CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

RESOLUTION NO. R9-2005-0036

A RESOLUTION ADOPTING AN AMENDMENT TO THE WATER QUALITY CONTROL PLAN FOR THE SAN DIEGO REGION (9) TO INCORPORATE TOTAL MAXIMUM DAILY LOADS (TMDLs) FOR TOTAL NITROGEN AND TOTAL PHOSPHORUS IN THE RAINBOW CREEK WATERSHED, SAN DIEGO COUNTY

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

BASIN PLAN AMENDMENT: The proposed amendment of the Water Quality Control Plan for the San Diego Region (Basin Plan) described in the recitals below was developed in accordance with California Water Code §13240 et seq.

2. **NECESSITY STANDARD [Government Code §11353(b)]:** This regulatory action meets the "Necessity" standard of the Administrative Procedures Act, Government Code, §11353, subdivision (b). Amendment of the Basin Plan to establish and implement total maximum daily loads (TMDLs) for Rainbow Creek is necessary because water quality in Rainbow Creek does not meet applicable water quality objectives for total nitrogen and total phosphorus (hereinafter nutrients) even with implementation of waste discharge requirements containing technology based effluent limits or water quality based effluent limits for discharges of pollutants to Rainbow Creek and its tributaries. These TMDLs for nutrients are necessary to ensure attainment of applicable water quality objectives and restoration of beneficial uses designated for Rainbow Creek.

3. **CLEAN WATER ACT SECTION 303(d):** Rainbow Creek is identified on the Clean Water Act Section 303(d) list of impaired waters due to excessive nutrient concentrations. Section 303(d) requires the Regional Board to develop and implement TMDLs under the conditions that exist in Rainbow Creek.

4. **BENEFICIAL USE IMPAIRMENTS**: Rainbow Creek supports a multitude of beneficial uses. The most sensitive beneficial uses are those designated for protection of aquatic life as described in the Basin Plan definition of the COLD and WARM beneficial uses. The municipal supply (MUN), warm freshwater habitat (WARM), cold freshwater habitat (COLD), wildlife habitat (WILD), contact water recreation (REC-1), and non-contact water recreation (REC-2) are threatened or impaired due to excessive levels of nutrients.

5. **WATER QUALITY OBJECTIVES**: The Basin Plan establishes that inland surface waters shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. The Basin Plan establishes the following numerical water quality objective for biostimulatory substances for the protection of the COLD and WARM beneficial uses:

   Total Nitrogen 1.0 mg/L
   Total Phosphorus 0.1 mg/L

   These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board.

   The Basin Plan establishes that waters designated for use as domestic or municipal supply shall not contain concentrations of nitrate in excess of the maximum contaminant levels set forth in California Code of Regulations, Title 22. The maximum contaminant level (MCL) for nitrate (as nitrogen) is 10 mg/L.

6. **WATER QUALITY OBJECTIVE VIOLATIONS:** Concentrations for nutrients in Rainbow Creek routinely exceed applicable water quality objectives for nutrients and nitrate. Sampling surveys conducted by the Regional Board in Rainbow Creek in Year 2000 documented water column concentrations as high as 21 mg/L of nitrate as nitrogen, 23 mg/L of total nitrogen and 1.7 mg/L of total phosphorus.

7. **ADVERSE EFFECTS OF NUTRIENTS:** An overload of nutrients can result in an imbalance of the natural cycling processes and can lead to problems ranging from annoyance due to an overabundance of algae and emergent vegetation to human health problems and adverse ecological effects. Nutrient concentrations in Rainbow Creek appear to be contributing to excessive algal growth. Excessive algae present a nuisance that threatens to impair aesthetic and recreational uses (REC1 and REC2). Excessive algae can create conditions that are harmful to aquatic life and degrade water quality, and threaten to impair warm water (WARM), cold water (COLD), and wildlife (WILD) beneficial uses.

8. **NUMERIC TARGETS:** TMDL Numeric Targets interpret and implement water quality standards (i.e., numeric and narrative water quality objectives and beneficial uses) and are established at levels necessary to achieve water quality standards. The Regional Board has set the total nitrogen and total phosphorus TMDL Numeric Targets for both the numeric and narrative water quality objectives equal to the numeric water quality objectives cited in Finding 5. The numeric targets for nitrate (as nitrogen) is 10 mg/L, total nitrogen is 1.0 mg/L and total phosphorus is 0.1 mg/L. Attainment of the TMDL numeric targets will result in attainment of water quality standards in Rainbow Creek.

9. **TOTAL MAXIMUM DAILY LOADS [40 CFR 130.2(i)]:** The Total Maximum Daily Loads (TMDLs) for total nitrogen and total phosphorus discharges into Rainbow Creek are calculated to be 1,658 kilograms of nitrogen per year (kg N/yr) and 165 kilograms of phosphorus per year (kg P/yr). The TMDLs are equal to the assimilative or Loading Capacity (LC) of Rainbow Creek for total nitrogen and total phosphorus and are defined as the maximum amount of total nitrogen and total phosphorus that Rainbow Creek can receive and still attain water quality objectives and protection of designated beneficial uses. The TMDLs are comprised of the sum of all individual Wasteload Allocations (WLAs) for point source discharges of nutrients, the sum of all Load Allocations (LAs) for nonpoint source discharges of nutrients, and natural background. The TMDLs include a margin of safety (MOS) that takes into account any uncertainties in the TMDL calculation. (i.e. TMDL = LC = $\sum$ WLAs + $\sum$ LAs + MOS). The TMDL calculations also account for seasonal variations and critical conditions.

10. **ALLOCATIONS AND REDUCTIONS:** A 74 percent (74%) overall reduction of total nitrogen loading and an 85 percent (85%) overall reduction of total phosphorus to Rainbow Creek are required to meet the TMDLs of 1,658 kg N/yr and 165 kg P/yr. The assigned allocations from each source translate into a percent reduction of nutrients from current loading.

Percent Reduction by Source	Total Nitrogen	Total Phosphorus
Point Sources		
Caltrans	68%	64%
Nonpoint Sources		
Commercial Nurseries	77%	90%
Agricultural Fields	77%	90%
Orchards	77%	90%
Park	50%	50%
Residential Areas	77%	90%
Urban Areas	50%	50%
Septic Tank Disposal Systems	77%	Not Applicable

11. **DISCHARGERS:** The Regional Board has identified Caltrans, County of San Diego, commercial nurseries, agricultural fields, orchards, parks, residential areas, urban areas, and septic tank disposal systems as causing or permitting the discharge of total nitrogen and total phosphorus to Rainbow Creek.

12. **IMPLEMENTATION ACTIONS**: Strategies that the Regional Board could take to implement the TMDL are described in the *Basin Plan Amendment and Technical Report for Total Nitrogen and Total Phosphorus Total Maximum Daily Loads For Rainbow Creek, dated February 9, 2005*.

13. **IMPLEMENTATION MONITORING:** Water quality monitoring will be required to evaluate the overall TMDL implementation effectiveness and success in attaining nutrient water quality objectives in Rainbow Creek and its tributaries.

14. **COMPLIANCE SCHEDULE:** Nutrient wasteload and load reductions are required over a 16-year phased compliance schedule period. The first four-year phase consists of nutrient reductions to attain the nitrate water quality objective and reduced phosphorus concentrations in Rainbow Creek. Incremental reductions of nutrient load are required throughout the subsequent 12-year period.

15. **SCIENTIFIC PEER REVIEW:** The scientific basis of this Basin Plan amendment has undergone external peer review pursuant to Health and Safety Code Section 57004. The Regional Board has considered and responded to all comments submitted by the peer review panel.

16. **STAKEHOLDER PARTICIPATION:** Interested persons and the public have had reasonable opportunity to participate in the development of this amendment to the Basin Plan. Efforts to solicit public review and comment include four (4) public workshops held between April 1999 and December 2004; two (2) public review and comment periods of at least 45 days preceding the Regional Board public hearing; and written responses from the Regional Board to oral and written comments received from the public.

17. **ECONOMIC ANALYSIS:** The Regional Board has considered the costs of implementing this Basin Plan amendment, and finds these costs to be reasonable relative to the water quality benefits derived from implementing the amendment.

18. **CEQA REQUIREMENTS:** The Basin Planning process has been certified as functionally equivalent to the California Environmental Quality Act (CEQA) requirements for preparing environmental documents and is, therefore, exempt from those requirements (Public Resources Code Section 21000 et seq.). The required environmental documents (Basin Plan amendment, staff report, and environmental checklist) have been prepared.

19. **DE MINIMIS ENVIRONMENTAL EFFECTS**: This Basin Plan amendment results in no potential for adverse effect, either individually or cumulatively, on fish and wildlife resources or the habitat upon which they depend. Any and all effects on the environment are expected to be beneficial.

20. **PUBLIC NOTICE**: The Regional 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.

21. **PUBLIC HEARING:** The Regional Board has, at public meetings on May 8, 2002 and December 8, 2004, held public hearings and heard and considered all comments

pertaining to this Basin Plan amendment.

NOW, THEREFORE, BE IT RESOLVED that

1. **AMENDMENT ADOPTION**: The Regional Board hereby adopts this amendment to the Basin Plan to incorporate the Rainbow Creek Total Nitrogen and Total Phosphorus TMDLs as set forth in Attachment A hereto.

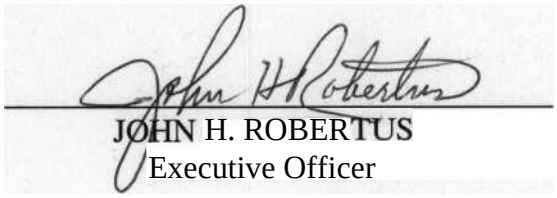
2. The Regional Board hereby approves the report *Basin Plan Amendment and Technical Report for Total Nitrogen and Total Phosphorus Total Maximum Daily Loads For Rainbow Creek, dated February 9, 2005*.

3. **CERTIFICATE OF FEE EXEMPTION**: The Executive Officer is authorized to sign a Certificate of Fee Exemption.

4. **AGENCY APPROVALS:** The Executive Officer is directed to submit the Basin Plan amendment to the State Water Resources Control Board (State Board) in accordance with California Water Code Section 13245. The Regional Board requests that the State Board approve the Basin Plan amendment and forward it to Office of Administrative Law (OAL) and the United States Environmental Protection Agency for approval.

5. NON-SUBSTANTIVE CORRECTIONS: If, during the approval process for this amendment, the State Board or 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 Regional Board of any such changes.

I, John H. Robertus, 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 February 9, 2005.



JOHN H. ROBERTUS
Executive Officer

ATTACHMENT A
TO RESOLUTION NO. R9-2005-0036
BASIN PLAN AMENDMENT

This Basin Plan Amendment establishes Total Maximum Daily Loads (TMDLs) and associated wasteload and load reductions for nutrients in Rainbow Creek, a tributary of the Santa Margarita River. This Amendment includes a program to implement the TMDLs and to monitor their effectiveness. Chapters 2, 3, and 4 of the Basin Plan are amended as follows:

1. **Chapter 2, Beneficial Uses**
   Table 2-2. ***Beneficial Uses of Inland Surface Waters, Santa Margarita River Watershed, Rainbow Creek, Hydrologic Unit Basin Numbers 2.23 and 2.22.***

Add the following footnote 3 to Rainbow Creek, Hydrologic Unit Basin Numbers 2.23 and 2.22:

> [3]Rainbow Creek is designated as an impaired water body for total nitrogen and total phosphorus pursuant to Clean Water Act Section 303(d). Total Maximum Daily Loads (TMDLs) have been adopted to address these impairments. See Chapter 3, Water Quality Objectives for Biostimulatory Substances and Chapter 4, Total Maximum Daily Loads.

2. **Chapter 3, Water Quality Objectives**
   Inland Surface Waters, Enclosed Bays and Estuaries, Coastal Lagoons, and Ground Waters

   Water Quality Objectives for Biostimulatory Substances:

Insert the following as new paragraph 5:

> Rainbow Creek is designated as an impaired water body for total nitrogen and total phosphorus pursuant to Clean Water Act Section 303(d). Total Maximum Daily Loads (TMDLs) have been adopted to address these impairments. See Chapter 2, Beneficial Uses Table 2-3. Beneficial Uses of Inland Surface Waters, Santa Margarita River Watershed, Rainbow Creek, Hydrologic Unit Basin Numbers 2.23 and 2.22, Footnote 3 and Chapter 4, Total Maximum Daily Loads.

3. **Chapter 4, Implementation**

Add the following new section to Chapter 4:

TOTAL MAXIMUM DAILY LOADS

Total Maximum Daily Loads (TMDLs) for Total Nitrogen and Total Phosphorus in the Rainbow Creek Watershed

On February 9, 2005, the Regional Board adopted Resolution No. R9-2005-0036, A Resolution Adopting An *Amendment To The Water Quality Control Plan For The San Diego Region (9) To Incorporate Total Maximum Daily Loads (TMDLs) For Total Nitrogen and Total Phosphorus In The Rainbow Creek Watershed, San Diego County*. The Basin Plan Amendment was subsequently approved by the State Water Resources Control Board on [Insert Date], the Office of Administrative Law on [Insert Date], and the United States Environmental Protection Agency on [Insert Date].

The TMDL is described in the Basin Plan Amendment and Technical Report for Total Nitrogen and Total Phosphorus Total Maximum Daily Loads For Rainbow Creek, dated February 9, 2005.

Problem Statement

Nitrate, total nitrogen, and total phosphorus concentrations in Rainbow Creek exceed the Inorganic Chemicals nitrate and Biostimulatory Substances water quality objectives. These exceedances threaten to unreasonably impair the municipal supply (MUN), warm freshwater habitat (WARM), cold freshwater habitat (COLD), and wildlife habitat (WILD) beneficial uses of Rainbow Creek. Excessive nutrient levels in Rainbow Creek promote the growth of algae in localized areas, creating a nuisance condition, that unreasonably interferes with aesthetics and contact and non-contact water recreation (REC1, REC2) and threatens to impair WARM, COLD and WILD beneficial uses. State highways, agricultural fields and orchards, commercial nurseries, residential and urban areas, and septic tank disposal systems contribute to increased nutrient levels in Rainbow Creek as a result of storm water runoff, irrigation return flows, and ground water contributions to the creek.

Numeric Targets

The Numeric Targets for nitrate, total nitrogen, and total phosphorus are set equal to the Inorganic Chemicals nitrate water quality objective for municipal water supply and the numeric goals of the Biostimulatory Substances water quality objective as defined in the Basin Plan and shown below.

Table 4 - A. Rainbow Creek Nitrate, Total Nitrogen, and Total Phosphorus Numeric Targets

Constituent	Water Quality Objective	Numeric Target
Nitrate (as nitrogen)	10 mg NO_3-N/L	10 mg NO_3-N/L
Total Nitrogen	1.0 mg N/L	1.0 mg N/L
Total Phosphorus	0.1 mg P/L	0.1 mg P/L

If the Inorganic Chemicals nitrate and Biostimulatory Substances water quality objectives in Rainbow Creek are modified in the future then the TMDL will be recalculated and the numeric targets will be set equal to the new water quality objectives.

Source Assessment

Seventy-nine percent (79%) and seventy percent (70%) of total nitrogen and total phosphorus mass loading, respectively, are attributable to controllable sources, which include certain land use activities, septic tank disposal systems (total nitrogen only), and Interstate 15 (I-15). The land use activities include commercial nurseries, agricultural fields, orchards, residential areas, urban areas, and park areas. Background and direct atmospheric deposition are not considered to be controllable sources.

Table 4 - B. Summary of Total Nitrogen and Total Phosphorus Sources to Rainbow Creek

Source	Total Nitrogen Mass Load (kg N/yr)	Percent Contribution (% N)	Total Phosphorus Mass Load (kg P/yr)	Percent Contribution (% P)
Land Uses Runoff	2,662	69	262	66
Background	779	20	116	29
Septic Tank Disposal Systems	200	5	0	0
I-15 Runoff (Caltrans)	153	4	14	4
Direct Atmospheric Deposition	40	1	2	1
Combined Sources	**3,834**	**100**	**394**	**100**

Total Maximum Daily Loads or Loading Capacity

The TMDLs for nutrients in Rainbow Creek are 1,658 kg N/yr for total nitrogen and 165 kg P/yr for total phosphorus in order to attain and maintain the Inorganic Chemicals – Nitrate and Biostimulatory Substances water quality objective in Rainbow Creek waters.

The annual loading limit of total nitrogen and total phosphorus to Rainbow Creek shall be reduced incrementally from the current load of 3,834 kg/yr and 394 kg/yr, respectively, to 1,658 kg/yr and 165 kg/yr, respectively, by no later than December 31, 2021. The annual nutrient loading limits to be attained by December 31, 2021 is listed in Table 4-C.

Table 4 - C. Annual Nutrient Loading Capacity and Compliance Date

TMDL	December 31, 2021[1]	
Total Nitrogen – Annual Load	1,658 kg/yr	3,648 lbs./yr
Total Phosphorus – Annual Load	165 kg/yr	365 lbs./yr

[1] Compliance to be achieved no later than this date. The Regional Board may require earlier compliance with these targets when it is reasonable and feasible.

Margin of Safety

Explicit and implicit margins of safety (MOS) were considered for these TMDLs. An explicit MOS of 5% is reserved to account for uncertainties and calculated to be 83 kg/year total nitrogen and 8 kg/year total phosphorus. An implicit MOS has been incorporated through conservative assumptions in the analysis.

Load Allocations and Wasteload Allocations

A seventy-four percent (74%) and an eighty-five percent (85%) overall reduction of total nitrogen and total phosphorus loading, respectively, to Rainbow Creek is required to meet the TMDLs described in Table 4 – C.

The load allocations for the initial annual loading are provided in Table 4 – D.1. and D.2., below. A margin of safety (MOS) of 5% is subtracted from this nutrient TMDL to account for unknowns, errors in assumptions, and potential future development in the watershed. This 5% is reserved for unknowns and is not allocated to any source. Allocations (other than for background and margin of safety) will be further reduced by 20% every 4 years until the biostimulatory targets for nitrogen and phosphorus are met. In the event that a nonpoint source becomes a permitted discharge, the portion of the load allocation that is associated with the source can become a wasteload allocation.

Table 4 – D.1. Annual Total Nitrogen Allocations for Rainbow Creek

Source	Annual Total Nitrogen Load Allocations			
	2009 kg/yr[1]	2013 kg/yr[1]	2017 kg/yr[1]	2021 kg/yr[1]
Load Allocations (LA)				
Commercial nurseries	390	299	196	116
Agricultural fields	504	386	253	151
Orchards	607	465	305	182
Park	5	3	3	3
Residential areas	507	390	260	149
Urban areas	40	27	27	27
Septic tank disposal systems	200	100	46	46
Air deposition	40	40	40	40
Wasteload Allocations (WLA)				
Caltrans highway runoff	118	90	59	49
Unidentified & future point sources	33	33	33	33
Total LA & WLA	**2,444**	**1,833**	**1,222**	**796**
Background[2]	779	779	779	779
MOS (not allocated)	83	83	83	83
Total	**3,306**	**2,695**	**2,084**	**1,658**

[1] To calculate pounds per year, multiply by 2.2.
[2] Background is calculated based on reference concentrations in San Diego streams and Rainbow Creek annual flow volumes.

Table 4 – D.2. Annual Total Phosphorus Allocations for Rainbow Creek

Source	Annual Total Nitrogen Load Allocations			
	2009 kg/yr[1]	2013 kg/yr[1]	2017 kg/yr[1]	2021 kg/yr[1]
Load Allocations (LA)				
Commercial nurseries	20	16	10	3
Agricultural fields	28	21	14	4
Orchards	50	37	24	6
Park	0.15	0.10	0.10	0.10
Residential areas	99	74	47	12
Urban areas	9	6	6	6
Air deposition	2	2	2	2
Wasteload Allocations (WLA)				
Caltrans highway runoff	11	8	5	5
Unidentified & future point sources	3	3	3	3
Total LA & WLA	**223**	**167**	**111**	**41**
Background[2]	116	116	116	116
Margin of Safety (not allocated)	8	8	8	8
Total	**346**	**291**	**235**	**165**

[1] To calculate pounds per year, multiply by 2.2.
[2] Background is calculated based on reference concentrations in San Diego streams and Rainbow Creek annual flow volumes.

Recalculations if Water Quality Objectives Change

If the water quality objectives for Biostimulatory Substances are changed in the future, then the MOS, TMDL and allocations and reductions will be recalculated using the method shown in Appendix D of the Basin Plan.

TMDL Implementation Action Plan

The necessary actions to implement the TMDLs are described in Section 9 of the *Technical Report for Total Nitrogen and Total Phosphorus Total Maximum Daily Loads (TMDLs) in Rainbow Creek*, dated February 9, 2005 and listed below.

A. Regional Board Actions

1. **Caltrans – Incorporate Wasteload Allocations in NPDES Storm Water Permit**
   The Regional Board shall request that the State Water Resources Control Board amend the Caltrans statewide NPDES storm water permit[1] to include the following

[1] The term "statewide NPDES storm water permit " refers to Order No. 99-06-DWQ, NPDES No. CAS000003, National Pollutant Discharge Elimination System Permit, Statewide Storm Water Permit,

requirements:

a. MS4 discharges to Rainbow Creek shall not exceed the following wasteloads for nitrogen and phosphorus:

Nitrogen Wasteload	Phosphorus Wasteload	Compliance Due Date
118 kg N/yr[1]	11 kg P/yr[1]	December 31, 2009
90 kg N/yr[1]	8 kg P/yr[1]	December 31, 2013
59 kg N/yr[1]	5 kg P/yr[1]	December 31, 2017
49 kg N/yr[1]	5 kg P/yr[1]	December 31, 2021

b. A directive to submit annual progress reports to the Regional Board detailing progress made on attaining the nutrient wasteload reductions in Rainbow Creek. The report shall be due on April 1 of each year shall be incorporated within Section 2, Program Management of Caltrans MS4 Order No. 99-06-DWQ, NPDES No. CAS000003. Reporting shall continue on an annual basis until the nutrient water quality objective is attained in Rainbow Creek.

2. **County of San Diego – Issue Water Code Governmental Water Quality Investigation Request Order for Nutrient Reduction and Management Plan**
The Regional Board shall issue an Order under CWC §13225 requiring the County of San Diego to investigate excessive levels of nutrients in Rainbow Creek and feasible management strategies to reduce nutrient loading in Rainbow Creek. A Nutrient Reduction and Management Plan (NRMP) for the Rainbow Creek watershed containing the elements described below in Section C, County of San Diego Nutrient Reduction Management Plan Elements, would satisfy such an Order. The County may submit alternative or additional elements equivalent to those described in Section C that would result in equivalent protection from, or prevention of, nutrient discharges to Rainbow Creek.

3. **County of San Diego – Establish Management Agency Agreement (MAA)**
The Regional Board shall consider, following concurrence with the County of San Diego's Nutrient Reduction and Management Plan (NRMP) for Rainbow Creek, entering into a Management Agency Agreement (MAA) with the County of San Diego. The MAA shall set forth the commitment of both parties to undertake various oversight responsibilities for the nonpoint source nutrient load reduction component of this TMDL, and the County's commitments to implement the NRMP.

4. **County of San Diego – Issue Water Code Governmental Water Quality Investigation Request for Groundwater Investigation and Characterization Report**
The Regional Board could issue an Order under CWC §13225 directing the County of

---

and Waste Discharge Requirements for the State of California, Department of Transportation (Caltrans) or subsequent superceding NPDES renewal Orders.

San Diego to prepare and submit a workplan and report described below in Section B, County of San Diego Actions, Item 3 Submit Groundwater Investigation and Characterization Workplan and Item 4 Groundwater Investigation and Characterization Report.

5. **CA Dept. of Forestry and Fire Protection – Issue Water Code Section 13267 Order**
   The Regional Board shall issue a CWC §13267 order directing the California Department of Forestry and Fire Protection, Rainbow Conservation Camp (CDFFP) to submit any additional technical information needed to 1) evaluate whether CDFFP's discharge is surfacing and/or contributing to the impairment of Rainbow Creek; and 2) estimate the actual nutrient load originating from the septic tank and percolation ponds to Rainbow Creek via groundwater flow. Based on the review of this information the Regional Board may further direct the CDFFP to implement an alternate means of wastewater disposal or additional treatment necessary to attain and maintain nutrient water quality objectives in Rainbow Creek.

6. **Establish Memorandum of Understanding (MOU) with Agencies or Organizations**
   The Regional Board shall consider entering into a memorandum of understanding (MOU) to document cooperative agreements with other agencies or organizations that are able to provide information, technical assistance, or financial assistance to dischargers to support the Regional Board's goals of attaining the nutrient load reductions required under this TMDL and compliance with the nutrient water quality objective. These agencies and organizations include, but are not limited to, the United States Department of Agriculture, Natural Resources Conservation Service (NRCS), Mission Resource Conservation District (MRCD), and the University Of California Cooperative Extension (UCCE).

7. **Adopt Waste Discharge Requirements (WDRs), Waivers, and Discharge Prohibitions**
   In conjunction with an MAA or MOU with another third-party representative, organization, or government agency describing an adequate NPS pollution control implementation program, the Regional Board shall adopt individual or general waivers or waste discharge requirements (WDRs) for NPS discharges in the Rainbow Creek watershed. The waivers or WDRs shall require NPS dischargers to either participate in the third party NPS program or, alternatively, submit individual pollution prevention plans that detail how they will comply with the waivers and WDRs. Alternatively, the Regional Board may adopt a discharge prohibition, which includes exceptions for those discharges that are adequately addressed in an acceptable third-party MAA or MOU NPS pollution control implementation program.

8. **Take Enforcement Actions**
   The Regional Board shall take enforcement action[2], as necessary, against any

[2] An enforcement action is any formal or informal action taken to address an incidence of actual or threatened noncompliance with existing regulations or provisions designed to protect water quality.

discharger failing to comply with applicable waiver conditions, waste discharge requirements (WDRs), discharge prohibitions, or take enforcement action, as necessary, to control the discharge of nutrients to Rainbow Creek, to attain compliance with the nutrient wasteload and load reductions specified in this TMDL, or to attain compliance with the nutrient water quality objectives. The Regional Board may also terminate the applicability of waivers and issue waste discharge requirements or take other appropriate action against any discharger(s) failing to comply with the waiver conditions.

9. **Review and Revise Existing Waste Discharge Requirements**
   The Regional Board shall review and, if necessary, update existing waste discharge requirements for discharges to land as well as groundwater in the Rainbow Creek watershed to incorporate effluent limitations for nutrients consistent with applicable nutrient groundwater quality objectives and surface water quality objectives.[3]

10. **Recommend High Priority for Grant Funds**
    The Regional Board shall recommend that the State Board assign a high priority to awarding grant funding[4] for projects to implement the Rainbow Creek nutrient TMDLs. Special emphasis will be given to projects that can achieve quantifiable nutrient load reductions consistent with the specific nutrient TMDL load allocations.

11. **Incorporate Water Code Section 13291 Regulations in Basin Plan**
    The Regional Board shall incorporate regulations currently under development by the State Water Resources Control Board pertaining to onsite wastewater treatment systems[5] into the Water Quality Control Plan for the San Diego Basin (Basin Plan) as

---

Potential enforcement actions include a notice of violation (NOV), notices to comply (NTC), imposition of time schedules (TSO), issuance of cease and desist orders (CDOs) and cleanup and abatement orders (CAOs), administrative civil liability (ACL), and referral to the attorney general (AG) or district attorney (DA). The Regional Board generally implements enforcement through an escalating series of actions to: (1) assist cooperative dischargers in achieving compliance; (2) compel compliance for repeat violations and recalcitrant violators; and (3) provide a disincentive for noncompliance.

[3] There are currently three dischargers in the Rainbow Creek watershed regulated under waste discharge requirements for the discharge of waste to land or groundwaters: Oak Crest Mobile Estates (Order No. 1993-69), Rainbow Conservation Camp (Order No. 1995-20), and Temecula Truck Inspection Facility (Order No. 1992-56). The Rainbow Truck Weigh and Inspection Facility, discharges under the terms of a waiver of waste discharge requirements (Order No. 2000-235)

[4] The State Water Resources Control Board administers the awarding of grants funded from Proposition 13, Proposition 50, Clean Water Act 319(h) and other federal appropriations to projects that can result in measurable improvements in water quality, watershed condition, and/or capacity for effective watershed management. Many of these grant fund programs have specific set-asides for expenditures in the areas of watershed management and TMDL implementation for NPS pollution.

[5] "Onsite wastewater treatment system(s)" (OWTS) is any individual or community onsite wastewater treatment, pretreatment and dispersal system including, but not limited to, a conventional, alternative, or experimental sewage dispersal system such a septic tanks having a subsurface discharge.

soon as practicable upon their adoption by the State Board.[6]

B. County of San Diego Actions

1. **Control MS4 Discharges to Rainbow Creek**
   For nutrient discharges to or from Municipal Separate Storm Sewer Systems (MS4) within the Rainbow Creek watershed, the County has an existing obligation under the NPDES requirements for MS4s in San Diego County [7] to require increasingly stringent best management practices, pursuant to the iterative process described in Receiving Water Limitation C.2.a.[8] of the MS4 Requirements, to reduce nutrients discharges in the Rainbow Creek watershed to the maximum extent practicable and restore compliance with the nutrient water quality objective.

2. **Submit Nutrient Reduction and Management Plan (NRMP)**
   The County of San Diego shall, upon request by the Regional Board pursuant to CWC §13225, prepare and submit a NRMP for the Rainbow Creek watershed, consistent with the SWRCB NPS Implementation and Enforcement Policy and containing the elements described in Section C, County of San Diego Nutrient Reduction and Management Plan or their equivalent. The County may submit alternative or additional elements equivalent to those described in Section C that would result in equivalent protection from, or prevention of, nutrient discharges to Rainbow Creek.

3. **Submit and Implement Groundwater Investigation and Characterization Workplan**
   The County of San Diego shall, upon request by the Regional Board pursuant to CWC §13225, undertake an investigation of groundwater quality within the Rainbow Creek watershed, and shall prepare and submit a workplan designed to guide the collection of information to produce the technical report described in Item 4, Groundwater Investigation and Characterization Report below. The workplan shall include the following:

   a. A schedule for completion of all activities and submission of a final Groundwater Investigation and Characterization Report.
   b. A description of proposed actions including drilling methods, analytical methods, sampling locations, and purging and sampling methods.

---

[6] CWC §13291 directs the Regional Board to incorporate the regulations in the Basin Plan upon their adoption by the State Water Resources Control Board.

[7] The term "MS4 NPDES Storm Water Permit" refers to Order No.2001-001, NPDES No. CAS0108758, *Waste Discharge Requirements For Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds of the County of San Diego, the Incorporated Cities Of San Diego County, and the San Diego Unified Port District* or subsequent superceding NPDES renewal Orders.

c. The location of existing monitoring wells and the proposed location of additional monitoring wells needed to characterize nutrient concentrations and their lateral and vertical extent in groundwater.
d. Contingencies for collection of additional samples.
e. Sufficient scope to meet the objectives of assessing nutrient loading from surface sources to groundwater and the contribution of groundwater to the nutrient loading and nutrient concentrations in Rainbow Creek
f. Consideration of the following elements or factors:
    i. Nutrient mass loading to groundwater in the fractured rock aquifer and the alluvial deposits aquifer[8] from septic systems, deep percolation of applied irrigation water, and any other sources.
    ii. Base flow contribution to Rainbow Creek from the fractured rock aquifer and the alluvial deposits aquifer.
    iii. Mass balance of nutrients in the fractured rock aquifer and alluvial deposits aquifer (nutrient mass loading to groundwater, removals from the groundwater system including denitrification, plant uptake, and groundwater discharge, and change in the load and concentration of nutrients in groundwater.

The County of San Diego shall implement the workplan within sixty (60) days after submission of the workplan, unless otherwise directed in writing by the Regional Board. Before beginning these activities the County shall notify the Regional Board of the intent to initiate the proposed actions included in the workplan submitted; and comply with any conditions set by the Regional Board.

4. **Submit Groundwater Investigation and Characterization Report**
   The County of San Diego shall, on a schedule agreed to in writing by the Regional Board, submit a Groundwater Investigation and Characterization Report containing a technical analysis and interpretation of the data to assess the contribution of groundwater to the nutrient loading and concentrations in Rainbow Creek. The report shall meet the objectives and address the considerations described in the Groundwater Investigation and Characterization Workplan. The report shall also present recommendations to refine assumptions, resolve uncertainties, and improve the scientific foundation of the TMDL with regard to quantifying groundwater nutrient loading to Rainbow Creek.

5. **Establish Management Agency Agreement (MAA)**
   The County of San Diego is requested to enter into a MAA with the Regional Board setting forth the commitment of both parties to undertake various implementation oversight responsibilities for the nonpoint source nutrient load reduction component of this TMDL and the County's commitments to implement the NRMP.

C. County Of San Diego Nutrient Reduction And Management Plan

[8] Groundwater beneath the Rainbow Creek watershed is interpreted to occur in both the alluvial deposits where present and in the fractured rock. The groundwater investigation report shall assess the relative contribution from each aquifer

1. **NPS Nutrient Reduction and Management Plan (NRMP)**
   A NRMP for the Rainbow Creek watershed shall describe the activities the County of San Diego could undertake to oversee discharger efforts to reduce nutrients in the runoff or groundwater discharges from new and existing (1) commercial nurseries; (2) agricultural fields; (3) orchards; (4) parks; (5) residential area; (6) urban areas; and; (7) septic tank disposal system land uses (hereinafter referred to as key nutrient sources). A NRMP should include the following elements as provided in items 2 through 17 below or alternative or additional elements equivalent to those described that would result in equivalent protection from, or prevention of, nutrient discharges to Rainbow Creek.

2. **Legal Authority**
   The County of San Diego should review its legal authority and evaluate its adequacy to mandate compliance with the nutrient load reductions specified in this TMDL through ordinance, statue, permit, contract or similar means. The County, at a minimum, should evaluate its authority to:

   a. Control the discharge of nutrients from nonpoint sources; and
   b. Prohibit discharges of nutrients which cause or contribute to exceedances of the nutrient load reductions specified in this TMDL or nutrient water quality objectives.

   Alternatively the County of San Diego may certify that its existing legal authority is adequate to mandate compliance with the nutrient load reductions specified in this TMDL and prevent increases in nutrient loading to Rainbow Creek.

3. **General Plan Modification**
   The County of San Diego should evaluate the adequacy of its General Plan to ensure that future land use and zoning decisions do not result in an increase in the nutrient loading to Rainbow Creek. The County should also describe the steps it will take to modify the General Plan as necessary. Alternatively the County of San Diego may certify that its existing General Plan is adequate to prevent an increase in nutrient loading to Rainbow Creek.

4. **Modify Development Project Approval Process**
   The County of San Diego should evaluate the adequacy of its development project approval / permitting process as necessary to ensure that discharges from proposed developments in the Rainbow Creek watershed will comply with the nutrient load reductions specified in this TMDL and ensure that nutrient water quality objectives are not exceeded. The County's evaluation should consider the need to ensure that all development in Rainbow Creek watershed will be in compliance with County's storm water ordinances, permits, and all other applicable ordinances and requirements. The County should also describe the steps it will take to modify the development project approval / permitting process as necessary. Alternatively the County of San Diego may certify that its project approval / permitting process is adequate to ensure that

discharges from proposed developments in the Rainbow Creek watershed will comply with the nutrients load reductions specified in this TMDL and ensure that nutrient water quality objectives are not exceeded.

5. **CEQA Reviews**
   The County of San Diego should evaluate the adequacy of its environmental review process pursuant to CEQA to ensure that new development in the Rainbow Creek watershed does not contribute to exceedances of the nutrient load allocations specified in this TMDL or violations of the nutrient water quality objective. For example, diligent performance of environmental review under CEQA and requirements for mitigation of the adverse environmental consequences to water quality of new development and detrimental agricultural practices can significantly reduce nutrient loading to Rainbow Creek. The County's evaluation should consider the need to aggressively review proposed projects that have the potential to contribute nitrogen and phosphorus to the Rainbow Creek watershed and require appropriate mitigation. The County should also describe the steps it will take to revise the development project approval / permitting process as necessary. Alternatively the County of San Diego may certify that its environmental review process pursuant to CEQA is adequate to ensure that new development in the Rainbow Creek watershed does not contribute to exceedances of the nutrient load allocations specified in this TMDL or violations of the nutrient water quality objective.

6. **Pollution Prevention (Nutrients)**
   The County of San Diego should describe the steps it will take to implement pollution prevention[9] methods for nutrients at sites owned by the County and require its use by owners or operators of nutrient sources, where appropriate.

7. **Source Identification (Nutrients)**
   The County of San Diego should describe the steps it will take to develop and update annually an inventory of the individual nutrient sources within the residential, urban, commercial nursery, agricultural field, orchard, park, and septic tank disposal system category of land uses. The use of an automated database system, such as Geographical Information System (GIS) is highly recommended.

8. **Threat to Water Quality Prioritization (Nutrients)**
   The County of San Diego should describe the steps it will take to establish priorities for inspection and oversight activities. Each individual nutrient source in each nonpoint source category should be classified as high, medium, or low threat to water quality. The inventory should include the following minimum information for each site: name; address; SIC codes as appropriate which best reflects the type of site; a narrative description characterizing the nutrient waste generated; and the potential for nutrient discharges to Rainbow Creek.

---

[9] Pollution Prevention is defined as practices and processes that reduce or eliminate the generation of pollutants, in contrast to source control, treatment, or disposal.

9. **MP Implementation (Nutrients)**
   The County of San Diego should describe the steps it will take to:
   a. Designate a set of minimum MMs / MPs [10] for the high, medium, and low threat to water quality nutrient sources identified in item 7 above. The designated minimum MPs for the high threat to water quality nutrient sources should be site and source specific as appropriate.
   a. Establish a time line for installation of the designated minimum MPs at each nutrient source within its jurisdiction. If particular minimum MPs are infeasible for any specific site/source the county of San Diego should describe the steps it will take to require the implementation of other equivalent MPs.

10. **Inspection of Sites and Sources (Nutrients)**
    The County of San Diego should describe the steps it will take to inspect high priority sites and sources for compliance with its ordinances and permits as well as nutrient load reductions required under this TMDL. Inspections should include review of MP implementation plans and effectiveness. The County should also describe the steps it will take to implement all inspection follow-up actions, including enforcement actions, as necessary to obtain discharger compliance in implementing MPs.

11. **Enforcement of Sites and Sources (Nutrients)**
    The County of San Diego should describe the steps it will take to enforce its ordinances, statues, permits, and contracts as necessary to attain compliance with the nutrient load reductions specified in this TMDL.

12. **Reporting of Non-compliant Sites (Nutrients)**
    The County of San Diego should describe the steps it will take to provide oral notification to the Regional Board of non-compliant sites that are determined to be recalcitrant in implementing MPs or attaining compliance with nutrient load reductions required under this TMDL within 24 hours of the discovery of noncompliance. The notification process should also include procedures for a follow-up written report to be submitted to the Regional Board within 5 days of the incidence of non-compliance.

13. **Monitoring to Assess Compliance With Nutrient Load Reductions**
    The County of San Diego should describe the steps it will take to conduct, or require nutrient sites or sources to conduct, a monitoring program to assess compliance of runoff or groundwater discharges with the load reductions from each of the land use categories assigned a load reduction. This can be accomplished by placing sampling

---

[10] In determining appropriate MPs the County of San Diego is encouraged to consult the State Water Resources Control Board's California Nonpoint Source Encyclopedia (2004) (http://www.waterboards.ca.gov/water_issues/programs/nps/encyclopedia.shtml). This publication contains extensive information on nutrient reduction management measures (MMs) and management practices (MPs) applicable to the NPS land use activities in the Rainbow Creek watershed. The County is also encouraged to consult the Regional Board's Watershed Management Approach for the San Diego Region, Nonpoint Source (http://www.waterboards.ca.gov/sandiego/programs/wmc.html) for additional information on management measures.

stations at strategic nodes that would monitor nutrient discharges from individual sources of a common land use category.

14. **Community Education and Outreach**
The County of San Diego should describe the steps it will take to develop a focused educational program to raise community awareness of the nutrient impairment problem, promote pollution prevention, and increase the use of applicable management measures and practices where needed to control and reduce nutrient discharges to Rainbow Creek. Public education, outreach, and training programs should involve applicable user groups and the community[11].

15. **Seek Financial Assistance**
The County of San Diego is encouraged to seek grant funding[12] for projects to implement the Rainbow Creek nutrient TMDLs, particularly those that can achieve quantifiable nutrient load reductions consistent with the specific nutrient TMDL load allocations.

16. **Nutrient Reduction and Management Plan (NRMP) Effectiveness**
The County of San Diego should describe the steps it will take to develop a long-term strategy for assessing the effectiveness of the NRMP. The long-term assessment strategy should identify specific direct and indirect measurements that the County will use to track the long-term progress towards achieving the nutrient load reductions required under this TMDL. Methods used for assessing effectiveness should include the following or their equivalent: surveys, pollutant loading estimations, and receiving water quality monitoring. The long-term strategy shall also discuss the role of monitoring data in substantiating or refining the assessment.

17. **Nutrient Reduction and Management Plan (NRMP) Annual Report**
The County of San Diego should describe the steps it will take to submit an annual NRMP report to the Regional Board by January 31 of each year following USEPA approval of this TMDL. The reporting period for this annual report should be the previous fiscal year. For example, the report submitted January 31, 2006 would cover the reporting period July 1, 2004 to June 30, 2005. The report should be incorporated in the annual Jurisdictional URMP Annual Report and the Watershed Specific URMP Annual Reports under the County's MS4 NPDES Permit and include the following information:

---

[11] Consideration should be given to expanding the County of San Diego's ongoing community and education outreach program under the County's MS4 NPDES Storm Water Permit to address the Rainbow Creek nutrient impairment problem. Additional suggestions for the information to be included in pollution prevention and education programs is contained in the State Water Resources Control Board's *California Nonpoint Source Encyclopedia* (2004) (http://www.waterboards.ca.gov/water_issues/programs/nps/encyclopedia.shtml).

[12] Information on available grant funds is contained in the in the State Water Resources Control Board's *California Nonpoint Source Encyclopedia* (2004) (http://www.waterboards.ca.gov/water_issues/programs/nps/encyclopedia.shtml).

a. Comprehensive description of all activities conducted by the County of San Diego to oversee implementation of the NRMP.
b. An accounting of all: inspections conducted; enforcement actions taken; and education efforts conducted.
c. An assessment of whether actions to implement designated minimum MPs at each nutrient source were actually carried out by dischargers.
d. An assessment of the compliance of runoff or groundwater discharges with the load reductions from each of the land use categories assigned a load reduction.
e. Identification of water quality improvements or degradation in Rainbow Creek with regard to attainment of the nutrient water quality objectives.
f. An evaluation of the effectiveness of the NRMP in achieving the nutrient load reductions required under this TMDL.

D. Discharger Actions

1. **State of California, Department of Transportation (Caltrans) Actions**
   Caltrans shall take all actions necessary to meet the nutrient wasteload reductions assigned to Caltrans. These nutrient wasteload reductions will eventually be incorporated into Caltrans statewide NPDES storm water permit. It is assumed that compliance with the nutrient wasteload reductions will be accomplished through the development and implementation of best management practices (BMPs). Caltrans shall also prepare and submit progress reports in accordance with the Caltrans statewide NPDES storm water permit or as otherwise directed by the Regional Board in a CWC §13383 order.

2. **State of California Department of Forestry and Fire Protection (CDFFP) Actions**
   CDFFP shall, upon direction by the Regional Board in a CWC §13267 order, undertake an investigation to 1) evaluate whether CDFFP's discharge is surfacing and/or contributing to the impairment of Rainbow Creek; and 2) estimate the actual nutrient load to Rainbow Creek from groundwater flow originating from the septic tank and percolation ponds.

3. **Nonpoint Source Dischargers (NPS Dischargers) Actions**
   NPS discharges of nutrients in the Rainbow Creek watershed result from (1) commercial nurseries; (2) agricultural fields; (3) orchards; (4) parks; (5) residential areas; (6) urban areas; and (7) septic tank disposal system land use activities. Individual landowners and other persons (NPS Dischargers) engaged in these land use activities shall implement pollution prevention[13] methods and increase the use of applicable management measures and practices[14] where needed to control and reduce

[13] Pollution Prevention is defined as practices and processes that reduce or eliminate the generation of pollutants, in contrast to source control, treatment, or disposal.

[14] In determining appropriate management methods and practices to control nutrient discharges interested persons are encouraged to consult the State Water Resources Control Board's *California Nonpoint*

nutrient discharges to Rainbow Creek and attain nutrient load reductions. Individual landowners and other persons are encouraged to seek grant funding[15] for projects to implement the Rainbow Creek nutrient TMDLs, particularly those that can achieve quantifiable nutrient load reductions consistent with the specific nutrient TMDL load allocations. NPS dischargers will be subject to Regional Board enforcement action for failing to: comply with applicable waiver conditions, waste discharge requirements (WDRs), discharge prohibitions; attain compliance with the nutrient load reductions specified in this TMDL; or attain compliance with the nutrient water quality objectives. The Regional Board may also terminate the applicability of waivers and issue waste discharge requirements to any NPS dischargers failing to comply with waiver conditions.

Source Encyclopedia (2004) http://www.waterboards.ca.gov/water_issues/programs/nps/encyclopedia.shtml. This publication contains extensive information on nutrient reduction management measures (MMs) and management practices (MPs) applicable to the NPS land use activities in the Rainbow Creek watershed. Interested persons are also encouraged to consult the Regional Board's Watershed Management Approach for the San Diego Region, Nonpoint Source (http://www.waterboards.ca.gov/sandiego/programs/wmc.html) for additional information on management measures.

[15] Information on available grant funds is contained in the in the State Water Resources Control Board's *California Nonpoint Source Encyclopedia* (2004) (http://www.waterboards.ca.gov/water_issues/programs/nps/encyclopedia.shtml).

TMDL Implementation Monitoring Plan
The necessary actions to monitor TMDL implementation are described in Section 10 of the *Technical Report for Total Nitrogen and Total Phosphorus Total Maximum Daily Loads (TMDLs) in Rainbow Creek*, dated February 9, 2005 and listed below.

A. Regional Board Actions

1. **Issue Order to Submit Monitoring Plan to Caltrans and County of San Diego**
   The Regional Board shall issue an Order to Caltrans under CWC §13383 and a Governmental Water Quality Investigation Request Order to the County of San Diego under CWC §13225, to prepare and submit an Implementation Monitoring Plan containing the elements described in **Section C. Implementation Monitoring Plan Elements** below. The Regional Board may amend this order at any time to include other nutrient dischargers in the Rainbow Creek watershed on a case-by case basis.

2. **Issue Order to Implement Monitoring Plan to Caltrans and County of San Diego**
   Upon concurrence with the County of San Diego's and Caltrans' Implementation Monitoring Plan the Regional Board shall issue an Order to Caltrans under CWC § 13383 and a Governmental Water Quality Investigation Request Order to the County of San Diego under CWC § 13225, to implement monitoring. The Regional Board may amend this order at any time to include other nutrient dischargers in the Rainbow Creek watershed on a case-by case basis.

B. County of San Diego and Caltrans Actions

1. **Prepare and Submit Monitoring Plan**
   The County of San Diego and Caltrans shall collaborate to prepare and submit an Implementation Monitoring Plan for the Rainbow Creek watershed containing the elements described in **Section C. Implementation Monitoring Plan Elements** below, upon direction by the Regional Board in a CWC §13225 / CWC §13383 Order. The number of monitoring stations in Rainbow Creek assigned to Caltrans should be based on the number of stations needed by Caltrans to demonstrate compliance with the nutrient wasteload allocation and the success of the TMDL in attaining the nutrient water quality objective in the portion of Rainbow Creek affected by its discharge. The Implementation Monitoring Plan shall be modified as requested by the Regional Board.

2. **Implement Monitoring Plan**
   The County of San Diego and Caltrans shall implement the Implementation Monitoring Plan upon direction by the Regional Board pursuant to a CWC §13225 / §13383 Order. The Regional Board may amend this order at any time to include other nutrient dischargers in the Rainbow Creek watershed on a case-by case basis.

C. Implementation Monitoring Plan Elements

The Implementation Monitoring Plan shall contain the following elements:

1. **Surface Water Monitoring Stations**
   Monitoring stations shall be proposed that best serve the monitoring objectives described above in Section 10.2 Monitoring Objectives. Previously monitored locations that shall be considered include Jubilee, Hines Nursery, Oak Crest, Rainbow Glen Tributary, Margarita Glen Tributary, Willow Glen-4, Willow Glen Tributary, Riverhouse, Via Milpas Tributary, and Stage Coach (See Figure A-3, in Appendix A). An additional sampling location between Oak Crest and Willow Glen-4 should also be considered. For instance, a monitoring location might be placed downstream of Oak Crest Mobile Estates to assess nutrient loading from this property. Monitoring stations shall also be considered at strategic nodes in Rainbow Creek and its tributaries that would monitor nutrient discharges from individual sources of a common land use category.

2. **Groundwater Monitoring Stations**
   The location of existing wells and the proposed location of additional monitoring wells needed to define nutrient concentration trends in groundwater. Methods for purging and sampling monitoring wells to provide representative samples for the waste constituents of interest should be described.

3. **Surface Water Monitoring Frequency**.
   Monitoring frequencies of the various monitoring parameters shall be proposed that best serve the monitoring objectives described above in Section 10.2 Monitoring Objectives. The frequencies should be adequate to evaluate ambient conditions and address any impact from low dissolved oxygen concentrations and algal growth.

4. **Groundwater Monitoring Frequency**
   Monitoring frequencies of the various monitoring parameters shall be proposed that best serve the monitoring objectives described above Section 10.2 Monitoring Objectives. The magnitude and timing of nutrient variability may vary significantly in monitoring wells that are located varying distances from nutrient sources. Sampling these wells will likely obtain water from varying depths in the aquifer. To define the nitrate variability at each well, the network will be sampled quarterly for two years. The observed variability will serve as a basis for determining the long-term sampling frequency for the network.

5. **Surface Water Quality Parameters**
   Surface Water Quality Parameters shall include nitrogen (including nitrate, nitrite, ammonia and total Kjeldahl nitrogen (TKN)), phosphorus (including orthophosphate and total), dissolved oxygen, pH, turbidity, and temperature.

6. **Groundwater Quality Parameters**
   Groundwater Quality Parameters shall include total nitrogen, nitrate, ammonia, nitrites, TKN, orthophosphate, total phosphorus, pH, dissolved Oxygen and TDS.

7. **Hydrology**
   Flow rate measurements shall be taken to calculate nutrient loading, to provide additional information about the hydrology of the watershed, and to identify patterns in algal growth.

8. **Algal Biomass**
   Characterization of algal species composition is needed to provide a more reliable indicator of trophic status and evidence of nutrient condition (USEPA 2000a). The growth of algae is stimulated principally by nutrients such as nitrogen and phosphorus, but also requires adequate water temperature, light, flow, and dissolved oxygen. It is assumed at this time that both factors are co-limiting. Characterization of algal species composition may give a better understanding of the relationships between all the factors that affect algal growth, including sunlight, nitrogen, phosphorus, temperature, and dissolved oxygen. Algal biomass should be quantified by mass and/or by % cover of bottom. Collection and measurement of algal biomass should be performed uniformly or by a standardized method.

9. **Biological Assessment Monitoring**
   It is recommended that biological assessment monitoring of benthic microinvertebrates be performed at a minimum of three stations on Rainbow Creek and a reference stream. Biological assessment monitoring should be performed in accordance with the California Stream Bioassessment Methods Manual (Harrington and Born 2000). Changes in the stream's biological integrity (e.g., an increase or decrease in diversity and abundance of sensitive species) could be used as an indicator of changes in the health of the creek. Sampling done in 1998-99 for the San Diego Ambient Bioassessment Program (CDFG 2000a) indicates that benthic macroinvertebrate communities vary seasonally. The seasonal trend could be due in part to rainfall and consequent streamflow conditions (e.g., scouring). Thus, sites should be sampled for benthic macroinvertebrates at least twice each year: once during the spring (i.e., May), and again in the fall (preferably in October).

10. **Monitoring Reports**
    Monitoring reports shall be submitted in both electronic and paper formats and include the following information:

    a. An executive summary addressing all sections of the monitoring report, comprehensive interpretations and conclusions, and recommendations for future actions.
    b. A description of monitoring station locations by latitude and longitude coordinates, frequency of sampling, quality assurance/quality control procedures and sampling and analysis protocols.

c. The data/results, methods of evaluating the data, graphical summaries of the data, and an explanation/discussion of the data.
d. An assessment of the compliance of runoff characteristics with the required load reductions from each of the land use categories assigned a load reduction.
e. Identification and analysis of trends in surface and groundwater quality and assessment of compliance with nutrient water quality objectives.
f. An evaluation of the effectiveness of the TMDL implementation actions and the need for revisions to improve the implementation action plan.

Table 4-D.3. Required Monitoring Parameters

Parameter	Type of sample[1]
Surface Water Monitoring	
Total nitrogen, nitrate, ammonia[2], nitrites, TKN, orthophosphate, and total phosphorus concentrations	Grab
Temperature	In Situ
pH	In Situ
Dissolved Oxygen	In Situ
Turbidity	In Situ
TDS	Grab
Flow rate	Field Measurement
Algal biomass (% cover of bottom and/or Chl a/ash free dry weight (AFDM))	In Situ and/or Grab
Benthic macroinvertebrate community analysis (recommended)	Grab
Groundwater Monitoring	
Total nitrogen, nitrate, ammonia[2], nitrites, TKN, orthophosphate, and total phosphorus concentrations	Grab
pH	Grab or In Situ
Dissolved Oxygen	Grab or In Situ
TDS	Grab or In Situ

[1] A California certified laboratory should be used with an approved QA/QC plan.
[2] All laboratory detection limits should be sufficient to determine compliance with the water quality objective. For example, un-ionized ammonia in surface waters (25 µg/L).

11. **Quality Assurance / Quality Control Plan**
The monitoring program shall develop and implement a QA/QC plan for field and laboratory operations to ensure that data collected are of adequate quality given the monitoring objectives[16]. The QA/QC plan for field operations shall cover the following, at a minimum:
    a. Quality assurance objectives;
    b. Sample container preparation, labeling and storage;
    c. Chain-of-custody tracking;
    d. Field setup;
    e. Sampler equipment check and setup;
    f. Sample collection;
    g. Use of field blanks to assess field contamination;
    h. Use of field duplicate samples;
    i. Transportation to the laboratory;
    j. Training of field personnel; and
    k. Evaluation, and enhancement if needed of the QA/QC plan.

    The QA/QC plan for laboratory operations shall cover the following, at a minimum:
    a. Quality assurance objectives;
    b. Organization of laboratory personnel, their education, experience, and duties;
    c. Sample procedures;
    d. Sample custody;
    e. Calibration procedures and frequency;
    f. Analytical procedures;
    g. Data reduction, validation, and reporting;
    h. Internal quality control procedures;
    i. Performance and system audits;
    j. Preventive maintenance;
    k. Assessment of accuracy and precision;
    l. Correction actions; and
    m. Quality assurance report.

12. **Reporting Period**
Annual reports should cover the period of October 1 through September 30. The reports should be submitted to the Regional Board by January 31 of the following year and should be incorporated within the annual receiving water monitoring reports required under the County of San Diego's MS4 NPDES Permit Receiving Waters Monitoring and Reporting Program.[17]

---

[16] For more information on QA/QC activities, including guidelines and example QA/QC documents, refer to http://www.waterboards.ca.gov/swamp/qapp.html

[17] The term "MS4 NPDES Storm Water Permit" currently refers to Order No.2001-001, NPDES No. CAS0108758, Waste Discharge Requirements For Discharges Of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds of the County of San Diego, the Incorporated Cities Of San Diego County, and the San Diego Unified Port District or subsequent superceding NPDES renewal Orders. Attachment B to this Order contains the Receiving Waters

13. **Reporting Frequency**
The first report shall be due in the first January following initiation of the monitoring program. Reporting shall continue on an annual basis until the nutrient water quality objective has been attained and maintained in Rainbow Creek.

Compliance Schedule

Total nitrogen and total phosphorus reductions are required over a 16-year phased compliance schedule period during which incremental load and wasteload reductions are required as shown in Table 4 – E, below. Twenty percent (20%) reductions are required every fourth year for the first three phases (by the end of year 12). The last (fourth) phase requires the remaining 14% total nitrogen reduction and 25% total phosphorus reduction needed to meet the TMDLs.

Table 4 - E. Total Nitrogen and Total Phosphorus Phased Load Reduction Compliance Schedule

Compliance Date	Total Nitrogen		Total Phosphorus	
	Current Load & Annual Loads (LA + WLA) kg N/yr	Cumulative % Reduction	Current Load & Annual Loads (LA + WLA) kg P/yr	Cumulative % Reduction
	3,055[1]		278[1]	
12/31/2009	2,444	20	222	20
12/31/2013	1,833	40	167	40
12/31/2017	1,222	60	111	60
12/31/2021	796	74	41	85

[1] Current annual nutrient loads from identified point and nonpoint sources (See Tables 4 - B). This value does not include the contribution for background.

Regardless of what actions are taken to achieve load and wasteload reductions, there may not be an immediate response in the water quality or biological condition of Rainbow Creek. For example, there may be significant time lags between when actions are taken to reduce nutrient loads and resulting changes in nutrient concentrations in Rainbow Creek. This is especially likely if nutrients from past activities are tightly bound to sediments or if nutrient-contaminated groundwater has a long residence time before its release to Rainbow Creek waters. A three-year response time is projected for Rainbow Creek to attain compliance with nutrient water quality objectives after reaching the desired nutrient wasteload and load reductions in 2021. Accordingly the projected date when Rainbow Creek will attain and maintain compliance with nutrient water quality objectives is December 31, 2024.

Monitoring and Reporting Program for Order No. 2001-01. The annual receiving water monitoring report is described in Table 6, Item 28, page 51 of Order No. 2001-01.

Agricultural Program Costs and Potential Sources of Financing

Pursuant to CWC § 13141 the Regional Board has estimated the TMDL Implementation Program cost for agricultural water quality control in Table 4 - F.

Table 4 - F. Cost of Implementing Agricultural Water Quality Control

	Initial Capital Costs $ per Operation		Annual Operational Costs $ per Operation	
	Low	High	Low	High
Commercial Nurseries	$26	$41,075	$3	$4,108
Orchards	$26	$57,705	$3	$5,771
Agricultural Fields	$26	$57,705	$3	$5,771

Potential sources of financing include:

- Federal Clean Water Act Section 319(h) grants.
- Federal Clean Water Act Section 205(j) grants.
- State of California Proposition 13 funded grants.
- Small Communities Grants for Water Reclamation and Wastewater Treatment Facilities
- Other state, federal and business loans, grants, and other assistance programs. These may include assistance from U.S. Small Business Administration and from conservation programs through various agencies such as the U.S. Department of Agriculture and Natural Resource Conservation Service
- Various secured and unsecured loans, including home equity loans and business loans.

Recalculation Procedures

At the end of the Basin Plan, add the following Appendix D:

APPENDIX D
METHOD FOR RECALCULATION OF THE TOTAL MAXIMUM DAILY LOADS FOR NITOGEN AND PHOSPHORUS IN RAINBOW CREEK

This appendix describes the method for recalculating Rainbow Creek TMDLs for nitrogen and phosphorus if the water quality objectives are modified in the future.

Numeric Target
The numeric targets are set equal to the new water quality objectives.

Margin of Safety

The explicit margin of safety (MOS) equals five percent of the loading capacity. The equation to calculate the loading capacity is given below.

Loading Capacity

The annual total nitrogen loading capacity is determined by multiplying the flow volume (in ft^3/yr) by the new water quality objective (in mg N/L) that will allow the creek to attain water quality standards. The equations below also use terms to convert milligrams to kilograms and cubic feet to liters. The loading capacity for nitrogen is as follows:

Low Flow (0-2.9 cfs)

17,764 * 1 e–3 ft^3/yr * **new water quality objective** in mg N/L * 28.32 L/ft3 * 1 e –6 kg/mg

= **new low flow loading capacity** in kg N/yr

Moderate – High Flow (3 – 39 cfs)

40,775 * 1 e–3 ft^3/yr * **new water quality objective** in mg N/L * 28.32 L/ft3 * 1 e –6 kg/mg

= **new moderate - high flow loading capacity** in kg N/yr

Total Annual Nitrogen Loading Capacity = sum of low flow and moderate - high flow loading capacity

Similarly, the annual total loading capacity for phosphorus is as follows:

Low Flow (0-2.9 cfs)

17,764 * 1 e–3 ft^3/yr * **new water quality objective** in mg P/L * 28.32 L/ft3 * 1 e –6 kg/mg

= **new low flow loading capacity** in kg P/yr

Moderate – High Flow (3 – 39 cfs)

40,775 * 1e–3 ft^3/yr * **new water quality objective** in mg P/L * 28.32 L/ft3 * 1 e –6 kg/mg

= **new moderate-high flow loading capacity** in kg P/yr

Total Annual Phosphorus Loading Capacity = sum of low flow and moderate - high flow loading capacity

Total Maximum Daily Load

The TMDLs for nitrogen and phosphorous are set equal to the total annual loading capacity for each pollutant. The allocations in Table D-1 below use the following equation to determine the total load allocations for nonpoint sources (LA) by subtracting background, the margin of safety (MOS), and the point source waste load allocations (WLA) from the TMDL.

$$TMDL = \sum(WLA) + \sum(LA) + Background + MOS$$

Allocations

The allocations of the total annual nitrogen and phosphorous loading capacities to the margin of safety, background, and various point and non-point sources are presented in Table D-1.

Table D-1. Total Nitrogen and Phosphorus Allocations for Rainbow Creek TMDL

Source	Nitrogen Allocation	Phosphorus Allocation
Margin of Safety (MOS)	5%[1]	5%[1]
Background	779 kg	116 kg
Caltrans (WLA)	New WQO * volume of Caltrans runoff	New WQO * volume of Caltrans runoff
Unidentified and Future Point Sources (WLA)	2%[1]	2%[1]
Total Allocation for Nonpoint Sources (LA) = Total Annual Loading Capacity – MOS – Background – Caltrans – Unidentified and Future Point Sources		
Commercial nurseries	16%[2]	9%[2]
Agricultural fields	21%[2]	12%[2]
Orchards	25%[2]	18%[2]
Park	0.4%	0.3%
Residential areas	21%[2]	36%[2]
Urban areas	4%[2]	18%[2]
Septic tank disposal systems	6%[2]	0%[2]
Air deposition	6%[2]	6%[2]

[1] percent of the total annual nitrogen and phosphorous loading capacity
[2] percent of the total allocation for nonpoint sources