Year-4 Current Use Pesticides Data Report and Quality Assurance Evaluation: Compendium of Deviation and Corrective Action Reports

For Current Use Pesticides Monitoring during the 2024 Water Year

Prepared By:

MLJ ENVIRONMENTAL

10/22/2025

Compendium Preface

This compendium provides a comprehensive record of all deviation and corrective action reports associated with the Delta Regional Monitoring Program's (DRMP) Current Use Pesticides (CUP) Year-4 Data Report and Quality Assurance Evaluation. It includes all finalized and duly signed Deviation Report and Corrective Action Forms, including those that were revised and finalized after the drafting, approval, and publication of the CUP Year-4 Data Report on the DRMP website.

The purpose of this compendium is to provide a consolidated and up-to-date account of all finalized deviation report summaries and their corresponding corrective actions related to Year-4 CUP monitoring activities, data reporting, and quality assurance evaluation efforts.

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Deviation 2023-25. Event 6 (WY 2024) USGS Field Blank Contamination on DOC 162

Deviation Report / Corrective Action Form

Title:	**CUP Event 1 (WY24) *Chironomus* larvae initial weights greater than 0.012 mg/ individual AFDW**
Deviation Number:	2023-03_CUPv1.4_Dev_WY24Event1_PER_Chironomus_InitialWeights
Prepared By:	Robert Pangle
Attached:	2023-03_CUPv1.4_Dev_121223_DeltaRMP_NonConformingDataReport_ChironomusT0Weights_S1.pdf

Applicable Reference(s):

Delta Regional Monitoring Program Quality Assurance Project Plan for Current Use Pesticides in the Sacramento-San Joaquin Delta Version 1.4, September 28, 2023

Complete the following table regarding the major milestones for the relevant deviation. Add additional rows as needed.

	Date	Notes/Description (optional)
Date Deviation Occurred:	12/19/2023	Upon completion of the drying process, the initial Ash-Free Dry Weight (AFDW) for two control batches of *Chironomus dilutus* larvae were recorded. These test batches were initiated on 12/12/2023 and 12/13/2023, and it was subsequently noted on 12/19/2023 (post drying) that both batches exceeded the measurement quality objective (MQO) of ≤0.12 mg/individual AFDW for t(0) weights.
Date DRMP Program Manager was notified:	12/22/2023	Stephen Clark, Technical Director at Pacific EcoRisk (PER), notified (via email) Melissa Turner (DRMP Technical Program Manager) of a deviation regarding *C. dilutus* testing that

	Date	Notes/Description (optional)
		was initiated with organisms above the MQO of ≤0.12 mg/individual AFDW for two control batches.
Date CVRWQCB QA Representative Notified:	12/22/2023	Stephen Clark (PER) notified Selina Cole (Region 5 QA Representative) of the non-conformance of mean initial t(0) weights via email.
Non-conforming Report sent:	1/18/2024	Initial Non-Conforming Report sent from Stephen Clark (PER) to MLJ.
Non-conforming Report sent:	2/2/2024	Revised Non-Conforming Report sent from Stephen Clark (PER) to account for pupation.
Deviation Form sent for Review:	2/15/2024	Stephen Clark (PER Technical Director).
Deviation Form sent for Review:	4/11/2024	Will Hagan (DRMP QA Officer)
Deviation Form Sent for Signatures:	4/29/2024	Originally sent for signatures
Approval Letter Received from CVRWQCB:	10/25/2024	The Central Valley Regional Water Quality Control Board's QA Representative position is currently vacant; however, Regional Board staff have reviewed the submitted QAPP Deviations Form and find the corrective actions sufficient. Regional Board approval was provided by Patrick Pulupa (CVRWQCB Executive Officer) for six CUP deviations including this one. The approval letter was sent to Debbie Mackey (DRMP President) on October 25, 2024.
Deviation Form Sent for Signatures post approval	11/21/2024	

Description of Deviation/Change:

PER discovered that the t(0) weights of *Chironomus dilutus* were greater than the SWAMP MQO of ≤0.12 mg/individual AFDW for both control batches. Test batches were initiated on 12/12/2023 (Control Batch 1) and 12/13/2023 respectively (Control Batch 2). The first batch (Control Batch 1) had a t(0) mean AFDW of 0.15 mg/individual and the second batch (Control Batch 2) of 0.14 mg/individual. The Control Batch 2 included four organisms which pupated; Control Batch 1 did not have any pupating organisms.

Reason for Deviation/Change

As noted in the non-conforming report attached to this deviation form, *C. dilutus* were received as 7-day old and 8-day old larvae on 12/9/2023 and 12/12/2023 from Aquatic Biosystems, Inc.

The organisms were held in-house and monitored closely until they were ten and nine days old respectively, when they were used for test initiation occurring on 12/12/2023 and 12/13/2023. Although the organisms were of the correct age for this method and test, the ash free dry weight was greater than allowed by the SWAMP MQO. An investigation was performed to determine the cause of the increased weight of the organisms including a) an assessment of test conditions, b) feeding rates, and c) water quality. The investigation did not identify any additional contributing factors to the organisms not meeting the AFDW <0.12 mg/individual. It was noted that historically larvae ordered from Aquatic Biosystems, Inc. have a greater likelihood of initial weights above the 0.12 mg/individual threshold compared to organisms reared in-house from egg casings by PER staff. Due to the timing for the selection of the sampling event coupled with the targeted organism age range of 8-10 days, egg cases could not be reared in house, so the organisms were received as larvae from the vendor that were of the correct age for testing.

Impact on Present and Completed Work (discuss potential magnitude of impact and bias of deviation/change, if this can be anticipated, if no impact is expected please indicate this)

The SWAMP MQO of AFDW ≤0.12 mg/individual is presumably targeted to reduce the likelihood of pupation/hatching during the 10-day test. No pupation or hatching occurred in the test batch that was initiated on 12/12/2023 even though the organism AFDW in Control Batch 1 was 0.15 mg/individual. No impact on the test results is expected since there was no pupation, and the age of the organisms was confirmed at 9-10 days old at time of test initiation. The organism AFDW in Control Batch 2 was 0.14 mg/individual. In Control Batch 2, initiated on 12/13/2023, four (4) organisms pupated with one transitioning to an adult during this testing. Pupation occurred in tests performed on samples collected from stations CONF-001 (Replicate C), CONF-003 (Replicate A and C) and CONF-004 (Replicate D). Pupated organisms were excluded from both the survival and growth endpoint statistics per the Data Management Standard Operating Procedure (v2.4).

Corrective Action	By Date	By Whom
The Tox Test Level QA Code of TAF [Test organisms exceed the maximum weight requirement at test initiation] will be applied to the samples in both Control Batches.	Prior to Electronic Data Deliverable Submission to MLJ data management team	Stephen Clark, Pacific EcoRisk Technical Director
The Tox Test Level QA Code of TMO [Test organisms escaped or are otherwise missing] will be applied to the effected samples in Control 2 that had pupation.	Prior to Electronic Data Deliverable Submission to MLJ data management team	Stephen Clark, Pacific EcoRisk Technical Director
Add a Tox Result Comment to the replicate records that had pupation: "1 organism pupated; 9 organisms used in statistics".	Prior to Electronic Data Deliverable Submission to MLJ data management team	Stephen Clark, Pacific EcoRisk Technical Director
PER needs 2.5 weeks advance notice for remaining CUP non-storm sampling events to allow for rearing of egg cases in-house. The Program Manager will help coordinate communication between the sampling team and PER for non-storm events that can be scheduled in advance to provide advance notice.	Prior to WY24 Events 3-6	Melissa Turner, DRMP Program Manager

ACKNOWLEDGED BY:

Pacific EcoRisk Technical Director:	DocuSigned by: STEPHEN CLARK C4D43551B2BC478...	Date:	11/25/2024
	Stephen Clark		

DRMP Program Manager:	DocuSigned by: Melissa Turner 9798DD915C44448...	Date:	11/21/2024
	Melissa Turner		

DRMP QA Officer:	DocuSigned by: Will Hagan A4691C48F968433...	Date:	11/25/2024
	Will Hagan		

CVRWQCB QA Representative*:	**Not Applicable**	Date:	10/25/2024
	Vacant		

*While these QAPP Deviation Forms will remain unsigned by the Central Valley Water Board due to the vacant QA Representative position, the current form is approved based on CVRWQCB staff scientist review and approval by the Central Valley Regional Water Quality Control Board Executive Officer Patrick Pulupa.

Evaluation of Non-Conforming Data

1.0 Incident Summary

Date of Incident:	12/12-13/23	Technical Mistake by PER Staff	
Client & Test Date:	Delta RMP; 12/12/23, 12/13/23	Organism Quality	X
Species:	*Chironomus dilutus*	Water Quality	
Test:	10d Chronic Toxicity	Solution Preparation	
Test ID:	103232-103240	Feeding/Food Quality	
Project Number:	35355	Organism Handling	
Manager on Duty:	SVV	Technical Experience	
Individuals Involved:		Undetermined	

2.0 Evaluation and Cause Analysis

The final ash free dry weight measurements recorded on 12/12 and 12/13 for the organisms associated with Delta RMP's 10-day chronic water exposure *Chironomus dilutus* toxicity tests were not ≤ 0.12 mg/individual as required by the SWAMP MQO. Two batches of tests were initiated. The organisms used to start testing had a mean ash free dry weight of 0.15 mg/individual (control 1) and 0.14 mg/individual (control 2). An investigation was performed to determine the cause of the increased weight of the organisms used for test initiation.

Organism Quality/Handling/Feeding

The tests were initiated on 12/12 and 12/13 using organism batch #14035 and #14040, which were received as 7-day old and 8-day old larvae on 12/9 and 12/12, respectively, from Aquatic BioSystems, Inc., PER's primary provider. The larvae were received in good condition at arrival with acceptable water quality parameters. The organisms were held in-house and monitored closely until they were 10 days old and 9 days old respectively, when they were used for test initiations, which is within the required age range for this test method. The cultures were observed to be in "good" condition for the duration of holding, with no observed mortalities. Historically, larvae ordered from ABS have a greater likelihood of having a weight greater than .012 mg/individual than organisms reared from an egg case by PER staff. Although the organisms were of the correct age for this method, they simply had a greater ash free dry weight listed as the SWAMP MQO, so organism quality is the most likely cause of the greater organism weight. It is important to note that the lower weight is presumably targeted to reduce pupation/hatching during the 10-day test. Four organisms pupated with one transitioning to an adult during this testing, and those have been excluded from both the survival and growth endpoints per past guidance from SWAMP staff and as approved by the Delta RMP TAC.

Other Factors

An investigation was performed on other factors that could have impacted testing including test conditions, feeding, and water quality. The investigation did not identify additional contributing factors to the organisms not meeting the ash free dry weight limit of ≤ 0.12 mg/individual.

3.0 Corrective Action / Preventative Action

Corrective Action: How will the situation/data be treated if it is encountered again? Who will implement?

The results were reported to the client and no retest was scheduled; therefore, no corrective actions are necessary at this time.

Preventative Action: Identify preventative measures that will be implemented. Who will implement?

N/A.

4.0 Monitoring of Corrective Action Effectiveness

30 Days later: There have been no other related issues in the thirty days following this incident.

Incident Open Date: 12/12/23 Incident Close Date: 1/13/24

Prepared By: Kevin Lung Quality Manager's Signature: Kevin Lung

Technical Director: Stephen Clark Technical Director's Signature:

Deviation Report / Corrective Action Form

Title:	**CUP Event 1 (WY24) Missed Tests Due to High Salinity**
Deviation Number:	2023-06_CUPv1.4_Dev_WY24Event1_PER_MissingTests_HighSalinity
Prepared By:	Cassandra Lamerdin
Attached:	24_0110_CUPTAC_RecommendationMemo.doc

Applicable Reference(s):

Delta Regional Monitoring Program Quality Assurance Project Plan for Current Use Pesticides in the Sacramento-San Joaquin Delta Version 1.4, September 28, 2023

Complete the following table regarding the major milestones for the relevant deviation. Add additional rows as needed.

	Date	Notes/Description (optional)
Date Deviation Occurred:	12/13/2023	Stephen Clark, Technical Director at Pacific EcoRisk (PER), notified (via email) Melissa Turner (DRMP Program Manager), Selina Cole (Region 5 QA Representative) and the TIE (Toxicity Identification Evaluation) Advisory Committee that four stations had conductivity above the evaluation threshold for three toxicity test species.
Date DRMP Program Manager was notified:	12/13/2023	
Date CVRWQCB QA Representative Notified:	12/13/2023	

	Date	Notes/Description (optional)
Deviation Form sent for Review:	05/01/2024	Stephen Clark (PER Technical Director)
Deviation Form sent for Review:	05/08/2024	Jim Orlando (USGS Project Manager)
Deviation Form sent for Review:	05/08/2024	Will Hagan (DRMP QA Officer)
Deviation Form Sent for Signatures:	05/09/2024	Originally sent for signatures
Approval Letter Received from CVRWQCB:	10/25/2024	The Central Valley Regional Water Quality Control Board's QA Representative position is currently vacant; however, Regional Board staff have reviewed the submitted QAPP Deviations Form and find the corrective actions sufficient. Regional Board approval was provided by Patrick Pulupa (CVRWQCB Executive Officer) for six CUP deviations including this one. The approval letter was sent to Debbie Mackey (DRMP President) on October 25, 2024.
Deviation Form Sent for Signatures post approval	11/21/2024	

Description of Deviation/Change:

On December 13, 2023, there was a deviation related to Current Use Pesticides (CUP) Event 1 (WY 2024) toxicity tests not performed for some species due to high conductivity. It was determined that conductivity was above threshold levels for three species (*Selenastrum capricornutum, Ceriodaphnia dubia and Pimephales promelas*) at Confluence sites during Event 1 sampling on December 12, 2023. Four stations (Conf-001, Conf-002, Conf-003 and Conf-004) had a total of eight tests (14 endpoints) that were not conducted due to elevated conductivity in surface water (Tables 1 and 2).

Table 1. Summary of sites with high conductivity sampled during Event 1 (December 12, 2023).

Station	Date	Conductivity (µS/cm)	*Selenastrum*	*Ceriodaphnia*	*Pimephales*
Conf-001	12/12/2023	7141	N/A[1]	N/A[1]	N/A[1]
Conf-002	12/12/2023	8354	N/A[1]	N/A[1]	N/A[1]
Conf-003	12/12/2023	2733	Within tolerance	N/A[1]	Within tolerance
Conf-004	12/12/2023	2576	Within tolerance	N/A[1]	Within tolerance

[1] Sample Not Tested: Conductivity exceeded upper limit

Table 2. Traditional species conductivity thresholds and alternate test species.

Traditional Species	Lower Threshold (µS/cm); Add High Conductivity Control	Upper Threshold (µS/cm); Use Alternate Test Species	Alternate Species
Selenastrum	1500	3000	*Thalassiosira*
Ceriodaphnia	1900	2500	*Hyalella*
Pimephales	1900	6000	*Menidia*

Reason for Deviation/Change

On December 13, 2023, Stephen Clark at PER contacted the Delta Regional Monitoring Program (DRMP) Program Manager, the Central Valley Regional Water Quality Control Board (CVRWQCB) Quality Assurance (QA) Representative, and DRMP Toxicity Identification Evaluation (TIE) Advisory Committee members via email indicating that the high conductivity measurements at four sites required discussion on next steps and alternate species use.

During notification with the DRMP Program Manager and TIE Advisory Committee, PER reminded the group that the use of alternative species was not part of the DRMP Request For Proposals and therefore the alternative species were not included in PER's scope. As a result, the PER contract does not include costs for these tests and species. In addition, PER discussed that some of the alternative species were not available with such short notice.

Impact on Present and Completed Work (discuss potential magnitude of impact and bias of deviation/change, if this can be anticipated, if no impact is expected please indicate this)

As stated above, there were four stations (Conf-001, Conf-002, Conf-003 and Conf-004) sampled on December 12, 2023 (total of eight tests and 14 endpoints) that will not be included in the WY 2024 dataset due to elevated conductivity in surface water.

The CUP TAC convened a meeting on January 8, 2024 to discuss and draft a recommendation memo (attached) for how to proceed when high conductivity is present at a site. Included in the discussion was a flowchart for how to determine the use of use of high conductivity controls and data management flagging for alternative controls when high conductivity is present.

Because the use of alternative species and these tolerance limits are already part of SWAMP recommendations and follow guidance for testing methods, there will be no change to the methods cited in the CUP QAPP. The current PER Standard Operating Procedures (SOPs) include the options to use an alternative control or species when deemed necessary.

Corrective Action	By Date	By Whom
Prior to sample events, conductivity will be checked remotely using results from the California Data Exchange Center (CDEC) site at Antioch and the timing of sample collection will be reviewed by USGS in all confluence sites for Events 2-6. This will allow time for additional communication and planning for implementing the alternative salinity procedures if deemed necessary	Prior to future Event Numbers 2-6	Jim Orlando, USGS Project Manager
Meet with TAC and create a recommendation memo for process when high salinities occur.	04/15/2024	Melissa Turner, DRMP Program Manager
Make modifications to the DRMP Data Management SOP to include specific flagging procedures for high salinity situations and submit an amendment to the CUP QAPP.	05/01/2024	Melissa Turner, DRMP Program Manager

ACKNOWLEDGED BY:

Pacific EcoRisk Technical Director:	DocuSigned by: Stephan Clark C4D43551B2BC478...	Date:	11/25/2024
	Stephen Clark		
USGS Project Manager:	Signed by: Jim Orlando B4DDF22E261F427...	Date:	11/25/2024
	Jim Orlando		
DRMP Program Manager:	DocuSigned by: Melissa Turner 9796DD915C44446...	Date:	11/26/2024
	Melissa Turner		
DRMP QA Officer:	DocuSigned by: Will Hagan A4691C48F968433...	Date:	11/25/2024
	Will Hagan		
CVRWQCB QA Representative*:	**Not Applicable**	Date:	10/25/2024
	Vacant		

*While these QAPP Deviation Forms will remain unsigned by the Central Valley Water Board due to the vacant QA Representative position, the current form is approved based on CVRWQCB staff scientist review and approval by the Central Valley Regional Water Quality Control Board Executive Officer Patrick Pulupa.

memo

Delta Regional Monitoring Program

To: DRMP Executive Committee

From: Current Use Pesticide (CUP) Technical Advisory Committee (TAC)

Date: April 17, 2024

Re: Delta RMP CUP TAC Recommendation for Addressing Pathogen-Related Mortality During Fathead Minnow (*Pimephales promelas*) Toxicity Testing

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Recommendation

The Delta Regional Monitoring Program (Delta RMP) Current Use Pesticide (CUP) Technical Advisory Committee (TAC) met on April 4, 2024, and discussed the impact of pathogen-related mortality (PRM) on testing of *Pimephales promelas* (fathead minnow). Under the current Delta RMP CUP study design, roughly 20% of the toxicity test samples for *P. promelas* were associated with PRM resulting in limited usability of the data.

The CUP study design outlined in the Quality Assurance Project Plan (QAPP) includes the following language regarding the goal and purpose of CUP monitoring:

"The Delta RMP was initiated under the encouragement of the Central Valley Regional Water Quality Control Board (CVRWQCB) with the primary goal of tracking and documenting the effectiveness of beneficial use protection and restoration efforts through comprehensive monitoring of water quality constituents and their effects in the Delta. Understanding the current water quality conditions within the Delta and the potential impacts to water quality conditions is important to preserve and enhance the Delta and inform corresponding regulatory and management decisions, which should be based upon sound science. A better understanding of the effects of contaminants in the apparent decline of Delta ecosystems is a priority for regulators and stakeholders. Pesticide use in the Delta and Central Valley is one of the potential drivers of these effects. Constantly changing pesticide use presents a challenge for environmental scientists, resource managers, and policy makers trying to understand whether these contaminants are impacting aquatic systems and if so, which pesticides are the biggest problem. Less than half of the pesticides currently applied in the Central Valley are routinely analyzed in monitoring studies and new pesticides are continually being registered for use. Therefore, baseline monitoring of ambient surface water for both aquatic toxicity and a broad list of current use pesticides is needed to understand whether current use pesticides contribute to observed toxicity in the Delta."

The CUP TAC is submitting a recommendation to utilize a 20-replicate per treatment method for toxicity testing of *P. promelas* to mitigate the impacts of PRM on the test results and data interpretation (i.e., determining if and how much the observed effects are due to pesticides or other toxicants vs. pathogen related). The recommendation is based on the overall objectives of the CUP monitoring design to better understand the impacts of pesticides on the aquatic ecosystem of the Delta including separating out the impact of confounding variables on those impacts.

Background

The CUP monitoring project has encountered issues related to PRM during toxicity testing of *P. promelas* across various sampling events throughout three water years of monitoring (the study has conducted two events of the fourth and final water year). Pathogen related toxicity is a test interference that occurs sporadically in *P. promelas* tests with ambient samples and is believed to be caused by water-borne pathogen(s). The CUP four-year study design includes the collection of 192 environmental samples over four years to be tested for toxicity to *P. promelas* (eight sites per event x six events per year x four years) plus field duplicate sample collected for quality assurance. To date, 20% of the samples tested for *P. promelas* toxicity as part of the current CUP study design have PRM (34 samples out of 172 total samples collected to date).

This memo proposes to adjust the number of organisms per container (two organisms per container versus 10 organisms per container) with the goal of reducing the probability of PRM impacting the statistical analysis of the endpoint data. This higher replicate test method is expected to reduce the likelihood of PRM affecting the interpretation of toxicity results by minimizing the variability in fish survival as a result of PRM especially when there is potential for additional mortality caused by contaminants (e.g., pesticides) in the water column. The proposed change is allowed by the U.S. Environmental Protection Agency (EPA, 2002) method 1000.0 for *P. promelas* to mitigate for PRM. Pathogen related mortality is not uncommon and increased replication/fewer fish per replicate has been used in other northern California monitoring programs including the Sacramento River Watershed monitoring program and for at least one municipal urban runoff monitoring program in the Bay Area Municipal Stormwater Collaborative (BAMSC). However, due to the increase of replica containers and personnel effort to manage the additional replicates (20 containers per test versus the four normally used), the cost for conducting the *P. promelas* tests will increase. The additional costs are viewed by the CUP TAC as a necessary investment to improve the quality of data collected and limit expenditures on test results with limited usability.

The EPA (2002) Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms notes in section 11.3.4 that “Pathogenic and/or predatory organisms in effluent samples or receiving water that is used for dilution may affect test organism survival and confound test results.” Under these circumstances, the EPA recommends taking steps to minimize pathogen interference to prevent test results from being confounded by mortality due to pathogens. The test design can be modified to control pathogen interference. The use of two fish per 20 mL in each 1-ounce test solution or two fish per 50 ml in each 4-ounce test solution can be used rather than 10 fish per 250 ml test solution. The total number of fish tested remains unchanged. The increase in replication does not affect the comparison of the test results as both methods are permitted within the same EPA method and the 20-replicate method requires pooling of replicates to generate four replicates for the weight comparison.

The EPA method provides an option of conducting the increased replicate per treatment as a follow-up test when PRM is evidenced; however, this would mean that the original test would be performed with the standard four replicates per treatment and then retested outside of hold time when PRM is evidenced. Instead, in the initial testing, the CUP TAC recommendation is to utilize the additional replicates in the test design as outlined by EPA when testing *P. promelas* for toxicity. This will avoid hold time violations for retesting but will incur a larger cost since tests associated with the remaining four sampling events in 2024 (starting with the April sampling event) will have additional costs related to testing incorporating PRM mitigation procedures versus testing without such procedures. To date, the highest percentage of samples experiencing PRM in a given water year is 39%, while the lowest percentage of PRM affected samples in a water year is 4%. Based on the water year with the highest percentage of samples with PRM, it is estimated that approximately 12 of the 32 toxicity tests to be performed over the next four events would be impacted by PRM (does not include field duplicates). It would cost roughly $10,000 less to retest samples impacted by PRM versus the CUP TAC recommendation to perform all *P. promelas* testing with the 20-container test setup. The value of spending the additional money is to avoid hold time violations that would impact the useability of the data.

The CUP TAC is made up of the following members: Selina Cole (CVRWQCB), Cam Irvine (RBI), Michael Johnson (MLJ Environmental), Karen Ashby (LWA), and Armand Ruby (ARC). Selina Cole was not present during the meeting but was informed separately of the discussion and recommendation. The TAC supports the recommendation.

Data Management

When reporting the proposed updates to testing described above, there would be several differences from previously reported *P. promelas* test results. The Summary results would receive a Test Quality Assurance (QA) Code “SN” [See narrative and/or special notes] with a Tox Batch comment of “Test performed using four replicates, each replicate of 10 fish was divided into five subreplicates with two fish/subreplicate”. The QA code does not impact data interpretation or usability; it provides additional narrative detail. The data will be comparable to prior collected data.

Budget Impacts

Conducting the test with PRM avoidance measures for the remaining four events for all *P. promelas* tests (including field quality control) adds **$37,403.31** to the PER budget.

Deviation Report / Corrective Action Form

Title:	**CUP Event 2 (WY24) *Chironomus* 10-day Toxicity Test Missed Hold Time**
Deviation Number:	2023-07_CUPv1.4_Dev_WY24Event2_PER_MissedHoldtime
Prepared By:	Robert Pangle
Attached:	2023-07_CUPv1.4_Dev_WY24Event2_PER_12324_C_Chiron_10dWater_DeltaRMPS1.pdf

Applicable Reference(s):

Delta Regional Monitoring Program Quality Assurance Project Plan for Current Use Pesticides in the Sacramento-San Joaquin Delta Version 1.4, September 28, 2023

Complete the following table regarding the major milestones for the relevant deviation. Add additional rows as needed.

	Date	Notes/Description (optional)
Date Deviation Occurred:	01/24/2024	The 48-hour hold time limit was exceeded for two Event 2 water samples collected on 01/22/2024 for use in 10-day chronic water exposure *Chironomus dilutus* toxicity tests due to late arrival of test organisms as a result of shipping delays.
Date DRMP Program Manager was notified:	01/25/2024	Stephen Clark, Technical Director at Pacific EcoRisk (PER), notified (via email) Melissa Turner (DRMP Technical Program Manager) of a deviation regarding a hold time violation.
Date CVRWQCB QA Representative Notified:	01/25/2024	Stephen Clark (PER) notified Selina Cole (Region 5 QA Representative) of the hold time violation.
Non-Conforming Report sent:	02/13/2024	Non-Conforming Report sent from Stephen Clark (PER) to Melissa Turner.

	Date	Notes/Description (optional)
Non-Conforming Report sent:	04/09/2024	Revised Non-Conforming Report sent from Stephen Clark (PER) to Melissa Turner to reflect correct hold time.
Deviation Form sent for Review:	03/26/2024	Stephen Clark (PER Technical Director)
Deviation Form sent for Review:	04/11/2024	Will Hagan (DRMP QA Officer)
Deviation Form Sent for Signatures:	04/15/2024	

Description of Deviation/Change:

On January 23, 2024, Stephen Clark at PER contacted the Delta Regional Monitoring Program (DRMP) Program Manager, the Central Valley Regional Water Quality Control Board (CVRWQCB) Quality Assurance (QA) Representative, and DRMP Toxicity Identification Evaluation (TIE) Advisory Committee members with an email indicating that an order of *Chironomus dilutus* organisms that were due to arrive for toxicity test initiation on 01/23/2024 had been delayed due to flight mechanical issues during shipping. It was noted that if the organisms did not arrive by the end of day (i.e., 01/23/2024), then testing would be initiated outside of the 48-hr hold time limit for the two samples (511ULCABR and 544LSAC13) collected during Event 2 monitoring on 01/22/2024. (Note: outside of the 36-hr hold limit, but within the maximum of 72 hrs. cited in EPA method manuals for justifications such as shipping delays). Organisms arrived on 01/24/2024 in acceptable condition, and the 10-day toxicity tests were initiated on 01/24/2024 at 13:50, which was outside of the 48-hour holding time limit. 511ULCABR was five hours outside of the 48-hr hold time and 544LSAC13 was 1 hour outside of the 48-hr hold time.

Reason for Deviation/Change

As discussed above, Stephen Clark at PER contacted the DRMP Program Manager, the CVRWQCB QA Representative, and DRMP TIE Advisory Committee members on 01/23/2024 via email indicating that an order of *Chironomus dilutus* organisms were delayed due to a flight mechanical issue which affected overnight shipping. In that email, Stephen Clark asked the DRMP TIE Advisory Committee for guidance on how to proceed given this delay. The potential scenarios for dealing with the delay were as follows: a) organisms arrive on 01/23/2024 and PER initiates testing within the 48-hr holding time limit, or b) organisms do not arrive until 01/24/2024, but hopefully in good health/quality, and at the maximum allowable age of 10-days old. This would result in the testing being initiated outside of the 48-hr holding time limit for DRMP (but within the maximum of 72 hrs cited in the EPA method manuals for justifications such as shipping delays), which would require a non-conforming report from PER. Members of the TIE Advisory Committee and the CVRWQCB QA Representative recommended that the tests proceed even if the organisms did not arrive until 01/24/2024, and, that if that situation occurred, a deviation form would need to be drafted, data would need to be flagged according to the Data Management SOP, and a laboratory report narrative would need to include an explanation of the situation. Subsequently, *Chironomus dilutus* organisms did not arrive by the end of day (i.e., 01/23/2024). Test organisms arrived on 01/24/2024 and were deemed to be of acceptable quality; testing was initiated outside of the 48-hr hold time limit on 01/24/2024 as directed by the TIE Advisory Committee.

Stephen Clark also provided additional background pertaining to PER standard operating procedures (SOPs) and the age at which organisms can be ordered for testing. PER SOPs targets

testing *Chironomus* at 8-10 days old; however, PER will only order organisms at an age of seven days old, due to past occurrences where organisms shipped at an age of six days old experienced high attrition during shipping which contributed to a considerable increase in invalid testing. In this current situation, there was no latitude to order organisms to arrive at PER on Saturday (01/20/2024) and hold them for anticipated testing since they would have been shipped at an age of six days old. Subsequently, organisms were scheduled for overnight shipping and delivery on 01/23/2024, which ended up being delayed until 01/24/2024. It was also noted by PER that it was their preference to rear *Chironomus dilutus* organisms in-house as to avoid shipping related stress and potential impacts on testing, but that is not possible for storm sampling events since there is insufficient advanced notice of sampling.

Impact on Present and Completed Work (discuss potential magnitude of impact and bias of deviation/change, if this can be anticipated, if no impact is expected please indicate this)

The TIE Advisory Committee members agreed that while the interpretation of the results from affected tests may be qualified, the toxicity tests are a useful assessment if toxicity is present in the samples. The discussion amongst TIE Advisory Committee members also indicated that given the current situation/issue, there is an inherent limitation associated with midge toxicity testing (i.e., *Chironomus dilutus*). It was noted that PER is making every effort to run tests according to the Delta RMP Quality Assurance Project Plan (QAPP) and measurement quality objectives (MQOs), but test organism availability at the right age and size appears to be an ongoing challenge. TIE Committee discussions also stressed that the current 2024 water year sampling will complete the first cycle of all regions in the rotating basin monitoring study design, and it is advisable to perform toxicity testing in the current situation as it will provide informative data. Although these organisms were received later than planned, they were within weight requirements and there was no pupation in the two samples. All toxicity tests associated with both of these samples were not toxic.

The laboratory is already doing as much as they can to avoid missing hold times for organisms that are shipped to the laboratory during storm season including effective communication with the samplers, laboratory, vendor, and Project Manager. Shipping delays are not in the control of the laboratory; therefore, PER uses in-house organisms whenever possible to limit situations where shipping delays could result in hold time violations. However, storm sampling events often result in the need for using outside vendor organisms.

Corrective Action	By Date	By Whom
The Tox Test Level QA Code of H will be applied to *Chironomus* tests initiation outside of hold time (samples 511ULCABR and 544LSAC13); a summary result comment will be added indicating how far out of hold time the toxicity testing was.	04/15/2024	Cassandra Lamerdin, DRMP Data Manager

ACKNOWLEDGED BY:

Pacific EcoRisk Technical Director:	DocuSigned by: STEPHEN CLARK C4D43551B2BC478...	Date:	4/18/2024
	Stephen Clark		

Regional Board QA Representative:	DocuSigned by: Selina Cole F3102A0E248746B...	Date:	4/17/2024
	Selina Cole		

DRMP Program Manager:	DocuSigned by: Melissa Turner 9796DD915C44446...	Date:	5/9/2024
	Melissa Turner		

DRMP QA Officer:	DocuSigned by: Will Hagan A4691C48F968433...	Date:	4/17/2024
	Will Hagan		

Evaluation of Non-Conforming Data

1.0 Incident Summary

Date of Incident:	1/23/24	Technical Mistake by PER Staff	
Client & Test Date:	Delta RMP; 1/23/24	Organism Quality	
Species:	*Chironomus dilutus*	Water Quality	
Test:	10d Chronic Toxicity	Solution Preparation	
Test ID:	104353-104354	Feeding/Food Quality	
Project Number:	35355	Organism Handling	
Manager on Duty:	SVV	Technical Experience	
Individuals Involved:		Undetermined	
		Shipping Delay	X

2.0 Evaluation and Cause Analysis

The 48-hr holding time limit for the two samples collected on 1/22/24 for Delta RMP's 10-day chronic water exposure *Chironomus dilutus* toxicity tests was exceeded. An investigation was performed to determine the cause of the deviation.

Organism Quality/Handling/Feeding

It is PER's preference to test samples with *C. dilutus* using egg cases that are reared under our culture conditions to remove shipping related stress and related impacts on testing (e.g., reduced survival/invalid testing, elevated organism t(0) weight, and/or pupation). However, this is not possible for storm sampling events since there is insufficient advanced notice of sampling to order 8-10 days old organisms that are the optimal age for testing in PER's SOP. Furthermore, PER requires that larval shipments be at least 7 days old with the preference to hold them in house for at least a day before testing given a high frequency of invalid testing that occurs when shipping ≤6-day old larvae and when the larvae are not held in house for at least a day to allow for some shipping related attrition prior to test initiation. Given the expected test initiation on 1/23/24 and that organism shipments can't be received on Sunday or Monday to achieve the targeted age for shipping and test initiation, organisms for the 1/23 test initiation had to be shipped overnight.

The samples arrived on the evening of 1/22 and were logged in the morning of 1/23. All tests with species other than *C. dilutus* were initiated within hold time, while the 10-day chronic water exposure *C. dilutus* tests were postponed due to a mechanical issue causing a flight delay; the *C.* dilutus did not arrive until 1/24. Shipping delays are out of the control of PER and Section 8.5.4 of the EPA freshwater chronic method manual specifically addresses this as a possibility by establishing "in no case should more than 72 h elapse between collection and first use of the sample." Although this is in the sample handling section, the same logic applies to delayed organism shipments.

The Delta RMP TIE Subcommittee was notified on 1/23 that the organisms would likely not arrive to allow for test initiation within the holding time limit, and they approved test initiation on 1/24 if the organisms didn't arrive until then and if PER believed that the organisms were of good quality. The Delta RMP TIE Subcommittee requires data qualification for samples tested outside of the holding time limit. The samples arrived on 1/24, organisms were observed to be of acceptable quality, and the testing was initiated as approved by the Subcommittee.

3.0 Corrective Action / Preventative Action

Corrective Action: How will the situation/data be treated if it is encountered again? Who will implement?

The shipping delay and related holding time exceedance were reported to the client. No additional corrective actions was necessary.

Preventative Action: Identify preventative measures that will be implemented. Who will implement?

N/A.

4.0 Monitoring of Corrective Action Effectiveness

30 Days later: There have been no other related issues in the thirty days following this incident.

Incident Open Date: 1/23/24 Incident Close Date: 2/4/24

Prepared By: Kevin Lung Quality Manager's Signature: Kevin Lung

Technical Director: Stephen Clark Technical Director's Signature:

Study Guidance Form

Client:	Delta RMP	Test Date:	1/24/24
Sample Description:	Ambient Water	Test ID #:	-
Species and Test Description:	C. Chironomus	Project #:	35355

Special Instructions:

COLLECT T0 WEIGHTS AND T10 WEIGHTS!!!

Measure and record ammonia at initiation and termination - CONTROL TOO!!
INITIATION AMMONIA CAN BE TRANSCRIBED FROM LOG-INS

WQ Analysts: Please make sure ALL old WQ fields are complete prior to dumping aliquots. Double check any anomalous values with another meter and record on observation sheet as appropriate.

Be sure to feed according to attached feeding sheet

**Aerate any test treatments that measure ≤2.5 mg/L; see SVV if low, but >2.5 mg/L

**At initiation, please have second analyst confirm all test replicates have been loaded with 10 orgs each

Confirmation signoff: SV

Please be very thorough with observations regarding extra organisms found ("hitchhikers"), dead organisms, missing organisms, pupated organisms - the more info the better!

TIE Trigger: ≥50% reduction in survival or growth

Test run at **23°C**

General Guidance:

10 Day Chronic *Chironomus dilutus* Toxicity Test Data

Client: Delta RMP

Test Material: 511ULCABR

Test ID#: 104358 Project #: 35355

Test Date: [illegible]

Organism Log#: [illegible]

Age: [illegible]

Organism Supplier: [illegible]

Control/Diluent: Reformulated EPAMH

Control Water Batch: 356

Treatment	Temp (°C)	pH New	pH Old	D.O. (mg/L) New	D.O. (mg/L) Old	Cond. (µS/cm) New	Cond. (µS/cm) Old	Ammonia (mg/L)	# Live Organisms A	B	C	D	SIGN-OFF
Lab Control	[illegible]	7.82		8.5		312		<1.00	10	10	10	10	Date: [illegible] Sol. Prep: [illegible]
100%	[illegible]	[illegible]		9.5		[illegible]		<1.00	10	10	10	10	Initi. Time: [illegible] Initi. Sign-off: [illegible]
													Sample ID: [illegible]
Meter ID	[illegible]	[illegible]		[illegible]		[illegible]		[illegible]	New WQ: [illegible]				Feed: [illegible]
Lab Control	[illegible]		7.40		6.4		311		10	10	10	10	Date: [illegible] Count Time: [illegible]
100%	[illegible]		7.59		6.9		269		10	10	10	10	Count Signoff: [illegible] Feed: [illegible]
Meter ID	[illegible]		[illegible]		[illegible]		[illegible]				Old WQ: SN		
Lab Control	[illegible]	8.02	7.47	9.0	7.0	310	321		10	12	10	9	Date: [illegible] Sol. Prep: [illegible]
100%	[illegible]	8.20	7.59	9.4	6.4	256	250		8	10	10	10	Maint. Time: 1340 Maint. Signoff: [illegible]
													Sample ID: [illegible]
Meter ID	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	EC12	EC13		New WQ: [illegible]		Old WQ: SN		Feed: [illegible]
Lab Control	[illegible]		7.67		5.2		326		10	12	10	9	Date: [illegible] Count Time: [illegible]
100%	[illegible]		7.71		8.0		279		8	10	10	10	Count Signoff: [illegible] Feed: [illegible]
Meter ID			[illegible]		[illegible]		[illegible]				Old WQ: SN		
Lab Control	23.2	8.01	[illegible]	8.1	[illegible]	327	[illegible]		10	12	10	9	Date: [illegible] Sol. Prep: [illegible]
100%	23.5	7.69	7.78	8.6	[illegible]	253	[illegible]		8	10	10	10	Maint. Time: 1345 Maint. Signoff: KL
													Sample ID: [illegible]
Meter ID	[illegible]	[illegible]	[illegible]	RD15	[illegible]	EC15	[illegible]		New WQ: [illegible]		Old WQ: [illegible]		Feed: KL
Lab Control	[illegible]		7.67		6.5		361		10	12	10	9	Date: [illegible] Count Time: [illegible]
100%	[illegible]		7.69		6.4		293		8	10	10	10	Count Signoff: [illegible] Feed: [illegible]
Meter ID	[illegible]		PH27		RD15		EC15				Old WQ: KF		
Lab Control	[illegible]	7.48	7.37	9.0	[illegible]	243	308		10	12	10	9	Date: [illegible] Sol. Prep: [illegible]
100%	[illegible]	7.41	[illegible]	9.6	6.4	236	241		7	9	10	10	Maint. Time: [illegible] Maint. Signoff: [illegible]
													Sample ID: [illegible]
Meter ID	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		New WQ: [illegible]		Old WQ: [illegible]		Feed: [illegible]
Lab Control	23.4		7.44		6.8		294		10	12	10	9	Date: [illegible] Count Time: [illegible]
100%	23.4		7.66		6.7		251		7	9	10	10	Count Signoff: [illegible] Feed: [illegible]
Meter ID	[illegible]		[illegible]		[illegible]		[illegible]				Old WQ: [illegible]		
Lab Control	[illegible]	7.93	7.33	8.6	5.8	308	314		10	12	10	9	Date: [illegible] Sol. Prep: [illegible]
100%	23.2	7.65	7.60	9.1	6.4	230	249		*	*	*	*	Maint. Time: [illegible] Maint. Signoff: TK
													Sample ID: [illegible]
Meter ID	[illegible]	OH29	PH27	RD10	RD15	EC12	EC14		New WQ: NB		Old WQ: [illegible]		Feed: TK
Lab Control			7.25		7.0		303		10	12	10	9	Date: [illegible] Count Time: [illegible]
100%	[illegible]		7.49		6.4		251		*	*	*	*	Count Signoff: [illegible] Feed: [illegible]
Meter ID	[illegible]		PH29		RD15		EC15				Old WQ: [illegible]		
Lab Control	[illegible]		[illegible]		[illegible]		361	1.07	10	12	10	9	Date: [illegible] Term Time: [illegible]
100%	[illegible]		7.76		8.1		266	<1.00	7	10	13	11	Term Signoff: [illegible]
Meter ID	[illegible]		[illegible]		[illegible]		EC5	[illegible]			Old WQ: [illegible]		

10 Day Chronic *Chironomus dilutus* Toxicity Test Data

Client: Delta RMP
Test Material: 544LSAC13
Test ID#: 104359 Project #: 35355
Test Date: 1/24/24
Organism Log#: 12139
Age: 10 days
Organism Supplier: ABS
Control/Diluent: Reformulated EPAMH
Control Water Batch: 356

Treatment	Temp (°C)	pH New	pH Old	D.O. (mg/L) New	D.O. (mg/L) Old	Cond. (µS/cm) New	Cond. (µS/cm) Old	Ammonia (mg/L)	# Live Organisms A	# Live Organisms B	# Live Organisms C	# Live Organisms D	SIGN-OFF
Lab Control	22.5	7.52		8.5		312		0.500	10	12	10	10	Date: 1/24/24; Sol. Prep: [illegible]
100%	22.8	[illegible]		8.4		[illegible]		2.00	10	10	10	10	Initi. Time: 1350; Initi. Sign-off: [illegible]
													Sample ID: 64785
Meter ID	[illegible]	[illegible]		[illegible]		[illegible]		[illegible]	New WQ: SV				Feed: [illegible]
Lab Control	[illegible]		7.40		6.4		311		10	10	10	10	Date: [illegible]; Count Time: [illegible]
100%	[illegible]		7.52		5.5		664		10	10	10	10	Count Signoff: [illegible]; Feed: [illegible]
Meter ID	[illegible]		pH27		RD15		EC13				Old WQ: SN		
Lab Control	23.0	7.03	7.47	9.0	7.0	310	321		10	12	10	9	Date: 1/25/24; Sol. Prep: [illegible]
100%	23.2	7.82	7.57	9.8	6.2	665	674		10	11	10	10	Maint. Time: [illegible]; Maint. Signoff: [illegible]
													Sample ID: 64785
Meter ID	170A	pH29	pH27	RD15	RD15	EC12	EC13		New WQ: [illegible]		Old WQ: SN		Feed: [illegible]
Lab Control	[illegible]		7.62		8.2		376		[illegible]	[illegible]	[illegible]	[illegible]	Date: [illegible]; Count Time: [illegible]
100%	[illegible]		7.75		7.9		678		10	[illegible]	10	10	Count Signoff: [illegible]; Feed: [illegible]
Meter ID	[illegible]		pH26		RD13		EC13				Old WQ: SN		
Lab Control	23.0	8.01	7.12	8.1	6.5	327	356		10	12	10	9	Date: 1/28/24; Sol. Prep: TK
100%	23.6	7.79	7.78	9.1	6.2	662	695		10	11	10	10	Maint. Time: 1345; Maint. Signoff: KL
													Sample ID: 64785
Meter ID	170A	[illegible]	[illegible]	RD15	[illegible]	EC15	[illegible]		New WQ: [illegible]		Old WQ: [illegible]		Feed: KL
Lab Control	23.7		7.27		2.5		361		10	12	10	9	Date: 1/29/24; Count Time: [illegible]
100%	23.5		7.69		7.2		679		10	11	10	11	Count Signoff: [illegible]; Feed: [illegible]
Meter ID	[illegible]		pH27		RD15		EC15				Old WQ: [illegible]		
Lab Control	23.2	7.46	7.27	9.0	6.2	293	302		10	12	10	9	Date: 1/30/24; Sol. Prep: [illegible]
100%	23.2	7.22	7.50	9.2	6.7	632	641		10	[illegible]	10	[illegible]	Maint. Time: [illegible]; Maint. Signoff: [illegible]
													Sample ID: 64785
Meter ID	[illegible]	[illegible]	[illegible]	RD10	[illegible]	EC12	[illegible]		New WQ: EG		Old WQ: [illegible]		Feed: [illegible]
Lab Control	23.0		7.44		6.8		249		10	12	10	9	Date: 1/31/24; Count Time: [illegible]
100%	23.3		7.60		7.1		644		10	11	10	11	Count Signoff: TK; Feed: TK
Meter ID	170A		pH27		RD15		EC14				Old WQ: [illegible]		
Lab Control	23.1	7.93	7.33	8.6	5.8	308	314		10	12	10	9	Date: 2/1/24; Sol. Prep: TK
100%	23.2	7.60	7.64	9.9	6.6	639	657		10	11	10	11	Maint. Time: 1515; Maint. Signoff: TK
													Sample ID: 64785
Meter ID	170A	pH29	pH27	RD10	RD15	EC12	EC14		New WQ: NB		Old WQ: AC		Feed: TK
Lab Control	[illegible]		7.25		7.0		303		10	12	10	9	Date: 2/2/24; Count Time: 0730
100%	[illegible]		7.61		6.3		649		10	11	10	11	Count Signoff: TK; Feed: TK
Meter ID	[illegible]		pH29		RD15		EC15				Old WQ: MM		
Lab Control	23		7.54		7.4		361	1.07	10	12	10	9	Date: 2/3/24; Term Time: [illegible]
100%	23.0		7.74		5.3		662	<1.00	10	11	10	12	Term Signoff: [illegible]
Meter ID	[illegible]		pH29		[illegible]		EC15	[illegible]			Old WQ: [illegible]		

10 Day Acute *Chironomus dilutus* Toxicity Test Data

Client: **Delta RMP** Project#: **35355** Batch #:

Small Flake Food Daily Preparation				
Day	Date	Tetramin (g)	Deionized Water (mL)	Sign-off
0	1/23/24	.600	100 ml	IK
1	1/25/24	.600	100ml	TL
2	1/26/24	.15	25 mL	
3	1/27/24	0.300	50 mL	SY
4	1/28/24	0.300	50ml	IKL
5	1/29/24	0.300	50 mL	IKL
6	1/30/24	0.300	50 mL	TL
7	1/31/24	0.300	50 mL	TK
8	2/1/24	0.300g	50 ml	TK
9	2/2/24	0.300	50 ml	TK

Mix 150 mg small flakes (powder, #50 sieved) in 25 mL Type I water daily to make a 6 mg/mL slurry.

Feeding Regime (recommended):
Days 0 - 3: 2mg Fish Food Flakes (0.4 mL of 6 mg/mL slurry)
Days 4 - 6: 4mg Fish Food Flakes (0.7 mL of 6 mg/mL slurry)
Days 7 - 9: 6mg Fish Food Flakes (1 mL of 6 mg/mL slurry)

Comments and Observations

Client: ARMP
Sample Description: Ambient Water
Species and Test Description: C. [illegible]
Test Date: 1/24/24
Test ID #:
Project #: 55255

Date	Initials	Description of Observation:
1/26/24	SJ	• Tx LWC-B x 10 counts confirmed by ASL. Nobody found in LWC-D.
		• [illegible] dead bodies in Tx [illegible]ABR-A, empty casings present.
		• Tx LSAL-B # organisms confirmed by SVV
1/28/24	CA	[illegible]
[illegible]	[illegible]	Cond. Count for 544LSAL [illegible] [illegible]
2/1/24	TK	Sand has become too dark to see tubes

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.

Deviation From Protocol

Client: △RMP
Test Date: 1/22/24
Sample Description: Control 1
Test ID #:
Species and Test Description: Chiron
Project #: 35355

Date	Initials	Description of Deviation
1/24/24	JC	Greater than 3° D in temperature from culture to loading

General Guidance:

1) All deviations from test protocol 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 deviation, your initials, the treatment affected, and the test replicate affected for each entry.
4) Record deviations in brief sentences. It is VERY IMPORTANT to also record the corrective action taken to address the deviation.
5) Leave a blank line between entries.

Typical deviations that should be recorded: modifying the test design or nuimber of replicates, organisms not transferred during renewal of solutions, using organisms outside of acceptable age range, or any test conditions that are outside of what the protocol requires.

Example: 8/26/08 AB Old chem DO of 100% effluent = 4.0 mg/L, started aeration of test at 17:00.

Test Organism Log-in

Organism Log #: **14139**

Total # of Orgs: 770

Date Received: 1/24/24

Age/Hatch Date: 1/14/2024 /

Species: Chironomus dil

Initial Mortality: 0

Source: ABS

Culture Water: Reborn EPRMM

Initial Observations upon Reciept:

Temp. (°C)	D.O. (mg/L)	Salinity (ppt) or Cond. (µS/cm)	Observation of Organism Health	Sign-off
17.2	17.4	376	good	DP
Meter ID: 66A	Meter ID: RDO	Meter ID: EC14		

Shipped Dry? Yes (No)

Husbandry Log Established? (Yes) No

Inform Lab Manager if organisms recieved are *Chironomus dilutus* Egg Cases, *Pimephales promelas* (FHM) Embryos, *Atherinops affinis* (Topsmelt), or Abalone Were they informed? Yes No (N/A)

If organisms split into multiple husbandry bins, how many? _____

Supplier information sheet must be attached to this sheet!

General Comments:

Test Organism Husbandry Log

Organism Log #: 14139 Total # of Orgs: 770 Initial Mortality: 0

Date Received: 1/24/24 Age/Hatch Date: 10d 1/14/24 / /

Species: Chironomus dil Culture Water: Reform. EPAMH

Source: ABS Test Type: A C Temp Adj?: (Y) N

Client Name: Term Date: 1/25

Instructions/Comments:

Temp Adj		
Init.	Date	Temp
	1/25/24	23°

Date	Time	Temp (°C)	D.O. (mg/L)	Sal (ppt) or Cond (µS/cm)	Feeding AM	Feeding Noon	Feeding PM	Mort.	Observations of Organism Health	Water Δ?	Sign-off
1/24/24	1100	17.2 Meter ID: 66A	17.4 Meter ID: RD10	376 Meter ID: EC14			JT	0	Good	N	AF
TERM 1/25/24	1518	19.6 Meter ID: 135A	6.8 Meter ID: RD13	375 Meter ID: EC15	JT			0	good	N	EG
		Meter ID:	Meter ID:	Meter ID:							
		Meter ID:	Meter ID:	Meter ID:							
		Meter ID:	Meter ID:	Meter ID:							
		Meter ID:	Meter ID:	Meter ID:							
		Meter ID:	Meter ID:	Meter ID:							
		Meter ID:	Meter ID:	Meter ID:							
		Meter ID:	Meter ID:	Meter ID:							
		Meter ID:	Meter ID:	Meter ID:							
		Meter ID:	Meter ID:	Meter ID:							
		Meter ID:	Meter ID:	Meter ID:							
		Meter ID:	Meter ID:	Meter ID:							
		Meter ID:	Meter ID:	Meter ID:							

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

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

ORGANISM HISTORY

DATE: 1/22/2024

SPECIES: *Chironomus dilutus (formerly C. tentans)*

AGE: Deposited 1/14/2024

LIFE STAGE: Second Instar 1/23/2024

HATCH DATE: Emergent 2/4/2024

BEGAN FEEDING: Immediately

FOOD: *Raphidocelis subcapitata.**, Flake slurry

Water Chemistry Record:	**Current**	**Range**
TEMPERATURE:	23°C	22-25°C
SALINITY/CONDUCTIVITY:	--	--
TOTAL HARDNESS (as $CaCO_3$):	118 mg/l	100-190 mg/l
TOTAL ALKALINITY (as $CaCO_3$):	75 mg/l	50-100 mg/l
pH:	8.13	7.70-8.30

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

Facility Supervisor

Deviation Report / Corrective Action Form

Title:	**CUP Event 2 (WY24) USGS Missed Turbidity on Sampling Day 1**
Deviation Number:	2023-10_CUPv1.4_Dev_WY24Event2_USGS_MissingTurbidityDay1
Prepared By:	Cassandra Lamerdin
Attached:	NA

Applicable Reference(s):

Delta Regional Monitoring Program Quality Assurance Project Plan for Current Use Pesticides in the Sacramento-San Joaquin Delta Version 1.4, September 28, 2023

Complete the following table regarding the major milestones for the relevant deviation. Add additional rows as needed.

	Date	Notes/Description (optional)
Date Deviation Occurred:	01/29/2024	Matt Uychutin (Field Crew, USGS) informed Cassandra Lamerdin (DRMP Data Manager) via email that there were no field turbidity results collected for the CUP WY 2024 Event 2, Day 1, sampling which occurred on 1/22/2024.
Date DRMP Program Manager was notified:	01/31/2024	Cassandra Lamerdin notified (via email) Melissa Turner (DRMP Program Manager) of a deviation regarding missed turbidity results on Day 1.

	Date	Notes/Description (optional)
Date CVRWQCB QA Representative Notified:	01/31/2024	Cassandra Lamerdin notified (via email) Selina Cole (Region 5 QA Representative) of a deviation regarding missed turbidity results on Day 1.
Deviation Form sent for Review:	04/9/2024	Jim Orlando (USGS Project Manager)
Deviation Form sent for Review:	04/11/2024	Will Hagan (DRMP QA Officer)
Deviation Form Sent for Signatures:	04/15/2024	Originally sent for signatures
Approval Letter Received from CVRWQCB:	10/25/2024	The Central Valley Regional Water Quality Control Board's QA Representative position is currently vacant; however, Regional Board staff have reviewed the submitted QAPP Deviations Form and find the corrective actions sufficient. Regional Board approval was provided by Patrick Pulupa (CVRWQCB Executive Officer) for six CUP deviations including this one. The approval letter was sent to Debbie Mackey (DRMP President) on October 25, 2024.
Deviation Form Sent for Signatures post approval	11/21/2024	

Description of Deviation/Change:

On January 31, 2024, Matt Uychutin from United States Geological Survey Organic Chemistry Research Laboratory (USGS-OCRL) informed the Delta Regional Monitoring Program (DRMP) Data Manager via email indicating that turbidity was not able to be measured in the field from two targeted sites (511ULCABR & 544LSAC13) during Event 2 (Day 1, January 22, 2024).

Reason for Deviation/Change

This deviation occurred due to a turbidity probe failure of instrument YSI EXO Multiparameter Sonde (YSI EXO1). The turbidity met calibration specifications the morning of sampling, but because of the timing of this event being part of storm sampling once the turbidity probe failed, there were no other spare instruments available that day. The probe was exchanged with a working sensor in time for Day 2 sampling on January 23, 2024.

Impact on Present and Completed Work (discuss potential magnitude of impact and bias of deviation/change, if this can be anticipated, if no impact is expected please indicate this)

There is minimal impact expected on missing two turbidity results. Overall, the project will still meet its completeness goal of 90%. Field equipment is maintained by USGS according to the requirements outlined in the CUP QAPP. Since this was an unforeseen probe failure, there are minimal corrective actions.

Corrective Action	By Date	By Whom
Results for turbidity were flagged with a QA Code of FIF [Instrument/Probe Failure]	02/15/2024	Cassandra Lamerdin, DRMP Data Manager
The field crew will look into having a backup instrument if available for future non-storm sampling events.	Future Non-Storm Events	Jim Orlando USGS Project Manager

ACKNOWLEDGED BY:

USGS Project Manager:	Signed by: Jim Orlando B4DDF22E261F427...	Date:	11/25/2024
	Jim Orlando		

DRMP Program Manager:	DocuSigned by: Melissa Turner 9796DD915C44446...	Date:	11/26/2024
	Melissa Turner		

DRMP QA Officer:	DocuSigned by: Will Hagan A4091C48F908433...	Date:	11/25/2024
	Will Hagan		

CVRWQCB QA Representative*:	**Not Applicable**	Date:	10/25/2024
	Vacant		

*While these QAPP Deviation Forms will remain unsigned by the Central Valley Water Board due to the vacant QA Representative position, the current form is approved based on CVRWQCB staff scientist review and approval by the Central Valley Regional Water Quality Control Board Executive Officer Patrick Pulupa.

Deviation Report / Corrective Action Form

Title:	**CUP Event 2 (WY24) *Chironomus* larvae initial weights greater than 0.012 mg/ individual AFDW**
Deviation Number:	2023-11_CUPv1.4_Dev_WY24Event2_PER_Chironomus_InitialWeights
Prepared By:	Robert Pangle
Attached:	2023-11_CUPv1.4_Dev_WY24Event2_PER_ChironomusT0Weights_S2_Revised.pdf

Applicable Reference(s):

Delta Regional Monitoring Program Quality Assurance Project Plan for Current Use Pesticides in the Sacramento-San Joaquin Delta Version 1.4, September 28, 2023

Complete the following table regarding the major milestones for the relevant deviation. Add additional rows as needed.

	Date	Notes/Description (optional)
Date Deviation Occurred:	01/24/2024	Upon completion of the drying process, the initial Ash-Free Dry Weight (AFDW) was recorded for *Chironomus dilutus* larvae in Control Batch #2. The larvae exceeded the measurement quality objective (MQO) of ≤0.12 mg/individual AFDW for t(0) weights.
Date DRMP Program Manager was notified:	02/02/2024	Stephen Clark, Technical Director at Pacific EcoRisk (PER), notified (via email) Melissa Turner (DRMP Technical Program Manager) of a deviation regarding *C. dilutus* testing that was initiated with organisms above the MQO of ≤0.12 mg/individual AFDW .

	Date	Notes/Description (optional)
Date CVRWQCB QA Representative Notified:	02/02/2024	Stephen Clark (PER) notified Selina Cole (Region 5 QA Representative) of the non-conformance of mean initial (t(0)) weights via email.
Non-conforming Report sent:	02/15/2024	Initial Non-Conforming Report (NCR) sent from Stephen Clark (PER) to MLJ.
Non-conforming Report sent:	03/08/2024	Two revised Non-Conforming Reports were sent from Stephen Clark (PER) to account for control reporting errors in the initial and first revised NCRs.
Deviation Form sent for Review:	03/26/2024	Stephen Clark (PER Technical Director)
Deviation Form sent for Review:	4/11/2024	Will Hagan (DRMP QA Officer)
Deviation Form Sent for Signatures:	4/29/2024	Originally sent for signatures
Approval Letter Received from CVRWQCB:	10/25/2024	The Central Valley Regional Water Quality Control Board's QA Representative position is currently vacant; however, Regional Board staff have reviewed the submitted QAPP Deviations Form and find the corrective actions sufficient. Regional Board approval was provided by Patrick Pulupa (CVRWQCB Executive Officer) for six CUP deviations including this one. The approval letter was sent to Debbie Mackey (DRMP President) on October 25, 2024.
Deviation Form Sent for Signatures post approval:	11/21/2024	

Description of Deviation/Change:

PER discovered that the t(0) weights of *Chironomus dilutus* were greater than the Surface Water Ambient Monitoring Program (SWAMP) Measurement Quality Objective (MQO) of ≤0.12 mg/individual AFDW for one of two control batches associated with Event 2 sampling. Two control batch tests were initiated on 01/24/2024 (Control Batch 1 and Control Batch 2). The first batch (Control Batch 1) had a mean AFDW of 0.09 mg/individual and the second batch (Control Batch 2) a mean of 0.19 mg/individual at time t(0). Control Batch 2 included two organisms which pupated from samples collected on 01/23/2024 from sites CONF-005 and CONF-006; Control Batch 1 did not have any pupating organisms.

Reason for Deviation/Change

As noted in the non-conforming report attached to this deviation form, *C. dilutus* organisms were all received as 10-day old larvae on 01/24/2024 (both control batches) from Aquatic

Biosystems, Inc. Test initiation occurring on 01/24/2024. Although the organisms were of the correct age for this method and test, Control Batch #2 had a greater AFDW than allowed by the SWAMP MQO. Due to the storm-driven nature of monitoring for Event 2, egg cases could not be reared in house, so the organisms were received as larvae from the vendor and were of the correct age for testing. An investigation was performed to determine the cause of the increased weight of the organisms including a) an assessment of test conditions, b) feeding rates, and c) water quality. The investigation did not identify any additional contributing factors to the organisms not meeting the AFDW <0.12 mg/individual. It was noted that historically larvae ordered from Aquatic Biosystems, Inc. have a greater likelihood of initial weights above the 0.12 mg/individual threshold compared to organisms reared in-house from egg casings by PER staff. Although the organisms were of the correct age for this method and received in good condition with acceptable water quality parameters, it is likely that robust organism quality is the most probable cause of the greater organism weight.

Impact on Present and Completed Work (discuss potential magnitude of impact and bias of deviation/change, if this can be anticipated, if no impact is expected please indicate this)

The SWAMP MQO of AFDW ≤0.12 mg/individual is presumably targeted to reduce the likelihood of pupation/hatching during the 10-day test. No pupation or hatching occurred in Control Batch #1, which had a mean organism AFDW of 0.09 mg/individual. The organism AFDW in Control Batch 2 was 0.19 mg/individual, and two organisms pupated during testing in Control Batch #2. Pupation occurred in tests performed on samples collected from stations CONF-005 (Replicate B), and CONF-006 (Replicate A). Pupated organisms were excluded from both the survival and growth endpoint statistical analyses and data were flagged per the Data Management Standard Operating Procedure (v2.4). Neither sample was toxic to *Chironomus*; it is expected that the omission of one organism in one replicate had minimal to no impact on the statistical analysis to determine toxicity for these two samples.

Corrective Action	By Date	By Whom
The Tox Test Level QA Code of TAF [Test organisms exceed the maximum weight requirement at test initiation] will be applied to the samples for Control Batch #2.	04/15/2024	Cassandra Lamerdin, DRMP Data Manager
The Tox Test Level QA Code of TMO [Test organisms escaped or are otherwise missing] will be applied to the effected samples in Control Batch #2 that had pupation.	Prior to Electronic Data Deliverable Submission to MLJ data management team	Stephen Clark, Pacific EcoRisk Technical Director
Add a Tox Result Comment to the replicate records that had pupation: "1 organism pupated; 9 organisms used in statistics".	Prior to Electronic Data Deliverable Submission to MLJ data management team	Stephen Clark, Pacific EcoRisk Technical Director
PER needs 2.5 weeks advance notice for remaining CUP non-storm sampling events to allow for rearing of egg cases in-house. The Program Manager will help coordinate communication between the sampling team and PER for non-storm events that can be scheduled in advance to provide advance notice.	Prior to WY24 Events 3-6	Melissa Turner, DRMP Program Manager

ACKNOWLEDGED BY:

Pacific EcoRisk Technical Director:	DocuSigned by: Stephan Clark C4D43551B2BC478...	Date:	11/25/2024
	Stephen Clark		

DRMP Program Manager:	DocuSigned by: Melissa Turner 9796DD915C44448...	Date:	11/26/2024
	Melissa Turner		

DRMP QA Officer:	DocuSigned by: Will Hagan A4691C48F968433...	Date:	11/25/2024
	Will Hagan		

CVRWQCB QA Representative*:	**Not Applicable**	Date:	10/25/2024
	Vacant		

*While these QAPP Deviation Forms will remain unsigned by the Central Valley Water Board due to the vacant QA Representative position, the current form is approved based on CVRWQCB staff scientist review and approval by the Central Valley Regional Water Quality Control Board Executive Officer Patrick Pulupa.

Evaluation of Non-Conforming Data

1.0 Incident Summary

Date of Incident:	1/24/24	Technical Mistake by PER Staff	
Client & Test Date:	Delta RMP; 1/24/24	Organism Quality	X
Species:	*Chironomus dilutus*	Water Quality	
Test:	10d Chronic Toxicity	Solution Preparation	
Test ID:	104360-104365	Feeding/Food Quality	
Project Number:	35355	Organism Handling	
Manager on Duty:	SVV	Technical Experience	
Individuals Involved:		Undetermined	

2.0 Evaluation and Cause Analysis

The final *Chironomus dilutus* ash free dry weight of 0.19 mg/individual recorded on 1/24 for Delta RMP's 10-day chronic water exposure Control 2 toxicity test batch was not ≤ 0.12 mg/individual as required by the SWAMP MQO. An investigation was performed to determine the cause of the increased weight of the organisms used for test initiation.

Organism Quality/Handling/Feeding

Two tests were initiated on 1/24: Control 1 using organism batch #14139, and Control 2 using organism batch #14143, which were both received as 10-day old larvae on 1/24 from Aquatic BioSystems, Inc., PER's primary provider. The larvae were received in good condition at arrival with acceptable water quality parameters. The organisms used to initiate Control 1 were schedule to arrive on 1/23 but did not arrive until 1/24 due to an airline mechanical issue. The organisms used to initiate Control 2 were from a separate batch of organisms that arrived on 1/24 as scheduled. The Control 1 organisms that had an extra day in shipping had a t(0) ash free dry weight of 0.09 mg/individual met the acceptable weight criteria of the SWAMP MQO, while the Control 2 organisms that had no shipping issues exceeded the SWAMP MQO with a t(0) ash free dry weight of 0.19 mg/individual. It is strange that organisms from different hatch dates but of the same age were of such different weights at t(0). Due to the storm-driven sampling not permitting ordering egg cases to hatch to 8-days old for testing, larvae had to be ordered for this testing. Historically, larvae ordered from ABS have a greater likelihood of having a weight >0.12 mg/individual than organisms reared from an egg case by PER staff. Although the organisms were of the correct age for this method, they simply had a greater ash free dry weight listed as the SWAMP MQO, so organism quality is the most likely cause of the greater organism weight. It is important to note that the lower weight is presumably targeted to reduce pupation/hatching during the 10-day test; two pupae were recorded in samples associated with Control 2, while no pupae were recorded for samples associated with Control 1.

Other Factors

An investigation was performed on other factors that could have impacted testing including test conditions, feeding, and water quality. The investigation did not identify additional contributing factors to the organisms not meeting the ash free dry weight limit of ≤ 0.12 mg/individual.

3.0 Corrective Action / Preventative Action

Corrective Action: How will the situation/data be treated if it is encountered again? Who will implement?

The results were reported to the client and no retest was scheduled; therefore, no corrective actions are necessary at this time.

Preventative Action: Identify preventative measures that will be implemented. Who will implement?

N/A.

4.0 Monitoring of Corrective Action Effectiveness

30 Days later: There have been no other related issues in the thirty days following this incident.

Incident Open Date: 1/24/24 Incident Close Date: 2/24/24

Prepared By: Kevin Lung Quality Manager's Signature: Kevin Lung

Technical Director: Stephen Clark Technical Director's Signature:

Control 1 - Initiate 1/23/24 **T0 weights**

Pan ID	Initial Ashed Pan Wt (mg)	Dry Pan + Larvae Wt (mg)	Ashed Pan + Larvae Wt (mg)	# Live Organisms (Larvae)	Mean Dry Weight (mg)	Mean Ash Free Dry Wt (mg)
1	93.27	94.43	93.48	10	0.12	0.10
2	94.44	95.33	94.57	10	0.09	0.08
3	111.05	112.3	111.37	10	0.13	0.09
4	99.43	100.45	99.64	10	0.10	0.08
				Mean =	0.11	0.09

Control 2 - Initiated 1/24/24 **T0 weights**

Pan ID	Initial Ashed Pan Wt (mg)	Dry Pan + Larvae Wt (mg)	Ashed Pan + Larvae Wt (mg)	# Live Organisms (Larvae)	Mean Dry Weight (mg)	Mean Ash Free Dry Wt (mg)
1	99.1	101.14	99.42	10	0.20	0.17
2	100.73	103.21	101.3	10	0.25	0.19
3	98.77	100.67	99.11	10	0.19	0.16
4	110.47	113.18	110.79	10	0.27	0.24
				Mean =	0.23	0.19

1300 Blue Spruce Drive, Suite C
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Toll Free: 800/331-5916
Tel:970/484-5091 Fax:970/484-2514

ORGANISM HISTORY

DATE: 1/22/2024

SPECIES: *Chironomus dilutus (formerly C. tentans)*

AGE: Deposited 1/14/2024

LIFE STAGE: Second Instar 1/23/2024

HATCH DATE: Emergent 2/4/2024

BEGAN FEEDING: Immediately

FOOD: *Raphidocelis subcapitata.**, Flake slurry

Water Chemistry Record:	Current	Range
TEMPERATURE:	23°C	22-25°C
SALINITY/CONDUCTIVITY:	--	--
TOTAL HARDNESS (as $CaCO_3$):	118 mg/l	100-190 mg/l
TOTAL ALKALINITY (as $CaCO_3$):	75 mg/l	50-100 mg/l
pH:	8.13	7.70-8.30

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

Facility Supervisor

Test Organism Log-in

Organism Log #: **14139**

Date Received: 1/24/24

Species: Chironomus dil

Source: ABS

Total # of Orgs: 770

Age/Hatch Date: 1/14/2024 1

Initial Mortality: 0

Culture Water: Reform EPRMM

Initial Observations upon Reciept:

Temp. (°C)	D.O. (mg/L)	Salinity (ppt) or Cond. (µS/cm)	Observation of Organism Health	Sign-off
17.2	17.4	376	good	AP
Meter ID: 661	Meter ID: RDO	Meter ID: EC14		

Shipped Dry? Yes (No)

Husbandry Log Established? (Yes) No

Inform Lab Manager if organisms recieved are *Chironomus dilutus* Egg Cases, *Pimephales promelas* (FHM) Embryos, *Atherinops affinis* (Topsmelt), or Abalone Were they informed? Yes No (N/A)

If organisms split into multiple husbandry bins, how many? _____

Supplier information sheet must be attached to this sheet!

General Comments:

Test Organism Husbandry Log

Organism Log #: 14139 Total # of Orgs: 770 Initial Mortality: 0

Date Received: 1/24/24 Age/Hatch Date: 1/14/24

Species: Chironomus dil Culture Water: Reform. EPAMH

Source: ABS Test Type: A C Temp Adj?: (Y) N

Client Name: Term Date: 1/25

Instructions/Comments:

Temp Adj		
Init.	Date	Temp
	1/25/24	23°

Date	Time	Temp (°C)	D.O. (mg/L)	Sal (ppt) or Cond (µS/cm)	Feeding AM	Feeding Noon	Feeding PM	Mort.	Observations of Organism Health	Water Δ?	Sign-off
1/24/24	1100	17.2 Meter ID: 66A	17.4 Meter ID: RDIO	376 Meter ID: EC14			[initials]	0	Good	N	[initials]
TERM [illegible]	[illegible]	[illegible] Meter ID: [illegible]	[illegible] Meter ID: RDB	[illegible] Meter ID: EC15	[initials]			0	good	N	[initials]
		Meter ID:	Meter ID:	Meter ID:							
		Meter ID:	Meter ID:	Meter ID:							
		Meter ID:	Meter ID:	Meter ID:							
		Meter ID:	Meter ID:	Meter ID:							
		Meter ID:	Meter ID:	Meter ID:							
		Meter ID:	Meter ID:	Meter ID:							
		Meter ID:	Meter ID:	Meter ID:							
		Meter ID:	Meter ID:	Meter ID:							
		Meter ID:	Meter ID:	Meter ID:							
		Meter ID:	Meter ID:	Meter ID:							
		Meter ID:	Meter ID:	Meter ID:							
		Meter ID:	Meter ID:	Meter ID:							

10 Day Chronic *Chironomus dilutus* Toxicity Test Data

Client: Delta RMP
Test Material: 511ULCABR
Test ID#: 104358 Project #: 35355
Test Date:

Organism Log#: 14139 Age: 10 days
Organism Supplier: ABS
Control/Diluent: Reformulated EPAMH
Control Water Batch: 356

Treatment	Temp (°C)	pH New	pH Old	D.O. (mg/L) New	D.O. (mg/L) Old	Cond. (µS/cm) New	Cond. (µS/cm) Old	Ammonia (mg/L)	# Live Organisms A	B	C	D	SIGN-OFF
Lab Control		7.52		8.5		312		<1.00	10	10	10	10	Date: 11/24/24 Sol. Prep: Initi. Time: Initl. Sign-off: Sample ID: Feed:
100%				9.5		266		1.00	10	10	10	10	
Meter ID								7.33	New WQ:		Old WQ:		
Lab Control			7.40		6.4		311		10	10	10	10	Date: Count Time: Count Signoff: Feed:
100%			7.59		6.9		269		10	10	10	10	
Meter ID											Old WQ:		
Lab Control		8.02	7.47	9.0	7.0	310	321		10	12	10	9	Date: Sol. Prep: Maint. Time: Maint. Signoff: Sample ID: Feed:
100%		7.80	7.59	9.9	6.4	256	250		8	10	10	10	
Meter ID									New WQ:		Old WQ:		
Lab Control			7.67		8.2		326		10	12	10	9	Date: Count Time: Count Signoff: Feed:
100%			7.71		8.0		279		8	10	10	10	
Meter ID											Old WQ:		
Lab Control		8.01	7.72	8.1		327			10	12	10	9	Date: Sol. Prep: Maint. Time: Maint. Signoff: Sample ID: Feed:
100%		7.69	7.75	8.6		253			8	10	10	10	
Meter ID									New WQ:		Old WQ:		
Lab Control			7.67		6.5		361		10	12	10	9	Date: Count Time: Count Signoff: Feed:
100%			7.69		6.4		293		8	10	10	10	
Meter ID											Old WQ:		
Lab Control		7.42	7.24	9.0		293			10	12	10	9	Date: Sol. Prep: Maint. Time: Maint. Signoff: Sample ID: Feed:
100%		7.21		9.6		236			7	9	10	10	
Meter ID									New WQ:		Old WQ:		
Lab Control			7.44		6.8		294		10	12	10	9	Date: Count Time: Count Signoff: Feed:
100%			7.66		6.7		251		7	9	10	10	
Meter ID											Old WQ:		
Lab Control		7.93	7.33	8.6	5.8	308	314		10	12	10	9	Date: 11/24 Sol. Prep: Maint. Time: Maint. Signoff: Sample ID: Feed:
100%		7.65	7.60	9.1	6.4	230	249		*	*	*	*	
Meter ID		PH29		EC10	EC15	EC12	EC14		New WQ: NB		Old WQ:		
Lab Control			7.25		7.0		303						Date: Count Time: Count Signoff: Feed:
100%			7.49		6.4		251		*	*	*	*	
Meter ID			PH29		EC15		EC15				Old WQ:		
Lab Control							361	1.07	10	12	10	9	Date: 12/1/24 Term Time: Term Signoff:
100%			7.16						7	10	13	11	
Meter ID											Old WQ:		

10 Day Chronic *Chironomus dilutus* Toxicity Test Data

Client: Delta RMP
Test Material: 544LSAC13
Test ID#: 104359 Project #: 35355
Test Date: 12-6-12-24

Organism Log#: 24139 Age: 10 days
Organism Supplier: EBS
Control/Diluent: Reformulated EPAMH
Control Water Batch: 356

Treatment	Temp (°C)	pH New	pH Old	D.O. (mg/L) New	D.O. (mg/L) Old	Cond. (µS/cm) New	Cond. (µS/cm) Old	Ammonia (mg/L)	# Live Organisms A	B	C	D	SIGN-OFF
Lab Control													Date: 12-7-24
													Sol. Prep:
100%													Initi. Time:
													Initi. Sign-off:
													Sample ID:
Meter ID									New WQ:				Feed:
Lab Control			7.40		6.4		311		10	10	10	10	Date: 12-16-24
													Count Time:
100%			7.52		5.5		664		10	10	10	10	Count Signoff:
													Feed:
Meter ID											Old WQ:		
Lab Control									10	12	10	9	Date:
													Sol. Prep:
100%									10	11	10	10	Maint. Time:
													Maint. Signoff:
													Sample ID:
Meter ID									New WQ:		Old WQ:		Feed:
Lab Control			7.62		5.2		376		10	12	10	9	Date:
													Count Time:
100%			7.75		7.9		678		10	11	10	10	Count Signoff:
													Feed:
Meter ID											Old WQ:		
Lab Control									10	12	10	9	Date:
													Sol. Prep:
100%									10	11	10	10	Maint. Time:
													Maint. Signoff:
													Sample ID:
Meter ID									New WQ:		Old WQ:		Feed:
Lab Control									10	12	10	9	Date:
													Sol. Prep:
100%									10	11	10	11	Maint. Time:
													Maint. Signoff:
													Sample ID:
Meter ID									New WQ:		Old WQ:		Feed:
Lab Control									10	12	10	9	Date:
													Count Time:
100%									10	11	10	11	Count Signoff:
													Feed:
Meter ID											Old WQ:		
Lab Control		7.93	7.33	8.6	5.8	308	314		10	12	10	9	Date: 21-1-25
													Sol. Prep:
100%		7.60	7.64	9.9	6.6	639	657		10	11	10	11	Maint. Time:
													Maint. Signoff:
													Sample ID:
Meter ID									New WQ: NB		Old WQ:		Feed:
Lab Control			7.25		7.0		303						Date:
													Count Time:
100%			7.61		6.3		649						Count Signoff:
													Feed:
Meter ID											Old WQ:		
Lab Control								1.07	10	12	10	9	Date:
													Term Time:
100%									10	11	10	12	Term Signoff:
Meter ID											Old WQ:		

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

AQUATIC BIO SYSTEMS ABS INC.

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

ORGANISM HISTORY

DATE: 1/23/2024

SPECIES: *Chironomus dilutus (formerly C. tentans)*

AGE: Deposited 1/14/2024

LIFE STAGE: Second Instar 1/23/2024

HATCH DATE: Emergent 2/4/2024

BEGAN FEEDING: Immediately

FOOD: *Raphidocelis subcapitata.**, Flake slurry

Water Chemistry Record:	**Current**	**Range**
TEMPERATURE:	23°C	22-25°C
SALINITY/CONDUCTIVITY:	--	--
TOTAL HARDNESS (as $CaCO_3$):	118 mg/l	100-190 mg/l
TOTAL ALKALINITY (as $CaCO_3$):	75 mg/l	50-100 mg/l
pH:	8.13	7.70-8.30

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

Facility Supervisor

Pacific EcoRisk Environmental Consulting and Testing

Test Organism Log-in

Organism Log #: **14143**

Total # of Orgs: 835

Date Received: 1/24/24

Age/Hatch Date: 10d 1/14/24

Species: Chironomus

Initial Mortality: 0

Source: BBS

Culture Water: Rec. EPA/MH

Initial Observations upon Reciept:

Temp. (°C)	D.O. (mg/L)	Salinity (ppt) or Cond. (µS/cm)	Observation of Organism Health	Sign-off
21.3	6.9	387	good	AP
Meter ID: 667	Meter ID: RDO	Meter ID: EC14		

Shipped Dry? Yes (No)

Husbandry Log Established? (Yes) No

Inform Lab Manager if organisms recieved are *Chironomus dilutus* Egg Cases, *Pimephales promelas* (FHM) Embryos, *Atherinops affinis* (Topsmelt), or Abalone Were they informed? Yes No (N/A)

If organisms split into multiple husbandry bins, how many? _____

Supplier information sheet must be attached to this sheet!

General Comments:

Test Organism Husbandry Log

Organism Log #: 14143
Date Received: 1/24/24
Species: Chironomus
Source: ABS
Client Name:

Total # of Orgs: 835 Initial Mortality: 0
Age/Hatch Date: 10 d 1/14/24
Culture Water: Ref. EPAMH
Test Type: A C Temp Adj?: Y (N)
Term Date: 1/25

Instructions/Comments:

Temp Adj		
Init.	Date	Temp

Date	Time	Temp (°C)	D.O. (mg/L)	Sal (ppt) or Cond (uS/cm)	Feeding AM	Feeding Noon	Feeding PM	Mort.	Observations of Organism Health	Water Δ?	Sign-off
1/24/24	1505	21.3 Meter ID: [illegible]	[illegible] Meter ID: [illegible]	[illegible] Meter ID: [illegible]			[illegible]	0	[illegible]		
[illegible]	[illegible]	[illegible] Meter ID: [illegible]	[illegible] Meter ID: [illegible]	[illegible] Meter ID: [illegible]	[illegible]			0	good	[illegible]	[illegible]
		Meter ID:	Meter ID:	Meter ID:							
		Meter ID:	Meter ID:	Meter ID:							
		Meter ID:	Meter ID:	Meter ID:							
		Meter ID:	Meter ID:	Meter ID:							
		Meter ID:	Meter ID:	Meter ID:							
		Meter ID:	Meter ID:	Meter ID:							
		Meter ID:	Meter ID:	Meter ID:							
		Meter ID:	Meter ID:	Meter ID:							
		Meter ID:	Meter ID:	Meter ID:							
		Meter ID:	Meter ID:	Meter ID:							
		Meter ID:	Meter ID:	Meter ID:							
		Meter ID:	Meter ID:	Meter ID:							

TEC [illegible]

10 Day Chronic *Chironomus dilutus* Toxicity Test Data

Client: Delta RMP
Test Material: CENT-016
Test ID#: 104360 Project #: 35355
Test Date: 1/24/24

Organism Log#: 14143 Age: 10 day
Organism Supplier: ABS
Control/Diluent: Reformulated EPAMH
Control Water Batch: 357

Treatment	Temp (°C)	pH New	pH Old	D.O. (mg/L) New	D.O. (mg/L) Old	Cond. (µS/cm) New	Cond. (µS/cm) Old	Ammonia (mg/L)	# Live Organisms A	B	C	D	SIGN-OFF
Lab Control	22.8	[illegible]		[illegible]		320		<1.00	10	10	10	11	Date: 1/24/24; Sol. Prep: [illegible]
100%	22.0	7.65		9.0		265		<1.00	10	10	10	10	Initi. Time: 1545; Initi. Sign-off: [illegible]
													Sample ID: [illegible]
Meter ID	[illegible]	[illegible]		[illegible]		[illegible]		[illegible]	New WQ: [illegible]				Feed: [illegible]
Lab Control	[illegible]		7.35		6.0		335		10	10	10	10	Date: [illegible]; Count Time: [illegible]
100%	[illegible]		7.42		5.9		275		10	10	10	10	Count Signoff: [illegible]; Feed: [illegible]
Meter ID	[illegible]		[illegible]		[illegible]		EC04				Old WQ: SN		
Lab Control	23.1	7.95	7.55	8.6	7.4	312	338		10	7	10	11	Date: 1/26/24; Sol. Prep: [illegible]
100%	23.2	7.77	7.66	9.6	7.2	262	293		9	9	10	9	Maint. Time: 1457; Maint. Signoff: [illegible]
													Sample ID: [illegible]
Meter ID	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		New WQ: [illegible]		Old WQ: SN		Feed: [illegible]
Lab Control	23.0		7.46		7.2		329		10	7	10	11	Date: 1/27/24; Count Time: [illegible]
100%	23.2		7.46		7.2		292		9	9	10	9	Count Signoff: [illegible]; Feed: [illegible]
Meter ID	[illegible]		[illegible]		[illegible]		[illegible]				Old WQ: [illegible]		
Lab Control	[illegible]	[illegible]	7.54	7.7	[illegible]	[illegible]	[illegible]		10	7	10	11	Date: [illegible]; Sol. Prep: [illegible]
100%	[illegible]	[illegible]	7.51	8.3	[illegible]	[illegible]	[illegible]		9	9	10	9	Maint. Time: [illegible]; Maint. Signoff: [illegible]
													Sample ID: [illegible]
Meter ID	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		New WQ: [illegible]		Old WQ: [illegible]		Feed: [illegible]
Lab Control	[illegible]		7.53		5.5		366		10	7	10	11	Date: [illegible]; Count Time: [illegible]
100%	[illegible]		7.59		5.2		282		9	9	10	9	Count Signoff: [illegible]; Feed: [illegible]
Meter ID	[illegible]		[illegible]		[illegible]		[illegible]				Old WQ: KF		
Lab Control	[illegible]	7.60	7.36	8.9	6.4	[illegible]	[illegible]		10	7	10	11	Date: 1/30/24; Sol. Prep: [illegible]
100%	[illegible]	7.66	7.45	9.5	6.2	246	[illegible]		9	9	10	8	Maint. Time: [illegible]; Maint. Signoff: [illegible]
													Sample ID: [illegible]
Meter ID	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		New WQ: [illegible]		Old WQ: [illegible]		Feed: [illegible]
Lab Control	[illegible]		7.41		5.5		333		10	7	10	11	Date: [illegible]; Count Time: [illegible]
100%	[illegible]		7.41		5.5		260		9	9	10	8	Count Signoff: [illegible]; Feed: [illegible]
Meter ID	[illegible]		[illegible]		[illegible]		[illegible]				Old WQ: [illegible]		
Lab Control	[illegible]	7.41	7.29	[illegible]	5.4	[illegible]	309		10	7	10	11	Date: [illegible]; Sol. Prep: [illegible]
100%	[illegible]	[illegible]	7.43	[illegible]	5.6	[illegible]	258		9	9	10	8	Maint. Time: [illegible]; Maint. Signoff: [illegible]
													Sample ID: [illegible]
Meter ID		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		New WQ: [illegible]		Old WQ: [illegible]		Feed: [illegible]
Lab Control	[illegible]		7.52		5.1		341		10	7	10	11	Date: [illegible]; Count Time: [illegible]
100%	[illegible]		7.41		5.9		[illegible]		9	9	10	8	Count Signoff: [illegible]; Feed: [illegible]
Meter ID	[illegible]		[illegible]		[illegible]		[illegible]				Old WQ:		
Lab Control	[illegible]		7.56		[illegible]		[illegible]	1.14	10	6	10	11	Date: 2/3/24; Term Time: [illegible]
100%			7.99		[illegible]		[illegible]	1.12	9	9	10	8	Term Signoff: [illegible]
Meter ID			[illegible]		[illegible]		[illegible]	[illegible]			Old WQ: [illegible]		

10 Day Chronic *Chironomus dilutus* Toxicity Test Data

Client: Delta RMP
Test Material: CENT-~~017~~ [illegible]
Test ID#: 104361 Project #: 35355
Test Date: 1/24/24

Organism Log#: 14143 Age: 10 days
Organism Supplier: ABS
Control/Diluent: Reformulated EPAMH
Control Water Batch: 357

Treatment	Temp (°C)	pH New	pH Old	D.O. (mg/L) New	D.O. (mg/L) Old	Cond. (µS/cm) New	Cond. (µS/cm) Old	Ammonia (mg/L)	# Live Organisms A	B	C	D	SIGN-OFF
Lab Control	[illegible]	7.96		8.6		322		<1.00	10	10	10	~~10~~ 11	Date: 1/24/24; Sol. Prep: [illegible]
100%	22.4	7.72		8.8		—	419	<1.00	10	10	10	10	Initi. Time: [illegible]; Initi. Sign-off: [illegible]
													Sample ID: [illegible]
Meter ID	[illegible]	[illegible]		[illegible]		[illegible]		[illegible]	New WQ: [illegible]				Feed: [illegible]
Lab Control	[illegible]		7.35		6.0		335		10	10	10	10	Date: [illegible]; Count Time: [illegible]
100%	[illegible]		7.48		6.3		413		10	10	10	10	Count Signoff: [illegible]; Feed: [illegible]
Meter ID	[illegible]		[illegible]		[illegible]		[illegible]				Old WQ: [illegible]		
Lab Control	23.1	7.85	7.55	8.6	7.4	312	338	[illegible]	~~10~~ 7	7	10	11	Date: [illegible]; Sol. Prep: [illegible]
100%	23.2	7.79	7.68	8.8	6.9	436	421		7	9	9	10	Maint. Time: 1455; Maint. Signoff: [illegible]
													Sample ID: [illegible]
Meter ID	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		New WQ: [illegible]		Old WQ: SN		Feed: [illegible]
Lab Control	23.0		7.42		[illegible]		324		10	7	10	11	Date: 1/27/24; Count Time: 1056
100%	23.2		7.44		6.1		[illegible]		7	9	9	9	Count Signoff: [illegible]; Feed: [illegible]
Meter ID	[illegible]										Old WQ: NK		
Lab Control	[illegible]	[illegible]	7.58	7.7	[illegible]	[illegible]	[illegible]		10	7	10	11	Date: [illegible]; Sol. Prep: [illegible]
100%	[illegible]	[illegible]	[illegible]	9.1	[illegible]	[illegible]	[illegible]		7	9	9	9	Maint. Time: [illegible]; Maint. Signoff: [illegible]
													Sample ID: [illegible]
Meter ID	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		New WQ: [illegible]		Old WQ: [illegible]		Feed: [illegible]
Lab Control	[illegible]		7.53		5.3		366		10	7	10	11	Date: [illegible]; Count Time: [illegible]
100%	[illegible]		7.60		6.4		453		7	9	9	9	Count Signoff: [illegible]; Feed: [illegible]
Meter ID	[illegible]		[illegible]		[illegible]		EC15				Old WQ: KF		
Lab Control	[illegible]	7.69	[illegible]	8.9	[illegible]	[illegible]	[illegible]		10	7	10	11	Date: [illegible]; Sol. Prep: [illegible]
100%	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	9	[illegible]	Maint. Time: [illegible]; Maint. Signoff: [illegible]
													Sample ID: [illegible]
Meter ID	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		New WQ: [illegible]		Old WQ: [illegible]		Feed: [illegible]
Lab Control			7.41		5.5		333		10	7	10	[illegible]	Date: [illegible]; Count Time: [illegible]
100%	[illegible]		7.14		5.9		[illegible]		6	9	[illegible]	[illegible]	Count Signoff: [illegible]; Feed: [illegible]
Meter ID	[illegible]		[illegible]		[illegible]		[illegible]				Old WQ: [illegible]		
Lab Control	[illegible]	[illegible]	[illegible]	[illegible]	5.8	[illegible]	[illegible]		10	7	10	11	Date: [illegible]; Sol. Prep: [illegible]
100%	[illegible]	[illegible]	[illegible]	[illegible]	5.2	[illegible]	455		6	9	9	8	Maint. Time: [illegible]; Maint. Signoff: [illegible]
													Sample ID: [illegible]
Meter ID	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		New WQ: [illegible]		Old WQ: [illegible]		Feed: [illegible]
Lab Control	[illegible]		[illegible]		5.1		[illegible]		10	7	10	11	Date: [illegible]; Count Time: [illegible]
100%	[illegible]		7.48		5.9		424		6	9	9	9	Count Signoff: [illegible]; Feed: [illegible]
Meter ID	[illegible]		[illegible]		[illegible]		[illegible]				Old WQ:		
Lab Control	[illegible]		[illegible]		6.5		[illegible]	1.14	10	6	10	11	Date: 2/3/24; Term Time: [illegible]
100%	[illegible]		[illegible]		[illegible]		436	.41	6	8	9	8	Term Signoff: [illegible]
Meter ID			[illegible]		[illegible]		[illegible]	[illegible]			Old WQ: [illegible]		

10 Day Chronic *Chironomus dilutus* Toxicity Test Data

Client: Delta RMP
Test Material: CONF-005
Test ID#: 104362 Project #: 35355
Test Date: 1/24/24

Organism Log#: 14143 Age: 10 days
Organism Supplier: ABS
Control/Diluent: Reformulated EPAMH
Control Water Batch: 357

Treatment	Temp (°C)	pH New	pH Old	D.O. (mg/L) New	D.O. (mg/L) Old	Cond. (µS/cm) New	Cond. (µS/cm) Old	Ammonia (mg/L)	# Live Organisms A	B	C	D	SIGN-OFF
Lab Control	22.5	7.56		8.6		322		<1.00	10	10	10	11	Date: 1/24/24; Sol. Prep: [illegible]
100%	22.1	7.73		8.5		[illegible]		<1.00	10	10	10	10	Initi. Time: [illegible]; Initi. Sign-off: [illegible]
Meter ID	[illegible]	[illegible]		[illegible]		[illegible]		[illegible]	New WQ: [illegible]				Sample ID: [illegible]; Feed: [illegible]
Lab Control			7.35		6.0		335		10	10	10	10	Date: [illegible]; Count Time: [illegible]
100%			7.52		6.5		641		10	10	10	10	Count Signoff: [illegible]; Feed: [illegible]
Meter ID	[illegible]		PH27		RDIS		EC14				Old WQ: SN		
Lab Control	23.1	7.45	7.55	8.6	7.4	312	335	[illegible]	10	7	10	11	Date: 1/26/24; Sol. Prep: [illegible]
100%	23.2	7.47	7.65	9.9	6.8	616	655		8	7	9	10	Maint. Time: 1407; Maint. Signoff: [illegible]
Meter ID	[illegible]	[illegible]	PH27	RD15	RD15	EC14	EC13		New WQ: [illegible]		Old WQ: SN		Sample ID: [illegible]; Feed: 126
Lab Control	23.0		7.77		7.8		624		10	7	10	11	Date: 1/27/24; Count Time: 1336
100%	23.1		7.83		7.8		663		8	7	9	10	Count Signoff: [illegible]; Feed: [illegible]
Meter ID	[illegible]		[illegible]		[illegible]		[illegible]				Old WQ: [illegible]		
Lab Control	[illegible]	[illegible]	7.54	7.7	6.2	[illegible]	346		10	7	10	11	Date: [illegible]; Sol. Prep: [illegible]
100%	[illegible]	[illegible]	7.58	9.0	[illegible]	[illegible]	[illegible]		8	7	9	10	Maint. Time: [illegible]; Maint. Signoff: [illegible]
Meter ID	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		New WQ: [illegible]		Old WQ: [illegible]		Sample ID: [illegible]; Feed: [illegible]
Lab Control	[illegible]		7.53		5.3		360		10	7	10	11	Date: [illegible]; Count Time: [illegible]
100%	[illegible]		7.60		6.1		654		8	7	9	10	Count Signoff: [illegible]; Feed: [illegible]
Meter ID	[illegible]		pH27		RD15		EC15				Old WQ: KF		
Lab Control	[illegible]	7.60	7.36	8.9	[illegible]	293	[illegible]		10	7	10	11	Date: [illegible]; Sol. Prep: [illegible]
100%	[illegible]	7.77	7.52	10.5	6.2	613	[illegible]		8	7	9	9	Maint. Time: [illegible]; Maint. Signoff: [illegible]
Meter ID	[illegible]	[illegible]	[illegible]	RD10	[illegible]	[illegible]	[illegible]		New WQ: EG		Old WQ: [illegible]		Sample ID: [illegible]; Feed: [illegible]
Lab Control			7.41		5.5		355		10	7	10	[illegible]	Date: [illegible]; Count Time: [illegible]
100%			7.44		6.3		629		—	7	9	9	Count Signoff: [illegible]; Feed: [illegible]
Meter ID	[illegible]		PH22		RD15		EC14				Old WQ: CLP		
Lab Control	[illegible]	7.91	7.28	8.5	5.4	296	329		10	7	10	11	Date: 2/1/24; Sol. Prep: [illegible]
100%	[illegible]	[illegible]	7.47	[illegible]	5.3	[illegible]	625		—	7	9	9	Maint. Time: [illegible]; Maint. Signoff: [illegible]
Meter ID	[illegible]	[illegible]	PH27	[illegible]	RD15	EC12	EC16		New WQ: [illegible]		Old WQ: [illegible]		Sample ID: [illegible]; Feed: [illegible]
Lab Control	[illegible]		7.32		[illegible]		341		10	7	10	11	Date: [illegible]; Count Time: [illegible]
100%	[illegible]		7.49		5.8		657		—	7	9	9	Count Signoff: [illegible]; Feed: [illegible]
Meter ID	[illegible]		[illegible]		[illegible]		[illegible]				Old WQ:		
Lab Control			7.30		[illegible]		[illegible]	1.14	10	6	10	11	Date: 2/3/24; Term Time: [illegible]
100%			7.53		7.41		[illegible]	1.01	—	6	9	9	Term Signoff: [illegible]
Meter ID			[illegible]		[illegible]		[illegible]	[illegible]			Old WQ: [illegible]		

10 Day Chronic *Chironomus dilutus* Toxicity Test Data

Client:	Delta RMP	Organism Log#:	19193
Test Material:	CONF-006	Organism Supplier:	A35
Test ID#:	104363 Project #: 35355	Control/Diluent:	Reformulated EPAMH
Test Date:	1/24/24	Control Water Batch:	357

Age: 10 days

Treatment	Temp (°C)	pH New	pH Old	D.O. (mg/L) New	D.O. (mg/L) Old	Cond. (µS/cm) New	Cond. (µS/cm) Old	Ammonia (mg/L)	# Live Organisms A	B	C	D	SIGN-OFF
Lab Control	22.5	7.84		8.6		320		<1.00	10	10	10	~~10~~ 11	Date: 1/24/24; Sol. Prep: 355
100%	[illegible]	[illegible]		[illegible]		[illegible]		<1.00	10	10	10	10	Initi. Time: [illegible]; Initi. Sign-off: [illegible]
													Sample ID: [illegible]
Meter ID	[illegible]	[illegible]		[illegible]		[illegible]		[illegible]	New WQ: [illegible]				Feed: [illegible]
Lab Control	[illegible]		7.35		6.0		335		10	10	10	10	Date: [illegible]; Count Time: [illegible]
100%	[illegible]		7.50		6.3		742		10	10	10	10	Count Signoff: [illegible]; Feed: TC
Meter ID	[illegible]		[illegible]		[illegible]		[illegible]				Old WQ: SN		
Lab Control	23.1	7.85	7.55	8.6	7.4	312	338		~~10~~ 9	7	10	11	Date: 1/26/24; Sol. Prep: [illegible]
100%	[illegible]	7.76	7.66	9.9	6.9	771	760		9	10	10	10	Maint. Time: [illegible]; Maint. Signoff: [illegible]
													Sample ID: [illegible]
Meter ID	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		New WQ: [illegible]		Old WQ: SN		Feed: [illegible]
Lab Control	23.0		7.40		[illegible]		389		10	7	10	11	Date: 1/27/24; Count Time: [illegible]
100%	23.2		7.35		7.3		774		9	9	9	10	Count Signoff: [illegible]; Feed: [illegible]
Meter ID	[illegible]										Old WQ: NK		
Lab Control	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		10	7	10	11	Date: [illegible]; Sol. Prep: [illegible]
100%	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		9	9	9	10	Maint. Time: [illegible]; Maint. Signoff: [illegible]
													Sample ID: [illegible]
Meter ID		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		New WQ: [illegible]		Old WQ: [illegible]		Feed: TC
Lab Control	[illegible]		7.53		5.3		366		10	7	10	11	Date: [illegible]; Count Time: [illegible]
100%			7.62		6.4		780		8	9	9	9	Count Signoff: [illegible]; Feed: [illegible]
Meter ID	[illegible]		pH 27		RO15		EC15				Old WQ: KF		
Lab Control	[illegible]	7.60	7.36	8.9	6.4	343	312		10	7	10	11	Date: 1/30/24; Sol. Prep: [illegible]
100%	[illegible]	7.78	7.44	10.8	6.2	746	764		8	8	8	9	Maint. Time: [illegible]; Maint. Signoff: [illegible]
													Sample ID: [illegible]
Meter ID	[illegible]	pH 29	pH 24	RO10	RO16	EC17	EC12		New WQ: EG		Old WQ: [illegible]		Feed: [illegible]
Lab Control	[illegible]		7.41		~~8.5~~ [illegible]		333		10	7	10	11	Date: [illegible]; Count Time: [illegible]
100%	[illegible]		7.45		6.5		741		8	8	8	9	Count Signoff: [illegible]; Feed: [illegible]
Meter ID	[illegible]		[illegible]		RO15		[illegible]				Old WQ: [illegible]		
Lab Control	[illegible]	[illegible]	7.28	8.5	5.4	[illegible]	[illegible]		10	7	10	11	Date: 2/1/24; Sol. Prep: [illegible]
100%	[illegible]	[illegible]	7.45	10.4	5.5	[illegible]	770		8	8	8	9	Maint. Time: [illegible]; Maint. Signoff: [illegible]
													Sample ID: [illegible]
Meter ID	[illegible]	[illegible]	pH 27	[illegible]	RO17	[illegible]	EC14		New WQ: [illegible]		Old WQ: [illegible]		Feed: [illegible]
Lab Control	[illegible]		7.32		[illegible]		319		10	7	10	11	Date: [illegible]; Count Time: [illegible]
100%	[illegible]		7.40		6.2		745		8	8	8	9	Count Signoff: [illegible]; Feed: TC
Meter ID	[illegible]		[illegible]		[illegible]		[illegible]				Old WQ:		
Lab Control			[illegible]		[illegible]		[illegible]	1.14	10	10	10	11	Date: 2/3/24; Term Time: 1355
100%	[illegible]		[illegible]		[illegible]		[illegible]	[illegible]	7	8	8	9	Term Signoff: [illegible]
Meter ID	[illegible]		[illegible]		[illegible]		[illegible]	[illegible]			Old WQ: [illegible]		

10 Day Chronic *Chironomus dilutus* Toxicity Test Data

Client: Delta RMP
Test Material: CONF-007
Test ID#: 104364 Project #: 35355
Test Date: 1/24-/2-

Organism Log#: 14193 Age: 10 days
Organism Supplier: [illegible]
Control/Diluent: Reformulated EPAMH
Control Water Batch: 357

Treatment	Temp (°C)	pH New	pH Old	D.O. (mg/L) New	D.O. (mg/L) Old	Cond. (µS/cm) New	Cond. (µS/cm) ~~Old~~	Ammonia (mg/L)	# Live Organisms A	B	C	D	SIGN-OFF
Lab Control	[illegible]	[illegible]		8.6		320		<1.00	10	10	10	11	Date: 1/24/24 Sol. Prep [illegible]
100%	[illegible]	[illegible]		9.5		426		<1.00	10	10	11	10	Initi. Time: [illegible] Initi. Sign-off: [illegible]
													Sample ID: [illegible]
Meter ID	[illegible]	[illegible]		[illegible]		[illegible]		[illegible]	New WQ: SV				Feed: [illegible]
Lab Control			7.35		6.0		335		10	10	10	10	Date: [illegible] Count Time: [illegible]
100%			7.49		6.2		430		10	10	10	10	Count Signoff: [illegible] Feed: [illegible]
Meter ID			[illegible]		[illegible]		[illegible]				Old WQ: SN		
Lab Control	[illegible]	7.45	7.55	8.6	7.4	312	338	[illegible]	10	7	10	11	Date: [illegible] Sol. Prep [illegible]
100%	[illegible]	7.49	7.70	9.9	6.5	401	440	[illegible]	8	7	11	7	Maint. Time: [illegible] Maint. Signoff: [illegible]
													Sample ID: [illegible]
Meter ID	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		New WQ: [illegible]		Old WQ: SN		Feed: [illegible]
Lab Control	[illegible]	[illegible]	7.61	[illegible]	[illegible]	[illegible]	[illegible]		10	7	10	11	Date: 1/24/24 Count Time: 1056
100%	[illegible]	[illegible]	7.71	[illegible]	[illegible]	[illegible]	[illegible]		8	6	11	7	Count Signoff: [illegible] Feed: [illegible]
Meter ID	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]				Old WQ: [illegible]		
Lab Control		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	Date: [illegible] Sol. Prep [illegible]
100%		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	Maint. Time: [illegible] Maint. Signoff: [illegible]
													Sample ID: [illegible]
Meter ID	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		New WQ: [illegible]		Old WQ: [illegible]		Feed: [illegible]
Lab Control			7.53		5.5		566		10	7	10	11	Date: 1/24/24 Count Time: [illegible]
100%			7.64		6.1		491		8	6	11	7	Count Signoff: [illegible] Feed: [illegible]
Meter ID	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]				Old WQ: [illegible]		
Lab Control	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	Date: [illegible] Sol. Prep [illegible]
100%	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	Maint. Time: [illegible] Maint. Signoff: [illegible]
													Sample ID: [illegible]
Meter ID	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		New WQ: [illegible]		Old WQ: [illegible]		Feed: [illegible]
Lab Control	[illegible]	[illegible]	7.51	[illegible]	[illegible]	[illegible]	333		[illegible]	[illegible]	[illegible]	[illegible]	Date: [illegible] Count Time: [illegible]
100%	[illegible]	[illegible]	7.52	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	11	7	Count Signoff: [illegible] Feed: [illegible]
Meter ID	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]				Old WQ: [illegible]		
Lab Control	[illegible]	[illegible]	7.58	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	Date: [illegible] Sol. Prep [illegible]
100%	[illegible]	[illegible]	7.43	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	Maint. Time: [illegible] Maint. Signoff: [illegible]
													Sample ID: [illegible]
Meter ID	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		New WQ: [illegible]		Old WQ: [illegible]		Feed: [illegible]
Lab Control	[illegible]	[illegible]	7.52	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	Date: [illegible] Count Time: [illegible]
100%	[illegible]	[illegible]	7.41	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	Count Signoff: [illegible] Feed: [illegible]
Meter ID	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]				Old WQ:		
Lab Control			[illegible]		[illegible]		[illegible]	[illegible]	10	[illegible]	10	11	Date: [illegible] Term Time: [illegible]
100%			[illegible]		[illegible]		[illegible]	[illegible]	[illegible]	4	11	7	Term Signoff: [illegible]
Meter ID			[illegible]		[illegible]		[illegible]	[illegible]			Old WQ: [illegible]		

10 Day Chronic *Chironomus dilutus* Toxicity Test Data

Client: Delta RMP
Organism Log#: 14143
Age: 10 days
Test Material: CONF-008
Organism Supplier: ABS
Test ID#: 104365 Project #: 35355
Control/Diluent: Reformulated EPAMH
Test Date: 1/23/24
Control Water Batch: 357

Treatment	Temp (°C)	pH New	pH Old	D.O. (mg/L) New	D.O. (mg/L) Old	Cond. (µS/cm) New	Cond. (µS/cm) Old	Ammonia (mg/L)	# Live Organisms A	B	C	D	SIGN-OFF
Lab Control	[illegible]	[illegible]		[illegible]		[illegible]		<1.00	10	10	10	11	Date: [illegible] Sol. Prep [illegible]
100%	23.9	[illegible]		[illegible]		[illegible]		<1.00	10	11	10	10	Initi. Time: [illegible] Initi. Sign-off: [illegible]
													Sample ID: [illegible]
Meter ID	[illegible]	[illegible]		[illegible]		[illegible]		[illegible]	New WQ: [illegible]				Feed: [illegible]
Lab Control	[illegible]		7.35		6.0		335		10	10	10	10	Date: [illegible] Count Time: [illegible]
100%	[illegible]		7.48		6.2		473		10	11	10	10	Count Signoff: [illegible] Feed: [illegible]
Meter ID	[illegible]		[illegible]		[illegible]		[illegible]				Old WQ: SN		
Lab Control	23.1	7.95	7.55	8.6	7.4	312	335		10	7	6?	11	Date: [illegible] Sol. Prep [illegible]
100%	23.2	7.20	7.64	10.1	6.6	454	492		9	11	9	10	Maint. Time: [illegible] Maint. Signoff: [illegible]
													Sample ID: [illegible]
Meter ID	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		New WQ: [illegible]		Old WQ: SN		Feed: [illegible]
Lab Control	[illegible]		7.92		[illegible]		[illegible]		10	7	10	11	Date: 1/27/24 Count Time: 1056
100%	[illegible]		7.27		3.1		479		9	11	8	10	Count Signoff: [illegible] Feed: [illegible]
Meter ID	[illegible]		[illegible]		[illegible]		[illegible]				Old WQ: [illegible]		
Lab Control	[illegible]	[illegible]	7.54	[illegible]	[illegible]	[illegible]	[illegible]		10	7	10	11	Date: [illegible] Sol. Prep [illegible]
100%	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		9	11	8	10	Maint. Time: [illegible] Maint. Signoff: [illegible]
													Sample ID: [illegible]
Meter ID		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		New WQ: [illegible]		Old WQ: [illegible]		Feed: [illegible]
Lab Control	[illegible]		7.53		5.3		[illegible]		10	7	10	11	Date: [illegible] Count Time: [illegible]
100%	[illegible]		7.60		6.0		478		9	11	8	10	Count Signoff: [illegible] Feed: [illegible]
Meter ID	[illegible]		[illegible]		[illegible]		[illegible]				Old WQ: KE		
Lab Control	[illegible]	[illegible]	[illegible]	8.9	[illegible]	[illegible]	[illegible]		10	7	10	11	Date: [illegible] Sol. Prep [illegible]
100%	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		9	10	8	9	Maint. Time: [illegible] Maint. Signoff: [illegible]
													Sample ID: [illegible]
Meter ID	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		New WQ: [illegible]		Old WQ: [illegible]		Feed: [illegible]
Lab Control	[illegible]		7.41		5.5		333		10	7	10	11	Date: [illegible] Count Time: [illegible]
100%	[illegible]		7.54		5.2		440		9	10	8	9	Count Signoff: [illegible] Feed: [illegible]
Meter ID	[illegible]		[illegible]		[illegible]		[illegible]				Old WQ: [illegible]		
Lab Control	[illegible]	[illegible]	7.28	8.5	5.4	[illegible]	[illegible]		10	7	10	11	Date: 2/1/24 Sol. Prep [illegible]
100%	[illegible]	[illegible]	7.40?	9.7?	5.1	440	467		9	10	8	9	Maint. Time: [illegible] Maint. Signoff: [illegible]
													Sample ID: [illegible]
Meter ID	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		New WQ: [illegible]		Old WQ: [illegible]		Feed: [illegible]
Lab Control	[illegible]		[illegible]		[illegible]		[illegible]		10	7	10	11	Date: [illegible] Count Time: [illegible]
100%	[illegible]		[illegible]		[illegible]		[illegible]		9	10	8	9	Count Signoff: [illegible] Feed: [illegible]
Meter ID	[illegible]		[illegible]		[illegible]		[illegible]				Old WQ:		
Lab Control	[illegible]		[illegible]		[illegible]		[illegible]	1.14	10	6?	10	11	Date: [illegible] Term Time: [illegible]
100%			[illegible]		[illegible]		467	[illegible]	9	10?	8	8	Term Signoff: [illegible]
Meter ID	[illegible]		[illegible]		[illegible]		[illegible]	[illegible]			Old WQ: [illegible]		

Deviation Report / Corrective Action Form

Title:	**CUP Event 1 (WY24) Babcock Lab Blank Contamination for TOC**
Deviation Number:	2023-12_CUPv1.4_Dev_WY24Event1_Babcock_LabBlankContaminationTOC
Prepared By:	Cassandra Lamerdin
Attached:	NA

Applicable Reference(s):

Delta Regional Monitoring Program Quality Assurance Project Plan for Current Use Pesticides in the Sacramento-San Joaquin Delta Version 1.4, September 28, 2023

Complete the following table regarding the major milestones for the relevant deviation. Add additional rows as needed.

	Date	Notes/Description (optional)
Date Deviation Occurred:	2/26/2024	Cassandra Lamerdin (DRMP Data Manager) reviewed the revised Lab Report (C3L2733) from Event 1 sampling which occurred on 12/11-12/2023.
Date DRMP Program Manager was notified:	2/26/2024	Cassandra Lamerdin notified (via email) Melissa Turner (DRMP Technical Program Manager) of a deviation regarding total organic carbon (TOC) lab blank contamination.
Date CVRWQCB QA Representative Notified:	2/26/2024	Cassandra Lamerdin notified (via email) Selina Cole (Region 5 QA Representative) of a deviation regarding TOC lab blank contamination.

	Date	Notes/Description (optional)
Deviation Form sent for Review:	5/01/2024	Tessa Fojut (SWAMP Program Manager)
Deviation Form sent for Review:	5/21/2024	Will Hagan (DRMP QA Officer)
Deviation Form Sent for Signatures:	5/23/2024	Originally sent for signatures
Approval Letter Received from CVRWQCB:	10/25/2024	The Central Valley Regional Water Quality Control Board's QA Representative position is currently vacant; however, Regional Board staff have reviewed the submitted QAPP Deviations Form and find the corrective actions sufficient. Regional Board approval was provided by Patrick Pulupa (CVRWQCB Executive Officer) for six CUP deviations including this one. The approval letter was sent to Debbie Mackey (DRMP President) on October 25, 2024.
Deviation Form Sent for Signatures post approval:	11/21/2024	

Description of Deviation/Change:

On February 23, 2024, Cassandra Lamerdin received a revised Babcock Lab Report 3CL2733 for Water Year 2024 (WY24) Current Use Pesticides (CUP) sampling Event 1 which occurred on December 11-12, 2023. This lab report was originally submitted on January 23, 2024 but was revised to update incorrect sample dates and copper method detection limits (MDLs) and reporting limits (RLs).

Upon review of the revised report received on February 26, 2024, it was identified that the Lab Blank for TOC was detected (0.205 mg/L) at a level above the MDL (0.13 mg/L) but below the RL (0.7 mg/L). The DRMP CUP Measurement Quality Objective (MQO) for Lab Blanks is <MDL; however, the MQO for Surface Water Ambient Monitoring Program (SWAMP) is <RL.

Reason for Deviation/Change

This deviation does not meet the DRMP lab blank contamination MQO but does meet the SWAMP MQO which is followed by the Central Valley Water Quality Regional Board as the contracting agency for analysis conducted by Babcock for the DRMP CUP; therefore, the results did not require reconfirmation from the laboratory but were flagged by the DRMP as not meeting project MQOs.

Impact on Present and Completed Work (discuss potential magnitude of impact and bias of deviation/change, if this can be anticipated, if no impact is expected please indicate this)

Low-level TOC laboratory blank contamination is documented in the dataset batch Babcock_DRMP_CUP_3L27033_W_TOC including the following: flagging the blank result with an IP QA Code [Analyte detected in field or lab generated blank] and flagging the associated samples (544LSAC13, 511ULCABR, Cent-013, Cent-014, Conf-001, Conf-002, Conf-003, Conf-004) with an additional FI QA Code [Analyte in field sample and associated blank]. The lab batch comment will include the following "TOC reported in lab blank at levels above MDL but below RL".

Corrective Action	By Date	By Whom
The TOC laboratory blank result will be flagged with an IP. The environmental samples in the analytical batch will be flagged with an QA Code of FI.	4/15/2024	Cassandra Lamerdin, DRMP Data Manager

ACKNOWLEDGED BY:

SWAMP Program Manager:	DocuSigned by: Tessa Fojut 7A88852197AE41E...	Date:	11/22/2024
	Tessa Fojut		

DRMP Program Manager:	DocuSigned by: Melissa Turner 0796DD915C44446...	Date:	11/22/2024
	Melissa Turner		

DRMP QA Officer:	DocuSigned by: Will Hagan A4691C48F968433...	Date:	11/22/2024
	Will Hagan		

CVRWQCB QA Representative*:	**Not Applicable**	Date:	10/25/2024
	Vacant		

*While these QAPP Deviation Forms will remain unsigned by the Central Valley Water Board due to the vacant QA Representative position, the current form is approved based on CVRWQCB staff scientist review and approval by the Central Valley Regional Water Quality Control Board Executive Officer Patrick Pulupa.

Deviation Report / Corrective Action Form

Title:	**CUP Event 3 (WY24) *Pimephales* 7-day Toxicity Test Missed Hold Time**
Deviation Number:	2023-13_CUPv1.5_Dev_WY24Event3_PER_PimephalesMissedHoldtime
Prepared By:	Robert Pangle, MLJ Environmental
Attached:	2023-13_050124_DeltaRMP_NonConfirmingDataReport_FatheadMinnow_NoTesting.pdf

Applicable Reference(s):

Delta Regional Monitoring Program Quality Assurance Project Plan for Current Use Pesticides in the Sacramento-San Joaquin Delta Version 1.5, February 09, 2024

Complete the following table regarding the major milestones for the relevant deviation. Add additional rows as needed.

	Date	Notes/Description (optional)
Date Deviation Occurred:	05/01/2024	Stephen Clark, Technical Director at Pacific EcoRisk (PER), notified (via email) Melissa Turner (DRMP Program Manager), Selina Cole (Region 5 QA Representative) and the Toxicity Identification Evaluation (TIE) Advisory Committee that a shipment of *Pimephales promelas* (*P. promelas*) was delayed in shipping, and that toxicity test initiation would exceed the 48-hour hold time as outlined in the QAPP.
Date DRMP Program Manager was notified:	05/01/2024	

	Date	Notes/Description (optional)
Date CVRWQCB QA Representative Notified:	05/01/2024	
Deviation Form sent for Review:	08/28/2024	Stephen Clark (PER Technical Director)
Deviation Form sent for Review:	08/30/2024	Will Hagan (DRMP QA Officer)
Deviation Form Sent for CVRWQCB Review:	10/17/2024	
Approval Letter Received from CVRWQCB:	02/28/2025	The Central Valley Regional Water Quality Control Board's QA Representative position is currently vacant; however, Regional Board staff have reviewed the submitted QAPP Deviations Form and find the corrective actions sufficient. Regional Board approval was provided by Patrick Pulupa (CVRWQCB Executive Officer) for 5 deviations including this one. The approval letter was sent to Debbie Mackey (DRMP President) on February 28, 2025.
Deviation Form Sent for Signatures post approval:	03/17/2025	

Description of Deviation/Change:

Current Use Pesticide (CUP) monitoring for Water Year (WY) 2024 occurred on April 29 and 30, 2024 for the spring snow melt event. Stephen Clark (Pacific EcoRisk) informed the Delta Regional Monitoring Program (DRMP) and the Toxicity Identification Evaluation (TIE) Advisory Committee in the evening of May 1, 2024 that an order of fathead minnows (*P. promelas*) were packaged and shipped on April 30, 2024 for overnight delivery but the delivery was delayed in route. The TIE Advisory Committee includes the Central Valley Regional Water Quality Control Board (CVRWQCB) Quality Assurance (QA) Representative.

In tracking the order, Pacific EcoRisk (PER) staff noted that the package had been delayed at the FedEx Memphis, TN shipping hub. PER staff called FedEx and FedEx representatives indicated that the package would arrive at PER by 3:00 p.m. on May 1, 2024 in time for initiating toxicity tests for samples collected on April 30, 2024 to meet the 48 hours hold time requirement. However, the organisms did not arrive on May 1, 2024 as expected which resulted in Stephen Clark emailing the following options and looking for direction from the TIE Advisory Committee:

1. Assuming that we receive the organisms tomorrow, we can initiate the testing outside of the 36 hr holding time limit but within the maximum of 72 hrs cited in the method manuals with

justifications for such shipping delays. However, the fish will be >48 hrs old, which is outside the requirement of <48 hrs old if shipped.

2. We can order new fish to be of the proper age, but they would arrive late in the morning on Friday, and depending on the receipt time of the shipment, some if not all of the samples will be outside of the maximum of 72 hrs holding time since they were collected on 4/30 from 10:35 a.m. to 12:45 p.m.

3. Do not test the four affected samples with the fathead minnow.

After some discussion via email and text messages, the TIE Advisory Committee members agreed to forgo *P. promelas* testing for the affected samples (4 environmental samples) since the delayed toxicity testing would occur outside of the CUP Quality Assurance Project Plan (QAPP) holding time limits for water samples and the organisms would be older than specified (>48 hours) in the test procedures.

This deviation affected four environmental samples collected on April 30, 2024 from stations Conf-009, Conf-010, Conf-011, and Conf-012.

Reason for Deviation/Change

A shipment of *P. promelas* test organisms was delayed in shipping, and toxicity test initiation could not be initiated within the 48-hour hold time limit per the CUP QAPP v1.5. The TIE Advisory Committee members discussed the option of initiating toxicity tests for *P. promelas* outside of the 48-hour holding time limit for the water samples (but still within the maximum of 72 hours cited in the method manuals with justifications for such shipping delays); however, this would create a scenario where the test organisms would exceed the age limitation for shipped organisms which is less than 48 hours and be run outside of hold time.

The option of ordering more test organisms was also discussed, but by the time the fish would arrive, the water samples would be outside of the QAPP hold time of 48 hours and also outside of the maximum 72-hour hold time of the method.

After considering these options, the TIE Advisory Committee members decided to forgo testing of *P. promelas* for the samples collected on April 30, 2024, as the results would potentially be inconclusive, and qualifiers would be required in either scenario. Stephen Clark also noted that there are no vendors in California for this test species. The current vendor is in Arkansas, with a backup in Colorado.

Impact on Present and Completed Work (discuss potential magnitude of impact and bias of deviation/change, if this can be anticipated, if no impact is expected please indicate this)

The WY 2024 (Year 4) data will be incomplete for *P. promelas* testing for samples collected from the Confluence Subregion for: Event 1 (2 samples not tested due to high conductivity, Deviation 2023-06_CUPv1.4_Dev_WY24Event1_PER_MissingTests_HighSalinity) and Event 3 (4 samples not tested due to delays in receiving test organisms, Deviation 2023-13_CUPv1.5_Dev_WY24Event3_PER_PimphalesMissedHoldTime).

At the time of this deviation form, 6 of the 24 samples collected for *P. promelas* toxicity testing are incomplete. This might have an impact on the interpretation of toxicity to fish in the Confluence Subregion. However, all samples collected from the two fixed sites (Buckley Cove and Ulatis Creek) have been tested for toxicity to *P. promelas*.

Since shipping delays are outside of the control of the laboratory or the DRMP, the only corrective action to take is to add comments in the database indicating why there are not *P. promelas* results for these samples.

Corrective Action	By Date	By Whom
A sample and collection comment was added to Stations Conf-009, Conf-010, Conf-011 and Conf-012 which states: "*Pimephales* was not tested at this station due to delays in shipping larvae."	June 1, 2024	Cassandra Lamerdin, DRMP Data Manager

ACKNOWLEDGED BY:

Pacific EcoRisk Technical Director:	DocuSigned by: STEPHEN CLARK C4D43551B2BC478...	Date:	3/17/2025
	Stephen Clark		

DRMP Program Manager:	DocuSigned by: Melissa Turner 9798DD915C44448...	Date:	3/27/2025
	Melissa Turner		

DRMP QA Officer:	DocuSigned by: Will Hagan A4691C48F968433...	Date:	3/27/2025
	Will Hagan		

CVRWQCB QA Representative*:	**Not Applicable**	Date:	02/28/2025
	Vacant		

*While these QAPP Deviation Forms will remain unsigned by the Central Valley Water Board due to the vacant QA Representative position, the current form is approved based on CVRWQCB staff scientist review and approval by the Central Valley Regional Water Quality Control Board Executive Officer Patrick Pulupa.

Corrective Action

1.0 Incident Summary

Date of Incident:	5/1/24
Incident:	Chronic fathead minnow testing could not be initiated due to organisms not arriving.
Nonconformance Source:	Non-Conforming Data
Incident Cause:	Shipping delay
Incident Investigator:	Kevin Lung, Quality Manager
Corrective Action Taken:	None
Corrective Action Implemented by:	Kevin Lung, Quality Manager
Monitoring of Corrective Action:	No further incidents occurred in the following 30 days.

2.0 Nonconformance Evaluation

On 5/1/24, NK notified the Lab Manager that the less than 48-hour old *Pimephales promelas* that had been ordered for Delta RMP chronic fathead minnow Control 2 (Test ID's #104793-104796, Project #35355) had not arrived. An investigation was performed to determine the cause of the missing organisms.

3.0 Root Cause

Shipping Delay

Although the correct amount and age of organisms were ordered, it was noted by Lab Management that the organisms had not arrived by the expected time. PER reached out to our FedEx (shipping company) account representative and left her a voicemail indicating that their online tracking system indicated that the organisms were still in Memphis one day after they were shipped and to check on the status of the delivery. As the account representative could not be reached, we reached out to the FedEx customer service department who indicated that the online information was in error and that we should receive the fish by 3:00 p.m.; although this would be late in the day, we could still initiate the testing by having staff stay late. Our account representative received the voicemail and followed up around 3:00 p.m. and indicated that the shipment was in fact still in Memphis and that the customer service representative was wrong that the organisms would be received in time for our testing. SLC reached out to the Delta RMP TIE Subcommittee to inform them of the delay in organism shipping and was instructed that the chronic *Pimephales promelas* test would not be performed for samples collected on April 30 since the samples would either be outside of the maximum hold time of 72 hours or fish >48 hours old from an external vendor would need to be used for the testing. A shipping delay was the cause of the test not being initiated as it was scheduled.

4.0 Corrective Action/Implemented by

Corrective Action: How will the situation be corrected? Who will implement?

No corrective action was necessary at this time.

5.0 Preventative Action

Preventative Action: Identify preventative measures that will be implemented. Who will implement?

No preventative action was necessary at this time.

6.0 Monitoring of Corrective Action Effectiveness

No further incidents occurred in the following 30 days.

Incident Open Date: 5/1/24 Incident Close Date: 6/1/24

Prepared By: Kevin Lung Quality Manager's Signature: Kevin Lung

Technical Director: Stephen Clark Technical Director's Signature:

Study Guidance Form

Client:	Delta RMP 2	Test Date:	5/1/24
Sample Description:	Ambient Water	Test ID #:	-
Species and Test Description:	C. FHM	Project #:	35355

Special Instructions:

SWAMP MQO conductivity range: 100-1900 uS/cm. Prepare high conductivity control for samples >1900 µS/cm by adding filtered seawater to EPAMH to match teh conductivity of each sample.

Do not test with samples >6000µS/cm, rather test with *Menidia*

Measure and record ammonia at initiation and termination - CONTROL TOO!!
INITIATION AMMONIA CAN BE TRANSCRIBED FROM LOG-INS

WQ Analysts: Please make sure ALL old WQ fields are complete prior to dumping aliquots. Double check any anomalous values with another meter and record on observation sheet as appropriate.

**Aerate any test treatments that measure ≤4.0 mg/L; see SVV if low, but >4.0 mg/L

**At initiation, please have second analyst confirm all test replicates have been loaded with 10 orgs each
Confirmation signoff: _____

TIE Trigger: ≥50% reduction in survival or growth

Please document PRM, photo evidence not needed
Test run in shell vials

Feed prior to maint!

Scientist 1t only please!

General Guidance:

7 Day Chronic Fathead Minnow Toxicity Test Data

Material: **Lab Control-2** Organism Log #: _____

Client: **Delta RMP** Test Date: 5/1/24 Organism Age: _____

Project #: 35355 Test ID: 104793-104796 Control Water: EPAMH Organism Supplier: _____

Lab Water Control-2

Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	Survival A	B	C	D	E	F	G	H	I	J	SIGN-OFF
0	7.40		8.9		340	24.5											Date: 5/1/24 New WQ: 40 Test Init.: Sol'n Prep: TK Time:
1																	Date: New WQ: Counts: Sol'n Prep: Old WQ: Time:
2																	Date: New WQ: Counts: Sol'n Prep: Old WQ: Time:
3																	Date: New WQ: Counts: Sol'n Prep: Old WQ: Time:
4																	Date: New WQ: Counts: Sol'n Prep: Old WQ: Time:
5																	Date: New WQ: Counts: Sol'n Prep: Old WQ: Time:
6																	Date: New WQ: Counts: Sol'n Prep: Old WQ: Time:
7																	Date: Old WQ: Test Term: Time:

Day	Survival K	L	M	N	O	P	Q	R	S	T
0										
1										
2										
3										
4										
5										
6										
7										

7 Day Chronic Fathead Minnow Toxicity Test Data

Material: CONF-009 Organism Log #: _____

Client: Delta RMP Test Date: 5/1/24 Organism Age: _____

Project #: 35355 Test ID: 104793 Control Water: EPAMH Organism Supplier: _____

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	Survival A	B	C	D	E	F	G	H	I	J	SIGN-OFF
100%	0	7.37		9.4		192	24.3											Date: 5/1/24 New WQ: MD Test Init.: Sol'n Prep: TL Time:
	1																	Date: New WQ: Counts: Sol'n Prep: Old WQ: Time:
	2																	Date: New WQ: Counts: Sol'n Prep: Old WQ: Time:
	3																	Date: New WQ: Counts: Sol'n Prep: Old WQ: Time:
	4																	Date: New WQ: Counts: Sol'n Prep: Old WQ: Time:
	5																	Date: New WQ: Counts: Sol'n Prep: Old WQ: Time:
	6																	Date: New WQ: Counts: Sol'n Prep: Old WQ: Time:
	7																	Date: Old WQ: Test Term: Time:

Day	Survival K	L	M	N	O	P	Q	R	S	T	Sample ID
0											70620
1											
2											
3											
4											
5											
6											
7											

7 Day Chronic Fathead Minnow Toxicity Test Data

Material: **CONF-010** Organism Log #: _____

Client: **Delta RMP** Test Date: 5/1/24 Organism Age: _____

Project #: 35355 Test ID: 104794 Control Water: EPAMH Organism Supplier: _____

Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	Survival A	B	C	D	E	F	G	H	I	J	SIGN-OFF
0	7.35		9.6		213	24.4											Date: 5/1/24 New WQ: HD Test Init.: Sol'n Prep: TL Time:
1																	Date: New WQ: Counts: Sol'n Prep: Old WQ: Time:
2																	Date: New WQ: Counts: Sol'n Prep: Old WQ: Time:
3																	Date: New WQ: Counts: Sol'n Prep: Old WQ: Time:
4																	Date: New WQ: Counts: Sol'n Prep: Old WQ: Time:
5																	Date: New WQ: Counts: Sol'n Prep: Old WQ: Time:
6																	Date: New WQ: Counts: Sol'n Prep: Old WQ: Time:
7																	Date: Old WQ: Test Term: Time:

Day	Survival K	L	M	N	O	P	Q	R	S	T	Sample ID
0											70621
1											
2											
3											
4											
5											
6											
7											

100%

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7 Day Chronic Fathead Minnow Toxicity Test Data

Material: CONF-011 Organism Log #: _____

Client: Delta RMP Test Date: 5/1/24 Organism Age: _____

Project #: 35355 Test ID: 104795 Control Water: EPAMH Organism Supplier: _____

100%

Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	Survival A	B	C	D	E	F	G	H	I	J	SIGN-OFF
0	7.36		9.8		154	24.6											Date: 5/1/24 New WQ: HD Test Init.: Sol'n Prep: TK Time:
1																	Date: New WQ: Counts: Sol'n Prep: Old WQ: Time:
2																	Date: New WQ: Counts: Sol'n Prep: Old WQ: Time:
3																	Date: New WQ: Counts: Sol'n Prep: Old WQ: Time:
4																	Date: New WQ: Counts: Sol'n Prep: Old WQ: Time:
5																	Date: New WQ: Counts: Sol'n Prep: Old WQ: Time:
6																	Date: New WQ: Counts: Sol'n Prep: Old WQ: Time:
7																	Date: Old WQ: Test Term: Time:

Day	Survival K	L	M	N	O	P	Q	R	S	T	Sample ID
0											70622
1											-
2											
3											
4											
5											
6											
7											

7 Day Chronic Fathead Minnow Toxicity Test Data

Client: **Delta RMP** Material: **CONF-012** Organism Log #:

Project #: 35355 Test ID: 104796 Test Date: 5/1/24 Organism Age:

Control Water: EPAMH Organism Supplier:

100%

Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	Survival A	B	C	D	E	F	G	H	I	J	SIGN-OFF
0	7.46		9.7		167	24.6											Date: 5/1/24 New WQ: HD Test Init.: Sol'n Prep: TC Time:
1																	Date: New WQ: Counts: Sol'n Prep: Old WQ: Time:
2																	Date: New WQ: Counts: Sol'n Prep: Old WQ: Time:
3																	Date: New WQ: Counts: Sol'n Prep: Old WQ: Time:
4																	Date: New WQ: Counts: Sol'n Prep: Old WQ: Time:
5																	Date: New WQ: Counts: Sol'n Prep: Old WQ: Time:
6																	Date: New WQ: Counts: Sol'n Prep: Old WQ: Time:
7																	Date: Old WQ: Test Term: Time:

Day	Survival K	L	M	N	O	P	Q	R	S	T	Sample ID
0											70623
1											
2											
3											
4											
5											
6											
7											

7 Day Chronic Fathead Minnow Toxicity Test Data

Client: **Delta RMP** Material: **Meter ID's** Test Date: 5/1/24

Project #: 35355 Test ID: - Control / Diluent: EPAMH

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	SIGN-OFF
Meter ID's	0	pH26		RD15		EC15	159A	Date: 5/1/24 New WQ: HD
	1							Date: New WQ: Old WQ:
	2							Date: New WQ: Old WQ:
	3							Date: New WQ: Old WQ:
	4							Date: New WQ: Old WQ:
	5							Date: New WQ: Old WQ:
	6							Date: New WQ: Old WQ:
	7							Date: Old WQ:

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Comments and Observations

Client: Delta RMP C2
Sample Description: Multiple
Species and Test Description: C. FHM

Test Date: 5/11/24
Test ID #: 104793-104796
Project #: 35355

Date	Initials	Description of Observation:
5/11/24	TF	Ammonia S

	T0	Tfinal
LWC	<1.00	
Cent 9	<1.00	
Cent 10	<1.00	
Cent 11	<1.00	
Cent 12	<1.00	
Meter ID	DR3800	

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.

Deviation Report / Corrective Action Form

Title:	**CUP Event 3 (WY24) *Ceriodaphnia* Toxicity Test Lost Control**
Deviation Number:	2023-14_CUPv1.5_Dev_WY24Event3_PER_CeriodaphniaControlLost
Prepared By:	Robert Pangle, MLJ Environmental
Attached:	2023-14_050224_DeltaRMP_NonConfirmingDataReport_ChronicCeriodaphnia.pdf

Applicable Reference(s):

Delta Regional Monitoring Program Quality Assurance Project Plan for Current Use Pesticides in the Sacramento-San Joaquin Delta Version 1.5, February 09, 2024

Complete the following table regarding the major milestones for the relevant deviation. Add additional rows as needed.

	Date	Notes/Description (optional)
Date Deviation Occurred:	05/02/2024	Stephen Clark, Technical Director at Pacific EcoRisk (PER), notified (via email) Melissa Turner (DRMP Program Manager), Selina Cole (Region 5 QA Representative) and the Toxicity Identification Evaluation (TIE) Advisory Committee that PER had accidently disposed of *Ceriodaphnia dubia* control treatments for a set of toxicity tests related to samples collected on April 30, 2024 (Event 3).
Date DRMP Program Manager was notified:	05/02/2024	
Date CVRWQCB QA Representative Notified:	05/02/2024	

	Date	Notes/Description (optional)
Deviation Form sent for Review:	08/28/2024	Stephen Clark (PER Technical Director)
Deviation Form sent for Review:	08/30/2024	Will Hagan (DRMP QA Officer)
Deviation Form Sent for CVRWQCB Review:	10/17/2024	
Approval Letter Received from CVRWQCB:	02/28/2025	The Central Valley Regional Water Quality Control Board's QA Representative position is currently vacant; however, Regional Board staff have reviewed the submitted QAPP Deviations Form and find the corrective actions sufficient. Regional Board approval was provided by Patrick Pulupa (CVRWQCB Executive Officer) for 5 deviations including this one. The approval letter was sent to Debbie Mackey (DRMP President) on February 28, 2025.
Deviation Form Sent for Signatures post approval:	03/17/2025	

Description of Deviation/Change:

Current Use Pesticide (CUP) monitoring for Water Year (WY) 2024 occurred on April 29 and 30, 2024 for the spring snow melt event. Stephen Clark, Technical Director at Pacific EcoRisk (PER), notified (via email) Melissa Turner (DRMP Program Manager), Selina Cole (Region 5 QA Representative) and the Toxicity Identification Evaluation (TIE) Advisory Committee that PER staff had accidently disposed of *Ceriodaphnia dubia* control treatments for four toxicity tests related to samples collected on April 30, 2024 (Event 3). This deviation affected the following locations/stations: Conf-009, Conf-010, Conf-011, and Conf-012. Stephen Clark indicated on May 2, 2024, that PER staff had re-started the affected tests outside of the standard 48-hour holding time limit (but within the maximal 72-hour holding time limit as outlined in EPA testing methods).

Reason for Deviation/Change

Stephen Clark indicated that the staff member involved was an experienced analyst, and that the premature disposal of the control treatments was accidental. The staff member self-reported the mistake and will undergo re-training on this toxicity testing method (which is required by the quality management system at PER when incidents such as this occur). The incident will also be written up in a performance report. In summary, a technical mistake by PER staff was the contributing factor to this error.

Impact on Present and Completed Work (discuss potential magnitude of impact and bias of deviation/change, if this can be anticipated, if no impact is expected please indicate this)

There were four stations (Conf-009, Conf-010, Conf-011 and Conf-012) sampled on April 30, 2024 that will have *C. dubia* toxicity tests performed outside of the 48-hour hold time limit (but within the maximal 72-hour holding time limit as outlined in EPA testing methods). Environmental samples affected were retested within five hours of the 48-hold time. Data will be flagged appropriately to indicate the hold time violation.

Corrective Action	By Date	By Whom
The PER staff member involved with the incident was re-trained on culturing and toxicity testing methods (which is required by the quality management system at PER when incidents such as this occur).	05/02/2024	Stephen Clark, Technical Director at PER
Station locations Conf-009, Conf-010, Conf-011 and Conf-012 sampled on April 30, 2024 (Event 3) will have toxicity test level QA Code of "H" [holding time violation has occurred] added to the *C. dubia* summary records and a comment with the time out of hold based on the collection time of each sample. The following generic comment will be updated with the specific time: "Organisms in initial test were poured out on Day 1. Testing reinitiated outside of standard 48-hr (X hr, XX min) but within maximum 72-hr hold time."	07/05/2024	Cassandra Lamerdin, DRMP Data Manager
Add a Lab Batch comment that samples were run out of hold time.	07/05/2024	Cassandra Lamerdin, DRMP Data Manager
Laboratory performance will be monitored against the completeness requirements of the QAPP referenced above	Ongoing	Will Hagan, DRMP QA Officer

ACKNOWLEDGED BY:

Pacific EcoRisk Technical Director:	DocuSigned by: STEPHEN CLARK C4D43551B2BC478...	Date:	3/17/2025
	Stephen Clark		

DRMP Program Manager:	DocuSigned by: Melissa Turner 9796DD915C44446...	Date:	3/27/2025
	Melissa Turner		

DRMP QA Officer:	DocuSigned by: Will Hagan A4891C48F968433...	Date:	3/27/2025
	Will Hagan		

CVRWQCB QA Representative*:	**Not Applicable**	Date:	02/28/2025
	Vacant		

*While these QAPP Deviation Forms will remain unsigned by the Central Valley Water Board due to the vacant QA Representative position, the current form is approved based on CVRWQCB staff scientist review and approval by the Central Valley Regional Water Quality Control Board Executive Officer Patrick Pulupa.

Corrective Action

1.0 Incident Summary

Date of Incident:	5/2/24
Incident:	Control 2 was terminated early invalidating the test
Nonconformance Source:	Non-Conforming Data
Incident Cause:	Technical Mistake by PER Staff
Incident Investigator:	Kevin Lung, Quality Manager
Corrective Action Taken:	Retest, Performance Evaluation issued, retraining
Corrective Action Implemented by:	Kevin Lung, Quality Manager
Monitoring of Corrective Action:	EK will be monitored for 30 days to assure that the same mistake does not occur.

2.0 Nonconformance Evaluation

On 5/2/24, ER notified the Quality Manager that he had accidentally disposed of the incorrect set of vials containing the adult organisms and had therefore terminated the Control 2 treatment for Delta RMP chronic *Ceriodaphnia dubia* control two (Test ID's #104766-104769, Project #35355). An investigation was performed to determine the cause of the mistake.

3.0 Root Cause

Technical Mistake by PER Staff

When interviewed, experienced analyst ER noted that he had accidentally terminated the vials containing the adult organisms after solution renewal, and immediately thereafter realized what he had done. He noted that he had been working almost exclusively on a special project for the last few weeks that had him maintaining *Ceriodaphnia* in a slightly different manner than usual, and he had not caught his mistake in time to correct it. He immediately notified the Quality Manager so a retest could be initiated. A technical mistake by PER staff was the contributing factor to this test being invalidated.

4.0 Corrective Action/Implemented by

Corrective Action: How will the situation be corrected? Who will implement?

A retest was immediately initiated (Test ID's #105848-105851) which met TAC, and a Performance Evaluation was issued to ER.

5.0 Preventative Action

Preventative Action: Identify preventative measures that will be implemented. Who will implement?

ER was immediately retrained in chronic *Ceriodaphnia* testing and reminded of the importance of ensuring you are not terminating the incorrect set of vials by setting up the workstation with 'new' chambers where adults are transferred in the back and the 'old' chambers that would not be containing the adults in the front and to check a representative test chamber for organisms prior to pouring them out.

6.0 Monitoring of Corrective Action Effectiveness

No further incidents occurred in the following 30 days.

Incident Open Date: 5/2/24 Incident Close Date: 6/2/24

Prepared By: Kevin Lung Quality Manager's Signature: Kevin Lung

Technical Director: Stephen Clark Technical Director's Signature:

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

Client: **Delta RMP** Material: **CONF-009** Test Date: 5/1/24

Project #: 35355 Test ID: 104766 Randomization: — Control Water: Mod EPAMH

Lab Water Control

Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Ammonia (mg/L)	Temp (°C)	Survival / Reproduction A	B	C	D	E	F	G	H	I	J	SIGN-OFF
0	7.45		8.6		348	4.00	24.2	0	0	0	0	0	0	0	0	0	0	Date: 5/1/24 New WQ: 035 Test Init.: ES3 Sol'n Prep: 035 Time: 1240
1	8.15		8.9		352			0	0	0	0	0	0	0	0	0	0	Date: 5/2/24 New WQ: 26 Counts: Sol'n Prep: AM Old WQ: Time: 1318
2																		Date: New WQ: Counts: Sol'n Prep: Old WQ: Time:
3																		Date: New WQ: Counts: Sol'n Prep: Old WQ: Time:
4																		Date: New WQ: Counts: Sol'n Prep: Old WQ: Time:
5																		Date: New WQ: Counts: Sol'n Prep: Old WQ: Time:
6																		Date: New WQ: Counts: Sol'n Prep: Old WQ: Time:
7																		Date: New WQ: Counts: Sol'n Prep: Old WQ: Time:
8																		Date: Old WQ: Counts: Time:
							Total=											Mean Neonates/Female =

100%

Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Ammonia (mg/L)	Temp (°C)	Survival / Reproduction A	B	C	D	E	F	G	H	I	J	Sample ID
0	7.51		8.8		200	<100	25.7	0	0	0	0	0	0	0	0	0	0	70620
1	8.07		9.2		195													70620
2																		
3																		
4																		
5																		
6																		
7																		
8																		
							Total=											Mean Neonates/Female =

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

Client: **Delta RMP** Material: **CONF-010** Test Date: 5/1/24

Project #: 35355 Test ID: 104767 Randomization: — Control Water: Mod EPAMH

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Ammonia (mg/L)	Temp (°C)	Survival / Reproduction A	B	C	D	E	F	G	H	I	J	SIGN-OFF
Lab Water Control	0	7.95		8.6		348	<1.00	24.2											Date: 5/1/24 New WQ: ES Test Init.: ES Sol'n Prep: ES Time: 1240
	1	8.15		8.9		352													Date: 5/7/24 New WQ: AC Counts: Sol'n Prep: AC Old WQ: Time:
	2																		Date: New WQ: Counts: Sol'n Prep: Old WQ: Time:
	3																		Date: New WQ: Counts: Sol'n Prep: Old WQ: Time:
	4																		Date: New WQ: Counts: Sol'n Prep: Old WQ: Time:
	5																		Date: New WQ: Counts: Sol'n Prep: Old WQ: Time:
	6																		Date: New WQ: Counts: Sol'n Prep: Old WQ: Time:
	7																		Date: New WQ: Counts: Sol'n Prep: Old WQ: Time:
	8																		Date: Old WQ: Counts: Time:
								Total=											Mean Neonates/Female =

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Ammonia (mg/L)	Temp (°C)	Survival / Reproduction A	B	C	D	E	F	G	H	I	J	Sample ID
100%	0	7.44		9.6		213	<1.00	25.6											70621
	1	7.48		9.4		210													70621
	2																		
	3																		
	4																		
	5																		
	6																		
	7																		
	8																		
								Total=											Mean Neonates/Female =

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

Client: **Delta RMP** Material: **CONF-011** Test Date: 5/1/24

Project #: 35355 Test ID: 104768 Randomization: — Control Water: Mod EPAMH

Lab Water Control

Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Ammonia (mg/L)	Temp (°C)	Survival / Reproduction A	B	C	D	E	F	G	H	I	J	SIGN-OFF
0	7.45		8.6		348	<1.00	24.2	0	0	0	0	0	0	0	0	0	0	Date: 5/1/24 New WQ: 651 Test Init.: CAS Sol'n Prep: ESS Time: 10:10
1	8.15		8.9		352													Date: 5/2/24 New WQ: 26 Sol'n Prep: AM Old WQ: Time:
2																		Date: New WQ: Counts: Sol'n Prep: Old WQ: Time:
3																		Date: New WQ: Counts: Sol'n Prep: Old WQ: Time:
4																		Date: New WQ: Counts: Sol'n Prep: Old WQ: Time:
5																		Date: New WQ: Counts: Sol'n Prep: Old WQ: Time:
6																		Date: New WQ: Counts: Sol'n Prep: Old WQ: Time:
7																		Date: New WQ: Counts: Sol'n Prep: Old WQ: Time:
8																		Date: Old WQ: Counts: Time:
							Total=											Mean Neonates/Female =

100%

Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Ammonia (mg/L)	Temp (°C)	Survival / Reproduction A	B	C	D	E	F	G	H	I	J	Sample ID
0	7.47		9.6		153	<1.00	24.7	0	0	0	0	0	0	0	0	0	0	70622
1	7.89		9.3		145													70632
2																		
3																		
4																		
5																		
6																		
7																		
8																		
							Total=											Mean Neonates/Female =

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

Client: **Delta RMP** Material: **CONF-012** Test Date: 5/1/24

Project #: 35355 Test ID: 104769 Randomization: — Control Water: Mod EPAMH

Lab Water Control

Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Ammonia (mg/L)	Temp (°C)	Survival / Reproduction A	B	C	D	E	F	G	H	I	J	SIGN-OFF
0	7.45		8.2		348	<1.00	24.2											Date: 5/1/24 New WQ: CSS Test Init.: ESI Sol'n Prep: ESI Time: 1140
1	8.15		8.9		352													Date: 5/2/24 New WQ: 126 Counts: Sol'n Prep: AMW Old WQ: Time:
2																		Date: New WQ: Counts: Sol'n Prep: Old WQ: Time:
3																		Date: New WQ: Counts: Sol'n Prep: Old WQ: Time:
4																		Date: New WQ: Counts: Sol'n Prep: Old WQ: Time:
5																		Date: New WQ: Counts: Sol'n Prep: Old WQ: Time:
6																		Date: New WQ: Counts: Sol'n Prep: Old WQ: Time:
7																		Date: New WQ: Counts: Sol'n Prep: Old WQ: Time:
8																		Date: Old WQ: Counts: Time:
							Total=											Mean Neonates/Female =

100%

Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Ammonia (mg/L)	Temp (°C)	Survival / Reproduction A	B	C	D	E	F	G	H	I	J	Sample ID
0	7.44		9.5		169	<1.00	24.1											70623
1	7.90		9.2		161													70623
2																		
3																		
4																		
5																		
6																		
7																		
8																		
							Total=											Mean Neonates/Female =

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

Client: **Delta RMP** Material: **Meter ID's** Test Date: 5/1/24

Project #: 35355 Test ID: Multiple Control / Diluent: Mod EPAMH

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	SIGN-OFF
Meter ID's	0	pH26		RD15		EC15	88A	Date: 5/1/24 New WQ: ESS
	1	PH29		RD15		EC12		Date: 5/2/24 New WQ: R6 Old WQ:
	2							Date: New WQ: Old WQ:
	3							Date: New WQ: Old WQ:
	4							Date: New WQ: Old WQ:
	5							Date: New WQ: Old WQ:
	6							Date: New WQ: Old WQ:
	7							Date: New WQ: Old WQ:
	8							Date: Old WQ:

Comments and Observations

Client: Delta RMP Test Date: 5/1/24

Sample Description: Ambient water Test ID #: multiple

Species and Test Description: C. Cerio Project #: 35355

Date	Initials	Description of Observation:
5/1/24	ESS	Board # 5982

Neonates	
2200	
0600	
Other	1200

Row	Board cup
A	1D
B	2C
C	2D
D	2F
E	2G
F	2H
G	2I
H	3E
I	3F
J	6J

General Guidance:

1) All observations are to be recorded on this sheet and transcribed 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 observations 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. Measured on second meter and confirmed conductivity of sample. New sample had >10% difference in conductivity than previous sample.

Deviation Report / Corrective Action Form

Title:	**CUP Event 3 (WY24) *Chironomus* larvae final ash-free dry weights measured incorrectly; t(0) AFDW not calculated**
Deviation Number:	2023-15_CUPv1.5_Dev_WY24Event3_PER_Chironomus_MissingInitialWt_Cntr1
Prepared By:	Robert Pangle
Attached:	2023-15_043024_DeltaRMP_NonConformingData_ChironomusT0Weight_PanError.pdf

Applicable Reference(s):

Delta Regional Monitoring Program Quality Assurance Project Plan for Current Use Pesticides in the Sacramento-San Joaquin Delta Version 1.5, February 09, 2024

Complete the following table regarding the major milestones for the relevant deviation. Add additional rows as needed.

	Date	Notes/Description (optional)
Date Deviation Occurred:	05/01/2024	The t(0) final ash-free dry weight (AFDW) measurements associated with DRMP's 10-day chronic water exposure *Chironomus dilutus* toxicity test for Control Batch 1 (associated with Event 3 monitoring) was measured incorrectly; therefore the t(0) AFDW could not be calculated.
Date DRMP Program Manager was notified:	05/13/2024	Stephen Clark, Technical Director at Pacific EcoRisk (PER), notified (via email) Melissa Turner (DRMP Technical Program Manager) and Selina Cole (Region 5 QA Representative) of a deviation regarding *C. dilutus* testing in which toxicity tests for Control Batch 1 were measured incorrectly.

	Date	Notes/Description (optional)
Date CVRWQCB QA Representative Notified:	05/13/2024	
Non-conforming Report sent:	05/13/2024	Initial Non-Conforming Report (NCR) sent from Stephen Clark (PER) to MLJ.
Deviation Form sent for Review:	08/28/2024	Stephen Clark (PER Technical Director)
Deviation Form sent for Review:	08/30/2024	Will Hagan (DRMP QA Officer)
Deviation Form Sent for CVRWQCB Review:	10/17/2024	
Approval Letter Received from CVRWQCB:	02/28/2025	The Central Valley Regional Water Quality Control Board's QA Representative position is currently vacant; however, Regional Board staff have reviewed the submitted QAPP Deviations Form and find the corrective actions sufficient. Regional Board approval was provided by Patrick Pulupa (CVRWQCB Executive Officer) for 5 deviations including this one. The approval letter was sent to Debbie Mackey (DRMP President) on February 28, 2025.
Deviation Form Sent for Signatures post approval:	03/17/2025	

Description of Deviation/Change:

The t(0) final ash-free dry weight (AFDW) measurements associated with Delta RMP's 10-day chronic water exposure *Chironomus dilutus* toxicity tests for Control Batch 1 (associated with Event 3 monitoring) were measured incorrectly; therefore the t(0) AFDW could not be calculated. In this incident, the wrong pans were weighed prior to placing pans and organisms in the muffle furnace for ashing. The dry weights of the small pans with the organisms should have been weighed prior to placing the pans into the muffle furnace for two hours at 550°C. However, only the outer pans were weighed prior to placement into the furnace (i.e., outer pans, which are only used for easier identification of pans and organisms). As only the outer pans were weighed before placing everything in the furnace (and not the inner pans that contained the organisms), there was no way to calculate the dry weight of the *C. dilutus* larvae. This deviation affected the Event 3 samples collected on April 29, 2024 from the following stations: 511ULCABR, 544LSAC13, 544LSAC13 (field duplicate), Cent-017, and Cent-018. An investigation was subsequently performed by PER to determine the cause of this error.

Reason for Deviation/Change

The staff member responsible for the incident was interviewed by PER staff and it was confirmed that he had been trained in the relevant laboratory procedures, which included reading the

standard operating procedures (SOPs) that outlined procedures for performing weighing for *C. dilutus* testing. The responsible staff member should have obtained the dry weights of the small pans with the organisms, and then placed the pans into the muffle furnace for two hours at 550°C. However, he weighed the outer pans, which are only used for easier identification of pans (as the sharpie ink used to label pans is removed by the furnace making it difficult to differentiate pans). As the staff member only weighed the outer pans before placing everything in the furnace, and not the inner pans that contained the organisms, there was no way to calculate the dry weight of the *C. dilutus* larvae. The responsible PER staff member noted that he failed to recognize that the pan he was weighing had no organisms or notice that the weights he was recording were more than four times the initial weights, which is anomalous. The responsible staff member also indicated that he did not recall that the SOP specifically states that "Only the inner foil pans will be weighed". The staff member also failed to measure the Quality Assurance (QA) pans, as is required to ensure that weights are consistent. If the staff member had weighed the QA pans and noted that the values were drastically different, it should have been another indication that he was weighing the incorrect pans. Therefore, a technical mistake by PER staff was the cause for the test failing to meet test acceptability criteria.

Impact on Present and Completed Work (discuss potential magnitude of impact and bias of deviation/change, if this can be anticipated, if no impact is expected please indicate this)

The results were reported to the DRMP Program Manager and no retest was scheduled since it is assumed that the initial weights would have met requirements based on the correct age of the organisms. It was reported that the organisms were of the correct age (9 days old) prior to the test initiation and no pupation occurred therefore the lack of an initial weight will not impact test results.

Corrective Action	By Date	By Whom
The responsible PER staff member was issued a Performance Evaluation, and the staff member was retrained on the weighing of test organisms.	05/13/2024	Stephen Clark (PER Technical Director)
Apply MN [Method procedures not followed] to control and samples for Control 1.	07/05/2024	Cassandra Lamerdin (DRMP Data Manager)
Add lab batch comment "MN: Initial weight of LABQA could not be determined due to technician error with weights."	07/05/2024	Cassandra Lamerdin (DRMP Data Manager)
Laboratory performance will be monitored against the completeness requirements of the QAPP referenced above	Ongoing	Will Hagan (DRMP QA Officer)

ACKNOWLEDGED BY:

Pacific EcoRisk Technical Director:	DocuSigned by: STEPHEN CLARK C4D43551B2BC478...	Date:	3/17/2025
	Stephen Clark		

DRMP Program Manager:	DocuSigned by: Melissa Turner 9796DD915C44446...	Date:	3/27/2025
	Melissa Turner		

DRMP QA Officer:	DocuSigned by: Will Hagan A4691C48F968433...	Date:	3/27/2025
	Will Hagan		

CVRWQCB QA Representative*:	**Not Applicable**	Date:	02/28/2025
	Vacant		

*While these QAPP Deviation Forms will remain unsigned by the Central Valley Water Board due to the vacant QA Representative position, the current form is approved based on CVRWQCB staff scientist review and approval by the Central Valley Regional Water Quality Control Board Executive Officer Patrick Pulupa.

Corrective Action

1.0 Incident Summary

Date of Incident:	4/30/24
Incident:	No AFDW for
Nonconformance Source:	Non-Conforming Data
Incident Cause:	Technical Mistake by PER Staff
Incident Investigator:	Kevin Lung, Quality Manager
Corrective Action Taken:	Performance Evaluation issued, staff retraining
Corrective Action Implemented by:	Kevin Lung, Quality Manager
Monitoring of Corrective Action:	No further incidents occurred in the following 30 days.

2.0 Nonconformance Evaluation

The T_0 final ash free dry weight measurements associated with Delta RMP's 10-day chronic water exposure *Chironomus dilutus* toxicity tests Control 1 were measured incorrectly, so the t(0) AFDW could not be calculated . An investigation was performed to determine the cause of the incorrectly weighed pans.

3.0 Root Cause

Technical Mistake by PER Staff

During the investigation, NK was interviewed and confirmed that he had been trained on weights which included reading the SOP which includes how to perform weights for *C. dilutus* testing. He should have performed the dry weights of the small pans with the organisms, and then place the pans into the furnace for two hours at 550°C. However, he weighed the outer pans, which are only used for easier identification of pans as the Sharpie ink used to label pans is removed by the furnace making it difficult to differentiate pans. As he weighed only the outer pans before placing everything in the furnace, and not the inner pans that contained the organisms, there is no way to calculate the dry weight of the *C. dilutus* larvae. NK noted that he failed to recognize that the pan he was weighing had no organisms or notice that the weights he was recording were more than four times the initial weights, which is anomalous. He also indiciated that he did not recall that the SOP specifically states that "Only the inner foil pans will be weighed". NK also failed to measure the QA pans, as is required to ensure that weights are consistent. If he had weighed the QA pans and noted that the values were drastically different, it should have been another indication that he was weighing the incorrect pans. Therefore, a technical mistake by PER staff was the cause for the test failing to meet TAC.

4.0 Corrective Action/Implemented by

Corrective Action: How will the situation be corrected? Who will implement?

The results were reported to the client and no retest was scheduled. NK was issued a Performance Evalaution and was retrained on the weighing of test organisms.

5.0 Preventative Action

Preventative Action: Identify preventative measures that will be implemented. Who will implement?
No preventative actions are necessary.

6.0 Monitoring of Corrective Action Effectiveness

No further incidents occurred in the following 30 days.

Incident Open Date: 5/1/24 Incident Close Date: 6/1/24

Prepared By: Kevin Lung Quality Manager's Signature: Kevin Lung

Technical Director: Stephen Clark Technical Director's Signature:

Weigh Pan Progress Sheet

Client / Project	Delta RMP
Test ID	104770-104774
Organism	*C. dilutus*
Test Material	T0 Weights
Control Batch	Control 1
Test Start Date	4/30/24
Pan Size Needed	*C. dilutus* pans
Date Needed By	4/29/24
Termination Date	5/10/24

Pans Numbered	Date	4/25/24	Signoff	DC
Pans In Furnace@550°C for 2h	Date	4/25/24 @1010	Signoff	DC
Pans Placed In Desiccator	Date	4/25/24 @1210	Signoff	DC
Initial Weights	Date	4/29/24	Signoff	SVV
Test Termination	Date	4/30/24	Signoff	RG
Pans in Oven at 100°C	Date	4/30/24	Signoff	RG
Pans Placed In Desicator	Date		Signoff	
Dry Weights	Date	5/1/24	Signoff	NK
Pans In Furnace@550°C for 2h	Date	05/01/2024 1518	Signoff	NK
Pans Placed In Desicator	Date	5/1/24 1718	Signoff	SVV
Ash-Free Dry Weights	Date	05/03/2024	Signoff	MK

NK 05/03/2024 Incorrect BOX
pans found in desicator on 5/1 - unknown who moved

Pacific EcoRisk

Chironomus dilutus Sediment Toxicity Test Weight Data

Client: **Delta RMP** Initial Wt. Date _____ Sign-off: _____

Test Material: Control 1 - T0 Weights Dry Wt Date: _____ Sign-off: _____

Test ID#: 104770-104774 Project #: 35355 Final Ashed Wt Date: _____ Sign-off: _____

Test Date: _____

Pan ID	Treatment *C. dilutus* pans		Initial Ashed Pan Wt (mg)	Dry Pan + Larvae Wt. (mg)	Ashed Pan + Larvae Wt. (mg)	# of Live Organisms			Mean Dry Weight (mg)	Mean Ash Free Dry Wt. (mg)
						Larvae	Pupae	Adult		
1	Lab Control	A	105.37	405.97	110.72					
2		B	92.08	411.01	117.69					
3		C	97.78	411.24	110.02					
4		D	113.09	418.18	~~102.55~~	115.2				
QA 1			95.23		95.21					
Balance ID				BAL04	BAL04					

5/4/24: Weigh out outer pans & subtract values, transcribe onto new sheet

5/4/24

outer pan 1 405.81

pan 2 411.14

pan 3 411.36

pan 4 418.34

5/4/24

Inner Pan 1: 106.35

Ashed pant lower wt

2: 93.38

3: ~~98.15~~ 98.17

4: 114.79

QA: 95.22

Pacific EcoRisk

Chironomus dilutus Sediment Toxicity Test Weight Data

Client: **Delta RMP**
Test Material: Control 1 - T0 Weights

Initial Wt. Date 4/29/24 Sign-off: SVV
Dry Wt Date: 05/01/24 Sign-off: MK

Test ID#: 104770-104774 Project #: 35355
Test Date: 4/30/24

Final Ashed Wt Date: _____ Sign-off: _____

Pan ID	Treatment		Initial Ashed Pan Wt (mg)	Dry Pan + Larvae Wt. (mg)	Ashed Pan + Larvae Wt. (mg)	# of Live Organisms			Mean Dry Weight (mg)	Mean Ash Free Dry Wt. (mg)
	C. dilutus pans					Larvae	Pupae	Adult		
1	Lab Control	A	105.37		~~110.72~~ 106.35	10	–	–		
2		B	92.08		~~117.64~~ 93.56	10	–	–		
3		C	97.78		~~110.02~~ 95.17	10	–	–		
4		D	113.04		~~115.20~~ 114.79	10	–	–		
QA 1			95.23		~~95.24~~ 95.22					
Balance ID			BAL04	BAL04	BAL04					

Deviation Report / Corrective Action Form

Title:	**CUP Event 3 (WY24) *Chironomus* larvae initial weights greater than 0.012 mg/ individual AFDW**
Deviation Number:	2023-16_CUPv1.5_Dev_WY24Event3_PER_Chironomus_InitialWeights_Cntr2
Prepared By:	Robert Pangle
Attached:	2023-16_050124_DeltaRMP_NonConfirmingDataReport_ChironomusT0Weight.pdf

Applicable Reference(s):

Delta Regional Monitoring Program Quality Assurance Project Plan for Current Use Pesticides in the Sacramento-San Joaquin Delta Version 1.5, February 09, 2024

Complete the following table regarding the major milestones for the relevant deviation. Add additional rows as needed.

	Date	Notes/Description (optional)
Date Deviation Occurred:	05/01/2024	Upon completion of the drying process, the initial Ash-Free Dry Weight (AFDW) was recorded for *Chironomus dilutus* larvae in Control Batch 2 (Event 3 monitoring). The larvae exceeded the Measurement Quality Objective (MQO) of ≤0.12 mg/individual AFDW for t(0) weights.
Date DRMP Program Manager was notified:	05/13/2024	Stephen Clark, Technical Director at Pacific EcoRisk (PER), notified (via email) Melissa Turner (DRMP Technical Program Manager) and Selina Cole (Region 5 QA Representative) of a deviation regarding *C. dilutus* testing that was initiated with organisms above the MQO of ≤0.12 mg/individual AFDW.

	Date	Notes/Description (optional)
Date CVRWQCB QA Representative Notified:	05/13/2024	
Non-conforming Report sent:	05/13/2024	Initial Non-Conforming Report (NCR) sent from Stephen Clark (PER) to MLJ.
Deviation Form sent for Review:	08/28/2024	Stephen Clark (PER Technical Director)
Deviation Form sent for Review:	08/30/2024	Will Hagan (DRMP QA Officer)
Deviation Form Sent for CVRWQCB Review:	10/17/2024	
Approval Letter Received from CVRWQCB:	02/28/2025	The Central Valley Regional Water Quality Control Board's QA Representative position is currently vacant; however, Regional Board staff have reviewed the submitted QAPP Deviations Form and find the corrective actions sufficient. Regional Board approval was provided by Patrick Pulupa (CVRWQCB Executive Officer) for 5 deviations including this one. The approval letter was sent to Debbie Mackey (DRMP President) on February 28, 2025.
Deviation Form Sent for Signatures post approval:	03/17/2025	

Description of Deviation/Change:

PER discovered that the t(0) weights of *Chironomus dilutus* were greater than the Surface Water Ambient Monitoring Program (SWAMP) Measurement Quality Objective (MQO) of ≤0.12 mg/individual mean ash free dry weight (AFDW) for Control Batch 2 associated with Event 3 sampling. The AFDW was 0.16 mg/individual for the organisms from culture #14298 that was used to start toxicity testing on May 1, 2024. An investigation was performed to determine the cause of the increased weight of the organisms used for test initiation on May 1, 2024. The Event 3 samples collected on April 30, 2024 from the following locations were affected by this deviation: Conf-009, Conf-010, Conf-011, and Conf-012.

Reason for Deviation/Change

Organism Quality: The Control Batch 2 testing was initiated on May 1, 2024 using 10-day old larvae reared from egg cases received on April 20, 2024 from Aquatic BioSystems Inc. (PER's primary vendor). The egg cases were received in good condition at arrival with acceptable water

quality parameters. All egg cases were noted as hatching on April 21, 2024 by an experienced PER analyst. The organisms (larvae) were held in-house and monitored closely until they were 10 days old when they were used for test initiation, which is within the required age range for this test method. The culture was observed to be in "good" condition for the duration of holding. Both the Quality Manager and the Assistant Lab Manager noted that the organisms used for test initiation looked physically larger than is typical for 10-day old organisms maintained by PER from egg cases, but that they appeared to be in excellent health. While larvae raised from egg cases by PER tend to have lower weights than larvae received from the vendor, these organisms were larger and more active than is typically seen from larvae raised from egg cases at PER. The visual observation of large larvae at test initiation is consistent with the larger larval t(0) weight. Organism quality (e.g., large larvae) appears to be a contributing factor to the test exceeding the SWAMP MQO for initial weight.

Feeding: All larvae were fed according to PER's Standard Operating Procedure (SOP) and by experienced analysts throughout the husbandry period, and there was no mistake made during organism husbandry that could account for the weight exceeding the SWAMP MQO. However, the hatch from egg cases can vary from several hundred organisms to over 2000, so it is possible that a lower hatching density occurred for these affected trays, which can cause the organisms to grow larger than usual due to having more food per organism in the culture. It should be noted that the *C. dilutus* larvae are very small (near microscopic), making food adjustments based on the quantity of hatching organisms next to impossible. Therefore, food density cannot be ruled out as a contributing factor to the test exceeding the SWAMP MQO.

Impact on Present and Completed Work (discuss potential magnitude of impact and bias of deviation/change, if this can be anticipated, if no impact is expected please indicate this)

The SWAMP MQO of AFDW ≤0.12 mg/individual is presumably targeted to reduce the likelihood of pupation/hatching during the 10-day test. Even though the larval t(0) weight in Control Batch 2 was 0.16 mg/individual, there were no pupating organisms in this control batch. Therefore, it is not expected that the larger larvae at the test start had an effect on the test batch results.

Corrective Action	By Date	By Whom
The Tox Test Level QA Code of TAF [Test organisms exceed the maximum weight requirement at test initiation] will be applied to the affected samples in Control Batch 2.	Prior to Electronic Data Deliverable Submission to MLJ data management team	Stephen Clark, Pacific EcoRisk Technical Director
Laboratory performance will be monitored against the completeness requirements of the QAPP referenced above	Ongoing	Will Hagan (DRMP QA Officer)

ACKNOWLEDGED BY:

Pacific EcoRisk Technical Director:	DocuSigned by: STEPHEN CLARK C4D43551B2BC478...	Date:	3/17/2025
	Stephen Clark		
DRMP Program Manager:	DocuSigned by: Melissa Turner 9796DD915C44446...	Date:	3/27/2025
	Melissa Turner		

DRMP QA Officer:	DocuSigned by: Will Hagan A4691C48F968433...	Date:	3/27/2025
	Will Hagan		

CVRWQCB QA Representative*:	**Not Applicable**	Date:	02/28/2025
	Vacant		

*While these QAPP Deviation Forms will remain unsigned by the Central Valley Water Board due to the vacant QA Representative position, the current form is approved based on CVRWQCB staff scientist review and approval by the Central Valley Regional Water Quality Control Board Executive Officer Patrick Pulupa

Corrective Action

1.0 Incident Summary

Date of Incident:	5/1/24
Incident:	t(0) AFDW exceeds SWAMP MQO of ≤0.12 mg/individual
Nonconformance Source:	Non-Conforming Data
Incident Cause:	Organism Quality
Incident Investigator:	Kevin Lung, Quality Manager
Corrective Action Taken:	None
Corrective Action Implemented by:	Kevin Lung, Quality Manager
Monitoring of Corrective Action:	None needed

2.0 Nonconformance Evaluation

The T_0 final ash free dry weight measurements associated with Delta RMP's 10-day chronic water exposure *Chironomus dilutus* toxicity tests Control 2 exceeded the SWAMP MQO of >0.12 mg/individual. The mean ash free dry weight was 0.16 mg/individual for the organisms from culture #14298 used to start testing on 5/1. An investigation was performed to determine the cause of the increased weight of the organisms used for test initiation on 5/1.

3.0 Root Cause

Organism Quality

The batch 2 testing was initiated on 5/1 using 10-day old larvae reared egg cases received on 4/20 from Aquatic BioSystems Inc. (PER's primary vendor). The egg cases were received in good condition at arrival with acceptable water quality parameters. The organisms were held in-house and monitored closely until they were 10 days old when they were used for test initiation, which is within the required age range for this test method. The culture was observed to be in "good" condition for the duration of holding. Both the Quality Manager and the Assistant Lab Manager both noted that the organisms used for test initiation were larger than is typical for 10-day old organisms maintained by PER from egg cases, but that they appeared to be in excellent health. While larvae raised from egg cases by PER tend to have lower weights then larvae received from the vendor, these organisms were larger and more active than is typically seen from larvae raised from egg cases at PER. The visual observation of large larvae at test initiation is consistent with the larger larval t(0) weight. Organism quality (e.g., large larvae) appears to be a contributing factor to the test exceeding the SWAMP MQO.

Feeding

Three egg cases were received on 4/20 and each was placed in a tray to hatch. All egg cases were noted as hatching on 4/21 by EJS, an experienced analyst. As the larvae were fed consistent with PER's SOP and by very experienced analysts throughout the husbandry period, there was no mistake made during organism husbandry that could account for the weight exceeding the SWAMP MQO. However, the hatch from egg cases can vary from several hundred organisms to over 2000, it is possible that a lower hatching density occurred for these trays, which can cause them to grow larger than usual due to having more food per organism in the culture. Note that the larvae are very small (near microscopic), making food adjustments based on the quantity of hatching organisms next to impossible. Therefore, food density cannot be ruled out as a contributing factor to the test exceeding the SWAMP MQO.

4.0 Corrective Action/Implemented by

Corrective Action: How will the situation be corrected? Who will implement?

The results were reported to the client and no retest was scheduled; therefore, no corrective actions are necessary at this time.

5.0 Preventative Action

Preventative Action: Identify preventative measures that will be implemented. Who will implement?
No preventative actions are necessary.

6.0 Monitoring of Corrective Action Effectiveness

Once the needed document was created, no additional monitoring of this incident was required.

Incident Open Date: 5/1/24 Incident Close Date: 6/1/24

Prepared By: Kevin Lung Quality Manager's Signature: Kevin Lung

Technical Director: Stephen Clark Technical Director's Signature:

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

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

ORGANISM HISTORY

DATE:	4/19/2024
SPECIES:	*Chironomus dilutus (formerly C. tentans)*
AGE:	Deposited on 4/19/2023
LIFE STAGE:	Second Instar 4/28/2024
HATCH DATE:	Emergent date 5/10/2024
BEGAN FEEDING:	Immediately
FOOD:	*Raphidocelis subcapitata.**, Flake slurry

Water Chemistry Record:	**Current**	**Range**
TEMPERATURE:	24°C	22-25°C
SALINITY/CONDUCTIVITY:	--	--
TOTAL HARDNESS (as $CaCO_3$):	189 mg/l	100-190 mg/l
TOTAL ALKALINITY (as $CaCO_3$):	100 mg/l	50-100 mg/l
pH:	7.56	7.20-8.30

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

Facility Supervisor

AQUATIC BIOSYSTEMS INC
1300 Blue Spruce Dr Ste. C
Fort Collins, CO 80524 US
(970) 484-5091
info@aquaticbiosystems.com

Packing Slip

BILL TO
Pacific EcoRisk Laboratories
Attn: Accounts Payable
2250 Cordelia Road
Fairfield, CA 94534

SHIP TO
Pacific EcoRisk Laboratories
2250 Cordelia Road
Fairfield, CA 94534

INVOICE # 152142
DATE 04/19/2024

SHIP DATE	SHIP VIA	P.O. NUMBER
04/19/2024	ups	35355

ACTIVITY	QTY
CHE Chironomus Egg Cases	2
Freight Shipping Charges	1
Sat Delivery Extra Saturday Delivery Charge	1

Test Organism Log-in

Organism Log #: **14298** Total # of Orgs: 3 egg cases

Date Received: 04/20/2024 Age/Hatch Date: 04/19/2024-05/10/2024

Species: Chironomus dilutus (formerly C. tentans) Initial Mortality:

Source: Aquatic Biosystems Culture Water: Reformulated EPA Hard

Initial Observations upon Reciept:

Temp. (°C)	D.O. (mg/L)	Salinity (ppt) or Cond. (µS/cm)	Observation of Organism Health	Sign-off
20.0	8.9	486.4	Good	NK
Meter ID: 66A	Meter ID: RD12	Meter ID: EC12		

Shipped Dry? Yes (No)

Husbandry Log Established? (Yes) No

Inform Lab Manager if organisms recieved are *Chironomus dilutus* Egg Cases, *Pimephales promelas* (FHM) Embryos, *Atherinops affinis* (Topsmelt), or Abalone Were they informed? (Yes) No N/A

If organisms split into multiple husbandry bins, how many? 3

Supplier information sheet must be attached to this sheet!

General Comments:

Pacific EcoRisk Environmental Consulting and Testing

Test Organism Husbandry Log

Organism Log #: 14298 Total # of Orgs: 3 eggs (dose) Initial Mortality: ____

Date Received: 04/20/2024 Age/Hatch Date: 04/19/2023-05/10/2024

Species: Chironomus dilutus (formerly C. tentans) Culture Water: Reformulated EPA Mod

Source: Aquatic Biosystems Test Type: (A) C Temp Adj?: Y N

Client Name: Delta Rhoptrt Term Date: 5/7

Instructions/Comments:

Eggs 4/21 wrong line

Temp Adj		
Init.	Date	Temp

Date	Time	Temp (°C)	D.O. (mg/L)	Sal (ppt) or Cond (µS/cm)	Feeding AM	Feeding Noon	Feeding PM	Mort.	Observations of Organism Health	Water Δ?	Sign-off
4/20/24	1048	20.0 Meter ID: 66A	8.9 Meter ID: RD12	486.4 Meter ID: EC12	—	—	—	0	Good	NO	NK
4/21/24	1619	22.4 Meter ID: 88A	8.8 Meter ID: RD12	385 Meter ID: EC13	HD	—	EM	0	Hatching Sand added	added N	ESS
4/22/24	1600	22.3 Meter ID: 120A	7.8 Meter ID: RD12	376 Meter ID: EC14	HD	—	JK	0	not obs - very small	added with	JK
4/23/24	1713	22.6 Meter ID: 120A	7.9 Meter ID: RD10	369 Meter ID: EC14	RG	—	ESS	0	not observed	added	ESS
4/24/24	1000	22.4 Meter ID: 120A	7.8 Meter ID: RD12	401 Meter ID: EC13	HD	—	JK	0	Small; Sand added	N	KL
4/25/24	1550	22.4 Meter ID: 159A	7.7 Meter ID: RD10	407 Meter ID: EC15	RM	—	JK	0	small, good	added	JK
4/26/24	1610	22.8 Meter ID: 142A	8.8 Meter ID: RD10	373 Meter ID: EC13	RM	—	SM	0	good	Y	SM
4/27/24	1447	23.2 Meter ID: 66A	7.6 Meter ID: RD12	389 Meter ID: EC15	KF	—	KF	0	good	N	MH
4/28/24	1643	22.3 Meter ID: 133A	8.5 Meter ID: RD13	349 Meter ID: EC15	HD	—	RM	0	good	Y	RM
4/29/24	1445	22.3 Meter ID: 142A	8.4 Meter ID: RD15	368 Meter ID: EC15	RM	—	TK	0	good	N	TK
4/30/24	1550	22.6 Meter ID: 66A	8.4 Meter ID: RD12	350 Meter ID: EC12	JK	—	TK	0	good	Y	TK
5/1/24	1115	22.7 Meter ID: 120A	8.1 Meter ID: RD15	403 Meter ID: EC15	HD	—	—	0	Good	N	HD
		Meter ID:	Meter ID:	Meter ID:							
		Meter ID:	Meter ID:	Meter ID:							

7 TO 10 days old TERM

Weigh Pan Progress Sheet

Client / Project	Delta RMP
Test ID	104775-104778
Organism	*C. dilutus*
Test Material	T0 Weights
Control Batch	Control 2
Test Start Date	5/1/24
Pan Size Needed	*C. dilutus* pans
Date Needed By	4/30/24
Termination Date	5/11/24

Pans Numbered	Date	4/25/24	Signoff	DC
Pans In Furnace@550°C for 2h	Date	4/25/24 @ 1010	Signoff	DC
Pans Placed In Desiccator	Date	4/25/24 @ 1210	Signoff	DC
Initial Weights	Date	4/29/24	Signoff	SVV
Test Termination	Date	5/1/24	Signoff	TK
Pans in Oven at 100°C	Date	5/1/24	Signoff	TK
Pans Placed In Desicator	Date	5/2/24	Signoff	MG
Dry Weights	Date	05/03/2024	Signoff	NK
Pans In Furnace@550°C for 2h	Date	05/03/2024 1030	Signoff	NK
Pans Placed In Desicator	Date	05/03/2024	Signoff	NK
Ash-Free Dry Weights	Date	5/4/24	Signoff	RG

Pacific EcoRisk

Chironomus dilutus Sediment Toxicity Test Weight Data

Client: **Delta RMP**
Test Material: Control 2 - T0 Weights
Test ID #: 104775-104778 Project #: 35355
Test Date: 5/1/24

Initial Wt. Date 4/29/24 Sign-off: SVV
Dry Wt Date: 05/07/2024 Sign-off: NK
Final Ashed Wt Date: 5/14/24 Sign-off: RG

Pan ID	Treatment		Initial Ashed Pan Wt (mg)	Dry Pan + Larvae Wt. (mg)	Ashed Pan + Larvae Wt. (mg)	# of Live Organisms			Mean Dry Weight (mg)	Mean Ash Free Dry Wt. (mg)
	C. dilutus pans					Larvae	Pupae	Adult		
1	Lab Control	A	93.95	96.73	94.75	10	—	←		
2		B	115.41	117.58	116.51	10	—	—		
3		C	107.30	109.88	108.18	10	—	—		
4		D	98.08	100.58	99.03	10	—	—		
QA 1			106.83	107.02	106.94					
Balance ID			BAL04	BAL04	BAL04					

Deviation Report / Corrective Action Form

Title:	**CUP Event 3 (WY24) Babcock Missed Hold Time for TKNv2**
Deviation Number:	2023-17_CUPv1.5_Dev_WY24Event3_Babcock_MissedHoldtime_TKN
Prepared By:	Robert Pangle, MLJ Environmental
Attached:	2023-17_SWRCB Region 5 CAR 25322 TKN.pdf

Applicable Reference(s):

Delta Regional Monitoring Program Quality Assurance Project Plan for Current Use Pesticides in the Sacramento-San Joaquin Delta Version 1.5, February 09, 2024.

Complete the following table regarding the major milestones for the relevant deviation. Add additional rows as needed.

	Date	Notes/Description (optional)
Date Deviation Occurred:	06/11/2024	Babcock Laboratories notified MLJ Environmental (MLJ) and the Central Valley Regional Water Quality Control Board (CVRWQCB) that six samples related to Event 3 (April 29-30, 2024) sampling had experienced a "Blank Spike fail low" during TKN-Dissolved laboratory analysis.
Date DRMP Program Manager Notified:	06/11/2024	Email sent from Allie Guerra (Babcock Laboratories) to Melissa Turner (DRMP Program Manager), Selina Cole (former QA Representative from the CVRWQCB, currently at State Water Resources Control Board [SWRCB]), and Alisha Wenzel (CVRWQCB) regarding the deviation.
Date CVRWQCB QA Representative Notified:	06/14/2024	As May 30, 2024, the CVRWQCB does not have a QA Representative. In the interim, Ryan Brown (CVRWQCB) has been tasked with tracking deviations. Selina Cole

	Date	Notes/Description (optional)
		(SWRCB) forwarded the 6/11/2024 email notification to Ryan Brown at CVRWQCB.
Deviation Form sent for Review:	01/08/2025	Juliett Machuca, Babcock Laboratories Special Programs Manager (representing Allie Guerra who is on leave until May 2025)
Deviation Form sent for Review:	01/24/2025	Will Hagan, DRMP QA Officer
Corrective Action Report sent:	02/27/2025	Juliett Machuca, Babcock Laboratories Special Programs Manager (representing Allie Guerra who is on leave until May 2025); deviation form was revised based on Corrective Action Report.
Approval Letter Received from CVRWQCB:	07/09/2025	The Central Valley Regional Water Quality Control Board's QA Representative position is currently vacant; however, Regional Board staff have reviewed the submitted QAPP Deviations Form and find the corrective actions sufficient. Regional Board approval was provided by Patrick Pulupa (CVRWQCB Executive Officer) for 9 deviations including this one. The approval letter was sent to Debbie Mackey (DRMP President) on July 09 , 2025.
Deviation Form Sent for Signatures:	08/05/2025	

Description of Deviation/Change:

Six samples from the Current Use Pesticide (CUP) Event 3 sampling were part of a batch that had a Laboratory Control Sample analyzed for TKN- Dissolved recovery below the Measurement Quality Objective (MQO) of 90-110% (Percent Recovery (PR) 72%). Samples were collected from the following locations: CENT-018, CONF-011, CONF-012, CONF-009, CONF-010, and CENT-017 (Grab 2), and five of the six samples were reanalyzed five days out of hold time as per the QAPP, whereas the sample for Cent-017 (Grab 2) was not reanalyzed due to laboratory staff oversight. The reanalyzed results were reported by the laboratory and flagged as out of hold time. The original and reanalyzed results for TKN concentrations are presented in **Table 1**.

Table 1. Details associated with the TKN Reanalysis (units mg/L).

Station Code	Sample Date	Sample Type Code	Analysis Date for Original Batch	Analysis Date for Reanalysis Batch	TKN Result Original Batch 4E25001	TKN Result Reanalysis Batch 4E31052	MDL	RL
Cent-018	29/Apr/2024	Grab	5/26/2024	6/2/2024	0.1	0.3	0.09	0.1
Cent-018	29/Apr/2024	Grab (Lab Replicate)	5/26/2024	6/2/2024	0.12	0.246	0.09	0.1
Cent-018	29/Apr/2024	MS1	5/26/2024	6/2/2024	1.1	1.24	0.09	0.1
Cent-018	29/Apr/2024	MS2	5/26/2024	6/2/2024	1.15	1.25	0.09	0.1
Conf-009	30/Apr/2024	Grab	5/26/2024	6/2/2024	ND	0.1	0.09	0.1
Conf-010	30/Apr/2024	Grab	5/26/2024	6/2/2024	0.2	0.2	0.09	0.1

Conf-011	30/Apr/2024	Grab	5/26/2024	6/2/2024	ND	0.1	0.09	0.1
Conf-012	30/Apr/2024	Grab	5/26/2024	6/2/2024	ND	0.1	0.09	0.1
Cent-017	29/Apr/2024	Grab2	5/26/2024	NA*	ND	NA*	0.09	0.1
LABQA	31/May/2024	LCS	5/26/2024	6/2/2024	0.772	0.984	0.09	0.1
LABQA	31/May/2024	Lab Blank	5/26/2024	6/2/2024	ND	ND	0.09	0.1

* Cent-017 Grab2 sample was not reanalyzed (NA) by Babcock due to laboratory staff error; original results not reported due to QC failures.

Reason for Deviation/Change:

Babcock Laboratories sent a Corrective Action Report (CAR) on February 27, 2025, where they determined the original analysis was ran on day 27 (post sampling), which was close to the holding time (28 days). The post sampling delay in the analysis was due to lab processing capacity and instrumentation issues. Upon Babcock's review of the Quality Control (QC) related to the original batch, and identification of the QC failure, Babcock determined that reanalysis should occur even though it would be outside the 28-day holding time. However, Cent-017 (Grab 2) was not marked for reanalysis due to internal procedures not being followed by Babcock staff. The CENT-017 Grab 2 sample is a field duplicate; the CENT-017 (associated environmental sample) was analyzed in a different batch and did not have QC failures or hold time issues.

Impact on Present and Completed Work (discuss potential magnitude of impact and bias of deviation/change, if this can be anticipated, if no impact is expected please indicate this)

The affected data will be flagged with a QA Code for the missed hold time and a Compliance Code of "Qualification" will be assigned. The reanalyzed samples, which were acidified in the field, showed higher results compared to the original analysis. However, the full impact of the five-day hold time violation remains uncertain.

Due to QC issues in the original analysis, and the fact that CENT-017 Grab 2 was not reanalyzed due to laboratory error, the CENT-017 TKN-Dissolved result for the Grab 2 sample is not reported. In addition, the Total Nitrogen (Dissolved) result which includes TKN-Dissolved and Nitrate + Nitrite as N will not be reported for CENT-017 (Grab 2) because it is missing the TKN-Dissolved component.

Corrective Action	By Date	By Whom
Results were flagged with a QA Code of H [A holding time violation has occurred] on the samples out of hold time. A lab batch and lab result comment was added.	August 22, 2024	Cassandra Lamerdin, DRMP Data Manager
Babcock Laboratories indicated in their notification email that the laboratory is currently working towards improving their internal processes with a focus on performing sample re-analyses with a quicker turnaround time.	October 1, 2024	Allie Guera, Babcock Laboratories Special Programs Manager
Corrective action has been taken by Babcock to review all data entry procedures, including re-analysis, with the appropriate employees. In addition, follow-up measures were put in place to catch oversights in this process moving forward. Effectiveness checks to date have shown no recurrences of this error.	February 27, 2025	Juliett Machuca, Babcock Laboratories Special Programs Manager

ACKNOWLEDGED BY:

Babcock Laboratories Special Programs Manager:	Signed by: Juliett Machuca 55EA4D7BA06C4B7...	Date:	9/9/2025
	Juliett Machuca		

DRMP Program Manager:	DocuSigned by: Melissa Turner 9736DD915C44448...	Date:	9/17/2025
	Melissa Turner		

DRMP QA Officer:	DocuSigned by: Will Hagan A4691C48F968433...	Date:	9/17/2025
	Will Hagan		

CVRWQCB QA Representative*:	**Not Applicable**	Date:	07/09/2025
	Vacant		

*While these QAPP Deviation Forms will remain unsigned by the Central Valley Water Board due to the vacant QA Representative position, the current form is approved based on CVRWQCB staff scientist review and approval by the Central Valley Regional Water Quality Control Board Executive Officer Patrick Pulupa.

BABCOCK Laboratories, Inc.
The Standard of Excellence for Over 100 Years

2/27/2025
Melissa Turner
State Water Resources Control Board - Region 5
11020 Sun Center Drive, Suite 200
Rancho Cordova, CA 95670

RE: Client Sample ID: DRMP CENT-017 2024-04-29-Rep, DRMP_CENT-018_2024-04-29, DRMP_CONF-011_2024-04-30, DRMP_CONF-012_2024-04-30, DRMP_CONF-009_2024-04-30, DRMP_CONF-010_2024-04-30
Babcock Work Order: C4E0785-04, -05, -06, -07, -08, -09
Sample Receipt Date: 4/29/2024

Babcock Laboratories, Inc. received the above-mentioned samples for TKN dissolved and total nitrogen dissolved analyses on 04/29/2024. Samples were received at the laboratory with a complete Chain of Custody. The batch quality control associated with the original TKN results failed and reanalysis did not occur due before sample expiration. The laboratory performed a root cause investigation and has taken corrective action to help prevent a future recurrence as summarized below.

Upon investigation it was determined that due to capacity and instrument issues, the original analysis of the samples was run close to the regulatory holding time. Upon review of the data and identification of the QC failure, re-analysis of the samples occurred past the regulatory holding time. Samples were reported qualified, however with sample C4E0785-04, an oversight occurred and the process in place was not followed for the re-analysis. Therefore, TKN dissolved and total nitrogen dissolved could not be reported for this sample.

Corrective action has been taken to review all data entry procedures, including re-analysis, with the appropriate employees. In addition, follow-up measures were put in place to catch oversights in this process moving forward. Effectiveness checks to date have shown no recurrences of this error.

The quality and reliability of the data we provide for your organization is of the utmost importance at Babcock Laboratories. We regret that these errors occurred and apologize for any inconvenience caused. If you have any questions or would like more information, please don't hesitate to contact your Project Manager in Client Services

Sincerely,

Julia Sudds
Quality Division Leader

Deviation Report / Corrective Action Form

Title:	**CUP Events 1 and 3 (WY24) PER Missing Required WQ Measures**
Deviation Number:	2023-18_CUPv1.5_Dev_WY24Event1_3_PER_MissingRequiredWQv2
Prepared By:	Robert Pangle, MLJ Environmental

Applicable Reference(s):

Delta Regional Monitoring Program Quality Assurance Project Plan for Current Use Pesticides in the Sacramento-San Joaquin Delta Version 1.5, February 09, 2024.

Complete the following table regarding the major milestones for the relevant deviation. Add additional rows as needed.

	Date	Notes/Description (optional)
Date Deviation Occurred:	07/08/2024	During the verification of data, Cassandra Lamerdin (DRMP Data Manager) documented two deviations that occurred in the Delta Regional Monitoring Program (DRMP) Current Use Pesticides (CUP) Study during water year 2024 (WY 24). Event 1 (WY24) had one site (511ULCABR) with no final *Pimephales promelas* dissolved oxygen and pH measure and Event 3 (WY24) had two missing water quality measurements at site Cent-018 (missing dissolved oxygen for *Ceriodaphnia dubia* and missing conductivity for *Selenastrum capricornutum*).
Date DRMP Program Manager Notified:	07/09/2024	Notification sent from Cassandra Lamerdin (MLJ Environmental) to Melissa Turner (DRMP Program Manager).
Date CVRWQCB QA Representative Notified:	07/11/2024	As of May 30, 2024, the CVRWQCB does not have a QA Representative. In the interim, Ryan Brown (CVRWQCB) has been tasked with tracking deviations. Ryan Brown and Meredith Howard at the Central Valley Regional

	Date	Notes/Description (optional)
		Water Quality Control Board (CVRWQCB) were notified of the deviation via email.
Deviation Form sent for Review:	11/22/2024	Stephen Clark, (PER Technical Director)
Deviation Form sent for Review:	11/26/2024	Will Hagan, DRMP QA Officer
Approval Letter Received from CVRWQCB:	07/09/2025	The Central Valley Regional Water Quality Control Board's QA Representative position is currently vacant; however, Regional Board staff have reviewed the submitted QAPP Deviations Form and find the corrective actions sufficient. Regional Board approval was provided by Patrick Pulupa (CVRWQCB Executive Officer) for 9 deviations including this one. The approval letter was sent to Debbie Mackey (DRMP President) on July 09, 2025.
Deviation Form Sent for Signatures:	08/05/2025	

Description of Deviation/Change:

According to the DRMP Current Use Pesticide (CUP) Quality Assurance Project Plan (QAPP v1.5), the toxicity laboratory, Pacific EcoRisk (PER), should take daily renewal water quality measurements for the following constituents: pH, temperature, conductivity, and dissolved oxygen (DO). In addition, for each renewal, one old and one new measurement of DO and pH must be recorded (see Table 8 of the Data Management Standard Operating Procedure, v2.4). Cassandra Lamerdin (DRMP QA Manager) verified PER results from CUP events and noted that Event 1 (WY24) had one sample from location 511ULCABR with a missing "old" renewal DO and pH measurement associated with *Pimephales promelas* testing from day 1, Event 3 (WY24), and had two missing water quality measurements for samples collected from site Cent-018 (missing "old" renewal DO measurement for *Ceriodaphnia dubia* , and missing final conductivity for *Selenastrum capricornutum*).

Both events were reported with the correct test QA Code of TWN by PER, but a deviation was not initiated at that time. Upon review of Event 3 by MLJ Environmental staff, it was determined that a deviation form should be created and the DRMP Program Manager and CVRWQCB staff were notified at that time.

Reason for Deviation/Change:

Event 1, *P. promelas* toxicity test (511ULCABR): the solutions were renewed without collecting an aliquot for the old water quality (DO and pH) on Day 1 of the test. This was documented by the analyst that made the error, and the laboratory Quality Management team at PER reminded the analyst to pay close attention to collecting the aliquot for old water into the pre-labeled cup before renewing the test solutions.

Event 3, *C. dubia* toxicity test (CENT-018): the Day 2 old water quality cup collected after solution renewals was tipped over before the DO could be measured. The Quality Management team at PER reminded the analyst to follow the process of their training, including securing the old water quality cups in a way that they will not be tipped over.

Event 3, *S. capricornutum* toxicity test (CENT-018): the solutions were collected for the final water quality data. The analyst recorded the temperature, pH, and DO, but failed to record conductivity on the bench sheet prior to pouring out the solution, even though the parameters are all measured concurrently. The Quality Management team at PER reminded the analyst to follow the process of their training, including double checking the bench sheet to ensure that all water quality parameters have been recorded prior to disposing of the solution.

Impact on Present and Completed Work (discuss potential magnitude of impact and bias of deviation/change, if this can be anticipated, if no impact is expected please indicate this)

The Event 1 renewal "old" water quality measurement for DO and pH result on day 1 will be missing for the *P. promelas* toxicity test for the sample collected at site 511ULCABR. Regarding toxicity, it was noted that no significant toxicity effects occurred in this sample for either the survival or biomass endpoints for *P. promelas*. All other daily DO and pH measurements were collected and recorded for this sample and met method requirements.

Likewise, the Event 3 renewal "old" dissolved oxygen result on day 2 is missing for the *C. dubia* toxicity test for the sample collected at site CENT-018. While it was noted that no significant toxicity effects occurred in this sample in relation to survival, significant toxicity (Sig. Effect = SL) was observed for the *C. dubia* reproduction endpoint for the CENT-018 sample. All other DO values were >4.0 mg/L, *C. dubia* tests rarely exhibit hypoxic conditions, and first broods on the two days following the lack of the D.O. measurement were normal.

Finally, the Event 3 final conductivity measurement is missing for the *S. capricornutum* toxicity test for the sample collected at site CENT-018. Regarding toxicity, it was noted that no significant toxicity effects occurred for the total cell count endpoint. All other conductivity measurements were collected and recorded for this sample and met method requirements.

Corrective Action	By Date	By Whom
A Tox Test Level QA Code of TWN (i.e., required water quality parameters not measured) will be applied to the samples in each test batch.	June 5, 2024	Stephen Clark, (PER Technical Director)
The PER Quality Management team reminded the analysts involved in all three incidents to follow the process of their training and laboratory testing procedures.	December 13, 2023 (Event 1), May 2, 2024 (Event 3, *Ceriodaphnia*) and May 4, 2024 (Event 3, *Selenastrum*) August 22, 2024	Stephen Clark, (PER Technical Director)
Laboratory performance will be monitored against the completeness requirements of the QAPP referenced above	Ongoing	Will Hagan (DRMP QA Officer)

ACKNOWLEDGED BY:

PER Technical Director:	DocuSigned by: STEPHEN Clark C4D43551B2BC478...	Date:	8/5/2025
	Stephen Clark		

DRMP Program Manager:	DocuSigned by: Melissa Turner 9796DD915C44446...	Date:	8/5/2025
	Melissa Turner		

DRMP QA Officer:	DocuSigned by: Will Hagan A4691C48F968433...	Date:	8/6/2025
	Will Hagan		

CVRWQCB QA Representative*:	**Not Applicable**	Date:	07/09/2025
	Vacant		

*While these QAPP Deviation Forms will remain unsigned by the Central Valley Water Board due to the vacant QA Representative position, the current form is approved based on CVRWQCB staff scientist review and approval by the Central Valley Regional Water Quality Control Board Executive Officer Patrick Pulupa.

Deviation Report / Corrective Action Form

Title:	**CUP Event 5 (WY24) PER Missing Required WQ Measures**
Deviation Number:	2023-20_CUPv1.5_Dev_WY24Event5_PER_MissingRequiredWQ
Prepared By:	Robert Pangle, MLJ Environmental

Applicable Reference(s):

Delta Regional Monitoring Program Quality Assurance Project Plan for Current Use Pesticides in the Sacramento-San Joaquin Delta Version 1.5, February 09, 2024.

Complete the following table regarding the major milestones for the relevant deviation. Add additional rows as needed.

	Date	Notes/Description (optional)
Date Deviation Occurred:	08/21/2024	Stephen Clark at Pacific EcoRisk (PER Technical Director) emailed Cassandra Lamerdin (DRMP Data Manager) and Melissa Turner (DRMP Program Manager) regarding a deviation that occurred during water year 2024 (WY24) Event 5 toxicity testing, in which two incidents occurred where water quality parameters were not measured.
Date DRMP Program Manager Notified:	08/21/2024	
Date CVRWQCB QA Representative Notified:	08/22/2024	As of May 30, 2024, the CVRWQCB does not have a QA Representative. In the interim, Ryan Brown (CVRWQCB) has been tasked with tracking deviations. Ryan Brown at the Central Valley Regional Water Quality Control Board (CVRWQCB) was notified of the deviation via email.
Deviation Form sent for Review:	11/22/2024	Stephen Clark, (PER Technical Director)

	Date	Notes/Description (optional)
Deviation Form sent for Review:	11/26/2024	Will Hagan, DRMP QA Officer
Approval Letter Received from CVRWQCB:	07/09/2025	The Central Valley Regional Water Quality Control Board's QA Representative position is currently vacant; however, Regional Board staff have reviewed the submitted QAPP Deviations Form and find the corrective actions sufficient. Regional Board approval was provided by Patrick Pulupa (CVRWQCB Executive Officer) for 9 deviations including this one. The approval letter was sent to Debbie Mackey (DRMP President) on July 09, 2025.
Deviation Form Sent for Signatures:	08/05/2025	

Description of Deviation/Change:

According to the DRMP Current Use Pesticide (CUP) Quality Assurance Project Plan (QAPP v1.5), the toxicity laboratory, Pacific EcoRisk (PER), should take daily renewal water quality measurements for the following constituents: pH, temperature, conductivity, and dissolved oxygen (DO). In addition, for each renewal, one old and one new measurement of DO and pH must be recorded (see Table 8 of the Data Management Standard Operating Procedure, v2.4). During the WY24 Event 5 testing, the following two incidents occurred where "old" renewal water quality parameters were not measured.

1) The cup with the old water quality solutions for the chronic fathead minnow (*Pimephales promelas*) test (CONF-017) was tipped over prior to the measurement of pH and DO on day 1. This was documented by the analyst that made the error, and the laboratory Quality Management team at PER reminded the analyst to follow the process of their training, including securing the old water quality cups in a manner that will not result in them being tipped over.

2) For the chronic *Ceriodaphnia dubia* test (CONF-026), the solutions were renewed without keeping a replicate cup for the "old" renewal water quality prior to pouring out the other nine replicates and prior to the measurement of pH and DO on day 1. This was documented by the analyst that made the error, and the laboratory Quality Management team at PER reminded the analyst to follow their training which requires collection of a cup from each treatment for old water quality and setting them aside into one area of their workstation prior to disposing of the other nine cups per treatment.

Reason for Deviation/Change:

Both incidents were the result of laboratory technician error, with similar errors previously resulting in deviation form *2023-18_CUPv1.5_Dev_WY24Event1_3_PER_MissingRequiredWQ*

In both incidents related to this deviation, it was documented by PER that the analyst made an error and that the laboratory Quality Management team at PER reminded the analyst(s) to follow

the process of their training, which included; a) securing the "old" water quality cups in a manner that will not result in them being tipped over, and b) the requirement which requires collection of a cup from each treatment for old water quality and setting them aside into one area of their workstation prior to disposing of the other nine cups per treatment.

Impact on Present and Completed Work (discuss potential magnitude of impact and bias of deviation/change, if this can be anticipated, if no impact is expected please indicate this)

1. The Event 5 "old" renewal pH and DO results for Day 1 will be missing for the *P. promelas* toxicity test for the sample collected at site CONF-017. Regarding toxicity, it was noted that significant toxicity effects (Sig. Effect = SL, both tests) occurred in this sample for both the survival and biomass endpoints for *P. promelas*; however, toxicity was associated with Pathogen Related Mortality. All other daily renewal measurements for pH and DO were taken and met method requirements.

2. Likewise, the Event 5 "old" renewal pH and DO results for Day 1 will be missing for the *C. dubia* toxicity test for the sample collected at site CONF-026. Regarding toxicity, it was noted that no significant toxicity was observed for *C. dubia* survival or reproduction for the CONF-026 sample. All other daily renewal measurements for pH and DO were taken and met method requirements.

Corrective Action	By Date	By Whom
A Tox Test Level QA Code of TWN (i.e., required water quality parameters not measured) will be applied to the samples in the test batch prior to data submission.	October 11, 2024	Cassandra Lamerdin, DRMP Data Manager
The PER Quality Management team reminded the analysts involved in both incidents to follow the process of their training and laboratory testing procedures.	July 24, 2024	Stephen Clark, (PER Technical Director)
Laboratory performance will be monitored against the completeness requirements of the QAPP referenced above	Ongoing	Will Hagan (DRMP QA Officer)

ACKNOWLEDGED BY:

PER Director:	DocuSigned by: STEPHEN CLARK C4D43551B2BC478...	Date:	8/5/2025
	Stephen Clark		

DRMP Program Manager:	DocuSigned by: Melissa Turner 9796DD915C44446...	Date:	8/5/2025
	Melissa Turner		

DRMP QA Officer:	DocuSigned by: Will Hagan A4691C48F968433...	Date:	8/6/2025
	Will Hagan		

CVRWQCB QA Representative*:	**Not Applicable**	Date:	07/09/2025
	Vacant		

*While these QAPP Deviation Forms will remain unsigned by the Central Valley Water Board due to the vacant QA Representative position, the current form is approved based on CVRWQCB staff scientist review and approval by the Central Valley Regional Water Quality Control Board Executive Officer Patrick Pulupa.

Deviation Report / Corrective Action Form

Title:	**CUP Event 5 (WY24) Babcock TKN (dis) Missed Hold Time**
Deviation Number:	2023-21_CUPv1.5_Dev_WY24Event5_Babcock_MissedHoldtime_TKNDis
Prepared By:	Robert Pangle, MLJ Environmental

Applicable Reference(s):

Delta Regional Monitoring Program Quality Assurance Project Plan for Current Use Pesticides in the Sacramento-San Joaquin Delta Version 1.5, February 09, 2024.

Complete the following table regarding the major milestones for the relevant deviation. Add additional rows as needed.

	Date	Notes/Description (optional)
Date Deviation Occurred:	08/23/2024	Babcock Laboratories notified MLJ Environmental (MLJ) and the Central Valley Regional Water Quality Control Board (CVRWQCB) on 08/23/2024 that Event 5 sample "CONF-026 2024-07-22 (for TKN Dissolved)", needed to be reanalyzed and would result in a hold time violation.
Date DRMP Program Manager Notified:	08/23/2024	Email notification sent from Allie Guerra (Babcock Laboratories) to Melissa Turner (DRMP Program Manager) and Ryan Brown (CVRWQCB) regarding the deviation.
Date CVRWQCB QA Representative Notified:	08/23/2024	As of May 30, 2024, the CVRWQCB does not have a QA Representative. In the interim, Ryan Brown (CVRWQCB) has been tasked with tracking deviations.
Deviation Form sent for Review:	11/26/2024	Will Hagan, DRMP QA Officer
Deviation Form sent for Review:	12/5/2024	Juliett Machuca, Babcock Laboratories Special Programs Manager (representing Allie Guerra who is on leave until May 2025)

	Date	Notes/Description (optional)
Approval Letter Received from CVRWQCB:	07/09/2025	The Central Valley Regional Water Quality Control Board's QA Representative position is currently vacant; however, Regional Board staff have reviewed the submitted QAPP Deviations Form and find the corrective actions sufficient. Regional Board approval was provided by Patrick Pulupa (CVRWQCB Executive Officer) for 9 deviations including this one. The approval letter was sent to Debbie Mackey (DRMP President) on July 9, 2025.
Deviation Form Sent for Signatures:	08/05/2025	

Description of Deviation/Change:

Current Use Pesticide monitoring occurred on July 22 and 23, 2024 for Event 5 of the 2024 water year (WY). Sample DRMP CONF-026 2024-07-22 was collected and sent to Babcock Laboratories for Total Kjeldahl Nitrogen (TKN) analysis. The laboratory determined that they needed to reanalyze the sample which would result in a hold time violation of one day. The reanalysis results for TKN were acceptable for sample "DRMP CONF-026 2024-07-22" but require a flag to indicate a hold time violation.

Reason for Deviation/Change:

The original value for the dissolved TKN result for this sample was 0.4 mg/L, whereas the total TKN result for this sample was 0.2 mg/L. The re-analysis was needed due to the dissolved fraction being greater than the total TKN result. After reanalysis, the dissolved TKN result came back non-detect (ND) and the total TKN came back at the same result of 0.2 mg/L. Subsequently, the dissolved TKN reanalysis for sample "DRMP CONF-026 2024-07-22" occurred past holding time. Babcock Laboratories indicated in their notification email that the laboratory is currently working towards improving their internal processes with a focus on performing sample re-analyses with a quicker turnaround time.

Impact on Present and Completed Work (discuss potential magnitude of impact and bias of deviation/change, if this can be anticipated, if no impact is expected please indicate this)

The affected data will be flagged with a QA Code for the missed hold time and a Compliance Code of "Qualified" will be assigned. The one day hold time violation should have minimal to no impact on the project objectives.

Corrective Action	By Date	By Whom
Results were flagged with a QA Code of H [A holding time violation has occurred] on the samples out of hold time. A lab batch and lab result comment was added.	October 9, 2024	Cassandra Lamerdin, DRMP Data Manager
Babcock Laboratories indicated in their notification email that the laboratory is currently working towards improving their internal processes with a focus on performing sample re-analyses with a quicker turnaround time.	August 23, 2024	Allie Guerra, Babcock Laboratories Special Programs Manager

ACKNOWLEDGED BY:

Babcock Laboratories Special Programs Manager	Signed by: Juliett Machuca 55EA4D7BA06C4B7...	Date:	9/9/2025
	Juliett Machuca		

DRMP Program Manager:	DocuSigned by: Melissa Turner 9790DD915C44446...	Date:	9/17/2025
	Melissa Turner		

DRMP QA Officer:	DocuSigned by: Will Hagan A4691C48F968433...	Date:	9/17/2025
	Will Hagan		

CVRWQCB QA Representative*:	**Not Applicable**	Date:	07/09/2025
	Vacant		

*While these QAPP Deviation Forms will remain unsigned by the Central Valley Water Board due to the vacant QA Representative position, the current form is approved based on CVRWQCB staff scientist review and approval by the Central Valley Regional Water Quality Control Board Executive Officer Patrick Pulupa.

Deviation Report / Corrective Action Form

Title:	**CUP Event 4 (WY24) Babcock Lab Blank Contamination for Copper**
Deviation Number:	2023-22_CUPv1.5_Dev_WY24Event4_Babcock_LabBlankContamination_CUv3
Prepared By:	Robert Pangle, MLJ Environmental

Applicable Reference(s):

Delta Regional Monitoring Program Quality Assurance Project Plan for Current Use Pesticides in the Sacramento-San Joaquin Delta Version 1.5, February 09, 2024.

Complete the following table regarding the major milestones for the relevant deviation. Add additional rows as needed.

	Date	Notes/Description (optional)
Date Deviation Occurred:	09/10/2024	Babcock Laboratories notified MLJ Environmental (MLJ) and the Central Valley Regional Water Quality Control Board (CVRWQCB) on 09/10/2024 that there were two method blank samples with detections of dissolved copper (equal to the MDL) run with samples collected during the CUP Event 4.
Date DRMP Program Manager Notified:	09/10/2024	Email notification sent from Allie Guerra (Babcock Laboratories) to Melissa Turner (DRMP Program Manager) and Ryan Brown (CVRWQCB) regarding the deviation.
Date CVRWQCB QA Representative Notified:	09/10/2024	As of May 30, 2024, the CVRWQCB does not have a QA Representative. In the interim, Ryan Brown (CVRWQCB) has been tasked with tracking deviations. Ryan Brown was notified of the deviation via email.
Deviation Form sent for Review:	02/04/2025	Juliett Machuca, Babcock Laboratories Special Programs Manager (representing Allie Guerra who is on leave until May 2025)

	Date	Notes/Description (optional)
Deviation Form sent for Review:	02/04/2025	Will Hagan, DRMP QA Officer
Approval Letter Received from CVRWQCB:	07/09/2025	The Central Valley Regional Water Quality Control Board's QA Representative position is currently vacant; however, Regional Board staff have reviewed the submitted QAPP Deviations Form and find the corrective actions sufficient. Regional Board approval was provided by Patrick Pulupa (CVRWQCB Executive Officer) for 9 deviations including this one. The approval letter was sent to Debbie Mackey (DRMP President) on July 9, 2025.
Deviation Form Sent for Signatures:	08/05/2025	

Description of Deviation/Change:

Ten samples were collected on June 24 through 25, 2024, for CUP Event 4 and analyzed for dissolved copper on July 15, 2024. The laboratory noted that both laboratory blanks had concentrations equal to the method detection limit (MDL) (0.3 ug/L) which does not meet the DRMP Measurement Quality Objective (MQO) of <MDL. On July 16, 2024, nine of the 10 samples were redigested and reanalyzed with new laboratory blanks as required per the method. One sample (a field blank, sampleID C4F340-02) was not redigested / reanalyzed due to technician error. The laboratory reported two batches. The original batch (Batch ID Babcock_DRMP_CUP_4G05019_W_M) includes the field blank that was not redigested/reanalyzed plus laboratory QC including a field blank duplicate, a laboratory control sample (LCS), a matrix spike (MS), a matrix spike duplicate (MSD), and two laboratory blank results qualified to indicate that the laboratory blank had contamination (QA Code IP [Analyte detected in field or lab generated blank]); in addition, the field blank and field blank duplicate were also qualified with a CEDEN Quality Assurance code (QA Code FI [Analyte in field sample and associated blank]) since the laboratory blank concentration was not <MDL (Table 1). Finally, the field blank duplicate in the original batch received a QA code of IP. The redigested/reanalyzed batch (Batch ID Babcock_DRMP_CUP_4G11045_W_M) includes the other nine samples collected on June 24 through June 25, 2024, a MS sample, a MSD sample, an LCS, and two laboratory blanks that were both below the MDL (Table 1).

Table 1. Details associated with WY 2024 Event 4 Laboratory Blank Contamination with Copper (units = µg/L).

Station Code	Sample Date	Sample Type Code	Analysis Date for Original Batch	Analysis Date for Reanalysis Batch	Copper Result Original Batch 4G05019	Copper Result Reanalysis Batch 4G11045	MDL	RL	CEDEN QA Code
544LSAC13	6/24/24	Grab	7/15/2024	7/16/2024	NA [1]	1.3	0.3	0.5	
544LSAC13	6/24/24	Field Blank	7/15/2024	7/16/2024	0.3 [a]	NA [2]	0.3	0.5	FI (original batch)

Station Code	Sample Date	Sample Type Code	Analysis Date for Original Batch	Analysis Date for Reanalysis Batch	Copper Result Original Batch 4G05019	Copper Result Reanalysis Batch 4G11045	MDL	RL	CEDEN QA Code
544LSAC13	6/24/24	Field Blank (Lab Rep 2)	7/15/2024	7/16/2024	0.7 [a, b]	NA [3]	0.3	0.5	FI, IP (original batch)
CONF-014	6/24/24	Grab	7/15/2024	7/16/2024	NA [1]	1.3	0.3	0.5	
CONF-013	6/24/24	Grab	7/15/2024	7/16/2024	NA [1]	1.2	0.3	0.5	
CONF-016	6/24/24	Grab	7/15/2024	7/16/2024	NA [1]	1.3	0.3	0.5	
CENT-019	6/25/24	Grab	7/15/2024	7/16/2024	NA [1]	1.2	0.3	0.5	
CENT-020	6/25/24	Grab	7/15/2024	7/16/2024	NA [1]	1.1	0.3	0.5	
CONF-025	6/25/24	Grab	7/15/2024	7/16/2024	NA [1]	1.3	0.3	0.5	
511ULCABR	6/25/24	Grab	7/15/2024	7/16/2024	NA [1]	2.4	0.3	0.5	
511ULCABR	6/25/24	Grab (Dupl.)	7/15/2024	7/16/2024	NA [1]	2.5	0.3	0.5	
LABQA	NA	Lab Blank 1	7/15/2024	7/16/2024	0.3 [c]	ND	0.3	0.5	IP (original batch)
LABQA	NA	Lab Blank 2	7/15/2024	7/16/2024	0.3 [c]	ND	0.3	0.5	IP (original batch)
LABQA	NA	LCS	7/15/2024	7/16/2024	19.5	19.3	0.3	0.5	
544LSAC13 [d] / CONF-025	6/24/24; 6/25/24	MS	7/15/2024	7/16/2024	18.8 [a]	20.8	0.3	0.5	FI (original batch)
544LSAC13 [d] / CONF-025	6/24/24; 6/25/24	MSD	7/15/2024	7/16/2024	19.7 [a]	20.1	0.3	0.5	FI (original batch)

[1] Original results not reported due to Batch 4G05019 Quality Control (QC) failures.

[2] 544LSAC13 (BLK; Field Blank) sample was not reanalyzed by Babcock due to a laboratory staff error.

[3] Reanalysis Batch 4G11045 did not include re-testing for a duplicate field blank.

[a] FI QA code (Analyte in field sample and associated blank) applied to field blank, field blank duplicate, matrix spike, and matrix spike duplicate results for the Original Batch 4G05019 QC samples.

[b] IP QA code (Analyte detected in field or lab generated blank) applied to duplicate field blank result for the Original Batch 4G05019 QC samples.

[c] Result was DNQ and was flagged with an IP QA code ("Detected Not Quantified" and "Analyte detected in field or lab generated blank", respectively) were applied by Babcock Laboratories to Lab Blank 1 and Lab Blank 2 report results for the Original Batch 4G05019 Lab Blank QC samples.

[d] The original batch MS/MSD was performed on the 544LSAC13 Field Blank, and the Reanalysis Batch MS/MSD was performed on the CONF-025 environmental sample.

Reason for Deviation/Change:

The Babcock analyst made an error in not redigesting/reanalyzing the field blank sample. All the other samples were redigested/reanalyzed and are associated with the dissolved copper batch Babcock_DRMP_CUP_4G11045_W_M listed in the final report.

Impact on Present and Completed Work (discuss potential magnitude of impact and bias of deviation/change, if this can be anticipated, if no impact is expected please indicate this)

For the original batch which was not redigested/reanalyzed, the field blank, the field blank duplicate, the matrix spike and the matrix spike duplicate will be flagged with a QA Code of FI [Analyte in field sample and associated blank] and assigned a compliance code of "Qualified". In addition, the field blank duplicate received an QA code of IP [Analyte detected in field or lab generated blank]. Given that the laboratory blank showed contamination it is unclear whether the field blank contamination was generated at the laboratory or the field. No additional corrective action items have been identified.

The redigested/reanalyzed batch which included environmental results had laboratory blanks <MDL meeting the DRMP MQO and therefore these samples were not impacted by the original batch.

Corrective Action	By Date	By Whom
The results in Babcock_DRMP_CUP_4G05019_W_M associated with the method blank contamination will be flagged with a QA Code of FI [Analyte in field sample and associated blank]. A comment will be added to the LabBatch indicating "Copper detected in LabBlank and FieldBlank. (>1/2xRL)"	October 15, 2024	Cassandra Lamerdin, DRMP Data Manager
The field blank laboratory split will be flagged with a QA Code of IP [Analyte detected in field or lab generated blank].	October 15, 2024	Cassandra Lamerdin, DRMP Data Manager

ACKNOWLEDGED BY:

Babcock Laboratories Special Programs Manager	Signed by: Juliett Machuca 55EA4D7BA06C4B7...	Date:	9/9/2025
	Juliett Machuca		

DRMP Program Manager:	DocuSigned by: Melissa Turner 9796DD915C44446...	Date:	9/17/2025
	Melissa Turner		

DRMP QA Officer:	DocuSigned by: Will Hagan A4691C48F968433...	Date:	9/17/2025
	Will Hagan		

CVRWQCB QA Representative*:	**Not Applicable**	Date:	07/09/2025
	Vacant		

*While these QAPP Deviation Forms will remain unsigned by the Central Valley Water Board due to the vacant QA Representative position, the current form is approved based on CVRWQCB staff scientist review and approval by the Central Valley Regional Water Quality Control Board Executive Officer Patrick Pulupa.

Deviation Report / Corrective Action Form

Title:	**CUP Event 6 (WY24) PER Chironomus; final ash-free dry weights measured incorrectly; Not(0) AFDW for Control Batch 1 and 2**
Deviation Number:	2023-23_CUPv1.5_Dev_WY24Event6_PER_Chironomus_InaccurateAFDW_Cntr1&2v2
Prepared By:	Robert Pangle, MLJ Environmental
Attached:	2023-23_091124_DeltaRMP_NonConformingData_ChironomusT0Weights.pdf

Applicable Reference(s):

Delta Regional Monitoring Program Quality Assurance Project Plan for Current Use Pesticides in the Sacramento-San Joaquin Delta Version 1.5, February 09, 2024

Complete the following table regarding the major milestones for the relevant deviation. Add additional rows as needed.

	Date	Notes/Description (optional)
Date Deviation Occurred:	09/14/2024	The t(0) ash-free dry weight (AFDW) measurements associated with DRMP's 10-day chronic water exposure *Chironomus dilutus* toxicity test for Control Batch 1 and 2 (associated with water year 2024 (WY24) Event 6 monitoring) were measured incorrectly; therefore, a reliable t(0) AFDW could not be calculated.
Date DRMP Program Manager was notified:	09/19/2024	Stephen Clark, Technical Director at Pacific EcoRisk (PER), notified (via email) Melissa Turner (DRMP Technical Program Manager) and Ryan Brown at the Central Valley Regional Water Quality Control Board (CVRWQCB) regarding the deviation.

	Date	Notes/Description (optional)
Date CVRWQCB QA Representative Notified:	09/19/2024	As of May 30, 2024, the CVRWQCB does not have a QA Representative. In the interim, Ryan Brown (CVRWQCB) has been tasked with tracking deviations. Ryan Brown at the Central Valley Regional Water Quality Control Board (CVRWQCB) was notified of the deviation via email.
Non-conforming Report sent:	09/19/2024	Initial Non-Conforming Report (NCR) sent from Stephen Clark (PER) to MLJ.
Deviation Form sent for Review:	01/16/2025	Stephen Clark (PER Technical Director)
Deviation Form sent for Review:	01/17/2025	Will Hagan (DRMP QA Officer)
Approval Letter Received from CVRWQCB:	07/09/2025	The Central Valley Regional Water Quality Control Board's QA Representative position is currently vacant; however, Regional Board staff have reviewed the submitted QAPP Deviations Form and find the corrective actions sufficient. Regional Board approval was provided by Patrick Pulupa (CVRWQCB Executive Officer) for 9 deviations including this one. The approval letter was sent to Debbie Mackey (DRMP President) on July 9, 2025.
Deviation Form Sent for Signatures:	08/05/2025	

Description of Deviation/Change:

The initial time [t(0)] ash free dry weight (AFDW) measurements associated with the Delta Regional Monitoring Program (DRMP) 10-day chronic water exposure *Chironomus dilutus* toxicity tests were measured incorrectly by PER staff; therefore, the t(0) AFDW could not be used. This error affects eight environmental samples and two controls collected for Water Year 2024 (WY24) Event 6 associated with Control Batch 1 and 2 *C. dilutus* toxicity tests initiated on September 11, 2024, and September 12, 2024, respectively. These t(0) weights of *C. dilutus* are used to determine if organisms meet the Surface Water Ambient Monitoring Program (SWAMP) Measurement Quality Objective (MQO) of ≤0.12 mg/individual AFDW. An investigation was carried out to determine the cause of the incorrectly weighed pans.

Reason for Deviation/Change

The reason an investigation was triggered was that there was a negative mean AFDW meaning that the AFDW per pan values were incorrectly measured and/or recorded and should not be used.

It was noted that there was very little change in weight during the three different weight measurements. In one replicate, there was less than a 0.2 mg difference between the "initial ashed pan" weight, the "dry pan + larvae" weight, and the "ashed pan + larvae" weight. Typically, even with the smallest organisms being loaded, there should be a weight gain of at

least 0.5 mg (i.e., during development), and more if the organisms used are larger. When the organisms are ashed, there should be a reduction in weight of at least 0.2 mg. However, for the t(0) measurements for both test batches, there was no effective weight loss after the organisms were ashed, and several replicates were even measured as being nominally higher in weight. To determine if there was a furnace malfunction, the pans were placed in the furnace a second time and the remeasured weights did not change sufficiently to produce a noticeable difference in the AFDW. To determine if there was an error in the "initial ashed pan" weights, the pans were opened, dried organisms were scraped off, and the pans were re-weighed, but there was little change in the "initial ashed pan" weights as well.

After interviewing all staff involved with measuring the components of the ash free dry weighing process, including "initial ashed pan weights", "dry pan+ larvae weights", and "ashed pan + larvae weights", PER Quality Management noted that no obvious mistakes were observed or reported by staff regarding the methodology employed during testing. To determine the AFDW of each test organism, the SOP calls for subtracting the weight of the "ashed pan + larvae" (i.e., post muffle furnace combustion) from the weight of the "dry pan + larvae weights" (i.e., pre muffle furnace combustion). This difference (in weight) is then divided by the number of organisms that were ashed in the pan (typically n=10) to calculate the AFDW per organism at toxicity test initiation [i.e., t(0)].

Additionally, PER noted that the organism husbandry cultures were noted as being in good condition, with one test being initiated with larger 10-day old organisms and the other with smaller 7-day old organisms, large enough to produce a weight similar to what has been measured in past tests, which eliminates organisms as being extremely small and thus affecting the AFDW.

In conclusion, PER Quality Management determined that a technical mistake by PER staff was the most likely contributing factor for the negative mean AFDW (resulting in it being unusable), although the specific staff mistake or oversight could not be identified.

Impact on Present and Completed Work (discuss potential magnitude of impact and bias of deviation/change, if this can be anticipated, if no impact is expected please indicate this)

The SWAMP MQO of AFDW ≤0.12 mg/individual is presumably targeted to reduce the likelihood of pupation/hatching during the 10-day test. In this instance, the SWAMP MQO could not be assessed. Control Batch 1 had pupation in replicates associated with two of the five samples that were tested (511ULCABR (rep B) and Conf- 024 (rep D). There was no pupation observed in Control Batch 2. The results were reported to the DRMP Program Manager and no retest was scheduled. *C. dilutus t*est acceptability criteria were met (≥80% mean survival in the controls, and an average of ≥0.60 mg ash-free dry weight for surviving individuals). Organisms at test start were of the correct age (7-10 days old) and it is assumed that the initial weights would have met requirements based on the correct age of the organisms.

Corrective Action	By Date	By Whom
PER Staff involved with the incident were retrained on the weighing of test organisms.	September 19, 2024	Stephen Clark (PER Technical Director)
The Tox Test Level QA Code of TMO [Test organisms escaped or are otherwise missing] will be applied to the affected samples in Control 1 that had pupation.	October 18, 2024	Stephen Clark (PER Technical Director)
Apply MN [Method procedures not followed] to control and samples for Control Batch 1 & 2.	November 30, 2024	Cassandra Lamerdin (DRMP Data Manager)
Add lab batch comment "MN: Initial weight of LABQA could not be determined due to technician error with weights."	November 30, 2024	Cassandra Lamerdin (DRMP Data Manager)
Laboratory performance will be monitored against the completeness requirements of the QAPP referenced above	Ongoing	Will Hagan (DRMP QA Officer)

ACKNOWLEDGED BY:

Pacific EcoRisk Technical Director:	DocuSigned by: STEPHEN CLARK C4D43551B2BC478...	Date:	8/5/2025
	Stephen Clark		

DRMP Program Manager:	DocuSigned by: Melissa Turner 9796DDD915C44446...	Date:	8/5/2025
	Melissa Turner		

DRMP QA Officer:	DocuSigned by: Will Hagan A4691C48F968433...	Date:	8/6/2025
	Will Hagan		

CVRWQCB QA Representative*:	**Not Applicable**	Date:	07/09/2025

	Vacant		

*While these QAPP Deviation Forms will remain unsigned by the Central Valley Water Board due to the vacant QA Representative position, the current form is approved based on CVRWQCB staff scientist review and approval by the Central Valley Regional Water Quality Control Board Executive Officer Patrick Pulupa

Corrective Action

1.0 Incident Summary

Date of Incident:	9/11-12/24
Incident:	No t(0) AFDW for 10-day *Chironomus* testing
Nonconformance Source:	Non-Conforming Data
Incident Cause:	Technical Mistake by PER Staff
Incident Investigator:	Kevin Lung, Quality Manager
Corrective Action Taken:	Staff retraining
Corrective Action Implemented by:	Kevin Lung, Quality Manager
Monitoring of Corrective Action:	No further incidents occurred in the following 30 days.

2.0 Nonconformance Evaluation

The t(0) final ash free dry weight measurements associated with both test batches of Delta RMP 10-day chronic water exposure *Chironomus dilutus* toxicity tests were measured incorrectly resulting in a negative mean AFDW, and therefore could not be used to calculate a reliable AFDW. An investigation was performed to determine the cause of the incorrectly weighed pans.

3.0 Root Cause

Technical Mistake by PER Staff

During the investigation, it was noted that there was very little change in weight during the three different weight measurements. In one replicate, there was less than a 0.2 mg difference between the initial ashed pan, the dry weight, and the ashed weight. Typically, even with the smallest organisms being loaded, there should be a weight gain of at least .5 mg, and more if the organisms used are larger. When the organisms are ashed, there should be a reduction in weight of at least .2 mg. However, for the t(0) measurements for both test batches, there was no effective weight lost after the organisms were ashed, and several replicates were even measured as being nominally higher in weight. To determine if there was a furnace malfunction, the pans were placed in the furnace a second time and the remeasured weights did not change sufficiently to produce a noticeable difference in the AFDW. To determine if there was an error in the initiatl ashed pan weights, the pans were opened, dried organisms were scraped off, and the pans were reweighed, but there was little change in the initial weights as well.

After interviewing all staff involved with the initial ashed pan weights, dry pan + larvae weights, and ashed pan + larvae weights, no obvious mistakes were noted in the method that the communicated, with all staff having followed the SOP. The cultures were noted as being in good condition, with one test being initiated with larger 10-day old organisms and the other with smaller 7 day old organisms, large enough to produce a weight similar to what has been

measured in past tests, which eliminates organisms as being extremely small and affecting the AFDW. A Technical Mistake by PER Staff was likely the contributing factor for the test failing to meet TAC, but the mistake could not be identified.

4.0 Corrective Action/Implemented by

Corrective Action: How will the situation be corrected? Who will implement?

The results were reported to the client and no retest was scheduled. RIL, RG, and NB were retrained on the weighing of test organisms.

5.0 Preventative Action

Preventative Action: Identify preventative measures that will be implemented. Who will implement?
No preventative actions are necessary.

6.0 Monitoring of Corrective Action Effectiveness

No further incidents occurred in the following 30 days.

Incident Open Date: 9/14/24 Incident Close Date: 10/14/24

Prepared By: Kevin Lung Quality Manager's Signature: Kevin Lung

Technical Director: Stephen Clark Technical Director's Signature:

Weigh Pan Progress Sheet

Client / Project	Delta RMP
Test ID	107139-107143, 107166
Organism	*C. dilutus*
Test Material	T0 Weights
Control Batch	Control 1
Test Start Date	9/11/24
Pan Size Needed	*C. dilutus* pans
Date Needed By	9/10/24
Termination Date	9/11/24

Pans Numbered	Date	9/11/24	Signoff	SVV
Pans In Furnace@550°C for 2h	Date	9/11/24 1010	Signoff	SVV
Pans Placed In Desiccator	Date	9/11/24 1220	Signoff	SVV
Initial Weights	Date	9/11/24 1555	Signoff	RG
Test Termination	Date	9/11/24	Signoff	RG
Pans in Oven at 100°C	Date	9/11/24	Signoff	RG
Pans Placed In Desicator	Date	9/12/24	Signoff @ 1306	EG
Dry Weights	Date	~~9-13-24~~ 9/14/24	Signoff	~~AS~~ NB
Pans In Furnace@550°C for 2h	Date	~~9-13-24~~ 9/14/24	Signoff @0950	~~AS~~ NB
Pans Placed In Desicator	Date	9/14/24	Signoff @1150	NB
Ash-Free Dry Weights	Date	9/14/24	Signoff	NB

Weigh inner pan only!

9/14/24 NB: corrected values

Chironomus dilutus Sediment Toxicity Test Weight Data

Client: **Delta RMP**

Test Material: Control 1 - T0 Weights

Test ID #: Multiple

Project #: 35355

Test Date: 9/11/24

Initial Wt. Date: 9/11/24 Sign-off: RG

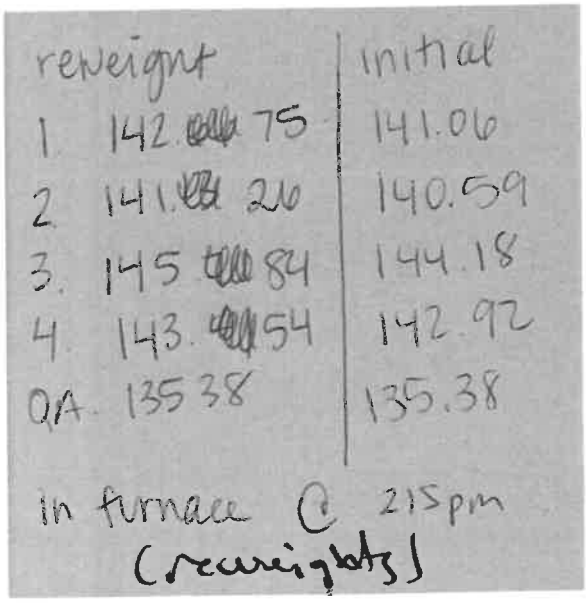
Dry Wt Date: ~~9/13/24~~ NB 9/14/24 Sign-off: NB

Final Ashed Wt Date: 9/14/24 Sign-off: NB

Pan ID	Treatment	Rep	Initial Ashed Pan Wt (mg)	Dry Pan + Larvae Wt. (mg)	Ashed Pan + Larvae Wt. (mg)	# of Live Organisms: Larvae	Pupae	Adult	Mean Dry Weight (mg)	Mean Ash Free Dry Wt. (mg)
1	Lab Control	A	142.56	142.74 ~~144~~ NB 9/13/24	142.75	10	—	—		
2	Lab Control	B	140.74	141.17 ~~143~~ NB 9/14/24	141.22	10	—	—		
3	Lab Control	C	145.08	~~144.17~~ ~~146~~ 145.7[illegible]	~~145~~ 145.85 NB 9/14/24	10	—	—		
4	Lab Control	D	143.27	143.57 ~~144~~ NB 9/14/24	143.71	10	—	—		
QA 1			135.13	135.04 NB 9/14/24	135.16					
Balance ID			BAL04	BAL17	BAL04					

Control 1 - Initiate 9/10/24 **T0 weights**

Pan ID	Initial Ashed Pan Wt (mg)	Dry Pan + Larvae Wt (mg)	Ashed Pan + Larvae Wt (mg)	# Live Organisms (Larvae)	Mean Dry Weight (mg)	Mean Ash Free Dry Wt (mg)
1	142.56	142.74	142.75	10	0.02	0.00
2	140.74	141.17	141.22	10	0.04	-0.01
3	145.08	145.72	145.85	10	0.06	-0.01
4	143.27	143.53	143.71	10	0.03	-0.02
				Mean =	0.04	-0.01



Weigh Pan Progress Sheet

Client / Project	Delta RMP
Test ID	107144-107146
Organism	*C. dilutus*
Test Material	T0 Weights
Control Batch	Control 2
Test Start Date	9/12/24
Pan Size Needed	*C. dilutus* pans
Date Needed By	9/11/24
Termination Date	9/12/24

Pans Numbered	Date	9/11/24	Signoff	SVV
Pans In Furnace@550°C for 2h	Date	9/11/24 1610	Signoff	SVV
Pans Placed In Desiccator	Date	9/11/24 1220	Signoff	SVV
Initial Weights	Date	9/12/24	Signoff	RL
Test Termination	Date	9/12/24	Signoff	RL
Pans in Oven at 100°C	Date	9/12/24	Signoff	RL
Pans Placed In Desicator	Date	9/13/24	Signoff	SVV
Dry Weights	Date	~~9-13-24~~ 9/14/24	Signoff	~~RL~~ NB
Pans In Furnace@550°C for 2h	Date	~~9-13-24~~ 9/14/24	Signoff @0950	~~RL~~ NB
Pans Placed In Desicator	Date	9/14/24	Signoff @1150	NB
Ash-Free Dry Weights	Date	9/14/24	Signoff	NB

Weigh inner pan only!

9/12/24 RL: wrong box

9/14/24 NB: corrected values

Chironomus dilutus Sediment Toxicity Test Weight Data

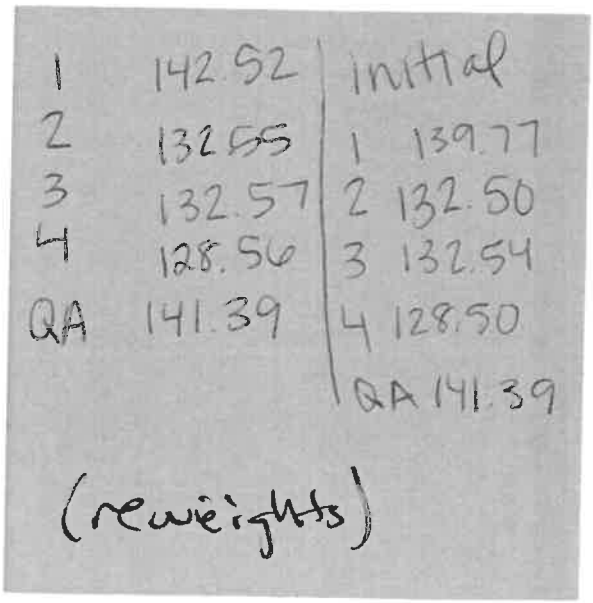
Client: **Delta RMP**
Test Material: Control 2 - T0 Weights
Test ID #: multpl Project #: 35355
Test Date: 9/12/24

Initial Wt. Date 9/12/24 Sign-off: RL
Dry Wt Date: 9/14/24 Sign-off: NB
Final Ashed Wt Date: 9/14/24 Sign-off: NB

Pan ID	Treatment	Rep	Initial Ashed Pan Wt (mg)	Dry Pan + Larvae Wt. (mg)	Ashed Pan + Larvae Wt. (mg)	# of Live Organisms: Larvae	Pupae	Adult	Mean Dry Weight (mg)	Mean Ash Free Dry Wt. (mg)
1	Lab Control	A	141.12 / 142.42	142.53	142.71					
2		B	132.09	132.53	132.53					
3		C	132.04	132.54	132.54					
4		D	128.17	128.38	128.59					
QA 1			141.12	141.27	141.34					
Balance ID			Bal 04	Bal 04	BAL04					

Contr 2 - Initiated 9/11/24 **T0 weights**

Pan ID	Initial Ashed Pan Wt (mg)	Dry Pan + Larvae Wt (mg)	Ashed Pan + Larvae Wt (mg)	# Live Organisms (Larvae)	Mean Dry Weight (mg)	Mean Ash Free Dry Wt (mg)
1	142.42	142.55	142.71	10	0.01	-0.02
2	132.09	132.46	132.53	10	0.04	-0.01
3	132.04	132.49	132.54	10	0.05	0.00
4	128.17	128.38	128.59	10	0.02	-0.02
				Mean =	0.03	-0.01



Deviation Report / Corrective Action Form

Title:	**CUP Event 6 (WY24) PER Hyalella; Missing Required Final WQ Measurement Ammonia**
Deviation Number:	2023-24_CUPv1.5_Dev_WY24Event6_PER_Hyalella_MissingFinalAmmoniaWQ
Prepared By:	Robert Pangle, MLJ Environmental
Attached:	2023-24_091524_DeltaRMP_NonConformingData_HyalellaFinalAmmonia.pdf

Applicable Reference(s):

Delta Regional Monitoring Program Quality Assurance Project Plan for Current Use Pesticides in the Sacramento-San Joaquin Delta Version 1.5, February 09, 2024.

Complete the following table regarding the major milestones for the relevant deviation. Add additional rows as needed.

	Date	Notes/Description (optional)
Date Deviation Occurred:	09/15/2024	A deviation occurred for water year 2024 (WY24) Event 6 *Hyalella azteca* toxicity testing, in which final ammonia was not measured for samples collected from 511ULCABR, CONF-021, CONF-023, CONF-024, and CONF-027, as well as the associated lab control treatment.
Date DRMP Program Manager Notified:	09/19/2024	Notification (via email) was sent from Stephen Clark (PER) to Melissa Turner (DRMP Program Manager) and Ryan Brown at the Central Valley Regional Water Quality Control Board (CVRWQCB) regarding the deviation.
Date CVRWQCB QA Representative Notified:	09/19/2024	As of May 30, 2024, the CVRWQCB does not have a QA Representative. In the interim, Ryan Brown (CVRWQCB) has been tasked with tracking deviations. Ryan Brown at the Central Valley Regional Water Quality Control

	Date	Notes/Description (optional)
		Board (CVRWQCB) was notified of the deviation via email.
Non-conforming Report sent:	09/19/2024	Initial Non-Conforming Report (NCR) sent from Stephen Clark (PER) to MLJ.
Deviation Form sent for Review:	02/04/2025	Stephen Clark, (PER Technical Director)
Deviation Form sent for Review:	02/10/2025	Will Hagan, DRMP QA Officer
Approval Letter Received from CVRWQCB:	07/09/2025	The Central Valley Regional Water Quality Control Board's QA Representative position is currently vacant; however, Regional Board staff have reviewed the submitted QAPP Deviations Form and find the corrective actions sufficient. Regional Board approval was provided by Patrick Pulupa (CVRWQCB Executive Officer) for 9 deviations including this one. The approval letter was sent to Debbie Mackey (DRMP President) on July 9, 2025.
Deviation Form Sent for Signatures:	08/05/2025	

Description of Deviation/Change:

On September 15, 2024, the Quality Assurance (QA) team at PER noticed that final ammonia was not measured on the terminated acute *H. azteca* test for WY24 Event 6 samples associated with Control Batch 1 and from locations 511ULCABR, CONF-021, CONF-023, CONF-024, CONF-027. An investigation was subsequently carried out to determine the cause of the mistake.

Reason for Deviation/Change:

When interviewed, the PER analyst involved with the incident noted that he had accidentally terminated the test without collecting samples for and measuring the final ammonia, even though he was familiar with the Delta Regional Monitoring Program (DRMP) requirement to measure ammonia at test termination. He admitted he did not read the Study Guidance sheet in front of the data sheets that stated in large letters that ammonia needed to be measured at test initiation and termination. A technical mistake by PER staff was the contributing factor to not achieving the DRMP Measurement Quality Objectives (MQOs) to measure ammonia in final test concentrations.

Impact on Present and Completed Work (discuss potential magnitude of impact and bias of deviation/change, if this can be anticipated, if no impact is expected please indicate this)

On September 15, 2024 there were eight (8) samples collected for toxicity analysis; all final water quality measurements were measured for all test species except *H. azteca*. For *H. azteca,* five (5) of the eight (8) samples do not have final ammonia measurements. The ammonia

concentrations at the end of the test for these five samples or the laboratory negative control are unknown, but none of these samples were toxic to *Hyalella*.

Corrective Action	By Date	By Whom
A Tox Test Level QA Code of TWN [required water quality parameter not measured] will be applied to the samples in the test batch prior to data submission.	December 11, 2024	Cassandra Lamerdin, DRMP Data Manager
A performance evaluation was issued to the PER analyst involved with the incident.	October 15,2024	Stephen Clark (PER Technical Director)
In addition to the Study Guidance sheets that already specify the requirement for PER staff to collect samples for final ammonia analyses, laminated red signs were added to the front of each clipboard that noted the need to measure ammonia at test termination.	September 15,2024	Stephen Clark (PER Technical Director)
Laboratory performance will be monitored against the completeness requirements of the QAPP referenced above.	Ongoing	Will Hagan (DRMP QA Officer)

ACKNOWLEDGED BY:

Pacific EcoRisk Technical Director:	DocuSigned by: STEPHEN Clark C4D43551B2BC478...	Date:	8/5/2025
	Stephen Clark		

DRMP Program Manager:	DocuSigned by: Melissa Turner 9796DD915C44446...	Date:	8/5/2025
	Melissa Turner		

DRMP QA Officer:	DocuSigned by: Will Hagan A4691C48F968433...	Date:	8/6/2025
	Will Hagan		

CVRWQCB QA Representative*:	**Not Applicable**	Date:	07/09/2025
	Vacant		

*While these QAPP Deviation Forms will remain unsigned by the Central Valley Water Board due to the vacant QA Representative position, the current form is approved based on CVRWQCB staff scientist review and approval by the Central Valley Regional Water Quality Control Board Executive Officer Patrick Pulupa.

Corrective Action

1.0 Incident Summary

Date of Incident:	9/15/24
Incident:	No final ammonia samples were collected
Nonconformance Source:	Non-Conforming Data
Incident Cause:	Technical mistake by PER Staff
Incident Investigator:	Kevin Lung, Quality Manager
Corrective Action Taken:	Data qualified in report, PE issued
Corrective Action Implemented by:	Kevin Lung, Quality Manager
Monitoring of Corrective Action:	ER will be monitored for 30 days to assure that the same mistake does not occur.

2.0 Nonconformance Evaluation

On 9/15/24, the daily QA team noticed that final ammonia was not measured on the terminated acute *Hyalella* test. An investigation was performed to determine the cause of the mistake.

3.0 Root Cause

Technical Mistake by PER Staff

When interviewed, analyst ER noted that he had accidentally terminated the test without collecting samples for and measuring the final ammonia, even though he was familiar with the Delta RMP requirement to measure ammonia at test termination. He admitted he did not read the Study Guidance sheet in front of the data sheets that stated in large letters that ammonia needed to be measured at initiation and termination. He also stated that he did not realize the test had been assigned to another analyst who received a communication to assure that final ammonia concentrations were measured at termination A technical mistake by PER staff was the contributing factor to not achieving the SWAMP MQO to measure ammonia in final test concentrations.

4.0 Corrective Action/Implemented by

Corrective Action: How will the situation be corrected? Who will implement?

The client was notified of the error and decided not to retest the samples, and a Performance Evaluation was issued to ER.

5.0 Preventative Action

Preventative Action: Identify preventative measures that will be implemented. Who will implement?

In addition to the Study Guidance sheets that already specify the requirement to collect samples for final ammonia analyses, laminated red signs were added to the front of each clipboard that noted the need to measure ammonia at termination.

6.0 Monitoring of Corrective Action Effectiveness

No further incidents occurred in the following 30 days.

Incident Open Date: 9/15/24 Incident Close Date: 10/15/24

Prepared By: Kevin Lung Quality Manager's Signature: Kevin Lung

Technical Director: Stephen Clark Technical Director's Signature:

Study Guidance Form

Client:	Delta RMP C+I	Test Date:	9/11/24
Sample Description:	Ambient Water	Test ID #:	-
Species and Test Description:	A. Hyalella	Project #:	35355

Special Instructions:

10 organisms/replicate, 4 replicates/treatment

Measure and record ammonia at initiation and termination - CONTROL TOO!!
INITIATION AMMONIA CAN BE TRANSCRIBED FROM LOG-INS

WQ Analysts: Please make sure ALL old WQ fields are complete prior to dumping aliquots. Double check any anomalous values with another meter and record on observation sheet as appropriate.

**Aerate any test treatments that measure ≤2.5 mg/L; see SVV if low, but >2.5 mg/L

Test run at 20°C

**At initiation, please have second analyst confirm all test replicates have been loaded with 10 orgs each
Confirmation signoff: [illegible]

TIE Trigger: ≥50% reduction in survival

RETURN WQ REPLICATES TO TEST ROOM AFTER OLD WQ ANALYSIS

General Guidance:

96 Hour Acute *Hyalella azteca* Toxicity Test Data

Client: Delta RMP ~~[illegible]~~ Ctl MH 9-12
Test Material: 511ULCABR
Test ID#: 107147 Project # 35355
Test Date: 9/11/24 Randomization: 4.6.2
Feeding T_{-2} Time: 0945 Initials: MD

Organism Log#: 14524 Age: 8-9 days
Organism Supplier: ABS
Control/Diluent: SAM-5S
Control Water Batch: 778
Feeding T46-hr Time: 0905 Initials: DC

Treatment	Temp (°C)	pH New	pH Old	D.O. New	D.O. Old	Conductivity (µS/cm)	Ammonia (mg/L)	# Live Animals A	B	C	D	Sign-Off
Control 1	20.3	7.71		8.6		434	<1.00	10 (~~8~~ LO 9/11)	10 (~~8~~ LO 9/11)	10 (~~8~~ LO 9/11)	10 (~~8~~ LO 9/11)	Date: 9/11/24; Sample ID: 71567; Test Solution Prep: TF
100%	20.7	8.05		8.5		620	<1.00	10 (~~8~~ LO 9/11)	10 (~~8~~ LO 9/11)	10 (~~8~~ LO 9/11)	10 (~~8~~ LO 9/11)	New WQ: SK; Initiation Time: 1815; Initiation Signoff: ZA
Meter ID	136A	PH26		RD10		EC15	DR3800					
Control	20.8				8.3			10	10	10	10	Date: 9/12/24; Count Time: 1030; Count Signoff: MH; Old WQ: JA
100%	20.6				8.4			10	10	10	10	
Meter ID	135A				RD15							
Control	20.6	7.85	7.47	8.7	7.4	373		10	10	10	10	Date: 9/13/24; Sample ID: 71567; Test Solution Prep: TF; New WQ: SV
100%	20.6	7.97	8.19	10.0	7.4	643		10	10	10	10	Count Time: 1238; Count Signoff: ABC; Old WQ: DAC
Meter ID	156A	pH26	PH29	RD15	RD15	EC14						
Control	20.5				8.2			10	10	10	10	Date: 9/14/24; Count Time: 906; Count Signoff: AM; Old WQ: DAC
100%	20.8				7.8			10	10	10	10	
Meter ID	130A				RD15							
Control	20.9		7.80		8.1	397	NM	10	10	10	10	Date: 9/15/24; Termination Time: 1627; Termination Signoff: [illegible]; Old WQ: SA
100%	20.8		8.29		7.5	670	NM	10	10	10	10	
Meter ID	163A		PH26		RD15	EC14	—					

96 Hour Acute *Hyalella azteca* Toxicity Test Data

Client: **Delta RMP**
Test Material: CONF-021
Test ID#: 107148 Project #: 35355
Test Date: 9/11/24 Randomization: 4.6.2
Feeding T-2 Time: 0845 Initials: HD

Organism Log#: 14524 Age: 8-9days
Organism Supplier: ABS
Control/Diluent: SAM-5S
Control Water Batch: 778
Feeding T46-hr Time: 0905 Initials: DC

Treatment	Temp (°C)	pH New	pH Old	D.O. New	D.O. Old	Conductivity (µS/cm)	Ammonia (mg/L)	# Live Animals A	B	C	D	Sign-Off
Control	20.7	7.71		8.6		434	<1.00	10 9/11	10 9/11	10 9/11	10 9/11	Date: 9/11/24
100%	19.9	8.04		10.2		916	<1.00	10 9/11	10 9/11	10 9/11	10 9/11	Sample ID: 71570
Meter ID	136A	PH26		RD10		EC15	DR3800					Test Solution Prep: TF
Control	20.8				8.3			10	10	10	10	New WQ: SK
100%	20.6				8.5			10	10	10	10	Initiation Time: 1815
Meter ID	135A				RD15							Initiation Signoff:
Control	20.6	7.85	7.47	8.7	7.4	373		10	10	10	10	Date: 9/12/24
100%	20.6	7.85	7.89	9.8	7.5	875		10	10	10	10	Count Time: 1030
Meter ID	136A	PH26	PH24	RD15	RD15	EC14						Count Signoff: MH
Control	20.5				8.2			10	10	10	10	Old WQ: DA
100%	20.9				7.6			10	10	10	10	Date: 9/13/24
Meter ID	136A				RD15							Sample ID: 71570
Control	20.9		7.80		8.1	397	NM	10	10	10	10	Test Solution Prep: TF
100%	20.7		7.81		8.2	930	NM	10	10	10	10	New WQ: SW
Meter ID	136A		PH26		RD15	EC14	—					Count Time: 1238
												Count Signoff: AER
												Old WQ: DAE
												Date: 9/14/24
												Count Time: 0906
												Count Signoff: AM
												Old WQ: DAE
												Date: 9/15/24
												Termination Time: 0927
												Termination Signoff:
												Old WQ:

96 Hour Acute *Hyalella azteca* Toxicity Test Data

Client: **Delta RMP**
Test Material: CONF-023
Test ID#: 107150 Project #: 35355
Test Date: 9/11/24 Randomization: 4.6.2
Feeding T-2 Time: 0945 Initials: HD

Organism Log#: 14524 Age: 8-9 days
Organism Supplier: ABS
Control/Diluent: SAM-5S
Control Water Batch: 778
Feeding T46-hr Time: 0905 Initials: DC

Treatment	Temp (°C)	pH New	pH Old	D.O. New	D.O. Old	Conductivity (µS/cm)	Ammonia (mg/L)	# Live Animals A	B	C	D	Sign-Off
Control 1	20.3	7.71		8.6		434	<1.00					Date: 9/11/24 Sample ID: 71571 Test Solution Prep: TF
100%	20.9	797		10.0		186	<1.00	10	10	10	10	New WQ: SK Initiation Time: 1815 Initiation Signoff:
Meter ID	136A	PH26		RD10		EC15	DR3800					
Control	20.8				8.3			10	10	10	10	Date: 9/12/24 Count Time: 1030 Count Signoff: MH
100%	20.8				8.3			10	10	10	10	Old WQ: DA
Meter ID	135A				RD15							
Control	20.6	7.85	7.47	8.7	7.4	373		10	10	10	10	Date: 9/13/24 Sample ID: 71571 Test Solution Prep: TF
100%	20.6	7.88	7.58	10.2	7.3	183		10	10	10	10	New WQ: SW Count Time: 1238 Count Signoff: ACL
Meter ID	156A	PH26	0429	RD15	RD15	EC14						Old WQ: DAC
Control	20.5				8.2			10	10	10	10	Date: 9/14/24 Count Time: 0906 Count Signoff: ACL
100%	20.9				8.0			10	10	10	10	Old WQ: DAC
Meter ID	130A				RD15							
Control	20.9		7.80		8.1	397	NM	10	10	10	10	Date: 9/13/24 Termination Time: 1427 Termination Signoff:
100%	20.8		7.86		8.3	192	NM	10	10	10	10	Old WQ: DA
Meter ID	163A		PH26		RD15	EC14	—					

96 Hour Acute *Hyalella azteca* Toxicity Test Data

Client: Delta RMP
Test Material: CONF-024
Test ID#: 107151 Project #: 35355
Test Date: 9/11/24 Randomization: 4.6.2
Feeding T-2 Time: 0645 Initials: HD

Organism Log#: 14524 Age: 8-9 days
Organism Supplier: ABS
Control/Diluent: SAM-5S
Control Water Batch: 7 78
Feeding T46-hr Time: 0905 Initials: DC

Treatment	Temp (°C)	pH New	pH Old	D.O. New	D.O. Old	Conductivity (µS/cm)	Ammonia (mg/L)	# Live Animals A	B	C	D	Sign-Off
Control	20.3	7.71		8.6		434	<1.00	10	10	10	10	Date: 9/11/24 Sample ID: 71568 Test Solution Prep: TF
100%	20.7	8.01		9.9		662	<1.00	10	10	10	10	New WQ: SK Initiation Time: 1815 Initiation Signoff:
Meter ID	136A	PH26		RD10		EC15	DR3800					
Control	20.8				8.3			10	10	10	10	Date: 9/12/24 Count Time: 1030 Count Signoff: MH
100%	20.8				8.5			10	10	10	10	Old WQ: JA
Meter ID	135A				RD15							
Control	20.6	7.85	7.47	8.7	7.4	373		10	10	10	10	Date: 9/13/24 Sample ID: 71568 Test Solution Prep: TF
100%	20.5	7.85	7.54	9.8	7.4	661		10	10	10	10	New WQ: SV Count Time: 1238 Count Signoff:
Meter ID	156A	pH26	pH29	RD15	RD15	EC14						Old WQ: DAC
Control	20.5				8.2			10	10	10	10	Date: 9/14/24 Count Time: 0906 Count Signoff: AEL
100%	20.9				7.9			10	10	10	10	Old WQ: DAC
Meter ID	130A				RD15							
Control	20.9		7.80		8.1	397		10	10	10	10	Date: 9/15/24 Termination Time: 1627 Termination Signoff:
100%	20.9		7.77		8.3	699		10	10	10	10	Old WQ:
Meter ID	163A		pH26		RD15	EC14						

96 Hour Acute *Hyalella azteca* Toxicity Test Data

Client: **Delta RMP**
Test Material: CONF-027
Test ID#: 107149 Project # 35355
Test Date: 9/11/24 Randomization: 4.6.2
Feeding T_{-2} Time: 0945 Initials: HD

Organism Log#: 14524 Age: 8-9 days
Organism Supplier: ABS
Control/Diluent: SAM-5S
Control Water Batch: 778
Feeding T46-hr Time: 0905 Initials: DC

Treatment	Temp (°C)	pH New	pH Old	D.O. New	D.O. Old	Conductivity (µS/cm)	Ammonia (mg/L)	# Live Animals A	B	C	D	Sign-Off
Control	20.3	7.71		8.6		434	<1.00	10	10	10	10	Date: 9/11/24 Sample ID: 71569 Test Solution Prep: TF
100%	20.5	7.99		10.2		528	<1.00	10	10	10	10	New WQ: SK Initiation Time: 1815 Initiation Signoff:
Meter ID	136A	pH26		RD10		EC15	DR3800					
Control	20.8				8.3			10	10	10	10	Date: 9/12/24 Count Time: 1030 Count Signoff: MH
100%	20.8				8.3			10	10	10	10	Old WQ:
Meter ID	135A				RD15							
Control	20.6	7.85	7.47	8.7	7.4	373		10	10	10	10	Date: 9/13/24 Sample ID: 71569 Test Solution Prep: TF
100%	20.5	7.91	7.49	10.3	7.4	523		10	10	10	10	New WQ: SW Count Time: 1238 Count Signoff:
Meter ID	156A	pH24	pH24	RD15	RD15	EC14						Old WQ:
Control	20.5				8.2			10	10	10	10	Date: 9/14/24 Count Time: 0906 Count Signoff:
100%	20.8				7.9			10	10	10	10	Old WQ:
Meter ID	130A				RD15							
Control	20.9		7.80		8.1	397	NM	10	10	10	10	Date: 9/15/24 Termination Time: 1429 Termination Signoff:
100%	20.8		7.80		8.2	549	NM	10	10	10	10	Old WQ:
Meter ID	163A		pH26		RD15	EC14	—					

Deviation Report / Corrective Action Form

Title:	**CUP Event 6 (WY24) USGS Field Blank Contamination on DOC**
Deviation Number:	2023-25_CUPv1.5_Dev_WY24Event6_USGS_EquipmentBlankContam_DOCv2
Prepared By:	Robert Pangle

Applicable Reference(s):

Delta Regional Monitoring Program Quality Assurance Project Plan for Current Use Pesticides in the Sacramento-San Joaquin Delta Version 1.5, February 09, 2024.

Complete the following table regarding the major milestones for the relevant deviation. Add additional rows as needed.

	Date	Notes/Description (optional)
Date Deviation Occurred:	10/07/2024	Allie Guerra (Babcock Project Manager) emailed USGS, MLJ Environmental, DRMP QA officer, and the CVRWQCB on October 7, 2024, to confirm that potential Dissolved Organic Carbon (DOC) contamination of a field blank sample may have occurred, and that Babcock was initiating a re-analysis of the sample in question to confirm the original results.
Date DRMP Program Manager Notified:	10/07/2024	
Date CVRWQCB QA Representative Notified:	10/07/2024	As of May 30, 2024, the CVRWQCB does not have a QA Representative. In the interim, Ryan Brown (CVRWQCB) has been tasked with tracking deviations. Ryan Brown at the CVRWQCB was notified of the deviation via email.
Deviation Form sent for Review:	02/05/2025	Jim Orlando (USGS Project Manager)

	Date	Notes/Description (optional)
Deviation Form sent for Review:	02/11/2025	Will Hagan (DRMP QA Officer)
Approval Letter Received from CVRWQCB:	07/09/2025	The Central Valley Regional Water Quality Control Board's QA Representative position is currently vacant; however, Regional Board staff have reviewed the submitted QAPP Deviations Form and find the corrective actions sufficient. Regional Board approval was provided by Patrick Pulupa (CVRWQCB Executive Officer) for 9 deviations including this one. The approval letter was sent to Debbie Mackey (DRMP President) on July 9, 2025.
Deviation Form Sent for Signatures:	08/22/2025	

Description of Deviation/Change:

On September 10, 2024, samples were collected by the United States Geological Survey (USGS) for Water Year (WY) 2024 Event 6 Current Use Pesticide (CUP) water quality monitoring. On October 7, 2024, Babcock Laboratories emailed the final laboratory analysis report (Report #C4I2113) for this sampling event to MLJ Environmental. Upon review of the report, Cassandra Lamerdin (MLJ Environmental) emailed Allie Guerra (Babcock Laboratories Project Manager), the United States Geological Survey (USGS), the DRMP QA Officer, and the Central Valley Regional Water Quality Control Board (CVRWQCB) on October 7, 2024, to inquire about potential Dissolved Organic Carbon (DOC) contamination in a field blank sample (DRMP_CONF-027_2024-09-10_BL). The field blank sample analyzed on September 26, 2024, indicated a detection for DOC at 0.46 mg/L (Reporting Limit = 0.30 mg/L). On October 7, 2024, Cassandra Lamerdin requested that Babcock re-analyze this sample to confirm the original results, and she asked both Jim Orlando (USGS Project Manager) and Allie Guerra (Babcock) to confirm that no laboratory transcription errors or abnormalities occurred or were observed in relation to the preparation and handling of the sample in question. Allie Guerra emailed USGS, MLJ Environmental, DRMP QA Officer, and the CVRWQCB on October 7, 2024, to confirm that potential DOC contamination of a field blank sample may have occurred, and that Babcock was initiating a re-analysis of the sample in question to confirm the original results.

In relation to DOC analysis, a total of three 40ml vials for each sample were prepared (filtered and acidified) within 24 hours of sampling (CUP QAPP v1.5). For the re-analysis, Babcock re-tested a second vial (vial B) for the sample in question. The DOC re-analysis for vial B occurred on October 8, 2024, within the 28-day hold time requirement. The DOC result for vial B was a non-detect (ND), in contrast to the first vial (vial A) which returned a detection for DOC at 0.46 mg/L. Babcock then performed an additional re-analysis of both vial A and B on October 18, 2024, which confirmed the original results for both vials. Specifically, in this additional re-analysis, the results indicated the presence of DOC in vial A (at 0.50 mg/L) and a non-detect for DOC in vial B. It should be noted that the second re-analysis confirmation did occur outside of the 28-day hold time.

In summary, out of a total of three 40 ml sample vials prepared for analysis of DOC for the field blank sample "DRMP_CONF-027_2024-09-10_BL", one (vial A) returned a detection of 0.46 mg/L and the second (vial B) returned a non-detect for DOC, and both results were confirmed via re-analysis (although the confirmation re-analysis was performed outside of the 28-day hold time).

Reason for Deviation/Change

In a previous deviation (Deviation # 2022-09), it was confirmed with the USGS that filtration for field blank samples always occurs in the USGS laboratory. In that instance, the USGS agreed to review sample preparation protocols included in the USGS National Field Manual (NFM) to ensure that adequate language is included regarding potential sources of contamination during the filtration process; it was agreed that if language was missing, the sampling procedures manual would be updated and the QAPP amended to include the updated protocol. Following that deviation in WY 2023, USGS confirmed that NFM Chapter A5 Section 5.2.2 included appropriate language which is copied and pasted below:

"Omit the methanol rinse when cleaning the equipment used to collect and process samples for total particulate carbon, particulate organic carbon, and dissolved and suspended organic carbon (TPC, POC, DOC). If equipment (such as a submersible pump) has been in contact with methanol or other organic solvent and must be used for TPC, POC, or DOC sampling, then flush the equipment with copious quantities of sample water before collecting the sample; collection of a blank sample for DOC quality control is recommended."

Further instructions from NFM Chapter A3 Section 3.2.2 incorporated at that point in time also included the following: "*Do not use methanol or other organic solvents on the equipment used to filter samples for organic-carbon analyses.*"

It is unclear what procedures or sources may have potentially contributed to the DOC detections in the field blank sample "DRMP_CONF-027_2024-09-10_BL."

Impact on Present and Completed Work (discuss potential magnitude of impact and bias of deviation/change, if this can be anticipated, if no impact is expected please indicate this)

Field blank results for DOC reported by Babcock for sample "DRMP_CONF-027_2024-09-10_BL" will be flagged according to the DRMP Data Management SOP. Accordingly, the 0.46 mg/L detection for DOC will be flagged a QA Code of "IP" (Analyte detected in field or lab generated blank), and a lab result / batch comment will be added stating that a second vial analyzed for this sample was ND and both results were confirmed by reanalysis. The concentrations of DOC in this batch were all above the RL for environmental samples and ranged from 1.6 to 8.0 mg/L. In addition, the second vial (vial B) was ND for DOC. It is not expected that this field blank concentration of DOC will have an impact on the project's overall purpose to characterize status and trends of pesticide concentrations and toxicity in the Delta.

Corrective Action	By Date	By Whom
Affected sample result will be flagged a QA Code of "IP" (Analyte detected in field or lab generated blank), and a lab result / batch comment will be added stating that a second vial analyzed for this sample was ND and both results were confirmed by reanalysis.	December 2, 2024	Cassandra Lamerdin

ACKNOWLEDGED BY:

USGS Field Lead:	Signed by: Matthew De Parsia 7F9B476F161242A...	Date:	8/27/2025
	Matt De Parsia		

DRMP Program Manager:	DocuSigned by: Melissa Turner 9796DD915C44446...	Date:	9/18/2025
	Melissa Turner		

DRMP QA Officer:	DocuSigned by: Will Hagan A4691C48F968433...	Date:	9/18/2025
	Will Hagan		

CVRWQCB QA Representative*:	**Not Applicable**	Date:	07/09/2025
	Vacant		

*While these QAPP Deviation Forms will remain unsigned by the Central Valley Water Board due to the vacant QA Representative position, the current form is approved based on CVRWQCB staff scientist review and approval by the Central Valley Regional Water Quality Control Board Executive Officer Patrick Pulupa.