CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

TENTATIVE RESOLUTION NO. R9-2011-0021

A RESOLUTION AMENDING *THE WATER QUALITY CONTROL PLAN FOR THE SAN DIEGO BASIN (9)* TO INCORPORATE THE TOTAL MAXIMUM DAILY LOAD FOR SEDIMENTATION IN LOS PEÑASQUITOS LAGOON

WHEREAS, The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board), finds that:

1. **Water Quality Control Plan**: The federal Clean Water Act[1] and state Porter-Cologne Water Quality Control Act[2] requires the San Diego Water Board to establish water quality standards for each waterbody within its region. The water quality standards for coastal waters in the San Diego Region are established in the *Water Quality Control Plan for the San Diego Basin (9)* (Basin Plan) and in the *Water Quality Control Plan for Ocean Waters of California* (Ocean Plan). Water quality standards include beneficial uses, water quality objectives (WQOs), and the antidegradation policy. The Basin Plan contains programs of implementation to achieve water quality standards.[3] Waterbodies that do not meet water quality standards are considered impaired.

2. **Clean Water Act Section 303(d) List of Water Quality Limited Segments:** Pursuant to Section 303(d) of the Clean Water Act, each state is required to identify impaired waters and establish a total maximum daily load (TMDL) at a level necessary to implement the applicable water quality standards.[4] Each state is required to develop a list that identifies and establishes a priority ranking for those waters requiring TMDLs.[5] The list is known as the Clean Water Act Section 303(d) List of Water Quality Limited Segments or more commonly, the 303(d) List. For the specific purpose of developing information, states are also required to estimate TMDLs for all other waters that are not identified on the 303(d) List. [6]

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[1] Clean Water Act section 303; U.S. Code section 1313

[2] California Water Code section 13240

[3] See Water Code section 13050(j). A "Water Quality Control Plan" or "Basin Plan" consists of a designation or establishment for the waters within a specified area of all of the following: (1) Beneficial uses to be protected, (2) Water quality objectives and (3) A program of implementation needed for achieving water quality objectives.

[4] Clean Water Act section 303(d)(1)(C); U.S. Code section 1313(d)(1)(C)

[5] Code of Federal Regulations Title 40 section 130.7(b)(1)

[6] Clean Water Act section 303(d)(3) states that "For the specific purpose of developing information, each State shall identify all waters within its boundaries, which is has not identified under paragraph (1)(A) and (1)(B) of this subsection and estimate for such waters the total maximum daily load with seasonal variations and margin of safety…"

3. **Purpose and Definition of Total Maximum Daily Load (TMDL)**: 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.

4. **TMDL Basin Plan Amendment**: Upon establishment and approval of TMDLs, the state is required to incorporate TMDLs into the state water quality management plan.[7] Along with various applicable statewide water quality control plans, the Basin Plan for the San Diego Region serves as the water quality management plan for the watersheds under the jurisdiction of the San Diego Water Board. Incorporating TMDLs into the Basin Plan requires an amendment to the Basin Plan and the development of an Implementation Plan. The Implementation Plan must include a description of the actions necessary to achieve the objectives, a time schedule for the actions to be taken, and a description of the monitoring to be undertaken to determine compliance with objectives.[8]

5. **Water Quality Impairment of Los Peñasqutios Lagoon**: As required by section 303(d) of the Clean Water Act, the Los Peñasqutios Lagoon (Lagoon) was placed on the 1996 List of Water Quality Limited Segments due to sedimentation and siltation loads that exceeded water quality objectives. The beneficial use that is most sensitive to increased sedimentation is estuarine habitat. Estuarine uses may include preservation or enhancement of estuarine habitats, vegetation, fish, shellfish, or wildlife (such as marine mammals or shorebirds). Other beneficial uses listed in the Basin Plan for the Lagoon include contact water recreation; non-contact water recreation; preservation of biological habitats of special significance; wildlife habitat; rare, threatened or endangered species; marine habitat; migration of aquatic organisms; spawning, reproduction and/or early development; and shellfish harvesting.

   Impacts associated with increased and rapid sedimentation include: reduced tidal mixing within Lagoon channels, degraded and (in some cases) net loss of riparian and salt marsh vegetation, increased vulnerability to flooding for surrounding urban and industrial developments, increased turbidity associated with siltation in Lagoon channels, and constricted wildlife corridor.

[7] Code of Federal Regulations Title 40 section 130.6(c)(1)

[8] Pursuant to the requirements of Article 3, commencing with section 13240, of Chapter 4 of the Porter-Cologne Water Quality Control Act, as amended, codified in Division 7, commencing with section 13000, of the Water Code

6. **Water Quality Objective**: The water quality objective for sediment is contained in the Basin Plan. The Basin Plan states, *"The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses."*

7. **Numeric Targets**: One or more quantitative numeric targets must be selected to calculate a TMDL for an impaired waterbody. Numeric targets are derived from and must be able to interpret and implement water quality standards (beneficial uses, water quality objectives, and the antidegradation policy). This means that attainment of the selected numeric targets in the impaired waterbody represents attainment of applicable water quality standards in the waterbody; i.e., when the numeric targets are met, the TMDL should be met, WQOs should be met and the beneficial uses should be restored. While numeric targets and TMDLs are derived from; represent; interpret; and implement water quality standards, they are not water quality standards.

   In the case of Los Peñasquitos Lagoon, because the applicable water quality objective for sediment is narrative, a number of potential numeric targets were considered. Ultimately a reference system approach was selected in which the "reference condition" was defined as the historic sediment loading rate at a time when the water quality standard was believed to have been met in the Lagoon. Consideration of various lines of evidence indicates that the Lagoon was likely achieving the water quality standard for sediment before the mid-1970s. A historic coverage for the Los Peñasquitos watershed was developed for this period using US Geological Survey topographic maps from the 1970s (primarily the La Jolla quadrangle-dated 1975). This historic land use distribution was used to calculate the numeric target using the LSPC watershed model. This historic sediment load of 12,360 tons per critical wet period (58.6 tons per day) represents the sediment TMDL numeric target.

8. **Sources of Sediment**: Sources of sediment 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 by converting pervious surfaces to impervious surfaces, which increases the volume and velocity of runoff 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.

   Sediment loading is transported and discharged to the Lagoon through the municipal separate storm sewer system (MS4); therefore, the San Diego County Phase I MS4 copermittees in the watershed are collectively identified as a significant sediment

source. Other watershed sources include both the Phase II MS4s and transportation infrastructure operated by the California Department of Transportation (Caltrans).

Another important sediment source is the ocean, which is considered an uncontrollable nonpoint source that contributes sediment to the Lagoon via storm surges, wave action, and tidal exchange.

9. **Calculation of Total Maximum Daily Loads**: The TMDL for sediment is equal to the total assimilative or loading capacity of the Lagoon. The loading capacity is defined as the maximum amount of sediment that the Lagoon can receive and still attain water quality objectives necessary for the protection of designated beneficial uses. Each TMDL must account for all known sources of a pollutant, whether from natural background, nonpoint sources, or point sources, and must include a margin of safety (MOS) to preclude pollutant loading from exceeding the actual assimilative capacities of the waterbody. The TMDL calculations also account for seasonal variations and critical conditions and were developed in a manner consistent with guidelines published by U.S. Environmental Protection Agency (USEPA).

10. **Technical TMDL Analysis**: The Staff Report contains the technical TMDL analysis, which includes a description of the impairment, selection of numeric targets, source analysis, linkage analysis (calculation of "existing" sediment loads and "allowable" sediment loads [or TMDLs]), method for allocating the TMDL to the identified point sources and nonpoint sources, and calculation of load reductions required from identified controllable sources (difference between "existing" and "allowable" sediment loads for each source). Development of the technical TMDL relied heavily on the October 2010 Technical Support Document prepared by Tetra Tech entitled, "Los Peñasquitos Lagoon Sediment/Siltation TMDL."

11. **Allocations and Reductions**: A TMDL is divided, or allocated, among the sources that contribute or may contribute pollutant loads to a waterbody. If there are point sources that contribute or may contribute pollutant loads to a waterbody, they are assigned portions of the TMDL known as wasteload allocations (WLAs). Nonpoint sources and natural background sources that contribute or may contribute pollutant loads to a waterbody are assigned portions of the TMDL known as load allocations (LAs). The TMDL is expressed mathematically as the sum of all the WLAs and LAs and margin of safety (i.e., TMDL = ΣWLAs + ΣLAs + MOS). For this sediment TMDL the Municipal MS4s and Caltrans are assigned WLAs, and the ocean boundary is assigned a LA. Sources that are not identified cannot be assigned a WLA or LA and are assumed to have a zero allowable load (i.e., WLA = 0 or LA = 0). Sources that are assigned a zero allowable load are not expected or allowed to discharge sediment to the Lagoon as part of the TMDL.

12. **Load Reductions Required to Attain TMDL:** According to the TMDL, the Phase I MS4s, Phase II MS4s, and Caltrans infrastructure within the watershed are collectively assigned a single total WLA. This means that only the Phase I MS4s, Phase II MS4s, and Caltrans are expected or allowed to discharge sediment to the

Lagoon. Based on the technical TMDL analysis, sediment load reductions are required in the discharges from the Phase I MS4s, Phase II MS4s, and Caltrans to meet the collective WLA and attain the TMDL in the Lagoon.

13. **TMDL Implementation Plan**: TMDLs are not self-implementing or directly enforceable for sources in the watershed. Instead, TMDLs must be implemented through the programs or authorities of the San Diego Water Board and/or other entities to compel dischargers responsible for controllable sources to achieve the pollutant load reductions identified by a TMDL analysis to restore and protect the designated beneficial uses of a waterbody.

    The amendment of the Basin Plan, in Attachment A, to establish and implement the sediment TMDL for the Lagoon includes a TMDL Implementation Plan that contains (1) the actions that the San Diego Water Board and/or other entities can take to implement the TMDL; (2) a compliance schedule by which the TMDL, and thereby the restoration of the beneficial uses in the receiving waters, are to be achieved; and (3) a description of the minimum components for a monitoring program that is required to assess compliance with the TMDL, WLAs, and LAs.

14. **Implementation of TMDL**: Because the Phase I MS4s are located at the base of the watersheds and have been identified as the most significant controllable source of sediment discharging to the Lagoon, this TMDL will be implemented primarily through the revision of the National Pollutant Discharge Elimination System (NPDES) permit regulating discharges from the Phase I MS4s. The Caltrans NPDES permit will also be revised. Federal regulations require that NPDES permits incorporate water quality based effluent limitations (WQBELs) that must be consistent with the requirements and assumptions of any available WLAs.[9] WQBELs may be expressed as numeric effluent limitations, when feasible, and/or as a best management practice (BMP) program of expanded or better-tailored BMPs.[10] The WQBELs will likely need to include a BMP program to achieve the load reductions required to attain the TMDL in the Lagoon.

    The Phase I MS4s and Caltrans will be required to submit a Sediment Load Reduction Plan outlining a proposed BMP program that will be capable of achieving the necessary load reductions required to attain the TMDL in the Lagoon. The Phase I MS4s and Caltrans will be responsible for reducing their sediment loads and/or demonstrating that their discharges are not causing exceedances of the WQOs. Phase II MS4s will be required to comply with existing requirements upon designation and enrollment under the Statewide Phase II MS4 general NPDES permit[11] or other individual Phase II MS4 permit issued by the San Diego Water

[9] Code of Federal Regulations Title 40 section 122.44(d)(1)(vii)(B)
[10] Code of Federal Regulations Title 40 section 122.44(k)(2)&(3)
[11] Order No. 2003-0005-DWQ, *National Pollutant Discharge Elimination System (NPDES) General Permit No. CAS000004, Waste Discharge Requirements for Storm Water Discharges from Small Municipal Separate Storm Sewer Systems (General Permit)*

Board. Industrial and construction storm water permittees will also be required to comply with existing requirements under their respective permits[12].

15. **Compliance Schedule**: Full implementation of the TMDL for sediment shall be completed as soon as possible but no later than 10 years from the effective date of the Basin Plan amendment. For dischargers in watersheds that undertake concurrent load reduction programs for other pollutant constituents (e.g. metals, pesticides, trash, nutrients, bacteria, etc.) together with the sediment load reduction requirements in this TMDL, an alternative compliance schedule may be proposed and incorporated by the San Diego Water Board into the implementing orders.

16. **TMDL Compliance Monitoring**: An essential component of implementation is water quality monitoring. Monitoring is needed to evaluate the progress toward attainment of the TMDL and restoring the beneficial uses in the receiving waters. Compliance with the TMDL will be assessed by monitoring the Lagoon and contributing creeks, and then comparing the results to the numeric target and surrogate goals established in the Sediment Load Reduction Plans. At the end of the TMDL compliance schedule, the annual sediment load must not exceed the numeric target.

17. **Compliance with WLA**: Ultimately, the TMDL in the Lagoon will be met when the dischargers responsible for controllable sources meet the total WLA. Otherwise, the dischargers responsible for controllable sources of sediment must provide evidence and demonstrate to the San Diego Water Board that their discharges are not causing exceedances of the WQO in the Lagoon.

18. **Scientific Peer Review**: The scientific basis for these TMDL has undergone external peer review pursuant to Health and Safety Code section 57004. The San Diego Water Board has considered and responded to all comments submitted by the peer review panel and has enhanced the Staff Report appropriately. No change to the fundamental approach to TMDL calculation was necessary as a result of the peer review process.

19. **California Environmental Quality Act Requirements:** Pursuant to Public Resources Code section 21080.5, the Resources Agency has approved the San Diego Water Board's basin planning process as a "certified regulatory program" that adequately satisfies the California Environmental Quality Act (CEQA) (Public Resources Code, section 21000 et seq.) requirements for preparing environmental documents [14 CCR 15251(g); 23 CCR 3782]. As such, the documents supporting the San Diego Water Board's proposed basin planning action contain the required environmental documentation under CEQA [23 CCR 3777]. This documentation includes the environmental checklist, the detailed Staff Report, responses to comments submitted during the peer review and public participation phases of the TMDL, the Basin Plan Amendment, and this resolution. For CEQA purposes, the

[12] Construction projects are covered under Order No. 2009-0009-DWQ, *National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities, CAS000002*. Industrial sites are covered under

"project" is both the adoption of a Basin Plan amendment establishing a TMDL for sediment in the Lagoon and all of the implementation activities undertaken by the responsible parties to comply with the TMDL.

20. **Project Impacts:** The accompanying CEQA environmental analysis satisfies the requirements of for a program level environmental review under CEQA, pursuant to Public Resources Code section 21159 and CCR Title 14, section 15187. Nearly all of the compliance obligations anticipated to be necessary to implement the TMDL for sediment will be undertaken by public agencies that will have their own obligations under CEQA for implementation projects that could have significant environmental impacts (*e.g.*, installation and operation of structural best management practices). Project level impacts will need to be considered in any subsequent environmental analysis performed by other public agencies pursuant to Public Resources Code section 21159.2.

    If not properly mitigated at the project level, implementation and compliance measures undertaken could have significant adverse environmental impacts. The environmental analysis for this TMDL, and in particular the environmental checklist and responses to comments, identify broad mitigation approaches that should be considered at the project level. The San Diego Water Board does not engage in speculation or conjecture regarding the projects that may be used to implement the TMDL rather the San Diego Water Board takes a broad general perspective consistent with the uncertainty regarding how the TMDL will ultimately be implemented. The San Diego Water Board only considers the reasonably foreseeable alternative methods of compliance, the reasonably foreseeable feasible environmental impacts of those methods of compliance, and the reasonably foreseeable mitigation measures which would avoid or eliminate the identified impacts. The lengthy implementation period allowed by the TMDL allows persons responsible for compliance with wasteload allocations or load allocations to develop and pursue many compliance approaches and mitigation measures.

21. **Project Mitigation:** The proposed amendment to the Basin Plan to establish a TMDL for sediment in the Lagoon could have a significant adverse effect on the environment. However, there are feasible alternatives, feasible mitigation measures, or both that would substantially lessen any significant adverse impact. The public agencies responsible for implementation measures needed to comply with the TMDL can and should incorporate such alternatives and mitigation into any projects or project approvals that they undertake for the Lagoon. Possible alternatives and mitigation are described in the CEQA environmental analysis, specifically the Staff Report and the environmental checklist.

22. **Economic Analysis**: The San Diego Water Board has considered the costs of the reasonably foreseeable methods of compliance with the load and wasteload allocations specified in this TMDL. The most reasonably foreseeable methods of compliance involve implementation of structural and non-structural controls. Surface water monitoring will be necessary to evaluate the effectiveness of these controls.

23. **Necessity Standard** [Government Code section 11353(b)]: Amendment of the Basin Plan to establish and implement the sediment TMDL for the Lagoon is necessary because the existing water quality in the Lagoon does not meet applicable water quality objectives for sediment. Clean Water Act section 303(d) requires the establishment and implementation of a TMDL under the water quality conditions that exist at the Lagoon. The TMDL for sedimentation is necessary to promote attainment of applicable water quality objectives and restoration of water quality needed to support the beneficial uses designated for the Lagoon.

24. **Stakeholder & Public Participation**: Interested persons and the public have had reasonable opportunity to participate in review of the proposed TMDL. Efforts to solicit public review and comment included a public workshop and CEQA scoping meeting in February 2011, a public workshop in April 2011, multiple meetings with the Stakeholder Advisory Group, a public review and comment period consisting of {insert length of public comment period} days, and a public hearing on June 8, 2011. Notices for all meetings were sent to interested parties including cities and counties with jurisdiction in the watershed draining to the Lagoon. All of the written comments submitted to the San Diego Water Board during the review and comment periods have been considered.

25. **Public Notice**: The San Diego Water Board has notified all known interested parties and the public of its intent to consider adoption of this Basin Plan amendment in accordance with Water Code section 13244.

NOW, THEREFORE, BE IT RESOLVED THAT

1. **Environmental Documents Certification**: The environmental analysis prepared pursuant to Public Resources Code section 21080.5 is hereby certified, and the Executive Officer is directed to file a Notice of Decision with the Resources Agency after State Water Board and Office of Administrative Law (OAL) approval of the Basin Plan Amendment, in accordance with section 21080.5(d)(2)(E) of the Public Resources Code and the California Code of Regulations, Title 23, section 3781.

2. **Amendment Adoption**: The San Diego Water Board hereby adopts the attached Basin Plan amendment as set forth in Attachment A hereto to establish a sediment TMDL for the Lagoon.

3. **Agency Approvals**: The Executive Officer is directed to submit this Basin Plan amendment to the State Board in accordance with Water Code section 13245.

4. **Non-Substantive Corrections**: If, during the approval process for this amendment, the San Diego Water Board, the State Board, or the OAL determines that minor, non-substantive corrections to the language of the amendment are needed for clarity or consistency, the Executive Officer may make such changes, and shall inform the San Diego Water Board of any such changes.

I, David W. Gibson, Executive Officer, do hereby certify the foregoing is a full, true and correct copy of a Resolution adopted by the California Regional Water Quality Control Board, San Diego Region, on June 8, 2011.

TENTATIVE
David W. Gibson
Executive Officer

ATTACHMENT A
TO RESOLUTION NO. R9-2011-0021

AMENDMENT TO THE *WATER QUALITY CONTROL PLAN FOR THE SAN DIEGO BASIN (9)* TO INCORPORATE THE SEDIMENT TOTAL MAXIMUM DAILY LOAD FOR THE LOS PEÑASQUITOS LAGOON

This Basin Plan amendment establishes a Total Maximum Daily Load (TMDL) and associated load and wasteload allocations for sediment in the Los Peñasqutios Lagoon (Lagoon). This amendment includes a program to implement the TMDL and monitor their effectiveness. Chapters 2, 3, 4, and 7 of the Basin Plan are amended as follows:

Chapter 2, *Beneficial Uses*

Table 2-3. *Beneficial Uses of Coastal Waters*

Consecutively number and add the following footnote to Los Peñasqutios Lagoon in Table 2-3:

> Los Peñasqutios Lagoon is designated as a water quality limited segment for sediment pursuant to Clean Water Act section 303(d). A Total Maximum Daily Load has been adopted to address this impairment. See Chapter 3, *Water Quality Objectives*, Sediment and Chapter 7, *Total Maximum Daily Loads, Sediment Total Maximum Daily Load for Los Peñasqutios Lagoon*.

Renumber any footnotes in Table 2-3 displaced by this new footnote.

Chapter 3, Water Quality Objectives

Water Quality Objectives for Sediment:

Add a second paragraph as follows:

> Los Peñasqutios Lagoon is designated as an impaired water body for sediment pursuant to Clean Water Act section 303(d). A Total Maximum Daily Load (TMDL) has been adopted to address this impairment. See Chapter 2, Beneficial Uses Table 2-3. Beneficial Uses of Coastal Waters, Los Peñasqutios Lagoon, Hydrologic Unit Basin Number 6.10 and Chapter 7, *Total Maximum Daily Loads, Sediment Total Maximum Daily Load for Los Peñasqutios Lagoon*.

Chapter 4, *Implementation*

Amend Table 4-1 to include the Los Peñasqutios Lagoon TMDL for sediment.

Total Maximum Daily Load for sediment in Los Peñasqutios Lagoon	TBD	TBD	TBD	TBD

Chapter 7, *Total Maximum Daily Loads*

Add the following section to the end of Chapter 7

Total Maximum Daily Load for sediment in Los Peñasqutios Lagoon

On [insert date], the San Diego Water Board adopted Resolution No. R9-2011-0021, *A Resolution Amending the Water Quality Control Plan For The San Diego Basin (9) to Incorporate the Total Maximum Daily Load for Sedimentation In Los Peñasquitos Lagoon*. The TMDL Basin Plan Amendment was subsequently approved by the State Water Resources Control Board (State Board) on [Insert date], the Office of Administrative Law on [Insert date], and the USEPA on [Insert date].

Problem Statement

Under section 303(d) of the Clean Water Act (CWA), states are required to identify waters whose beneficial uses have been impaired due to specific constituents. Los Peñasquitos Lagoon was placed on Section 303(d) list of Water Quality Limited Segments in 1996 for sedimentation and siltation with an estimated area affected of 469 acres. The Lagoon is subject to the development of a total maximum daily load (TMDL). (USEPA, 2009)

The Lagoon is an estuarine system that is part of the Torrey Pines State Natural Reserve. In addition to its marine influence, the Lagoon receives freshwater inputs from an approximately 60,000-acre watershed comprised of three major canyons (Carroll Canyon, Los Peñasquitos Canyon, and Carmel Canyon). Given the status of "Natural Preserve" by the California State Parks, the Lagoon is one of the few remaining native salt marsh lagoons in southern California, providing a home to several endangered species. (California State Parks, 2009) 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 the Pacific Flyway, offering migratory birds a safe place to rest and feed, as well as providing refuge for coastal marine species that use the Lagoon to feed and hide from predators.

The San Diego Basin Plan states, "The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses". Beneficial uses listed in the Basin Plan for the Lagoon include contact water recreation; non-contact water recreation (although access is not permitted in some areas per California State

Parks); preservation of biological habitats of special significance; estuarine habitat; wildlife habitat; rare, threatened or endangered species; marine habitat; migration of aquatic organisms; spawning, reproduction and/or early development; and shellfish harvesting. The beneficial use that is most sensitive to increased sedimentation is estuarine habitat. Estuarine uses may include preservation or enhancement of estuarine habitats, vegetation, fish, shellfish, or wildlife (such as marine mammals or shorebirds).

Impacts associated with increased and rapid sedimentation include: reduced tidal mixing within Lagoon channels, degraded and (in some cases) net loss of riparian and salt marsh vegetation, increased vulnerability to flooding for surrounding urban and industrial developments, increased turbidity associated with siltation in Lagoon channels, and constricted wildlife corridor. The Los Peñasquitos Lagoon Enhancement Plan and Program (1985), San Diego Basin Plan (1994), and Clean Water Act section 303(d) highlight sedimentation as a significant impact associated with urban development and a leading cause in the rapid loss of salt marsh habitat in the Lagoon, making sediment reduction a management priority.

According to California State Parks, 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 unimpaired tidal salt marsh and 120 acres of unimpaired freshwater wetlands. (California State Parks 2010) The remaining 180 acres of salt marsh and brackish marsh vegetation are impaired by excessive sedimentation, which converted the coastal salt marsh to freshwater or upland habitats. The environmental processes that support wetland habitats in the Lagoon have been altered by urban development in three ways:

1) Increase in the volume and frequency of freshwater input
2) Increase in sediment deposition
3) Decrease in the tidal prism

These factors have led to decreases in saltwater and brackish marsh habitats and increases in freshwater habitats as well as increases in the abundance of non-native species.

Developing a sediment TMDL for the Lagoon is necessary for the restoration of the beneficial uses of the Lagoon, including the estuarine beneficial use most impacted by sediment accumulation.

Numeric Target

The water quality objective for sediment is contained in the Basin Plan. The Basin Plan states, "The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses." Because the sediment water quality objective

is narrative, a numeric target is needed to evaluate attainment of the narrative water quality objective for sediment. Consideration of various lines of evidence indicates that the Lagoon was likely achieving the water quality standard for sediment before the mid-1970s. A historic coverage for the Los Peñasquitos watershed was developed for this period using US Geological Survey topographic maps from the 1970s (primarily the La Jolla quadrangle-dated 1975). This historic land use distribution was used to calculate the numeric target using the LSPC watershed model. This historic sediment load of 12,360 tons per critical wet period (58.6 tons per day) represents the sediment TMDL numeric target.

[Insert table number]. Los Peñasqutios Lagoon Numeric Target

Source	Historic Load (tons)	Daily Load (tons)
TMDL	12,360	58.6
Watershed contribution (WLA)	2,580	12.2
Ocean boundary (LA)	9,780	46.4
MOS	Implicit	Implicit

Source Analysis

Sources of sediment 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 by converting pervious surfaces to impervious surfaces, which increases the volume and velocity of runoff 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.

Sediment loading is transported and discharged to Lagoon through the municipal separate storm sewer system (MS4); therefore, the San Diego County Phase I MS4s are identified as a source. Other sources include both Phase II MS4s and transportation infrastructure operated by the California Department of Transportation (Caltrans).

An additional sediment source is the ocean, which is an uncontrollable nonpoint source that attributes sediment to the Lagoon via storm surges, wave action, and tidal exchange.

Linkage Analysis

The purpose of the linkage analysis is to quantify the maximum allowable sediment loading that can be received by the Lagoon and still attain the WQOs of the applicable beneficial uses. This numeric value is represented by the TMDL.

The linkage analysis is based on computer models that were developed to represent the physical processes within the Lagoon and the associated watershed. The models provide estimation of sediment loadings from the watersheds based on rainfall events, and simulation of the response of the Lagoon to these loadings.

Available data were used to configure, calibrate, and validate a customized modeling framework developed to support sediment TMDL development. The modeling framework consists of a watershed model (based on the Loading Simulation Program in C++, LSPC) and a receiving water model (based on the Environmental Fluids Dynamic Code, EFDC). The watershed model was used to calculate existing and historical sediment loading to the Lagoon from the Los Peñasquitos watershed, while the Lagoon receiving water model was used to simulate hydrodynamics and sediment transport characteristics for this tidally-influenced waterbody.

Total Maximum Daily Loads and Allocations

The TMDL for sediment is equal to the total assimilative or loading capacity of the Lagoon. The loading capacity is defined as the maximum amount of sediment that the Lagoon can receive and still attain water quality objectives necessary for the protection of designated beneficial uses. Each TMDL must account for all known sources of a pollutant, whether from natural background, nonpoint sources, or point sources, and must include a margin of safety (MOS) to preclude pollutant loading from exceeding the actual assimilative capacities of the waterbodies. The TMDL calculations also account for seasonal variations and critical conditions and were developed in a manner consistent with guidelines published by USEPA.

A total WLA was assigned to the point sources within the watershed, which include the Phase I MS4 permitees (San Diego County, the City of San Diego, the City of Del Mar, and the City of Poway), Phase II MS4 permittees, and Caltrans. A total LA was assigned to the nonpoint source in the watershed, which is the ocean boundary. 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. The TMDL, watershed-wide load reductions, LAs and WLAs are shown below in [Insert table numbers].

[Insert table number]. Los Peñasqutios Lagoon Load Reductions, WLAs, and LAs.

Source	Current Load (tons)	Historical Load (tons)	Load Reduction (tons)	Percent Reduction Required
TMDL	13,663	12,360	1,303	10%
Watershed contribution (WLA)	7,719	2,580	5,139	**67%**
Ocean boundary (LA)	5,944	9,780	+3,836 (increase)	+39% (increase)

TMDL Implementation Plan

The San Diego Water Board uses its authorities and programs to regulate discharges from the controllable sources in the Region. The controllable sources that are subject to regulation are, in turn, responsible for complying with the requirements issued by the San Diego Water Board. Table [Insert table number] summarizes the actions that the San Diego Water Board will use to implement this TMDL.

[Insert table number]. Summary of San Diego Water Board Actions

Action	Sub-actions
Enforce Basin Plan	Enforce existing Basin Plan waste discharge prohibitions
Issue investigative Orders	Issue California Water Code section 13225, 13267, and/or 13383 investigative orders requiring load reduction plans to be developed on a watershed scale.
Enforce Phase I MS4 permit[a]	Enforce existing discharge prohibitions and receiving water limitations
Revise and reissue Phase I MS4 permit[a]	Incorporate water quality based effluent limitations into permit Incorporate requirement to develop Load Reduction Plan Incorporate compliance schedule
Enroll discharges under Phase II MS4 permit[b]	Require enrollment of small MS4 dischargers under Phase II MS4 permit.
Revise and reissue Phase II MS4 permit[b]	Incorporate water quality based effluent limitations into permit Incorporate requirement to develop Load Reduction Plan Incorporate compliance schedule
Enforce Caltrans permit[c]	discharge prohibitions and receiving water limitations
Revise and reissue Caltrans permit[c]	Incorporate water quality based effluent limitations into permit Incorporate requirement to develop Load Reduction Plan Incorporate compliance schedule
Enforce general industrial storm water permit[d]	Enforce existing discharge prohibitions, effluent limitations, and receiving water limitations
Revise and reissue general industrial storm water permit[d]	Incorporate water quality based effluent limitations into permit Incorporate requirement to develop Load Reduction Plan Incorporate compliance schedule
Enforce general construction storm water permit[e]	Enforce existing discharge prohibitions, narrative effluent limitations, and receiving water limitations
Revise and reissue general construction storm water permit[e]	Incorporate water quality based effluent limitations into permit Incorporate requirement to develop Load Reduction Plan Incorporate compliance schedule
Issue Basin Plan Amendment	Revise the requirements and/or provisions for implementing this TMDL

a. 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.*
b. 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*
c. Order No. 2003-0005-DWQ, *National Pollutant Discharge Elimination System (NPDES) General Permit No. CAS000004, Waste Discharge Requirements for Storm Water Discharges from Small Municipal Separate Storm Sewer Systems*
d. Order No. 97-03-DWQ, *National Pollutant Discharge Elimination System (NPDES) General Permit No. CAS000001, Waste Discharge Requirements for Discharges of Storm Water Associated with Industrial Activities Excluding Construction Activities*
e. Order No. 2009-0009-DWQ, *National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities, CAS000002*

Monitoring for TMDL Compliance and Compliance Assessment

An essential component of implementation is monitoring. Monitoring is needed to evaluate the progress toward attainment of the TMDL and restoring the beneficial uses in the Lagoon.

Monitoring for compliance will initially be conducted by the Phase I MS4s and Caltrans. The minimum components for any monitoring program that will be used to evaluate progress toward attainment of the TMDLs should include the following:

1. Baseline data. Characterize Lagoon and watershed conditions to provide a basis for future comparisons.
2. Implementation monitoring. Ensure that identified management actions are undertaken.
3. Effectiveness monitoring. Assess whether the source controls have the desired effects.
4. Trend Monitoring. Assess changes in conditions over time relative to the baseline and identified target values.
5. Validation Monitoring. Validate source analysis and linkage methods.

The monitoring program must be developed to answer the following questions:

1. What is the ecological health of the Lagoon?
2. How is the Lagoon's health changing with time?
3. Are the dischargers performing actions that are effective at reducing the sediment load?

4a. Are TMDL components accurate and effective?

4b. Are watershed sources of sediment, bacteria, and freshwater adequately characterized?

Compliance Schedule {tentative}

Because dischargers in the Los Penasquitos watershed will be addressing required load reductions from multiple water quality improvement projects in addition to sediment, namely bacteria, the compliance schedule is 20 years from Office of Administrative Law approval of the Bacti I TMDL. Interim reductions are required to be met after 9 years. Regarding sediment, these interim milestones described in Table [*Insert table number*] apply.

[Insert table number] Compliance Schedule Including Milestones

Compliance Year (year after OAL approval)	Wasteload Reduction Milestone
5	20% final
10	40% final
13	60% final
15	80% final
20	100% final

TMDL Implementation Milestones {tentative}

Accomplishing the goals of the implementation plan will be achieved by cooperative participation from all responsible parties, including the San Diego Water Board. Major milestones are described in Table [*Insert table number*].

[Insert table number] TMDL Implementation Milestones

Item	Implementation Action	Responsible Parties	Date
1	Obtain approval of Sediment TMDL from the State Water Board, OAL, and USEPA.	San Diego Water Board	Effective date[a]
2	Issue, reissue, or revise general WDRs and NPDES requirements for the Phase I MS4s to incorporate the requirements for complying with the TMDL and total WLA.	San Diego Water Board	Within 5 years of effective date[a]
3	Issue, reissue, or revise general WDRs and NPDES requirements for Caltrans to incorporate the requirements for complying with the TMDL and total WLA.	San Diego Water Board, State Water Board	Within 5 years of effective date[a]
4	Issue, reissue, or revise general or individual WDRs and NPDES requirements for Phase II MS4s to incorporate the requirements for complying with the TMDL and total WLA.	San Diego Water Board, State Water Board	Within 5 years of effective date[a]
5	Completion of Load Reduction Plan	MS4s and NPDES permittees[b]	Within 18 months of OAL effective date of sediment TMDL[a]
6	Comments on Load Reduction Plan	MSan Diego Water Board Executive Officer	Within 6 months of submittal
7	Phased, adaptive implementation of Load Reduction Plan	MS4s and NPDES permittees[b]	In accordance with load reduction strategy - ongoing throughout implementation
8	Submit SLRP Progress Reports to San Diego Water Board	MS4s and NPDES permittees[b]	In accordance with respective permit annual reporting dates

Item	Implementation Action	Responsible Parties	Date
9	Enforcement Actions	San Diego Water Board	As needed after effective date[a]
10	Refine Load Reduction Plan	MS4s and NPDES permittees[b]	As warranted by completion of special studies, additional monitoring and data compilation, or as requested by the Executive Officer
11	Reopen and reconsider TMDL	San Diego Water Board	As defensible by additional data and significant findings as compiled by dischargers and/or watershed stakeholders[c]
12	Meet Interim Goal #1 of 20% required reduction in sediment or documented improvement in surrogate goals	MS4s and NPDES permittees[b]	Within 5 years of effective date of TMDL[a]
13	Meet Interim Goal #2 of 40% required reduction in sediment or documented improvement in surrogate goals	MS4s and NPDES permittees[b]	Within 9 years of effective date of TMDL[a]
14	Meet Interim Goal #3 of 60% required reduction in sediment or documented improvement in surrogate goals	MS4s and NPDES permittees[b]	Within 13 years of effective date of TMDL[a]
15	Meet Interim Goal #4 of 80% required reduction in sediment or documented improvement in surrogate goals	MS4s and NPDES permittees[b]	Within 15 years of effective date of TMDL[a]
16	Attain final 100% reduction in sediment or documented surrogate goals	MS4s and NPDES permittees[b]	Within 20 years of effective date of TMDL[a]

[a] Effective date is the date of approval by OAL.
[b] When a Phase II MS4 is enrolled under the State General Permit for Small MS4s or issued an individual NPDES permit, the MS4 Dischargers will be both the Phase I MS4s and Phase II MS4s in this Implementation Milestone item.
[c] If no Basin Plan amendment has been initiated within five years of the effective date of this TMDL Basin Plan amendment and the San Diego Water Board determines that insufficient data exist to support the initiation of a Basin Plan amendment, a subsequent Basin Plan amendment to revise the requirements and/or provisions for the implementation of this TMDL will not be initiated until the Executive Officer determines the conditions to initiate a Basin Plan amendment are met.