

**Amendment to the Water Quality Control Plan – Los Angeles Region
to Incorporate the
Total Maximum Daily Load for Eutrophic, Algae, Ammonia, and Odors
(Nutrient) in Machado Lake**

Adopted by the California Regional Water Quality Control Board, Los Angeles Region on
May 1, 2008

Amendments

Table of Contents

Add:

Chapter 7. Total Maximum Daily Loads (TMDLs)

7- 29 Machado Lake Nutrient TMDL

List of Figures, Tables, and Inserts

Add:

Chapter 7. Total Maximum Daily Loads (TMDLs)

Tables

7-29 Machado Lake Eutrophic, Algae, Ammonia, and Odors (Nutrient) TMDL

7-29.1. Machado Lake Eutrophic, Algae, Ammonia, and Odors (Nutrient)
TMDL - Elements

7-29.2. Machado Lake Eutrophic, Algae, Ammonia, and Odors (Nutrient)
TMDL - Implementation Schedule

Chapter 7. Total Maximum Daily Loads (TMDLs)

Machado Lake Eutrophic, Algae, Ammonia, and Odors (Nutrient) TMDL

This TMDL was adopted by:

The Regional Water Quality Control Board on May 1, 2008.

This TMDL was approved by:

The State Water Resources Control Board on **[Insert date]**.

The Office of Administrative Law on **[Insert date]**.

The U.S. Environmental Protection Agency on **[Insert date]**.

This TMDL is effective on **[Insert Date]**

The elements of the TMDL are presented in Table 7-29.1 and the Implementation Plan
in Table 7-29.2

Table 7-29.1. Machado Lake Eutrophic, Algae, Ammonia, and Odors (Nutrient) TMDL: Elements

TMDL Element	Regulatory Provisions
<p>Problem Statement</p>	<p>Excessive loadings of nutrients, in particular nitrogen (including ammonia) and phosphorus, cause eutrophic effects, including algae and odors, which impair the beneficial uses of Machado Lake. The nutrient enrichment results in high algal productivity; algal blooms have been observed in the lake during summer months. In addition, high nutrient concentrations contribute to excessive and nuisance macrophyte growth. Algae respiration and decay depletes oxygen from the water column creating an adverse aquatic environment. Machado Lake was placed on the Clean Water Act 303(d) list of impaired waterbodies in 1998, 2002, and 2006 for ammonia, algae, odors, and eutrophic.</p> <p>Applicable Water Quality Objectives for this TMDL are narrative objectives for Biostimulatory Substances and Taste and Odor; and numeric objectives for Dissolved Oxygen and Ammonia.</p> <p>The beneficial uses of Machado Lake include beneficial uses associated with recreation (REC 1 and REC 2), aquatic life (WARM, WILD, RARE, and WET) and water supply (MUN).</p> <p>This TMDL addresses the eutrophic, algae, ammonia, and odor listings which impair these uses.</p>
<p>Numeric Targets</p>	<p>The total phosphorus target for Machado Lake is 0.1 mg/L as a monthly average concentration in the water column, which is based upon US EPA Nutrient Criteria Technical Guidance Manual for Lakes and Reservoirs. A ratio of total nitrogen to total phosphorus of 10 is the basis for the total nitrogen (TKN + NO₃-N + NO₂-N) numeric target of 1.0 mg/L as a monthly average concentration in the water column. The total nitrogen target incorporates all forms of nitrogen including TKN, which is the sum of organic nitrogen and ammonia nitrogen, nitrate nitrogen (NO₃-N), and nitrite nitrogen (NO₂-N). The total nitrogen target expressed as a monthly average is protective of chronic aquatic life exposure for ammonia. There is a separate numeric target for ammonia of 5.95 mg/L as an hourly average to be protective of acute aquatic life exposure. The chlorophyll a target is 20 ug/L based on EPA guidance and the Carlson Trophic Status Index. The dissolved oxygen target is a single sample concentration of no less than 5 mg/L measured at 0.3 meter above the sediments based on the Basin Plan objective. The following table provides the numeric targets for the Machado Lake TMDL.</p>

Attachment A to Resolution No. R08-006

TMDL Element	Regulatory Provisions	
	Indicator	Numeric Target
	Total Phosphorus	0.1 mg/L monthly average
	Total Nitrogen (TKN + NO ₃ -N + NO ₂ -N)	1.0 mg/L monthly average
	Ammonia - N	5.95 mg/L one-hour average
	Ammonia - N	2.15 mg/L 30 day average
	Dissolved Oxygen	5 mg/L single sample minimum measured 0.3 meter above the sediments.
	Chlorophyll a	20 µg/L monthly average
Source Analysis	<p>The point sources of nutrients into Machado Lake are stormwater discharges from the municipal separate storm sewer system (MS4), California Department of Transportation (Caltrans), and general construction and industrial discharges. Stormwater discharges to Machado Lake occur through the following subdrainage systems: Drain 553, Wilmington Drain, Project 77/510, and Walteria Lake. Discharges from Walteria Lake and Drain 553 are tributary to the Wilmington Drain, which then directly discharges in the northern portion of Machado Lake. Approximately, 88 % of the discharge into the lake enters through the Wilmington Drain.</p> <p>The major nonpoint source of nutrients to Machado Lake is internal nutrient loading (nutrient flux from sediments). Atmospheric deposition is also a nonpoint source of total nitrogen. Nutrient loads from wind resuspension, bioturbation, birds, and general surface runoff are minor sources. Special studies may be conducted to further evaluate sources.</p>	
Linkage Analysis	<p>The linkage analysis focuses on the relationship between the nutrient loading to the lake and the numeric targets established to measure attainment of beneficial uses. The Nutrient Numeric Endpoints BATHTUB Spreadsheet Model, which was developed by Tetra Tech for US EPA, was used to establish the linkage between nutrient loading to Machado Lake and the predicted water quality response. The model performs water and nutrient balance calculations under steady-state conditions. Eutrophication related water quality conditions are expressed in terms of total phosphorus, ortho-phosphorus, total nitrogen, inorganic nitrogen, chlorophyll a, transparency (Secchi depth), and hypolimnetic oxygen depletion rates. The linkage analysis demonstrates that assigning waste load and load allocations for total nitrogen and total phosphorus will address eutrophication related water quality conditions.</p>	
Waste Load Allocations	<p>Waste load allocations are assigned to urban stormwater dischargers (MS4, Caltrans, general construction and general industrial) in both wet and dry weather. The final waste load allocations are assigned as concentration based allocations of 0.1 mg/L and 1.0 mg/L as monthly averages for total phosphorus and total nitrogen (TKN + NO₃-N + NO₂-N), respectively.</p>	

Attachment A to Resolution No. R08-006

TMDL Element	Regulatory Provisions																									
	<p>Interim WLAs are based on current in-lake concentrations. The effective date interim total nitrogen and total phosphorus waste load allocations are set as the 95th percentile of current concentrations in the lake. The 5 year interim total nitrogen WLAs are established as a 30 percent reduction from current in-lake concentrations. Concentration-based interim and final WLAs will be included in stormwater permits in accordance with NPDES guidance and requirements. The tables below present the interim and final waste load allocations for the stormwater discharges.</p> <table border="1" data-bbox="435 611 1422 936"> <thead> <tr> <th data-bbox="435 611 886 705">Waste Load Allocations</th> <th data-bbox="891 611 1101 705">Total Phosphorus</th> <th data-bbox="1105 611 1422 705">Total Nitrogen (TKN + NO₃-N + NO₂-N)</th> </tr> <tr> <td></td> <th data-bbox="891 711 1101 793">Final WLA (mg/L)</th> <th data-bbox="1105 711 1422 793">Final WLA (mg/L)</th> </tr> </thead> <tbody> <tr> <td data-bbox="435 800 886 936">MS4 Permittees¹ Caltrans, General Construction and Industrial stormwater permits</td> <td data-bbox="891 800 1101 936">0.1</td> <td data-bbox="1105 800 1422 936">1.0</td> </tr> </tbody> </table> <p data-bbox="391 972 1461 1079">1. Municipal Separate Storm Sewer System (MS4) Permittees that are responsible for discharges to Machado Lake include: Los Angeles County, Los Angeles County Flood Control District, and the Cities of Carson, Lomita, Los Angeles, Palos Verdes Estates, Rancho Palos Verdes, Redondo Beach, Rolling Hills, Rolling Hills Estates, and Torrance.</p> <table border="1" data-bbox="402 1121 1450 1476"> <thead> <tr> <th data-bbox="402 1121 688 1245">Waste Load Allocations</th> <th data-bbox="693 1121 891 1245">Years After Effective Date</th> <th data-bbox="896 1121 1154 1245">Interim Total Phosphorus WLAs (mg/L)</th> <th data-bbox="1159 1121 1450 1245">Interim Total Nitrogen (TKN + NO₃-N + NO₂-N) WLAs (mg/L)</th> </tr> </thead> <tbody> <tr> <td data-bbox="402 1251 688 1476" rowspan="3">MS4 Permittees, Caltrans, General Construction and Industrial Stormwater permits</td> <td data-bbox="693 1251 891 1310">At Effective Date¹</td> <td data-bbox="896 1251 1154 1310">1.25</td> <td data-bbox="1159 1251 1450 1310">3.50</td> </tr> <tr> <td data-bbox="693 1316 891 1375">5²</td> <td data-bbox="896 1316 1154 1375">1.25</td> <td data-bbox="1159 1316 1450 1375">2.45</td> </tr> <tr> <td data-bbox="693 1381 891 1476">9.5 (Final WLAs³)</td> <td data-bbox="896 1381 1154 1476">0.10</td> <td data-bbox="1159 1381 1450 1476">1.00</td> </tr> </tbody> </table>			Waste Load Allocations	Total Phosphorus	Total Nitrogen (TKN + NO ₃ -N + NO ₂ -N)		Final WLA (mg/L)	Final WLA (mg/L)	MS4 Permittees ¹ Caltrans, General Construction and Industrial stormwater permits	0.1	1.0	Waste Load Allocations	Years After Effective Date	Interim Total Phosphorus WLAs (mg/L)	Interim Total Nitrogen (TKN + NO ₃ -N + NO ₂ -N) WLAs (mg/L)	MS4 Permittees, Caltrans, General Construction and Industrial Stormwater permits	At Effective Date ¹	1.25	3.50	5 ²	1.25	2.45	9.5 (Final WLAs ³)	0.10	1.00
Waste Load Allocations	Total Phosphorus	Total Nitrogen (TKN + NO ₃ -N + NO ₂ -N)																								
	Final WLA (mg/L)	Final WLA (mg/L)																								
MS4 Permittees ¹ Caltrans, General Construction and Industrial stormwater permits	0.1	1.0																								
Waste Load Allocations	Years After Effective Date	Interim Total Phosphorus WLAs (mg/L)	Interim Total Nitrogen (TKN + NO ₃ -N + NO ₂ -N) WLAs (mg/L)																							
MS4 Permittees, Caltrans, General Construction and Industrial Stormwater permits	At Effective Date ¹	1.25	3.50																							
	5 ²	1.25	2.45																							
	9.5 (Final WLAs ³)	0.10	1.00																							

¹ The compliance point for all effective date interim WLAs is measured in the lake.

² The compliance point for all year 5 interim WLAs is measured as specified in Implementation Plan Section II of Table 7-29.1

³ The compliance point for all final WLAs is measured as specified in Implementation Plan Section II of Table 7-29.1

Attachment A to Resolution No. R08-006

TMDL Element	Regulatory Provisions																							
<p>Load Allocations</p>	<p>Load allocations are assigned for nonpoint source discharges to the lake, primarily internal loading from the lake. The final load allocations for internal loading are concentration based allocations of 0.1 mg/L and 1.0 mg/L as monthly averages for total phosphorus and total nitrogen (TKN + NO₃-N + NO₂ -N), respectively. Concentration based load allocations are appropriate and can be evaluated by monitoring the nutrient concentrations in the water column.</p> <p>Interim LAs are based on current in-lake concentrations. The effective date interim total nitrogen and phosphorus load allocations are set at the 95th percentile of current concentrations in the lake. The 5 year interim total nitrogen LAs are established as a 30 percent reduction from current in-lake concentrations. The tables below present the final and interim load allocations for the nonpoint sources.</p> <table border="1" data-bbox="415 747 1435 1073"> <thead> <tr> <th data-bbox="415 747 862 842">Load Allocations</th> <th data-bbox="862 747 1105 842">Total Phosphorus</th> <th data-bbox="1105 747 1435 842">Total Nitrogen (TKN + NO₃-N + NO₂-N)</th> </tr> <tr> <td></td> <th data-bbox="862 842 1105 936">Final LA (mg/L)</th> <th data-bbox="1105 842 1435 936">Final LA (mg/L)</th> </tr> </thead> <tbody> <tr> <td data-bbox="415 936 862 1073">Internal Nutrient Load (City of Los Angeles Department of Recreation and Parks)</td> <td data-bbox="862 936 1105 1073">0.1</td> <td data-bbox="1105 936 1435 1073">1.0</td> </tr> </tbody> </table> <table border="1" data-bbox="391 1108 1456 1436"> <thead> <tr> <th data-bbox="391 1108 656 1226">Load Allocations</th> <th data-bbox="656 1108 883 1226">Years After Effective Date</th> <th data-bbox="883 1108 1159 1226">Interim Total Phosphorus LAs (mg/L)</th> <th data-bbox="1159 1108 1456 1226">Interim Total Nitrogen (TKN + NO₃-N + NO₂-N) LAs (mg/L)</th> </tr> </thead> <tbody> <tr> <td data-bbox="391 1226 656 1436" rowspan="3">Internal Nutrient Load (City of Los Angeles Department of Recreation and Parks)</td> <td data-bbox="656 1226 883 1289">At Effective Date</td> <td data-bbox="883 1226 1159 1289">1.25</td> <td data-bbox="1159 1226 1456 1289">3.50</td> </tr> <tr> <td data-bbox="656 1289 883 1331">5</td> <td data-bbox="883 1289 1159 1331">1.25</td> <td data-bbox="1159 1289 1456 1331">2.45</td> </tr> <tr> <td data-bbox="656 1331 883 1436">9.5 (Final LAs)</td> <td data-bbox="883 1331 1159 1436">0.10</td> <td data-bbox="1159 1331 1456 1436">1.00</td> </tr> </tbody> </table>	Load Allocations	Total Phosphorus	Total Nitrogen (TKN + NO ₃ -N + NO ₂ -N)		Final LA (mg/L)	Final LA (mg/L)	Internal Nutrient Load (City of Los Angeles Department of Recreation and Parks)	0.1	1.0	Load Allocations	Years After Effective Date	Interim Total Phosphorus LAs (mg/L)	Interim Total Nitrogen (TKN + NO ₃ -N + NO ₂ -N) LAs (mg/L)	Internal Nutrient Load (City of Los Angeles Department of Recreation and Parks)	At Effective Date	1.25	3.50	5	1.25	2.45	9.5 (Final LAs)	0.10	1.00
Load Allocations	Total Phosphorus	Total Nitrogen (TKN + NO ₃ -N + NO ₂ -N)																						
	Final LA (mg/L)	Final LA (mg/L)																						
Internal Nutrient Load (City of Los Angeles Department of Recreation and Parks)	0.1	1.0																						
Load Allocations	Years After Effective Date	Interim Total Phosphorus LAs (mg/L)	Interim Total Nitrogen (TKN + NO ₃ -N + NO ₂ -N) LAs (mg/L)																					
Internal Nutrient Load (City of Los Angeles Department of Recreation and Parks)	At Effective Date	1.25	3.50																					
	5	1.25	2.45																					
	9.5 (Final LAs)	0.10	1.00																					
<p>Margin of Safety</p>	<p>The uncertainties associated with this TMDL are due to limited data from the stormdrains entering the lake and the inherent seasonal and annual variability in delivery of phosphorus and nitrogen for external sources and nutrient cycling within the lake. To address these uncertainties, conservative numeric targets were selected by establishing the targets under a critical lake volume. Likewise, the waste load and load allocations are based on a constant value for internal loading. Moreover, the lake conditions under which the load capacity was developed were based on dry weather critical conditions when the lake level is</p>																							

Attachment A to Resolution No. R08-006

TMDL Element	Regulatory Provisions
	reduced and therefore loading capacity is reduced. These conservative approaches provide an implicit margin of safety.
Seasonal Variations and Critical Conditions	<p>The external nutrient loading to Machado Lake generally occurs during winter and spring months, in conjunction with storm events. During the dry season the lake receives minimal external loading. In the summer there is the release of nutrients from the sediments. At the same time there is very little water inflow and a decreased lake level due to evaporation. These seasonal variations cause increased nutrient concentrations. Moreover, the reduced lake volume during the summer months provides less assimilative capacity. The critical condition for the attainment of beneficial uses at Machado Lake occurs during the summer months. Also, the critical conditions for dissolved oxygen impairments related to algae growth are during the warm dry summer months when algal respiration is highest. The Machado Lake nutrient TMDL accounts for seasonal and critical conditions of the summer months by assigning a load allocation to the lake sediments and requiring a reduction in this source of nutrients to the lake, and by assigning WLAs to urban stormwater dischargers year-round.</p>
Special Studies and Monitoring Plan	<p><u>Special Studies</u></p> <p>Additional monitoring and special studies may be undertaken by dischargers and responsible agencies to evaluate the uncertainties and assumptions made in the development of this TMDL. (The results of special studies may be used to reevaluate waste load allocations and load allocations when the Machado Lake Nutrient TMDL is reconsidered.)</p> <p><i>Optional Study #1:</i> Core flux study to estimate the nutrient flux from sediments under equilibrium conditions. Results from this study would be beneficial to gauge the success of implementation measures such as aeration.</p> <p><i>Optional Study #2:</i> A study to understand factors such as nitrogen and phosphorus sedimentation rates (particulate settling velocities), the overall lake sedimentation rate, and sediment resuspension rate. These factors would be important for a Machado Lake nutrient budget and gauging the potential need for periodic hydraulic dredging.</p> <p><i>Optional Study #3:</i> A work plan for permittees to assess compliance with TMDL WLAs on a mass basis for total nitrogen and total phosphorous. The work plan should detail testing methodologies, BMPs, and treatments to be implemented to attain and demonstrate a reduction of total nitrogen and phosphorous loading on a mass basis. A final report including the results shall be submitted to the Regional Board for Executive Officer approval.</p> <p>Additional special studies proposed by stakeholders are optional and will be considered at the 7.5 year TMDL reconsideration. All proposed special study work plans and documents shall be submitted to the Regional Board for Executive Officer approval prior to special studies being initiated.</p>

Attachment A to Resolution No. R08-006

TMDL Element	Regulatory Provisions
	<p><u>Monitoring Plan</u></p> <p>A Monitoring and Reporting Program (MRP) plan to assess compliance with LAs and WLAs measured in lake must be submitted to the Executive Officer for approval within one year of the effective date. Monitoring will begin 60 days after the Executive Officer has approved the monitoring plan.</p> <p>This MRP plan will be required as part of the Lake Water Quality Management Plan as discussed in the Implementation Section.</p> <p>The MRP plan will be designed to monitor and implement this TMDL. The monitoring plan is required to measure the progress of pollutant load reductions and improvements in water quality. The monitoring plan shall</p> <ul style="list-style-type: none"> ▪ Determine attainment of total phosphorus, total nitrogen, ammonia, dissolved oxygen, and chlorophyll <i>a</i> numeric targets. ▪ Determine compliance with the waste load and load allocations for total phosphorus, and total nitrogen. ▪ Monitor the effect of implementation actions on lake water quality <p>Responsible jurisdictions shall be required to begin monitoring sixty days after the Executive Officer approves the MRP. Field samples and water samples shall be collected bi-weekly on a year-round basis. The lake sampling sites will be located in the open water portion of the lake with one in the northern portion and one in the southern portion of the lake. <i>In situ</i> measurements of water quality shall be made.</p> <p>The water quality probes will be calibrated immediately prior to departure to the field against known pH, EC, and DO solutions. Secchi depth, a measurement of transparency, will also be measured with a standard Secchi disk or other approved method. Additionally, a staff gauge shall be placed in an appropriate location at the lake to measure changes in lake elevation.</p> <p>The monitoring plan shall consider stratification for the collection of water samples. Water samples shall be analyzed for constituents including but not limited to the following.</p> <ul style="list-style-type: none"> ▪ Total nitrogen ▪ Total phosphorus ▪ Nitrate (NO₃-N) ▪ Total ammonia (NH₃-N) ▪ Ortho-phosphorus (PO₄) ▪ Total Dissolved Solids ▪ Total Suspended Solids ▪ Chlorophyll <i>a</i> ▪ Turbidity

Attachment A to Resolution No. R08-006

TMDL Element	Regulatory Provisions
	<p>Detection limits shall be less than the numeric targets in this TMDL. A monitoring report shall be prepared and submitted to the Regional Board annually within six months after the completion of the final sampling event of the year.</p> <p>If an alternative WLA compliance option is selected, an appropriate separate TMDL compliance MRP Plan and TMDL Implementation Plan must be submitted for Executive Officer approval. Annual monitoring reports demonstrating compliance or non-compliance with WLAs shall be submitted for Executive Officer approval.</p> <p>All compliance monitoring must be conducted in conjunction with a Regional Board approved Quality Assurance Project Plan (QAPP). The QAPP shall include protocols for sample collection, standard analytical procedures, and laboratory certification.</p>

Attachment A to Resolution No. R08-006

TMDL Element	Regulatory Provisions
<p>Implementation Plan</p>	<p>Compliance with the TMDL is based on the assigned WLAs and LAs. Compliance with this TMDL will require the implementation of NPDES stormwater permit limits and lake management activities to reduce nutrient loading to the lake, reduce nutrient concentrations in the lake, prevent excessive algal biomass growth, and maintain an adequate dissolved oxygen concentration. Table 7-29.2 contains a schedule for responsible jurisdictions to implement BMPs and a Lake Water Quality Management Plan to comply with the TMDL.</p> <p>I. Implementation and Determination of Compliance with LAs</p> <p>Compliance with the LAs will be measured in the lake and will be achieved through a combination of implementation of lake management projects and BMPs to reduce external and internal nutrient loading to the lake and to reduce and manage internal nutrient sources.</p> <p>Load allocations will be implemented through the following:</p> <ul style="list-style-type: none"> (1) Memorandum of Agreement (MOA), or (2) Clean Up and Abatement Order or Other Regulatory Order <p>The responsible jurisdictions for the load allocations shall be allowed one year from the effective date of this TMDL to enter into a Memorandum of Agreement (MOA) with the Executive Officer, detailing the voluntary efforts that will be undertaken to attain the load allocations. The MOA shall comply with the <u>Water Quality Control Policy for Addressing Impaired Waters: Regulatory Structure and Options</u> ("Policy"), including part II, section 2 c ii and related provisions, and shall be consistent the requirements of this TMDL. If the MOA is timely adopted, and so long as it is implemented, the program described in the MOA shall be deemed "certified", pursuant to the Policy, subject to the conditions of Policy section 2 e. The MOA shall include development of a Lake Water Quality Management Plan (LWQMP), must be approved by the Executive Officer, and may be amended with Executive Officer approval, as necessary. If a MOA is not established with responsible jurisdictions within one year or if responsible jurisdictions do not comply with the terms of the MOA, a cleanup and abatement order pursuant to Water Code section 13304, or another appropriate regulatory order, shall be issued to implement the load allocations.</p> <p>Furthermore, the implementation of the MOA must result in attainment of the TMDL load allocations. If the MOA and LWQMP are not implemented or otherwise do not result in attainment of load allocations, the certification shall be revoked, the MOA rescinded, and the load allocations shall be implemented through a cleanup and abatement order, or other order, as described above. Implementation of the MOA shall be reviewed annually by the Executive Officer as part of the Monitoring and Reporting Program (MRP) annual reports.</p> <p>To the satisfaction of the Executive Officer the LWQMP shall meet the following criteria:</p>

Attachment A to Resolution No. R08-006

TMDL Element	Regulatory Provisions
	<ul style="list-style-type: none"> ■ One and one half years from the effective date of the TMDL responsible jurisdictions shall submit a LWQMP, MRP Plan and QAPP for approval by the Executive Officer. ■ The LWQMP shall include a list of cooperating parties. ■ The LWQMP shall address appropriate water quality monitoring and a timeline for the implementation of management practices to reduce and manage nutrient loading to the lake. The timeline shall ensure that the implementation actions are underway prior to Regional Board reconsideration of the TMDL. The LWQMP shall present a comprehensive management plan and strategy for achieving the LAs at Machado Lake and attaining numeric targets and beneficial uses. The LWQMP shall include a schedule for implementation actions. ■ The LWQMP shall achieve compliance with the load allocations through the implementation of lake management strategies to reduce and manage internal nutrient sources. The lake management implementation actions may include, but are not limited to the following: <ul style="list-style-type: none"> ■ Wetland restoration ■ Aeration system ■ Hydraulic Lake dredging ■ Hydroponic Islands ■ Alum treatment ■ Fisheries Management ■ Macrophyte Management and Harvesting ■ Maintain Lake Level – Supplemental Water ■ The LWQMP shall include a MRP Plan. The MRP shall include a requirement that the responsible jurisdictions report compliance and non-compliance with load allocations as part of annual reports submitted to the Regional Board. Compliance with the load allocations shall be measured in the lake at two locations, one in the north portion and one in the south. The average of these two sampling locations shall determine compliance with the load allocations. MRP protocols may be based on Surface Water Ambient Monitoring Program (SWAMP) protocols for water quality monitoring or alternative protocols proposed by dischargers and approved by the Executive Officer. ■ A QAPP shall also be submitted to the Regional Board for approval by the Executive Officer to ensure data quality. The QAPP shall include protocols for sample collection, standard analytical procedures, and laboratory certification. The QAPP may be based on SWAMP protocols for water quality monitoring and quality assurance or alternative protocols proposed by dischargers and approved by the Executive Officer.

Attachment A to Resolution No. R08-006

TMDL Element	Regulatory Provisions
	<ul style="list-style-type: none"> ■ The MOA and LWQMP program shall include assurances that it will be implemented by the responsible jurisdiction. ■ Implementation of the LWQMP program should include a Health and Safety Plan to protect personnel. <p>The Executive Officer may require a revised assessment under the MOA and LWQMP:</p> <ul style="list-style-type: none"> (a) To prevent nutrients from accumulating or recycling in the lake in deleterious amounts that impair water quality, contribute to negative eutrophic conditions or adversely affect beneficial uses; (b) To reflect the results of nutrient assessment or special studies <p>Cleanup and Abatement Order or Other Regulatory Order:</p> <p>Alternatively, responsible jurisdictions may propose, or the Regional Board may impose, an alternative program which would be implemented through a cleanup and abatement order, or any other appropriate order or orders, provided the program is consistent with the allocations, reductions, and schedule described in Table 7-29.2.</p> <ul style="list-style-type: none"> ❖ Determination of Compliance with Interim LAs <p>Responsible parties shall comply with numeric interim LAs or may be deemed in compliance with the interim LAs through implementation of lake sediment removal and/or lake management implementation actions in accordance with the LWQMP schedule as approved by the Regional Board Executive Officer.</p> <p>II. Implementation and Determination of Compliance with WLAs</p> <p>WLAs will be incorporated into NPDES stormwater permits.</p> <p>Stormwater permittees may be deemed in compliance with waste load allocations by actively participating in a LWQMP and attaining the waste load allocations for Machado Lake. Stormwater permittees and the responsible party for the lake may work together to implement the LWQMP and reduce external nutrient loading to attain the TMDL waste load allocations measured in the lake.</p> <p>Alternatively, MS4 Permittees may be deemed in compliance with waste load allocations by demonstrating reduction of total nitrogen and total phosphorous on an annual mass basis measured at the stormdrain outfall of the permittee's drainage area. The annual mass based allocation shall be equal to a monthly average concentration of 0.1 mg/L TP and 1.0 mg/L TN based on approved flow conditions. Permittees must demonstrate total nitrogen and total phosphorous load reductions to be achieved in accordance with a special study workplan approved by the Executive Officer.</p> <p>Compliance may also be demonstrated as concentration based monthly averages</p>

Attachment A to Resolution No. R08-006

TMDL Element	Regulatory Provisions
	<p>for TP and TN measured at the stormdrain outfall of the permittee's drainage area.</p> <p>MS4 Permittees shall be required to develop and implement a MRP plan and TMDL Implementation Plan. The MRP plan shall include a requirement that the responsible jurisdictions report compliance and non-compliance with waste load allocations as part of annual reports submitted to the Regional Board.</p> <p>❖ Determination of Compliance with Interim WLAs</p> <p>Responsible parties may comply with the numeric interim WLAs or may be deemed in compliance with the interim WLAs through implementation of external nutrient source reduction projects in accordance with the TMDL Implementation Plan schedule as approved by the Regional Board Executive Officer.</p> <p>The Regional Board may revise these WLAs and the compliance point based on the collection of additional information developed through special studies or monitoring conducted as part of this TMDL.</p> <p>The Regional Board will reconsider the TMDL at 7.5 years from the effective date based on water quality monitoring and special studies.</p>

TMDL Element	Regulatory Provisions
	<p>III. APPLICATION OF ALLOCATIONS TO RESPONSIBLE JURISDICTIONS</p> <p>Responsible jurisdictions to attain WLAs for this TMDL include but are not limited to:</p> <ul style="list-style-type: none"> • Caltrans • General Stormwater Permit Enrollees • MS4 Permittees including: <ul style="list-style-type: none"> ➢ Los Angeles County ➢ Los Angeles County Flood Control District ➢ Cities of Carson, ➢ City of Lomita, ➢ City of Los Angeles, ➢ City of Palos Verdes Estates, ➢ City of Rancho Palos Verdes, ➢ City of Redondo Beach, ➢ City of Rolling Hills, ➢ City of Rolling Hills Estates, ➢ City of Torrance. <p>The City of Los Angeles, Department of Recreation and Parks is responsible jurisdiction to implement the assigned Load Allocations for this TMDL.</p>

**Table 7-29.2 Machado Lake Eutrophic, Algae, Ammonia, and Odors (Nutrient)
TMDL: Implementation Schedule**

Task Number	Task	Responsible Jurisdiction	Date
1	Effective date interim waste load (WLA) and load allocations (LA) for total nitrogen and total phosphorus apply.	California Department of Transportation (Caltrans), Municipal Separate Storm Sewer System Permittees ⁴ (MS4 Permittees), City of Los Angeles – Department of Recreation and Parks	Effective Date of TMDL
2	Responsible jurisdictions shall enter into a Memorandum of Agreement (MOA) with the Regional Board to implement the load allocations.	City of Los Angeles – Department of Recreation and Parks	1 year from effective date of TMDL
3	Regional Board staff shall begin development of a Clean Up and Abatement Order or other regulatory order to implement the load allocations if an MOA is not established with responsible jurisdictions.	Regional Board Staff	1 year from effective date of TMDL
4	Clean Up and Abatement Order or other regulatory order adopted by the Regional Board if an MOA is not established with responsible jurisdictions. The Clean Up and Abatement Order or other regulatory order shall reflect the TMDL Implementation Schedule.	Regional Board Staff	1.5 years from effective date of TMDL
5	Responsible jurisdictions whose compliance is determined as concentration based WLAs measured at end of pipe shall submit a Monitoring and Reporting Program (MRP) Plan to the Executive Officer for approval.	Caltrans, MS4 Permittees	One year from effective date of TMDL
6	Responsible jurisdictions shall submit a Lake Water Quality Management Plan, MRP Plan and Quality Assurance Project Plan for approval by the Executive Officer to comply with MOA.	City of Los Angeles – Department of Recreation and Parks	1.5 years from effective date of TMDL
7	Responsible jurisdictions shall submit a work plan for optional special study #3 (if responsible jurisdictions choose to conduct this special study) for approval by the Executive Officer.	Caltrans, MS4 Permittees	One year from effective date of TMDL

⁴ Municipal Separate Storm Sewer System (MS4) Permittees that are responsible for discharges to Machado Lake include: Los Angeles County, Los Angeles County Flood Control District, and the Cities of Carson, Lomita, Los Angeles, Palos Verdes Estates, Rancho Palos Verdes, Redondo Beach, Rolling Hills, Rolling Hills Estates, and Torrance.

Attachment A to Resolution No. R08-006

Task Number	Task	Responsible Jurisdiction	Date
8	Responsible jurisdictions shall submit work plans for optional special studies #1 and #2 (if responsible jurisdictions choose to conduct special studies) for approval by the Executive Officer.	Caltrans, MS4 Permittees, City of Los Angeles – Department of Recreation and Parks	1.5 years from effective date of TMDL
9	Responsible jurisdictions shall begin monitoring as outlined in the approved MRP plan.	Caltrans, MS4 Permittees, City of Los Angeles – Department of Recreation and Parks	Sixty days from date of MRP Plan approval
10	Responsible jurisdictions shall begin implementation of Lake Water Quality Management Plan.	City of Los Angeles – Department of Recreation and Parks	Sixty days from date of Lake Water Quality Management Plan approval
11	Responsible jurisdictions whose compliance is determined as concentration based WLAs measured at end of pipe shall submit a TMDL Implementation Plan including BMPs to address discharges from storm drains.	Caltrans, MS4 Permittees	Two years from effective date of TMDL
12	Responsible jurisdictions whose compliance is determined as concentration based WLAs measured at end of pipe shall begin implementation of BMPs to address discharges from stormdrains	Caltrans, MS4 Permittees	Sixty days from date of Implementation Plan approval
13	Responsible jurisdictions shall submit annual monitoring reports. The monitoring reports shall include a requirement that the responsible jurisdictions demonstrate compliance with the MOA. If the MOA and Lake Water Quality Management Plan are not implemented or otherwise do not result in attainment of load allocations, the Regional Board shall revoke the MOA and the load allocations shall be implemented through a Clean Up and Abatement Order or other regulatory order.	City of Los Angeles – Department of Recreation and Parks	Annually – from date of Lake Water Quality Management Plan approval
14	Responsible jurisdictions whose compliance is determined as concentration based WLAs measured at end of pipe shall submit annual monitoring reports.	Caltrans, MS4 Permittees	Annually – from date of MRP Plan approval
15	Optional Special Study #3 completed and final report submitted for Executive Officer approval.	Caltrans, MS4 Permittees	Within 2.5 years of effective date of TMDL

Attachment A to Resolution No. R08-006

Task Number	Task	Responsible Jurisdiction	Date
16	Responsible jurisdictions shall submit a MRP Plan and TMDL Implementation Plan for the alternative mass based WLA compliance option (if selected), to the Executive Officer for approval.	Caltrans, MS4 Permittees	Within 2.5 years of effective date of TMDL
17	Responsible jurisdictions shall begin monitoring and implementing projects/programs as outlined in the approved MRP and TMDL Implementation Plan for the alternative mass based WLA compliance option.	Caltrans, MS4 Permittees	Sixty days from date of MRP/ Implementation Plan approval
18	Responsible jurisdictions whose compliance is determined as mass based WLAs measured at end of pipe shall submit annual monitoring reports.	Caltrans, MS4 Permittees	Annually – from date of MPR/ Implementation Plan approval
19	Optional Special Studies completed and Special Study final reports submitted for Executive Officer approval.	Caltrans, MS4 Permittees, City of Los Angeles – Department of Recreation and Parks	Within 6 years of effective date of TMDL
20	Regional Board staff and responsible jurisdictions will present an Information Item to the Regional Board on the progress of TMDL implementation efforts and compliance with implementation schedules.	Regional Board staff and responsible jurisdictions	4 years from effective date of TMDL
21	5 Year interim total nitrogen WLA and LA apply.	Caltrans, MS4 permittees, City of Los Angeles – Department Recreation and Parks	Within 5 years of effective date of TMDL
22	Regional Board will reconsider the TMDL to include results of optional special studies and water quality monitoring data completed by the responsible jurisdictions and revise numeric targets, WLAs, LAs, and the implementation schedule as needed.	Regional Board	7.5 years from effective date of TMDL
23	Responsible jurisdictions shall achieve Final WLAs and LAs for total nitrogen (including ammonia) and total phosphorus and demonstrate attainment of numeric targets for total nitrogen, ammonia, total phosphorus, dissolved oxygen, and chlorophyll a. Responsible parties shall demonstrate attainment of water quality standards for total nitrogen, ammonia, total phosphorus, dissolved oxygen, and biostimulatory substances in accordance with federal regulations and state policy on water quality control.	Caltrans, MS4 Permittees, City of Los Angeles – Department of Recreation and Parks	Within 9.5 years of effective date of TMDL