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California Regional Water Quality Control Board

Los Angeles Region



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320 W. 4th Street, Suite 200, Los Angeles, California 90013
Phone (213) 576-6600 FAX (213) 576-6640 - Internet Address: <http://www.swrcb.ca.gov/rwqcb4>

Gray Davis
Governor

February 11, 2003

Mr. Terrence Fleming
U.S. Environmental Protection Agency
75 Hawthorne Street (WTR-2)
San Francisco, CA 94105

SUBJECT: COMMENTS ON THE DRAFT MALIBU CREEK WATERSHED NUTRIENT TMDL

We appreciate the opportunity to review and comment on the nutrient Total Maximum Daily Load for the Malibu Creek watershed. We recognize the complexity of the nutrient effects impairment in this watershed and greatly appreciate USEPA's efforts in developing this TMDL. This letter articulates our two major concerns regarding USEPA's draft TMDL. These are: 1) the finding that the algal impairment only occurs during the summer, and 2) the selection of numeric targets, waste load allocation, and load allocations during the winter, as defined in the TMDL. We also offer comment on conditions that may change the system's assimilative capacity and offer opportunity for temporary relief from the most stringent allocations.

Finding of Impairment

The Water Quality Control Plan for the Los Angeles Region (Basin Plan) states that, "*Waters shall not contain floating materials, including solids, liquids, foams, and scum, in concentrations that cause nuisance or adversely affect beneficial uses.*" In addition, the plan states, "*Water shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growth causes nuisance or adversely affects beneficial uses.*"

The Regional Board has interpreted this narrative objective as algal cover in excess of 30% adversely affecting (i.e., not supporting) recreational beneficial uses. This criterion is applied to both floating or bottom algae and is based on literature (Biggs 2000). During the 2002 Water Quality Assessment, the Regional Board staff proposed to list water bodies for excess algal growth when more than 10% of the samples exceeded 30% cover. A minimum of ten samples within a three-year period were required to assess a waterbody.

USEPA assessed the data set for each sampling station during "summer" and "winter", as defined in the TMDL. Although the data clearly indicate that the average percent algal cover tends to be higher in the summer than in the winter, as shown in Table 7 in the TMDL, the Regional Board's criterion for assessing impairment is still exceeded at four of the eight sampling stations during the winter.

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EPA Response: *There is evidence of algal impairment in Malibu Creek throughout the year. Our review of the algae data available for Malibu Creek and Lagoon indicates algae are clearly present at levels of concern during the summer season (as defined in the TMDL) throughout the Malibu Creek watershed, and present at levels of potential concern during the winter months at several watershed locations.*

EPA did not intend to question the State's decision to list Malibu Creek and Lagoon for algae. We acknowledge that the Regional Board applied assessment criteria based on Biggs (2000) to interpret its narrative standard for the purpose of Section 303(d) listing. We believe it was appropriate to apply the Biggs guidelines in the screening-level exercise entailed by the Section 303(d) listing process; however, it is unclear whether it is appropriate to apply Biggs' recommended guidelines in the manner suggested by the Regional Board to develop the Malibu Creek TMDLs for nutrients to address algal impacts.

EPA carefully considered the application of Biggs' recommended algae assessment guidelines for purposes of Malibu Creek TMDL development. We believed that it was important to carefully evaluate the extent of algal impairment in order to develop the problem statement for the TMDLs. In addition, federal regulations require that TMDLs take into account "seasonal variations" in pollutant effects and "critical conditions for streamflow, loading, and water quality parameters." (40 CFR 130.7 (c)(1)). Therefore, EPA considered the Biggs algae guidelines and other water quality parameters to assess algal impairment and determine the appropriate means of accounting for seasonal variations and critical conditions for these TMDLs.

Based on our review of the Biggs report cited by the State, we believe it is appropriate to consider the Biggs guidelines in the TMDLs but to apply them in a manner somewhat different than applied by the State. This response discusses in detail the basis for EPA's decision to apply the Biggs guidelines differently than the State did.

First, we note that the Biggs report was developed for assessment of water quality conditions in New Zealand based on assessment of New Zealand streams. The Biggs report emphasizes that the recommended guidelines are "provisional" and "have not been fully tested" for evaluation of nutrient enrichment effects. Biggs emphasizes that the recommended guidelines are "not a prescriptive recipe" and recommends application of these guidelines through a fairly rigorous management planning approach that has not yet been followed by the State.

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Second, the Regional Board applied the Biggs guidelines in a manner different than recommended by Biggs. The Regional Board applied the 30% cover guideline to be exceeded in no more than 10% of sample observations all algae types. We note that Biggs recommended a threshold of 30% cover for filamentous (floating) algae greater than 2 cm in length and a threshold of 60% cover for bottom algae greater than 0.3 cm thick. Biggs did not recommend application of a 10% frequency of exceedence for these cover algae guidelines as suggested by the State. EPA carefully considered Biggs' recommendations concerning temporal analysis of algae, nutrient, and biomass data for impairment assessment. Biggs recommended application of the algae cover guidelines "during summer low flows" and noted that the aesthetics/recreation guidelines are "only expected to be applied over the summer months". Biggs generally recommends evaluation of mean nutrient and biomass levels over relatively long averaging periods (monthly, seasonally, or annually).

It is not clear on what basis the State recommends application of the 10% frequency of exceedence threshold. EPA assessment guidance recommends application of the 10% frequency threshold for assessment of water chemistry samples for evaluating aquatic life beneficial uses and for other parameters (potentially including algae) for which the State has adopted water quality standards for assessment of primary contact recreation beneficial uses. Because the algae cover thresholds recommended by Briggs and applied by the State are not chemical indicators and are not based on adopted water quality standards, EPA believes it is not clear whether it is appropriate to apply a 10% exceedence frequency to the algae cover thresholds recommended by Biggs.

Third, the Biggs guidelines refer to floating and bottom algaes of specified sizes, and it is unclear whether the available data describe data consistent with Biggs algae size specifications. Therefore, it is not clear that the available data are directly comparable to the Biggs assessment guidelines.

EPA concludes that it is useful to compare the available algae data to the Biggs thresholds but that the application of a seasonal means is more clearly consistent with Biggs recommendations than application of a 10% frequency of exceedance trigger value. Evaluation of seasonal mean values also assists in analysis of seasonal variations and critical conditions. We do not believe it is necessary to consider the 30% cover guideline for floating algae and 60% cover guideline for bottom algae as absolute thresholds; instead, EPA considered whether seasonal mean values for both floating and bottom algae closely approached or exceeded these thresholds at different locations. Given the uncertainty about whether the available data are fully comparable with the

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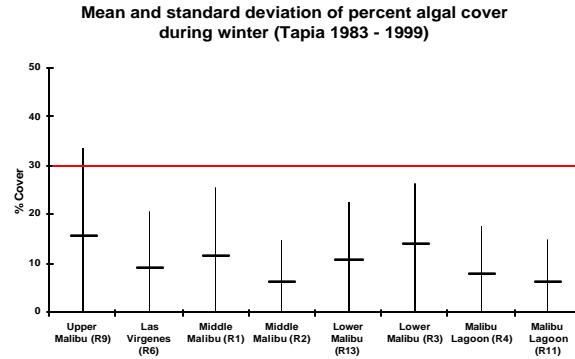
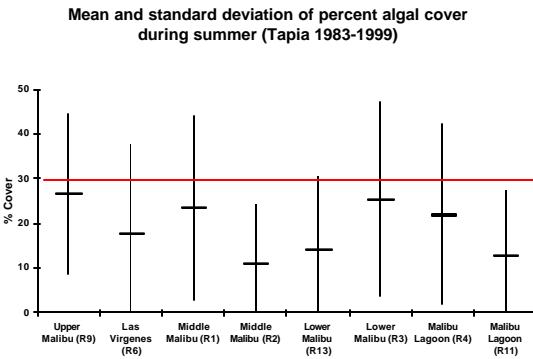
Biggs guidelines, we conclude that it is more appropriate to make rough comparisons between available algae data (including seasonal mean data values) and the individual Biggs guidelines.

Based on these considerations, EPA evaluated algae data on a seasonal basis and evaluated both the mean values and the range of values at each sampling locations. We compared the seasonal mean values to the guidelines recommended by Biggs for filamentous algae (30%) and for bottom algae (60%) at each sampling location. This analysis found that in the summer, mean algae levels were very close to 30% for floating algae at 4 of 8 locations and very close to or above 60% for bottom algae at 4 of 7 locations. In winter, mean algae levels were substantially below 30% for floating algae at all locations and below 60% for bottom algae at all locations. EPA believes these data support the decision to focus primarily on algae impairment in the summer season and secondarily on algae problems in the winter season. See following response to comment for additional analysis of the algae data.

EPA recommends additional evaluation of the relationship between algae levels and beneficial use impacts of concern, including recreational and aquatic life impacts, to determine the appropriateness of applying the Biggs recommended guidelines and to determine the appropriate exceedence frequencies for future assessment purposes.

Based on the data provided in the TMDL and its own data assessment, the Regional Board staff determined that upper Malibu Creek (R9), middle Malibu Creek (R1 and R2), and lower Malibu Creek (R3) are impaired for excessive algal growth during both the winter and summer seasons, as defined in this TMDL.

EPA Response: *We have re-evaluated the algae data for summer and winter time periods using both Tapia and Heal the Bay data sets. The Tapia data set is based primarily on floating algae and indicates that the extent of algal cover is greater in the summer than in the winter months.*



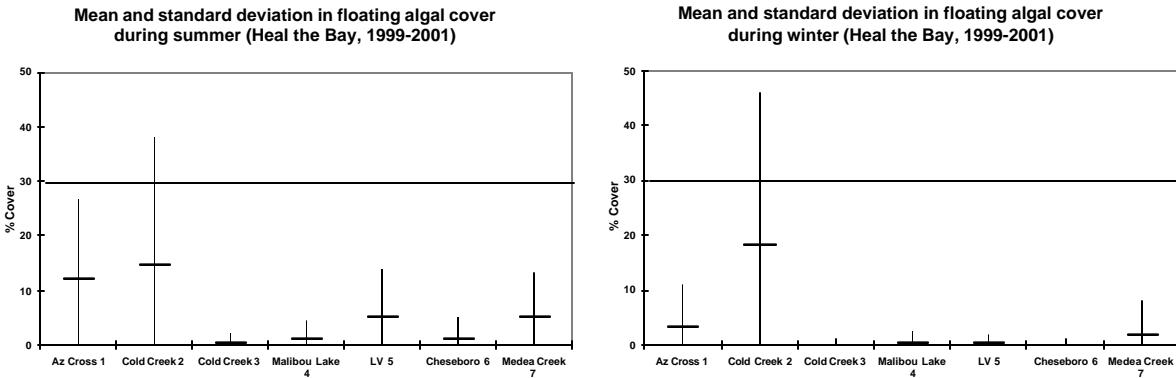
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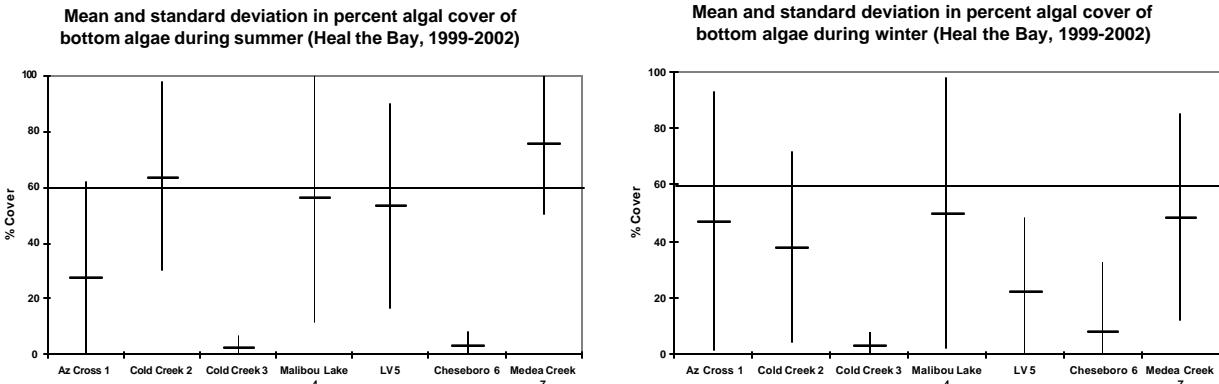
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The floating algae data from the Heal the Bay data set indicates a similar pattern.



An assessment of the bottom algae indicates that there are some exceedances of Biggs' recommended 60% cover guideline in both summer and winter time periods. Summer mean bottom algae levels exceed this guideline in some locations. The mean winter levels do not.



These suggest that the issue of algal impairment is open to interpretation. We agree that the data appear to support a clear conclusion that floating algae are present at levels of concern in the summer. There is also some evidence that bottom algae are present at levels of concern throughout the year.

Numeric Targets

USEPA has established a numeric target of 1.0 mg/L total nitrogen and 0.1 mg/L total phosphorus for controlling excessive algal biomass. The Regional Board agrees that these numeric targets are within the

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range most often cited in literature including a study of lakes in Southern California (Lund et al., 1994), as levels necessary to prevent eutrophication.

Regional Board staff had earlier proposed a numeric target of 2.5 mg/L nitrate (LARWQCB, 2001 c) based upon values in upper Malibu Creek, upstream of the Tapia Water Reclamation Facility (referred to hereinafter as Tapia). However, based upon review of these numbers against more recent literature values, and in recognition that upper Malibu Creek itself is impaired for algae, we conclude that 2.5 mg/L nitrate is too high to control excessive algal growth. This conclusion is based on the assumption that excessive algal growth is caused by nitrate enrichment. The Regional Board staff support USEPA's numeric targets of 1.0 mg/L total nitrogen and 0.1 mg/L total phosphorus to control excessive algal growth in the summer.

The proposed winter numeric target, waste load allocation, and load allocation are too high to address the algal impairment. These numbers are based on the Basin Plan objective of 10 mg/L nitrate/nitrite nitrogen, with no limits for phosphorus. Although, we acknowledge that other factors including light intensity, temperature, and flow may change the levels of nutrient reductions required to control algae in the winter, by all accounts, these numbers are too high to control excessive algal growth.

EPA Response: *We are pleased that the Regional Board concurs with the numeric targets that EPA is establishing for total nitrogen and total phosphorous during the summer. We disagree with the Regional Boards assertion that these limits should be applied in the winter month given the uncertainties in 1) the extent and magnitude of the winter-time impairment, 2) the relationship between nutrients and algal abundance in the winter and 3) the relationship between winter flows and nutrient accumulation in the lakes and lagoons. There is not sufficient justification for imposing stringent winter-time targets at this time. We believe that the establishment of a winter-time concentration-based target of 8 mg/l for nitrate nitrogen will reduce total nitrogen loadings to the system. If further studies indicate that more stringent reductions are required during the winter season, the State may reconsider and revise the TMDLs at a later date.*

Rain-Affected Days

Although, we disagree in general with USEPA's proposed wintertime waste load and load allocations, these allocations may be allowable during rain affected days. Numeric targets for excessive algal growth need not apply during rain-affected days¹ because storms flows provide high water velocities, substratum instability, and suspended particle abrasion, all of which decrease algal biomass. However, reductions in nutrient discharges must be reinstated soon after a rain event as, according to Biggs, high flow

¹ In the Santa Monica Bay Pathogen TMDL, the term "rain affected days" was coined to described days that waterbody was had higher than normal flows caused by a recent storm event. Rain affected days was defined as days of over 0.1 inch of rain and the preceding three days.

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disturbances tend to reset algal biomass accumulation in a community, so that a new cycle of colonization occurs followed by exponential growth (Biggs, 2000). The definition of rain affected days provided in the Santa Monica Bay Wet-Weather Pathogen TMDL may be used as a guideline for temporarily suspending a wintertime waste load allocation and load allocation designed to address the wintertime algal impairment.

EPA Response: *The approach recommended may be a reasonable way of dealing with the issue of loadings from winter time flows. However, insufficient information is available at this time to support application of this suggestion. First we would need to have better data on the extent and magnitude of nutrient accumulation in the lagoon and lakes. Second we would need to have a better understanding of the relationship between flow and algal scour. Note that the CH2MHill report asserts that flows greater than 1 fps are sufficient to scour algae and reset the clock; however this is contested by Heal-The-Bay in their comment letter. We understand that studies are underway to assess the extent of nutrient accumulation in the lagoon. We know of no studies that are being planned to assess the relationship between flow and algae in the Creeks. The Regional Board may wish to consider this method of TMDL expression if and when they review and revise the TMDL.*

"Summer" And "Winter"

The watershed is a complex system and includes a series of lakes, intermittent and blue line streams, and the Malibu Lagoon. The lagoon opens in the winter time, and tends to close in the summer. When the lagoon sand bar breaches, discharge from the lagoon is believed to contribute to bacteria exceedances at Surfrider Beach. Tapia is the sole permitted point source discharge in the watershed. In an effort to minimize "breaching of the lagoon sand bar," the Regional Board issued a discharge prohibition to Tapia, effective from April 15 to November 15. However, the lagoon typically remains open for some time after the discharge prohibition takes effect. Although the TMDL described "summer" and "winter" as two distinct periods, coinciding with the Tapia discharge prohibition period, the transition in the lower watershed occurs gradually over a period of several days to weeks, depending on rainfall patterns. Therefore, if during the final analysis, summer and winter numeric targets differ, it may be appropriate to link these targets to the actual opening and closing of the lagoon or other factors contributing to the system's assimilative capacity.

EPA Response: *We appreciate this comment, but are unclear how to implement the recommendation. The Regional Board may wish to address this comment if they review and revise the TMDL at a later date. We also note that the hypothesis that low controlled flows during the summer months may actually be contributing to the summer time algae problem is consistent with Biggs (2000).*

Again, we thank USEPA for their efforts in developing the TMDL. As noted in the TMDL report, the Regional Board has contracted on-going studies regarding the relationship between nutrients and excessive

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algal growth and the potential for nutrient sediment fluxing in the Malibu Lagoon. We expect that these studies will provide an improved understanding of the dynamics of this complex watershed, and the level of nutrient reductions that may be needed during both summer and winter seasons to restore the water quality in the Malibu Creek Watershed. The Regional Board plans to develop a TMDL and implementation plan once these studies are concluded.

Should you have any questions regarding our comments please contact Melinda Becker (213) 576-6681 or Rod Collins (213) 576-6691.

Sincerely,

Jonathan Bishop
Section Chief, Regional Programs

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