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TO: Dr. Gerald W. Bowes
State Water Resources Control Board

In reply refer to:
650653:chenning

FROM: David W. Gibson
Executive Officer
California Regional Water Quality Control Board, San Diego Region

DATE: December 20, 2010

SUBJECT: **Request for Scientific Peer Review for the Basin Plan Amendment Incorporating the *Los Peñasquitos Lagoon Sedimentation Total Maximum Daily Load (TMDL)***

The purpose of this memorandum is to request initiation of the process for selection of scientific peer reviewers, pursuant to the requirements of Health and Safety Code section 57004, for the proposed Basin Plan amendment to incorporate the *Los Peñasquitos Lagoon Sedimentation Total Maximum Daily Load*. This project addresses Los Peñasquitos Lagoon, which was first added to the Clean Water Act Section 303(d) Water Quality Limited Segments List in 1996 for sedimentation/siltation. The goal of the proposed action is to restore impaired beneficial uses of this waterbody by establishing a TMDL to address the impairment, amending the Basin Plan to incorporate the TMDL, and implementing the TMDL through various regulatory measures.

The proposed Basin Plan Amendment includes the Sedimentation TMDL for Los Peñasquitos Lagoon. The purpose of peer review for the Sedimentation TMDL is to review the scientific basis of the TMDL, including the numeric target, load reduction calculations, assumptions, and the implementation plan. I request that you solicit reviewers with expertise in soil science, hydrogeology, water quality modeling, and a familiarity with statistics.

In order to assist in the selection of reviewers, the following information is provided as attachments to this letter:

Attachment 1. A brief summary of the *Los Peñasquitos Lagoon Sedimentation Total Maximum Daily Load*;

Attachment 2. A brief review of the scientific issues that require peer review; and

Attachment 3. A list of individuals involved in the development of this project.

The Basin Plan Amendment, the draft Staff Report, and supporting documents are not included as part of this submittal; these documents will be provided to the peer reviewers at a later date.

The San Diego Water Board will consider the proposed amendment at its regularly scheduled meeting in June 2011. The draft Staff Report and supporting materials are expected to be ready for peer review by mid January 2011. Given the Board's priority for this amendment, the reviewers are asked to provide comments within 30 days of receipt of the draft Staff Report and supporting materials.

Please contact Ms. Cathryn Henning of my staff if you have any questions or need further information, at (858) 636-3161 or chenning@waterboards.ca.gov.

Thank you for your assistance with this matter.

DWG:dsj:clh

Enclosures (3)

cc (via email):

Catherine George Hagan, OCC, (CHagan@waterboards.ca.gov)

Rik Rasmussen, Chief, State Water Board Planning Standards & Implementation Unit (RRasmussen@waterboards.ca.gov)

Los Peñasquitos Lagoon Sedimentation Total Maximum Daily Load

Summary of Proposed Basin Plan Amendment

Problem

The Los Peñasquitos Lagoon (Lagoon) is currently listed on the Clean Water Act Section 303(d) Water Quality Limited Segments list for impairment due to sedimentation/siltation. The Lagoon is impaired due to sediment-associated impacts from urban development and urban runoff delivered by the storm drain system to the Lagoon from the surrounding watershed. The Lagoon is not meeting the narrative water quality objective (WQO) for sediment. As a result, numerous beneficial uses are impaired, primarily those associated with protection of aquatic life (e.g., Estuarine, Marine Life Habitat, and Preservation of Biological Habitats of Special Significance, etc.).

Purpose

The purpose of the proposed action is to restore the Lagoon to water quality conditions in which the WQO is once again met. This is done by establishing and implementing a Total Maximum Daily Load (TMDL) for sedimentation. When the TMDL and associated pollutant allocations are met, water quality standards in the waterbody should be restored. A TMDL is both (1) a calculation of the maximum loading capacity of the impaired waterbody for each impairing pollutant; and (2) an implementation plan to guide actions necessary to cleanup the waterbodies and restore water quality standards.

Proposed Action

The proposed action is the adoption of a Basin Plan amendment to incorporate the TMDL, associated waste load allocations, and required load reductions into the Basin Plan. The Basin Plan Amendment would include the following regulatory provisions:

1. *Numeric Target.* A numeric target is needed to evaluate attainment of the narrative water quality objective for sediment. Using a weight of evidence approach, the numeric target for sediment, as calculated based upon land use distribution, was set equal to the historical mid-1970s sedimentation rate, which was assumed to represent natural sedimentation conditions.
2. *Sedimentation Rates.* The Loading Simulation Program in C++ (LSPC) was used to calculate both historic and existing conditions within the watershed. The LSPC watershed model was linked to the Environmental Fluid Dynamics Code (EFDC) to model hydrodynamics and sediment transport in the Lagoon. These models were used to establish sedimentation rates under both historic and existing conditions.
3. *Load Reduction Calculations.* Percent reductions were calculated based on the difference between the allowable sediment load (i.e., TMDL) and the sediment load that corresponds with existing conditions.
4. *Allocations.* The TMDL assigns a waste load allocation to point sources and a load allocation to non-point sources. A 67 percent sediment load reduction is required for the watershed contribution. The MS4 copermittees (County of San Diego, the City of San Diego, the City of Del Mar, and the City of Poway) and Caltrans will be responsible for making the required load reductions. No reduction is required for the

identified non-point source which is the ocean boundary (sediment loads contributed by wave action, storm surge, and tidal flow) and is considered uncontrollable.

5. *Implementation Plan.* The Implementation Plan will include a range of regulatory alternatives available to the San Diego Water Board to require the responsible parties to meet the waste load reductions. Specifically, the San Diego Water Board plans to amend the San Diego Municipal Storm Water Permit[1] to include the requirements of the TMDL. In addition, the San Diego Water Board plans to request that the State Water Board amend the Caltrans Storm Water Permit[2] to include the requirements of the TMDL. The primary TMDL implementation action to be required of the responsible parties will include development of a Sediment Load Reduction Plan (SLRP). The SLRP may involve imposing requirements for low-impact development, installation of best management practices, implementation of hydromodification controls, installation of physical structures to catch sediment, removal of existing sediment, and/or restoration of the Lagoon. If needed, the San Diego Water Board may issue Water Code section 13267 investigative orders to direct responsible parties to complete required plans in the interim, while the amendments to the above NPDES Permits are completed.
6. *Monitoring Program.* Monitoring is required to gauge progress in achieving allocations and load reductions.

Background

The Los Peñasquitos Lagoon (Lagoon) and Los Peñasquitos watershed is located in the Los Peñasquitos Hydrologic Unit in central San Diego County. The Lagoon is a relatively small estuarine system that is part of the Torrey Pines State Natural Reserve; the Lagoon is one of the few remaining native salt marsh lagoons in southern California. The Lagoon is ecologically diverse, supporting a variety of plant species, and providing habitat for numerous bird, fish, and small mammal populations. The Lagoon also serves as a stopover for migratory birds and provides habitat for coastal marine and salt marsh species.

The Lagoon consists of approximately 510 acres of wetland habitats including coastal salt marsh (this includes salt panne, tidal channels, and mudflats), brackish marsh, riparian woodland and scrub, and freshwater marsh. The Lagoon's 510 acres include approximately 210 acres of tidal salt marsh and 120 acres of freshwater wetlands that are considered unimpaired. The remaining 180 acres of salt marsh and brackish marsh vegetation has been impaired by sedimentation, converting coastal salt marsh to freshwater or upland habitats. The 93 square mile Los Peñasquitos coastal watershed includes Carroll Canyon Creek, Carmel Creek, and Los Peñasquitos Creek. These creeks drain portions of the cities of San Diego, Poway, and Del Mar. In addition, a small portion of San Diego County is located in the eastern headwaters area. There are also several major road corridors that are maintained by Caltrans within the watershed.

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[1] Order No. R9-2007-0001, NPDES No. CAS0108758, *Waste Discharge Requirements (WDRs) for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems Draining the Watersheds of the County of San Diego, the Incorporated Cities of San Diego County, the San Diego Unified Port District, and the San Diego County Regional Airport Authority.*

[2] Order No. 99-06-DWQ, *National Pollutant Discharge Elimination System (NPDES) Permit for Storm Water Discharges from the State of California, Department of Transportation Properties, Facilities, and Activities*

The watershed is characterized by semi-arid, Mediterranean climate of coastal Southern California that has extended periods of drought with rainfalls concentrated in January to March. The climate is generally mild with annual temperatures averaging around 65°F near the coastal areas. Average annual rainfall ranges from nine to eleven inches along the coast.

Los Peñasquitos Lagoon Sedimentation Total Maximum Daily Load

Description of Scientific Issues to be Addressed by Peer Reviewers

The statute mandate for external scientific peer review (Health and Safety Code section 57004) states that the reviewer's responsibility is to determine whether the scientific portion of the proposed rule is based on sound scientific knowledge, methods, and practices.

Determination of scientific validity for each of the following issues that constitute the scientific portion of the proposed regulatory action is needed. An explanatory statement is provided for each issue to focus the review.

1. **Sediment Loading Calculation.** Estimation of sediment loading from nine categories of land uses based on estimated impervious fractions. (See the Source Assessment section of the Staff Report)

   There are many potential sources that have influenced the accumulation of sediment within the Lagoon. Sources include erosion of canyon banks, bluffs, scouring stream banks, and tidal influx. Some of these processes are exacerbated by anthropogenic disturbances, such as urban development within the watershed. Urban development transforms the natural landscape and results in increased runoff due to hydromodifcation resulting in scouring of sediment, primarily below storm water outfalls that discharge into canyon areas. Sediment loads are transported downstream to the Lagoon during storm events causing deposits on the salt flats, and in Lagoon channels. These sediment deposits have gradually built-up over the years due to increased sediment loading and inadequate flushing, which directly and indirectly affects lagoon functions and salt marsh characteristics.

   Since several land use types share hydrologic or pollutant loading characteristics, many land uses were grouped into similar classifications resulting in a subset of nine categories for modeling. The total area for each land use was multiplied by its respective impervious factor to calculate the estimated impervious fractions. The Loading Simulation Program in C++ (LSPC) model utilizes algorithms that require land use in each catchment to be divided into pervious and impervious categories.

2. **Numeric Target Selection.** Determination that multiple lines of evidence agreed with each other and that attainment of the selected numeric target will result in attainment of the narrative sediment water quality objective and restoration of beneficial uses in the Lagoon. (See the Numeric Targets section of the Staff Report)

The TMDL weight of evidence approach utilizes a historical review of available literature regarding urbanization trends and Lagoon impacts to identify an appropriate time period for calculating the numeric target. The lines of evidence that comprise the approach include urbanization trends, population data, flow data, and a Lagoon conditions evaluation. The lines of evidence indicate that land use conditions present during the mid-1970s represent a time when water quality objectives were met in the Lagoon (i.e., reference conditions). To characterize this historical period, historic land use coverage for the watershed was developed and LSPC model simulations were performed. The resulting net annual sediment load was identified as the TMDL numeric target and represents the loading (assimilative) capacity of the Lagoon for sediment.

3. **Model Assumptions.** Determination that assumptions used in the Loading Simulation Program in C++ (LSPC) and the Environmental Fluids Dynamic Code (EFDC) model were appropriate to accurately calculate sediment load reductions. (See the Modeling Report referenced in Appendix A to the Staff Report)

   The model makes assumptions which simplify the load estimations. One set of assumptions refers to the amount of irrigation water applied within the watershed. Another set of assumptions refers to soil characteristics.

   The amount of irrigation water applied is an important component of the water balance in Southern California because summer flows are a function of the irrigation factor. Calculation of the amount of irrigation water applied involves several estimations and assumptions including an assumption that the daily amount of irrigation water is distributed evenly over time; estimated crop coefficients (0.8 for residential and commercial lawns and 0.85 for agricultural areas); an estimated efficiency factor (80 percent); and an assumption that if precipitation exceeds water demand, then the irrigation demand is zero.

   The Soil Survey Geographic Database was used to characterize the soils, obtain soil erodibility values, and determine particle size distribution. Soils transported by surface runoff were assumed to be composed of 5 percent sand, twice as much clay as the percentage of clay within each hydrologic soil group, and the remainder assigned to the silt fraction. Default values for porosity (0.4) and density (1.99 gm/cm^3) were used to characterize sediment.

   Bank erosion within lagoon channels was not simulated; therefore, sediment erosion and resuspension are assumed to occur only with respect to bottom sediment. In addition, sediment transported via diffusive bed load processes was not characterized in the LSPC modeling.

4. **Implicit Margin of Safety.** Utilization of an implicit margin of safety (MOS) rather than an explicit MOS to account for uncertainty in the TMDL. (See the Identification of Load Allocations and Reductions section of the Staff Report)

An MOS is incorporated into a TMDL to account for uncertainty in developing the relationship between pollutant discharges and water quality impacts. An explicit MOS was not used to reserve a portion of the loading capacity. Instead, an implicit MOS was included through the application of conservative assumptions in the modeling and TMDL analysis. These assumptions include selection of the critical condition; determination of the soil composition in surface runoff; determination of the reference condition; and selection of the critical location.

5. **Implementation Plan.** Completion of the actions described in the Implementation Plan is expected to result in attainment of the narrative sediment water quality objective and restoration of beneficial uses in the Lagoon. (See the Implementation Plan section of the Staff Report)

   The Implementation Plan provides the reviewer with the context in which the scientific components will be implemented. The Implementation Plan is a regulatory provision of the Basin Plan amendment, which is briefly summarized in item 5 of Attachment 1 to this document.

<u>The Big Picture</u>

Reviewers are not limited to addressing only the specific issues presented above and are asked to contemplate the broader perspective.

1. In reading the staff technical reports and proposed implementation language, are there any additional scientific issues that are part of the scientific basis of the proposed rule not described above? If so, please comment with respect to the statute language given above.

2. Taken as a whole, is the scientific portion of the proposed rule based upon sound scientific knowledge, methods, and practices?

Reviewers should also note that some proposed actions may rely significantly on professional judgment where available scientific data are not as extensive as desired to support the statute requirement for absolute scientific rigor. In these situations, the proposed course of action is favored over no action.

The preceding guidance will ensure that reviewers have an opportunity to comment on all aspects of the scientific basis of the proposed San Diego Water Board action. At the same time, reviewers also should recognize that the San Diego Water Board has a legal obligation to consider and respond to all feedback on the scientific portions of the proposed rule. Because of this obligation, reviewers are encouraged to focus feedback on the scientific issues that are relevant to the central regulatory elements being proposed.

Los Peñasquitos Lagoon Sedimentation Total Maximum Daily Load

Individuals Involved in Development of Proposed Basin Plan Amendment

California Regional Water Quality Control Board, San Diego Region

- Cathryn Henning
- Deborah Jayne
- Benjamin Tobler
- Charles Cheng
- Amy Mecklenborg
- Cynthia Gorham
- John Odermatt
- Laurie Walsh

Consultant

- Steve Carter, Tetra Tech, Inc.
- Clint Boschen, Tetra Tech, Inc.

USEPA Region IX

- Cindy Lin

Stakeholder Advisory Group

Name	Organization	Name	Organization
Ruth Kolb	City of San Diego	Contantine Kontaxis	Caltrans
Beverly Morisako	City of San Diego	Stephanie Gaines	County of San Diego
Drew Kleis	City of San Diego	Todd Snyder	County of San Diego
Clem Brown	City of San Diego	Tracy Cline	County of San Diego
Cherlyn Cac	City of San Diego	Mike Hastings	LP Lagoon Foundation
Joe DeStefano	City of Del Mar	Livia Borak	Coast Law Group
Kelly Barker	City of Del Mar	Steve Gruber	Weston Solutions
Malik Tamimi	City of Poway	Darren Smith	California State Parks
May Alsheikh	Caltrans		