



COUNTY OF LAKE WATER RESOURCES

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Scott De Leon
Director

August 29, 2012

Ms. Holly Grover
California Regional Water Quality
Control Board, Central Valley Region
11020 Sun Center Drive, #200
Rancho Cordova, CA 95670-6114

RE: Clear Lake Nutrient TMDL

Dear Holly,

We have reviewed the Clear Lake Nutrient Total Maximum Daily Load Update, July 2012 Draft, and offer the following:

- We do not believe the TMDL places enough emphasis on the nutrient cycling from the sediments. The Technical Report acknowledges this by stating:

There is evidence that internal loads of P are a larger source than external loads on an annual basis. (Tetra Tech, 2004, p 23)

There is some discussion of the phosphorus coming from the sediments (300-500 tons). In addition, hundreds of tons of nitrogen are added to the Clear Lake water column during the summer months by nitrogen fixation and/or cycling from the sediments (generally 1,000 to 2,000 tons, and as much as 4,400 tons in 1990). Lake County began measuring nitrogen in sediments in late 2011 in an attempt to determine how much of this is coming from the sediments. Until sufficient data is collected, it will not be clear how much nitrogen is cycling from the sediments and how much is due to nitrogen fixation. Based on ammonia cycling in Upper Klamath Lake, hundreds of tons of nitrogen could be coming from Clear Lake sediments.

Although phosphorus concentrations are being reduced in the sediments, phosphorus concentrations in the water column have increased substantially since the late 1980's. The premise of reducing external phosphorus loading will lead to reduced phosphorus cycling from the sediments and reduced phosphorus in the water column does not appear to be supported by the data.

Phosphorus cycling increased significantly in the late 1980's and has continued to be high. This increase in cycling comes after external loading had been reduced substantially (Richerson, 2008). Until the cause of this increase in phosphorus cycling is known, appropriate strategies to reduce this cycling and limit nuisance cyanobacteria growth cannot be developed and implemented.

- The County believes reduction in external phosphorus and nitrogen is supported by general limnological principles and supports the TMDL's target of reducing the phosphorus load to

Clear Lake. By reducing this load, reductions in other nutrients and micronutrients, which currently play an unknown role in cyanobacteria blooms, should be realized.

- We take exception of the portrayal of agricultural conversions on pages 9 and 10. It is our observation that conversions to wine grapes has resulted in a reduction in erosion, especially compared to walnut orchards. Typical walnut operations in the past included tilling and floating the walnut orchard in the late summer/early fall to facilitate harvest, resulting in no cover crop during the early winter until germination of tilled seed occurred. The Soil Conservation Service reported up to 12 inches of top soil loss in a 40-50 year period in the Red Hills region due to these practices in walnut orchards (Leonard Kashuba, personal communication)¹. In contrast, most vineyards have been implementing BMP's during the conversion process and maintain a cover crop. Many vineyard owners with severely degraded soils are working actively to rebuild the top soil layer to improve their productivity. This disparity in erosion and land management practices was highlighted during a tour of the Irrigated Lands tour in Lake County for CVRWQCB staff several years ago. A quick review of some of the soil types in the Soil Survey of Lake County identifies the need for cover crops in the steeper soils, i.e. the Glenview Series (138 et seq.). Lake County has regulated development and conversion of agricultural properties for over 10 years due to the erosion hazard, something the State of California does not regulate. Under the current Grading Ordinance (Chapter 30, LCC, adopted July 17, 2007), implementation of BMP's is required for new agricultural properties (native vegetation to agriculture) and conversions of deep rooted crops, i.e. orchard to vineyard, on soils with a moderate to severe hazard rating. The citation of Tetra Tech, who spent approximately one day observing conditions in Lake County, is very misleading.

We request that the Agricultural Sources section be revised as it implies that an increase of approximately 2,500 acres of vineyards play a significant role in the Clear Lake nutrient budget, although they affect less than one percent of the 287,300 acre watershed. The vineyard conversion discussion is misleading and is likely to be cited in the future, even though there has been no documentation of the impact of agricultural conversions on erosion.

Should the TMDL Update be revised to illustrate the need for a better understanding of internal loading and the limnology of Clear Lake and what factors are driving the nuisance algal blooms and if the section on Agricultural Sources be revised as requested, the County would support the Staff Conclusions and Recommendations as presented in the Update.

If you may have any questions I may be reached at (707) 263-2344.

Sincerely,

Thomas R. Smythe
Water Resources Engineer

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¹ Recent conversion of many of the walnut orchards to sustainable and/or organic farming has reduced erosion from the remaining walnut orchards.