	pH? Y/N	TEMP: SEALED:	Y/N	INTACT:	Y/N									Aqueous Nondrinking Water FE = Low R L s, Aqueous
3D	BIO	wc	AA				COMMENTS:											Noridrinking Wa Drinking Water	fer Digestec Metals, DW = SL = Soil Shidge, Solid FP =
SIL	AA HP	SV PT	OT	VOA														500 mi Amber F (Plastic), HG = H	TYPES: AL = Amber Liter AHL = T = Pint (Plastic), OT = Quart talf Gallon (Plastic), SJ = Soil Ja
W/HNO ₃		H;SO ₂		NaOH															BT = Brass Tube, VOA = 40mL er Type Container
PIL	HNO	()	H,SO,	Na	OH	HCL												R PR	M F

CHAIN-OF-CUSTODY RECORD

Pacific EcoRisk 2250 Cordelia Rd., Fairfield, CA 94534 (707) 207-7760 FAX (707) 207-7916

Client Name:	ADI	1 En	VIVONN	Intron					REG	UES	TED AN	IALYS	IS	
Client Address:						mı	nia	So	lella	eca				
Phone:			FAX:			astru	aph	hal	Hya ter)	azt			1	
Project Manager:						leng	poi	mep	val!	Hyalella (
Project Name:	CCCW	18-59	I			Se	Cel	Pil	urvi	lyal edin				
Project # / P.O. Number:				52		Chronic Selenastrum capricornutum	Chronic Ceriodaphnia dubia	Chronic Pimephales promelas	sy S	ay f		0		1 1
Client Sample ID			Sample Matrix*	*******************************	ntainer Type	S	Chr	S	10-day Survival Hyalella azfeca (water)	10-day Hyalella azteca (sediment)				
544R0002505-W-02				10	1 gall. amber	-			Х			-	+	+
544R00025US-W-02	2-28-14	1000	STRMW	AW	Igal umber	-			X		8		-	
Samples collected by:	Samples collected by:								REC	DEIVE	D BY:			
Note - Fathead minnow testing standard EPA protocol (i.e., 4 contract # 030.0	replicates)		Print: /4 Organiza Date: 2	ISHED BY:	insc	e:15	T	Prin Org Date RE(Sign	aniza e: CEIVE natur nt:	tion: 7/28// D BY:	Han		:1520

115

SAWANNIP IE	llelldliDatar&	Sheet (Wate	iziOhemileri	av Palitinava	zadelzatan)	Fiva Gibraa	-11162	81					-
*StationCod		7 R 0 0	111112	y dicione	(e)IE) CIDE)	Eventraype	=,,,,,		base (initial/dat	te)		Pg	of Pgs
*Funding:	1/			*Date (mm/d	d/yyyy): () 3	14	117	*Group:	HUH			*Agency: ((CWP
	000		5 ED	ArrivalTime:	15,00	DepartureTin	1 11000		(1st sample):	1240		*Protocol:	MC
ProjectCod			202	*Personnel:	The state of the s	THE RESERVE THE PARTY OF THE PA		THE RESERVE OF THE PARTY OF THE	aterChem WaterT	Tox Habitat Fiel	dMeas	*PurposeFail	ure:
	sank Thalweg	Midchannel (*GPS/DGPS	Lat (do	lidddda)	Long:(di	dg:dgggg)	OCCUPATION	N METHOD:	Walk-in	Bridge RIV	Othe
GPS Device:	1-6 Ce	1 100		Tärgeti			-		STARTING B	ANK (facing o	lownstrea	m):/ LB)/ RE	3 / NA
Datum: NAD8		Accuracy (ft / n		"Actual!		5275	- 122	08150				ted then:88	
Habitat Ol	oservation	si((Golleotto	nMethod⊫	iiHabiltati gj	anerile))	WADEABILITY:	BEAUFORT	-	DISTANCE	above		M WIDTH (m)	504460000000000000000000000000000000000
SITE	ODOR:	None Sulfides	s,Sewage,Pet	roleum,Smoke	Other	Y/W/Unk	SCALE (see attachment):	9	FROW		-	DEPTH (m):	1.50
SKY	CODE:		-	ast, Fog, Smo		WIND	H	Aerial Zinline C	TURITORY, NORE.	DUDGE FIDES	Concretec	Hanney Gradeo	
	RESENCE:					DIRECTION	We⊕rE		ther Dwedly		N		iple): US/DS/W/
				Sheen,Foam,T					RB & LB assigned Instream; RENAM		1: (RB /	EB//BB//US	/ DS / ##)
		Bedrock, Con	/			ther	14	StationCod	e_yyyy_mm_dd_u	uniquecode)			
WATER	CLARITY:			(>4" vis), Murl		PRECIP	ITATION:	None, Fog, D	rizzle (Rain) Sr	now	2: (RB /	(B) BB (US)	/ DS / ##)
WATER	RODOR:	Mone, Sulfide	s, Sewage, Pe	etroleum, Mixe	d, Other	PRECIF	PITATION (las	st 24 hrs):	Unknown <1"	>1", None			
WATER	COLOR:	Colorless Gre	een, Yellow, B	Brown L		EVIDENCE	OF FIRES:	No)<1 year,	<5 years		3: (RB /	TBy BB / US	(DS) ##)
OVERLAN	D RUNOFF (ast 24 hrs):	none, light r	noderate / hea	vy, unknown						9		
Control of the last of the las	ED FLOW:	NA, Dry Wat	erbody Bed,	No Obs Flow	Isolated Po	ol, Trickle (<	0.1cfs). 0.1-1	cfs 1-5cfs	5-20cfs, 20-50	ofe 50-200	ofe >20	Nofe	
Field Meas	surements	(Sample by	pe)⊟lfleldl	Measure; M	ethode≡tH	eld)				00 200	010, -20	ocia	
	DepthCollec (m)	Velocity (fps)	Air Temp (°C)	Water Temp (°C)	pН	O ₂ (mg/L)	O ₂ (%)	Specific	Salinity (ppt)	Turbidity			
SUBSURF/MID/	77	/		Service and	7 0		1	(uS/cm)		(ntu)			
BOTTOM/REP	12	1 100	SS	14.9	1.8	10,66	101	G14.	12				
SUBSURF/MID/ BOTTOM/REP				1-11		1.00	10	7,400	1				
SUBSURF/MID/ BOTTOM/REP													
Instrument:										-	1		
Calib. Date:													
damples i	laken (# of	COntainers	(i)lled)) - Mi	thod⊨Wat	ar Chala	Field Dup YE	S / NO: (Sample	eType = Grah / Is	ntegrated; LABEL	ID = EigldOA	prosto sell	antina anno d	
SAMPLE TYP	E: (Grab / I	ntegrated		LECTION DE	- Allento Later Control Control	Indiv bottle /	whand hy no	le hy hucket):	Teflon tubing;	Kommor Dal	o P Donk	ection record up	on data entry
	DepthCollec (m)	Inorganics	Bacteria	Chl a	TSS / SSC	MOC/ DOC	Total Hg	Dissolved	Total Metals	Dissolved	Urgan	Toxicity	VOAs
Sub/Surface	12				4	1 m3 v/oa		Mercury	The motalo	Metals	CS		VOAS
Sub/Surface					-	1					1.1	JOKISH	
COMMENTS	6- M-	nala	0120	1011	V. CR.	Just to	1	4.4					
. tretre	- Darly as	s cere	~~~~	2 00 21/1-	1 24	10/0	chuser	Meder	y way	& MNEY	ardio	1000	of chain
willow	1 6400	s cale							,	+		1	
_		4					95						Modified 02/10/

80 to fee with Tri

Trib of Grayan

Pyrethron Pestades, Fip. Degravates (2K)

5510 1105, Grayson @ Ardith

Midchannel OpenWater Accuracy (ft/m): Si (GollectionMethod: None) Sulfides, Sewage, Policy (Sample Type = Field Velocity (fps) Midchannel OpenWater Accuracy (ft/m): Si (GollectionMethod: None) Sulfides, Sewage, Policy (Sample Type = Field Velocity (fps) Midchannel OpenWater Accuracy (ft/m): Si (GollectionMethod: None) Sulfides, Sewage, Policy (Sample Type = Field Velocity (fps) Midchannel OpenWater Accuracy (ft/m): Si (GollectionMethod: None) Sulfides, Sewage, Policy (Sample Type = Field Velocity (fps) Midchannel OpenWater Accuracy (ft/m): Si (GollectionMethod: None) Sulfides, Sewage, Policy (Sample Type = Field Velocity (fps) Midchannel OpenWater Accuracy (ft/m): Si (GollectionMethod: None) Sulfides, Sewage, Policy (Sample Type = Field Velocity (fps) Midchannel OpenWater Accuracy (ft/m): Si (GollectionMethod: None) Sulfides, Sewage, Policy (Sample Type (Sample Type) (Sample Type) Accuracy (ft/m): Si (GollectionMethod: None) Sulfides, Sewage, Policy (Sample Type) None) Sulfides, Sewage, Policy (S	ArrivalTime: *Personnel: C *GPS/DGPS Target: *Actual: Habitat generate, Fog, Smoky lySheen,Foam,Traitele, Gravel, Sand, Mody (>4" vis), Murky Petroleum, Mixed, , Brown Moderate / heavy d, No Obs Flow, dMeasure; Me	Lat (dd 37, 950 neric) Other Mud, Unk, Other (<4" vis) Other y, unknown Isolated Po	WADEABILITY: Y N / Unk WIND DIRECTION (from): ther PRECIPI EVIDENCE	Long (do Lon	AerialZipline, O StationCode None, Fog, D t 24 hrs): No, <1 year,	(1st sample): aterChem WaterTo OCCUPATION STARTING BA Roin DISTANCE FROM BANK (m): CATION: None, 1 ther RB & LB assigned astream; RENAMi a yyyy_mm_dd_ui vizzle) Rain, Sni Unknown, <1"	METHOD: NK (facing d t of Sample (NH) Snuge, Pipes, when facing E to niquecode) ow >1", None	Walk-in E ownstream if Integrate STREAM WATER CONCRETE OF 1: (RB / L)	m): LB / RE ed, then =88 ii // WIDTH (m): DEPTH (m):	ure: Othe 3 / NA nidbase) : Omnor, curven, ple): US / DS / W/ / DS / ##)
Midchannel OpenWater Accuracy (ft/m): S(GollectionMethod None) Sulfides, Sewage, Proceedings (See Bottom), Cloud None) Sulfides, Sewage, Pro	*Personnel: C *GPS/DGPS Target: *Actual: = Habitat_gen etroleum,Smoke,O ercast, Fog, Smoky lySheen,Foam,Tra: ble, Gravel, Sand, M dy (>4" vis), Murky Petroleum, Mixed, t, Brown t, moderate / heavy d, No Obs Flow, dMeasure; Me	Lat (dd 37. 950 neric) Other Mud, Unk, Other (<4" vis) Other y, unknown Isolated Po	MADEABILITY: WADEABILITY: WIND DIRECTION (from): ther PRECIPI EVIDENCE	Long (do Lon	*SampleTime e applicable): (Waldeddddd) 1 7 3 0 4 AerialZipline, O PHOTOS (F dow StationCode None, Fog., D t 24 hrs): (No, k1 year, walleddiddddddddddddddddddddddddddddddddd	(1st sample): aterChem WaterTo OCCUPATION STARTING BA Roin DISTANCE FROM BANK (m): CATION: None, 1 ther RB & LB assigned astream; RENAMi a yyyy_mm_dd_ui vizzle) Rain, Sni Unknown, <1"	METHOD: NK (facing d t of Sample (Nhere of Sampl	Walk-in) Bounstream if-Integrate STREAM WATER Concretect 1: (RB / L	*PurposeFailu Bridge R/V_m): LB / RE ed. then =88 ii // WIDTH (m): DEPTH (m): Hamiler, Gradec CATION (to samu LB / BB / US	Ure: Othe 3 / NA in dbase) Control, Curven, inple): US / DS / ##) // DS / ##)
Midchannel OpenWater OpenWater Accuracy (ft/m): S(GollectionMethod None Sulfides, Sewage, Policy Vascular, Nonvascular, Oil Bedrock, Concrete, Cobb Clear (see bottom), Clour (None) Sulfides, Sewage, Colorless, Green) Yellow, Last 24 hrs): none, (light NA, Dry Waterbody Bed (Sample Type = Field Velocity (fps) Air Temp	*GPS/DGPS Target: *Actual: *Actual: *Habitat_genetroleum,Smoke,Oercast, Fog, Smoky lySheen,Foam,Trable, Gravel, Sand, Marky Petroleum, Mixed, , Brown t, moderate / heavy d, No Obs Flow, dMeasure; Me	Lat (dd 37. 950 neric) Other Mud, Unk, Other (<4" vis) Other y, unknown Isolated Po	MADEABILITY: WADEABILITY: WIND DIRECTION (from): ther PRECIPI EVIDENCE	Long (do Lon	AerialZipline, O StationCode None, Fog, D t 24 hrs): No, <1 year,	OCCUPATION STARTING BA ROIN DISTANCE FROM BANK (m): CATION: NOTE: Ither RB & LB assigned astream; RENAMI Lyyyy_mm_dd_ur rizzle) Rain, Sn. Unknown, <1",	METHOD: NK (facing d t of Sample (NH) Snuge, Pipes, when facing E to niquecode) ow >1", None	Walk-in E ownstrear if Integrate STREAM WATER CONCRETE LOCK 1: (RB / L) 2: (RB / L)	Bridge R/V_m): LB / RB ed, then -88 in M WIDTH (m): DEPTH (m): name, gradec CATION (to samue) B/ BB / US	Others / NA / NA / Na / NA / NA / NA / NA / NA
Accuracy (ft/m): S:(GollectionMethod (None) Sulfides, Sewage, Proceedings of the Color of the C	Target: "Actual: "Habitat_gen etroleum,Smoke,O ercast, Fog, Smoky lySheen,Foam,Trasole, Gravel, Sand, M dy (>4" vis), Murky Petroleum, Mixed, , Brown t, moderate / heavy d, No Obs Flow, dMeasure; Me	37. 950 neric:) Other	WADEABILITY: Y N / Unk WIND DIRECTION (from): ther PRECIPI EVIDENCE	BEAUFORT SCALE (see attachment): WALLE (SEE ATTACHMENT): TATION: OF FIRES:	AerialZipline, O PHOTOS (F dow StationCode None, Fog, (D t 24 hrs):	DISTANCE FROM BANK (m): CATION: NONE; ther RB & LB assigned instream; RENAMi a yyyy_mm_dd_ui rizzle) Rain, Sni Unknown, <1"	when facing E to niquecode)	OWNSTREAM STREAM WATER CONCRETE LOC 1: (RB / L	M): LB / RE ed, then =88 if M WIDTH (m): DEPTH (m): Tamiler, Gradeo ATION (to sam AB / BB / US LB / BB / US	nidbase) control, Curven, ple): US / DS / W/ / DS / ##)
Accuracy (ft / m): s (GollectionMethod None) Sulfides, Sewage, Policy Clear, Partly Cloudy) Over Vascular, Nonvascular, Oil Bedrock, Concrete, Cobb Clear (see bottom), Clour (None) Sulfides, Sewage, Colorless, Green) Yellow, Last 24 hrs): none, (light NA, Dry Waterbody Bed (Sample Type = Field Velocity (fps) Air Temp	*Actual: # Habitat_gen retroleum,Smoke,O ercast, Fog, Smoky lySheen,Foam,Trasole, Gravel, Sand, M dy (>4" vis), Murky Petroleum, Mixed, , Brown t, moderate / heavy d, No Obs Flow, dMeasure; Me	neric) Other , Hazy sh,Other (e) Mud, Unk, Ot (<4" vis) , Other y, unknown Isolated Po	WADEABILITY: Y N / Unk WIND DIRECTION (from): ther PRECIPI PRECIPI EVIDENCE	BEAUFORT SCALE (see attachment): WHEE TATION: PITATION (last of FIRES:	AerialZipline, O PHOTOS (F dow StationCode None, Fog, D t 24 hrs):	Roin DISTANCE FROM BANK (m): CATTON: None, 1 ther RB & LB essigned instream; RENAMi gyyyy_mm_dd_ui rizzle) Rain, Sni Unknown, <1" 5 years	when facing E to niquecode)	STREAM WATER CONCRETE LOC 1: (RB / L) 2: (RB / L)	M WIDTH (m): DEPTH (m): Tamer, oracec CATION (to same	ridbase): : : : : : : : : : : : : : : : : : :
None Sulfides, Sewage, Policies, Concrete Cobb Clear (see bottom), Clour (None) Sulfides, Sewage, Colorless, Green; Yellow, Last 24 hrs): none, light NA, Dry Waterbody Bed (Sample Type = Field Velocity (fps) Air Temp	etroleum,Smoke,Oercast, Fog, Smoky lySheen,Foam,Trasole, Gravel, Sand, Murky Petroleum, Mixed, , Brown t, moderate / heavy d, No Obs Flow, dMeasure; Me	neric) Other , Hazy sh,Other (e) Mud, Unk, Ot (<4" vis) , Other y, unknown Isolated Po	WADEABILITY: Y N / Unk WIND DIRECTION (from): ther PRECIPI PRECIPI EVIDENCE	BEAUFORT SCALE (see attachment):	AerialZipline, O AAPHOTOS (F dow StationCode None, Fog, (D t 24 hrs):	Roin DISTANCE FROM BANK (m): CATTON: None, 1 ther RB & LB essigned instream; RENAMi gyyyy_mm_dd_ui rizzle) Rain, Sni Unknown, <1" 5 years	when facing E to niquecode)	STREAM WATER CONCRETE LOC 1: (RB / L) 2: (RB / L)	M WIDTH (m): DEPTH (m): Tamer, oracec CATION (to same	ridbase): : : : : : : : : : : : : : : : : : :
None Sulfides, Sewage, Porchago Clear, Partly Cloudy Over Vascular, Nonvascular, Oil Bedrock, Concrete Cobb Clear (see bottom), Cloud None Sulfides, Sewage, Colorless Green, Yellow, Last 24 hrs): none, (light NA, Dry Waterbody Bed Sample Type = Field Velocity (fps) Air Temp	etroleum,Smoke,O ercast, Fog, Smoky lySheen,Foam,Trasole, Gravel, Sand, M dy (>4" vis), Murky Petroleum, Mixed, Brown t, moderate / heavy d, No Obs Flow, dMeasure; Me	Other	WIND DIRECTION (from): ther PRECIPI EVIDENCE	SCALE (see attachment): WHEN TATION: PITATION (last OF FIRES:	PHOTOS (i dow StationCode None, Fog,(D t 24 hrs):	FROM BANK (m): CATTON: NOTE: ther RB & LB assigned instream; RENAMe yyyyymm_dd_ui rizzle) Rain, Sni Unknown, <1",	when facing E to niquecode) ow >1", None	WATER Concreted LOC 1: (RB / L	DEPTH (m): namer, Gradec CATION (to sam UB)/ BB / US	O 3 nonito, cuiven, nple): US/DS/WI/ (DS/##)
Clear, Partly Cloudy) Ove Vascular, Nonvascular, Oil Bedrock, Concrete, Cobb Clear (see bottom), Cloud None) Sulfides, Sewage, Colorless, Green, Yellow, ast 24 hrs): none, (light NA, Dry Waterbody Bed (Sample Type = Field Velocity (fps) Air Temp	ercast, Fog, Smoky lySheen,Foam,Tra- ole, Gravel, Sand, M dy (>4" vis), Murky Petroleum, Mixed, Brown t, moderate / heavy d, No Obs Flow, dMeasure; Me	Mud, Unk, Other (<4" vis) , Other , unknown Isolated Po	WIND DIRECTION (from): ther PRECIPI PRECIPI EVIDENCE	attachment): W TATION: PITATION (last	PHOTOS (i dow StationCode None, Fog,(D t 24 hrs):	BANK (m): CATION: None, 1 ther RB & LB assigned instream; RENAME is yyyy_mm_dd_ui irizzle) Rain, Sni Unknown, <1",	when facing E to niquecode) ow >1", None	1: (RB / L	ATION (to samuel) BB / US	Onrio, Caiven, ple): US / DS / (Wi / y DS / ##)
Vascular, Nonvascular, Oil Bedrock, Concrete, Cobb Clear (see bottom), Cloud None) Sulfides, Sewage, Colorless, Green, Yellow, ast 24 hrs): none, light NA, Dry Waterbody Bed (Sample Type = Hieli Velocity (fps) Air Temp	lySheen,Foam,Trai ole, Gravel, Sand, M dy (>4" vis), Murky Petroleum, Mixed, Brown t, moderate / heavy d, No Obs Flow, dMeasure; Me	Mud, Unk, Ot (<4" vis) , Other y, unknown Isolated Po	DIRECTION ((from): ther	ITATION: PITATION (last	PHOTOS (i dow StationCode None, Fog,(D t 24 hrs):	ther RB & LB assigned instream; RENAMe yyyyy_mm_dd_ui rizzle) Rain, Sni Unknown,(<1",	when facing E to niquecode) ow >1", None	1: (RB / L	CATION (to samu (B)/ BB / US LB / BB / US	Onrio, Caiven, ple): US / DS / (Wi / y DS / ##)
Vascular, Nonvascular, Oil Bedrock, Concrete, Cobb Clear (see bottom), Cloud None) Sulfides, Sewage, Colorless, Green, Yellow, ast 24 hrs): none, light NA, Dry Waterbody Bed (Sample Type = Hieli Velocity (fps) Air Temp	lySheen,Foam,Trai ole, Gravel, Sand, M dy (>4" vis), Murky Petroleum, Mixed, Brown t, moderate / heavy d, No Obs Flow, dMeasure; Me	Mud, Unk, Ot (<4" vis) , Other y, unknown Isolated Po	therPRECIPI PRECIPI PRECIPI EVIDENCE	ITATION: PITATION (last	StationCode None, Fog,(D t 24 hrs): No, <1 year,	nstream; RENAMi s_yyyy_mm_dd_ui rizzle) Rain, Sni Unknown,(<1",	E to niquecode) ow 3>1", None	1: (RB / L	LB / BB / US	(DS/##)
Bedrock, Concrete, Cobb Clear (see bottom), Cloud None) Sulfides, Sewage, Colorless Green, Yellow, Last 24 hrs): none, (light NA, Dry Waterbody Bed (Sample Type = Field Velocity (fps) Air Temp	ole, Gravel, Sand, Murky dy (>4" vis), Murky Petroleum, Mixed, Brown moderate / heavy d, No Obs Flow, dMeasure; Me	Mud, Unk, Ot (<4" vis) , Other y, unknown Isolated Po	PRECIPI PRECIPI PRECIPI EVIDENCE	OF FIRES:	StationCode None, Fog,(D t 24 hrs): No, <1 year,	nstream; RENAMi s_yyyy_mm_dd_ui rizzle) Rain, Sni Unknown,(<1",	E to niquecode) ow 3>1", None	2: (RB / L	LB / BB /ÚS	(DS/##)
Clear (see bottom), Cloud (None) Sulfides, Sewage, Colorless Green; Yellow, ast 24 hrs): none, light NA, Dry Waterbody Bed (Sample Type = Field Velocity (fps) Air Temp	dy (>4" vis) Murky Petroleum, Mixed, Brown t, moderate / heavy d, No Obs Flow, dMeasure; Me	(<4" vis) Other y, unknown Isolated Po	PRECIPION PRECIP	OF FIRES:	None, Fog, D t 24 hrs): No, <1 year,	Vizzle) Rain, Sn Unknown, <1", 5 years	ow >1", None			
None Sulfides, Sewage, Colorless Green, Yellow, Last 24 hrs): none, (light NA, Dry Waterbody Bed (Sample Type = Field Velocity (fps) Air Temp	Petroleum, Mixed, Brown moderate / heavy d, No Obs Flow, dMeasure; Me	Other	PRECIF EVIDENCE	OF FIRES:	t 24 hrs): No, <1 year,	Unknown (<1") <5 years	>1", None			
Colorless Green, Yellow, ast 24 hrs): none, light NA, Dry Waterbody Bed (Sample Type = Heli Velocity (fps) Air Temp	, Brown t, moderate / heavy d, No Obs Flow, dMeasure; Me	y, unknown Isolated Po	EVIDENCE	OF FIRES:	No, <1 year,	<5 years		3: (RB / I	LB/BB/US	/DS/##)
NA, Dry Waterbody Bed (Sample Type = Field Velocity (fps) Air Temp	moderate / heavy d, No Obs Flow, dMeasure; Me	Isolated Po	ol, Trickle (<0						200200000	
NA, Dry Waterbody Bed (SampleType = Field Velocity (fps) Air Temp	d, No Obs Flow,	Isolated Po).1cfs), (0.1-1	cfs 1-5cfs,	5-20cfs 20-50				
(SampleType = Field	dMeasure; Me			J. ICIS), (U.1-1	CIS/ 1-DCIS,					
Velocity (fps) Air Temp		Charles Company of the Company of th				20013, 20-001	crs, 50-2000	ns, >200	CIS	
(°C)	Water Temp (°C)	рН	O ₂ (mg/L)	O ₂ (%)	Specific Conductivity	Salinity (ppt)	Turbidity (ntu)			
100	15,59	8,2	11.62	116.1	0.295	0.14				
								1		-
	Method⊨Water	r_Grab	Field Dup YE	S (NO) (Sample	eType (Gray) / Ir	tegrated; LABEL_	ID = FieldQA;	create colle	ection record up	oon data entry
ntegrated Co	OLLECTION DEVI	ICE:	Indiv bottle (b	y hand, by po	le, by bucket);	Teflon tubing; k	(emmer; Pole	& Beake	r; Other	
Inorganics Bacteria	Chl a	TSS (SSO	(LOC) DOC	Total Hg	Dissolved	Total Metals	Dissolved	Organi	Toxicity	VOAs
			1		-			4	ef	
		250 m	3 +40						10×130	
	ntegrated C	ntegrated COLLECTION DEV	Inorganics Bacteria Chl a TSS SSO	ntegrated COLLECTION DEVICE: Indiv bottle (b Inorganics Bacteria Chl a TSS SSO (TOC) DOC	Inorganics Bacteria Chl a TSS SSO TOCY DOC Total Hg	ntegrated COLLECTION DEVICE: Indiv bottle (by hand, by pole, by bucket); Inorganics Bacteria Chl a TSS SSO TOCY DOC Total Hg Dissolved Mercury	ntegrated COLLECTION DEVICE: Indiv bottle (by hand, by pole, by bucket); Teflon tubing; K Inorganics Bacteria Chl a TSS SSO TOC DOC Total Hg Dissolved Mercury Total Metals	ntegrated COLLECTION DEVICE: Indiv bottle (by hand, by pole, by bucket); Teflon tubing; Kemmer; Pole Inorganics Bacteria Chl a TSS SSC TOCY DOC Total Hg Dissolved Mercury Total Metals Dissolved Metals	ntegrated COLLECTION DEVICE: Indiv bottle (by hand, by pole, by bucket); Teflon tubing; Kemmer; Pole & Beake Inorganics Bacteria Chl a TSS SSO TOCY DOC Total Hg Dissolved Mercury Total Metals Dissolved Metals CS	Inorganics Bacteria Chl a TSS SSO TOCY DOC Total Hg Dissolved Mercury Total Metals Dissolved Dissolved Metals Dissolved Metals Dissolved Metals Dissolved Metals Dissolved Metals Dissolved Dissolved Dissolved Metals Dissolved Dissolv

Pyrethroid Pesticules, Figranil, Begradates (KZ)

1885 N. KELLY ROAD NAPA, CA 94558 (707) 258-4000 FAX (707) 226-1001

PAGE

CLLLI ROAD WATA, CA 24000	(101) 230-4000	17th (101) 220
CHAIN OF CLISTODY		

1		all	res			HAIN OF CUSTODY											
-	ANA	LYTICAL L	ABORAT	ORY	CAMP COLD /						P.U. 1	NOMBE	R				LAB ORDER # POTING
CLIENT:					CWP-SSID / (1	_		_	_				1001-07
	vironmer	ital			Alessar	ndro Hnatt					2	MALY	SES F	REQUE	STED		
MAILING ADI		uite 101,	Canual			STATE: ZF	9	05070		hr I					1	10	
BILLING ADD		outle 101,	Soquei			CA ATTN:		95073								31.1	TURN-AROUND TIME
same as						Alessandro Hnatt			Pesticides	cides						41	X STANDARD
PHONE NUM 831-477			PHONE NUMB 1-477-089		SAMPLER (PRINT &	SIGN NAME):			Pes	esti	7	ates					RUSH
001-111	-2000	00		23					orine	ds F	Fipronil	Degradates	TOC	SSC		11	DUE DATE:
CALTEST LAB#	DATE SAMPLED	TIME SAMPLED	SAMPLE MATRIX	CONTAINER TYPE! AMOUNT**	PRESERVATIVE	SAMPLE IDENTIFICATION / SITE	CLIENT LAB #	COMP. or GRAB	Organochlorine	Pyrethroids Pesticides	Œ.	Dec					DUE DATE:
- · · · · ·	3-26-14	12:10		2 x 1L AG	<6C	207R00011DS-W-01		Grab	x								
Part.		1	Strmwtr	2 x 1L AG	<6C	207R00011DS-W-02		Grab		x	x	x					
			Strmwtr	3 x 40ml VOA	<6C, HCI	207R00011DS-W-02		Grab					x		7		
137			Strmwtr	250 ml	<6C	207R00011DS-W-01		Grab						x			-
71	12.0	17:19	Strmwtr	2 x 1L AG	<6C	207R00011US-W-01_		Grab	x								
	(Kr		Strmwtr	2 x 1L AG	<6C	207R00011US-W-01		Grab		x	x	x					
			Strmwtr	3 x 40ml VOA	<6C, HCI	207R00011US-W-01_		Grab	Т				x		1		
The same			Strmwtr	250 ml	<6C	207R00011US-W-01		Grab						x	T		
										П					T	T	
						1 9 less Carbo	4										
dia							1										
NOT THE																	
1	RELING	JISHED BY		DATE/T	TIME	A RECEIVED BY	RELIN	DUISHED BY	Y					DA	TE/TIME		RECEIVED BY
1/2	Utr.	-		3/20/	517	HILL									/		
				11/	,										/		
Samples:	WC BIO	MICRO WC	BIO	AA	SV VOA	pH7 Y/N TEMP: SEALED:	Y/N	INTACT:	Y/N		22.0						*MATRIX: AQ = Aqueous Nondrinking Water, Digested Metals; FE = Low R.L.s, Aqueous Nondrinking Water, Digested Metals; DW =
CC:	AA	sv	VOA			COMMENTS: -			N.				172		441	1011	Drinking Water; SL = Soil Sludge, Solid ; FP = "CONTAINER TYPES: AL = Amber Liker; AHL:
SIL;	HP	PT	QT	VOA			71	4110		15				100			500 ml Amber; PT = Pint (Plastic); QT = Quart (Plastic); HG = Haif Gallon (Plastic); SJ = Soil Ji B4 = 4oz. BACT; BT = Brass Tube; VOA = 40mL
W/HNO,	1491	H ₂ SO ₄		NaCH	Mar- Sal					37							VOA: OTC - Other Type Container
PIL;	HNO ₃		4,50,	N	NOH .	HCL						170		111	W		B DD M E

CHAIN-OF-CUSTODY RECORD

Pacific EcoRisk 2250 Cordelia Rd., Fairfield, CA 94534 (707) 207-7760 FAX (707) 207-7916

Client Name:		,							REQI	JESTE	D ANA	LYSIS		
Client Address:	A 30	DH GSP	FAX:	5 + 5€	ile lo/	Chronic Selenastrum capricornutum	Chronic Ceriodaphnia dubia	Chronic Pimephales promelas	Hyalella ter)	10-day Hyalella azteca (sediment)				
Project Manager:						len	riod	mer	ay Survival Hya azteca (water)	Hyalella (sediment)				
Project Name:	ecci	V 155	GIG	730. N	01.0202	Serico	9 5	C Pi	urv	Lya				
Project # / P.O. Number:		1.1.2				cap	onic	roni	ay S	(s				
Client Sample ID	Sample Date	Sample Time	Sample Matrix*	Co Number	ntainer Type	ਹਿੰ	ਨੁ	ပ်	10-d	10-6				
2018000105-W-0	3-26-17	COS 24	STRMW	10	1 gall, ambe	_			Х					
201800011 US-W-01	3-16-6	1240	STRING	10	Isal Andre	-				-	-			
	-			-		+-	-	-			-	-		-
	-				-	+							\vdash	_
	-		-		-	-	1				1			-
Samples collected by		-						N. C.	A.P.					
Comments/Special Instructi				RELINQL	JISHED BY:	BER STA	ol	and the second second	REC	EIVE	BY:			
Note - Fathead minnow testing	g is to be p	performe	d using the	Signature	: Lork	De		_	Sign	nature:	20	Long	'_	-
standard EPA protocol (i.e., 4	replicates	()		Print: L	EAS AL	DIN	68	R	Prin	t: Y.,	Cha	di	yeur	7
				Organiza		+			Org	anizati	ion: /	ER	-	
				Date: 3	26-14	Tim	ne:/6	60	Date	a: 3/	26/1	4	Time:	1600
				RELING	JISHED BY:				REC	EIVE	BY:			,
				Signatur	e:				-	nature	:			2.0
				Print:					Prin					
				Organiza	ition:			-	-	anizat	ion:			
				Date:		Tin	ne:		Dat	6;			Time:	

^{*}Example Matrix Codes: (FW = Freshwater); (SW = Saltwater); (WW = Wastewater); (STRMW = Stormwater); (SED = Sediment); or other

* New station code 544M5HOGZ

nown stepan location near 1007 Clescent Dr. Bientwood SWAMP Field Data Sheet (Sediment Chemistry) - EventType=WQ Entered in d-base (initial/date) *StationID: 544 R00025 *Date (mm/dd/yyyy): 07 / 22 *Agency: ADH CCOW 12014 *Group: CCWP Protocol: RMC *Funding: ArrivalTime: DepartureTime: 1,00 *SampleTime (1st sample): 10:15 *Purpose (circle applicable) SedChem SedTox Habitat Benthic (, Smakin *ProjectCode: *PurposeFailure: *Personnel: *Location: Bank Thalweg Midchannel OpenWater Lat (dd.ddddd) Long (ddd.ddddd) OCCUPATION METHOD: Walk-in Bridge R/V Other *GPS/DGPS 37.92300 121-71441 GPS Device: Verizon Lucid cell Phone Target: STARTING BANK (facing downstream) (LB) RB / NA 92288 Point of Sample (if Integrated, then -88 in dbase) - 121-71410 *Actual! Same as Water/Probe Collection? YES NO Datum: NAD83 Accuracy (ft/ m): [Q STREAM WIDTH (m): DISTANCE 1 -Habitat Observations (CollectionMethod = FROM BEAUFORT WATER DEPTH (m): Habitat generic) "Only complete Sed Observations (bolded) if WQ WADEABILITY: SCALE BANK (m): N / Unk Observations are already recorded see Attachtment HYDROMODIFICATION: None, Bridge, Pipes, ConcreteChannel, SITE ODOR: None, Sulfides, Sewage, Petroleum, Smoke, Other GradeControl, Culvert, AerialZipline, Other WIND LOCATION (to sample): (US / DS / WI / NA SKY CODE: Clear, Partly Cloudy, Overcast, Fog, Smoky, Hazy DIRECTION PHOTOS (RB & LB assigned when facing 1: (RB (LB) BB (US) DS / ##) (from): OTHERPRESENCE: Vascular, Nonvascular, OilySheen, Foam, Trash, Other downstream; RENAME to DOMINANTSUBSTRATE: Bedrock, Concrete, Cobble, Boulder, Gravel, Sand, Mud. Unk, Other StationCode yyyy mm_dd_uniquecode): 465 2: (RB(/LBY BB / US / DS)/##) SEDODOR: None, Sulfides, Sewage, Petroleum, Mixed, Other PRECIPITATION: None, Fog, Drizzle, Rain, Snow SEDCOLOR: Colorless, Green, Yellow, Brown PRECIPITATION (last 24 hrs): Unknown, <1", >1", None 3: (RB / LB / BB / US / DS / ##) Silt/Clay, FineSand, CoarseSand, Gravel, Cobble, Mixed, HardPanClay EVIDENCE OF FIRES: SEDCOMPOSITION: No, k1 years, <5 years OBSERVED FLOW: NA, Dry Waterbody Bed, No Obs Flow, Isolated Pool, (Trickle (<0.1cfs)) 0.1-1cfs, 1-5cfs, 5-20cfs, 20-50cfs, 50-200cfs, >200cfs Samples Taken (# of containers filled) - Method=Sed Grab Field Dup YES \NO:)(SampleType = Grab / Integrated; LABEL_ID = FieldQA; create collection record upon data entry Scoop (SS / PC / PE) Core (SS / PC / PE), Grab (Van Veen / Eckman / Petite Ponar) COLLECTION DEVICE: COLLECTION DEVICE AREA (m2): Sample DepthCollec Benthic Coll. Equipment Sediment Grain Archive Benthic Sieve Size Metals/HgT Organics Selenium Toxicity SWI Type: (cm) Used Only (Y / N) Size/TOC Chemistry Infauna Area (m2) (mm) Integrated 3 Grab Integrated Grab Integrated Grab Integrated Grab down steem location for SSID Study #1 Pyrethroids, fipronil and degredates
used trypur conted bucket and scoop #3 percent solids COMMENTS: Sample taken (a) 10:15 Modified 06/27/08

* New station code 544M5H065 544M5H062

Down sterm Location

StationID:	544	R 0 0 0	25	*Date (mm/dd	/ww): 0 7	112	10.114		711			5	
	CCC	1./ D				V V V	12014	*Group: A	DH .O.	15		*Agency:	+ DH CCCW
ProjectCode		no L		ArrivalTime:	9:30	DepartureTim	ne: (1)00	*SampleTime	(1st sample):	47.4	5-	*Protocol:	CCCWPRI
	r.			*Personnel:	.cerruh', C.				aterChem WaterT	ox Habitat Field	dMeas	*PurposeFa	lure: A
Location: B	ank Thalweg	(Midchannel O	penWater	*GPS/DGPS	Lat (dd	.ddddd)	Long (do	ld.ddddd)	OCCUPATION	METHOD:	Walk-in	Bridge R/V	Ot
SPS Device:	Verizon L	wid cell	phone	Target:	- 37.92	300	- 121-7	1441	STARTING BA	NK (facing d	lownstrea	m): (LB) R	B / NA
atum: NAD83	3	Accuracy (ft) m): (8	*Actual:	37.92	-288	- 121	H410 _	Poin	t of Sample ((if Integra	ted, then -88	in dbase)
Habitat Ob	servations	(Collection	Method =	Habitat_ge	eneric)	WADEABILITY:	BEAUFORT	12-31	DISTANCE()	5	STREAM	M WIDTH (m): /
SITE	DDOR:	None Sulfides	Sewage, Pet	roleum,Smoke,	Other	Y) N / Unk	SCALE (see attachment):	7	FROM BANK (m):		WATER	DEPTH (m)	0-25
SKYC	ODF:	Clear Partly C	loudy Overo	ast, Fog, Smok	v Hazv	WIND	W4 De E	HYDROMODIF AerialZipline, O	ICATION: None, I	Bridge, Pipes, (Control, Culvert, nple): US DS / V
OTHER PE		Vascular, Nonv				DIRECTION (from):	***		RB & LB assigned	when facing		LB BB /(US	
		Bedrock, Cond			/		4	200	nstream; RENAM e_yyyy_mm_dd_ur		res		
	CLARITY:						ITATION:				/	LB BB / US	(DSV ##)
F 73-1	1	Clear (see bot					ITATION:	-	rizzle, Rain, Sn		-		0
0.75	COLOR:	Colorless. Gre		etroleum, Mixed	i, Otner	- 0.00	OF FIRES:		Unknown, <1",	>1", None	3: (RB/	LB/ BB/ US	5 / DS / ##)
ield Meas	DepthCollec (m)	(SampleType Velocity (fps)	Air Temp (°C)	Water Temp (°C)	ethod = Fi	O ₂ (mg/L)	O ₂ (%)	Specific Conductivity	Salinity (ppt)	Turbidity (ntu)			
SUBSURF/MID/ BOTTOM/REP	4 inches	13545		21.66	7,80	5.28DO	60-6	1592	3.86				
SUBSURF/MID/ BOTTOM/REP													
SUBSURF/MID/ BOTTOM/REP													
Instrument:	YS1 556												
Calib. Date:	41-22-60												
Samples T	aken (# of	containers	filled) - M	ethod=Wate	er_Grab	Field Dup YE	S / NO: (Sample	Type = Grab / In	tegrated; LABEL_	ID = FieldQA;	create colle	ection record u	oon data entry
	E: Grab / I		COI	LECTION DEV					Teflon tubing; h				1
	DepthCollec	Inorganics	Bacteria	Chia	TSS/SSC	TOC / DOC	Total Hg	Dissolved	Total Metals	Dissolved	Organi	Toxicity	VOAs
Sub/Surface													
Sub/Surface				. 11									
OMMEN 19:	, Sinny o	and Casually	Paining [very ishtra	(V)	V.		1,706 1	15/6	4-1	5.11	Mac Cole	conents onl

* New station code 544MSH065

AAAAIII	ield Data S	heet (Sedi	ment Chem	istry) - Eve	ntType=W	Q		Entered in d-l	oase (initial/d	ate)		Pg o	f 2 Pg
StationID:	544	ROOL	025	*Date (mm/do	d/yyyy):07	122	12014	*Group:	+DH			*Agency:	Distru
Funding:	222	WP		ArrivalTime:	11:10	DepartureTim	e: 12.00	*SampleTime	(1st sample)): 11:45		*Protocol: Pa	MC
ProjectCod	e:			*Personnel:	1. cerui, a	Santlin	*Purpose (circle	applicable)(Se	dChem SedT	ox Habitat Bent	hic	*PurposeFailu	ire:
_ocation: E	Bank Thalweg	Midchannel	OpenWater	*GPS/DGPS	Lat (do	liddddd)	Long (dd	ld(ddddd)	OCCUPATION	ON METHOD:	Walk-in Brid	ge R/V	Othe
PS Device:	100000	av a	- 1	Target:	37.92	57	- 121-7	+2174	STARTING	BANK (facing of	ownstream):	LB / RB / NA	4
o bevice.	Verizon L	ucid cel	phone	*Actual:	37,9	21,689	- 121 7	2700	IF.	oint of Sample	(if Integrated,	then -88 in dba	se)
atum: NAD8	3	Accuracy (ft) n	n): [8	S	ame as Wate	r/Probe Collect			DISTANCE	0 75	STREAM W	IDTH (m): 15)
abitat_g	bservations eneric) **on are already reco	ly complete Se	nMethod = d Observations	bolded) If WQ		WADEABILITY:	BEAUFORT SCALE see	2	DISTANCE FROM BANK (m):	V. +3	WATER DE		ES CM
	ODOR:	- Control	s,Sewage,Petro	oleum,Smoke	Other	O.	Attachtment					Pipes, Concrete	
SKY	CODE:	Clear Partly	Cloudy, Overca	st, Fog, Smol	ky, Hazy	WIND DIRECTION	W◆⊕►E			ol, Culvert, Aeri (to sample): U			
OTHERP	RESENCE:	VasculariNor	vascular, OilyS	heen,Foam,Ti	rash,Other_	(from): N	Š		RB & LB assign	ned when facing	1: (RB / LB)	BB / USY DS /	##)
OMINANT	SUBSTRATE:	Bedrock, Cor	ncrete, Cobble,	Boulder, Grav	vel, Sand, Muc	Unk, Other_		2.50	e_yyyy_mm_dd				
SED	ODOR:	None, Sulfide	Sewage, Pe	troleum, Mixe	d, Other	PRECIP	TATION:	None, Fog, D	rizzle Rain	Snow	2: (RB /LB)	BB / US DS/	##)
SEDO	OLOR:	Colorless, Gr	een, Yellow, B	rown Block)		PRECIP	PITATION (last	t 24 hrs):	(Unknown) <	1", >1", None	0		
SEDCOM	POSITION:	Silt/Clay, Fine	eSand, Coarse	Sand, Gravel,	Cobble, Mixed	d, HardPanClay	EVIDENCE	OF FIRES:	No <1 year	rs, <5 years	3: (RB / LB)	BB US / DS /	##)
OBSERV	ED FLOW:	NA, Dry Wate	erbody Bed, No	Obs Flow, Is	olated Pool, T	rickle (<0.1cfs)	0.1-1cfs, 1-5	cfs, 5-20cfs, 2	0-50cfs, 50-2	200cfs, >200cfs			
amples	Taken (# of	containers	s filled) - Me	thod=Sed	Grab	Field Dup YE	S / NO: (Sample	eType = Grab / Ir	tegrated; LABE	EL_ID = FieldQA;	create collection	record upon data	entry
COL	LECTION DE	/ICE:	Scoop (SS / F	C (PE, Core	(SS/PC/PE), Grab (Van V	een / Eckman	/ Petite Ponar)	COLLECTIO	N DEVICE AF	REA (m2):	
Sample Type:	DepthCollec (cm)	Equipment Used	Sediment Only (Y / N)	Grain Size/TOC	Organics	* Z -Metals/HgT	X 3 Selenium	Toxicity	SWI	Archive Chemistry	Benthic Infauna	Benthic Coll. Area (m²)	Sieve Siz (mm)
Integrated Grab				- F	7	2	1	3					
Integrated Grab													
Integrated Grab													
Integrated													
								-6.4	1	-1	_ x	1	1
Grab OMMENTS		1			D. Stu	1	× 1	Purethr	ords. F	ipromit/	and di	egredate	25

* New station code 544 MSH065 upstream location

	ield Data S		The state of the s		and the state of the state of	The state of the s	ATAL MINISTER PROPERTY.	Entorou in a c	pase (initial/date	-1		Pg 7	of 2 Pg
StationID:	5441	000	25	*Date (mm/dd	(yyyy): 07	122	12014	*Group: A	-DH			*Agency:	ART CCCW
Funding: 1	CCCV	VP_		ArrivalTime:	WID	DepartureTim	ie: 12',00	*SampleTime	(1st sample):	10:15	11:45	*Protocol:	RMC
ProjectCode	e:			*Personnel:	1. Cerruti, C.	Soullin	*Purpose (circl	e applicable): Wa	aterChem WaterT	ox Habitat Field	Meas '	*PurposeFa	ailure:
Location: B	Bank Thalweg	Midchannel O	penWater	*GPS/DGPS	Lat (dd	.ddddd)	Long (d	ddiadddd)	OCCUPATION	METHOD:	Walk-in I	Bridge R/\	/Ot
GPS Device:				Target:	37-921	57	- 121.7	2174	STARTING BA	NK (facing d	ownstrear	m): LB / I	RB / NA
Datum: NAD8	3	Accuracy (ft/m):	*Actual:	35,921	689	-191.7	72200	Poin	t of Sample (if Integrate	ed, then -8	3 in dbase)
Habitat Ob	servations	(Collection	iMethod =	Habiltat_ge	neric)	WADEABILITY:	BEAUFORT		DISTANCE	7	STREAM	MWIDTH (n	1): 1.5
SITE	ODOR:	None, Sulfides,	Sewage,Pet	roleum,Smoke,	Other	Y) N / Unk	SCALE (see attachment):		FROM BANK (m):	1 15	WATER	DEPTH (m	S. B. Actes 1
SKY	CODE:	Clear, Partly C	loudy Overo	ast, Fog, Smok	ky, Hazy	WIND DIRECTION	W ∢ E	HYDROMODIFI AerialZipline, Ot		Bridge, Pipes, (ConcreteCh	annel, Grade	Control Culvert DS / W
OTHER PI	RESENCE:	Vascular, Nonv				(from): N	Š		RB & LB assigned				S/ DS / ##)
		Bedrock, Cond							nstream; RENAM e_yyyy_mm_dd_ui				~
	A second second	Clear (see bot	_		-		ITATION:		rizzle, Rain, Sn		2: (RB /(I	LB/I BB / U	S /(DS) ##)
	RODOR:			etroleum, Mixed			PITATION (las		Unknown <1",				
	-				5, Other			No, k1 year,		-1 , None	3: (RB (I	LB BBY U	S / DS / ##)
OVERLAN	ED FLOW:	Colorless, Gre ast 24 hrs): NA, Dry Wate (Sample Ty)	none, light, r	noderate / heav	Isolated Po	ool, Trickle (<			5-20cfs, 20-50	Ocfs, 50-200	cfs, >200	Ocfs	
OVERLAN	D RUNOFF (LED FLOW: Surements DepthCollec	ast 24 hrs): NA, Dry Wate (SampleTy)	none, light, rerbody Bed, pe = Fleidi Air Temp	No Obs Flow, Weasure: M Water Temp	Isolated Po	ool, Trickle (<		1cfs, 1-5cfs,		Turbidity	cfs, >200	Ocfs	
OVERLAN OBSERVI	ED FLOW:	ast 24 hrs): NA, Dry Wate (SampleTy)	none, light, r erbody Bed, pe = Fieldi	noderate / heav No Obs Flow, Measure; M	Isolated Po	ool, Trickle (<	0.1cfs), 0 ₁ 1-	1cfs, 1-5cfs,	5-20cfs, 20-50	a, il di	cfs, >200	Ocfs	
OVERLAN OBSERVI	D RUNOFF (L ED FLOW: SUrements DepthCollec (m)	ast 24 hrs): NA, Dry Wate (SampleTy)	none, light, rerbody Bed, pe = Fleidi Air Temp	No Obs Flow, Weasure: M Water Temp (°C)	Isolated Po ethod = File pH	ool, Trickle (<	0.1cfs), 0 ₁ 1-	1cfs, 1-5cfs, Specific Conductivity	5-20cfs, 20-50 Salinity (ppt)	Turbidity	cfs, >200	Ocfs	
OVERLAN OBSERVI FIELD Meas SUBSURF/MID/ BOTTOM/REP SUBSURF/MID/ BOTTOM/REP	D RUNOFF (L ED FLOW: SUrements DepthCollec (m)	ast 24 hrs): NA, Dry Wate (SampleTy)	none, light, rerbody Bed, pe = Fleidi Air Temp	No Obs Flow, Weasure: M Water Temp (°C)	Isolated Po ethod = File pH	ool, Trickle (<	0.1cfs), 0 ₁ 1-	1cfs, 1-5cfs, Specific Conductivity	5-20cfs, 20-50 Salinity (ppt)	Turbidity	cfs, >200	Ocfs	
OVERLAN OBSERVI FIEID Meas SUBSURF/MID/ BOTTOM/REP SUBSURF/MID/ BOTTOM/REP SUBSURF/MID/	D RUNOFF (L ED FLOW: SUrements DepthCollec (m)	Ast 24 hrs): NA, Dry Wate (Sample Ty) Velocity (fps)	none, light, rerbody Bed, pe = Fleidi Air Temp	No Obs Flow, Measure: M Water Temp (°C)	Isolated Po ethod = File pH	ool, Trickle (<	0.1cfs), 0 ₁ 1-	1cfs, 1-5cfs, Specific Conductivity	5-20cfs, 20-50 Salinity (ppt)	Turbidity	cfs, >200	Ocfs .	
OVERLAN OBSERVI FIEID Meas SUBSURF/MID/ BOTTOM/REP SUBSURF/MID/ BOTTOM/REP	D RUNOFF (LED FLOW: Surrements DepthCollec (m) Hinches	Ast 24 hrs): NA, Dry Wate (Sample Ty) Velocity (fps)	none, light, rerbody Bed, pe = Fleidi Air Temp	No Obs Flow, Measure: M Water Temp (°C)	Isolated Po ethod = File pH	ool, Trickle (<	0.1cfs), 0 ₁ 1-	1cfs, 1-5cfs, Specific Conductivity	5-20cfs, 20-50 Salinity (ppt)	Turbidity	cfs, >200	Ocfs	
OVERLAN OBSERVI FIEID Meas SUBSURF/MID/ BOTTOM/REP SUBSURF/MID/ BOTTOM/REP SUBSURF/MID/ BOTTOM/REP Instrument: Calib. Date:	DRUNOFF (LED FLOW: Surements DepthCollec (m) 4 inches	Ast 24 hrs): NA, Dry Wate (Sample Ty) Velocity (fps)	none, light, rerbody Bed, pe = Fleid Air Temp (°C)	No Obs Flow, Weasure; M Water Temp (°C)	Isolated Po	ool, Trickle (< eld) O ₂ (mg/L) 3,7500	0.1cfs), 0,1- 0 ₂ (%)	Specific Conductivity	5-20cfs, 20-50 Salinity (ppt)	Turbidity (ntu)			upon data entry
OVERLAN OBSERVI Field Meas SUBSURF/MID/ BOTTOM/REP SUBSURF/MID/ BOTTOM/REP SUBSURF/MID/ BOTTOM/REP Instrument: Calib. Date: Samples 1	DRUNOFF (LED FLOW: SUrements DepthCollec (m) Hinches YS 1 550 07-32 Taken (# of	eontainers	none, light, rerbody Bed, pe = Fieldi Air Temp (°C)	No Obs Flow, Weasure; M Water Temp (°C)	Isolated Poethod = File pH 7.6	O ₂ (mg/L) 327500	0.1cfs), 0.1	Specific Conductivity (683 leType = Grab / In ple, by bucket);	5-20cfs, 20-50 Salinity (ppt) = %	Turbidity (ntu)	create colle	ection record	upon data entry
OVERLAN OBSERVI Field Meas SUBSURF/MID/ BOTTOM/REP SUBSURF/MID/ BOTTOM/REP SUBSURF/MID/ BOTTOM/REP Instrument: Calib. Date: Samples 1	DRUNOFF (LED FLOW: Surements DepthCollec (m) Hinches YS 1 550 07-22 Taken (# of	containers	none, light, rerbody Bed, pe = Fieldi Air Temp (°C)	No Obs Flow, Weasure; M Water Temp (°C)	Isolated Poethod = File pH 7.6\	O ₂ (mg/L) 327500	0.1cfs), 0.1	Specific Conductivity (683 leType = Grab / In ple, by bucket);	5-20cfs, 20-50 Salinity (ppt)	Turbidity (ntu)	create colle	ection record	upon data entry
OVERLAN OBSERVI FIEID Meas SUBSURF/MID/ BOTTOM/REP SUBSURF/MID/ BOTTOM/REP Instrument: Calib. Date: Samples T	PE. Grab / In DepthCollec	eontainers	none, light, rerbody Bed, pe = Field Air Temp (°C)	No Obs Flow, Weasure: M Water Temp (°C) なみよう	Isolated Poethod = File pH 7.6\	O ₂ (mg/L) 3.7500 Field Dup YE	0.1cfs), 0,1-	Specific Conductivity (683 leType = Grab / In ple, by bucket);	5-20cfs, 20-50 Salinity (ppt) = %	Turbidity (ntu) ID = FieldQA; (Kemmer; Pole Dissolved	create colle	ection record	
OVERLAN OBSERVI FIEID Meas SUBSURF/MID/ BOTTOM/REP SUBSURF/MID/ BOTTOM/REP SUBSURF/MID/ BOTTOM/REP Instrument: Calib. Date: Samples T SAMPLE TYP Sub/Surface Sub/Surface	DRUNOFF (LED FLOW: SUrements DepthCollec (m) 4 inches 75 1 550 07 - 32 Taken (# of	eontainers	none, light, rerbody Bed, pe = Field Air Temp (°C)	No Obs Flow, Weasure: M Water Temp (°C) なみよう	Isolated Poethod = File pH 7.6\	O ₂ (mg/L) 3.7500 Field Dup YE	0.1cfs), 0,1-	Specific Conductivity (683 leType = Grab / In Die, by bucket); Dissolved	5-20cfs, 20-50 Salinity (ppt) = 80 tegrated; LABEL_ Teflon tubing; I	Turbidity (ntu) ID = FieldQA; (Kemmer; Pole Dissolved	create colle	ection record	
OVERLAN OBSERVI FIEID Meas SUBSURF/MID/ BOTTOM/REP SUBSURF/MID/ BOTTOM/REP SUBSURF/MID/ BOTTOM/REP Instrument: Calib. Date: Samples T SAMPLE TYPE	DRUNOFF (LED FLOW: SUrements DepthCollec (m) 4 inches 75 1 550 07 - 32 Taken (# of	eontainers	none, light, rerbody Bed, pe = Field Air Temp (°C)	No Obs Flow, Weasure: M Water Temp (°C) なみよう	Isolated Poethod = File pH 7.6\	O ₂ (mg/L) 3.7500 Field Dup YE	0.1cfs), 0,1-	Specific Conductivity (683 leType = Grab / In ple, by bucket);	5-20cfs, 20-50 Salinity (ppt) = 80 tegrated; LABEL_ Teflon tubing; I	Turbidity (ntu) ID = FieldQA; (Kemmer; Pole Dissolved	create colle	ection record	

* New station code 207WAL060

down stream East Branch Grayson Creek @ Ardith Lane SWAMP Field Data Sheet (Sediment Chemistry) - Eventrype=W0 Entered in d-base (initial/date) CCCWP *StationID: 207 R0001 *Agency: Environmenta *Date (mm/dd/yyyy): 07 122 *Group: DepartureTime: 12:30 *SampleTime (1st sample): Funding: ArrivalTime: 1015 *Protocol: RMC *Purpose (circle applicable): SedChem, SedTox Habitat Benthic *Personnel: K. PANB, B. Haeget *PurposeFailure: *ProjectCode: *Location: Bank Thalweg Midchannel OpenWater Lat (dd.ddddd) Long (ddd.ddddd) OCCUPATION METHOD: (Walk-in) Bridge R/V *GPS/DGPS 37,95995 - 122 . 07304 STARTING BANK (facing downstream): (LB) RB / NA Target: GPS Device: (36/Min etex 20 Point of Sample (if Integrated, then -88 in dbase) 37.95850 *Actual: 122.06634 Accuracy (ft) m): 34 14 Same as Water/Probe Collection? (YES) NO Datum: NAD83 STREAM WIDTH (m): DISTANCE Habitat Observations (CollectionMethod = FROM BEAUFORT 0.8 WATER DEPTH (m): Habitat generic) "Only complete Sed Observations (bolded) if WQ BANK (m): WADEABILITY: SCALE Y N / Unk Observations are already recorded Attachtment HYDROMODIFICATION: None, Bridge, Pipes, ConcreteChannel, SITE ODOR: None, Sulfides, Sewage, Petroleum, Smoke, Other GradeControl, Culvert, AerialZipline, Other W. E WIND LOCATION (to sample): US / DS / WI / NA SKY CODE: Clear, Partly Cloudy, Overcast, Fog, Smoky, Hazy DIRECTION PHOTOS (RB & LB assigned when facing 1: (RB /(LBY BB / (US)) DS / ##) (from): NW Vascular (Nonvascular, Oily Sheen, Foam, Trash, Other OTHERPRESENCE: downstream; RENAME to DOMINANTSUBSTRATE: Bedrock, Concrete, Cobble, Boulder, Gravel, Sand, Mud. Unk, Other StationCode_yyyy_mm_dd_uniquecode): 2: (RB /LB) BB / US /(DS),##) SEDODOR: None, Sulfides, Sewage, Petroleum, Mixed, Other PRECIPITATION: None, Fog, Drizzle, Rain, Snow Colorless, Green, Yellow, Brown SEDCOLOR: PRECIPITATION (last 24 hrs): Unknown, <1", >1", None 3: (RB (LB) BB) US / DS / ##) SEDCOMPOSITION: Silt/Clay, FineSand, CoarseSand, Gravel, Cobble, Mixed, HardPanClay EVIDENCE OF FIRES: No. k1 years. <5 years OBSERVED FLOW: NA, Dry Waterbody Bed, No Obs Flow, Isolated Pool, Trickle (<0.1cfs), 21-1cfs, 1-5cfs, 5-20cfs, 20-50cfs, 50-200cfs, >200cfs Samples Taken (# of containers filled) - Method=Sed. Grab. Field Dup YES (NO:\SampleType = Grab / Integrated; LABEL ID = FieldQA; create collection record upon data entry COLLECTION DEVICE: Scoop (SS / PC (PE, Core (SS / PC / PE), Grab (Van Veen / Eckman / Petite Ponar) COLLECTION DEVICE AREA (m2): # 2 Benthic Coll. Sample DepthCollec Equipment Sediment Grain Benthic Sieve Size Archive Organics Metals/HgT Setenium SWI Toxicity Type: (cm) Used Only (Y / N) Size/TOC Chemistry Infauna Area (m2) (mm) Integrated 3 2 2 Grab Integrated Grab Integrated Grab Integrated Grab COMMENTS: *1 Priethroids, Figranil, and degredates down stemm location for SSID Study used kynnr conted scoop or bucket X2 organochlorine pesticides *3 Percent Solids Modified 06/27/08 down stream East Branch Grayson Creek @ Adulh lone

SWAMP F	ield Data S	neet (Water	Chemistr	y & Discrete	e Probe) -	Eventrype	-4405	Entered in d-l	base (initial/date	=)		Pg Z	of 2 Pg
StationID:	2071	2000	11	*Date (mm/dd	/yyyy): 07	122	12014	*Group: A	DH			*Agency: C	CCWP
Funding: _	CCC	WP		ArrivalTime:	10:15	DepartureTim	e: 13:30	*SampleTime	(1st sample):	11:40	5	*Protocol:	RMC
ProjectCode	e:			*Personnel:	(lewis, (2. Sendlin	*Purpose (circle	e applicable): Wa	aterChem WaterT	ox Habitat Eiek	Meas	*PurposeFa	ilure:
Location: B	Bank Thalweg	Midchannel O	penWater	*GPS/DGPS	Lat (dd	l.ddddd)	Long (do	dd.ddddd)	OCCUPATION	METHOD:	Walk-in)	Bridge R/V	Ot
SPS Device:	Gathin	etrex	20	Target:	37.95	195	- 122.0	17304	STARTING BA	ANK (facing d	ownstrea	m): LB / F	RB / NA
atum: NAD83	3	Accuracy (ft) m): 14	*Actual:	37.95	850	- 122 -		Poin	t of Sample (if Integrat	ted, then -88	in dbase)
labitat Ob	oservations	(Collection	nMethod =	Habitat_ge	neric)	WADEABILITY:	BEAUFORT		DISTANCE		STREAM	M WIDTH (m	1): 1.6
SITE	ODOR:	None Sulfides	,Sewage,Petr	oleum,Smoke,	Other	Y/ N / Unk	SCALE (see attachment):	1	FROM BANK (m):	0.4	WATER	DEPTH (m)	CM 3
CICY						WIND	₩		ICATION: None,	Bridge, Pipes, (
SKY C				ast, Fog, Smok	_	DIRECTION	W- S	AerialZipline, 0	tner RB & LB assigned	when facing		(B)/ BB / US	mple): US / DS / W
				Sheen, Foam Tr		(from): NW		dow	nstream; RENAM	E to	11/10/1	B	,,
	SANTAL SANTAL			, Boulder, Grav					e_yyyy_mm_dd_u		2. (RR /	(B) BB / US	S / ÚS / ##)
WATER	CLARITY:	Clear (see bot	tom), Cloudy	(>4" vis), Murk	y (<4" vis)	PRECIP	ITATION:	None, Fog, D	rizzle, Rain, Sn	ow	2. (1107)	EB) 557 5.	37 (80) 1111)
		Mana Culfidas	Sewage P	etroleum, Mixed	d, Other	PRECIF	PITATION (las	t 24 hrs):	Unknown, <1"	, >1", None	0 (55)	LB)(BB)/US	2 / DC / ##\
WATER	RODOR:	None, Sundes	o, comage, i										
WATER OVERLAN OBSERVE	RCOLOR: ID RUNOFF (L ED FLOW:	Goloriess, Greast 24 hrs): (een, Yellow, B none, light, r erbody Bed,	noderate / heav	Isolated Po	ool, Trickle (<		No, 1 year,	<5 years 5-20cfs, 20-50	Ocfs, 50-200			57057##)
WATER OVERLAN OBSERVE	RCOLOR: ID RUNOFF (LED FLOW: Surements DepthCollec	Goloriess, Great 24 hrs): NA, Dry Wate (SampleTy)	een, Yellow, B none, light, r erbody Bed,	rown moderate / heav	Isolated Po	ool, Trickle (<	0.1cfs), (0.1-1	Icfs, 1-5cfs,	5-20cfs, 20-50	Ocfs, 50-200 Turbidity			57057##)
WATER OVERLAN OBSERVI	RCOLOR: ID RUNOFF (LED FLOW: Surements	Goloriess, Greast 24 hrs): (none, light, r erbody Bed, pe = Field	noderate / heav No Obs Flow, Measure; M	Isolated Po	ool, Trickle (<		lcfs, 1-5cfs,					57057##)
WATER OVERLAN OBSERVE FIELD Meas	RCOLOR: ID RUNOFF (LED FLOW: Surements DepthCollec	Goloriess, Great 24 hrs): NA, Dry Wate (SampleTy)	none light, rerbody Bed, pe = Field! Air Temp	noderate / heav No Obs Flow, Measure; M Water Temp	Isolated Po	ool, Trickle (<	0.1cfs), (0.1-1	Icfs, 1-5cfs,	5-20cfs, 20-50	Turbidity			5/05/##)
WATER OVERLAN OBSERVE Field Meas SUBSURF/MID/ BOTTOMSEP	RCOLOR: ID RUNOFF (L ED FLOW: Surements DepthCollec (m)	Goloriess, Great 24 hrs): NA, Dry Wate (SampleTy)	none light, rerbody Bed, pe = Field! Air Temp	noderate / heav No Obs Flow, Measure; M Water Temp (°C)	Isolated Po ethod = Fi	ool, Trickle (<	0.1cfs), (0.1-1	Specific Conductivity	5-20cfs, 20-50	Turbidity			57057##)
WATER OVERLAN OBSERVE FIELD MEAS SUBSURF/MID/ BOTTOM/REP SUBSURF/MID/ BOTTOM/REP	RCOLOR: ID RUNOFF (L ED FLOW: Surements DepthCollec (m)	Goloriess, Great 24 hrs): NA, Dry Wate (SampleTy)	none light, rerbody Bed, pe = Field! Air Temp	noderate / heav No Obs Flow, Measure; M Water Temp (°C)	Isolated Po ethod = Fi	ool, Trickle (<	0.1cfs), (0.1-1	Specific Conductivity	5-20cfs, 20-50	Turbidity			5/05/##)
WATER OVERLAN OBSERVE FIELD MEAS SUBSURF/MID/ BOTTOM/REP SUBSURF/MID/ BOTTOM/REP	RCOLOR: ID RUNOFF (LED FLOW: Surements DepthCollec (m)	Goloriess, Great 24 hrs): NA, Dry Wate (Sample Ty) Velocity (fps)	none light, rerbody Bed, pe = Field! Air Temp	noderate / heav No Obs Flow, Measure; M Water Temp (°C)	Isolated Po ethod = Fi	ool, Trickle (<	0.1cfs), (0.1-1	Specific Conductivity	5-20cfs, 20-50	Turbidity			5/05/##)
WATER OVERLAN OBSERVE FIELD MEAS SUBSURF/MID/ BOTTOM/REP SUBSURF/MID/ BOTTOM/REP Instrument:	RCOLOR: ID RUNOFF (L ED FLOW: Surements DepthCollec (m)	Goloriess, Greast 24 hrs): NA, Dry Wate (SampleTy) Velocity (fps)	none light, rerbody Bed, pe = Field! Air Temp	noderate / heav No Obs Flow, Measure; M Water Temp (°C)	Isolated Po ethod = Fi	ool, Trickle (<	0.1cfs), (0.1-1	Specific Conductivity	5-20cfs, 20-50	Turbidity			5/05/##)
WATER OVERLAN OBSERVE FIELD Meas SUBSURF/MID/ BOTTOM/REP SUBSURF/MID/ BOTTOM/REP Instrument: Calib. Date:	RCOLOR: ID RUNOFF (LED FLOW: Surements DepthCollec (m) 0.02 YS1.55 07-22	Goloriess, Great 24 hrs): NA, Dry Wate (SampleTy) Velocity (fps)	none light, rerbody Bed, pe = Fieldi Air Temp (°C)	noderate / heav No Obs Flow, Measure; M Water Temp (°C)	pH 8.30	ool, Trickle (< eld) O ₂ (mg/L)	O.1cfs), (0.1-1	Specific Conductivity	5-20cfs, 20-50	Turbidity (ntu)	cfs, >20	00cfs	
WATER OVERLAN OBSERVE FIELD MEAS SUBSURF/MID/ BOTTOM/REP SUBSURF/MID/ BOTTOM/REP Instrument: Calib. Date:	PE: Grab / In	Goloriess, Greast 24 hrs): NA, Dry Wate (SampleTy) Velocity (fps) Containers	none light, rerbody Bed, pe = Field! Air Temp (°C)	No Obs Flow, Weasure; M Water Temp (°C) Al 2 ethod=Wate	solated Poethod = Find pH 8.30	Pield Dup YE	O.1cfs), (0.1-1 O ₂ (%)	Specific Conductivity 12 19 eType = Grab / Ir le, by bucket);	5-20cfs, 20-50 Salinity (ppt) httegrated; LABEL_ Teflon tubing; I	Turbidity (ntu)	create collecte & Beake	ection record u	
WATER OVERLAN OBSERVE FIELD MEAS SUBSURF/MID/ BOTTOM/REP SUBSURF/MID/ BOTTOM/REP Instrument: Calib. Date:	PE: Grab / In	Goloriess, Great 24 hrs): (NA, Dry Wate (SampleTy) Velocity (fps)	none light, rerbody Bed, pe = Field! Air Temp (°C)	No Obs Flow, Weasure; M Water Temp (°C) Al 2 ethod=Wate	solated Poethod = Find pH 8.30	Pield Dup YE	O.1cfs), (0.1-1 O ₂ (%)	Specific Conductivity 12 19 eType = Grab / Ir le, by bucket);	5-20cfs, 20-50 Salinity (ppt)	Turbidity (ntu)	create collecte & Beake	ection record u	
WATER OVERLAN OBSERVE FIELD MEAS SUBSURF/MID/ BOTTOM/REP SUBSURF/MID/ BOTTOM/REP Instrument: Calib. Date:	PE: Grab / In DepthCollec	Goloriess, Greast 24 hrs): NA, Dry Wate (SampleTy) Velocity (fps) Containers	none light, rerbody Bed, pe = Field! Air Temp (°C)	No Obs Flow, Weasure; M Water Temp (°C) Al 2 ethod=Wate	solated Poethod = Find pH 8.30	Pield Dup YE	O.1cfs), (0.1-1 O ₂ (%)	Specific Conductivity 12 19 eType = Grab / Ir le, by bucket);	5-20cfs, 20-50 Salinity (ppt) httegrated; LABEL_ Teflon tubing; I	Turbidity (ntu) ID = FieldQA; Kemmer; Pole Dissolved	create collecte & Beake	ection record u	ipon data entry

Targeti 37 95275 - 122 08 150 Datum: NAD83 Accuracy (*) m): L* Same as Water/Probe Collection? YES NO DISTA Habitat Observations (GollectionMethod = Habitat generic) monivomplete Sed Observations (bolded) (fWQ) Observations are already recorded SITE ODOR: Mone, Sulfides, Sewage, Petroleum, Smoke, Other SKY CODE: Clear, Partly Cloudy, Overcast, Fog, Smoky, Hazy OTHERPRESENCE: Vascular, Menvascular, Dilysheen, Foam Tash, Other DOMINANTSUBSTRATE: Bedrock, Concrete, Cobble, Boulder, Gravel, Sand, Mud, Unk, Other SEDODOR: None) Sulfides, Sewage, Petroleum, Mixed, Other SEDCOLOR: Colorless, Green, Yellow, Brown SEDCOMPOSITION: Sitt/Clay, FineSand, CoarseSand, Gravel, Cobble, Mixed, HardPanClay SEDCOMPOSITION: Sitt/Clay, FineSand, CoarseSand, Gravel, Cobble, Mixed, HardPanClay SEDCOMPOSITION: NA, Dry Waterbody Bed, No Obs Flow, Isolated Pool, Trickle (<0.1cfs), 0.1-1ofs, 1-5cfs, 5-20cfs, 20-50cfs Samples Taken (# of containers filled) - Method=Sed_Grab COLLECTION DEVICE: Scoop (SS / PC / PE), Core (SS / PC / PE), Grab (Van Veen / Eckman / Petite Ponar)	PATION METHOD: TING BANK (facing d Point of Sample) NCE (m): 0 - 5 DMODIFICATION: N Control, Culvert, Aeria TION (to sample): Us assigned when facing RENAME to um_dd_uniquecode):	downstream): STREAM W WATER DE None, Bridge, rialZipline, Oth JS / DS / WI / 1: (RB / LB)	*PurposeFailudge R/V	Other A CV eChannel, ##)
Personnel: K. Levi 3, B. Hacach Purpose (circle applicable): Sedchem Lat (ddiddddd) Long (dddiddddd) OCCU GPS Device: Grann Plex 20 Target: 37.95275 - 122.08150 STAR Pattual: 37.95275 - 122.08150 STAR Accuracy (f) m): LH Same as Water/Probe Collection? (YES) NO Distrations (GollectionMethod) = Habitat (Doservations (GollectionMethod) = Habitat (Beneric)) "Only complete Sed Observations (bolded) (f/WG) Observations are already recorded SKY CODE: Clear, Partly Cloudy, Overcast, Fog, Smoky, Hazy OTHERPRESENCE: (Vascular, Menvascular, OilySheen, Foam, Tash, Other DOMINANTSUBSTRATE: Bedrock, Concrete, Cobble, Boulder, Gravel, Sang, Mud, Unk, Other SEDODOR: None) Sulfides, Sewage, Petroleum, Mixed, Other SEDCOLOR: Colorless, Green, Yellow, Brown SEDCOMPOSITION: Sill/Clay, EneSand, CoarseSand, Gravel, Cobble, Mixed, HardPanClay OBSERVED FLOW: Na, Dy Waterbody Bed, No Obs Flow, Isolated Pool, Trickle (<0.1cfs), 0.1-1cfs, 1-5cfs, 5-20cfs, 20-50cfs Field Dup YES (No) (SampleType = Grab / Integrated COLLECTION DEVICE: Scoop (SS / PC / PE, Core (SS / PC / PE), Grab (Van Veen / Eckman / Petite Ponar)	SedTox Habitat Bent PATION METHOD: TING BANK (facing d Point of Sample: NCE (m):	downstream): STREAM W WATER DE None, Bridge, rialZipline, Oth JS / DS / WI / 1: (RB / LB)	*PurposeFailudge R/V	Other
*Personnel: K. Levi 3 B. Mac of Purpose (circle applicable): Sedchem *Cocation: Bank Thalweg Midchannel OpenWater *GPS/DGPS Lat (dd/ddddd) Long (ddd/ddddd) OCCU GPS Device: Gran et al. (2008 155 - 122 08 150 STAR 37. 952 5 - 122 08 150 STAR 37. 952 5 - 122 08 155 STAR 37. 952 80 - 122 08 155 STAR 37. 952 80 - 122 08 155 STAR 37. 952 80 - 122 08 155 STAR 37. 952 80 - 122 08 155 STAR 37. 952 80 - 122 08 155 STAR 37. 952 80 - 122 08 155 STAR 37. 952 80 - 122 08 155 STAR 37. 952 80 - 122 08 155 STAR 37. 952 80 - 122 08 155 STAR 37. 952 80 - 122 08 155 STAR 37. 952 80 - 122 08 155 STAR 37. 952 80 - 122 08 155 STAR 37. 952 80 - 122 08 155 STAR 37. 952 80 - 122 08 155 STAR 37. 952 80 - 122 08 155 STAR 37. 952 80 - 122 08 155 STAR 37. 952 80 - 122 08 155 STAR 37. 952 80 STAR 37.	PATION METHOD: TING BANK (facing display to be provided by the part of the pa	walk-in Brid downstream): ei(lfilntegrated STREAM W WATER DE None, Bridge, rialZipline, Oth JS / DS / WI / 1: (RB / LB)	AB RB / NA I then 88 in dbe VIDTH (m): } PPTH (m): 3 Pipes Concrete ner NA) BB (US) DS /	Other A
Target: 37.95275 - 122.08150 STAR Same as Water/Probe Collection? YES NO	Point of Sample Roll (facing de Point of Sample) NCE (m): 0 - 5 DMODIFICATION: No Control, Culvert, Aeric (FION (to sample): Usassigned when facing RENAME to m_dd_uniquecode): Rain, Snow	downstream): E (if Integrated) STREAM W WATER DE None, Bridge, rialZipline, Oth JS / DS / WI / I: (RB / LB)	RB / NA Hithen -88 in doa VIDTH (m): 1 EPTH (m): 3 Pipes Concrete NA Y BB / USY DS /	A A Se) CN eChannel,
Datum: NAD83 Accuracy (ft) m): Lit Same as Water/Probe Collection? YES NO DISTATION: NAD83 Accuracy (ft) m): Lit Same as Water/Probe Collection? YES NO DISTATION: WADEABILITY: SCALE See Attachtment DISTATION: WADEABILITY: SCALE See Attachtment SITE ODOR: None, Sulfides, Sewage, Petroleum, Smoke, Other SKY CODE: Clear, Partly Cloudy Overcast, Fog, Smoky, Hazy OTHERPRESENCE: Vascular, Venvascular, VilySheen, Foam, Tash, Other DOMINANTSUBSTRATE: Bedrock, Concrete, Cobble, Boulder, Gravel, Sand, Mud, Unk, Other SEDODOR: None) Sulfides, Sewage, Petroleum, Mixed, Other SEDCOLOR: Colorless, Green, Yellow, Brown SEDCOMPOSITION: Silt/Clay, FineSand, CoarseSand, Gravel, Cobble, Mixed, HardPanCla) SEDCOMPOSITION: Silt/Clay, FineSand, CoarseSand, Gravel, Cobble, Mixed, HardPanCla) SEDCOMPOSITION: NA, Dry Waterbody Bed, No Obs Flow, Isolated Pool, Trickle (<0.1cfs), (1-1cfs) 1-5cfs, 5-20cfs, 20-50cfs Samples Taken (# of containers filled) - Method=Sed_Grab COLLECTION DEVICE: Scoop (SS / PC / PE, Core (SS / PC / PE), Grab (Van Veen / Eckman / Petite Ponar)	Point of Sample NCE (m): 0 - 5 DMODIFICATION: N Control, Culvert, Aeric FION (to sample): Usassigned when facing RENAME to m_dd_uniquecode): Rain, Snow	WATER DE None, Bridge, rialZipline, Oth JS / DS / WI / 1: (RB / LB)	WIDTH (m): \ PIPES Concrete ner NA BB (US) DS /	eChannel,
Datum: NAD83 Accuracy (ft m): [4] Same as Water/Probe Collection? YES NO DISTATION: WADEABILITY: SCALE See Attachtment HyDR Grade LOCA OTHERPRESENCE: Vascular, Venvascular, DilySheen, Foams Trash, Other SEDODOR: None) Sulfides, Sewage, Petroleum, Mixed, Other SEDODOR: None) Sulfides, Sewage, Petroleum, Mixed, Other SEDCOLOR: Colorless, Green, Yellow, Brown SEDCOMPOSITION: Silt/Clay, FineSand, CoarseSand, Gravel, Cobble, Mixed, HardPanCla) SEDCOMPOSITION: NA, Dry Waterbody Bed, No Obs Flow, Isolated Pool, Trickle (<0.1cfs), 0.1-1cfs, 1-5cfs, 5-20cfs, 20-50cfs Samples Taken (# of containers filled) - Method=Sed Grab COLLECTION DEVICE: Scoop (SS / PC / PE, Core (SS / PC / PE), Grab (Van Veen / Eckman / Petite Ponar)	OMODIFICATION: No Control, Culvert, Aeric FION (to sample): Usuassigned when facing RENAME to m_dd_uniquecode): Rain, Snow	WATER DE None, Bridge, rialZipline, Oth JS / DS / WI / 1: (RB / LB)	Pipes Concrete ner NA) BB /USy DS /	eChannel,
Habitat Observations (GollectionMethod = Habitat generic) **Only complete Sed Observations (bolded) (fWQ Observations are already recorded SITE ODOR: None, Sulfides, Sewage, Petroleum, Smoke, Other SKY CODE: Clear, Partly Cloudy Overcast, Fog, Smoky, Hazy OTHERPRESENCE: Vascular, Nenvascular, OilySheen, Foams Tash, Other (from): NW PHOTOS (RB & LB downstream StationCode_yyyy_n SEDODOR: None) Sulfides, Sewage, Petroleum, Mixed, Other PRECIPITATION: None) Fog, Drizzle, It SEDCOLOR: Colorless, Green, Yellow, Brown PRECIPITATION (last 24 hrs): Inknot SEDCOMPOSITION: Silt/Clay, FineSand, CoarseSand, Gravel, Cobble, Mixed, HardPanClay EVIDENCE OF FIRES: No. 1 OBSERVED FLOW: NA, Dry Waterbody Bed, No Obs Flow, Isolated Pool, Trickle (<0.1cfs), 0.1-1cfs, 1-5cfs, 5-20cfs, 20-50cfs Samples Taken (# of containers filled) - Method=Sed Grab Field Dup YES NO (SampleType = Grab / Integrated COLLECTION DEVICE: Scoop (SS / PC / PE, Core (SS / PC / PE), Grab (Van Veen / Eckman / Petite Ponar)	OMODIFICATION: No Control, Culvert, Aeric FION (to sample): Usuassigned when facing RENAME to m_dd_uniquecode): Rain, Snow	WATER DE None, Bridge, rialZipline, Oth JS / DS / WI / 1: (RB / LB)	Pipes Concrete ner NA) BB /USy DS /	eChannel,
SKY CODE: Clear, Partly Cloudy Overcast, Fog, Smoky, Hazy OTHERPRESENCE: Vascular, Nenvascular, OilySheen, Foam, Frash, Other DOMINANTSUBSTRATE: Bedrock, Concrete, Cobble, Boulder, Gravel, Sand, Mud, Unk, Other SEDODOR: None Sulfides, Sewage, Petroleum, Mixed, Other SEDCOLOR: Colorless, Green, Yellow, Brown SEDCOMPOSITION: Silt/Clay, FineSand, CoarseSand, Gravel, Cobble, Mixed, HardPanCla) SEDCOMPOSITION: Silt/Clay, FineSand, CoarseSand, Gravel, Cobble, Mixed, HardPanCla) SEDCOMPOSITION: NA, Dry Waterbody Bed, No Obs Flow, Isolated Pool, Trickle (<0.1cfs), 0.1-1cfs, 1-5cfs, 5-20cfs, 20-50cfs Samples Taken (# of containers filled) - Method=Sed_Grab Field Dup YES (NO) (SampleType = Grab / Integrated COLLECTION DEVICE: Scoop (SS / PC / PE, Core (SS / PC / PE), Grab (Van Veen / Eckman / Petite Ponar)	Control, Culvert, Aeric FION (to sample): Usuassigned when facing RENAME to m_dd_uniquecode):	rialZipline, Oth JS / DS / WI / 1: (RB / LB)	NA Y BB /USY DS /	##)
DOMINANTSUBSTRATE: Bedrock, Concrete, Cobble, Boulder, Gravel, Sand, Mud, Unk, OtherStationCode_yyyy_n SEDODOR: None) Sulfides, Sewage, Petroleum, Mixed, Other PRECIPITATION: None, Fog, Drizzle, Fog. Sept. Se	RENAME to m_dd_uniquecode):	~		
SEDCOLOR: Colorless, Green, Yellow, Brown PRECIPITATION (last 24 hrs): Unknown SEDCOMPOSITION: Silt/Clay, FineSand, CoarseSand, Gravel, Cobble, Mixed, HardPanClay EVIDENCE OF FIRES: No. 11 OBSERVED FLOW: NA, Dry Waterbody Bed, No Obs Flow, Isolated Pool, Trickle (<0.1cfs), Q.1-1cfs, 1-5cfs, 5-20cfs, 20-50cfs Samples Taken (# of containers filled) - Method=Sed Grab Field Dup YES NO. (SampleType = Grab / Integrated COLLECTION DEVICE: Scoop (SS / PC / PE, Core (SS / PC / PE), Grab (Van Veen / Eckman / Petite Ponar)		2: (RB / LB)BB / US (DS)	##)
SEDCOMPOSITION: Silt/Clay, FineSand, CoarseSand, Gravel, Cobble, Mixed, HardPanClay EVIDENCE OF FIRES: No. 1 OBSERVED FLOW: NA, Dry Waterbody Bed, No Obs Flow, Isolated Pool, Trickle (<0.1cfs), Q.1-1cfs, 1-5cfs, 5-20cfs, 20-50cfs Samples Taken (# of containers filled) - Method=Sed_Grab Field Dup YES NO. (SampleType = Grab / Integrated COLLECTION DEVICE: Scoop (SS / PC / PE, Core (SS / PC / PE), Grab (Van Veen / Eckman / Petite Ponar)	vn)<1", >1", None			
OBSERVED FLOW: NA, Dry Waterbody Bed, No Obs Flow, Isolated Pool, Trickle (<0.1cfs), Q.1-1cfs, 1-5cfs, 5-20cfs, 20-50cfs Samples Taken (# of containers filled) - Method=Sed_Grab Field Dup YES (NO) (SampleType = Grab / Integrated COLLECTION DEVICE: Scoop (SS / PC / PE, Core (SS / PC / PE), Grab (Van Veen / Eckman / Petite Ponar)		0		
Samples Taken (# of containers filled) - Method=Sed_Grab Field Dup YES (NO) (SampleType = Grab / Integrated COLLECTION DEVICE: Scoop (SS / PC / PE, Core (SS / PC / PE), Grab (Van Veen / Eckman / Petite Ponar)	years, <5 years	3: (RB / LB)	BBY US / DS /	##)
COLLECTION DEVICE: Scoop (SS / PC / PE, Core (SS / PC / PE), Grab (Van Veen / Eckman / Petite Ponar)	50-200cfs, >200cfs	5		
	LABEL_ID = FieldQA;	create collection	n record upon data	entry
	COLLECTIO	ON DEVICE AF	REA (m2):	
Type: (Cit) Used Offiny (1714) Size/TOC * * 3	Archive Chemistry	Benthic Infauna	Benthic Coll. Area (m²)	Sieve Siz (mm)
Integrated 2 1 2 1 3				
Integrated Grab				
Integrated Grab				
Integrated Grab				
OMMENTS: Up stream location for 5510 Study *1 Pyrethroids, Fipro		-11		

* New Station code 207WAL078

up stream 1 Trib of Grayson @ Footbridge between Mercury Way & Vineyard Ct SWAMP Field Data Sheet (Water Chemistry & Discrete Probe) - EventType=WQ Entered in d-base (initial/date) *StationID: 207 000 *Date (mm/dd/vvvv): 07 / 22 12014 *Group: ADF *Agency: CCCWP *Funding: CCC WP ArrivalTime: 12:45 DepartureTime: 15:15 *Protocol: *SampleTime (1st sample): *Personnel: K-Lewis, B. Haeser Purpose (circle applicable): WaterChem WaterTox Habitat FieldMeas) *ProjectCode: *PurposeFailure: *Location: Bank Thalweg Midchannel OpenWater OCCUPATION METHOD: Walk-in Bridge R/V Lat (dd.ddddd) Long (ddd.ddddd) *GPS/DGPS GPS Device: etrex 20 37,95275 - 121.08150 TEL MAIN Target: STARTING BANK (facing downstream): (LB) / RB / NA 77.95280. - 122-08155 Accuracy (fty m): 14 Datum: NAD83 Point of Sample (if Integrated, then -88 in dbase) *Actual: BEAUFORT Habitat Observations (CollectionMethod = Habitat generic DISTANCE STREAM WIDTH (m): WADEABILITY: SCALE (see FROM Y) N / Unk WATER DEPTH (N): CM 3 SITE ODOR: None: Sulfides, Sewage, Petroleum, Smoke, Other BANK (m): attachment): HYDROMODIFICATION: None, Bridge, Pipes, SencreteChannel, GradeControl, Culvert, WIND Clear, Rartly Cloudy, Overcast, Fog, Smoky, Hazy SKY CODE: AerialZipline, Other LOCATION (to sample): US / DS / WI / DIRECTION PHOTOS (RB & LB assigned when facing 1: (RB /(LB)/ BB (US)/ DS / ##) (from): NW OTHER PRESENCE: Vascolar, Nonvascular, OilySheen, Foam, Trash, Other downstream; RENAME to DOMINANT SUBSTRATE: Bedrock, Concrete, Cobble, Boulder, Gravel, Sand, Mud, Unk, Other StationCode yvvy mm dd uniquecode): 2: (RB /(LB) BB / US / DS) ##) WATERCLARITY: Clear (see bottom), Cloudy (>4" vis), Murky (<4" vis) PRECIPITATION: None Fog, Drizzle, Rain, Snow WATERODOR: Unknown, <1", >1", None None, Sulfides, Sewage, Petroleum, Mixed, Other PRECIPITATION (last 24 hrs): 3: (RB / LB / BB / US / DS / ##) WATERCOLOR: EVIDENCE OF FIRES: No. <1 year, <5 years Colorless, Green, Yellow, Brown OVERLAND RUNOFF (Last 24 hrs): _none, light, moderate / heavy, unknown NA, Dry Waterbody Bed, No Obs Flow, Isolated Pool, Trickle (<0.1cfs), Q.1-1cfs, 1-5cfs, 5-20cfs, 20-50cfs, 50-200cfs, >200cfs OBSERVED FLOW: Field Measurements (SampleType = FieldMeasure; Method = Field) DepthCollec Velocity (fps) Specific Air Temp Water Temp Turbidity O₂ (mg/L) 02 (%) Salinity (ppt) Conductivity (m) ch (ntu) SUBSURF/MID/ 25.76 8.46 12.17 1637 BOTTOM/REP SUBSURF/MID/ BOTTOM/REP SUBSURF/MID/ BOTTOM/REP 451556 Instrument: Calib. Date: 07-22-14 Samples Taken (# of containers filled) - Method=Water Grab Field Dup YES / NO: (SampleType = Grab / Integrated; LABEL_ID = FieldQA; create collection record upon data entry SAMPLE TYPE: Grab / Integrated COLLECTION DEVICE: Indiv bottle (by hand, by pole, by bucket); Teflon tubing; Kemmer; Pole & Beaker; Other DepthCollec Inorganics Dissolved Dissolved Bacteria Chla TSS / SSC TOC / DOC Total Ho **Total Metals** Toxicity VOAs Sub/Surface Sub/Surface COMMENTS: water field measurements only-Modified 02/10/11

3		C	alte	oct				• NAPA, CA 94558 • ((707) 258-4000	• Fax (70	7) 226-	1001						LAB ORDER#:
	9		TICAL LABO		SAMP OF C				CTNAME					PAGE		(OF_	P.O. #
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	HONE #:				E: 177.0895	SAMI		PRINT & SIGN NAME):	2					7/10/1	3/7	79	3/	DUE DATE:
_		DATE MPLED			CONTAINER AMOUNT/TYPE			* Refer to Pe	Marks HON SITE	CLIENT LAB#	COMP.	23	1/2/8	1	77	7/	/	New site IDS REMARKS
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	11	A	NQUISHED	BY	7-1-2	TE/TIME		RECEIVED BY	0	RELIN	IQUISHED	BY			Di	ATE/TII	ME	RECEIVED BY
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	Samples:		MICRO_		OMET	SV		OA TEMP:°C	SEALED: Y_	_/ N	INTACT	: Y	/ N_		MATE	RIX: V	/ = Aq	ueous Nondrinking Water, Digested Metals;
ONLY	BD: BIO_	S		MET			COM	MENTS										queous Nondrinking Water, Digested Metals; er; SL = Soil, Sludge, Solid; FP = Free Product
FOR LAB USE ONLY	SIL: HP_			V	OA													PES: AL = Amber Liter; AHL = 500 ml Plastic); QT=Quart (Plastic); HG = Half Gallon
3 LAB	W/HNO)3-	H,SO	NaOH											(Plastic	:); SJ =	Soil J	lar; B4 = 4 oz. BACT; BT = Brass Tube; VOA = Other Type Container
FOR	PIL: HNO,		H,SO,	_ NaOH	HCL										3.5116.			

Caltest ANALYTICAL LABORATORY NAPA, CA 94558 • (707) 258-4000 • Fax (707) 226-1001 • www.caltestlabs.com PAGE OF POJECT #/PROJECT NAME OF CUSTODY REPORT ATTN: ANALYSES REQUESTED ADDRESS: CITY: STATE: ZIP: TURN-AROUND									
BILLING ADDRESS: SAME CS above PHONE #: FAX PHONE:	TURN-AROUND TIME STANDARD RUSH								
831-477-2003 831-477-0895	>	DUE DATE:							
CALTEST DATE TIME SAMPLED MATRIX CONTAINER AMOUNT/TYPE PR	Refer to Remarks SAMPLE IDENTIFICATION SITE	CLIENT OF GRAB	7/3	77/	New site IDS REMARKS				
07-72-14 1445 Sed 2x802 AG	4°C 607 R00011US-01	COMP X							
1445 2x802 AG	1 207 R000 11US-02		X		207WAL078				
1445 \x801CG	207 R000 11 V5-03		X						
1445 1x802CG	207 ROOO NUS-04			X	207WAL078				
1145 2x802 AG	207 ROW 11 25-01	X			207WAL078 207WAL078 207WAL060				
1145 2x802 AG	207 ROOU 11 DS- 02		X		207. 11 = /0				
1145 1 x 802 CG	207 ROCO 11 DS-08		X		207WAL060				
1/45 1x802CG	V 207 ROOO 11 D5 - 04		X		207 WAL 060 207 MAL 2020				
	tra				DHIGINA				
					HITE - 0				
By submittal of sample(s), client agrees to abide	e by the Terms and Conditions set forth on the rever	se of this document.							
RELINQUISHED BY DATE		DATE/TIME	RECEIVED BY						
5P10 HIELEZ OT-30	755 Wh								
Samples: WC	SVVOATEMP:°C SEALED: Y COMMENTS	_/ N INTACT: Y_	/ N	MATRIX: W = Aqueous Nondrinking Water, Digested Metals; ML = Low R.L.s, Aqueous Nondrinking Water, Digested Metals; DW = Drinking Water; SL = Soil, Sludge, Solid; FP = Free Product CONTAINER TYPES: AL = Amber Liter; AHL = 500 ml					
BD. BIOWCMET		Amber; PT = Pint (Plastic); QT=Quart (Plastic); HG = Half Gallon (Plastic); SJ = Soil Jar; B4 = 4 oz. BACT; BT = Brass Tube; VOA = 40 mL.VOA; OTC = Other Type Container							



Pacific EcoRisk 2250 Cordelia Rd., Fairfield, CA 94534 (707) 207-7760 FAX (707) 207-7916

CHAIN-OF-CUSTODY RECORD

Results To:	TIESS WIND FINAL I			o: ADH Environmental			REQUESTED ANALYSIS								
Address:	ADH Environmental & Address:				1			_							
	3065 Port								,	Arter					
	Sogrel, CA	9507	3						161	E					
Phone:	231 . 477	2003		Phone:	d	11			U	させ					1. 3
Attn:	Alessandro	Hnutt		Attn:	(1	16			3	Hy. Ilela					
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Project Name:	CCCWP -	5510							1	Duy		1 1		1	
P.O.#/Ref: 030.001 0202								×	92						
Client Sa	mnle ID	Sample	Sample	Sample	Grab/ Container			TOX	2				1		
Chefft Sa	imple 1D	Date	Time	Matrix*	Comp	Number	CB oat 1	ype 1901x3	-						
544 ROOO	25050	07-22-14		sed	and		-5	cleur glass	X						
544 ROOO	25 D5 @	1	10:15	i		СР	3901	1991 X3	χ						
207 ROOD	11053		1015	34)		ce		19a1 X3	X						
207 R000		V	1015		V	CP	39al-	1galX3	X						
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Samples Collected	l Bv:														
Comments/Special Instruction:			RELINQUISHED BY:				RECEI	VED B	V:						
			Signature: Show			Signature: Mally Celler						-			
preserved at 4°C			Print: BRAS MAELEZ			Print: Molly Alar									
			Organization: ANH			Organization: PE12									
* Please amend sample ID's as follows:			Date: 07-33-14 Time: 17-15			Date: 7/22/14 Time: \7/5									
0 544R00025US to 544MSH065			RELINQUISHED BY:			RECEIVED BY:									
2 544R00025DS to 544MSH062			Signature:			Signature:									
Q = 07 000 01 05 to - 00 MIN 1 070			Print:			Print:									
3 707 RODO 11 US to 207 WAL 078 (4) 207 RODO 11 DS to 207 WAL 0 60			Organization:			Organization:									
(4) 207 MOOO 11 DS TO 207 WALOGO				Date:	: Time: Date: Time: WW = Wastewater); (STRMW = Stormwater); (SED = Sediment); or other										
*Example Matrix C	Codes: (EFF - Efflue	ent) $(FW = F$	reshwater); (SW = Saltwa	ater); (WW =	= Wastewa	ater): (ST	RMW = Sto	rmwa	ter): (SF	D = Sedi	ment):	or other		

Appendix J. TIE Laboratory Reports





Alessandro D. Hnatt ADH Environmental 3065 Porter Street, Suite 101 Soquel, CA 95073

April 8, 2014

Alessandro:

I have enclosed one copy of our report "Evaluation of the Chronic Toxicity of Contra Costa Clean Water Program Stormwater Samples" for the samples that were collected February 6, 2014. Briefly, both of the samples collected were toxic to Hyalella azteca. There was an 81.3% reduction in survival in the 544R00025US sample and an 87.5% reduction in survival in the 544R00025DS sample.

In response to these observations, a targeted TIE was performed the downstream stormwater sample (544R00025DS) in an attempt to identify suspected cause(s) of toxicity. The results of this testing are presented below:

Effects of TII	E treatments on	the toxicity of	CCCWP stormy	water sample to Hyalella azteca
TIE Treatment	N	Mean % Surviv	al	Effects of TIE Treatment?
TIE Treatment	Control/Blank	50% Effluent	100% Effluent	Effects of TIE Treatment?
Baseline	100		16	toxicity present
PBO	100	0	0	increase in toxicity
Carboxylesterase	92.5		98	toxicity removed
BSA	100		46	partial reduction of toxicity

The following trends (changes in sample toxicity relative to the untreated water sample [Baseline] test) were observed:

- The addition of PBO to the test solutions increased toxicity to *H. azteca* survival (survival decreased from 16% to complete mortality). These results suggest that compounds which are detoxified by the cytochrome-P450 system (e.g., pyrethroid insecticides) were contributing to sample toxicity;
- The addition of carboxylesterase decreased the survival toxicity (from 16% survival to 98% survival), suggesting that type I and type II pyrethroids are contributing to the toxicity (Weston and Amweg 2007). However, it should be noted that the esterase control treatment (BSA) also reduced toxicity, suggesting that some of the reduced toxicity was due the presence of large organic molecules. The use of carboxylesterase as a TIE treatment is still experimental and these results need to be used judiciously and in conjunction with other TIE treatment (e.g., PBO); and

• There was partial toxicity removal as a result of BSA addition, since BSA does not cleave the ester bond in type I and type II pyrethroids, evidence of greater reduction in toxicity in the esterase treatment than seen in the BSA treatment is indicative of type I and type II pyrethroids as a the cause of the stormwater toxicity.

The weight of evidence from the TIE performed on the downstream stormwater sample suggests that the toxicity was likely due to pyrethroid insecticides.

If you have any questions regarding the performance and interpretation of these tests, feel free to contact my colleague Eddie Kalombo or myself at (707) 207-7760.

Sincerely,

Stephen L. Clark Vice President/Special Projects Director



Pacific EcoRisk is accredited in accordance with NELAP (ORELAP ID 4043). Pacific EcoRisk certifies that the test results reported herein conform to the most current NELAP requirements for parameters for which accreditation is required and available. Any exceptions to NELAP requirements are noted, where applicable, in the body of the report. This report shall not be reproduced, except in full, without the written consent of Pacific EcoRisk. This testing was performed under Lab Order 19397.



Evaluation of the Chronic Toxicity of Contra Costa Clean Water Program Stormwater Samples

Samples collected February 6, 2014

Prepared For:

ADH Environmental 3065 Porter Street, Suite 101 Soquel, CA 95073

Prepared By:

Pacific EcoRisk 2250 Cordelia Road Fairfield, CA 94534

April 2014



Evaluation of the Chronic Toxicity of Contra Costa Clean Water Program Stormwater Samples

Samples collected February 6, 2014

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- Appendix A Chain-of-Custody Record for the Collection and Delivery of the CCCWP Stormwater Samples
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- Appendix C Test Data and Summary of Statistics for the Evaluation of the Chronic Toxicity of CCCWP Stormwater to *Hyalella azteca* Follow-Up Toxicity Identification Evaluation (TIE): 544R00025DS
- Appendix D Test Data and Summary of Statistics for the Reference Toxicant Evaluation of the *Hyalella azteca*

1. INTRODUCTION

Under contract to ADH Environmental, and in support of the Bay Area Stormwater Management Agencies Association (BASMAA) Regional Monitoring Coalition ongoing monitoring efforts, Pacific EcoRisk (PER) has been contracted to evaluate the toxicity of stormwater samples collected for the Contra Costa Clean Water Program (CCCWP). This evaluation consist of performing the following US EPA toxicity tests:

• 10-day survival test with the freshwater amphipod *Hyalella azteca*.

These toxicity tests were conducted on stormwater samples collected on February 6, 2014. In order to assess the sensitivity of the test organisms to toxic stress, a reference toxicant test was also performed. As a result of the magnitude of toxicity observed, and at the request of the ADH Environmental, PER conducted a targeted Phase 1 Toxicity Identification Evaluation (TIE). This report describes the performance and results of these tests.

2. CHRONIC TOXICITY TEST PROCEDURES

The methods used in conducting testing with *H. azteca* followed a test protocol that is based on a modification of the US EPA guidelines, "Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated Contaminants with Freshwater Invertebrates" (EPA/600/R-99/064).

2.1 Sample Receipt and Handling

On February 6, ADH collected stormwater samples into appropriately-cleaned containers, which were transported, on ice and under chain-of-custody, to the PER testing laboratory in Fairfield, CA. Upon receipt at the testing laboratory, aliquots of each sample were collected for analysis of initial water quality characteristics (Table 1), with the remainder of each sample being stored at 0-6°C except when being used to prepare test solutions.

The chain-of-custody record for the collection and delivery of these stormwater samples is provided as Appendix A.

	Table 1. Initial water quality characteristics of the CCCWP stormwater samples.											
Date Sample Received	(mg/L) = (mg/L) = (mg/L) = (mg/L) = (mg/L) = (mg/L)											
2/7/14	544R00025US-W-01	1.9	7.61	8.3	122	424	1836	<1.0				
2/7/14	544R00025DS-W-01	1.9	7.66	10.6	118	420	1823	<1.0				

2.2 Survival Toxicity Testing of Stormwater Samples with Hyalella azteca

This test consists of exposing the amphipods to the stormwater samples for 10 days, after which effects on survival are evaluated. The specific procedures used in this testing are described below.

The *H. azteca* used in this testing were obtained from a commercial supplier (Chesapeake Cultures, VA). Upon receipt at the PER laboratory, the organisms were maintained at 23°C in aerated aquaria containing Standard Artificial Medium (SAM-5S) water (Borgmann 1996) prior to their use in this test. During this pre-test period, the organisms were fed the alga *Selenastrum capricornutum* and Yeast-Cerophyll®-Trout (YCT) food amended with *Spirulina*.

The Lab Control water for these tests consisted of SAM-5S water. The stormwater samples were tested at the 100% concentration only. "New" water quality characteristics (pH, D.O., and conductivity) were measured on the test solutions prior to use in these tests.

There were 5 replicates for each test treatment, each replicate consisting a 250-mL glass beaker containing 100 mL of test solution. These tests were initiated by allocating ten 8-day old *H. azteca*, into each replicate, followed by the addition of 1.5 mL of *Spirulina* amended YCT. The replicate beakers were placed into a temperature-controlled room at 23°C, under cool-white fluorescent lighting on a 16L:8D photoperiod.

Each day of the tests, each replicate beaker was examined and the number of surviving organisms determined; 'old' water quality characteristics were measured in one randomly-selected beaker at each test treatment at this time. On Days 2, 4, 6, and 8 of the test, the organisms were fed 1.5 mL of *Spirulina* amended YCT in each test chamber.

On Day 5 of the 10-day tests, fresh test solutions were prepared and characterized, as before. Each replicate was examined, with any dead animals, uneaten food, wastes, and other detritus being removed. The number of live organisms in each replicate was determined and then approximately 80% of the test media in each beaker was carefully poured out and replaced with fresh test solution. "Old" water quality characteristics (pH, D.O., and conductivity) were measured on the old test solution that had been discarded from one randomly-selected replicate at each treatment.

After 10 days of exposure, the tests were terminated and the number of live organisms in each replicate was recorded. The resulting survival data were analyzed to evaluate any impairment due to the stormwater samples; all statistical analyses were performed using CETIS® statistical software.



2.2.1 Reference Toxicant Testing of the Hyalella azteca

In order to assess the sensitivity of the *H. azteca* test organisms to toxic stress, a reference toxicant test was performed. The reference toxicant test was performed as a 96-hr waterborne exposure to Control water spiked with KCl at test concentrations of 0, 0.1, 0.2, 0.4, 0.8 and 1.6 g/L. The resulting survival data were statistically analyzed to determine key dose-response point estimates (e.g., EC50); all statistical analyses were made using the CETIS® software. This response endpoint was then compared to the 'typical response' range established by the mean \pm 2 SD of the point estimates generated by the 20 most recent previous reference toxicant tests performed by this lab.

2.3 Follow-Up Toxicity Identification Evaluation (TIE) Procedures

At the direction of the client, a Phase I TIE "targeted" was performed to identify if pyrethroid insecticides were the cause of toxicity.

The goal of the Phase I TIE fractionation procedures is to determine the class of compounds (e.g., organics, metals, ammonia, etc.) responsible for sample toxicity. This is achieved by performing physical and chemical manipulations (or treatments) on the sample. Changes in toxicity that result from the TIE treatments help characterize the physical-chemical nature of the compound(s) responsible for the observed toxicity, which in turn can be used to identify the compound(s) responsible for the toxicity. The specific treatments used in this targeted TIE are described below.

2.3.1 TIE Fractionation Method Blanks

As part of the TIE process, a method blank is prepared for each treatment and then tested to determine whether any of the TIE treatment procedures contribute any artifactual toxicity to the manipulated sample. The method blanks consisted of aliquots of Control water subjected to each of the TIE test treatments (discussed below).

2.3.2 Baseline

The Baseline test is simply a re-test of the untreated stormwater sample to confirm the persistence of toxicity during the concurrent TIE testing, and to provide a "benchmark" of toxicity against which to evaluate toxicity removal by the TIE treatments. The Baseline test was performed as described in Section 2.2.

2.3.3 Piperonyl Butoxide (PBO) Addition

This TIE treatment can help identify toxicity caused by toxicants subject to metabolic activation/detoxification by the cytochrome-P450 system:

• an <u>increase in toxicity</u> after PBO treatment is indicative of a contaminant that is typically *detoxified* by the cytochrome-P450 enzyme system (e.g., carbamates, pyrethroids [Amweg and Weston 2007], etc.), whereas



• a <u>decrease in toxicity</u> after PBO treatment is indicative of a contaminant that is *activated* by the cytochrome-P450 system [e.g., organophosphate (OP) pesticides].

The simultaneous presence of compounds that are detoxified *and* compounds that are activated by the cytochrome-P450 system (e.g., the co-occurrence of both OP-pesticides and pyrethroid pesticides) may cancel each other out. The PBO treatment consisted of addition of PBO to the stormwater sample at 50% and 100% dilution (and method blank) at a concentration of 50 μ g/L. This test was then performed as described in Section 2.2.

2.3.4 Carboxylesterase Addition

The use of carboxylesterase to hydrolyze pyrethroids (via cleaving of the ester bond) has been proposed as a simple, mechanistic-based method to selectively identify pyrethroid-associated toxicity. Carboxylesterase is an enzyme that degrades type I and type II pyrethroids and has been used in recent studies to help identify pyrethroid-associated toxicity (Wheelock et al. 2004; Weston and Amweg 2007). It should be noted that this treatment is still experimental in nature and should be used in conjunction with other pyrethroid-targeted TIE treatments (e.g., PBO addition and temperature adjustment) via a weight-of-evidence approach.

Carboxylesterase may also alleviate toxicity by acting as dissolved organic matter (DOM) and providing complexation substrate to other hydrophobic compounds thus reducing the bioavailability of the toxicant; to control for the DOM effect, a bovine serum albumin (BSA) test was performed. Since BSA does not cleave the ester bond in type I and type II pyrethroids, pyrethroid-induced toxicity would be evident by a greater reduction in toxicity in the esterase treatment than seen in the BSA treatments. Any reductions in toxicity above and beyond that observed for aeration and/or BSA would be indicative of type I and type II pyrethroids as the cause of the toxicity.

These carboxylesterase treatment consisted of addition of carboxylesterase to the water sample (and method blank) at a carboxylesterase concentration of 73 mg/L (or 1.25 Units/mL); the corresponding BSA test consisted of addition of BSA to the water sample (and method blank) at a concentration of 73 mg/L. The carboxylesterase and BSA tests were performed as described in Section 2.2.

Note – Anomalous mortalities due to hypoxia (low D.O.) occurred in the one carboxylesterase blank replicate. This replicate was removed from statistical analysis.

3. RESULTS

3.1 Effects of the CCCWP Stormwater on Hyalella azteca

The results for these tests are summarized below in Table 2. There were significant reductions in *H. azteca* survival in the upstream and downstream 544R00025 stormwater samples. The test data and summary of statistical analyses for these tests are presented in Appendix B.

Table 2. Effec	Table 2. Effects of CCCWP stormwater on <i>Hyalella azteca</i> .										
Test Initiation Date (Time) Treatment/Sample ID 10-Day Mean % Survival											
	Lab Control	96									
3/7/13 (1855)	544R00025US	18*									
	544R00025DS	12*									

^{*} The response at this test treatment was significantly less than the Lab Control treatment response at p < 0.05.

3.2 Performance of the Follow-Up Targeted TIE

3.2.1 Results of Targeted Phase I TIE of the "544R00025DS" Stormwater Sample

The results for this Phase I TIE are summarized below in Table 3. The following trends (changes in sample toxicity relative to the untreated water sample [Baseline] test) were observed:

- The addition of PBO to the test solutions increased toxicity to *H. azteca* survival (survival decreased from 16% survival to complete mortality). These results suggest that compounds which are *detoxified* by the cytochrome-P450 system (e.g., pyrethroid insecticides) were contributing to sample toxicity;
- The addition of carboxylesterase decreased the survival toxicity (from 16% survival to 98% Survival), suggesting that type I and type II pyrethroids are contributing to the toxicity (Weston and Amweg 2007). However, it should be noted that the esterase control treatment (BSA) also reduced toxicity, suggesting that some of the reduced toxicity was due the presence of large organic molecules. The use of carboxylesterase as a TIE treatment is still experimental and these results need to be used judiciously and in conjunction with other TIE treatment (e.g., PBO); and
- There was partial toxicity removal as a result of BSA addition, since BSA does not cleave the ester bond in type I and type II pyrethroids, evidence of greater reduction in toxicity in the esterase treatment than seen in the BSA treatment is indicative of type I and type II pyrethroids as a the cause of the stormwater toxicity.

The test data and the summary of statistical analyses for these tests are presented in Appendix C.



Table 3. Effects of	Table 3. Effects of TIE treatments on the toxicity of CCCWP stormwater sample on <i>H. azteca</i> survival											
TIE Treatment Mean % Survival Effects of TIE Treatment?												
TIE Treatment	Control/Blank	50% Effluent	100% Effluent	Effects of TIE Treatment?								
Baseline	100		16*	toxicity present								
PBO	100	0*	0*	increase in toxicity								
Carboxylesterase	92.5ª		98	toxicity removed								
BSA	100		46*	partial reduction of toxicity								

^{*} The response at this test treatment was significantly less than the Lab Control treatment response at p < 0.05.

a - Anomalous mortalities due to hypoxia (low D.O.) occurred in the one carboxylesterase blank replicate. This replicate was removed from statistical analysis.

4. AQUATIC TOXICITY DATA QUALITY CONTROL

Four QC measures were assessed during the toxicity testing:

- Maintenance of acceptable test conditions;
- Negative Control testing;
- Positive Control (reference toxicant) testing; and
- Concentration Response Relationship assessment.

4.1 Maintenance of Acceptable Test Conditions

All test conditions (e.g., pH, D.O., temperature, etc.) were within acceptable limits for these tests. All analyses were performed according to laboratory Standard Operating Procedures.

4.2 Negative Control Testing

The responses at the Lab Control treatments were acceptable.

4.3 Positive Control Testing

4.3.1 Reference Toxicant Toxicity to Hyalella azteca

The results of this test are presented in Table 4. The EC50 of 0.57 g/L is slightly above the "typical response" upper threshold value of 0.54 g/L KCl, suggesting that these organisms may have been slightly less sensitive to toxicant stress than is typical and that the survival responses in the accompanying stormwater tests should be interpreted judiciously.

The test data and summary of statistical analyses for this test are presented in Appendix D.

Table 4. Reference toxicant testing: Ef	Table 4. Reference toxicant testing: Effects of KCl on <i>Hyalella azteca</i> survival.										
KCl Treatment (g/L)	Mean% Survival										
Control	100										
0.1	100										
0.2	100										
0.4	100										
0.8	0*										
1.6	0*										
Summary	of Statistics										
EC50 =	0.57 g/L KCl										
"Typical response" range (mean ±2 SD)	0.26 – 0.54 g/L KCl										

^{*} The response at this test treatment was significantly less than the Lab Control treatment response at p < 0.05.



4.4 Concentration Response Relationships

The concentration-response relationships for the reference toxicant tests were evaluated as per EPA guidelines (EPA-821-B-00-004), and were determined to be acceptable.

5. SUMMARY & CONCLUSIONS

Toxicity of CCCWP Stormwater to Hyalella azteca

There were significant reductions in *H. azteca* survival in the upstream (US) and downstream (DS) 544R00025 stormwater samples.

Targeted Phase I TIE of the "544R00025DS" Stormwater Sample

A targeted TIE was performed on the downstream stormwater sample (544R00025DS). The following trends (changes in sample toxicity relative to the untreated water sample [Baseline] test) were observed:

- The addition of PBO to the test solutions increased toxicity to *H. azteca* survival (survival decreased from 16% survival to complete mortality). These results suggest that compounds which are *detoxified* by the cytochrome-P450 system (e.g., pyrethroid insecticides) were contributing to sample toxicity;
- The addition of carboxylesterase decreased the survival toxicity (from 16% survival to 98% Survival), suggesting that type I and type II pyrethroids are contributing to the toxicity (Weston and Amweg 2007). However, it should be noted that the esterase control treatment (BSA) also reduced toxicity, suggesting that some of the reduced toxicity was due the presence of large organic molecules. The use of carboxylesterase as a TIE treatment is still experimental and these results need to be used judiciously and in conjunction with other TIE treatment (e.g., PBO); and
- There was partial toxicity removal as a result of BSA addition, since BSA does not cleave the ester bond in type I and type II pyrethroids, evidence of greater reduction in toxicity in the esterase treatment than seen in the BSA treatment is indicative of type I and type II pyrethroids as a the cause of the stormwater toxicity.

The weight of evidence from the TIE performed on the downstream stormwater sample suggests that the toxicity was likely due to pyrethroid insecticides.



6. LITERATURE CITED

Amweg EL, Weston DP (2007) Whole sediment toxicity identification evaluation tools for pyrethroid insecticides: I. Piperonyl butoxide addition. *Environ. Toxicol. Chem.* 26:2389-2396.

Wheelock CE, Miller JL, Miller MJ, Gee SJ, Shan G, Hammock B (2004) Development of toxicity identification evaluation procedures for pyrethroid detection using esterase activity. *Environ. Toxicol. Chem.* 23:2699–2708.

Weston DP, Amweg EL (2007) Whole sediment toxicity identification evaluation tools for pyrethroid insecticides: II. Esterase addition. *Environ. Toxicol. Chem.* 26:2397-2404.

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Appendix A

Chain-of-Custody Record for the Collection and Delivery of the CCCWP Stormwater Samples

CHAIN-OF-CUSTODY RECORD

Pacific EcoRisk

2250 Cordelia Rd., Fairfield, CA 94534
(707) 207-7760 FAX (707) 207-7916

Client Name:	ADH	Envi	rohme	AAA					REQ	UEST	ED A	NAL'	YSIS			
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Project Name:	110/		$\overline{}$	1 .			8 E	IIC PIMED	<i>-tyalella</i> (water)	重			1			
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Appendix B

Test Data and Summary of Statistics for the Evaluation of the Chronic Toxicity of the CCCWP Stormwater Samples to *Hyalella azteca*



CETIS Summary Report

Report Date:

02 Mar-14 16:09 (p 1 of 1)

Test Code:

ADH_0207_HA_C1 | 08-6541-7375

							lest Code	: A	DH_0207_	HA_C1 U	8-6541-737
Hyalella Survival	and Growth Test									Paci	fic EcoRisk
Start Date: 07 Ending Date: 17	1-6599-0950 7 Feb-14 18:55 7 Feb-14 09:05 1 14h	Test Type: Protocol: Species: Source:	Survival-Gro GCML Hyalella azto Chesapeake				Analyst: Diluent: Brine: Age:	Not A	Kalombo pplicable pplicable		
Sample Code	Sample Notes	ı									
544R00025US 544R00025DS	Upstream Sam Downstream S	•									
Sample Code	Sample ID			Receive Date	Sample A		Client Nan	ne		Project	
ADH_0207_HA_C 544R00025US 544R00025DS	1 15-4211-5762 10-7678-2817 17-0680-4397	06 Fe	b-14 20:50 0	7 Feb-14 18:55 7 Feb-14 17:40 7 Feb-14 17:40	22h (1.9 °	°C)	ADH Enviro	onment	al, Inc.	19397	
Sample Code	Material Type	Samı	ole Source		Station L	.ocatio	n		Latitude	Lor	ngitude
ADH_0207_HA_C 544R00025US 544R00025DS	1 Sediment Stormwater Stormwater	CCC/ CCC/ CCC/	ΝP		LABQA 544R0003 544R0003				-		
Survival Rate Sur	nmary					******					<u> </u>
Sample Code	Cou	nt Mean	95% LC	CL 95% UCL	Min	Max	Std	Err	Std Dev	CV%	%Effect
ADH_0207_HA_C	1 5	0.96	0.94	0.98	0.9	1	0.02	45	0.0548	5.71%	0.0%
544R00025US	5	0.18	0.149	0.211	0.1	0.3	0.03	74	0.0837	46.5%	81.3%
544R00025DS	5	0.12	0.0888	0.151	0	0.2	0.03	74	0.0837	69.7%	87.5%
Survival Rate Det	ail										***
Sample Code	Rep	1 Rep 2	Rep 3	Rep 4	Rep 5						
ADH_0207_HA_C	1 . 1	0.9	1	1	0.9						
544R00025US	0.2	0.3	0.1	0.2	0.1						
544R00025DS	0.1	0.2	0.1	0	0.2		· ·				
Survival Rate Bin	omials						-				
Sample Code	Rep			Rep 4	Rep 5						
ADH_0207_HA_C	1 10/10	9/10	10/10	10/10	9/10						,
544R00025US	2/10	3/10	1/10	2/10	1/10						
544R00025DS	1/10	2/10	1/10	0/10	2/10						

CETIS Analytical Report

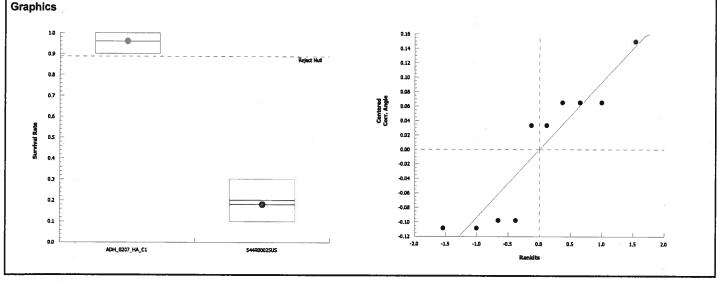
Report Date:

02 Mar-14 16:09 (p 1 of 2)

Test Code: Al

ADH 0207 HA C1 | 08-6541-7375

						Test	Code:	ADH_0207_	_HA_C1 0	8-6541-737
Hyalella Survival a	nd Growth Test			·					Paci	fic EcoRisk
•	7335-5517 Mar-14 16:09		rvival Rate rametric-Two	o Sample			IS Version: cial Results		1.8.5	
Data Transform	Zeta	Alt Hyp	Trials	Seed		PMSD	Test Res	ult		
Angular (Corrected)	NA	C>T	NA	NA		7.52%				
Equal Variance t T	wo-Sample Test									
Sample Code vs	Sample Code	Test Stat	Critical	MSD DF	P-Value	P-Type	Decision	ι(α:5%)		
ADH_0207_HA_C1	544R00025US	14.5	1.86	0.118 8	<0.0001	CDF	Significar	nt Effect		
ANOVA Table										
Source	Sum Squares	Mean Sq	uare	DF	F Stat	P-Value	Decision	(a:5%)		
Between	2.101034	2.101034		1	210	<0.0001	Significar			
Error	0.07996342	0.009995	428	8			Ū			
Total	2.180998			9	_					
Distributional Test	s									
Attribute	Test		Test Stat	Critical	P-Value	Decision	(α:1%)			
Variances	Variance Ratio I	=	1.51	23.2	0.6999	Equal Va	<u> </u>			
Distribution	Shapiro-Wilk W	Normality	0.845	0.741	0.0510	•	istribution			
Survival Rate Sum	mary						-			
Sample Code	Cour	nt Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
ADH_0207_HA_C1	5	0.96	0.892	1	1	0.9	1	0.0245	5.71%	0.0%
544R00025US	5	0.18	0.0761	0.284	0.2	0.1	0.3	0.0374	46.5%	81.3%
Angular (Corrected) Transformed S	ummary				<u> </u>				
Sample Code	Cour	nt Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
ADH_0207_HA_C1	5	1.35	1.24	1.46	1.41	1.25	1.41	0.0399	6.63%	0.0%
544R00025US	5	0.43	0.294	0.566	0.464	0.322	0.58	0.049	25.5%	68.1%
Graphics										
1.0 F					0.36 F		1			



Client:	2117 2222 2117 (Organism Log#: 7	930 Age:	8 days
Test Material:	544R	00025 U/S (up-s	tream)	Organism Supplier:	Chesapeake	0
Test ID#:	55256	Project #:	19397	Control/Diluent:	SAM-5 Hyalella W	ater
Test Date:		2-7-14		Control Water Batch:	54	

	1	р	н	DO	(mg/L)	Conductivity	1	# 1	ive Organ	ieme	-	
Treatment	Temp (°C)	new	old	new	old	(μS/cm)	A	В	C	D	E	SIGN-OFF
Lab Control	23.3	7.84		9.1		389	10	10	10	(0	10	Date: 2 - 7 - 7 4 Sample IRS 24018 340
100%	23.3	7.61		8.1		1835	10	10	(0	10	10	Test Solution Prep:
Meter ID	430	PHIS		RDOY		ELOY						Initiation Time 1800 1855
Lab Control	23.2				გ.3		10	9	10	10	10	Date: 2/8/14 Count Time: 1/4/0
100%	23.2				7.6		9	10	10	10	10	Count Signoff: KB Old WQ: M A
Meter ID	43A				4006							
Lab Control	23.4				5.5		10	9	10	10	9	Date: 2/9/14 Count Time 1036
100%	23.4				6.1		8	7	6	10	9	Count Signoff: Old WQ:
Meter ID	4315				PDOY							Feed:
Lab Control	23.7				7.0		10	9	10	10	٩	Date: 2/10/14 Count Time: 1030
100%	23.7				6.0		7	7	5	8	6	Count Signoff: MK Old WQ: 0. M.S.
Meter ID	43A				4004							
Lab Control	23.4				7.3		10	9	10	10	9	Date: 2///4 Count Time RS5
100%	23.4				7.3		7	7	5	8	6	Count Signoff:
Meter ID	43/				KAUS							Feed: //
Lab Control	23.\	8.11	7.75	8.3	8.1	461	10	9 4	10	/0	9	Sample ID: 34017
100%	23.1	7.85	7.73	10.1	7.5	1926	6	6	4	7	5	Test Solution Prep: See
Meter ID	454	PHIL	1416	H05	P-006	EL04						Renewal Time: 1345 Renewal Signoff:
												Old WQ:
Lab Control	23.1				7.2		10	9	10	10	9	Date: 2-13-14 Count Time: 1015
100%	23.1				6.2		4	ч	4	5	5	Count Signoff: Old WQ:
Meter ID	43A				4067							Feed.
Lab Control	23,3				4.165		10	9	10	10	9	Date: 2/4/4 Count Time. 9/5
100%	23.3				4.5		3	4	2	3	3	Count Signoff Old WQ MK
Meter ID	43A				RP05							
Lab Control	23.2				5.0		10	9	10	10	9	Date: 2/15/19 Count Time: 900
100%	23.2				4.2		2	4		2	1	Count Signoff: Old WQ:
Meter ID	45A				2007							Date: 2/16/14
Lab Control	231				5.4		10	9	10	16	9	Count Time: 1105
100%	33.1				5.1		a	4		2	ì	Count Signoff: Old WQ:
Meter ID	434				ROOT							Date: S
Lab Control	231		7.50		5.6	441	10	9	10	10	9	Date: 2 . 17 . 19 Termination Time: 0905
					-							
100% Meter ID	23.1		7.74		5.6 2004	2000 ECJ9	2	3	1	2	1	Termination Signoff: Solid WQ: 0.M.S.

1

CETIS Analytical Report

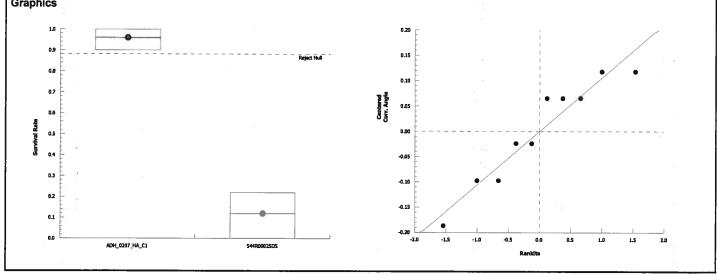
Report Date:

02 Mar-14 16:09 (p 2 of 2)

Test Code:

ADH 0207 HA C1 | 08-6541-7375

						Test	Code: A	ADH_0207_	_HA_C1 0	8-6541-737
Hyalella Survival and	Growth Test		•						Paci	fic EcoRisk
•		•	ırvival Rate ırametric-Two	Sample			IS Version: cial Results:	CETISv ² Yes	1.8.5	
Data Transform	Zeta	Alt Hyp	Trials	Seed		PMSD	Test Resu	ılt		
Angular (Corrected)	NA	C > T	NA	NA		8.26%				
Equal Variance t Two	-Sample Test									
Sample Code vs S	Sample Code	Test Stat	Critical	MSD DF	P-Value	P-Type	Decision(α:5%)		
ADH_0207_HA_C1 5	44R00025DS	14.5	1.86	0.129 8	<0.0001	CDF	Significan	Effect		7
ANOVA Table			·			9 E				
Source S	um Squares	Mean Sq	uare	DF	F Stat	P-Value	Decision(α:5%)		
Between 2.	504565	2.504565		1	209	<0.0001	Significant	Effect		
	0957804	0.011972	55	8	_					
Total 2.	600346			9	=					
Distributional Tests										
Attribute T	est		Test Stat	Critical	P-Value	Decision	(α:1%)			
Variances V	/ariance Ratio F		2.01	23.2	0.5170	Equal Var	iances			
Distribution S	hapiro-Wilk W N	ormality	0.91	0.741	0.2836	Normal D	stribution			
Survival Rate Summa	ry	8						Н		
Sample Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
ADH_0207_HA_C1	5	0.96	0.892	1	1	0.9	1	0.0245	5.71%	0.0%
544R00025DS	5	0.12	0.0161	0.224	0.1	0	0.2	0.0374	69.7%	87.5%
Angular (Corrected) T	ransformed Sur	nmary								
Sample Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
ADH_0207_HA_C1	5	1.35	1.24	1.46	1.41	1.25	1.41	0.0399	6.63%	0.0%
544R00025DS	5	0.346	0.189	0.503	0.322	0.159	0.464	0.0565	36.5%	74.3%
Graphics						-7				
10					0.20		1			
0.9			Reject Null	-	0.15		 			
0.8			rusjana 1905		0.10			9	•/•	2



Client:		ADH / CCCWF		Organism Log#:	7930 Age: 8 days	
Test Material:	544R00	025 D/S (down	-stream)	Organism Supplier:	Cheapealce	
Test ID#:	55260	Project #:	19397	Control/Diluent:	SAM-5 Hyalella Water	
Test Date:		2-7-14		Control Water Batch:	54	

Treatment Temp (**) Temp
1007 23.3 7.86 9.1 387 10 10 10 10 10 10 10 1
100% 23.3 7.64 10.6 1823 10 10 10 10 10 10 10 1
Meter ID 450 PM/5 PD44 ECO4 Initiation Signoff PO44 ECO4 Initiation Signoff PO44 ECO4 Initiation Signoff PO44 ECO4 Initiation Signoff PO45
100% 23.2 7.9 8 10 10 10 10 10 10 10
Meter ID 43A
Lab Control 23.4
100% 33.4 5.8 6 10 10 9 Count Signoff 32
Meter ID 43 #
100% 23.7 5.1 5 8 9 7 9 Count Time 1030
100% 23.7 5.1 5 8 9 7 9 Count Signoff MK Oid WQ M.S.
Meter ID 43A 47094
100% 23.4 5.7 6 8 9 7 9 Count Signoff. 25.5
3.7 0 0 0 7 7 7 1 odwgg 7
Meter ID U3A Freed (4)
Lab Control 23.1 8.11 7.75 8.8 8.1 46 10 9 10 10 9 Date: 1.12.14 Sample ID: 34018
Motor ID Mark Otto Otto Otto Otto
Renewal Signoff Mac
Lab Control 23.1 7.2 10 9 10 10 9 Date: 2-13-14
100% 23.1 5.4 2 6 5 4 5 Count Signoff
Meter ID 454 2067 Feet
Lab Control 23.3 4.6 10 9 10 10 9 Date 2/14/19
100% 23.3 3.6 2 6 4 2 3 Count Signof: Am.
Meter ID 434 RDOS
Lab Control 23-2 5.0 10 9 10 10 9 Date: 21:5/17
100% 23.2 3.6 2 4 4 1 3 COUNT SIGNOFF.
Meter ID 494
Meter ID 494 EOOA
Meter ID 494 EOOF Free!
Meter ID 49A
Meter ID 194 10 10 10 10 10 10 10 1
Meter ID 494

Appendix C

Test Data and Summary of Statistics for the Evaluation of the Chronic Toxicity of the CCCWP Stormwater to *Hyalella azteca* – Follow-Up Toxicity Identification Evaluation (TIE): 544R00025DS



Client:		ADH/CCCWP		Organism Log#:	7966 Ag	e: 7-8,8 d.
Test Material:	54	4R00025DS-W-	01	Organism Supplier:	mahasasal	- Chescipeak
Test ID#:	55383	Project #:	19397	Control/Diluent:	SAM-5 Hya	
Test Date:	6	1/15/14		Control Water Batch:	81	

	pH D.O. (mg/L) Conductivity # Live Organisms											
Treatment	Temp (°C)	new	old	new	old	Conductivity (µS/cm)	A	# L B	ive Organ C	isms D	E	SIGN-OFF
Lab Control	ස ද	7.81		84		428	10	10	10	10	10	Date 2/15/14 Sample ID 34.018
100%	63 A	7.84		8.7		1921	10	10	10	10	10	Test Solution Prep: New WQ: FOLB
Meter ID	A SP	P4118		RDOU		EC09						Initiation Time: 1639 Initiation Signoff: 7
Lab Control	23.1				8.૨		10	ιο	10	10	10	Date 2, 16, 14 Count Time: 1180
100%	23.1				7.0		lo	10	q	10	10	Count Signoff.
Meter ID	434				ROOY							
Lab Control	23.3				5.6		10	10	10	10	10	Date: 2-17-14 Count Time: 1210
100%	23.3				53		9	10	9	10	10	Count Signoff Old WQ
Meter ID	438				1005							Feed On
Lab Control	33. 2				5.6		10	10	10	10	10	Date: 0/18/19 Count Time: 1100
100%	23.2				6.1		8	9	7	10	10	Count Signoff Old WQ
Meter ID	Y3A				RD04							^{Date:} 2/19/14
Lab Control	23.3				7.8		10	10	10	10	10	Count Time 1400
100%	23.3				7.7		8	8	4	8	7	Count Signoff MK
Meter ID	43 A				1007							Feed: MK
Lab Control	२३.२	8.4	7.84	9.0	8.0	430	10	10	10	10	10	Date 220/17 Sample ID 34018 Test Solution Prep
100% Meter ID	23.2	7.91	8.12	9.6	7.5	1904	P	5	4	5	2	New WQ A5
Meter ID	43/F	Pth9	PHI5	+ 007	RP05	B/04						ديا
												Renewal Signoff
Lab Control	22.9				3.2		10	10	10	10	10	Count Time: 1500
100%	12.9				4.5		15	5	2	0	0	Count Signoff Old WQ:
Meter 1D	43A				ROOT							Feed 2
Lab Control	23.1				4.5		10	10	10	10	10	Date 2/22/14 Count Time 400
	23.1				154.0		5	2	2		_	Count Signoff: A
Meter ID	43A				RDOS							
	23.1				6.2		10	10	10	10	10	Date: 2/23/19 Count Time: 1/23/2 Count Signoff: 2/2
	23.4				6.0		7	a	Q M			Old WQ FEN?
Meter ID Lab Control	438 121				PD07			1 6			10	Date 2 24 14
	32 l				5.6		10		10	10	10	Count Time 1430
	23.1				4.7		4	3	ð		100000000	old WQ & CP
	13A				RD04							Date 7 (2 (114
	33.3		7.80		5.7	477	10	10	10	10	10	Termination Time 100
	23.9		7.88		6.0	2177	14	જ	a	_	_	Termination Signoff CJD Old WQ: CP
Meter ID	43A		3HI6		RDO4	EC06						

Client:		A	DH /CCC	WP		Organism Log#: 7966 Age: 7-8d						
Test Material:		544R000 383	025DS-W-		397	Organism			_C		beck 5 Hyalella	
Test ID#: Test Date:			Project #:	19.	397	Control Wat	l/Diluent: ter Batch:			SAM-		water
Treatment	T (10)		Н	D.O.	(mg/L)	Conductivity		# L	ive Organi		•	SIGN-OFF
	Temp (°C)	new	old	new	old	(µS/cm)	A	В	C	D	E	Date: 2 /(5//4
PBO Blank	33 ∙5	7.90		8.6		420	16	10	10	10	16	Sample ID: 24/5/4 Test Solution Prep: 2014
50% 100%	23.2	7.92		8.6		1165	10	10	10	10	10	Initiation Time: 1680
Meter ID	23.2 U3 K	7.90		8.6		1882	10		10	10	D	Initiation Signoff:
PBO Blank	23.1				8.1		10	10	10	lo	10	Date: 2, 16, 14 Count Time: 1786
50%	23.1				7.1		10	(0	10	10	10	Count Time: 1200 Count Signoff: 600
100%	28.1				1.0		10	(0	10	10	10	
Meter ID	464				RDo Y					000000	888888	Date 2-17-14
PBO Blank	23.3				5.3		10	10	10	10	10	Count Time: Count Signoff:
50%	23.3				(g.Q)		A	7	10	7	9	Old WQ
100%	23.3				004		<u></u>	5_	<u>ب</u>	3	5	Fced:
Meter ID PBO Blank	43A				5.8		10	10	10	1	10	Date: 2/18// /
	23.2				6.0		7	7	_	1	9	Count Time: 106
100%	23.3				6.2		_	9	10	9	4	Old WQ CP
Meter ID	23.2 43A				R004		5	5	٠	3		
PBO Blank	23.3				7.4		10	10	10	10	10	Date: 2/19/14 Count Time: 14/00
50%	23.3				7.2		9	5	7	3	7	Count Signoff Old WQ:
100%	23.3				7.2		3	1	1	0	1	Feed: MK
Meter ID	43A				4004							Date A A A // 9
PBO Blank	83.3	8.12	7.73	9.0	6.7	411	10	10	10	10	10	Date: Sample (D: 3 4 6 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7
50%	23.2	798	7.80	9.1	6.9	1199	251	0	0	0	1	New WQ AS Renewal Time: 1455
100%	23.3	797	7.94	9.1	7.4	FUB	70	0	0	0		Renewal Signoff.
Meter ID PBO Blank	72.9	0449	PH15	400¥	4.5	ECA	lO	10	10	10		Date: 2/2///
50%	12.9				1.2		0	-	10	-	>	Count Time: 1800 Count Signoff 2
100%	12.9				6.9		-	_	_	_		Feed:
Meter ID	43A				Ran							
PBO Blank	23.1				2.7		10	10	10	10	10	Date 2/22/19 Count Time 900
50%	23.1				_			-	_	_		Count Signoff
100%	23.1				_		_	_	_	_	-	
Meter ID	43A				Rpos - a				112			Date 2/23/14
PBO Blank	23.1				5.9		10	10	10	10	10	Date: 2/23/14 Count Time: 7/230 Count Signoff: 7/2
50%							_	_		-		Old WQ: SAR Feed:
100% Meter ID	43A				8.00 7		 	_	<u> </u>			
PBO Blank	23.1				5.7		10	10	10	10	10	Date: 2 244 Count Time C 1430
50%	-				_		_	_	_	_	_	Count Signoff:
100%					_			_	2	~	_	
Meter ID	НЗА				RD04							Date: Date:
PBO Blank	23.2		7.88		5.7	455	10	10	10	10	10	Date: 25 Termination Time: 100 Termination Signoff: COD
50%	23.9		-			-	_	-	_		_	Old WQ: LP
100%	237		0#1/				_	-		_		
Meter ID	434		PHIL		ROOH	EC06						

Client:		ADH /CCCWP		Organism Log#:	7966 Age: 7-8d	
Test Material:	544R00025I	OS-W-01 + Carb	oxyl Esterase	Organism Supplier:	Chescoecke	
Test ID#:	55383	Project #:	19397	Control/Diluent:	SAM-5 Hyalella Water	
Test Date:	2/	15/14		Control Water Batch:	81	

			Н	DO	(mg/L)	Conductivity		#1	ive Organi	sms		
Treatment	Temp (°C)	new p	old	new	old	(μS/cm)	Ã	В В	C	D	E	SIGN-OFF
Carboxyl esterase Blank	२३ २	802		8.7		423	ь	10	10	10	10	Date 2/15/14 Sample ID 34018
100%	ಞ.ಇ	7.92		86		1869	10	10	10	0	0	Test Solution Prep New WQ: FOUR
Meter ID	43 A	8149		PDOY		E109						Initiation Time
Carboxyl esterase Blank	23.\				۵. ۴		(0	(0	10	(0	ī0	Date: 2 14 14 Count Time 1100
100%	23.1				2.0		10	10	10	(0	10	Count Signoff Esc
Meter ID	AGH				RD04							
Carboxyl esterase Blank	233				3.9		10	10	9	10	Ö	Date: 217/4 Count Time 12/6
100%	23.3				2,4		9	10	10	10	1U	Count Signoff Old WQ
Meter ID	43A				eno5							Feed M
Carboxyl esterase Blank	<i>æ</i> .a				4.6		10	10	9	10	10	Date 2/18/19 Count Time 100 Count Signoff
	<u> 33.4</u>				5.2		9	10	10	10	10	Old WQ CP
Meter ID	434				RDOY							Date 2/19/14
Carboxyl esterase Blank	23.3				5.1		10	9	9	10	10	Count Signoff MK
100%	23.3				71		9	10	10	10	(0	Old WQ: A5
Meter ID	43A				4007							Date 220/14
Carboxyl esterase Blank	23.2	8.07	7.65	9.1	5.5	417	10	9	9	10	10	Sample ID 340) & Test Solution Prep
100%	23.2	7.99	7.81	9.0	5.7	vqob	9	10	10	10	10	New WQ: AS
Meter ID	43A	! (૧૧૧	PH15	1061	RD05	6 09						Renewal Time Renewal Signoff
												Old WQ CP
Carboxyl esterase Blank	22,9				3.4		10	9	9	10	10	Date 2/2//14 Count Time 1800
7001	27,9				6.4		9	10	10	10	6	Count Signoff 2
Meter ID	477				የ _ው ን				iiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii			Date 2 22/14
Carboxyl esterase Blank	23.1				1.7		10	9	9	10	10	Count Time 900
100%	23.1				7.6		9	10	10	10	10	Count Signoff A
Meter ID	43A				2005							Date 2] 23/14
Carboxyl esterase Blank	23.1				7.4		1	9	9	10	10	Count Time [030
100%	23.1				7.7		9	10	10	10	10	Old WQ
Meter ID	438				2007							Freed PL
Carboxyl esterase Blank	23.1				7.4		ı	9	9	10	10	Date 3/24/M Count Time 1430 Count Signoff CCTD
100%	23.1				7.7		9	10	10	10	10	old WQ CP
Meter ID	43A				RD04							
Carboxyl esterase Blank	53'9		8.02		6.7	523	1	9	9	9	10	Date 2 25/14 Termination Time 1100
100%	23.2		8.20		7.3.	2201	9	10	10	10	10	Termination Signoff (7)
	434		PHIC	**********	RD04	EC06						

Client:		ADH/CCCWP		Organism Log#:	7966 Age: 7-8 d	
Test Material:	544R	00025DS-W-01	+ BSA	Organism Supplier:	Chesadeale	
Test ID#:	55383	Project #:	19397	Control/Diluent:	SAM-5 Hyalella Water	
Test Date:	a	15114		Control Water Batch:	81	

		posterio de la companya della companya della companya de la companya de la companya della compan			((T.) 1				0			
Treatment	Temp (°C)	new	H old	D.O. new	(mg/L) old	Conductivity (μS/cm)	A	# L: B	ive Organi C	sms D	Е	SIGN-OFF
BSA Blank	ૐ .∡	8.00		8.6		413	Ŝ	10	10	10	10	Date: 2/15/14 Sample ID: 3 401%
100%	23.2	7.94		8.6		1890	10	10	10	10	10	New WQ FOUB
Meter ID	43A	PHIS		12004		569						Initiation Time: 630 Initiation Signoff:
BSA Blank	23.\				6.1		10	10	10	10	10	Date: 2 . 16 . 14 Count Time:
100%	25.1				2.9		(0	10	10	10	10	Count Signoff
Meter ID	45 N				RDOY							Old WQ
BSA Blank	23.3				5.0		10	0	10	10	10	Date 12-17-14 Count Time)210
100%	23.3				2.0		10	10	લ્	10	ت	Count Signoff:
Meter ID	439				400S							Feed:
BSA Blank	33 .2				4.4		10	16	10	10	10	Date: 2/18/14 Count Time: 1100
100%	23·a				4.7		10	10	જ	10	10	Count Signoff:
Meter ID	43A				RDOY							Date: # 4 o 4 set
BSA Blank	23.3				4.4		10	10	10	10	10	Date: Z/19/14 Count Time 1400
100%	23.3				6.0		8	6	7	8	8	Count Signoff: MK
Meter ID	43A				F094							Pate: 200//V
BSA Blank	23.2	8.15	7.58	9.2	4.3	409	10	OI	10	10	10	Sample ID: 34018
100%	33.Z	4.93	7.81	9.1	5,3	1912	34	6	3	6	8	Test Solution Prep:
Meter ID	43 <i>A</i>	Otha	PHIS	rout	RD05	とのよ						Renewal Time: 1655 Renewal Signoff
												Old W.O. C. D. C.
BSA Blank	22.9				3.4		10	10	10	10	10	Date 2/2/1/4 Count Time: 1600
100%	23.9				6.7		43	6	3	6	8	Count Signation
Meter ID	430				KD07							Date:
BSA Blank	23.1				1.8		10	10	10	10	10	Count Time: 900
100%	25.1				7.0		4	5	3	6	7	Count Signoff:
Meter ID	43A				RP05							Date: 2 בו
BSA Blank	231				7.4			10	16	-	10	Date: 2/23/19 Count Time: /036 Count Signoff: 2/
100%	23.1				7.7		4	5	2	6	7	Old WQ: ZAS
Meter ID	431				2007							Pate: 2/24/14
BSA Blank	23.1				7.2		10	10	10	-	10	Count Signoff: C5D
100%	23.1				7.5		4	5	1	6	17	old WQ: ZP
Meter ID	43A				RD04							Date 3 Jac 144
BSA Blank	23.2		8.09		6.9	522	10	10	10	10	10	Date 2 2514 Termination Time. 100
100%	23.2		8.18		6.9	2201	4	5	1	6	7	Termination Signoff: O
Meter ID	43A		PHIS		2004	EC 06						

Appendix D

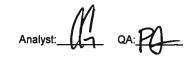
Test Data and Summary of Statistics for the Reference Toxicant Evaluation of the *Hyalella azteca*

CETIS Summary Report

Report Date: Test Code:

15 Feb-14 15:46 (p 1 of 1) 55244 | 12-2780-2249

Hyalella 96-h Acute Survival Test Pacific EcoRisk Batch ID: 19-8480-8516 Test Type: Survival (96h) Analyst: Cassy Giover **Start Date:** 07 Feb-14 17:40 EPA-821-R-02-012 (2002) Diluent: SAM-5S Protocol: 11 Feb-14 16:55 Ending Date: Not Applicable Species: Hyalella azteca Brine: **Duration:** Chesapeake Cultures, Inc. Source: Age: Sample ID: 12-2997-3710 Code: Client: Reference Toxicant Sample Date: 07 Feb-14 17:40 Material: Potassium chloride Project: 22049 Receive Date: 07 Feb-14 17:40 Source: Reference Toxicant Sample Age: NA (23.3 °C) Station: In House **Comparison Summary** Analysis ID **Endpoint** NOEL LOEL TOEL **PMSD** TU Method 04-8301-8359 96h Survival Rate 0.5657 Fisher Exact/Bonferroni-Holm Test 0.4 0.8 NA **Point Estimate Summary** Analysis ID **Endpoint** Level g/L 95% LCL 95% UCL TU Method 04-4756-7462 96h Survival Rate EC50 0.566 0.454 0.704 Binomial/Graphical 96h Survival Rate Summary C-g/L **Control Type** Count Mean 95% LCL 95% UCL Min Max Std Err Std Dev CV% %Effect 0 Lab Water Contr 10 1 0 0 0.0% 0.0% 1 1 0.1 0 0 10 1 1 1 1 1 0.0% 0.0% 0.2 10 1 1 1 1 1 0 0 0.0% 0.0% 10 0.4 1 1 1 1 1 0 0 0.0% 0.0% 0.8 10 0 0 0 0 0 0 0 100.0% 0 1.6 10 0 0 0 0 0 0 100.0% 96h Survival Rate Detail C-g/L **Control Type** Rep 1 Rep 2 Rep 3 Rep 4 Rep 5 Rep 6 Rep 7 Rep 9 Rep 8 Rep 10 Lab Water Contr 1 0 1 1 1 1 1 1 1 1 0.1 1 1 1 1 1 1 1 1 1 0.2 1 1 1 1 1 1 1 1 1 0.4 1 1 1 1 1 1 1 1 1 1 0.8 0 0 0 0 0 0 0 0 0 0 1.6 0 0 0 0 0 0 0 0 0 0 96h Survival Rate Binomials C-g/L **Control Type** Rep 1 Rep 6 Rep 8 Rep 2 Rep 3 Rep 4 Rep 5 Rep 7 Rep 9 Rep 10 0 Lab Water Contr 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 0.1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 0.2 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 0.4 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 0.8 0/1 0/1 0/1 0/1 0/1 0/1 0/1 0/1 0/1 0/1 0/1 1.6 0/1 0/1 0/1 0/1 0/1 0/1 0/1 0/1 0/1



Hyalella 96-h Acute Survival Test

Test Type: Survival (96h)

Protocol: Ali Protocols

Organism: Hyaleila azteca (Freshwater Amphip Protocols Endpoint: 96h Survival Rate

Pacific EcoRisk

Material: Potassium chloride

Source: Reference Toxicant-REF

Hyalella 96-h Acute Survival Test 0.7 ECS0-g/L Potassium chloride -2s 0.2 0.1 0.0 -2s Warning Limit: 0.2621 -3s Action Limit: 0.2185 0.3773 20 Mean: Count: 20.00% +2s Warning Limit: 0.5429 +3s Action Limit: 0.6513 Sigma: NA CV:

Qualif	ly Con	trol Data	а								
Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2013	Jul	25	16:30	0.2828	-0.09443	-1.583			00-1823-9671	20-7751-0916
2			26	14:30	0.4583	0.08108	1.07			11-2447-7250	10-1665-7756
3		Aug	15	16:50	0.3009	-0.07641	-1.243			00-1985-9655	15-6499-7663
4			22	15:50	0.4	0.02273	0.3215			03-4648-2331	16-3196-9760
5			23	15:30	0.3249	-0.05237	-0.8211			15-2391-2292	08-1418-9228
6		Sep	12	16:00	0.4092	0.0319	0.446			15-4907-0534	08-4072-9838
7			15	16:05	0.3931	0.01586	0.2263			20-8032-4728	11-2664-4219
8		Oct	10	14:15	0.3482	-0.02905	-0.4402			17-8638-2812	17-1370-8594
9			27	15:00	0.4	0.02273	0.3215			07-6368-8256	01-2718-7046
10		Nov	6	15:40	0.4	0.02273	0.3215			15-7026-7439	19-7036-5835
11			20	17:00	0.5657	0.1884	2.226	(+)		01-7958-1543	09-3590-7589
12			21	16:55	0.3031	-0.07412	-1.202			17-4328-3485	11-7628-5959
13		Dec	11	17:45	0.3429	-0.0344	-0.5254			06-4892-3798	02-7681-8091
14	2014	Jan	22	15:30	0.3887	0.01145	0.1643			15-1323-9580	12-5039-1906
15			23	12:20	0.4634	0.08616	1.13			12-4927-8114	03-4534-5077
16			24	13:50	0.4287	0.05144	0.7023			04-8256-1553	14-6784-2933
17			29	12:45	0.3482	-0.02905	-0.4402			02-0910-9206	20-3009-8021
18			30	13:00	0.2828	-0.09443	-1.583			07-7453-2234	19-6136-6595
19			31	15:00	0.3651	-0.01214	-0.1796			07-3562-2451	09-8419-3354
20		Feb	4	16:00	0.4595	0.08221	1.083			07-2556-9878	06-3437-8862
21			7	17:40	0.5657	0.1884	2.226	(+)		12-2780-2249	04-4756-7462

96 Hour *Hyalella azteca* Reference Toxicant Test Data

Client:	Reference T	Foxicant		Organism Log #:	7930 A	ige: 8days
Test Material:	Potassium (Chloride		Organism Supplier:	Oresa	peake
Test ID#:	55244 Pro	oject#	22049	Control/Diluent:	SAM-	5 Hyalella Water
Test Date:	2-7-14 Randomi	ization:	10.6.3	Control Water Batch:	54	
Feeding To	Time: Ogoo I	Initials: _	25	Feeding T46	Time: 1100	Initials

0.1	Temp (°C)	рН	D.O. (mg/L)	Conductivity					7 .	<u> </u>	1				
Control 0.1	(°C)	рн	(mg/I)					#	Live	Anima	us				Sian Off
0.1	23.3		(1118/12)	(μS/cm)	Α	В	С	D	Е	F	G	Н	I	J	Sign-Off
0.1		S.01	7.0	443	1	1	1	1))	1	١	1	1	Test Solution Prep: 5H
	23.3	7.93	9.0	601	1	1	1	1	1	١	1	1	}	1	New WQ:
J U.Z	23.3	7.91	9.0	761	1	1	1)	١		,	1	1	1	Initiation Date: 7-14
0.4	23.3	7.85	9.2	1157	1	1		1	-)	١	١	١	1	Initiation Time: /7 40 Initiation Signoff: RT Batch #: 14
0.8	23.3	7.81	9.5	1901	i	ī	Ī	T	1	1	1	١	1	1	Initiation Signoff:
1.6	23.3	7.76	10.2	3320	1	1	1	1	1	1	1	1	1	1	RT Batch #: 14
Meter ID	43A	p4 19	1007	F109											
Control	23.2				1	1	1	1	١	1	1	(1	l	Count Date: 2/8/14
0.1	23,2				1	1	1	ı	1	l	1		ı	1	Count Time: 1100
0.2	23,2				١	1	i	ı	1	1	1	1	١	Ī	Count Signoff: との
0.4	23.2				1	1	T	ı	1	ı	1	l	l	1	
0.8	23.2				Ī	1	1	0	0	0	0	0	0	O	
1.6	23.2				0	0	0	0	0	0	0	0	0	0	
Meter ID	43H														
Control	23.3				7	1	1	,	1)	,	1	1	١	Count Date: 2-9-14
0.1	23.3				1	T)	1	1	1)))	1	Count Time: 1056
0.2	73.3				ī	1	1	1	1	1	1	1	1	1	Count Signoff:
	73.3				1	1		1	1	1	1	١	j	١	
0.8	23.3				0	0	0	-	-	-	-	-	_	_	
1.6	-				-	-	-	-	-	-	-	_	-	-	
Meter ID	43A														
Control	23.7				١	١	١	1	1	1	ŧ	ı	1	1	Count Date: 2/10/14
0.1	23.7				١	1	1	ı	1	١	•	1	ı	1	Count Time: (115
0.2	23.7				1	•	,	1	1	1	ı	1	١	1	Count Signoff: MK
0.4	23.7				1	١	1	1	ı	1	i i	1	1	1	
0.8	-				-	-	-	-	-	-	_	-	-	_	
1.6	-				-	-	-	-	-	-	_	-	-	-	
Meter ID	43A														
Control	23.4	7.86	9.8	445	1			1			l]_	L		Termination Date:
0.1	23.4	7-87	9.5	613	l									J	Termination Date: Termination Time: Termination Signoft Old WQ:
	23.4	7.86	9.3	769	Ti	1	13			1					Termination Signoff
0.4	23.4	7.85	9.1	1170	Li				100						Old WQ: AWS
0.8	- 0	7.85	9.0	1900		-		-	- 1	-	-	-	-	_	
1.6	-	7.82	8.7	3330	-	-	_	_	-	-	-	-	-	_	
Meter ID	43A	PH19	RDOT	EC04											



Alessandro D. Hnatt ADH Environmental 3065 Porter Street, Suite 101 Soquel, CA 95073

September 9, 2014

Alessandro:

I have enclosed one copy of our report "Evaluation of the Chronic Toxicity of Contra Costa Clean Water Program Ambient Sediment Samples" for the samples that were collected July 22, 2014. The results of this testing are summarized below:

Toxicity summary for CCCWP-SSID ambient sediment samples to Hyalella azteca.						
Sample Station	Toxicity Present Relative to Lab Control treatment?					
Sample Station	Survival	Growth				
207WAL078	Yes	Yes				
207WAL060	Yes	no				
544MSH065	Yes	Yes				
544MSH062	Yes	Yes				

In response to the observed reduction in survival and growth, a targeted TIE was performed on the upstream stormwater sample (544MSH065) in an attempt to identify suspected cause(s) of toxicity. The results of this testing are presented below:

Effects of TIE treatments on the toxicity of CCCWP-SSID ambient sediment sample to								
Hyalella azteca.								
	Toxicity Present Relative to Lab Control treatment?							
TIE Treatment	Mean % Survival		Weight		Effects of TIE			
	Control/Blank	100%	Control/Blank	100%	Treatment?			
Baseline	96.7	6.7*	0.13	0.03*	toxicity present			
Aeration	96.7	13.3*	0.12	0.08	toxicity present			
PBO	96.7	0*	0.12	N/A	increase in toxicity			
Carboxylesterase	100	76.7	0.15	0.09*	reduction of toxicity			

^{*}The response at this test treatment was significantly less than the Lab Control treatment response at p < 0.05.

There was still a statistically significant reduction in *H. azteca* survival and growth in the test of the untreated sediment, indicating that the toxicity that had been observed in the initial testing of this sample was persistent. The following trends (changes in sample toxicity relative to the untreated water sample [Baseline] test) were observed:

The addition of PBO to the test solutions increased toxicity to *H. azteca* survival (survival decreased from 6.7% to complete mortality). These results suggest that compounds which are detoxified by the cytochrome-P450 system (e.g., pyrethroid insecticides) were contributing to sample toxicity; and

• The addition of carboxylesterase removed the significant reduction in survival (increased from 6.7% survival to 76.7% survival), suggesting that type I and type II pyrethroids are contributing to the toxicity (Weston and Amweg 2007). The use of carboxylesterase as a TIE treatment is still experimental and these results need to be used judiciously and in conjunction with other TIE treatment (e.g., PBO).

The weight of evidence from the TIE performed on the upstream ambient sediment sample suggests that the toxicity was likely due to pyrethroid insecticides.

If you have any questions regarding the performance and interpretation of these tests, feel free to contact my colleague Eddie Kalombo or myself at (707) 207-7760.

Sincerely,

Digitally signed by com.apple.idms.appleid.prd.75733 96d6a2f514d2b446864737862394

d70787541673d3d Date: 2014.09.10 09:52:50 -08'00'

Stephen L. Clark

Vice President/Special Projects Director



Pacific EcoRisk is accredited in accordance with NELAP (ORELAP ID 4043). Pacific EcoRisk certifies that the test results reported herein conform to the most current NELAP requirements for parameters for which accreditation is required and available. Any exceptions to NELAP requirements are noted, where applicable, in the body of the report. This report shall not be reproduced, except in full, without the written consent of Pacific EcoRisk. This testing was performed under Lab Order 19397.



Evaluation of the Chronic Toxicity of Contra Costa Clean Water Program Ambient Sediment Samples

Samples collected July 22, 2014

Prepared For:

ADH Environmental 3065 Porter Street, Suite 101 Soquel, CA 95073

Prepared By:

Pacific EcoRisk 2250 Cordelia Road Fairfield, CA 94534

September 2014



Evaluation of the Chronic Toxicity of Contra Costa Clean Water Program Ambient Sediment Samples

Samples collected July 22, 2014

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- Appendix C Test Data and Summary of Statistics for the Evaluation of the Toxicity of the CCCWP Ambient Sediment Samples to *Hyalella azteca* Follow-Up Toxicity Identification Evaluation (TIE): 544MSH065
- Appendix D Test Data and Summary of Statistics for the Reference Toxicant Evaluation of the *Hyalella azteca*

1. INTRODUCTION

Under contract to ADH Environmental, and in support of the Bay Area Stormwater Management Agencies Association (BASMAA) Regional Monitoring Coalition ongoing monitoring efforts, Pacific EcoRisk (PER) has been contracted to evaluate the toxicity of stormwater samples collected for the Contra Costa Clean Water Program (CCCWP). This evaluation consist of performing the following US EPA toxicity test:

• 10-day survival and growth sediment toxicity test with the amphipod *Hyalella azteca*.

This toxicity test was conducted on ambient sediment samples collected on July 22, 2014. In order to assess the sensitivity of the test organisms to toxic stress, a reference toxicant test was also performed. As a result of the magnitude of toxicity observed, and at the request of the ADH Environmental, PER conducted a targeted Phase I Toxicity Identification Evaluation (TIE) on one of the samples that exhibited toxicity to *H. azteca*. This report describes the performance and results of these tests.

2. CHRONIC TOXICITY TEST PROCEDURES

The methods used in conducting the chronic toxicity tests followed the guidance established by the following publications and EPA manuals:

- "Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated Contaminants with Freshwater Invertebrates, Second Edition" (EPA/600/R-99/064);
- Methods for Aquatic Toxicity Identification Evaluations Phase I Toxicity Characterization Procedures (EPA/600/66-91/003);
- Sediment Toxicity Identification Evaluation (TIE) Phases I, II, and III General Document (EPA/600/R-07/080);
- Amweg EL, Weston DP. 2007. Whole Sediment Toxicity Identification Evaluation Tools for Pyrethroid Insecticides: I. Piperonyl Butoxide Addition. *Environmental Toxicology and Chemistry* 26(11): 2389-2396; and
- Weston DP, Amweg EL. 2007. Whole Sediment Toxicity Identification Evaluation Tools for Pyrethroid Insecticides: II. Esterase Addition. *Environmental Toxicology and Chemistry* 26(11): 2397-2404.

2.1 Sample Receipt and Handling

On July 22, ADH collected ambient sediment samples into appropriately-cleaned containers, which were transported, on ice and under chain-of-custody, to the PER testing laboratory in Fairfield, CA. Upon receipt at the testing laboratory, aliquots of each sample were collected for analysis of initial water quality characteristics (Table 1), with the remainder of each sample being stored at 0-6°C except when being used to prepare test solutions.

The chain-of-custody record for the collection and delivery of these stormwater samples is provided as Appendix A.

Table 1. Colle	ection of the CCCWP-SSID ambient	sediment samples.
Sample ID	Sediment Sample Collection Date	Sample Receipt Date
544MSH065	7/22/14 (1145)	7/22/14 (1715)
544MSH062	7/22/14 (1015)	7/22/14 (1715)
207WAL078	7/22/14 (1445)	7/22/14 (1715)
207WAL060	7/22/14 (1145)	7/22/14 (1715)

2.2 Sediment Toxicity Testing with Hyalella azteca

The freshwater sediment toxicity test with *Hyalella azteca* consists of exposing the amphipods to the sediment for 10 days, after which effects on survival and growth are evaluated. The specific procedures used in this testing are described below.

The *Hyalella azteca* used in this testing were obtained from a commercial supplier (Aquatic Biosystems, Fort Collins, CO). Upon receipt at the laboratory, the amphipods were placed into HDPE tanks containing SAM-5S water at 23°C, and were fed the alga *Selenastrum capricornutum* and Yeast-Cerophyll®-Trout (YCT) food amended with *Spirulina*.

Each site sediment was tested at the 100% concentration only. The Control treatment sediment consisted of a composite of reference site sediments that has been maintained under culture at the PER lab for >3 months. There were 8 replicates for each test treatment. Each replicate container consisted of a 300 mL tall-form glass beaker with a 3 cm ribbon of 540 μ m mesh NITEX attached to the top of the beaker with silicone sealant. Each sediment sample was homogenized immediately prior to introduction of the sediments into the test replicates. Approximately 100 mL of sediment was then loaded into each of the test replicate containers. Each of the test replicates was carefully filled with clean overlying SAM-5S water. The test replicates with sediments and clean overlying water were established 24 hrs prior to the introduction of the amphipods.

After this initial 24 hr period, the overlying water in each replicate was flushed with one volume of fresh control water (approximately 150 mL). For each test treatment, a small aliquot of the renewed overlying water was then collected from each of the 8 replicates and composited for measurement of "initial" water quality characteristics (pH, dissolved oxygen [D.O.], conductivity, alkalinity, hardness, and total ammonia). Then, ten 12-13 day-old amphipods were randomly allocated into each replicate, followed by the addition of 1.0 mL of YCT food. The test replicates were then returned to the temperature-controlled rooms. At the time of test initiation for each set of tests, 8 replicates of 10 randomly-selected organisms were collected, dried, and

weighed (described below) to determine the mean dry weight of the test organisms at test initiation.

Each day, for the following 9 days, each test replicate was examined for the presence of any dead amphipods. A small aliquot of the overlying water in each of the 8 replicates was then collected and composited as before for measurement of "old" D.O., after which each replicate was flushed with one volume of fresh water. Another small aliquot of the overlying water in each of the 8 replicates was then collected and composited as before for measurement of "new" D.O., after which each replicate was fed 1.0 mL of YCT, and then replaced within the temperature-controlled room.

After 10 days exposure, an aliquot of overlying water was collected from each replicate and composited for analysis of the "final" water quality characteristics. The sediments in each replicate container were then carefully sorted and sieved and the number of surviving amphipods determined. The surviving organisms were euthanized in methanol and transferred to small pretared weighing pans, which were placed into a drying oven at 100°C. After drying for ~24 hrs, the pans were transferred to a desiccator to cool, and then weighed to the nearest 0.01 mg to determine the mean dry weight per surviving organism for each replicate. The resulting survival and growth (mean dry weight) data were then analyzed to evaluate any impairment due to the sediments; all statistical analyses were performed using the CETIS® statistical package (TidePool Scientific, McKinleyville, CA).

2.2.1 Reference Toxicant Testing of the *Hyalella azteca*

In order to assess the sensitivity of the H. azteca test organisms to toxic stress, a reference toxicant test was performed. The reference toxicant test was performed as a 96-hr waterborne exposure to Control water spiked with KCl at test concentrations of 0, 0.1, 0.2, 0.4, 0.8 and 1.6 g/L. The resulting survival data were statistically analyzed to determine key dose-response point estimates (e.g., EC50); all statistical analyses were made using the CETIS® software. This response endpoint was then compared to the 'typical response' range established by the mean \pm 2 SD of the point estimates generated by the 20 most recent previous reference toxicant tests performed by this lab.

2.3 Follow-Up Bulk Sediment Toxicity Identification Evaluation (TIE) Procedures

At the direction of the client, a Phase I TIE "targeted" was performed to identify if pyrethroid insecticides were the cause of toxicity.

The goal of the Phase I TIE fractionation procedures is to determine the class of compounds (e.g., organics, metals, ammonia, etc.) responsible for sample toxicity. This is achieved by performing physical and chemical manipulations (or treatments) on the sediment sample. Changes in toxicity that result from the TIE treatments help characterize the physical-chemical nature of the compound(s) responsible for the observed toxicity, which in turn can be used to identify the compound(s) responsible for the toxicity. The specific treatments used in this targeted TIE are described below.

2.3.1 TIE Fractionation Method Blanks

As part of the TIE process, a method blank is prepared for each treatment and then tested to determine whether any of the TIE treatment procedures contribute any artifactual toxicity to the manipulated sample. The method blanks were prepared by treating aliquots of Control sediment with each of the fractionation test treatments (discussed below).

2.3.2 Baseline

The Baseline test is simply a re-test of the untreated bulk sediment sample to confirm the persistence of toxicity during the concurrent TIE testing, and to provide a "benchmark" of toxicity against which to evaluate toxicity removal by the TIE treatments. The Baseline test and TIE fractionation treatment test sediments were tested with *Hyalella azteca* as described in Section 2.2, with the exception that there were 3 replicates for each test treatment, each replicate consisting a 100-mL glass beaker containing 30 mL of sediment with 10 *Hyalella azteca* per replicate. All statistical analyses were performed using CETIS® statistical software.

2.3.3 Piperonyl Butoxide (PBO) Addition

This TIE treatment can help identify toxicity caused by toxicants subject to metabolic activation/detoxification by the cytochrome-P450 system:

- an <u>increase in toxicity</u> after PBO treatment is indicative of a contaminant that is typically *detoxified* by the cytochrome-P450 enzyme system (e.g., carbamates, pyrethroids [Amweg and Weston 2007], etc.), whereas
- a <u>decrease in toxicity</u> after PBO treatment is indicative of a contaminant that is *activated* by the cytochrome-P450 system [e.g., organophosphate (OP) pesticides].

The simultaneous presence of compounds that are detoxified *and* compounds that are activated by the cytochrome-P450 system (e.g., the co-occurrence of both OP-pesticides and pyrethroid pesticides) may cancel each other out. The PBO treatment consisted of addition of PBO to the bulk sediment overlying water (and method blank) at a concentration of $25 \,\mu\text{g/L}$. This test was then performed as described in Section 2.2.

2.3.4 Carboxylesterase Addition

The use of carboxylesterase to hydrolyze pyrethroids (via cleaving of the ester bond) has been proposed as a simple, mechanistic-based method to selectively identify pyrethroid-associated toxicity. Carboxylesterase is an enzyme that degrades type I and type II pyrethroids and has been used in recent studies to help identify pyrethroid-associated toxicity (Wheelock et al. 2004; Weston and Amweg 2007). It should be noted that this treatment is still experimental in nature and should be used in conjunction with other pyrethroid-targeted TIE treatments (e.g., PBO addition and temperature adjustment) via a weight-of-evidence approach.

The carboxylesterase treatment consisted of addition of carboxylesterase to the sediment test overlying water (and method blank) at a carboxylesterase concentration of 73 mg/L (or 1.25 Units/mL). The carboxylesterase test was performed as described in Section 2.2.

2.3.5 Aeration Treatment

The aeration treatment is designed to characterize effluent toxicity that can be attributed to volatile, sublatable, or oxidizable compounds. Using a pipette connected to an air-delivery system, the sediment test overlying water (and method blank) was for the duration of the test. Aeration also can have the physical effect of removing surface-active agents. Surface-active agent compounds congregate on the liquid/gas interface of the air bubbles and are carried to the surface of the solution where they can adhere to the sides of the container or are released into the atmosphere. A method blank was prepared in a similar fashion. The aeration treatment was included in this TIE since the original toxicity tests had to be aerated due to low dissolved oxygen in the overlying water at test initiation. The aeration treatment toxicity testing was performed as described in Section 2.2.

3. RESULTS

3.1 Effects of the CCCWP Ambient Sediment on Hyalella azteca

The results for these tests are summarized below in Table 2. There were significant reductions in *H. azteca* survival in all of the samples, and significant reductions in growth in the 207WAL078, 544MSH065, and 544MSH062 ambient sediment samples. There was no reduction in growth in the 207WAL060 ambient sediment sample.

The test data and summary of statistical analyses for these tests are presented in Appendix B.

Table 2. Effects of CC	CWP ambient sediment on Hy	valella azteca.
Comple Station	Toxicity Present Relative	e to Lab Control treatment?
Sample Station	% Survival	Weight (mg)
Control	100	0.086
207WAL078 (207R00011US)	97.1* (2.9% reduction)	0.070* (18.5% reduction)
207WAL060 (207R00011DS)	90* (10% reduction)	0.088
544MSH065 (544R00025US)	3.75* (96.3% reduction)	0.006* (92.7% reduction)
544MSH062 (544R00025DS)	48.8* (51.2% reduction)	0.035* (59% reduction)

^{*} The response at this test treatment was significantly less than the Lab Control treatment response at p < 0.05.

3.2 Performance of the Follow-Up Targeted TIE

3.2.1 Results of Targeted Phase I TIE of the "544MSH065" Ambient Sediment Sample

The results for this Phase I TIE are summarized below in Table 3. The following trends (changes in sample toxicity relative to the untreated water sample [Baseline] test) were observed:

- There was still a statistically significant reduction in *H. azteca* survival and growth in the test of the untreated sediment, indicating that the toxicity that had been observed in the initial testing of this sample was persistent;
- The addition of PBO to the test solutions increased toxicity to *H. azteca* survival (survival decreased from 6.7% to complete mortality). These results suggest that compounds which are *detoxified* by the cytochrome-P450 system (e.g., pyrethroid insecticides) were contributing to sample toxicity; and
- The addition of carboxylesterase removed the significant reduction in survival (increased from 6.7% survival to 76.7% survival), suggesting that type I and type II pyrethroids are contributing to the toxicity (Weston and Amweg 2007). The use of carboxylesterase as a TIE treatment is still experimental and these results need to be used judiciously and in conjunction with other TIE treatments (e.g., PBO).

The test data and the summary of statistical analyses for these tests are presented in Appendix C.

Table 3. Effects of TI	E treatments or	n the toxicity	of the 544MSI	H065 ambi	ient sediment sample
		to Hyalella	azteca.		
	To	xicity Present	Relative to La	b Control	treatment?
TIE Treatment	Mean %	Survival	Weig	ht	Effects of TIE
	Control/Blank	100%	Control/Blank	100%	Treatment?
Baseline	96.7	6.7*	0.13	0.03*	toxicity persistent
Aeration	96.7	13.3*	0.12	0.08	toxicity present
PBO	96.7	0*	0.12	N/A	increase in toxicity
Carboxylesterase	100	76.7	0.15	0.09*	reduction of toxicity

^{*} The response at this test treatment was significantly less than the Lab Control treatment response at p < 0.05.

4. AQUATIC TOXICITY DATA QUALITY CONTROL

Four QC measures were assessed during the toxicity testing:

- Maintenance of acceptable test conditions;
- Negative Control testing;
- Positive Control (reference toxicant) testing; and
- Concentration Response Relationship assessment.

4.1 Maintenance of Acceptable Test Conditions

All test conditions (e.g., pH, D.O., temperature, etc.) were within acceptable limits for these tests. As the dissolved oxygen measurements were below 2.5 mg/L immediately prior to test initiation, all of the samples except for the 544MSH062 sample were aerated during testing. All analyses were performed according to laboratory Standard Operating Procedures.

4.2 Negative Control Testing

The responses at the Lab Control treatments were acceptable.

4.3 Positive Control Testing

4.3.1 Reference Toxicant Toxicity to Hyalella azteca

The results of this test are presented in Table 4. The EC50 for this test was consistent with the "typical response" range established by the reference toxicant test database for this species, indicating that these organisms were responding to toxic stress in a typical fashion. The test data and summary of statistical analyses for this test are presented in Appendix D.

Table 4. Reference toxicant testing: Ef	fects of KCl on <i>Hyalella azteca</i> survival.
KCl Treatment (g/L)	Mean% Survival
Control	100
0.1	100
0.2	100
0.4	40*
0.8	0*
1.6	0*
Summary	of Statistics
EC50 =	0.37 g/L KCl
"Typical response" range (mean ±2 SD)	0.27 – 0.60 g/L KCl

^{*} The response at this test treatment was significantly less than the Lab Control treatment response at p < 0.05.



4.4 Concentration Response Relationships

The concentration-response relationships for the reference toxicant tests were evaluated as per EPA guidelines (EPA-821-B-00-004), and were determined to be acceptable.

5. SUMMARY & CONCLUSIONS

There were significant reductions in *H. azteca* survival in all of the samples, and significant reductions in growth in the 207WAL078, 544MSH065, and 544MSH062 ambient sediment samples. There was no reduction in growth in the 207WAL060 ambient sediment sample.

Based on the magnitude of the reduction in survival observed for the 544MSH065 sample, a targeted TIE was performed on the sample. The following trends (changes in sample toxicity relative to the untreated water sample [Baseline] test) were observed:

- There was still a statistically significant reduction in *H. azteca* survival and growth in the test of the untreated sediment, indicating that the toxicity that had been observed in the initial testing of this sample was persistent;
- The addition of PBO to the test solutions increased toxicity to *H. azteca* survival (survival decreased from 6.7% to complete mortality). These results suggest that compounds which are *detoxified* by the cytochrome-P450 system (e.g., pyrethroid insecticides) were contributing to sample toxicity; and
- The addition of carboxylesterase removed the significant reduction in survival (increased from 6.7% survival to 76.7% survival), suggesting that type I and type II pyrethroids are contributing to the toxicity (Weston and Amweg 2007). The use of carboxylesterase as a TIE treatment is still experimental and these results need to be used judiciously and in conjunction with other TIE treatment (e.g., PBO).

The weight of evidence from the TIE performed on the upstream ambient sediment sample suggests that the toxicity was likely due to pyrethroid insecticides.



6. LITERATURE CITED

Amweg EL, Weston DP. 2007. Whole sediment toxicity identification evaluation tools for pyrethroid insecticides: I. Piperonyl butoxide addition. *Environ. Toxicol. Chem.* 26:2389-2396.

Wheelock CE, Miller JL, Miller MJ, Gee SJ, Shan G, Hammock B. 2004. Development of toxicity identification evaluation procedures for pyrethroid detection using esterase activity. *Environ. Toxicol. Chem.* 23:2699–2708.

Weston DP, Amweg EL. 2007. Whole sediment toxicity identification evaluation tools for pyrethroid insecticides: II. Esterase addition. *Environ. Toxicol. Chem.* 26:2397-2404.

Appendix A

Chain-of-Custody Record for the Collection and Delivery of the CCCWP Ambient Sediment Samples



CHAIN-OF-CUSTODY RECORD

Pacific EcoRisk 2250 Cordelia Rd., Fairfield, CA 94534 (707) 207-7760 FAX (707) 207-7916

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Project Name:	CCCWP-	0155						The L		
P.O.#/Ref:	030.001	20.00						70-		
Client Sa	Client Sample Sample Sample Grab/ Container Date Time Matrix* Comp. Number Container	Sample Date	Sample Time	Sample Matrix*	Grab/	Contain Contain	Per Italian	0]		
544 R000 25 US	08030	41-66-70	15	Sec	1	CO + ath clare the	CO + art cler the fire	×	+	
544 ROOD 15	15 DS @		51.01	-		CD 390-1	14001X2	×		
307 ROOD	11 05 3		る公	35		Co 3 ast	10.1 X3	<>		
207 Roco	I DSC		1914	1	>	Chart		<>		
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Comments/Special Instruction:	Instruction:				RELINQUISHED BY	SHED BY:	000000000000000000000000000000000000000	RECE	RECEIVED BY:	100 100 100 100 100 100 100 100 100 100
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					Date: 07-32-14	14 Time:	17.15	Date:	7/22/14	Time: 1715
O 544 RODOS US	4	5 44ms# 06 >	v		RELINQUISHED BY:	SHED BY:		RECE	RECEIVED BY:	
3 544R00035DS	4	COO HSWHHS	4		Signature:			Signature:	ure:	
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7	4	A . D	c		Organization:			Organ	Organization:	
		YOU MYE ON			Date:	Time:	Date: Time:	Date:		Time:

18/62

Appendix B

Test Data and Summary of Statistics for the Evaluation of the Toxicity of the CCCWP Ambient Sediment Samples to *Hyalella azteca*



CETIS Summary Report

Report Date: Test Code: 14 Aug-14 13:27 (p 1 of 2) 544MSH062 | 12-4174-5973

								Test Code		J441V	1311002 12	-41/4-59/3
Hyalella Surviv	val and Growth Test										Pacifi	c EcoRisk
Batch ID: Start Date: Ending Date: Duration:	09-9010-4697 27 Jul-14 16:40 06 Aug-14 12:00 9d 19h	Test Type: Protocol: Species: Source:	GCML Hyalella a	ızteca	(10 day) tures, Inc.			Analyst: Diluent: Brine: Age:	Not /	ara Luna Applicable Applicable		
Sample Code	Sample ID	Samp	le Date	Recei	ive Date	Sample A	ge	Client Nar	ne		Project	
Lab Control 207WAL078 207WAL060 544MSH065 544MSH062	07-2024-9688 10-3577-9053 14-8088-4311 12-0131-0279 03-6621-9776	22 Jul 22 Jul 22 Jul	-14 16:40 -14 14:45 -14 11:45 -14 14:45 -14 10:15	22 Jul 22 Jul 22 Jul	I-14 16:40 I-14 17:15 I-14 17:15 I-14 17:15 I-14 17:15	NA (23 °C 5d 2h (0.6 5d 5h (1 ° 5d 2h (0.6 5d 6h (0 °) S °C) C) S °C)	ADH Envir	onmen	ital, Inc.	19397	
Sample Code	Material Type	Samp	le Source			Station Lo	ocatio	ก		Latitude	Long	gitude
Lab Control 207WAL078 207WAL060 544MSH065 544MSH062	Sediment Sediment Sediment Sediment Sediment	ADH I ADH I ADH I	Environme Environme Environme Environme Environme	ntal, Ind ntal, Ind ntal, Ind ntal, Ind	o. o. o.	LABQA 207WAL00 207WAL00 544MSH00 544MSH00	60 65				•	
Mean Dry Weig	ght-mg Summary											
Sample Code	Cour	nt Mean	95%	LCL	95% UCL	Min	Max	Std	Err	Std Dev	CV%	%Effect
Lab Control	8	0.085	7 0.07	05	0.101	0.066	0.11	3 0.00	0644	0.0182	21.2%	0.0%
207WAL078	7	0.0699	9 0.06	19	0.0779	0.054	0.07	89 0.00	0326	0.00862	12.3%	18.5%
207WAL060	8	0.087	5 0.07	1	0.104	0.0667	0.12	0.00	0701	0.0198	22.6%	-2.09%
544MSH065	8	0.006	25 -0.00	0853	0.021	0	0.05	0.00	0625	0.0177	283.0%	92.7%
544MSH062	8	0.035	2 0.01	65	0.0538	0	0.05	5 0.00	0787	0.0223	63.3%	59.0%
Survival Rate S	Summary							-				
Sample Code	Cour				95% UCL	Min	Max		Err	Std Dev	CV%	%Effect
Lab Control	8	1	1		1	1	1	0		0	0.0%	0.0%
207WAL078	7	0.971	0.92		1	0.9	1	0.0		0.0488	5.02%	2.86%
207WAL060	8	0.9	0.85		0.945	0.8	1	0.0		0.0535	5.94%	10.0%
544MSH065	8	0.037			0.126	0	0.3	0.03		0.106	283.0%	96.2%
544MSH062	8	0.488	0.21	8	0.757	0	0.9	0.1	14	0.323	66.2%	51.2%
Mean Dry Weig	ght-mg Detail											
Sample Code	Rep '				Rep 4	Rep 5	Rep			Rep 8		
Lab Control	0.066		0.06		0.091	0.075	0.11			0.082		
207WAL078	0.078		0.05		0.0644	0.074	0.07					
207WAL060	0.096		0.08		0.075	0.0667	0.07		l	0.072		
544MSH065	0	0	0		0.05	0	0	0		0		
544MSH062	0.04	0.04	0		0.048	0.055	0	0.04	183	0.05		
Survival Rate I	Detail				·							
Sample Code	Rep 1	Rep 2	Rep	3	Rep 4	Rep 5	Rep	6 Rep	7	Rep 8		
Lab Control	1	1	1		1	1	1	1		1		
207WAL078	1	1	0.9		1	1	1	0.9				
207WAL060	0.9	1	0.9	ı	0.9	8.0	0.9	0.9		0.9		
544MSH065	0	0	0		0.3	0	0	0		0		
544MSH062	0.7	0.6	0		0.5	0.6	0	0.6		0.9		
				. —								

Analyst: 12 QA: MIN

CETIS Summary Report

Report Date: Test Code: 14 Aug-14 13:27 (p 2 of 2) 544MSH062 | 12-4174-5973

Hyalella Survival and Grow	th Test								Pacific EcoRisk
Survival Rate Binomials									
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	
Lab Control	10/10	10/10	10/10	10/10	10/10	10/10	10/10	10/10	
207WAL078	10/10	10/10	9/10	10/10	10/10	10/10	9/10		
207WAL060	9/10	10/10	9/10	9/10	8/10	9/10	9/10	9/10	
544MSH065	0/10	0/10	0/10	3/10	0/10	0/10	0/10	0/10	
544MSH062	7/10	6/10	0/10	5/10	6/10	0/10	6/10	9/10	

10-Day Hyalella azteca Sediment Toxicity Test Data

Client:	ADH Environmental	Org. Supplier:	ABS
Project#:	19397	Org. Log #:	8379
Test ID#:	58103	Org. Age/Size:	13days

			Test I	/Iaterial	7	Water Oua	lity Measuren	ents	
Day	Date			ntrol		Parameter	Value	Meter ID	Sign-off:
				Organisms		рН	7.69		AM Change:
0	7/27/14	A 10	B 10	c ,o	D 10	D.O. (mg/L)	7.8	ROOT	WQ: D. S
	1.01/10	E 10	F 10	G 10	# 10	Conductivity (µS/cm)	458	ECOM	Initiation Time:
						Alkalinity (mg/L)	V 46		Initiation Counts:
						Hardness (mg/L)	V 126		Confirmation Counts:
						Ammonia (mg/L)	41.00	DR3800	PM Fced:
						Temp. (°C)	23.0	84A	
			# of M	ortalities	****************	Old D.O. (mg/L)	7.4	2009	AM Change: WQ: WQ:
1	7/28/14	A 0	B Ø	CO	DO	New D.O. (mg/L)	7.4	RDOG	Mortality Counts:
	1/201.1	KAPO	F D	G O	H 0	Temp. (°C)	23.4	844	PM Change: PM Feed: MO
			# of M	ortalities		Old D.O. (mg/L)	7.0	ROS	AM Change: WQ: VZ
2:	1/2/14	^ <i>b</i>	B 6	C 6	[□] 6	New D.O. (mg/L)	8.4	RDOS	Mortality Counts:
		EO	FO	G U	но	Temp. (°C)	24.2016	84A	PM Change: 7/2 PM Feed: V
				ortalities		Old D.O. (mg/L)	7.8	P007	AM Change WQ: WW
3	7/30/14	^ 0	B 0	C 0	PO	New,D.O. (mg/L)	8.1	RD07	Mortality Counts:
	101.	E ()	FO	G O	H O	Temp. (°C)	23.3	.84A	PM Change: PM Feed V
				ortalities		Old D.O. (mg/L)	6.2	01"	AM Change: WO:
4	7-31-14	^A 6	В	° 0	D 0	New D.O. (mg/L)	7.3	2204	Mortality Counts:
	, ,,,,,	E O	FO	G 0	H 0	Temp. (°C)	22.6	844	PM Change PM Feed: 127
			# of Me	ortalities		Old D.O. (mg/L)	7.4		AM Change: NOWQ: KAQ
5	811/14	A 0	B	^C O	D O	New D.O. (mg/L)	7.6		Mortality Counts: KMP
	011/19	E 0	F O	G O	H	Temp. (°C)	23.3		PM Change / PM Feed:
			# of Mo	ortalities		Old D.O. (mg/L)	7.4		AM Change: KMP WQ: KMP
6	8/2/14	^ 0	BO	^c 0	0	New D.O. (mg/L)	7.5		Mortality Counts: LMO
	4/1/	E 0	F 0	G O	Н О	Temp. (°C)	22.7		PM Change: PM Feed PM
	11/		# of Mo	ortalities		Old D.O. (mg/L)	7.8		AM Change: DMS WQ: DMS
7	8/3/14	^ 6	B 0	c O	DO	New D.O. (mg/L)	2.1		Mortality Counts:
	, ,	E O	FO	G O	G H	Temp. ("C)	23.3		PM Change: Om 5 PM Feed: SM
			# of Mo	ortalities		Old D.O. (mg/L)	7.3	PDII	AM Change: TEN WQ: TUL
8	8/4/14	^ O	B	c O	D 0	New D.O. (mg/L)	7.4		Mortality Counts: 1842
		E 0	FO	G . O	H O	Temp. (°C)	22.8	84A	PM Change: PM Feed:
				ortalities		Old D.O. (mg/L)	7-0	2004	AM Change: pm5 WQ: pm5
9	8/5/14	^ 0	B 0	° 0_	D	New D.O. (mg/L)	7-8	0.01/4	Mortality Counts:
		0	0	G ()	н О	Temp. (°C)	23.0	84 A	PM Change: OM 5 PM Feed: 6415
			# A	live		pН	7.57	PH16	WQ: FOUR
10	\	10	^B (6	10	D (0	D.O. (mg/L)	7.4	P D04	Termination Counts:
5151515151515151	90000000000	lo	10	_C 10	H 10	Conductivity (µS/cm)	436	Ecob	Termination Time: /260
				· · · · · · · · · · · · · · · · · · ·		Alkalinity (mg/L)	J 53		
				de la companya del la companya del la companya de la companya de la companya de la companya de la companya del la c		Hardness (mg/L)	122		
						Ammonia (mg/L)	11-00	0123800	
						Temp. (°C)	22.8	84A	

Hyalella azteca Weight Data Sheets

Client:	ADH Environmental	Test Init Date: _	7, 27, 14	_Balance ID:	BALOI
Sample ID:	Control	Tare Wt Date: _	8.2.14	_ Sign-Off:	VK
Test ID:	58103	Final Wt Date: _	8.7.14	Sign-Off:	BUL
Project #:	19397				

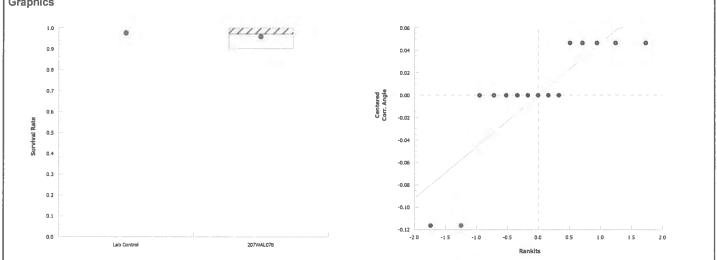
Pan	Concentration Replicate	Initial Weight. (mg)	Final Weight. (mg)	# organisms	Ave Weight (mg)
1	A	61.77	62.43	10	0.066
2	В	68.97	69,75	10	0,078
3	С	67.88	68.57	10	0,069
4	D	66,18	67,09	lo	0.091
5	Е	72,72	75.47	10	0.075
6	F	68.77	69.40	lo	0.113
7	G	66.47	67.59	ıo	0.112
8	Н	65.18	66.60	10	0.081
QA ı		59,73	59.13		

Report Date:

14 Aug-14 13:27 (p 5 of 8) 544MSH062 | 12-4174-5973

Test Code:

						1631	Coue.	UTTIN	1011002 1	2-4114-331
Hyalella Survival	and Growth Test								Paci	fic EcoRisI
	3-4183-9143 4 Aug-14 13:26	Endpoint: St Analysis: No	urvival Rate onparametric-	Two Sample	9		IS Version: ial Results	CETISv1	.8.7	
Data Transform	Zeta	a Alt Hyp	Trials	Seed		PMSD	Test Resi	ult		
Angular (Correcte	d) NA	C > T	NA	NA		4.28%				
Wilcoxon Rank S	Sum Two-Sample	Test								
Sample Code v	s Sample Code	Test Sta	t Critical	Ties DF	P-Value	P-Type	Decision	(a:5%)		
Lab Control	207WAL078	48	NA		<0.0001	Exact	Significan	t Effect		
ANOVA Table										
Source	Sum Squares	Mean So	uare	DF	F Stat	P-Value	Decision	(a:5%)		
Between	0.008094273	0.008094	1273	1	2.77	0.1197	Non-Signi	ficant Effec		
Error	0.0379419	0.002918	3608	13						
Total	0.04603618			14						
Distributional Te	sts									
Attribute	Test		Test Stat	Critical	P-Value	Decision	(α:1%)			
Variances	Variance Ratio	F	2.49E+13	9.16	<0.0001	Unequal Variances				
Distribution	Shapiro-Wilk V	/ Normality	0.713	0.833	0.0003	Non-normal Distribution				
Survival Rate Su	mmary									
Sample Code	Cou	int Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
Lab Control	8	1	1	1	1	1	1	0	0.0%	0.0%
207WAL078	7	0.971	0.926	1	1	0.9	1	0.0184	5.02%	2.86%
Angular (Correct	ed) Transformed \$	Summary								
Sample Code	Cou	ınt Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
Lab Control	8	1.41	1.41	1.41	1.41	1.41	1.41	0	0.0%	0.0%
207WAL078	7	1.37	1.29	1.44	1.41	1.25	1.41	0.0301	5.82%	3.3%
Graphics								·		
1.0 (**		T. T. T.			0.06					
	•	1111	111.		F					
0.0										



10-Day Hyalella azteca Sediment Toxicity Test Data

Client:	ADH Environmental	Org. Supplier:	ABS
Project#:	19397	Org. Log #:	8379
Test 1D#:	58110	Org. Age/Size:	12-13days

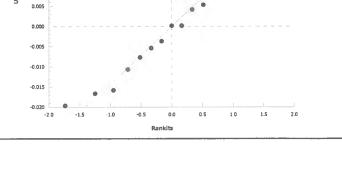
D	D-4	<u> </u>	Test N	laterial		Water Qua	lity Measurem	ients	G. m
Day	Date	207WAL	078 207R 0	0011US MF		Parameter	Value	Meter ID	Sign-off:
			# Live (Organisms		pН	7.57	nH21	AM Change: Dm.5
0	7/27/14	^ 10	B 10	c 10	D 10	D.O. (mg/L)	6.3	PD04	WQ: Dm 5
		E 10	F 10	G 10	H 10	Conductivity (µS/cm)	505	EC04	Initiation Time: 1640
						Alkalinity (mg/L)	/ 93		Initiation Counts:
						Hardness (mg/L)	142		Confirmation Counts:
						Ammonia (mg/L)	41.00	1723800	PM Feed:
						Temp. (°C)	23.0	84 A	
	-11		# of M	ortalities		Old D.O. (mg/L)	2.18.0	2009	AM Change: WQ: LUL
1	THEN	^ 0	B 0	° O	D 0	New D.O. (mg/L)	77	4007	Mortality Counts:
	1 -1 -	E KINS O	F 6	O & KM	H 0	Temp. (°C)	23.4	RYA	PM Change: PM Feed: 200
	- 11 - 1		# of M	ortalities		Old D.O. (mg/L)	7,4	1209	AM Change UK WQ: UIC
2	7/29/14	^ 0	B 0	° 0	0	New D.O. (mg/L)	7.7	RDO	Mortality Counts:
		E 0	F	GO	H 0	Temp. (°C)	22.9	SUA	PM Change: PM Feed:
			# of M	ortalities		Old D.O. (mg/L)	7.7	12007	AM Change: WQ: WQ:
3 .	7/30/14	^ O	^B 0	° o	^D O	New D.O. (mg/L)	8.0	k007	Mortality Counts: U
		6	F 0	G O	H 0	Temp. (°C)	23.3	SYA	PM Change: PM Feed: V
			# of M	ortalities		Old D.O. (mg/L)	8.42	8-300	AM Change: ATC WQ: ATC
4	7-31-14	^ 6	^B O	c 0	D 0	New D.O. (mg/L)	8.2	PDOY	Mortality Counts: APC
		E 0	0 0 0 0		н 6	Temp. (°C)	228	848	PM Change: APP PM Feed:
	21.4	# of Mortalities		Old D.O. (mg/L)	7.7	RDOY	AM Change: KHP ^{VQ:} KMP		
5	8/1/14	^ 0	° 0	0	0	New D.O. (mg/L)	7.9	KD04	Mortality Counts: ZUP
		E O	^r 0	0	н д	Temp. (°C)	13.3	84A	PM Change: V PM Feed: V K
	-1.1.		# of Me	ortalities	15		1780KM		AM Change: KMP WQ: KMP
6	8/2/14	0	0	0	0	New D.O. (mg/L)	8.3	R007	Mortality Counts: EMP
	/ ·	0	0	0	H 0	Temp. (°C)	22.7	84A	PM Change PM Feed: PM
	9/2/	Α	# of Mo	ortalities	15	Old D.O. (mg/L)	7.4		AM Change: DNS WQ: DN 5
7	8/3/14	<u> </u>	ຶ	0	0	New D.O. (mg/L)	7.8	1-11	Mortality Counts: Forus
		9	່ວ	0	н о	Temp. (°C)	23.3		PM Change: Om 5 PM Feed SM
	delile	Α		ortalities	ID	Old D.O. (mg/L)	47	1001	AM Change: Rue WQ: Row Mortality Counts: +++5
8	8/4/14	0	6	^c D	D 0	New D.O. (mg/L)	7.8		. 10
		E 0	0	0	["] 0	Temp. (°C)	22.8	SHA	PM Change: PM Feed: OS
	8/- /114	Δ .	# of Mo	ortalities	ID	Old D.O. (mg/L)	7.4	7 7 7	AM Change: pmsWQ: pm5
9	8/5/14	<u> </u>	0	0	H 0	New D.O. (mg/L)	7.7	PPU	Mortality Counts: PMS
		ð	0	0	ⁿ 0	Temp. (°C)	23.0		PM Change: On 5PM Feed: Om 5
	1	Δ	# A	live	ID -	pН	7.81	rni-6	WO: FOVO
- 10	8/6/14	10	10	े व	10	D.O. (mg/L)	79	PDOY	Termination Counts:
R32332333		10	10	==	H 4	Conductivity (µS/cm)	550	E006	Termination Time: 1260
						Alkalinity (mg/L)	V 123		
				\$ 0.00 to \$0.00 to \$0		Hardness (mg/L)	162		
						Ammonia (mg/L)		1153800	
						Temp. (°C)	55-8	84A	

Report Date:

14 Aug-14 13:27 (p 1 of 8) 544MSH062 | 12-4174-5973

Test Code:

-	•					Test	Code:	544M	SH062 12	2-4174-597
Hyalella Survival	and Growth Test								Pacif	ic EcoRisk
		•	an Dry Weig ametric-Two	_			S Version: ial Results	CETISv1 Yes	8.7	
Data Transform	Zeta	Alt Hyp	Trials	Seed		PMSD	Test Resu	ılt		
Untransformed	NA	C > T	NA	NA		15.6%				
Equal Variance t	Two-Sample Test						-			
Sample Code v	s Sample Code	Test Stat	Critical	MSD DF	P-Value	P-Type	Decision((α:5%)		
Lab Control	207WAL078	2.1	1.77	0.013 13	0.0279	CDF	Significan	t Effect		
ANOVA Table										
Source	Sum Squares	Mean Squ	uare	DF	F Stat	P-Value	Decision((α:5%)		
Between	0.0009373499	0.0009373	3499	1	4.41	0.0559	Non-Signi	ficant Effect		
Error	0.002765303	0.0002127	7156	13						
Total	0.003702653			14						
Distributional Tes	sts									
Attribute	Test		Test Stat	Critical	P-Value	Decision	(α:1%)			
Variances	Variance Ratio F		4.46	10.8	0.0879	Equal Var	iances			
Distribution	Shapiro-Wilk W Norr	mality	0.938	0.833	0.3628	Normal D	istribution			
Mean Dry Weight	-mg Summary									
Sample Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
Lab Control	8	0.0857	0.0705	0.101	0.08	0.066	0.113	0.00644	21.2%	0.0%
207WAL078	7	0.0699	0.0619	0.0779	0.07	0.054	0.0789	0.00326	12.3%	18.5%
Graphics		,								
0.12					0.030					
					0.025					
0.10					0.025					
0.10					0.020					
	1119111			¥	0.015					



207WAL078

0.02

0.00

Lab Control

Hyalella azteca Weight Data Sheets

Client: ADH Environmental Test Init Date: 7.27.14 Balance ID: Sample ID: 207WAL078 Tare Wt Date: 8.2.14 Sign-Off: VK

Test ID: 58110 Final Wt Date: 8.7.14 Sign-Off: Excellent Project #: 19397

Pan	Concentration Replicate	Initial Weight. (mg)	Final Weight. (mg)	# organisms	Ave Weight (mg)
17	A	59,83	60.61	lo	0.078
18	В	71, 48	72.18	10	0.070
19	С	62.61	63.16	9	0.054
20	D	64.66	65.14	ιo	0.064
21	Е	68.57	69.31	lb	0.074
22	F	66.31	67.01	ıσ	9,079
23	G	70.98	- 31.08		
24	Н	58.52	59.01	9	0.07
QA \		59.73	59,74		

CETIS Analytical Report

Report Date: Test Code:

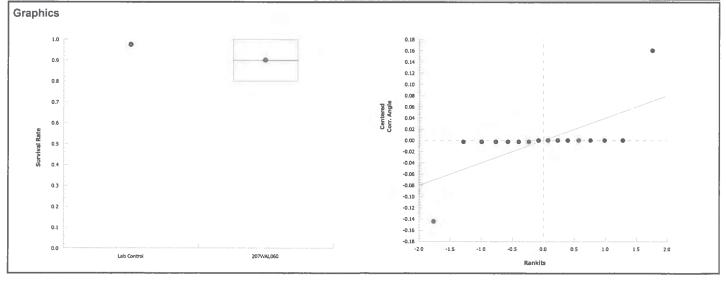
14 Aug-14 13:27 (p 6 of 8) 544MSH062 | 12-4174-5973

Hyalella Survival and Growth Test Pacific EcoRisk Endpoint: Survival Rate Analysis ID: 12-4833-5624 **CETIS Version: CETISv1.8.7** Nonparametric-Two Sample Analyzed: 14 Aug-14 13:26 Analysis: Official Results: Yes **Data Transform** Zeta Alt Hyp **PMSD Test Result** Trials Seed Angular (Corrected) C > T NA NA 4.33% Wilcoxon Rank Sum Two-Sample Test Sample Code vs Sample Code **Test Stat** Critical DF P-Value P-Type Decision(a:5%) Ties Lab Control 207WAL060 40 NA 14 0.0007 Exact Significant Effect 1 **ANOVA Table** Source Sum Squares Mean Square DF F Stat P-Value Decision(a:5%) Between 0.1028308 0.1028308 <0.0001 30.9 Significant Effect 1 Error 0.0466386 0.003331328 14 Total 0.1494694 15

Distributional Tes	ets				
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F	2.63E+13	8.89	<0.0001	Unequal Variances
Distribution	Shapiro-Wilk W Normality	0.528	0.841	<0.0001	Non-normal Distribution

Survival Rate Summary										
Sample Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
Lab Control	8	1	1	1	1	1	1	0	0.0%	0.0%
207WAL060	8	0.9	0.855	0.945	0.9	8.0	1	0.0189	5.94%	10.0%

Angular (Corrected) Transfor	med Sumn	nary				Angular (Corrected) Transformed Summary												
Sample Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect								
Lab Control	8	1.41	1.41	1.41	1.41	1.41	1.41	0	0.0%	0.0%								
207WAL060	8	1.25	1.18	1.32	1.25	1.11	1.41	0.0289	6.52%	11.4%								



10-Day Hyalella azteca Sediment Toxicity Test Data

Client:	ADH Environmental	Org. Supplier:	ABS
Project#:	19397	Org. Log #:	8379
Test ID#:	58112	Org. Age/Size:	12-13 days

	1_		Test N	Taterial		Water Qua	lity Measuren	nents	
Day	Date	207WAL060	207R	0011DS MF		Parameter	Value	Meter ID	- Sign-off:
			# Live (Organisms		рН	7.57	OHZI	AM Change: Dm 5
0	7/27/14	A 10° B	10	c 10	D 10	D.O. (mg/L)	6-7	12 p 0 9	wo: pms
	114/19	E 10 P	10	G 10	H 10	Conductivity (µS/cm)	479	E 604	Initiation Time: 1640
						Alkalinity (mg/L)	1 86		Initiation Counts:
						Hardness (mg/L)	1 155		Confirmation Counts:
						Ammonia (mg/L)	u1.00	DR3803	PM Feed:
						Temp. (°C)	23.0	344	
			# of M	ortalities		Old D.O. (mg/L)	8.1	2009	AM Change: WQ: WQ:
1	7/28/14	A O B	0	° J	D 0	New D.O. (mg/L)	71	2009	Mortality Counts:
	1121.	E 6 F	0	G 0	H .	Temp. (°C)	23.4	84A	PM Change: PM Feed: PM
	l al		# of M	ortalities		Old D.O. (mg/L)	8.0	RDOS	AM Change: VK WQ: UK
2	7/29/4	A O B	0	C 0	D 0	New D.O. (mg/L)	7.9	2005	Mortality Counts:
		E 0 F	0	G 0	H 0	Temp. (°C)	22.9	840	PM Change: UR PM Feed: V
	1 1 1		# of Me	ortalities		Old D.O. (mg/L)	7.7	2007	AM Change: WQ: UL
3	7/30/14	A O B	0	° 0	D O	New D.O. (mg/L)	79	2007	Mortality Counts:
		E 0 F	0	G O	н о	Temp. (°C)	23.3	84A	PM Change: VK PM Feed: VK
			# of Me	ortalities		Old D.O. (mg/L)	4.4	PPOI	AM Change: WQ: ARP
4	7-31-14	A O B	0	^c b	D 0	New D.O. (mg/L)	7.944	PUUT	Mortality Counts:
	1 31 11	E O F	D	G D	H 0	Temp. (°C)	12.8	BUH	PM Change: PM Feed: AP
			# of Mo	ortalities		Old D.O. (mg/L)	4.9	RD04	AM Change: VMPWQ: KMP
5	8/1/14	A O B	0	^c 0	D 0	New D.O. (mg/L)	6.2	P.D04	Mortality Counts:
	91 11 1	E 0 F	0)	G O	H 0	Temp. (°C)	23.3	84A	PM Change VK PM Feed: VK
			# of Mo	ortalities		Old D.O. (mg/L)	5.4	2907	AM Change: MPWQ: KMP
6	8/2/14	^ O B	0	° 0	D	New D.O. (mg/L)	0.58.0KM	RDOT	Mortality Counts:
	,-,,	6 O F	0	G 0	H	Temp. (°C)	22.7	84A	PM Change: VW PM Feed: (V)
			# of Mo	ortalities		Old D.O. (mg/L)	6.4	RPII	AM Change: PM5 WQ: PM5
7	8/3/14	^ O B	0	° 0	D 0	New D.O. (mg/L)	6.6	1-01	Mortality Counts: FORB
		E 0 F	0	^G 0	H 0	Temp. (°C)	23.3		PM Change: On S PM Feed: SM
	$\begin{bmatrix} 1 & 1 & 1 \end{bmatrix}$	A IR	# of Mo	ortalities		Old D.O. (mg/L)	8-0	edu	AM Change TEHWQ: TOH
8	8/4/14		0	0	0	New D.O. (mg/L)	7.5	2	Mortality Counts:
		6	D	0	TO H	Temp. (°C)	12.8	OR DIFT	PM Change: S PM Feed: CS
	9/- /		# of Mo	ortalities		Old D.O. (mg/L)	8.0		AM Change: DM 5WQ: DM 5
9	8/5/14	^ O B	0	0	D 0	New D.O. (mg/L)	8.1	PD04	Mortality Counts: OMS
		0	0	G 0	H D	Temp. (°C)	23.0	84 A	PM Change: PM 5 PM Feed: PM 5
	10/1	A Ib	# A	live	IIS	pН	7.88	PH/6	W. FOUR
10	8/6/14	^ q	10	9	9	D.O. (mg/L)	8-1	P-004	Termination Counts:
	000000000000	8	9	ଁ ୧	" 9	Conductivity (µS/cm)	534	ECO's	Termination Time: [250
			2 4 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5			Alkalinity (mg/L)	V 112		
			4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4			Hardness (mg/L)	√ 183		
						Ammonia (mg/L)	1.17	pf3900	
						Temp. (°C)	22-8	84A	

CETIS Analytical Report

0.02

Lab Control

Report Date:

14 Aug-14 13:27 (p 2 of 8)

Test Code: 544MSH062 | 12-4174-5973

						Test	Code:	544N	/ISH062 1	2-4174-597
Hyalella Survi	ival and Growth Test						·-		Paci	fic EcoRisk
Analysis ID: Analyzed:		ndpoint: Me nalysis: Pa	an Dry Weig rametric-Two	_			IS Version: ial Results:	CETISv1 Yes	.8.7	
Data Transfor	rm Zeta	Alt Hyp	Trials	Seed		PMSD	Test Resu	ilt		
Untransformed	AA b	C > T	NA	NA		19.5%				
=qual Variand	ce t Two-Sample Test									
Sample Code	vs Sample Code	Test Stat	Critical	MSD DF	P-Value	P-Type	Decision(α:5%)		
Lab Control	207WAL060	-0.188	1.76	0.017 14	0.5733	CDF	Non-Signi	ficant Effect	t	
ANOVA Table										
Source	Sum Squares	Mean Sq	uare	DF	F Stat	P-Value	Decision(
Between	1.283993E-05	1.283993	E-05	1	0.0354	0.8534	Non-Signi	ficant Effect	t	
Error	0.005071048	0.000362	2177	14						
Total	0.005083888			15						<u> </u>
Distributional	Tests									
Attribute	Test		Test Stat	Critical	P-Value	Decision	(α:1%)			
Variances	Variance Ratio F		1.19	8.89	0.8275	Equal Var	riances			
Distribution	Shapiro-Wilk W No	ormality	0.885	0.841	0.0464	Normal D	istribution			,
Mean Dry Wei	ight-mg Summary									
Sample Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
Lab Control	8	0.0857	0.0705	0.101	0.08	0.066	0.113	0.00644	21.2%	0.0%
207WAL060	8	0.0875	0.071	0.104	0.082	0.0667	0.12	0.00701	22.6%	-2.09%
Graphics										
0.14					0.035				-	
					0.030				- 2 / "	
0.12					0.025					
					0.020					
0.10				2	0.015		1			
0.08	1117111	7//	111	Centered	0.010		l t	ó		
Mean Dry Weight-mg					5 0.00s			/•		
W 0.06			Reject Null		0.000		¥	<u></u>		
ea .					-0.005		•			
1000										

-0.010 -0.015

-0.020

-1.0

0.5

1.0

1.5

207WAL060

Hyalella azteca Weight Data Sheets

Client: ADH Environmental Test Init Date: 7.27.14 Balance ID: Sample ID: 207WAL060 Tare Wt Date: 8.2.14 Sign-Off: VK

Test ID: 58112 Final Wt Date: 8.7.14 Sign-Off: Project #: 19397

Pan	Concentration Replicate	Initial Weight. (mg)	Final Weight. (mg)	# organisms	Ave Weight (mg)
25	A	78.08	78.95	q	0.0967
26	В	63.53	64.73	lo	0.120
27	С	71, 21	72.10	٩	0.089
28	D	65.16	66.00	٩	0.076
29	Е	80.44	81.04	8	0.0667
30	F	64,91	65.62	٩	0.071
31	G	67.69	68.68	٩	0.110
32	Н	90.64	91.36	٩	0.072
QA 2		71.05	71.05		

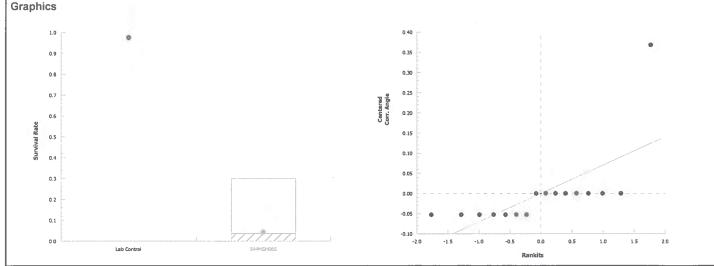
Report Date:

14 Aug-14 13:27 (p 7 of 8)

Test Code:

544MSH062 | 12-4174-5973

									Test	Code:	544N	/ISH062 1	2-4174-5973
Hyalella Surviv	al a	nd Growth Test										Pacif	fic EcoRisk
		9643-3210 Aug-14 13:26	Endpoint Analysis:		vival Rate nparametric-	Two San	nple			S Version: ial Results:	CETISv1 Yes	.8.7	
Data Transform	n n	Zeta	Alt	Нур	Trials	Seed			PMSD	Test Resu	lt	-	
Angular (Correct	ted)	NA	C >		NA	NA			6.19%				
Wilcoxon Rank	Su	m Two-Sample T	est										
Sample Code	VS	Sample Code	Test	Stat	Critical	Ties	DF	P-Value	P-Type	Decision(x:5%)		
Lab Control		544MSH065	36		NA	0	14	<0.0001	Exact	Significant	Effect		
ANOVA Table													
Source		Sum Squares	Mea	n Squ	ıare	DF		F Stat	P-Value	Decision(r:5%)		
Between		5.766035	5.76	6035		1		521	<0.0001	Significant	Effect		
Error		0.1549824	0.01	10701	7	14							
Total		5.921017				15							
Distributional T	rest:	3											
Attribute		Test			Test Stat	Critical	l	P-Value	Decision	(α:1%)			
Variances		Variance Ratio	F		8.72E+13	8.89		<0.0001	Unequal \	/ariances			
Distribution		Shapiro-Wilk W	Normality		0.469	0.841		<0.0001	Non-norm	al Distributio	n		
Survival Rate S	Sum	mary		-									
Sample Code		Cou	nt M ea	n	95% LCL	95% U	CL	Median	Min	Max	Std Err	CV%	%Effect
Lab Control		8	1		1	1		1	1	1	0	0.0%	0.0%
544MSH065		8	0.03	75	0	0.126		0	0	0.3	0.0375	283.0%	96.2%
Angular (Corre	cted) Transformed S	ummary										
Sample Code		Cou	nt Mea	n .	95% LCL	95% UC	CL	Median	Min	Max	Std Err	CV%	%Effect
Lab Control		8	1.41		1.41	1.41		1.41	1.41	1.41	0	0.0%	0.0%
544MSH065		8	0.21	1	0.087	0.336		0.159	0.159	0.58	0.0526	70.4%	85.0%
Graphics													
1.0								0.40		ı			
0.9								0.35		! !		•	



10-Day Hyalella azteca Sediment Toxicity Test Data

Client:	ADH Environmental	Org. Supplier:	ABS
Project#:	19397	Org. Log #:	8379
Test ID#:	58114	Org. Age/Size:	12-13 days

	Dut		Test N	Taterial		Water Qua	lity Measuren	nents	
Day	Date	S44MSH06	5 544R0	0025US		Parameter	Value	Meter ID	Sign-off:
			# Live (Organisms		pН	7.52	PHZI	AM Change: Om 5
. 0	7/27/14	A 10	B 10	c 10	D 10	D.O. (mg/L)	7.1	P.004	wo: on5
		E 16	F /O	G 10	H /O	Conductivity (µS/cm)	495	EC04	Initiation Time: 1640
						Alkalinity (mg/L)	1 79		Initiation Counts:
						Hardness (mg/L)	142		Confirmation Count
						Ammonia (mg/L)	41.00	DK3800	PM Feed:
						Temp. (°C)	23.0	84A	
	. 1 1		# of M	ortalities		Old D.O. (mg/L)	8.1	ROOM	AM Change: WQ: WQ:
1	7/28/14	^ <i>O</i>	B O	° 0	0	New D.O. (mg/L)	8.2	12009	Mortality Counts:
	' '	E KAL O	F 1950	G PARO	H KAR O	Temp. (°C)	23.4	SYA	PM Change PM Feat P
			# of Me	ortalities		Old D.O. (mg/L)	8.2	RDOS	AM Change VIC WQ: VIC
2	7/29/14	6	B 0	° 0	0	New D.O. (mg/L)	811	NDOS	Mortality Counts: V/C
	1 1 1	E 0	0	G 0	H O	Temp. (°C)	23.9	RDOS	PM Change: VK PM Feed: VC
			# of Mo	ortalities		Old D.O. (mg/L)	7.9	2007	AM Change: CA WOUR
3	7/30/14	^ O	D	ိစ	P 0	New D.O. (mg/L)	7-8	12007	Mortality Counts:
		6	0	ို	[™] O	Temp. (°C)	84A	84A	PM Change V K PM Feed: V K
			# of Mo	ortalities	16	Old D.O. (mg/L)	6.7	SPC ZON	AM Change: WQ:
4	7-31-14	Î Ô	<u> </u>	° 0	0	New D.O. (mg/L)	8:1	PDOY	Mortality Counts:
	-61		<u>' 0</u>	° 0	H O	Temp. (°C)	228	A 18	PM Change PM Feed PM Feed
			# of Mo	ortalities	To the state of th	Old D.O. (mg/L)	8.0	RDOY	AM Change: KMP
5	8/1/14	^ O	0	0	D 0	New D.O. (mg/L)	8.	RD04	Mortality Counts:
		9	0	G O	H	Temp. (°C)	23.3	84A	PM Change: Y PM Feed: UK
			# of Mo	ortalities	16	Old D.O. (mg/L)	7.8	RDST	AM Change: LNP WQ: LNP
6	8/2/14	^ O	<u> </u>	0	0	New D.O. (mg/L)	7.8	RP07-	Mortality Counts: KMP
	' // /	0	0	0	H 0	Temp. (°C)	22.7	84A	PM Change: PM Feed PM Feed
	9/-	1	# of Mo	ortalities	15	Old D.O. (mg/L)	8-1	ROII	AM Change: Dms WQ: Dm5
.7	8/3/14	^ 0	0	0	^D O	New D.O. (mg/L)	8.3	POII	Mortality Counts: FOVS
		ا ک	0	G O	^H O	Temp. (°C)	23.3		PM Change: PM Feed: SM
	chalus	, , , , , , , , , , , , , , , , , , ,	# of Mo	ortalities		Old D.O. (mg/L)	7.7		AM Change: TenWQ: Ten
8	8/4/14	<u> 0</u>	<u>0</u>	0	0	New D.O. (mg/L)	7.4	10	Mortality Counts: 724
		0	0	° 0	H D	Temp. (°C)	228	92+8YA	PM Change: PM Feed C
		A	# of Mo	ortalities	15	Old D.O. (mg/L)	8-1		AM Change: OM5 WQ: DM S
9	8/5/14	^ O	0	0	0	New D.O. (mg/L)	8.3	I-bac	Mortality Counts: DM5
		0	0	0	н О	Temp. (°C)	23.0	84 A	PM Change: Oms PM Feed: Oms
	\tilde{T}	-	# A	live		pН	7-87	PHIS	wo: Form
10	8/6/14	^ 0	0	ိဗ	ື 3	D.O. (mg/L)	8.1	PDOY	Termination Counts:
01010101010101010101		6	ပ	⁶ 💍	н о	Conductivity (µS/cm)	521	5CO6	Termination Time:
						Alkalinity (mg/L)	V. 93		
			10 mm m m m m m m m m m m m m m m m m m			Hardness (mg/L)	V 162		
		0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0				Ammonia (mg/L)	1.84	DP3800	
						Temp. (°C)	22.8	84A	

Report Date:

14 Aug-14 13:27 (p 3 of 8) 544MSH062 | 12-4174-5973

Test Code:

Hyalell	a Survi	val and Growth Test								Pacif	ic EcoRisk
Analys Analyz		19-1115-8945 14 Aug-14 13:26		ean Dry Weig inparametric-	-	9		S Version		.8.7	
	ansfor		Alt Hyp	Trials NA	Seed NA		PMSD 18.4%	Test Res	sult		
Wilcox	on Ran	k Sum Two-Sample 1	Test					-			
Sample	Code	vs Sample Code	Test Stat	Critical	Ties DF	P-Value	P-Type	Decision	n(a:5%)		
Lab Co	ntrol	544MSH065	36	NA	0 14	<0.0001	Exact	Significa	nt Effect		
ANOVA	Table										-
Source)	Sum Squares	Mean Sq	uare	DF	F Stat	P-Value	Decision	· · · · · · · · · · · · · · · · · · ·		
Betwee	n	0.02528073	0.025280		1	78.5	<0.0001	Significa	nt Effect		, ,
Error		0.004507259	0.000321	947	14						
Total		0.02978799			15				 :		
Distrib	utional	Tests									
Attribu		Test		Test Stat		P-Value	Decision				
/arianc Distribu		Variance Ratio Shapiro-Wilk W		1.06 0.767	8.89 0.841	0.9405 0.0010	Equal Var	rances ral Distribut	lion		
			Normality	0.767	0.041	0.0010	NOII-HOITI	al Distribut	lion		<u> </u>
		ght-mg Summary									
Sample		Cou		95% LCL		Median	Min	Max	Std Err	CV%	%Effect
Lab Co 544MS		8 8	0.0857 0.00625	0.0705 -0.00853	0.101 0.021	0.08	0.066 0	0.113 0.05	0.00644 0.00625	21.2% 283.0%	0.0% 92.7%
			0.00025	-0.00000	0.021			0.00	0.00020	200.070	32.1 70
Mean Dry Weight-mg	0.12	7779777.	7777		Centhered	0.045 0.040 0.035 0.030 0.025 0.025 0.010 0.005 -0.005 -0.010 -0.015		••••			
	0.00		7777	///		-0.025	-1.5 -1.0	-0.5 0	.0 0.5 1	1.0 1.5	2.0
		Lab Control	544MSI	H065				Rankits			

Hyalella azteca Weight Data Sheets

Client: _	ADH Environmental	Test Init Date: _	7.27,14	_ Balance ID:	BALOI
Sample ID: _	544MSH065	Tare Wt Date: _	8.2.14	_ Sign-Off:	VK
Test ID: _	58114	Final Wt Date: _	8.7.14	_ Sign-Off:	Buc
Project #: _	19397				

Pan	Concentration Replicate	Initial Weight. (mg)	Final Weight. (mg)	# organisms	Ave Weight (mg)
33	A	64.92		0	
34	В	67.81		0	_
35	С	66,49		0	
36	D	132.81	134.96	3	0.050
37	Е	72.82		Ø	
38	F	67.50	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	0	
39	G	70.67	_	0	
40	Н	60.03	_	0	_
QA 2		71.05	71,05		

Report Date:

14 Aug-14 13:27 (p 8 of 8)

544MSH062 | 12-4174-5973 Test Code:

					Test	Code:	544N	1SH062 1:	2-4174-597
al and Growth Test				<u> </u>				Pacif	ic EcoRis
12-1339-0826 14 Aug-14 13:26	*		Two Sample	e				.8.7	
n Zeta	Alt Hyp	Trials	Seed		PMSD	Test Res	ult		
ted) NA	C > T	NA	NA		15.3%				
Sum Two-Sample To	est								
vs Sample Code	Test Sta	t Critical	Ties DF	P-Value	P-Type	Decision	(a:5%)		
544MSH062	36	NA	0 14	<0.0001	Exact	Significan	t Effect		
Sum Squares	Mean Sq	uare	DF	F Stat	P-Value	Decision	(a:5%)		
1.75214	1.75214		1	23.1	0.0003	Significan	t Effect		
1.063089	0.075934	19	14						
2.815228			15						
Tests									
Test		Test Stat	Critical	P-Value	Decision	(α:1%)			
Variance Ratio F	-	5.98E+14	8.89	<0.0001	Unequal \				
Shapiro-Wilk W	Normality	0.778	0.841	0.0014	Non-norm	nal Distributi	on		
Summary									
Cour	it Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
8	1	1	1	1	1	1	0	0.0%	0.0%
8	0.488	0.218	0.757	0.6	0	0.9	0.114	66.2%	51.2%
cted) Transformed Si	ummary								
Cour	it Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
8	1.41	1.41	1.41	1.41	1.41	1.41	0	0.0%	0.0%
8	0.75	0.424	1.08	0.886	0.159	1.25	0.138	51.9%	46.9%
				0.6					
				0.5					
				0.4		1 1			
				0.3		1			
			T.	g 0.2				•	
			m tere	0.1					
	1///		ŭ	Š 0.0			• • •		
	////			-0.1					
				F-		1			
	12-1339-0826 14 Aug-14 13:26 n Zeta ted) NA Sum Two-Sample Tovs Sample Code 544MSH062 Sum Squares 1.75214 1.063089 2.815228 Fests Variance Ratio F Shapiro-Wilk W Summary Cour 8 8 Cted) Transformed St Cour	12-1339-0826	Test Test Stat Variance Ratio F Shapiro-Wilk W Normality Shapiro-Wilk W Normality Summary Count Mean 95% LCL 8 1.41 1.	12-1339-0826	Test Test	Test Test Sun Square Su	12-1339-0826	Test Test Sum Square Mean Square Surificant Summary Summary Summary Count Mean 95% LCL Sys UCL Median Min Max Std Err Surificant Surifican	Pacific Paci

Rankits

0.2

Lab Control

-0.2 -0.3 -0.4

-0.6

10-Day Hyalella azteca Sediment Toxicity Test Data

Client:	ADH Environmental	Org. Supplier:	ABS
Project#:	19397	Org. Log #:	8379
Test ID#:	58116	Org. Age/Size:	12-13 days

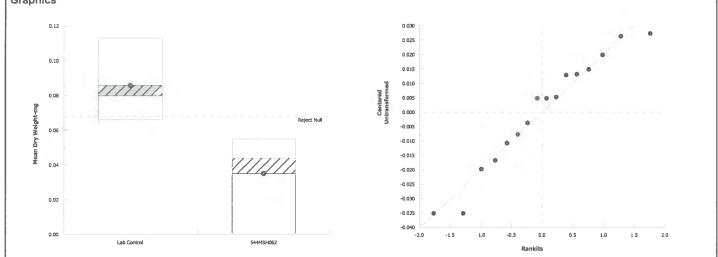
D	D-4-		Test M	aterial		Water Qua	lity Measuren	ients	G: or
Day	Date	544MSH06	2 544R00	0025DS+4F		Parameter	Value	Meter ID	Sign-off:
			# Live O	rganisms		pН	7.65	pH21	AM Change: DM.5
0	7/27/14	A 10	10	c 10	D 10	D.O. (mg/L)	7.6	RDUU	wo: on S
		E /O	10	G / O	H 10	Conductivity (µS/cm)	547	ECOY	Initiation Time: 1646
						Alkalinity (mg/L)	v 78		Initiation Counts:
						Hardness (mg/L)	151		Confirmation Counts
						Ammonia (mg/L)	41.00	023800	PM Feed:
						Temp. (°C)	23.0	84A	
			# of Mo	rtalities		Old D.O. (mg/L)	7.4	RDOG	AM Change WQ: WL
1	7/28/4	OSMP	0	^c d	0	New D.O. (mg/L)	7.1	12009	Mortality Counts:
		ORNO	O DEKTAP	0	H O	Temp. (°C)	23.4	84A	PM Change: PM Feed: PM
	al alt		# of Mo	rtalities		Old D.O. (mg/L)	7.8	RDOS	AM Change: UK WQ: UK
2	7/29/4	A B	6	C	Do	New D.O. (mg/L)	7.9	2005	Mortality Counts: V/C
	,	E	۵	G 💪	H 0	Temp. (°C)	22.9	84 A	PM Change PM Feed: V/L
	1 .		# of Mo	rtalities		Old D.O. (mg/L)	7.8	2007	AM Change WQ: KM
3	7/30/14	^ 0	0	° 0	D	New D.O. (mg/L)	7.9	2007	Mortality Counts:
		E I	0	° O	H O	Temp. (°C)	23.3	84A	PM Change: V PM Feed: V
			# of Mo	rtalities		Old D.O. (mg/L)	6.6	PDOY	AM Change: NF WQ: NF
4	7-31-14	A O	0	° 6	^D 6	New D.O. (mg/L)	7.5	PDOY	Mortality Counts:
		E 0	0	G S		Temp. (°C)	228	84A	PM Change: APF PM Feed: AP
			# of Mo	rtalities		Old D.O. (mg/L)	7.5	RDOY	AM Change: KMP WQ: KMP
5 5	8/1/14	^ O	0	c O	0	New D.O. (mg/L)	7.6	POOY	Mortality Counts:
		E O	0	G O	H Q	Temp. (°C)	23.3	84A	PM Change: PM Feed:
	4		# of Mo	rtalities		Old D.O. (mg/L)	7.4	RDOT	AM Change: KMPWQ: KMP
6	8/2/14	A O	σ	° 0	0	New D.O. (mg/L)	1970 75	2007	Mortality Counts:
		E O	0	G 0	Н	Temp. (°C)	22.7	84A	PM Change: PM Feed:
	2.		# of Mo	rtalities		Old D.O. (mg/L)	6.8	RpII	AM Change: on 5 WQ: DM5
7	8/3/14	A 0	0	^с . О	D 0	New D.O. (mg/L)	7.5	RDII	Mortality Counts: FOVB
		්	D	G O	H O	Temp. (°C)	23.3	844	PM Change: OM SPM Feed SM
	. 11		# of Mo	rtalities		Old D.O. (mg/L)	6.6	2011	AM Change: TOWQ: The
8	8/4/14	A O	0	C	D 🙋	New D.O. (mg/L)	70	PON	Mortality Counts:
Ç.		E O	0	G 0	H	Temp. (°C)	22.8	8417	PM Change: PM Feed 5
,	0/:		# of Mo	rtalities		Old D.O. (mg/L)	6.9	12004	AM Change: DMSWQ: DMS
9	8/5/19	^ O	0	0	D 0	New D.O. (mg/L)	7.5	100	Mortality Counts:
		E O	0	G 0	н О	Temp. (°C)	23.0	844	PM Change: OM SPM Feed: OM
-31	al .		# Al	live		рН	7.67	PH16	WQ: FOUB
10	8/6/14	A 7	6	C	^D 5	D.O. (mg/L)	7.2	RDOY	Termination Counts:
		6	0	G 6	н q	Conductivity (µS/cm)	457	EC06	Termination Time:
						Alkalinity (mg/L)	V 71		
						Hardness (mg/L)	V 180		
						Ammonia (mg/L)	41.00	DP3800	
						Temp. (°C)	22.8	84A	

Report Date:

14 Aug-14 13:27 (p 4 of 8) 2-4174-5973

Test Code: 544MSH062 12	rest oode.	044101002 12
	Test Code:	544MSH062 12

						lest	Code:	244IV	1911/05 1	Z -4 1/4-59/
Hyalella Survival a	and Growth Test								Paci	fic EcoRisk
	8499-8034 Aug-14 13:26		an Dry Weig rametric-Two	•			S Version: ial Results	CETISv1 : Yes	.8.7	
Data Transform	Zeta	Alt Hyp	Trials	Seed		PMSD	Test Res	ult		
Untransformed	NA	C > T	NA	NA		20.9%				
Equal Variance t 1	Two-Sample Test		-							
Sample Code vs	Sample Code	Test Stat	Critical	MSD DF	P-Value	P-Type	Decision	(a:5%)		
Lab Control	544MSH062	4.97	1.76	0.018 14	0.0001	CDF	Significan	t Effect		
ANOVA Table										
Source	Sum Squares	Mean Squ	ıare	DF	F Stat	P-Value	Decision	(a:5%)		
Between	0.0102347	0.0102347	7	1	24.7	0.0002	Significan	t Effect		
Error	0.005791049	0.0004136	6464	14						
Total	0.01602575			15						
Distributional Tes	ts									
Attribute	Test		Test Stat	Critical	P-Value	Decision	(a:1%)			
Variances	Variance Ratio F	=	1.5	8.89	0.6079	Equal Var	iances			
Distribution	Shapiro-Wilk W	Normality	0.944	0.841	0.4013	Normal D	istribution			
Mean Dry Weight-	mg Summary	·						<u>-</u>		
Sample Code	Cour	nt Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
Lab Control	8	0.0857	0.0705	0.101	0.08	0.066	0.113	0.00644	21.2%	0.0%
544MSH062	8	0.0352	0.0165	0.0538	0.044	0	0.055	0.00787	63.3%	59.0%
Graphics										
0.12					0.030					



Analyst: II QA: Sun

Hyalella azteca Weight Data Sheets

Client: ADH Environmental Test Init Date: 1,21,14 Balance ID: Bala

Pan	Concentration Replicate	Initial Weight. (mg)	Final Weight. (mg)	# organisms	Ave Weight (mg)
41	A	74.59	74,67	7	0.040
42	В	68.30	68.54	6	0.640
43	С	65,51		0	
44	D	55,86	56.10	5	0,048
45	Е	70.15	70.48	6	0.035
46	F	67.76	1400	0	
47	G	71.99	72.28	6	0, 0483
48	Н	61.70	62.15	9	0,050
QA 2		71.05	71.05		

Appendix C

Test Data and Summary of Statistics for the Evaluation of the Toxicity of the CCCWP Ambient Sediment Samples to *Hyalella azteca* – Follow-Up Toxicity Identification Evaluation (TIE): 544MSH065



CETIS Summary Report

Report Date: Test Code: 08 Sep-14 14:58 (p 1 of 1) 58801 | 11-1351-5332

Hyalella Survival and Growth Test Pacific EcoRisk Batch ID: 02-8200-7394 Test Type: Survival-Growth (10 day) Padrick Anderson Analyst: Start Date: 09 Aug-14 15:00 Protocol: EPA/600/R-99/064 (2000) Diluent: Not Applicable Species: Ending Date: 19 Aug-14 12:00 Hyalella azteca Brine: Not Applicable **Duration:** 9d 21h Source: Aquatic Biosystems, CO Age: Sample ID: 13-3721-7571 Code: Baseline ADH Environmental, Inc. Client: Sample Date: 22 Jul-14 11:45 Sediment 19397 Material: Project: Receive Date: 22 Jul-14 17:15 Source: ADH Environmental, Inc. (ADH ENVIRO) Sample Age: 18d 3h (0 °C) Station: 544MSH065

Comparison	Summary										
Analysis ID	Endpoint		NOEL	LOEL	TOEL	PMSD	TU	Method			
18-3759-4452	Mean Dry Wei	ght-mg	<100	100	NA	45.4%	>1	Equal Va	riance t Two	-Sample Te	st
10-2182-1396	Survival Rate		<100	100	NA	16.8%	>1	Equal Va	riance t Two	-Sample Te	st
Mean Dry We	ight-mg Summa	ary									
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Control Sed	3	0.134	0.0894	0.179	0.116	0.152	0.0105	0.0181	13.5%	0.0%
100		3	0.0267	-0.0881	0.141	0	0.08	0.0267	0.0462	173.0%	80.2%

Survival R	Rate Summary										
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Control Sed	3	0.967	0.823	1	0.9	1	0.0333	0.0577	5.97%	0.0%
100		3	0.0667	0	0.354	0	0.2	0.0667	0.115	173.0%	93.1%

Mean Dry	/ Weight-mg Detail						
C-%	Control Type	Rep 1	Rep 2	Rep 3			
0	Control Sed	0.116	0.152	0.135	-		
100		0	0	0.08			
Survival	Rate Detail						
C-%	Control Type	Rep 1	Rep 2	Rep 3			
0	Control Sed	1	0.9	1			

100		0	0	0.2	
Survival	Rate Binomials				
C-%	Control Type	Rep 1	Rep 2	Rep 3	
0	Control Sed	10/10	9/10	10/10	
100		0/10	0/10	2/10	

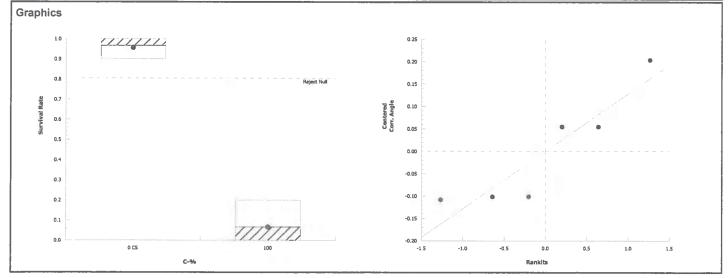


CETIS Analytical Report

Report Date: Test Code: 08 Sep-14 08:31 (p 2 of 2)

58801 | 11-1351-5332

Hyalella Sur	vival an	d Growth	Test						-		Pacif	ic EcoRisk
Analysis ID: Analyzed:		82-1396 ep-14 8:31			vival Rate rametric-Two	Sample			S Version:	CETISv1 : Yes	.8.7	
Data Transfe	orm		Zeta	Alt Hyp	Trials	Seed		PMSD	Test Resi	ult		
Angular (Cor	rected)		NA	C > T	NA	NA		16.8%	Fails surv	ival rate		
Equal Varia	nce t Tw	o-Sample	Test									
Control	vs	C-%		Test Stat	Critical	MSD DF	P-Value	P-Type	Decision	α:5%)		
Control Sed		100*		9.52	2.13	0.246 4	0.0003	CDF	Significan	t Effect		
ANOVA Tabl	e											
Source		Sum Squa	ares	Mean Squ	ıare	DF	F Stat	P-Value	Decision(α:5%)		
Between		1.806068		1.806068		1	90.7	0.0007	Significan	t Effect		
Error	(0.0796689	8	0.0199172	24	4						
Total	•	1.885737				5						
Distribution	al Tests											
Attribute		Test			Test Stat	Critical	P-Value	Decision(α:1%)			
Variances		Variance	Ratio F		3.5	199	0.4445	Equal Var	iances			-
Distribution		Shapiro-V	Vilk W No	ormality	0.836	0.43	0.1207	Normal Di	stribution			
Survival Rat	e Summ	ary										
C-%	Contro	ol Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Contro	Sed	3	0.967	0.823	1	1	0.9	1	0.0333	5.97%	0.0%
100			3	0.0667	0	0.354	0	0	0.2	0.0667	173.0%	93.1%
Angular (Co	rrected)	Transform	ned Sum	ımary					- v.			
C-%	Contro	ol Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Contro	I Sed	3	1.36	1.12	1.59	1.41	1.25	1.41	0.0543	6.93%	0.0%
100			3	0.26	-0.177	0.698	0.159	0.159	0.464	0.102	67.6%	80.8%





CETIS Analytical Report

Report Date:

08 Sep-14 08:31 (p 1 of 2)

Test Code:

58801 | 11-1351-5332

										lest	Code:		58801 1	1-1351-5332
Hyalella Sur	vival a	nd Growth	n Test										Pacit	ic EcoRisk
Analysis ID: Analyzed:		3759-4452 Sep-14 8:3	1	Endpoin Analysis		an Dry Weig rametric-Two	_				S Version: ial Results:	CETISv1 Yes	.8.7	
Data Transfo	orm		Zeta	Alt	Нур	Trials	Seed			PMSD	Test Resu	ılt		
Untransforme	ed		NA	C >	T	NA	NA			45.4%	Fails mear	dry weigh	t-mg	
Equal Varian	nce t Tv	vo-Sampl	e Test						-				· · · · · · · · · · · · · · · · · · ·	·
Control	vs	C-%		Tes	t Stat	Critical	MSD	DF	P-Value	P-Type	Decision(a:5%)		
Control Sed	1 .	100*		3.76	3	2.13		4	0.0099	CDF	Significant			
ANOVA Table	e													
Source		Sum Squ	ares	Mea	an Squ	are	DF		F Stat	P-Value	Decision(a:5%)		
Between		0.017412	17	0.0	7412	17	1		14.1	0.0198	Significant	Effect		
Error		0.004923	207	0.00	12308	302	4							
Total		0.022335	37				5							
Distributiona	al Tests	5												
Attribute		Test				Test Stat	Critical		P-Value	Decision(α:1%)			
Variances		Variance	Ratio F			6.5	199		0.2667	Equal Var	iances			
Distribution		Shapiro-	Wilk W	Normality		0.874	0.43		0.2431	Normal Di	stribution			
Mean Dry We	eight-m	ng Summa	ary											
C-%	Cont	rol Type	Coun	t Mea	ın	95% LCL	95% UC	L	Median	Min	Max	Std Err	CV%	%Effect
0	Contr	ol Sed	3	0.13	34	0.0894	0.179		0.135	0.116	0.152	0.0105	13.5%	0.0%
100			3	0.02	267	-0.0881	0.141		0	0	0.08	0.0267	173.0%	80.2%
Graphics														
0.16									0.05999999493	_				
	[-													
0.14			_						0.04999999578			!		
왕 D.12									0.03999999662	-				
epht-	i		!					- 1	0.0299999747	-				
Mean Dry Weight-mg								Centered	0.01999999831					
0.08				,—				1	0.00999999916					
-						Reject Null								



0.04

o cs

C-%

10-Day Freshwater Sediment Toxicity Test Data

Client:	ADH/RMC	_ Project #: _	19397	Organism Supplier/Log Number:	ABS/ 8422
Species:	Hyalella azteca	_ Test ID#: _	58801	· Organism Age/Size:	12/13 days
				Control Water:	

	(***		4 1	· · · · · ·		200		itroi water:	
Treatment =	900000000	Con	-		1(00% - 544			Sign-offs:
Day 0			New D.O.	7,9			New D.O.	6.7	Initiation Time: 1500
Date: 8-9-14			Meter ID	P11					WQ: Mu
Temp. (°C) = 23.0	10	B 10	10		^ / O	B 10	10		WQ: Initiation Counts: Confirmation Counts
Feed: MM					,				
Day 1	Old D.O.	7.6	New D.O.	7.6	Old D.O.	7.5	New D.O.	7, 5	AM Change:
Date: 8.10.14	Meter ID	ROLL	Meter ID	100					WQ: Esc
Temp. (°C) = 12.8	A 3	B	0		A	B 0	0		PM Change:
Feed: Ex-							0,,0		Mortality Counts:
Day 2	Old D.O.	8.4	New D.O.	8.4	Old D.O.	8,3	New D.O.	8.5	AM Change:
Date: 8.11.14	Meter ID	2007	Meter ID	2007					
Temp. (°C) = 23.0	^A 0	B	CO		^ O	ВО	င် ခ		PM Change:
Feed: Bun	-		· ·			_	-		Mortality Counts:
Day 3	Old D.O.	8.6	New D.O.	8.7	Old D.O.	8.6	New D.O.	8.7	AM Change: Fue
Date: 8.12.14	Meter ID	2009	Meter ID	Roog					O
Temp. (°C) = 22.9	A	B	င ဗ		l ^A	B	C		PM Change: Mortality Counts:
Feed: Eun	0		<u> </u>		0	0			Mortality Counts:
Day 4	Old D.O.	8.7	New D.O.	8.7	Old D.O.	8.2	New D.O.	8.7	AM Change:
Date: 8.18.14	Meter ID	RDII	Meter ID	RBU					WQ:
Temp. (°C) = 11.9	^۸ ن	B 6	c O		^ o	B	င ව		PM Change:
Feed: Eu						0			Mortality Counts:
Day 5	Old D.O.	8.4	New D.O.	8.5	Old D.O.	8,1	New D.O.	8.5	AM Change:
Date: 8.14.14	Meter ID	Root	Meter ID	RAOT					WQ: Bec
Temp. (°C) = 11.8	A O	B W	C		^A o	B	С		IPM Change
Feed: Eug		O	O			0	0		Mortality Counts:
Day 6	Old D.O.	8.4	New D.O.	8.4	Old D.O.	8.2	New D.O.	8.3	AM Change:
Date: 8-15-14	Meter ID	2009	Meter ID	2009					WQ:
Temp. (°C) = 23.1	A	0	c O		A 0	B	с <i>О</i>		PM Change:
Feed: MM	0				Ü				Mortality Counts:
Day 7	Oid D.O.	8.5	New D.O.	8.5	Old D.O.	8.3	New D.O.	8.3	AM Change:
Date: 8-16-14	Meter ID	POIL	Meter ID	6011					WQ:
Temp. (°C) = 12.1	A 0	В	C		A 0	B	C 0		PM Change:
Feed:			0						Mortality Counts:
Day 8	Old D.O.	8,4	New D.O.	8.6	Old D.O.	8.3	New D.O.	8.6	AM Change:
Date: 8.11.14	Meter ID	EDIL	Meter ID	ROIL					WQ:
Temp. (°C) = 12.3	A	В	C		A O	В	° 0		PM Change:
Feed:	0	0	0						Mortality Counts:
Day 9	Old D.O.	8,6	New D.O.	8.8	Old D.O.	8.4	New D.O.	2.8	AM Change:
Date: 3.18,14	Meter ID	2011	Meter ID	RON					WQ: BOL
Temp. (°C) = 11.4	Α	В	С		A	В	C		PM Change: —
Feed: Eur	0	O	0		0	0	0		Mortality Counts:
Day 10	Old D.O.	8.3			Old D.O.	7, 9			Termination
Date: 8.19,14	Meter ID	20 07							Counts: fun
	# Alive/Re	plicate			# Alive/Re	plicate			WQ:
	١ .	В	C		A	В	C		
	10	9	10		0	0	٤		

Report Date:

08 Sep-14 14:56 (p 1 of 1)

Report Date.	00 Оср-14 14.50 (р 1 от
Test Code:	58801a 03-7045-94

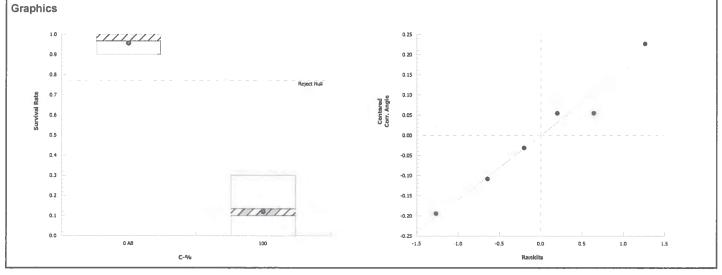
Hyalella Surv	ival and Growth	Test		- E										Pacifi	c EcoRisk
Batch ID: Start Date: Ending Date: Duration:	01-2600-7207 09 Aug-14 15:0 19 Aug-14 12:0 9d 21h		Test Proto	col: es:	EPA Hya	vival-Growth A/600/R-99/0 Ilella azteca Iatic Biosyst	064 (2000)			Analy Diluer Brine Age:	nt:	Not /	rick Anderso Applicable Applicable	n	
Receive Date:	08-9875-5755 22 Jul-14 11:45 22 Jul-14 17:15 18d 3h (0°C)		Code Mater Source Static	ial: :e:	Sed ADI	ation liment H Environme MSH065	ental, Inc. (A	ADH ENVII	RO)	Client		ADH 1939	Environme 7	ntal, Inc.	
Comparison	Summary														
Analysis ID 02-6734-8419 01-7668-1575	Endpoint Mean Dry Weig Survival Rate	jht-mg		NOEL 100 <100		>100 100	NA NA	83.5% 20.2%	1 >1		•	l Vari		Sample Te	
Mean Dry We	ight-mg Summa	ry													
C-%	Control Type	Cou	nt	Mean		95% LCL	95% UCL	Min	Max	K	Std E	rr	Std Dev	CV%	%Effect
0 100	Aeration Blank	3 3		0.119 0.0844	ļ	0.103 -0.115	0.134 0.284	0.114 0	0.12 0.16		0.003 0.046		0.00627 0.0804	5.28% 95.2%	0.0% 28.9%
Survival Rate	Summary														
C-%	Control Type	Cou	nt	Mean		95% LCL	95% UCL	Min	Max	C	Std E	rr	Std Dev	CV%	%Effect
0 100	Aeration Blank	3		0.967 0.133		0.823 0	1 0.513	0.9 0	1 0.3		0.033 0.088		0.0577 0.153	5.97% 115.0%	0.0% 86.2%
Mean Dry Wei	ight-mg Detail														
C-%	Control Type	Rep	1	Rep 2		Rep 3									
0	Aeration Blank	0.126	3	0.114		0.116									
100		0.16		0		0.0933									
Survival Rate	Detail														
C-%	Control Type	Rep	1	Rep 2		Rep 3									
0	Aeration Blank	1		0.9		1									
100		0.1		0		0.3									
Survival Rate	Binomials														
C-%	Control Type	Rep	1	Rep 2		Rep 3									
0	Aeration Blank	10/10		9/10		10/10									-
100		1/10		0/10		3/10									



08 Sep-14 08:37 (p 2 of 2)

58801a | 03-7045-9434

									lest	Code:		58801a 03	5-7045-9434
Hyalella Sur	vival ar	nd Growth	Test									Pacif	ic EcoRisk
Analysis ID: Analyzed:		668-1575 Sep-14 8:36	6	Endpoint Analysis:		rvival Rate rametric-Two	Sample			IS Version: cial Results:	CETISv [*] Yes	1.8.7	
Data Transfo	orm		Zeta	Alt	Нур	Trials	Seed		PMSD	Test Resu	lt		
Angular (Cor	rected)		NA	C >	T	NA	NA		20.2%	Fails survi	val rate		
Equal Varia	nce t Tv	vo-Sample	Test										
Control	vs	C-%		Tes	t Stat	Critical	MSD DF	P-Value	P-Type	Decision(a:5%)		
Aeration Blar	nk	100*		7.49)	2.13	0.286 4	0.0008	CDF	Significant	Effect		
ANOVA Tabl	e												· · · · · · · · · · · · · · · · ·
Source		Sum Squa	ares	Mea	ın Sqı	are	DF	F Stat	P-Value	Decision(a:5%)		
Between		1.512935		1.51	2935		1	56.2	0.0017	Significant	Effect		
Error		0.1077692	2	0.02	69423	3	4			•			
Total		1.620704					5						
Distribution	al Tests	;					77.						
Attribute		Test				Test Stat	Critical	P-Value	Decision	(α:1%)			
Variances		Variance	Ratio I	F		5.09	199	0.3286	Equal Var	· · ·			
Distribution		Shapiro-V	Vilk W	Normality		0.974	0.43	0.9162	Normal D	istribution			
Survival Rat	e Sumr	nary											
C-%	Cont	rol Type	Cour	nt Mea	n	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Aerat	ion Blank	3	0.96	7	0.823	1	1	0.9	1	0.0333	5.97%	0.0%
100			3	0.13	3	0	0.513	0.1	0	0.3	0.0882	115.0%	86.2%
Angular (Co	rrected) Transfori	med S	ummary									
C-%	Cont	rol Type	Cou	nt Mea	n	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Aerat	ion Blank	3	1.36		1.12	1.59	1.41	1.25	1.41	0.0543	6.93%	0.0%
•						-0.174	0.881	0.322			0.123		



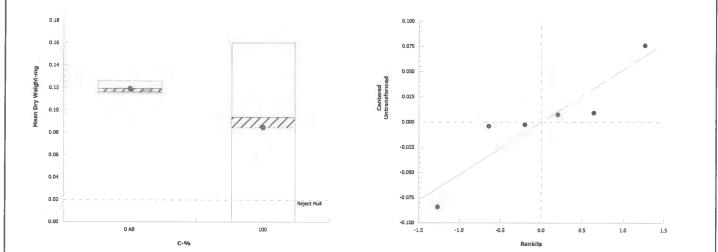


CETIS Analytical Report

Report Date: Test Code: 08 Sep-14 08:37 (p 1 of 2)

58801a | 03-7045-9434

										lest	Code:		58801a 0	3-7045-943
Hyalella Sur	vival and	Growth	Test										Paci	fic EcoRisk
Analysis ID: Analyzed:	02-673- 08 Sep	4-8419 -14 8:37	7	Endpo Analy		an Dry Weig ametric-Two	_				S Version: ial Results		.8.7	
Data Transfo	orm		Zeta		Alt Hyp	Trials	Seed			PMSD	Test Res	ult		
Untransforme	ed		NA		C > T	NA	NA			83.5%	Passes n	nean dry wei	ght-mg	
Equal Variar	nce t Two-	Sample	Test											
Control	vs C	-%			Test Stat	Critical	MSD	DF	P-Value	P-Type	Decision	(a:5%)		
Aeration Blar	ık 1	00			0.738	2.13	0.099	4	0.2506	CDF	Non-Sign	ificant Effect		
ANOVA Tabl	е													
Source	Sı	ım Squ	ares		Mean Squ	are	DF		F Stat	P-Value	Decision	(a:5%)		
Between	0.0	0017718	375		0.0017718	75	1		0.545	0.5012	Non-Sign	ificant Effect		
Error	0.0	0129977	7		0.0032494	26	4				3			
Total	0.0	0147695	58				5							
Distributiona	al Tests	-									-			
Attribute	T	est				Test Stat	Critical		P-Value	Decision(α:1%)			
Variances	V	ariance	Ratio F	:		164	199		0.0121	Equal Var	iances			
Distribution	S	hapiro-V	Vilk W	Norma	lity	0.889	0.43		0.3119	Normal Di	stribution			
Mean Dry W	eight-mg \$	Summa	ry											
C-%	Control	Туре	Coun	it l	Mean	95% LCL	95% UC	:L	Median	Min	Max	Std Err	CV%	%Effect
0	Aeration	Blank	3	(0.119	0.103	0.134		0.116	0.114	0.126	0.00362	5.28%	0.0%
100			3	-	0.0844	-0.115	0.284		0.0933	0	0.16	0.0464	95.2%	28.9%
Graphics														
0.18									0.100					
-														





10-Day Freshwater Sediment Toxicity Test Data

Client:	ADH/RMC	Project #:	19397	Organism Supplier/Log Number:	ABS/ 8422
Species:	Hyalella azteca	Test ID#:	58801	Organism Age/Size:	12/13 days
				Control Water:	5AM-5

							Con	trol Water:	<u> 5AM-S</u>
Treatment =		Aeratio	n Blank		544	R00025U	S + Aera	tion	Sign-offs:
Day 0			New D.O.	8.2			New D.O.	7.6	Initiation Time: 1500
Date: 819114			Meter ID	2011					WQ:
Temp. (°C) = 23.0	A	В	С		A	В	C		Initiation Counts:
Feed: nm	10	10	10		10	10	10		Confirmation Counts
Day 1	Old D.O.	٦.4	New D.O.	7.4	Old D.O.	7.4	New D.O.	7.4	AM Change:
Date: 3.10.14	Meter ID	Roll	Meter ID	RDIL					WQ:
Temp. (°C) = 21.8	A	В	C		A O	B .	C 0		PM Change:
Feed: Esa	0	0	0			0			Mortality Counts:
Day 2	Old D.O.	8.2	New D.O.	8.4	Old D.O.	8.1	New D.O.	8.4	AM Change:
Date: 8.11.14	Meter ID	ROOT	Meter ID	PA01		10			WQ: Bleen
Temp. (°C) = 13.0	A 0	B ©	0		^ 0	ိ ပ	0		PM Change:
Feed: Bea	_						_		Mortality Counts:
Day 3		8.3	New D.O.	8.1	Old D.O.	8.4	New D.O.	8.7 	AM Change:
Date: 8.12.14	Meter ID	200 1	Meter ID	P049	A	IR			
Temp. (°C) = 12.9	0	0	0		ا م	0	0		PM Change: Mortality Counts:
Feed: Eur	0110.0		5.0				N DO		
Day 4	Old D.O.	8.3	New D.O.	8.7	Old D.O.	8.1	New D.O.	%.1	AM Change:
Date: 8.13.14	Meter ID	ROII	Meter ID	LOU	A	IB	iliiliiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii		WQ:
Temp. (°C) = 11.9 Feed: 5km	0	0	0		0	0	0		Mortality Counts:
Day 5	Old D.O.	0.8	New D.O.	8.5	Old D.O.	7.8	New D.O.	8.5	
Date: 8,14,14	Meter ID	Roo7	Meter ID	0.5 Re07			New D.O.		AM Change: WQ:
Temp. (°C) = 11.8	A	В	C		A	 B	C		PM Change:
Feed: Sur	0	0	0		0	0	0		Mortality Counts:
Day 6	Old D.O.	8.3	New D.O.	8.3	Old D.O.	7.9	New D.O.	7.7	AM Change:
Date: 8 15/14	Meter ID	2009	Meter ID	2009					AM Change: WQ:
Temp. (°C) = 23.\	A	В	C		A	В	C		PM Change: —
Feed:	0	0	0		0	0	0		Mortality Counts:
Day 7	Old D.O.	8.3	New D.O.	8.4	Old D.O.	8.1	New D.O.	8.1	AM Change: حمير
Date: 8-16-14	Meter ID	RDII	Meter ID	RDII					WQ:
Temp. (°C) =22.7	A	В	C		A .	B 0	C		PM Change: -
Feed:	0	0	0		0		0		Mortality Counts:
Day 8	Old D.O.	8.3	New D.O.	8.6	Old D.O.	8,3	New D.O.	8.C	AM Change:
Date: 8.17.14	Meter ID	RAII	Meter ID	ROU					WQ:
Temp. ($^{\circ}$ C) = 11.3	^ o	B			A 0	B	0		PM Change:
Feed:			0						Mortality Counts:
Day 9	Old D.O.	8.2	New D.O.	8.8	Old D.O.	8.2	New D.O.	8.8	AM Change:
Date: 3.18.14	Meter ID	RB11	Meter ID	ROW	A	B			WQ:
Temp. (°C) = 22.1	0	0	0		0	0	0	1 2 3 4 5 4 5 4 5 5 5 5 5 5 5 5 5 5 5 5 5 5	PM Change: Mortality Counts:
Feed: Ban		<u> </u>	388888888			<u> </u>			Termination
Day 10	Old D.O.	8.5			Old D.O.	7.7			Counts:
Date: 8,19,14	Meter ID # Alive/R	Fedy			# Alive/R	enlicete			WQ:
Temp. (°C) = 12.5	# Alive/R	В	IC		# Alive/K	В	C		
	10	9	10		ı	0	3		
		<u> </u>	<u> </u>		<u> </u>				

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58801b | 19-5160-7963

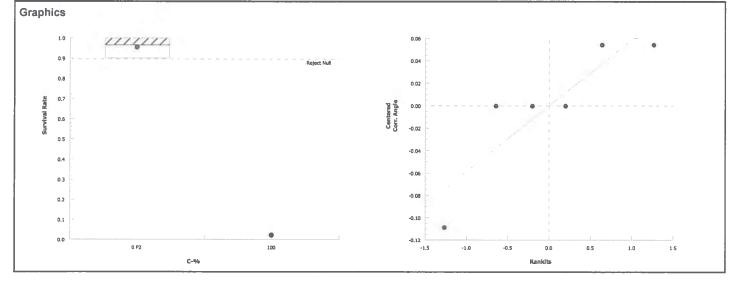
								est Code:			00001011	9-3 100-790
Hyalella Surv	ival and Growth	Test									Pacit	ic EcoRisk
Batch ID: Start Date: Ending Date: Duration:	01-2914-6876 09 Aug-14 15:0 19 Aug-14 12:0 9d 21h		Test Type: Protocol: Species: Source:	Hyalella azt	99/064 (2000)		C E	nalyst: Diluent: Brine: Age:	Not Ap	k Anders oplicable oplicable	on	
Receive Date:	15-8148-7129 22 Jul-14 11:45 : 22 Jul-14 17:15 18d 3h (0°C)		Code: Material: Source: Station:	PBO @ 25 sediment ADH Enviro 544MSH065	nmental, Inc. (/	ADH ENVI	F	Client: Project:	ADH E 19397	Environme	ental, Inc.	
Comparison S	Summary											
Analysis ID 18-4552-3379 17-7973-1725	Endpoint Mean Dry Weig Survival Rate	jht-mg	<100 <100	100	TOEL NA NA	PMSD 15.2% 7.35%	TU >1 >1		al Variar		-Sample Te	
Mean Dry We	ight-mg Summa	ry							· ·. · · · · · · · · · · · · · · · · ·			
C-% 0 100	Control Type PBO 25 Blank	Cour 3	0.116 0			Min 0.1 0	Max 0.128 0	0.008 0	825 (Std Dev 0.0143	CV% 12.4%	%Effect 0.0% 100.0%
Survival Rate	Summary											
C-% 0 100	Control Type PBO 25 Blank	Cour 3 3	0.967		1 0	Min 0.9 0	Max 1 0	Std E 0.033 0	33 (Std Dev 0.0577	CV% 5.97%	%Effect 0.0% 100.0%
Mean Dry Wei	ight-mg Detail											
C-% 0 100	Control Type PBO 25 Blank	0.128 0		2 Rep 3 0.119 0							···	
Survival Rate	Detail			·								
C-% 0 100	Control Type PBO 25 Blank	Rep 1	1 Rep 2 0.9 0	Rep 3 1 0								
Survival Rate	Binomials											
C-% 0 100	Control Type PBO 25 Blank	10/10 0/10		2 Rep 3 10/10 0/10								



08 Sep-14 08:44 (p 2 of 2)

58801b | 19-5160-7963

								00001			
Hyalella Sur	vival and Growth	n Test								Paci	fic EcoRisk
Analysis ID: Analyzed:	17-7973-1725 08 Sep-14 8:4			rvival Rate rametric-Two	Sample			IS Version:	CETISv1	.8.7	
Data Transfo	orm	Zeta	Alt Hyp	Trials	Seed		PMSD	Test Resu	ult		
Angular (Cor	rected)	NA	C > T	NA	NA		7.35%	Fails survi	ival rate		
Equal Variar	nce t Two-Sampl	e Test							-: "		
Control	vs C-%		Test Stat	Critical	MSD DF	P-Value	P-Type	Decision(α:5%)		
PBO 25 Blan	k 100*		22.1	2.13	0.116 4	<0.0001	CDF	Significan		 	
ANOVA Tabl	e										
Source	Sum Squ	iares	Mean Squ	uare	DF	F Stat	P-Value	Decision(α:5%)		
Between	2.156087	-	2.156087		1	487	<0.0001	Significant	t Effect		
Error	0.017706	22	0.004426	555	4						
Total	2.173793				5						
Distributiona	al Tests										
Attribute	Test			Test Stat	Critical	P-Value	Decision	(a:1%)			
Variances	Mod Lev	ene Equa	lity of Variance	1	98.5	0.4226	Equal Var	iances			
Variances	Levene E	Equality of	f Variance	16	21.2	0.0161	Equal Var	iances			
Distribution	Shapiro-	Wilk W N	ormality	0.814	0.43	0.0778	Normal D	istribution			
Survival Rat	e Summary										
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	PBO 25 Blank	3	0.967	0.823	1	1	0.9	1	0.0333	5.97%	0.0%
100		3	0	0	0	0	0	0	0		100.0%
Angular (Co	rrected) Transfor	med Sun	nmary								
	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
C-%											
0	PBO 25 Blank	3	1.36	1.12	1.59	1.41	1.25	1.41	0.0543	6.93%	0.0%





Variances

Variances

Distribution

Report Date: Test Code: 08 Sep-14 08:44 (p 1 of 2) 58801b | 19-5160-7963

									1631	ooue.	0000	10 10-0100-7000
Hyalella Survi	val a	nd Growth Tes	t									Pacific EcoRisk
Analysis ID:		1552-3379		•	Mean Dry Weig	_				IS Version:	CETISv1.8.7	
Analyzed:	08 9	Sep-14 8:44	Ar	nalysis: I	Parametric-Two	Sample	:		Offic	ial Results:	Yes	
Data Transform	m	Ze	ta	Alt Hy	p Trials	Seed			PMSD	Test Result	t	
Untransformed		N/A	\	C > T	NA	NA			15.2%	Fails mean	dry weight-mg	
Equal Varianc	e t T	wo-Sample Tes	t									
Control	VS	C-%		Test St	tat Critical	MSD	DF	P-Value	P-Type	Decision(a	:5%)	
PBO 25 Blank		100*		14	2.13	0.018	4	<0.0001	CDF	Significant E	∃ffect	
ANOVA Table		-										
Source		Sum Squares		Mean S	Square	DF		F Stat	P-Value	Decision(a	:5%)	
Between		0.02006811		0.0200	6811	1		196	0.0002	Significant I	Effect	
Error		0.0004086705		0.0001	021676	4						
Total		0.02047678				5						
Distributional	Test	5										
Attribute		Test			Test Stat	Critica	1	P-Value	Decision	(a:1%)		

Mean Dry Weight-mg Summary											
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0 .	PBO 25 Blank	3	0.116	0.0802	0.151	0.119	0.1	0.128	0.00825	12.4%	0.0%
100		3	0	0	0	0	0	0	0		100.0%

98.5

21.2

0.43

8.04

0.878

0.1074

0.0471

0.2586

Equal Variances

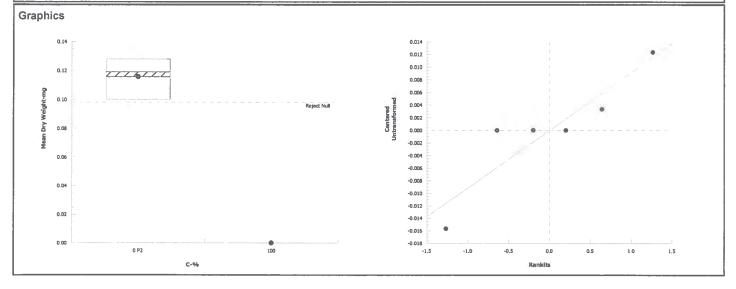
Equal Variances

Normal Distribution

Mod Levene Equality of Variance 7.84

Levene Equality of Variance

Shapiro-Wilk W Normality



10-Day Freshwater Sediment Toxicity Test Data

Client:	ADH/RMC	Project #: _	19397	Organism Supplier/Log Number:	ABS/8422
Species:_	Hyalella azteca	_ Test ID#: _	58801	Organism Age/Size:	12/13 days

							Con	trol Water:	54M-5
Treatment =	=	25 μg/L P	BO Blan	ık	544R	00025US	+ 25 µg/	L PBO	Sign-offs:
Day 0			New D.O.	8.1			New D.O.		Initiation Time: 1500
Date: 8-9-14			Meter ID	FRII					WO:
Temp. (°C) = 13.0	A	В	С		A	B 10	C		Initiation Counts
Feed: M	10	10	10		10		10		Confirmation Count
Day 1	Old D.O.	7.2	New D.O.	7.4	Old D.O.	7.1	New D.O.	7.4	AM Change:
Date: 8.10.14	Meter ID	RDII	Meter ID	ROII					WQ: Eur
Temp. ($^{\circ}$ C) = 12.8		B	0		^ 0	B .	င ဗ		PM Change:
Feed: Euc									Mortality Counts:
Day 2	Old D.O.	8.1	New D.O.	3.8	Old D.O.	3. (New D.O.	8.1	AM Change:
Date: 3.11.14	Meter ID	В	Meter ID		A	IB -			WQ:
Temp. (°C) = 13.0 Feed: Eur	^ 0	5 0	0		0	° 0	0		PM Change:
	0140	-	Ni D.O		-		N DO		Mortality Counts:
Day 3 Date: 8.12.14	Old D.O. Meter ID	8.3	New D.O. Meter ID		Old D.O.	8.2	New D.O.	8.7	AM Change: WQ:
Temp. (°C) = 11.9	A	В	C	Roos	A	В			WQ: 8662 PM Change:
Feed: cen	0	0	0		0	0	0		Mortality Counts:
Day 4	Old D.O.	8.2	New D.O.	8.5	Old D.O.	8.1	New D.O.	8.5	AM Change:
Date: 8.13.14	Meter ID	ROIL	Meter ID						WQ: Sea
Temp. (°C) = 11.9	A	В	C		A	В	C		PM Change: 👝
Feed: Eur	0	0	0		0	0	0		Mortality Counts:
Day 5	Old D.O.	7.7	New D.O.	8.0	Old D.O.	7,8	New D.O.	8.0	AM Change:
Date: 8.14,14	Meter ID	ROOT	Meter ID	LooT					WQ:
Temp. (°C) = 11.8	A	В	C		A	В	С		PM Change:
Feed: Bee	0	0	0		0	0	0		Mortality Counts:
Day 6		8.1	New D.O.	8.2	Old D.O.	7.9	New D.O.	٦. გ	AM Change:
Date: 8/15/14	Meter ID	2209	Meter ID	2009					WQ:
Temp. (°C) = 23.\	^ 0	В			^ 0	B 0	^		PM Change:
Feed:		0	0				0		Mortality Counts:
Day 7	Old D.O.	8.3	New D.O.	0. 4	Old D.O.	8.2	New D.O.	8.1	AM Change: WQ:
Date: 8:16-14	Meter ID	12011	Meter ID	ROIL	A	IR			***********
Temp. (°C) = 22.7 Feed:	0	0	C		0	0	0		PM Change:
Day 8		8,3	New D.O.			2 .			AM Change:
Day 8	Old D.O. Meter ID	9.0	Meter ID	8.2	Old D.O.	7.2	New D.O.	0.4	WO:
Temp. (°C) = 11.3	A	B	C		<u> </u>	B	C		PM Change:
Feed:	0	0	0		0	0	0		Mortality Counts:
Day 9	Oid D.O.	8.1	New D.O.	8-7	Old D.O.	8.0	New D.O.	8.7	
Date: 8, 18,14	Meter ID	RDII	Meter ID	RAH					AM Change: WQ:
Temp. (°C) = 21.9	A	В	C		A	В	C		PM Change: —
Feed: Eur	0	0	0		0	0	0		Mortality Counts:
Day 10	Old D.O.	8.2			Old D.O.	7.6			Termination
Date: 8.19.14	Meter ID	Noo1							Counts:
Temp. (°C) = 22.4	# Alive/Ro	eplicate			# Alive/Re	plicate			WQ: Suc
	A [O	q	c (O		A 0	B Ø	C 0		

CETIS Summary Report

Report Date:

08 Sep-14 14:59 (p 1 of 1)

Test Code:

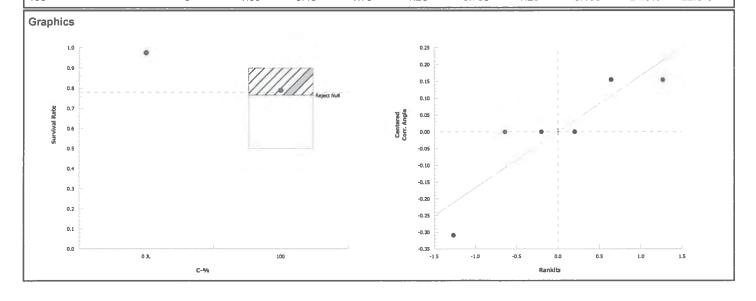
58801c | 03-7775-1808

									Test C	ouc.		00001010	3-7773-100
Hyalella Surv	ival and Growth	Test										Pacif	ic EcoRisk
Batch ID: Start Date: Ending Date: Duration:	06-0653-7694 09 Aug-14 15:0 09 Aug-14 12:0 NA	0 P	est Type: rotocol: pecies: ource:	EPA/ Hyale	ival-Growth 600/R-99/0 ella azteca itic Biosyst	064 (2000)			Analys Diluen Brine: Age:	t: N	Padrick Anderso lot Applicable lot Applicable 2	on	
Receive Date	16-4939-1953 22 Jul-14 11:45 : 22 Jul-14 17:15 18d 3h (0°C)	IV S	ode: laterial: ource: tation:	Sedir ADH		s ental, Inc. (A	DH ENVIF	₹0)	Client: Projec		DH Environme 9397	ental, Inc.	
Comparison S	Summary										· · · · · · · · · · · · · · · · · · ·		
Analysis ID 01-6200-3848 16-9849-8596	Endpoint Mean Dry Weig Survival Rate	ht-mg	<100 100		100 >100	TOEL NA NA	PMSD 18.7% 22.0%	TU >1 1			d Variance t Two Variance t Two	-	
Mean Dry We	ight-mg Summa	ry											
C-%	Control Type	Count	Mean	!	95% LCL	95% UCL	Min	Max	ζ :	Std En	r Std Dev	CV%	%Effect
0 100	Carboxylesteras	3	0.149 0.089		0.0966 0.0693	0.202 0.109	0.132 0.08	0.17		0.0123 0.0046		14.2% 9.01%	0.0% 40.2%
Survival Rate	Summary												
C-%	Control Type	Count	Mean	;	95% LCL	95% UCL	Min	Max		Std Erı	r Std Dev	CV%	%Effect
0 100	Carboxylesteras	3	1 0.767		1 0.193	1	1 0.5	1 0.9		0 0.133	0 0.231	0.0% 30.1%	0.0% 23.3%
Mean Dry We	ight-mg Detail												
C-%	Control Type	Rep 1	Rep 2	!	Rep 3								
0 100	Carboxylesteras	0.132 0.08	0.143 0.094		0.173 0.0933								
Survival Rate	Detail												
C-%	Control Type	Rep 1	Rep 2	!	Rep 3								
0	Carboxylesteras	1	1		1								
100		0.5	0.9		0.9								
Survival Rate	Binomials	. •											
C-%	Control Type	Rep 1	Rep 2		Rep 3								
0	Carboxylesteras		10/10		10/10								
100		5/10	9/10	!	9/10								



08 Sep-14 08:49 (p 2 of 2) 58801c | 03-7775-1808

							rest	Code:		30001010	3-1113-1000
Hyalella Sur	vival and Growth	Test	· · ·		_					Paci	fic EcoRisk
Analysis ID: Analyzed:	16-9849-8596 08 Sep-14 8:49			rvival Rate rametric-Two	Sample			IS Version: cial Results:	CETISv1 Yes	.8.7	
Data Transfo	orm	Zeta	Alt Hyp	Trials	Seed		PMSD	Test Resu	ılt		
Angular (Corr	rected)	NA	C > T	NA	NA		22.0%	Passes su	ırvival rate		
Equal Varian	ice t Two-Sample	Test						· · · · · · · · · · · · · · · · · · ·			
Control	vs C-%		Test Stat	Critical	MSD DF	P-Value	P-Type	Decision(α:5%)		
Carboxyleste	rase Bl 100		2.05	2.13	0.329 4	0.0546	CDF	Non-Signi	ficant Effect	1	
ANOVA Tabl	e				42						
Source	Sum Squa	res	Mean Sq	uare	DF	F Stat	P-Value	Decision(α:5%)		
Between	0.151228		0.151228		1	4.22	0.1091	Non-Signif	ficant Effect		
Error	0.1433127		0.035828	18	4						
Total	0.2945407				5						
Distributiona	al Tests										
Attribute	Test			Test Stat	Critical	P-Value	Decision	(a:1%)			
Variances	Mod Leve	ne Equa	lity of Variance	1	98.5	0.4226	Equal Var	riances			
Variances	Levene E	quality o	f Variance	16	21.2	0.0161	Equal Var	riances			
Distribution	Shapiro-V	Vilk W N	ormality	0.814	0.43	0.0778	Normal D	istribution			
Survival Rat	e Summary										
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Carboxylesteras	3	1	1	1	1	1	1	0	0.0%	0.0%
100		3	0.767	0.193	1	0.9	0.5	0.9	0.133	30.1%	23.3%
Angular (Coi	rrected) Transfori	ned Sur	nmary	·····							
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Carboxylestera	3	1.41	1.41	1.41	1.41	1.41	1.41	0	0.0%	0.0%
100	•	3	1.09	0.43	1.76	1.25	0.785	1.25	0.155	24.5%	22.5%

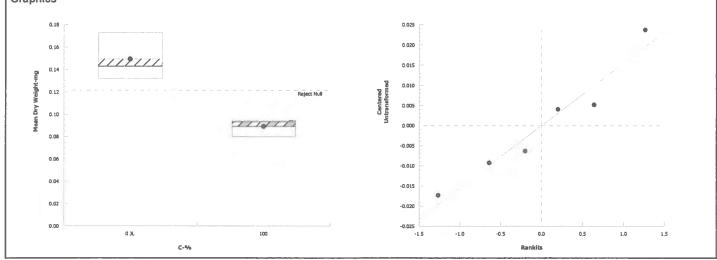




Report Date:

08 Sep-14 08:49 (p 1 of 2)

CE 113 An	alytical Rep	ort					•	Code:		•	3-7775-1808
Hyalella Sur	vival and Growth	n Test								Paci	fic EcoRisk
Analysis ID: Analyzed:	01-6200-3848 08 Sep-14 8:4	9	•	Mean Dry Weig Parametric-Two	_			IS Version:	CETISv1	.8.7	· · · · · · · · · · · · · · · · · · ·
Data Transfo	orm	Zeta	Alt Hyp	Trials	Seed		PMSD	Test Resu	ılt		
Untransforme	ed	NA	C > T	NA	NA		18.7%	Fails mea	n dry weigh	t-mg	
Equal Variar	nce t Two-Sampl	e Test									
Control	vs C-%		Test St	at Critical	MSD DF	P-Value	P-Type	Decision(α:5%)		
Carboxyleste	rase BI 100*		4.59	2.13	0.028 4	0.0051	CDF	Significan	t Effect		
ANOVA Tabl	e										
Source	Sum Squ	ares	Mean S	quare	DF	F Stat	P-Value	Decision(a:5%)		
Between	0.005413	35	0.00541	335	1	21	0.0101	Significan	Effect		
Error	0.001029	894	0.00025	74735	4						
Total	0.006443	244			5						
Distributiona	al Tests										
Attribute	Test			Test Stat	Critical	P-Value	Decision	(α:1%)			
Variances	Variance	Ratio I	F	6.97	199	0.2510	Equal Var	riances			
Distribution	Shapiro-	Wilk W	Normality	0.953	0.43	0.7677	Normal D	istribution			
Mean Dry W	eight-mg Summa	ary									
C-%	Control Type	Cour	nt Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Carboxylestera	s 3	0.149	0.0966	0.202	0.143	0.132	0.173	0.0123	14.2%	0.0%
100		3	0.0893	0.0693	0.109	0.0933	0.08	0.0944	0.00464	9.01%	40.2%
Graphics											





10-Day Freshwater Sediment Toxicity Test Data

Client: _	ADH/RMC	_ Project #: _	19397	Organism Supplier/Log Number:	ABS/8422
Species:_	Hyalella azteca	_ Test ID#: _	58801	Organism Age/Size:	12/13 days
				Control Water:	SAM-5

	Control Water:								
Treatment =	Ca	rboxylest	terase Bl	ank	544R00	025US +	Sign-offs:		
Day 0			New D.O.				New D.O.	6-9	Initiation Time: 1500
Date: 3/9/14			Meter ID	PDII					WQ: M
Temp. (°C)'= 23, 6	A a	В	C		A 10	В	C		Initiation Counts:
Feed: M	10	10	10		10	10	10		Confirmation Coun
Day 1	Olċ D.O.	7.5	New D.O.	7.4	Old D.O.	7.3	New D.O.	7.4	AM Change:
Date: 8.10.14	Meter ID	RD II	Meter ID	ROIL					WQ: Gue
Temp. ($^{\circ}$ C) = 21.8	A	В	C		l ^A	В	C		PM Change:
Feed: Exa	0	0	0		0	O	0		Mortality Counts:
Day 2	Ord D.O.	8.2	New D.O.	8.1	Old D.O.	8, 3	New D.O.	8.1	AM Change:
Date: 8.11.14	Meter ID		Meter ID						WQ:
Temp. (°C) = 13.0	A O	B	C O		^A O	BO	0		PM Change: —
Feed: Fan.	-					-			Mortality Counts:
Day 3	Old D.O.	8.1	New D.O.	8.6	Old D.O.	8.1	New D.O.	8.6	AM Change:
Date: 8.12.14	Meter ID	Pogs	Meter ID	2009					WQ:
Temp. (°C) = 22.4	A 0	B	0		A ~	В	C _		PM Change:
Feed:	0				0	, ,	0		Mortality Counts:
Day 4	Old D.O.	8.0	New D.O.	8.4	Old D.O.	7.9	New D.O.	8.4	AM Change:
Date: 8.13.14	Meter ID	Ib	Meter ID	ILDII.					WQ: Glee
Temp. (°C) = 22.9	Ô	B	c O		^ o	B 0	0		PM Change:
Feed: Sea									Mortality Counts:
Day 5	Old D.O.	7.8	New D.O.	7,8	Old D.O.	7.8	New D.O.	7.3	AM Change:
Date: 8.14.14	Meter ID	Loca	Meter ID	Cool					WQ:
Temp. (°C) = 11.8	0	B Ø	c Ø		^ ര	В О	0		PM Change:
Feed: Sea.									Mortality Counts:
Day 6	Old D.O.	7.8	New D.O.	7.9	Old D.O.	7,8	New D.O.	7.8	AM Change:
Date: 8/15/14	Meter ID	2709		ZD09					WQ:
Temp. (°C) = 23. \	0	o	C 0			ا ہ	0		PM Change:
Feed:									Mortality Counts:
Day 7		8,0		7.9	Old D.O.	7.9	New D.O.	7.9	AM Change:
Date: 8.16-14	Meter ID	POII	Meter ID	RD (1	A	D	4 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		WQ:
Temp. (°C) = 22.7	^ o		ט			0	0		PM Change:
Feed:									Mortality Counts:
Day 8	Old D.O.		New D.O.	8.2	Old D.O.	7, 7	New D.O.	8.2	AM Change: Alex
Date: 8.17.14	Meter ID	RD II	Meter ID	ROU	A	R	C		WQ:
Temp. $(C) = 11.1$	0	٥	0			် စ	٥		PM Change:
Feed: Bus.	01150								Mortality Counts:
Day 9	Old D.O.	8,0	New D.O.	8.5	Old D.O.	7, 3	New D.O.	8. 5	AM Change:
Date: 3.18.14	Meter ID	B	Meter ID	RON	A	В			WQ:
Temp. (°C) = 21.9	0		0		Î o	٥	0		PM Change:
Feed: Eec.									Mortality Counts:
Day 10	Old D.O.	7.8			Old D.O.	7.5			Termination Counts:
Date: 8,19,14	Meter ID	RD 01			# A 12/T	_1			***************************************
Temp. (°C) = 12.4	# Alive/Re	pucate B	C	1888888888	# Alive/Re	plicate	C	300000000000000000000000000000000000000	WQ:
	10	10	10		^ 5	ຶ ໆ	9		
						1	,		

Hyalella azteca Weight Data Sheets

Client:	ADH/RMC	Project #:	19397	Balance ID:	BALOI
Sample ID:	544R00025US	Tare Wt Date:	8/11/14	Sign-Off:	FOUS
Test ID #:	58801	Final Wt Date:	8/20/14	Sign-Off:	CJG

Pan	Concentration Replicate		Initial Weight. (mg)	Final Weight. (mg)	# organisms	Ave Weight (mg)
1	Control	A	65.27	66.43	10	0.116
2	4	В	63.46	64.83	9	0.152
3		С	61.79	63.14	10	0.135
4	Aeration Blank	A	65.23	66.49	10	0.126
5		В	63.52	64.55	વ	0,114
6		С	64.09	65.25	10	0.116
7	25 μg/L PBO Blank	A	64.29	ú5.57 ·	10	0,128
8		В	63.34	64.24	ą	0.100
9		С	63.69	64.88	10	0.119
10	Carboxylesterase	A	66.79	62-17 68.11	10	0,151
11	Blank	В	66.10	44.53	(0	0.143
12		С	60.70	62.43	10	0.173
13	100% 544R00025US	Α	67.02	_	0	
14	pfn	В	58.19		0	
15		С	63.45	63.61	٤	0.080
16	544R00025US + Aeration	Α	66.25	66.41	L	0.160
17		В	66.92	_	0	
18		С	65.50	65.78	3	0.093
19	544R00025US + 25 μg/L PBO	Α	59.77		0	
20		В	61.26		0	-
21		С	68.48	_	,0	
22	544R00025US + Carboxylesterase	A	63.24	63.64	5	0,080
23		В	63.27	64.12	9	0.094
24		С	61.65	62.49	٩	0.093
QA I			65.74	65.75		
QA 2			66.66	66.64		

Freshwater Sediment Test Water Quality Characteristics

Client:	ADH/RMC	Species:	Hyallela azteca

Initial Water Quality Characteristics for Overlying Water

Date: 8-9-14

Site	pН	D.O. (mg/L)	Conductivity (µS/cm)	Alkalinity	Hardness	Total Ammonia	Test ID #
Control	8.36	7.9	504	65 V	138 √	41.00	58801
Aeration Blank	8.33	8.2	574	72 .	140 /	41.00	
25 μg/L PBO Blank	8.34	8.1	546	61 V	133 /	41.00	
Carboxylesterase Blank	8.31	8.0	567	78 /	170 /	41.00	
100% - 544R0025US	7.79	6.7	690	138	169 1	21.00	
544R0025US + Aeration	8.15	7.6	724	155 ✓	187 🗸	1.02	
544R0025US + 25 μg/L PBO	7.92	5.9	659	144	164	1.07	
544R0025US + Carboxylesterase	8,19	6.9	762	179 🗸	197 /	2.16	
Meter ID	PH 24	ROII	Ec10	✓	/	PR3800	
Sign-off	m	IMM	m	m	w	, pur	

Final Water Quality Characteristics for Overlying Water

Date: 8 .19, 14

Site	рН	D.O. (mg/L)	Conductivity (µS/cm)	Alkalinity	Hardness	Total Ammonia	
Control	7.73	8.3	457	51 /	149 -	21.00	
Aeration Blank	7.79	8.3	442	53	143 -	11.00	
25 μg/L PBO Blank	1.83	8.2	458	44 +	182 -	21.00	
Carboxylesterase Blank	7.82	7.8	502	82	165 -	7-47	
100% - 544R0025US	8.06	7.9	561	79	198	1.57	
544R0025US + Aeration	8.06	7.7	509	81	160 ~	1.26	
544R0025US + 25 μg/L PBO	8.07	7.6	550	97 ~	193	1.18	
544R0025US + Carboxylesterase	8.00	7.3	515	109	215 -	8.15	
Meter ID	bt 51	R007	₿ ७ Ч			DR3800	
Sign-off	isa	BUL	Ber	ALC	en	u	

Appendix D

Test Data and Summary of Statistics for the Reference Toxicant Evaluation of the *Hyalella azteca*



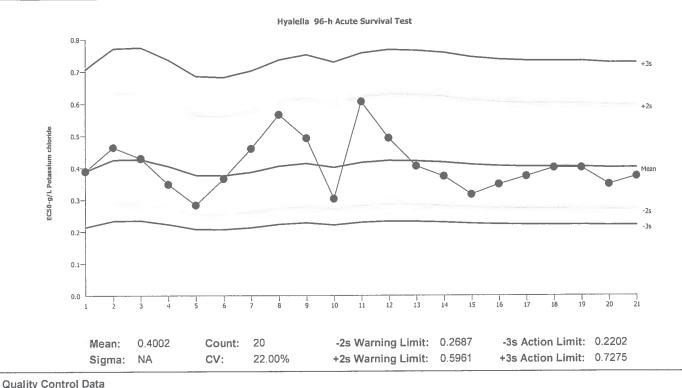
02 Aug-14 08:09 (p 1 of 1) 58640 | 10-7064-3733

Pacific EcoRisk Hyalella 96-h Acute Survival Test 01-9707-2882 Survival (96h) Analyst: Michelle Kawaguchi Batch ID: Test Type: Diluent: SAM-5S EPA-821-R-02-012 (2002) 27 Jul-14 16:00 Protocol: Start Date: Ending Date: 31 Jul-14 14:35 Brine: Not Applicable Species: Hyalella azteca 10 Source: Chesapeake Cultures, Inc. Age: **Duration:** 95h Reference Toxicant 11-9072-4585 Code: Client: Sample ID: Potassium chloride Project: 22820 Material: Sample Date: 27 Jul-14 16:00 Source: Reference Toxicant Receive Date: 27 Jul-14 16:00 In House Sample Age: NA (23 °C) Station: **Comparison Summary PMSD** LOEL TU Method Analysis ID **Endpoint** NOEL TOEL Fisher Exact/Bonferroni-Holm Test 19-6365-8524 96h Survival Rate 0.2 0.4 0.2828 NA **Point Estimate Summary** 95% UCL TU Method Analysis ID **Endpoint** Level g/L 95% LCL Spearman-Kärber 19-9425-5682 96h Survival Rate EC50 0.373 0.301 0.463 96h Survival Rate Summary CV% %Effect Std Err Std Dev C-g/L **Control Type** Count Mean 95% LCL 95% UCL Min Max 0.0% 0.0% Lab Water Contr 10 1 1 0 0 0 0 0.0% 0.0% 1 1 1 0 0.1 10 1 1 0 0.0% 0.0% 1 1 0 0.2 10 1 1 0.4 0.207 0.593 0 1 0.163 0.516 129.0% 60.0% 0.4 10 0 0 0 0 0 0 0 100.0% 10 0.8 100.0% 0 0 0 0 0 0 0 1.6 10 96h Survival Rate Detail **Control Type** Rep 2 Rep 3 Rep 4 Rep 5 Rep 6 Rep 7 Rep 8 Rep 9 Rep 10 C-g/L Rep 1 1 1 1 1 0 Lab Water Contr 1 1 1 1 1 1 1 1 1 1 1 1 0.1 1 1 1 1 1 0.2 1 1 1 1 1 0 0 0 1 0 0 1 0 1 0.4 1 0 0 0 0 0 0.8 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1.6 96h Survival Rate Binomials Rep 6 Rep 7 Rep 8 Rep 9 Rep 10 Rep 2 Rep 3 Rep 4 Rep 5 C-g/L **Control Type** Rep 1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 Lab Water Contr 1/1 1/1 1/1 0 1/1 1/1 1/1 1/1 1/1 1/1 1/1 0.1 1/1 1/1 1/1 0.2 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 0/1 0/1 0/1 0/1 1/1 0/1 0.4 1/1 0/1 1/1 1/1 0/1 0/1 0/1 0/1 0/1 0/1 0/1 0/1 0/1 0/1 0.8 0/1 0/1 0/1 0/1 0/1 0/1 0/1 1.6 0/1 0/1 0/1

02 Aug-14 08:10 (1 of 1)

Report Date:

Pacific EcoRisk Hyalella 96-h Acute Survival Test Organism: Hyalella azteca (Freshwater Amphip Material: Potassium chloride Test Type: Survival (96h) Reference Toxicant-REF Protocol: EPA-821-R-02-012 (2002) Endpoint: 96h Survival Rate Source:



Quant	ty Con	li Oi Dale	2									
Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID	
1	2014	Jan	22	15:30	0.3887	-0.01152	-0.1466			15-1323-9580	12-5039-1906	
2			23	12:20	0.4634	0.06319	0.7359			12-4927-8114	03-4534-5077	
3			24	13:50	0.4287	0.02847	0.345			04-8256-1553	14-6784-2933	
4			29	12:45	0.3482	-0.05202	-0.6989			02-0910-9206	20-3009-8021	
5			30	13:00	0.2828	-0.1174	-1.743			07-7453-2234	19-6136-6595	
6			31	15:00	0.3651	-0.0351	-0.4608			07-3562-2451	09-8419-3354	
7		Feb	4	16:00	0.4595	0.05924	0.693			07-2556-9878	06-3437-8862	
8			7	17:40	0.5657	0.1654	1.737			12-2780-2249	04-4756-7462	
9			15	17:00	0.4925	0.09222	1.041			20-0080-3088	01-2359-2306	
10			20	15:45	0.3031	-0.09709	-1.395			05-7047-7703	05-1521-5106	
11			27	18:10	0.6063	0.2061	2.085	(+)		00-8786-3488	13-6064-7851	
12			28	18:20	0.4925	0.09222	1.041			17-7114-0796	13-7617-1964	
13		Mar	1	17:30	0.4048	0.004573	0.05703			13-0688-9437	00-6627-1218	
14			27	13:00	0.3732	-0.02702	-0.3509			08-8207-4257	13-7765-3936	
15		Apr	19	16:00	0.3162	-0.08406	-1.184			08-9365-8733	12-7246-8879	
16		May	17	15:20	0.3482	-0.05202	-0.6989			10-0231-2264	05-8112-0401	
17			30	14:30	0.3732	-0.02702	-0.3509			07-8466-6021	10-2686-8051	
18		Jun	5	16:40	0.4	-0.00024	-0.00297			21-3469-3919	07-7147-2954	
19		Jul	20	16:00	0.4	-0.00024	-0.00297			05-0442-5035	13-8903-6798	
20			24	14:15	0.3482	-0.05202	-0.6989			11-0314-5496	07-7675-6316	
21			27	16:00	0.3732	-0.02702	-0.3509			10-7064-3733	19-9425-5682	

96 Hour *Hyalella azteca* Reference Toxicant Test Data

			9-10
Client:	Pacific EcoRisk	Organism Log #:	3387 Age: 47 + 2 days
Test Material:	Potassium Chloride	Organism Supplier:	Chesapeake Cultures
Test 1D#:	58640 Project # 22820	Control/Diluent:	SAM-5
Test Date:	7-27-14 Randomization: 10.10.9	Control Water Batch:	/27
Feeding To	Time: 0830 Initials: CP	Feeding T46	Time: 0950 Initials: MA

	Temp		D.O.	Conductivity				#]	Live A	Anima	ıls				
Treatment (g/L)	(°C)	pН	(mg/L)	(μS/cm)	Α	В	С	D	Е	F	G	Н	I	J	Sign-Off
Control	23.0	8.02	6.7	403	١	1	П		Т	1	1	١	1	1	Test Solution Prep
0.1	23.0	1.99	7,0	170°24	ì	1	1	i	(i	1	1	1	1	Test Solution Prep:
0.2	23.0		7.0	771	ĺ	,	i	1	1	Ī	1	1		ı	Initiation Date: 7714
0.4	23.0		1.3	1177	1	1		1	1	1	1	1	1		Initiation Time: 1000
0.8	23.0	7.95	7.6	1882			1	1	1	ı	1	1	1	1	Initiation Signoff: MA
1.6	23.0		8.9	3310	i	1	1	1	1	1	1	1	1	T	RT Batch #:
Meter ID	43A	PHIS	2009	Ecoq						$\overline{\mathbb{I}}$					
Control	23,2				1	1	1		(1	-	1)	Count Date: 7/28/14
0.1	23.2				ī	1	1	1	1	1	1	1	1	1	Count Time: COIC
0.2	23.2				ī	1	1	1	1		1	1	l	١	Count Signoff:
	23.73				ī	1	1	1	١	1	-	1	ŧ	(
0.8	23.2				Ö	0	0	0	0	1	0	6	0	6	
1.6	23. D				Ò	0	0	0	0	O	Ó	0	0	0	
Meter ID	43A														
Control	23,3				1	١	١	1	١	١	1	1	1	1	Count Date: 7/29/14
0.1	23,3				1	1	1	1	((1	1	١	Count Time: 0945
0.2	23,3				١	1	1	١	Ī	١	1	1	1	1	Count Signoff: MA
0.4	23,3				1	0	\	1	(١	1	0	1		
0.8					0	0	0	0	0	0	0	0	0	0	
1.6					0	0	O	0	0	0	0	0	0	0	
Meter ID	43A														
Control	23.1				1	1	1	1	1	1	1	1	1	1	Count Date: 7/30/14
0.1	23.1				1	1	1	1	(1	1	١	1	1	Count Time: 1025
0.2	23.1				1	1	1.	t	1	1	1	1	l	1	Count Signoff: MA
0.4	23.1				j	-		0	1	0	0		1	0	
0.8					-	-	_	_		-	-	_	-	-	
1.6					-		_	_	_	_	_		_	_	
Meter ID	43A														
Control	230	7.59	7.4	556	١	٦	1	٦	١	١	١	١	١	١	Termination Date: 7/31/11
0.1	23.0	7.53	7.7	779	1	1	1	1	1	1	1	1	1)	Termination Time: 1435
0.2	23.0	7.58	7.6	788	1		1	1	1	1	1	1	1	1	Termination Time: 1435 Termination Signoff: Aws Old WQ: A
0.4	23.0	7.65	7.4	1338		-		_	1		_	_	1	_	Old WQ:
0.8	_	7.81	7.6	2203	-		-	_			_	_	_	_	
1.6	_	7.84	7.7	3860	_	_	_	_	_	_	_	_	_	_	
Meter ID	43A	MZI	RDII	Ecos											
		1													