

---

## Central Valley Regional Water Quality Control Board

8 September 2016

David Guy  
Sacramento Valley Water Quality Coalition  
455 Capitol Mall, Suite 335  
Sacramento, CA 95814

### **DETERMINATION THAT WALKER CREEK AMMONIA RESULTS DO NOT TRIGGER A MANAGEMENT PLAN**

Thank you for your 16 May 2016 request to determine that the development of a management plan is not required for ammonia in Walker Creek in the Colusa Glenn subwatershed of the Sacramento Valley Water Quality Coalition (Coalition). The Coalition's primary basis for the request is that the exceedances were not the result of agricultural discharges.

The information provided in the Coalition's request letter and the attached staff memorandum support the conclusion that irrigated agriculture did not cause or contribute to the ammonia exceedances observed in Walker Creek near Highway 99W and County Road 33. Monitoring during the months of the exceedances was conducted in an isolated pool which was not hydrologically connected to the rest of Walker Creek and not representative of irrigated agriculture discharges. The conditions in the pool led to elevated temperatures and pH levels that were not caused by irrigated agriculture, but resulted in lowered water quality criteria to which the ambient ammonia concentrations were compared.

For the reasons above, I have determined that the development of a management plan for ammonia is not required. The Coalition should continue to collect and analyze samples from Representative monitoring site Walker Creek according to the schedule set forth in the Coalition's Monitoring Plan.

If you have any questions or comments regarding this approval letter, please contact Lynn Coster by phone at (530) 224-2437 or by email at [Lynn.Coster@waterboards.ca.gov](mailto:Lynn.Coster@waterboards.ca.gov).

#### *Original signed by*

Pamela C. Creedon  
Executive Officer

Enclosure: Staff Review of the Determination that Walker Creek Ammonia Results Do Not Trigger a Management Plan

cc: Bruce Houdesheldt, Northern California Water Association  
Claus Suverkropp, Larry Walker Associates

---

**Central Valley Regional Water Quality Control Board**

**TO:** Susan Fregien  
Senior Environmental Scientist  
IRRIGATED LANDS REGULATORY PROGRAM

**FROM:** Lynn Coster  
Environmental Scientist  
MONITORING AND IMPLEMENTATION UNIT  
IRRIGATED LANDS REGULATORY PROGRAM

**DATE:** 17 August 2016

**SUBJECT: DETERMINATION THAT WALKER CREEK AMMONIA RESULTS DO NOT TRIGGER A MANAGEMENT PLAN**

The Sacramento Valley Water Quality Coalition (SVWQC, Coalition) is required to implement management plans for constituents that exceed water quality objectives at the same site more than once in a three-year period (Order R5-2014-0030-R1). According to the Order, however, the Executive Officer may determine that the development of a management plan is not required if there is sufficient evidence that irrigated agriculture does not cause or contribute to the water quality problem. On 16 May 2016, the Coalition submitted a request to determine that the exceedances of ammonia water quality objectives observed at Walker Creek in the Colusa Glenn subwatershed are not valid as a trigger for management plan requirements. The request is based upon the contention that the samples were collected from an isolated pool with conditions that resulted in the lowering of the ammonia exceedance criterion, and the exceedances were not the result of agricultural discharges. The Central Valley Water Board staff reviewed the Coalition's request.

**Staff evaluation of evidence presented to support the request:**

**Background:** Located in the Colusa Glenn subwatershed, Walker Creek near Highway 99W and County Road 33 serves as a Representative monitoring site for the subwatershed. The predominant crops grown within the drainage include rice, grain, pasture, corn, almonds, olives, range, prunes, and walnuts.

**Monitoring data:** Representative sites are monitored comprehensively on a recurring basis to track trends in surface water quality and to identify water quality problems. Monitoring site locations are representative of all areas and all types of irrigated agricultural waste discharge within the drainages represented. At a minimum, assessment monitoring for a comprehensive suite of constituents (as defined in the Order's Monitoring and Reporting Program) is conducted at Representative sites for two consecutive years (Assessment Years) followed by two consecutive years of monitoring only for those constituents required for surface water management plans or other Special Project monitoring (Non-Assessment Years). Assessment monitoring includes general water quality parameters, nutrients, pathogen indicators, water column and sediment toxicity, pesticides, and metals. The last two-year assessment period consisted of Water Year 2014 (October 2013 through September 2014) and 2015 (October 2014 through September 2015).

Nutrient monitoring includes ammonia, as nitrogen; nitrate + nitrite, as nitrogen; soluble orthophosphate, as phosphorus; and phosphorus, as total phosphorous. Monitoring is conducted during both the storm and irrigation seasons.

Ammonia monitoring data collected in Walker Creek from April 2009 through September 2015 is shown in Figure 1. Ambient ammonia concentrations were compared to the most stringent water quality objective derived from either the Basin Plan<sup>1</sup> taste and odor threshold or USEPA Water Quality Criteria for Ammonia<sup>2,3</sup>. As shown by the data, ammonia concentrations are typically well below the water quality objective. During the past few years, the site was dry during several of the summer and/or fall months, and monitoring was unable to be conducted.

**Figure 1. Ammonia (as N) in Walker Creek near Hwy 99W and County Road 33 (April 2009 - September 2015)**

Monitoring Results

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2015	0.055/1.5	0.51/1.5	0.13/0.34	0.23/0.87	0.21/0.04							
2014	0.25/1.5	0.099/1.5	<0.04/0.82	0.088/1.32	0.044/0.90	0.077/0.85	0.27/1.07	0.20/0.19				0.29/1.5
2013											<0.04/1.5	0.12/1.5
2012												
2011	0.16/1.5	0.088/1.5	0.12/1.5	0.13/1.5	0.21/1.5	0.066/1.47	<0.04/0.9	0.055/1.5			0.055/1.5	<0.04/1.5
2010												
2009				0.13/1.5	<0.06/1.2	0.15/1.5	<0.06/1.5	<0.06/1.07	<0.06/1.5	<0.06/1.5	0.32/1.5	0.14/1.5

**Legend**

not sampled    
  no exceedance    
  exceedance (µg/L)    
  site dry; not sampled

Note: Results listed as Ammonia concentration (mg/L) / Most Stringent Water Quality Objective

Ammonia exceedances were observed in Walker Creek in August 2014 and May 2015. The ammonia concentration in August 2014 was 0.20 mg/L (with an exceedance criterion of 0.19 mg/L) and in May 2015 was 0.21 mg/L (with an exceedance criterion of 0.04 mg/L). For these two events, water quality objectives were calculated using the USEPA Aquatic Life Ambient Water Quality Criteria for Ammonia – Freshwater 2013, which are temperature and pH dependent.

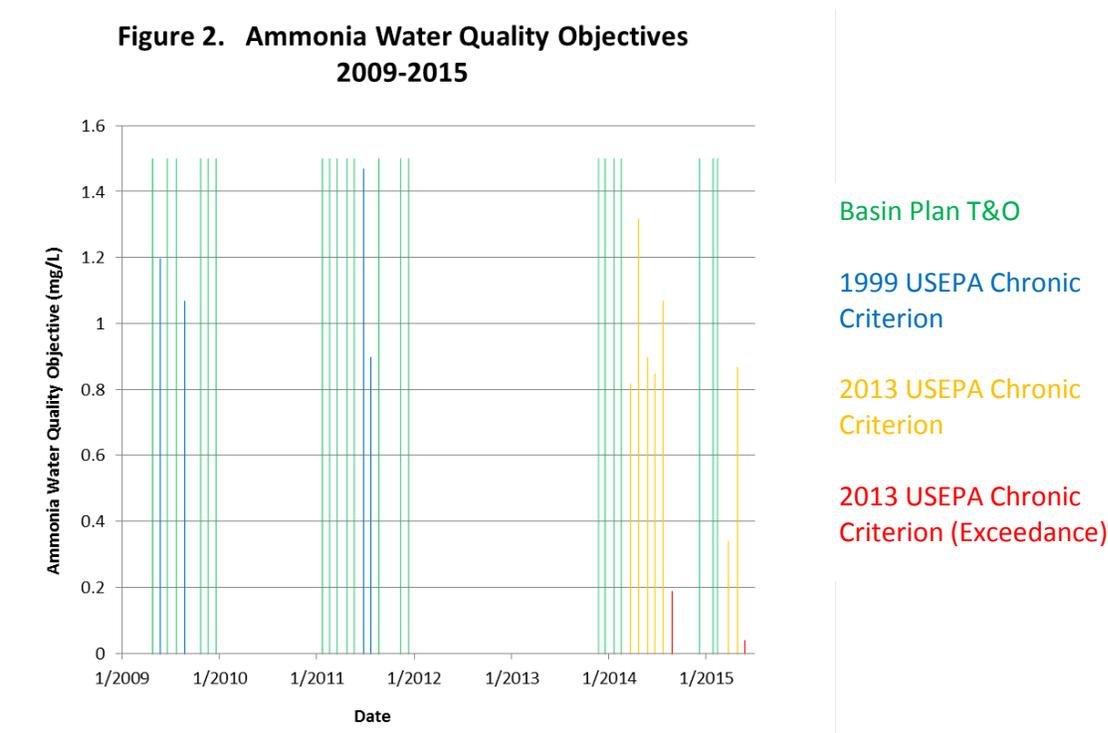
In both the August 2014 and May 2015 monitoring events, samples were collected from an isolated pool with no upstream or downstream hydrologic connectivity to the rest of the water body. The lack of flow and stagnant water were the likely cause of elevated temperatures (28.2°C and 27.0°C, respectively) and conditions that supported significant algal growth; the 15 May 2015 field log noted an abundance of green algae in the water. Elevated pH levels were documented for these monitoring events (pH levels of 8.53 and 9.95, respectively) and are likely attributed to photosynthetic carbon dioxide assimilation. Algae utilize sunlight to photosynthesize food for growth. During photosynthesis, carbon dioxide is removed from the water, resulting in an increase in ambient pH levels. Although the observed ammonia concentrations were not unusually high, the increased temperatures and pH levels resulted in a lowering of the ammonia water quality criteria to which the ambient ammonia concentrations were compared.

<sup>1</sup> Water Quality Control Plan (Basin Plan) for the California Regional Water Quality Control Board: Central Valley Region, the Sacramento River Basin and the San Joaquin River Basin, (Fourth Edition, Revised) October 2011.

<sup>2</sup>USEPA 1999 Update of Ambient Water Quality Criteria for Ammonia.

<sup>3</sup>USEPA Aquatic Life Ambient Water Quality Criteria for Ammonia – Freshwater 2013.

The water quality objectives for the 35 ammonia monitoring events at Walker Creek from 2009 through 2015 are shown in Figure 2. Due to elevated temperatures and pH levels, the respective trigger limits of 0.19 and 0.04 mg/L for the August 2014 and May 2015 monitoring events were significantly lower than the usual exceedance criterion (Figure 2). None of the other monitoring events from 2009 through 2015 occurred in stagnant, isolated pools, and no other ammonia exceedances were observed.



#### Staff recommendation:

August 2014 and May 2015 monitoring of Walker Creek was conducted in an isolated pool which was not hydrologically connected to the rest of Walker Creek at the time the samples were collected. The stagnant water had no flow, significant algal growth, and elevated temperature and pH levels. Ammonia concentrations were compared to water quality criteria that were lowered due to elevated temperatures and pH levels, and observed concentrations exceeded the trigger limits. Because the conditions under which samples were collected are not considered representative of irrigated agriculture discharges, staff recommends that the development of a management plan is not required.