State of California
California Regional Water Quality Control Board, Los Angeles Region

RESOLUTION NO. R4-2006-012
June 8, 2006

Amendment to the *Water Quality Control Plan for the Los Angeles Region* to Incorporate a Total Maximum Daily Load for Metals for the Calleguas Creek, its Tributaries, and Mugu Lagoon

WHEREAS, the California Regional Water Quality Control Board, Los Angeles Region, finds that:

1. The Federal Clean Water Act (CWA) requires the California Regional Water Quality Control Board, Los Angles Region (Regional Board) to develop water quality objectives, which are sufficient to protect beneficial uses for each water body found within its region. Water bodies that do not meet water quality objectives or support beneficial uses are considered impaired.

2. A consent decree between the U.S. Environmental Protection Agency (U.S. EPA), Heal the Bay, Inc. and BayKeeper, Inc. was approved on March 22, 1999. This court order directs the U.S. EPA to complete Total Maximum Daily Loads (TMDLs) for all impaired waters within 13 years. A schedule was established in the consent decree for the completion of the first 29 TMDLs within 7 years, including completion of a TMDL to reduce metals in the Calleguas Creek, its tributaries, and Mugu Lagoon by U.S. EPA by March 22, 2007. The remaining TMDLs will be scheduled by Regional Board staff within the 13-year period.

3. The elements of a TMDL are described in 40 CFR 130.2 and 130.7 and section 303(d) of the CWA, as well as in U.S. EPA guidance documents (Report No. EPA/440/4-91/001). A TMDL is defined as the sum of the individual waste load allocations for point sources, load allocations for nonpoint sources and natural background (40 CFR 130.2). Regulations further stipulate that TMDLs must be set at levels necessary to attain and maintain the applicable narrative and numeric water quality standards with seasonal variations and a margin of safety that takes into account any lack of knowledge concerning the relationship between effluent limitations and water quality (40 CFR 130.7(c)(1)). The regulations in 40 CFR 130.7 also state that TMDLs shall take into account critical conditions for stream flow, loading and water quality parameters.

4. The numeric targets in this TMDL are not water quality objectives and do not create new bases for enforcement against dischargers apart from the existing, numeric water quality standards they translate. The targets merely establish the bases through which load allocations (LAs) and waste load allocations (WLAs) are calculated. WLAs are only enforced for a discharger's own discharges, and then only in the context of its National Pollutant Discharge Elimination System (NPDES) permit, which must contain effluent limits consistent with the assumptions and requirements of the WLA (40 C.F.R. 122.44(d)(vii)(B)). The Regional Board will develop permit requirements through subsequent permit actions that will allow all interested persons, including but not limited to municipal storm water dischargers, to provide comments on how the WLA will be translated into permit requirements.

5. As envisioned by Water Code section 13242, the TMDL contains a "description of surveillance to be undertaken to determine compliance with objectives." The Compliance Monitoring and Special Studies elements of the TMDL recognize that monitoring will be necessary to assess the on-going condition of the Calleguas Creek, its tributaries, and Mugu Lagoon and to assess the on-going effectiveness of efforts by dischargers to reduce metals loading to the Calleguas Creek. Special studies may also be appropriate to provide further information about new data, new or alternative sources, and revised scientific assumptions. The TMDL does not establish the requirements for these monitoring programs or reports, although it does recognize the type of information that will be necessary to secure. The Regional Board's Executive Officer will issue orders to appropriate entities to develop and to submit monitoring programs and technical reports. The Executive Officer will determine the scope of these programs and reports, taking into account any legal requirements, and issue the orders to the appropriate entities.

6. Upon establishment of TMDLs by the State or U.S. EPA, the State is required to incorporate the TMDLs along with appropriate implementation measures into the State Water Quality Management Plan (40 CFR 130.6(c)(1), 130.7). This Water Quality Control Plan for the Los Angeles Region (Basin Plan), and applicable statewide plans, serves as the State Water Quality Management Plans governing the watersheds under the jurisdiction of the Regional Board. Attachment A to this resolution contains the Basin Planning language for this TMDL.

7. The Calleguas Creek Watershed is located in southeast Ventura County, California, and in a small portion of western Los Angeles County, and drains an area of approximately 343 square miles from the Santa Susana Pass in the east, to Mugu Lagoon in the southwest. Current land use is approximately 26 percent agriculture, 24 percent urban, and 50 percent open space. The tributaries and the streams of the Calleguas Creek Watershed are divided into fourteen segments, or reaches. The 2002 Clean Water Act 303(d) list identified lower reaches of the Calleguas Creek watershed (reach 1, 2, and 3) as impaired for copper, mercury, nickel, selenium, and zinc. These listings were approved by the State Water Resources Control Board on February 4, 2003. The proposed TMDL addresses impairments of water quality caused by these metals in lower reaches of the Calleguas Creek Watershed.

8. On May 18, 2000, the USEPA promulgated numeric criteria for priority pollutants for the State of California, known as the California Toxics Rule (CTR), codified as 40 CFR section 131.38. Federal water quality standards under section 303 of the Clean Water Act consist of designated uses and criteria to protect those uses. (40 C.F.R. 131.3(i)). Designated uses are beneficial uses under state law, and criteria are water quality objectives under state law. The CTR establishes the numeric water quality objectives for various toxic pollutants. These objectives apply "without exeception" to all inland surface waters within the State of California, including the Los Angeles region. (40 C.F.R. 131.38(d)(1)-(2)).

9. "[I]t is the national policy that the discharge of toxic pollutants in toxic amounts be prohibited." (33 U.S.C. 1251(a)(3).) Water quality standards, including the CTR, reflect this express national policy of Congress. When a pollutant is present at levels in excess of the CTR numbers, then the pollutant is present in toxic amounts. In this sense, the numeric objectives in the CTR are USEPA's determination of when priority pollutants are present at toxic amounts in contravention of Congress's national policy.

10. The Regional Board's goal in establishing the Calleguas Creek Metals TMDL is to protect the aquatic life and wildlife beneficial uses of Calleguas Creek, its tributaries, and Mugu

Lagoon, and to achieve the numeric water quality objectives set to protect these uses as contained in the CTR.

11. The water quality targets for copper in the TMDL are expressed as the copper water quality objective multiplied by a water-effect ratio (WER) consistent with the federal California Toxics Rule (CTR). A WER is a means to account for a difference between the toxicity of copper in laboratory dilution water and its toxicity in local waterbodies. A WER of 1.0 indicates equivalence between local waters and laboratory dilution water, while a WER of greater (*less*) than 1.0 indicates lower (*higher*) toxicity in local waters than in laboratory dilution waters. The water-effect ratio (WER) has a default value of 1.0 unless a site-specific WER is approved. To use a WER other than the default of 1.0, a study must be conducted consistent with USEPA's WER guidance and adopted by the Regional Board through the state's basin plan amendment process.

12. A WER study for Mugu Lagoon (Reach 1) lower Calleguas Creek (Reach 2), Revolon Slough (Reach 4) and Beardsley Wash (Reach 5) was conducted by Larry Walker Associates for the Calleguas Creek Management Group with involvement by Regional Board staff. A draft technical report dated September 21, 2005 contains recommended WERs of 2.13 for Mugu Lagoon and Revolon Slough and 4.06 for lower Calleguas Creek.

13. Regional Board staff commented on the draft report in a letter to Larry Walker Associates dated March 15, 2006. Regional Board staff identified several concerns and data limitations of the study that constrained the scientifically defensible alternatives available to the Board. Given these data limitations and unresolved technical issues, Regional Board staff proposed a single WER for the lagoon and lower creek that would be protective. Regional Board staff agreed to reconsider this single WER value if additional wet weather data were collected in the creek and technical issues were resolved. In response to Regional Board comments, Larry Walker Associates sampled an additional wet weather event on April 14, 2006 and Regional Board staff is actively engaged in discussions with Larry Walker Associates and independent technical experts to resolve other technical issues.

14. Upon resolution of these issues, Regional Board staff will recommend site-specific WERs for Mugu Lagoon (Reach 1), lower Calleguas Creek (Reach 2), Revolon Slough (Reach 4) and Beardsley Wash (Reach 5) to the Regional Board. Prior to Regional Board consideration, the proposed basin plan amendment to incorporate site-specific WERs must be submitted for peer review as required by Health and Safety Code section 57004 and be subject to public review and comment.

15. If site-specific WERs are approved by the Regional Board, the TMDL targets and allocations shall be implemented in accordance with the approved WERs using the equations set forth in Table 7-19.1 under "Numeric Targets", "Waste Load Allocations" and "Load Allocations", of the TMDL.

16. Calleguas Creek stakeholders have been actively engaged with USEPA and the Regional Board on a variety of watershed planning initiatives in the Calleguas Creek Watershed. Key stakeholders have formed the Calleguas Creek Watershed Management Plan (CCWMP), an established, stakeholder-led watershed management group that has been continually operating since 1996. The CCWMP has broad participation from federal, State and county agencies, municipalities, POTWs, water purveyors, groundwater management agencies, and agricultural and environmental groups. As part of its mission to address issues of long-range comprehensive water resources; land use; economic development; open space preservation,

enhancement and management, the CCWMP proposed to USEPA and Regional Board to take the lead on development of the TMDLs.

17. Regional Board staff have worked with the CCWMP and USEPA in the development of a detailed technical document that analyzes and describes the specific necessity and rationale for the development of this TMDL. The technical document entitled "Calleguas Creek Watershed Metals and Selenium TMDL" prepared by Larry Walker Associates is an integral part of this Regional Board action and was reviewed, and accepted by the Regional Board as a supporting technical analysis before acting. The technical document provides the detailed factual basis and analysis supporting the problem statement, numeric targets (interpretation of the narrative and numeric water quality objectives, used to calculate the pollutant allocations), source analysis, linkage analysis, waste load allocations (for point sources), load allocation (for nonpoint sources), margin of safety, and seasonal variations and critical conditions of this TMDL.

18. On June 8, 2006, prior to the Board's action on this resolution, public hearings were conducted on the Calleguas Creek Watershed Metals TMDL. Notice of the hearing for the Calleguas Creek Watershed Metals TMDL was published in accordance with the requirements of Water Code Section 13244. This notice was published in the Ventura County Star on April 10, 2006.

19. The public has had reasonable opportunity to participate in the review of the amendment to the Basin Plan. A draft of the Calleguas Creek Watershed Metals TMDL was released for public comment on March 30, 2006; a Notice of Hearing and Notice of Filing were published and circulated 45 days preceding Board action; Regional Board staff responded to oral and written comments received from the public; and the Regional Board held a public hearing on June 8, 2006 to consider adoption of the TMDL.

20. In amending the Basin Plan, the Regional Board considered the requirements set forth in Sections 13240 and 13242 of the California Water Code.

21. Because the TMDL implements existing numeric water quality objectives (i.e., the numeric water quality criteria established by U.S. EPA in the CTR), the Regional Board has consistently maintained (along with the State Water Resources Control Board) that adopting a TMDL does not require the water boards to consider the factors of Water Code section 13241. The consideration of the Water Code section 13241 factors, by section 13241's express terms, only applies "in establishing water quality objectives." Here the Regional Board is not establishing water quality objectives, but as required by section 303(d)(1)(C) of the Clean Water Act is adopting a TMDL that will implement the previously established objectives that have not been achieved.

22. While the Regional Board is not required to consider the factors of Water Code section 13241, it, nonetheless, has developed and received significant information pertaining to the Water Code section 13241 factors and considered that information in developing and adopting this TMDL. The past, present, and probable future beneficial uses of water have been considered in that the Calleguas Creek is designated for a multitude of beneficial uses in the Basin Plan. Various living organisms (including vegetation, fish, invertebrates, and wildlife) are present in, transient through, and will be present in the Calleguas Creek. Dry weather surface water in the Calleguas Creek watershed is primarily composed of groundwater, municipal wastewater, urban non-stormwater discharges, and agricultural runoff. In the upper reaches of the watershed, upstream of any wastewater discharges,

groundwater discharge from shallow surface aquifers provide a constant base flow. "Storm-peaking" refers to peak discharges limited to a wet weather season and concentrated into a few days after short-term, discrete storm events, when flow commonly is two to three orders of magnitude greater than non-storm flow. The environmental characteristics of the Calleguas Creek are spelled out at length in the Basin Plan and in the technical documents supporting this Basin Plan amendment, and have been considered in developing this TMDL. Water quality conditions that reasonably could be achieved through the coordinated control of all factors which affect water quality in the area have been considered via the discussion of likely means of compliance, and studies indicating that a mix of best management practices (BMPs), rather than advanced treatment plants, would achieve the water quality criteria established in the CTR. Authorizing certain storm water dischargers to rely on BMPs in the first instances reflects the reasonableness of the action in terms of the ability to implement the requirements, as well as a belief that the water quality conditions can reasonably be achieved in any event. Establishing a plan that will ensure the Calleguas Creek is not toxic is a reasonable water quality condition. However, to the extent that there would be any conflict between the consideration of the factor in Water Code section 13241 subdivision (c), if the consideration were required, and the Clean Water Act, the Clean Water Act would prevail. Notably, national policy established by Congress prohibits the discharge of toxic pollutants in toxic amounts. Economic considerations were considered throughout the development of the TMDL. Some of these economic considerations arise in the context of Public Resources Code section 21159 and are equally applicable here. This implementation program recognizes the economic limitations on achieving immediate compliance—especially for municipal storm water dischargers. The TMDL also authorizes the use of BMPs, to the extent authorized by law, for various storm water dischargers. Economic considerations were considered and are reflected in an implementation program that is flexible and allows 10 years for POTWs, and 15 years for agricultural and permitted stormwater dischargers to comply with the final allocations. The need for housing within the region has been considered, but this TMDL is unlikely to affect housing needs. Whatever housing impacts could materialize are ameliorated by the flexible nature of this TMDL and the implementation schedule.

23. The amendment is consistent with the State Antidegradation Policy (State Board Resolution No. 68-16), in that it does not authorize any lowering of water quality and is designed to implement existing water quality objectives. Likewise, the amendment is consistent with the federal Antidegradation Policy (40 CFR 131.12).

24. Pursuant to Public Resources Code section 21080.5, the Resources Agency has approved the Regional Water Boards' basin planning process as a "certified regulatory program" that adequately satisfies the California Environmental Quality Act (CEQA) (Public Resources Code, Section 21000 et seq.) requirements for preparing environmental documents. (14 Cal. Code Regs. § 15251(g); 23 Cal. Code Regs. § 3782.) As such, the Regional Water Board's basin planning documents together with an Environmental Checklist, are the "substitute documents" that contain the required environmental documentation under CEQA. (23 Cal Code Regs. § 3777.) The detailed technical report entitled "Calleguas Creek Watershed Metals and Selenium TMDL", this resolution, and the Environmental Checklist serve as the substitute documents for this project. The project itself is the establishment of a TMDL for toxic metals in the Calleguas Creek, its tributaries, and Mugu Lagoon. While the Regional Board has no discretion to not establish a TMDL (the TMDL is required by federal law) or for determining the water quality standard to be applied (the CTR establishes the numeric water quality objectives that must be implemented), the Board does exercise discretion in assigning waste load allocations and load allocations, determining the program of

implementation, and setting various milestones in achieving the numeric water quality standards established in the CTR.

25. A CEQA Scoping hearing was conducted on January 26, 2006 in the City of Thousand Oaks, 2100 E. Thousand Oaks Blvd., Thousand Oaks, California. A notice of the CEQA Scoping hearing was sent to interested parties including cities and/or counties with jurisdiction in or bordering the Calleguas Creek watershed.

26. The lengthy implementation period allowed by the TMDL, will allow many compliance approaches to be pursued. In preparing the accompanying CEQA substitute documents, the Regional Board has considered the requirements of Public Resources Code section 21159 and California Code of Regulations, title 14, section 15187, and intends the substitute documents to serve as a tier 1 environmental review. Many compliance obligations will be undertaken directly by public agencies that will have their own obligations under CEQA. In addition, public agencies such as the Ventura County, Farm Bureau and the Resource Conservation Disctrict, are expected to facilitate compliance obligations per participated growers, and to the extent that the proposed projects including installation of BMPs, are subject to project-level CEQA analysis, the public agency may assume those responsibilities. Individual growers who propose BMPs that impact waters of the State through dredge or fill operations will be subjected to applicable State and federal permitting requirements. In this instance, the "Lead" State agency will assure compliance with project-level CEQA analysis. Project level impacts will need to be considered in any subsequent environmental analysis performed by other public agencies, pursuant to Public Resources Code section 21159.2. If not properly mitigated at the project level, there could be adverse environmental impacts. The substitute documents for this TMDL, and in particular the Environmental Checklist and staff's responses to comments, identify broad mitigation approaches that should be considered at the project level. Consistent with CEQA, the substitute documents do not engage in speculation or conjecture and only consider the reasonably foreseeable environmental impacts of the methods of compliance, the reasonably foreseeable feasible mitigation measures, and the reasonably foreseeable alternative means of compliance, which would avoid or eliminate the identified impacts.

27. The proposed amendment could have a significant adverse effect on the environment. However, there are feasible alternatives, feasible mitigation measures, or both that would substantially lessen any significant adverse impact. The public agencies responsible for those parts of the project can and should incorporate such alternatives and mitigation into any subsequent projects or project approvals. Possible alternatives and mitigation are described in the CEQA substitute documents, specifically the TMDL technical report and the Environmental Checklist. To the extent the alternatives, mitigation measures, or both are not deemed feasible by those agencies, the necessity of implementing the federally required metals TMDL and removing the metals-related toxicity impairment from the Calleguas Creek (an action required to achieve the express, national policy of the Clean Water Act) outweigh the unavoidable adverse environmental effects.

28. Health and Safety Code section 57004 requires external scientific peer review for certain water quality control policies. Prior to public notice of the draft TMDL, the Regional Board submitted the scientific basis and scientific portions of the Calleguas Creek Watershed Metals and Selenium TMDL to Theo Dillaha, Ph.D., P.E. (Virginia Tech) and Rhea L. Williamson, Ph.D. (San Jose State University) for external scientific peer review. Written peer review reports were received by the Regional Board. Minor modifications were made to the

scientific portions of the TMDL to address concerns identified during the peer review process.

29. The regulatory action meets the "Necessity" standard of the Administrative Procedures Act, Government Code, Section 11353, Subdivision (b). As specified above, federal regulations require that TMDLs be incorporated into the water quality management plan. The Regional Board's Basin Plan is the Regional Board's component of the water quality management plan, and the Basin Plan is how the Regional Board takes quasi-legislative, planning actions. Moreover, the TMDL is a program of implementation for existing water quality objectives, and is, therefore, appropriately a component of the Basin Plan under Water Code section 13242. The necessity of developing a TMDL is established in the TMDL staff report, the section 303(d) list, and the data contained in the administrative record documenting the metals impairments of the Calleguas Creek, its tributaries, and Mugu Lagoon.

30. The Basin Plan amendment incorporating a TMDL for metals for the Callegus Creek, its Tributaries, and Mugu Lagoon must be submitted for review and approval by the State Water Resources Control Board (State Board), the State Office of Administrative Law (OAL), and the U.S. EPA. The Basin Plan amendment will become effective upon approval by U.S. EPA. A Notice of Decision will be filed with the Resources Agency.

THEREFORE, be it resolved that pursuant to sections 13240 and 13242 of the Water Code, the Regional Board hereby amends the Basin Plan as follows:

1. Pursuant to Sections 13240 and 13242 of the California Water Code, the Regional Board, after considering the entire record, including oral testimony at the hearing, hereby adopts the amendments to Chapter 7 of the Water Quality Control Plan for the Los Angeles Region, as set forth in Attachment A hereto, to incorporate the elements of the Calleguas Creek, its Tributaries, and Mugu Lagoon Metals TMDL.

2. The Executive Officer is directed to forward copies of the Basin Plan amendment to the State Board in accordance with the requirements of section 13245 of the California Water Code.

3. The Regional Board requests that the State Board approve the Basin Plan amendment in accordance with the requirements of sections 13245 and 13246 of the California Water Code and forward it to OAL and the U.S. EPA.

4. If during its approval process Regional Board staff, 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 Board of any such changes.

5. The Executive Officer is authorized to sign a Certificate of Fee Exemption.

I, Jonathan Bishop, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of a resolution adopted by the California Regional Water Quality Control Board, Los Angeles Region, on June 8, 2006.

Jonathan S.Bishop
Executive Officer

6/29/06
Date

Attachment A to Resolution No. R4-2006-012

Proposed Amendment to the Water Quality Control Plan – Los Angeles Region

to Incorporate the

Total Maximum Daily Load for Metals and Selenium in the Calleguas Creek, its Tributaries and Mugu Lagoon

Adopted by the California Regional Water Quality Control Board, Los Angeles Region on June 8, 2006

Amendments

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Chapter 7. Total Maximum Daily Loads (TMDLs)
Calleguas Creek Watershed Metals and Selenium TMDL

This TMDL was adopted by:

The Regional Water Quality Control Board on June 8, 2006.

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].

The elements of the TMDL are presented in Table 7-19.1 and the Implementation Plan in Table 7-19.2

Table 7-19.1. Calleguas Creek Watershed Metals and Selenium TMDL: Elements

TMDL Element	Calleguas Creek Watershed Metals and Selenium TMDL
Problem Statement	Three of fourteen reaches in the Calleguas Creek Watershed (CCW) including Revolon Slough, Lower Calleguas Creek – Reach 2, and Mugu Lagoon are identified on the 2002 Clean Water Act Section 303(d) list of water-quality limited segments as impaired due to elevated levels of metals and selenium in water. The 303(d) listings, which were approved by the State Water Resources Control Board in February 2003, require the development of Total Maximum Daily Loads (TMDLs) to establish the maximum amount of pollutants a water body can receive without exceeding water quality standards. TMDLs for listed metals and selenium are presented herein in one document because, as a class of compounds, they possess similar physical and chemical properties that influence their persistence, fate, and transport in the environment.
Numeric Targets	This TMDL establishes four types of numeric targets: (1) California Toxics Rule (40 CFR Part 131) (CTR) criteria in dissolved fraction for copper, nickel, and zinc, and in total recoverable form for mercury and selenium; (2) ~~F~~fish tissue targets for mercury; (3) ~~B~~bird egg targets for mercury and selenium; and (4) ~~S~~sediment quality guidelines for copper, nickel, and zinc for 303(d) listed reaches. Attainment of sediment quality targets will be evaluated in combination with sediment toxicity data, if available. **~~1.~~Copper Targets** Subwatershed | Water Quality Target (ug dissolved Copper/L): Dry Weather CCC, Wet Weather CMC | Sediment Target[3] (SQuiRTs, ERL) (ppb) Mugu Lagoon | 3.1*WER[1] | 4.8*WER[1] | 34000 Calleguas Creek 2 | 3.1*WER[1] | 4.8*WER[1] | 34000 Calleguas Creek 3 | 25.9 | 26.3 | NA[2] Revolon/Beardsley | 3.1*WER[1] | 4.8*WER[1] | NA[2] Conejo | 27.9 | 41.6 | NA[2] Arroyo Simi/Las Posas | 29.3 | 29.8 | NA[2] The water quality targets for copper in the TMDL are expressed as the copper water quality criteria from the federal California Toxics Rule (CTR). Those criteria include a numerical threshold multiplied by a water-effect ratio (WER). The WER has a default value of 1.0 unless a site-specific WER is approved. To use a WER other than the default of 1.0, a study must be conducted consistent with USEPA's WER guidance and adopted by the Regional Board through the state's basin plan amendment process. A WER study for Mugu Lagoon (Reach 1), lower Calleguas Creek (Reach 2), Revolon Slough (Reach 4) and Beardsley Wash (Reach 5) has been submitted to the Regional Board. If the Regional Board approves site-specific WERs for copper in these waterbodies, the TMDL targets will be modified in accordance with all legal and regulatory requirements and implemented in accordance with the approved WERs ~~using the equations set forth in Table 7-19.1 above.~~

TMDL Element	Calleguas Creek Watershed Metals and Selenium TMDL

[2] – Sediment targets were not selected as alternative target for this reach as it is not on the 303(d) list.
[3] – Sediment targets are based on screening levels endorsed by the National Oceanic and Atmospheric Administration (NOAA) in their Screening Quick Reference Tables (SQuiRTs) (Buchman, 1999)~~foot note reference the source fof the Sediment Targets in the table~~

~~2.~~Mercury Targets

Media	Target
Fish Tissue (Human Health)	0.3 mg methylmercury/kg wet weight
Fish Tissue (Wildlife)	
*** Trophic Level (TL) 3[1]<50 mm**	0.03 mg methylmercury/kg wet weight
*** TL3 50-150 mm**	0.05 mg methylmercury/kg wet weight
*** TL3 150-350 mm**	0.1 mg methylmercury/kg wet weight
Bird Egg (Wildlife)	less than 0.5 mg total mercury/kg wet weight
Water Column	0.051 ug total mercury/L

~~a)Fish Tissue (Human Health): 0.3 mg methylmercury/kg wet weight~~
~~b)Fish Tissue (Wildlife):~~
~~Trophic Level (TL) 3[1] < 50 mm: 0.03 mg methylmercury/kg wet weight~~
~~TL3 50-150mm: 0.05 mg methylmercury/kg wet weight~~
~~TL3 150-350mm: 0.1 mg methylmercury/kg wet weight~~
~~c)Bird Egg (Wildlife): less than 0.5 mg total mercury/kg wet weight~~
~~d)Water Column Target: 0.051 ug total mercury/L~~

[1] Tropic Level 3: Predators (e.g., minnows, sunfish) on tropic level 2 organism (e.g., copepods and water fleas)

~~3.~~Nickel Targets

Subwatershed	Water Quality Target (ug dissolved Nickel/L)		Sediment Target[1] (SQuiRTs, ERL) (ppb)
	Dry Weather CCC	Wet Weather CMC	
Mugu Lagoon	8.2	74	20900
Calleguas Creek 2	8.2	74	NA[2]
Calleguas Creek 3	149	856	NA[2]
Revolon/Beardsley	8.2	74	NA[2]
Conejo	160	1292	NA[2]
Arroyo Simi/Las Posas	168	958	NA[2]

[1] Sediment targets are based on screening levels endorsed by the National Oceanic and Atmospheric Administration (NOAA) in their Screening Quick Reference Tables (SQuiRTs) (Buchman, 1999)
[2] Sediment targets were not selected as alternative target for this reach as it is not listed on the 303(d) list.

A study to support a site specific objective (SSO) for nickel has been submitted to the Regional Board and is currently under reviewed by the Regional Board and U.S. EPA staff. If a SSO for nickel is approved, the Regional Board will consider revision to the numeric targets for nickel based on the approved SSO.

~~4.~~Selenium Targets

TMDL Element	Calleguas Creek Watershed Metals and Selenium TMDL

Subwatershed	Water Quality Target (ug total selenium/L)		Bird Egg (ug/g)
	Dry Weather CCC	Wet Weather CMC	
Mugu Lagoon	71	290	6
Calleguas Creek 2	5	290	6
Calleguas Creek 3	5	NA[1]	6
Revolon/Beardsley	5	290	6
Conejo	5	NA[1]	6
Arroyo Simi/Las Posas	5	NA[1]	6

[1] "NA" indicates that a target is not available for this constituent ~~as~~ because criterion for fresh water is not defined in the CTR.

~~5.~~Zinc Targets

Subwatershed	Water Quality Target (ug dissolved Zinc/L)		Sediment Target[1] (SQuiRTs, ERL)
	Dry Weather CCC	Wet Weather CMC	(ppb)
Mugu Lagoon	81	90	150000
Calleguas Creek 2	81	90	NA[2]
Calleguas Creek 3	338	214	NA[2]
Revolon/Beardsley	81	90	NA[2]
Conejo	365	324	NA[2]
Arroyo Simi/Las Posas	382	240	NA[2]

[1] Sediment targets are based on screening levels endorsed by the National Oceanic and Atmospheric Administration (NOAA) in their Screening Quick Reference Tables (SQuiRTs) (Buchman, 1999)

[2] Sediment targets were not selected as alternative target for this reach ~~as~~ because it is not on the 303(d) list.

Source Analysis

Significant sources of metals and selenium include urban runoff, agricultural runoff, groundwater seepage, and POTW effluent. For mercury, open space was also a significant source. Sources were also analyzed as a function of wet and dry weather. Higher loads were delivered during wet weather for all constituents, due to the association between metals and particulate matter~~.~~.

The source analysis indicates naturally occurring mercury in soil may be a significant source, and that naturally occurring nickel, copper, zinc, and selenium in soil may be a contributing source, and that naturally occurring selenium in groundwater may be a significant source. The TMDL Implementation Plan ~~also~~ includes special studies to further assess~~address~~ natural sources of metals in soil.

TMDL Element	Calleguas Creek Watershed Metals and Selenium TMDL
Linkage Analysis	Linkage between sources and instream pollutant concentrations was established through a dynamic water quality Hydrologic Simulation Program – FORTRAN (HSPF). The model output generally resulted in a conservative estimate of receiving water concentrations for metals. The model was used to calculate load reductions necessary to meet the ~~Numeric~~ numeric ~~Targets~~targets. ~~The load and waste load allocations were calculated based on the load reductions required to meet the numeric targets.~~ The load reductions were used to calculate the load and waste load allocations.
Waste Load Allocations	In the case of copper, nickel, and selenium, waste load allocations (WLAs) ~~are~~ were developed for both wet and dry-weather. The dry-weather WLAs apply to days when flows in the stream are less than the 86th percentile flow rate for each reach. The wet-weather WLAs apply to days when flows in the stream exceed the 86th percentile flow rate for each reach. Annual mass loads of mercury in suspended sediment were developed according to low, medium, and high annual flow categories. ~~A margin of safety of 15% was included in the WLAs for copper and nickel.~~ **Publicly Owned Treatment Works (POTWs)** Concentration-based and mass-based WLAs are established -for copper, and nickel, ~~and selenium~~ in total recoverable forms, and are applied to POTWs during both wet and dry weather. Mass-based WLAs are developed for mercury for POTWs. Zinc allocations are not set because current information indicate that numeric targets for zinc are attained. The TMDL Implementation Plan includes a task to provide State Board data to support delisting of zinc. Waste load allocations for selenium are not set for POTWs because POTWs do not discharge to reaches listed for selenium. ~~A margin of safety of 15% was included in the WLAs for copper and nickel.~~ Interim limits are included to allow time for dischargers to put in place implementation measures necessary to achieve final waste load allocations. The daily maximum and monthly average interim limits are set equal to the 99th and 95th percentile of available discharge data, respectively. **~~1.~~Interim and Final WLAs for Total Recoverable Copper in Water Column**

TMDL Element	Calleguas Creek Watershed Metals and Selenium TMDL

POTW	Interim		Final[1]		
	Daily Maximum (ug/L)	Monthly Average (ug/L)	Daily Maximum (ug/L)[2]	Monthly Average (ug/L)[2]	lb/day
Hill Canyon WWTP	20.0	16.0	(a)	(a)	0.11*WER - 0.04
Simi Valley WQCP	(b)	(b)	31.0	30.5	(c)
Moorpark WTP	(b)	(b)	31.0	30.5	(d)
Camarillo WRP	57.0	20.0	(a)	(a)	0.12*WER - 0.04
Camrosa WRP	(b)	(b)	27.4	27.0	(d)

[1] If site-specific WERs are approved by the Regional Board, TMDL waste load allocations shall be implemented in accordance with the approved WERs using the equations set forth above. Regardless of the final WERs, total copper loading shall not exceed current loading. In addition, effluent concentrations shall not exceed the performance standards of current treatment technologies.

[2] Concentration-based targets have been converted to total recoverable allocations using the CTR default translator of 0.96

(a) Concentration-based final limits will be included in the permits in accordance with NPDES guidance and requirements, but are not calculated as part of the TMDL.

(b) Interim limits are not required because the discharger is meeting the final limits.

(c) Discharges from Simi Valley WQCP do not reach lower Calleguas Creek and Mugu lagoon during dry weather. Monitoring will be conducted and mass-based WLAs will be evaluated if targets are not met in Arroyo Simi/Las Posas or downstream reaches.

(d) Discharger does not contribute loading during dry weather. Concentration-based WLAs apply during wet weather when discharges occur. Monitoring will be conducted and mass-based WLAs will be evaluated if targets are not met in receiving water and/or downstream reaches.

~~2.~~Interim and Final WLAs for Total Recoverable Nickel in Water Column

POTW	Interim		Final		
	Daily Maximum (ug/L)	Monthly Average (ug/L)	Daily Maximum (ug/L)1	Monthly Average (ug/L)2	lb/day
Hill Canyon WWTP	8.3	6.4	(a)	(a)	0.3
Simi Valley WQCP	(b)	(b)	960.0	169.0	(c)
Moorpark WTP	(b)	(b)	960.0	169.0	(d)
Camarillo WRP	16.0	6.2	(a)	(a)	0.2
Camrosa WRP	(b)	(b)	858.0	149.0	(d)

[1] Concentration-based targets have been converted to total recoverable allocations using the CTR default translator of 0.998.

[2] Concentration-based targets have been converted to total recoverable allocations using the CTR default translator of 0.997.

(a) Concentration-based final limits will be included in the permits in accordance with NPDES

TMDL Element	Calleguas Creek Watershed Metals and Selenium TMDL

guidance and requirements, but are not calculated as part of the TMDL.

(b) Interim limits are not required because the discharger is meeting the final limits.

(c) Discharges from Simi Valley WQCP do not reach lower Calleguas Creek and Mugu lagoon during dry weather. Monitoring will be conducted and mass-based WLAs will be evaluated if targets are not met in Arroyo Simi/Las Posas or downstream reaches.

(d) Discharger does not contribute loading during dry weather. Concentration-based WLAs apply during wet weather when discharges occur. Monitoring will be conducted and mass-based WLAs will be evaluated if targets are not met in receiving water and/or downstream reaches.

A study to support a SSO for nickel has been submitted to the Regional Board and is currently under reviewed by the Regional Board and U.S. EPA staff. If a SSO for nickel is approved, the Regional Board will consider revision to the final WLAs for nickel based on the approved SSO.

~~3.~~Interims and Final WLAs for Mercury in Suspended Sediment~~:~~

POTW	Interim (lb/month)	Final (lb/month)
Hill Canyon WWTP	0.23	0.022
Simi Valley WQCP	0.18	0.031
Moorpark WTP	N/A	N/A
Camarillo WRP	0.03	0.015
Camrosa WRP	N/A	N/A

Waste load allocations for POTWs are based on the median monthly mercury effluent concentrations ~~which are currently more stringent than the numeric targets~~ multiplied by the design flow where the total load in water is assumed equal to the suspended sediment load. Interim WLAs for mercury are based on the 90th percentile concentration observed in effluent discharge and multiplied by the design flow, and apply to all flow conditions.

POTW	Interim (lb/month)	Final (lb/month)
Hill Canyon WWTP	0.23	0.022
~~Simi Valley WQCP~~	~~0.18~~	~~0.031~~
Moorpark WTP	N/A	N/A
Camarillo WRP	0.03	0.015
Camrosa WRP	N/A	N/A

~~Urban Runoff~~Permitted Stormwater Dischargers (PSDs)

PSDs include m~~M~~ass-based WLAs ~~are~~ established for copper, nickel, and selenium in total recoverable forms. Mass-based WLAs are developed for mercury in suspended sediment. Interim limits are included to allow time for dischargers to put in place implementation measures necessary to achieve final waste load allocations. The daily

TMDL Element	Calleguas Creek Watershed Metals and Selenium TMDL

maximum and monthly average interim limits are set equal to the 99th and 95th percentile of available discharge data.

~~1.~~Interim Limits and Final ~~Waste Load Allocations~~WLAs for Total Recoverable Copper, Nickel, and Selenium

Interim limits and waste load allocations are applied ~~in~~ to receiving water.

~~A.~~A. Interim Limits

Constituents	Calleguas and Conejo Creek			Revolon Slough		
	Dry CMC (ug/L)	Dry CCC (ug/L)	Wet CMC (ug/L)	Dry CMC (ug/L)	Dry CCC (ug/L)	Wet CMC (ug/L)
Copper*	23	19	204	23	19	204
Nickel	15	13	(a)	15	13	(a)
Selenium	(b)	(b)	(b)	14	13	(a)

(a) The current loads do not exceed the TMDL under wet conditions~~,~~; interim limits are not required.
(b) Selenium allocations have not been developed for this reach as it is not on the 303(d) list.
~~(b) Implementation actions includes consideration of watershed-wide selenium impacts.~~
(c) Attainment of interim limits will be evaluated in consideration of background loading data, if available.

~~B.~~B. Final WLAs for Total Recoverable Copper, Nickel, and Selenium

~~1.~~Dry-Weather WLAs in Water Column ~~(lbs/day)~~

Flow Range	Calleguas and Conejo Creek			Revolon Slough		
	Low Flow	Average Flow	Elevated Flow	Low Flow	Average Flow	Elevated Flow
Copper1 (lbs/day)	0.04*WER - 0.02	0.12*WER - 0.02	0.18*WER - 0.03	0.03*WER - 0.01	0.06*WER - 0.03	0.13*WER - 0.02
Nickel (lbs/day)	0.100	0.120	0.440	0.050	0.069	0.116
Selenium (lbs/day)	(a)	(a)	(a)	0.004	0.003	0.004

~~*~~1 If site-specific WERs are approved by the Regional Board, TMDL waste load allocations shall be implemented in accordance with the approved WERs using the equations set forth above. Regardless of the final WERs, total copper loading shall not exceed current loading.

(a) Selenium allocations have not been developed for this reach as it is not on the 303(d) list.
~~Implementation actions include consideration of the watershed-wide selenium impacts.~~

~~2.~~Wet-Weather WLAs in Water Column ~~(lbs/day)~~

TMDL Element	Calleguas Creek Watershed Metals and Selenium TMDL

Constituent	Calleguas Creek	Revolon Slough
Copper[1] (lbs/day)	(0.00054*Q^2*0.032*Q - 0.17)*WER - 0.06	(0.0002*Q2+0.0005*Q)*WER
Nickel[2] (lbs/day)	0.014*Q^2+0.82*Q	0.027*Q^2+0.47*Q
Selenium[2] (lbs/day)	(a)	0.027*Q^2+0.47*Q

~~1~~ 1 If site-specific WERs are approved by the Regional Board, TMDL waste load allocations shall be implemented in accordance with the approved WERs using the equations set forth above. Regardless of the final WERs, total copper loading shall not exceed current loading.

~~2~~ 2 Current loads do not exceed loading capacity during wet weather. Sum of all loads cannot exceed loads presented in the table

(a) Selenium allocations have not been developed for this reach as it is not on the 303(d) list. ~~Implementation actions include consideration of the watershed-wide selenium impacts.~~

Q: Daily storm volume.

~~H.~~Interim Limits and Final WLAs for Mercury in Suspended Sediment ~~(lbs/yr)~~

Final WLAs are set at 80% reduction ~~from~~ of HSPF load estimates. Interim limits for mercury in suspended sediment are set equal to the highest annual load within each flow category, based on HSPF output for the years 1993-2003.

Flow Range	Calleguas Creek		Revolon Slough	
	Interim (lbs/yr)	Final (lbs/yr)	Interim (lbs/yr)	Final (lbs/yr)
0-15,000 MGY	3.3	0.4	1.7	0.1
15,000-25,000 MGY	10.5	1.6	4	0.7
Above 25,000 MGY	64.6	9.3	10.2	1.8

MGY: million gallons per year.

TMDL Element	Calleguas Creek Watershed Metals and Selenium TMDL

Final WLAs for Other NPDES Dischargers

~~I.~~Final WLAs for Total Recoverable Copper, Nickel, and Selenium

Reach	Copper[1]		Nickel		Selenium	
	Dry Monthly Everage (ug/L)[2]	Wet Daily Maximum (ug/L)[2]	Dry Monthly Average (ug/L)[3]	Wet Daily Maximum (ug/L)[3]	Dry Monthly Average (ug/L)	Wet Daily Maximum (ug/L)
1	3.7*WER	5.8*WER	8.2	74	(b)	(b)
2	3.7*WER	5.8*WER	8.2	74	(b)	(b)
3	27.0	27.4	149	859	(b)	(b)
4	3.7*WER	5.8*WER	8.3	75	5	290
5	3.7*WER	5.8*WER	8.3	75	5	290
6	(a)	31.0	(a)	958	(b)	(b)
7	(a)	31.0	(a)	958	(b)	(b)
8	(a)	31.0	(a)	958	(b)	(b)
9	29.1	43.3	160	1296	(b)	(b)
10	29.1	43.3	160	1296	(b)	(b)
11	29.1	43.3	160	1296	(b)	(b)
12	29.1	43.3	160	1296	(b)	(b)
13	29.1	43.3	160	1296	(b)	(b)

~~*~~[1] If site-specific WERs are approved by the Regional Board, TMDL waste load allocations shall be implemented in accordance with the approved WERs using the equations set forth above. Regardless of the final WERs, total copper loading shall not exceed current loading. In addition, effluent concentrations shall not exceed the performance standards of current treatment technologies

~~**~~[2] Concentration-based targets have been converted to total recoverable allocations using the CTR default translator of 0.96 for freshwater reaches and 0.83 for saltwater reaches.

~~***~~[3] Concentration-based targets have been converted to total recoverable allocations using the CTR default translator of 0.997 for freshwater reaches and 0.99 for saltwater reaches.

(a) Discharges from these reaches do not reach lower Calleguas Creek and Mugu Lagoon during dry weather. Allocations are not required for these reaches.

~~(b)~~(b) Selenium waste load allocations have not been developed for this reach as it is not on the 303(d) list. ~~Implementation actions include consideration of the watershed-wide selenium impacts.~~

~~II.~~Final WLAs for Mercury

TMDL Element	Calleguas Creek Watershed Metals and Selenium TMDL
	There is insufficient information to assign mass based WLAs to these sources. Therefore concentration-based waste loads allocations are set equal to 0.051 ~~(~~ug/L~~)~~ for other NPDES dischargers based on the CTR water column target for protection of human health from consumption organism only.
Load Allocation	Mass-based load allocations (LAs) for agriculture, and open space are developed for copper, nickel, and selenium in total recoverable forms. Open space represents background loads from ambient sources (i.e. natural soil concentrations, atmospheric deposition, and natural groundwater seepage) discharged from undeveloped open space, but not ambient sources that are discharged from developed land, such as agricultural and urban areas. LAs are developed for both wet and dry-weather. The dry-weather LAs apply to days when flows in the stream are less than 86th percentile flow rate for each reach. The wet-weather LAs apply to days when flows in the stream exceed 86th percentile flow rate for each reach. Annual mass loads of mercury in suspended sediment were developed according to low, medium, and high annual flow categories. ~~A margin of safety of 15% was included in the LAs for copper and nickel.~~

~~1.~~Interims and Final Load Allocations for Total Recoverable Copper, Nickel, and Selenium

Interim limits are included to allow time for dischargers to put in place implementation measures necessary to achieve final load allocations. The daily maximum and monthly average interim limits are set equal to the 99th and 95th percentile of available discharge data. Interim limits and final load allocations are applied in receiving water at the compliance points.

A. Interim Limits

Constituents	Calleguas and Conejo Creek			Revolon Slough		
	Dry CMC (ug/L)	Dry CCC (ug/L)	Wet CMC (ug/L)	Dry CMC (ug/L)	Dry CCC (ug/L)	Wet CMC (ug/L)
Copper*	24	19	1390	24	19	1390
Nickel	43	42	(a)	43	42	(a)
Selenium	(b)	(b)	(b)	6.7	6	(a)

(a) The current loads do not exceed the TMDL under wet conditions, interim limits are not required.
(b) Selenium allocations have not been developed for this reach as it is not on the 303(d) list. Implementation actions includes consideration of watershed-wide selenium impacts.
(c) Attainment of interim limits will be evaluated in consideration of background loading data, if available.

~~B.~~B. Final Load Allocation

~~1.~~Dry Weather LAs in Water Column ~~(lbs/day)~~

TMDL Element	Calleguas Creek Watershed Metals and Selenium TMDL

Constituent		Calleguas Creek			Revolon Slough		
		Low Flow	Average Flow	Elevated Flow	Low Flow	Average Flow	Elevated Flow
Copper[1] (lbs/day)	Agriculture	0.07* WER-0.03	0.12* WER-0.02	0.31*WER - 0.05	0.07*WER 0.03	0.14*WER-0.07	0.35*WER - 0.07
	Open Space	0.150	0.080	0.130	0.050	0.120	0.110
Nickel (lbs/day)	Agriculture	0.420	0.260	0.970	0.390	0.690	1.600
	Open Space	0.450	0.420	0.560	0.010	0.020	0.020
Selenium (lbs/day)	Agriculture	(a)	(a)	(a)	0.008	0.007	0.018
	Open Space	(a)	(a)	(a)	0.180	0.310	0.490

~~*~~ [1] If site-specific WERs are approved by the Regional Board, TMDL load allocations shall be implemented in accordance with the approved WERs using the equations set forth above.

(a) Selenium allocations have not been developed for this reach as it is not on the 303(d) list. Implementation actions include consideration of the watershed-wide selenium impacts.

~~2.~~Wet Weather LAs in Water Column ~~(lbs/day)~~

Constituent		Calleguas Creek	Revolon Slough
Copper*	Agriculture	(0.00017*Q^2*0.01*Q - 0.05)*WER - 0.02	(0.00123*Q^2+0.0034*Q)* WER
	Open Space	0.0000537*Q^2+0.00321*Q	0.0000432*Q^2+0.000765*Q
Nickel**	Agriculture	0.014*Q^2+0.82*Q	0.027*Q^2+0.47*Q
	Open Space	0.014*Q^2+0.82*Q	0.027*Q^2+0.47*Q
Selenium**	Agriculture	(a)	0.1*Q^2+1.8*Q
	Open Space	(a)	0.027*Q^2+0.47*Q

~~*~~

Constituent		Calleguas Creek	Revolon Slough
Copper[1] (lbs/day)	Agriculture	(0.00017*Q^2*0.01*Q - 0.05)*WER - 0.02	(0.00123*Q^2+0.0034*Q)* WER
	Open Space	0.0000537*Q^2+0.00321*Q	0.0000432*Q^2+0.000765*Q
Nickel[2] (lbs/day)	Agriculture	0.014*Q^2+0.82*Q	0.027*Q^2+0.47*Q
	Open Space	0.014*Q^2+0.82*Q	0.027*Q^2+0.47*Q
Selenium[2] (lbs/day)	Agriculture	(a)	0.1*Q^2+1.8*Q
	Open Space	(a)	0.027*Q^2+0.47*Q

~~**~~ [1] If site-specific WERs are approved by the Regional Board, TMDL load allocations shall be implemented in accordance with the approved WERs using the equations set forth above.

~~**~~ [2] Current loads do not exceed loading capacity during wet weather. Sum of all loads cannot exceed loads presented in the table

(a) Selenium allocations have not been developed for this reach as it is not on the 303(d) list. ~~Implementation actions include consideration of the watershed-wide selenium impacts.~~

Q –Daily storm volume

~~II.~~Interim and Final LAs for Mercury in Suspended Sediment ~~(lbs/yr)~~

Final LAs are set at 80% reduction ~~from~~ of HSPF load estimates. Interim limits for mercury in suspended sediment are set equal to the highest annual load within each flow category, based on HSPF output for the years 1993-2003

TMDL Element	Calleguas Creek Watershed Metals and Selenium TMDL

Flow Range	Calleguas Creek				Revolon Slough			
	Agriculture		Open Space		Agriculture		Open Space	
	Interim (lbs/yr)	Final (lbs/yr)	Interim (lbs/yr)	Final (lbs/yr)	Interim (lbs/yr)	Final (lbs/yr)	Interim (lbs/yr)	Final (lbs/yr)
0-15,000 MGY[1]	3.9	0.5	5.5	0.7	2	.	2.9	0.2
15,000-25,000 MGY	12.6	1.9	17.6	2 .7	4.8	0.8	6.7	1.1
Above 25,000 MGY	77.5	11.2	108.4	17.9	12.2	2.2	17.1	2

[1]—MGY: million gallons per year.

Margin of Safety

A margin of safety (MOS) for the TMDL is designed to address any uncertainty in the analysis that could result in targets not being achieved in the water bodies. Both implicit and explicit MOS are included for this TMDL. The implicit MOS stems from 1) the use of conservative assumptions made during development of multiple numeric targets to ensure sufficient protection under all conditions, and 2) conservative methods employed in developing the TMDL. Background loads are assigned to the TMDL and assumed to remain constant throughout implementation of the TMDL. This results in higher required reductions for the other sources. Calculation of allocations is based on never exceeding numeric target concentrations ~~rather~~ more than ~~the~~ once in three years as specified in the CTR ~~exceedance referenced in the CTR~~. Calculations of current loads and loading capacity for Mugu Lagoon are based on the combined discharges from Calleguas Creek and Revolon Slough (without any dilution provided by tidal flushing), which over predicts actual concentrations in the Lagoon. A 15% explicit MOS is also included for copper and nickel to account for the uncertainty resulting from the calculation of the allowable load based on the median flow rate and translator of each flow category. The 15% explicit MOS is determined sufficient to address the elevated flow category, but still account for the more conservative nature of low and average category.

Future Growth

Ventura County accounts for slightly more than 2% of the state's residents with a population of 753,197 (US Census Bureau, 2000). GIS analysis of the 2000 census data yields a population estimate of 334,000 for the CCW, which equals about 44% of the county population. According to the Southern California Association of Governments (SCAG), growth in Ventura County averaged about 51% per decade from 1900-2000; with growth exceeding 70% in the 1920s, 1950s, and 1960s. Significant population growth is expected to occur within and near present city limits until at least 2020. Future growth may initially

TMDL Element	Calleguas Creek Watershed Metals and Selenium TMDL
	increase loadings as construction activities expose bare soil and increase erosion-related discharges to receiving water. However, once development has been completed the presence of impermeable land surface and landscaped areas may reduce the amount of natural soils that are eroded and carried to the stream. For copper, future growth could increase loadings from urban areas and POTWs due to increased traffic (i.e., brake pad residues), architectural copper use and corrosion of copper pipes. Selenium loading may increase if increased irrigation raises the groundwater table and increases high selenium groundwater seepage to surface waters. However, if increased growth results in increased water demand and high selenium groundwater is pumped and treated to supply this demand, the selenium could decrease.
Seasonal Variations and Critical Conditions	Seasonal variations are addressed for copper, nickel, and selenium by developing separate allocations for wet and dry weather. Critical conditions for copper, nickel, and selenium ~~are~~ were developed using model results to calculate the maximum observed 4-day average dry weather concentration and the associated flow condition. Wet weather, as a whole, is defined as a critical condition. For mercury, there is no indication that mercury contamination in Mugu Lagoon is consistently exacerbated at any particular time of the year. Since the potential effects of mercury are related to bioaccumulation in the food chain over a long period time, any other short term variations in concentration which might occur are not likely to cause significant impacts upon beneficial uses. Therefore, seasonal variations do not affect critical conditions for the Calleguas Creek watershed mercury TMDL.
Special Studies and Monitoring Plan	**Special Studies** Several special studies are planned to improve understanding of key aspects related to achievement of WLAs and LAs for the Metals and Selenium TMDL ***1. Special Study #1 (Optional) – Evaluation and Initiation of Natural Sources Exclusion*** The TMDL technical report has identified ambient sources as the primary significant selenium and mercury loadings in the watershed and as potentially significant sources of copper and nickel. The portion of all ambient sources associated with open space runoff and natural groundwater seepage is accounted for in this TMDL as "background load." This special study will evaluate whether or not background loads for each constituent qualify for natural source exclusion. This study

TMDL Element	Calleguas Creek Watershed Metals and Selenium TMDL
	will also consider whether ~~or not~~ any portion of the ambient source contribution for agricultural or urban runoff loads qualify for natural source exclusions and/or provide a basis for site specific objectives. The presence of natural sources makes achievement of selenium and mercury targets during all conditions unlikely. For copper, achievement of the CTR targets or the WER based targets (if approved) in Revolon Slough may not be feasible due to the magnitude of background loads. Completion of site specific objectives and/or a use attainability analysis shall be required to review any potential change to water quality objectives for these constituents. This special study will be used to develop the necessary information to revise- the water quality objectives for selenium and mercury and possibly for copper and nickel. ***2. Special Study #2 – Identification of selenium contaminated Groundwater Sources*** The purpose of this special study will be to identify groundwater with high concentrations of selenium that is either being discharged directly to the stream or used as irrigation water. The investigation will focus on areas where groundwater has a high probability of reaching the stream and identify practical actions to reduce the discharge of the groundwater to the stream. The analysis will include an assessment of the availability of alternative water supplies for irrigation water, the costs of the alternative water supplies and the costs of reducing groundwater discharges. ***3. Special Study #3– Investigation of Soil Concentrations and Identification of "Hot Spots"*** The purpose of this special study will be to identify terrestrial areas with high concentrations of metals and/or selenium, either due to anthropogenic sources or resulting from high natural concentrations in soils. Use of detailed soil maps for the watershed in combination with field survey and soil sampling may lead to identification of areas important for reducing overall loads reaching the stream. Identification of any areas with elevated soil concentrations of metals and/or selenium would create an opportunity for efficient and targeted implementation actions, such as remediation or erosion control. ***4. Special Study #4 (Optional) – Determination of Water Effect Ratio for Copper in Revolon Slough***

TMDL Element	Calleguas Creek Watershed Metals and Selenium TMDL
	The purpose of this optional special study would be to calculate a WER for copper that is specific to Revolon Slough. A WER was not previously developed for Revolon Slough because it was not listed for copper. Subsequent monitoring demonstrated that the saltwater copper CTR criterion was exceeded in ~~the~~ Revolon Slough. This Study would parallel the developed WER for Mugu Lagoon and Calleguas Creek. This is an optional special study to be conducted if desired by the stakeholders or determined necessary by the Executive Officer. ***5. Special Study #5 (Optional) – Determination of Site-Specific Objectives for Mercury and Selenium*** Special Study #1 will evaluate whether a natural source exclusion is appropriate for background loads of mercury and selenium or any portion of the ambient source contributions to non-background loads in the Calleguas Creek watershed. This special study will develop any SSOs deemed necessary to account for the background conditions and/or site-specific impacts of mercury and selenium (and possibly for copper and nickel) on wildlife and humans in the watershed. This is an optional special study to be conducted if desired by the stakeholders or determined necessary for establishing a natural source exclusion. **Monitoring Plan** The Calleguas Creek Watershed TMDL Monitoring Plan (CCWTMP) is designed to monitor and evaluate the implementation of this TMDL and refine the understanding of metal and selenium loads. CCWTMP is intended to parallel efforts of the Calleguas Creek Watershed Nutrients TMDL, Toxicity TMDL, and OC Pesticide, PCBs, and Sediment TMDL monitoring programs. The proposed CCWTMP shall be made available for public review before approval by the Executive Officer. The goals of the CCWTMP include: (1) to determine compliance with copper, mercury, nickel, and selenium numeric targets at receiving water monitoring stations and at POTWs discharges; (2) to determine compliance with waste load and load allocations for copper, mercury, nickel, and selenium at receiving water monitoring stations and at POTWs discharges; (3) to monitor the effect of implementation action by ~~urban~~PSDs, POTW, ~~and~~ agricultural dischargers, and other NPDES permittees on in-stream water [redacted]; and (4) to implement the CCWTMP in a manner consistent with other TMDL implementation plans and regulatory actions within the Calleguas Creek watershed. Monitoring conducted through the Conditional Waiver for Disharges

TMDL Element	Calleguas Creek Watershed Metals and Selenium TMDL
	from Irrigated Lands (Conditional Waiver Program) may meet part of the needs of the CCWTMP. To the extent monitoring required by the Metals and Selenium TMDL Implementation Plan parallels monitoring required by the Conditional Waiver Program, ~~it~~ monitoring shall be coordinated with ~~the Conditional Waiver Program~~ monitoring conducted by individuals and groups subject to the term and conditions of the Conditional Waiver Program. Monitoring will begin within one year of the effective date of the TMDL. For the first year, ~~I~~in-stream water column samples will be collected monthly for analysis of general water quality constituents (GWQC), copper, mercury, nickel, selenium, and zinc ~~for the first year~~. After the first year, the Executive Officer will review the monitoring report and revise the monitoring frequency as appropriate. In-stream water column samples will be generally be collected at the base of Revolon Slough and Calleguas Creek, and in Mugu Lagoon (collection of flow-based samples will occur above the tidal prism). Additionally, sediment samples will be collected semi-annually in Mugu Lagoon and analyzed for sediment toxicity resulting from copper, mercury, nickel, selenium, and zinc. At such a time as numeric targets are consistently met at these points, an additional site or sites will be considered for monitoring to ensure numeric targets are met throughout the lower watershed. Additional samples will be collected concurrently at stations that are representative of agricultural and urban runoff ~~land use stations~~ as well as at POTWs in each of the subwatersheds and analyzed for GWQCs, copper, mercury, nickel, selenium, and zinc. The location of these ~~land use~~ stations will be determined before initiation of the CCWTMP. Environmentally relevant detection limits will be used for metals and selenium (i.e. detection limits lower than applicable target), if available at a commercial laboratory. ***Compliance sampling station locations:***

TMDL Element	Calleguas Creek Watershed Metals and Selenium TMDL

Subwatershed	Station ID	Station Location	Constituent
Mugu Lagoon	01-11-BR	11th Street Bridge	Water Column: Cu, Ni, Hg, Se, Zn
			Bird Egg: Hg, Se
			Fish Tisue: Hg, Se
			Sediment: Cu, Ni, Hg, Se, Zn
Revolon Slough	04-WOOD	Revolon Slough East Side of Wood Road	Water Column: Cu, Ni, Hg, Se, Zn
			Fish Tisue: Hg, Se
Calleguas Creek	03-CAMAR	Calleguas Creek at University Drive	Water Column: Cu, Ni, Hg, Se, Zn
	03D-CAMR	Camrosa Water Reclamation Plant	Water Column: Cu, Ni, Hg, Se, Zn
	9AD-CAMA	Camarillo Water Reclamation Plant	Water Column: Cu, Ni, Hg, Se, Zn
Conejo Creek	10D-HILL	Hill Canyon Wastewater Treatment Plant	Water Column: Cu, Ni, Hg, Se, Zn

Implementation Plan

The final WLAs will be included for permitted stormwater discharges, POTWs, and other NPDES discharges in accordance with the compliance schedules provided in Table 7-19.2. The Regional Board may revise these WLAs based on additional information developed through special studies and/or monitoring conducted as part of this TMDL. In addition, the implementation schedule was developed with the assumption that a WER for copper and a SSO for nickel will proceed following the TMDL. Should adoption and approvals of the WER and SSO not proceed, additional implementation actions could be required. The implementation plan includes discussion of implementation actions to address these conditions.

WLAs established for ~~the three major POTWs~~Simi Valley WQCP, Camrosa WRP, and Moorpark WTP in this TMDL will be implemented through NPDES permit limits. Compliance will be determined through monitoring of final effluent discharge as defined in the NPDES permit. The Hill Canyon and Camarillo WRPs are working towards discontinuing the discharge of effluent to Conejo Creek. If this plan is implemented, the POTW allocations for the watershed will be achieved by reduction of effluent discharges to the stream. The implementation plan includes sufficient time for this plan to be implemented. However, if this plan is altered, the POTWs will need to meet allocations through other methods such as source control activities. The Regional Board will need to ensure that permit conditions are consistent with the assumptions of the WLAs. Should federal, state, or regional guidance or practice for implementing WLAs into permits be revised, the Regional Board may reevaluate the TMDL to incorporate such guidance.

In accordance with current practice, a group concentration-based WLA

TMDL Element	Calleguas Creek Watershed Metals and Selenium TMDL
	has been developed for all permitted stormwater discharges, including municipal separate storm sewer systems (MS4s), Caltrans, general industrial and construction stormwater permits, and Naval Air Weapons Station Point Mugu. MS4 WLAs will be incorporated into the NPDES permit as receiving water limits measured in-stream at the base of Revolon Slough and Calleguas Creek, and in Mugu Lagoon and will be achieved through the implementation of BMPs as outlined in the implementation plan. The Regional Board will need to ensure that permit conditions are consistent with the assumptions of the WLAs. If BMPs are to be used, the Regional Board will need to detail its findings and conclusions supporting the use of BMPs in the NPDES permit fact sheets. Should federal, state, or regional guidance or practice for implementing WLAs into permits be revised, the Regional Board may reevaluate~~d~~ the TMDL to incorporate such guidance. The Regional Board may revise these WLAs based on the collection of additional information developed through special studies and/or monitoring conducted as part of this TMDL. LAs will be implemented through the State's Nonpoint Source Pollution Control Program (NPSPCP) and Conditional Waiver for Discharges from Irrigated Lands adopted by the Los Angeles Regional Water Quality Control Board on November 3, 2005. Compliance with LAs will be measured in-stream at the base of Revolon Slough and Calleguas Creek and in Mugu Lagoon and will be achieved through the implementation of BMPs consistent with the NPSPCP and the Conditional Waiver Program. The Conditional Waiver Program requires the development of an agricultural water quality management plan (AWQMP) to address pollutants that are exceeding receiving water quality objectives as a result of agricultural discharges. Therefore, implementation of the load allocations will be through the development of an AWQMP for metals and selenium. Implementation of the load allocations will also include the coordination of BMPs being implemented under other required programs to ensure metal discharges are considered in the implementation. Additionally, agricultural dischargers will participate in educational seminars on the implementation of BMPs as required under the Conditional Waiver Program. Studies are currently being conducted to assess the extent of BMP implementation and provide information on the effectiveness of BMPs for agriculture. This information will be integrated into the AWQMP that will guide the implementation of agricultural BMPs in the Calleguas Creek watershed. After implementation of these actions, compliance with the allocations and TMDL will be evaluated and the allocations reconsidered if necessary based on the special studies and monitoring plan section of

TMDL Element	Calleguas Creek Watershed Metals and Selenium TMDL
	the implementation plan Agricultural and ~~urban~~ PSDs dischargers will have a required 25%, 50% and 100% reduction in the difference between the current loadings and the load allocations at 5, 10 and 15 years after the effective date, respectively. Achievement of required reductions will be evaluated based on progress towards BMP implementation as outlined in the UWQMPs, AWQMP, Conditional Waiver Program~~for Irrigated Lands~~, and in consideration of background loading information, if available. If the interim reductions are not met, the dischargers will submit a report to the Executive Officer detailing why the reductions were not met and the steps that will be taken to meet the required reductions. As shown in Table 7-19.2, implementation of LAs will be conducted over a period of time to allow for implementation of the BMPs, as well as coordination with special studies and implementation actions resulting from other TMDL Implementation Plans ~~(Nutrient, Historic Pesticides and PCBs, Sediment, Metals, Bacteria, etc.)~~for the Calleguas Creek watershed. The Regional Board may revise the LAs based on the collection of additional information developed through special studies and/or monitoring conducted as part of this TMDL.

Table 7-19.2 Calleguas Creek Watershed Metals and Selenium TMDL: Implementation Schedule

Item	Implementation Action[1]	Responsible Party	Completion Date
1	Effective date of interim Metals and Selenium TMDL waste load allocation (WLAs), and final WLAs for other NPDES permittees	POTWs, Permitted Stormwater Dischargers[2] (PSD), Other NPDES Permittees	Effective date of the amendment
2	Effective date of interim Metals and Selenium TMDL load allocation (LAs)	Agricultural Dischargers	Effective date of the amendment
3a	Submit Calleguas Creek Watershed Metals and Selenium Monitoring Program	POTWs, PSD, Agricultural Dischargers	Within 3 months after the effective date of the amendment
3b	Implement Calleguas Creek Watershed Metals and Selenium Monitoring Program	POTWs, PSD, Agricultural Dischargers	Within 3 months of Executive Officer approval of the monitoring program
3c	Re-calibrate HSPF water quality model based on first year of monitoring data	POTWs, PSD, Agricultural Dischargers	1 year after submittal of first annual monitoring report
4a	Conduct a source control study, develop and submit an Urban Water Quality Management Program (UWQMP) for copper, mercury, nickel, and selenium	MS4s	Within 2 years after the effective date of the amendment
4b	Conduct a source control study, develop and submit an UWQMP for copper, mercury, nickel, and selenium	Caltrans	Within 2 years after the effective date of the amendment
4c	Conduct a source control study, develop and submit an UWQMP for copper, mercury, nickel, and selenium	NAWS point Mugu (US Navy)	Within 2 years after the effective date of the amendment
5	Implement UWQMP	PSD	Within 1 year of approval of UWQMP by the Executive Officer
6	Develop and submit an Agricultural Water Quality Management Program (AWQMP) as described in the Conditional Waiver Program	Agricultural Dischargers	Within 2 years after the effective date of the amendment
7	Implement AWQMP	Agricultural Dischargers	Within 1 year of approval of AWQMP by the Executive Officer
8	Develop WLAs and LAs for zinc if impairment for Mugu Lagoon is maintained on the final 2006 303(d) list	Regional Board or USEPA	Within 1 year of the final 2006 303(d) list
9	Submit progress report on salinity management plan, including status of reducing WRP effluent discharges to Conejo and Calleguas Creek reaches of the watershed	POTWs	Within 3 years after the effective date of the amendment
10	If progress report identifies the effluent discharges reduction is not progressing, develop and	POTWs	Within 4 years after the effective date of the

[1] The Regional Board regulatory programs addressing all discharges in effect at the time this implementation task is due may contain requirements substantially similar to the requirements of these implementation tasks. If such requirements are in place in another regulatory program including other TMDLs, the Executive Officer may revise or eliminate this implementation task to coordinate this TMDL implementation plan with other regulatory programs.

[2] Permitted Stormwater Dischargers (PSD) include MS4s, Caltrans, the Naval Air Weapons Station at Point Mugu, and general industrial and construction permittees.

Item	Implementation Action[1]	Responsible Party	Completion Date
	implement source control activities for copper, mercury, nickel, and selenium		amendment
11	Re-evaluation of POTW interim waste load allocations for copper, mercury, and nickel	POTWs	Within 5 years after the effective date of the amendment
12a	Evaluate the results of the OCs TMDL, Special Study – Calculation of sediment transport rates in the Calleguas Creek watershed for applicability to the metals and selenium TMDL	Agricultural Dischargers, PSD	Within 6 months of completion of the study
12b	Include monitoring for copper, mercury, nickel, and selenium in the OC pesticides TMDL, special Study – Monitoring of sediment by source and land use type	Agricultural Dischargers, PSD	Within 2 years after the effective date of the amendment
12c	Expand scope of the OC Pesticide TMDL, Special Study – Examination of food webs and accumulation in the Calleguas Creek watershed to ensure protection of wildlife to include mercury	Interested parties	If necessary, prior to end of the implementation period
12d	Evaluate the results of the OC Pesticides TMDL, Special Study – Effects of BMPs on Sediment and Siltation to determine the impacts on metals and selenium	Agricultural Dischargers, PSD	Within 6 months of completion of the study
13a	Submit work plan for Special Study #1 (Optional) – Identification of Natural Sources Exclusion	Agricultural Dischargers, PSD	Within 1 year after the effective date of the amendment
~~14b~~1 ~~4a~~13 b	Submit results of Special Study #1 (Optional) – Identification of Natural Sources Exclusion	Agricultural Dischargers, PSD	Within 3 years of approval of workplan by Executive Officer
14a	Submit work plan for Special Study #2 – Identification of selenium Contaminated Groundwater Sources	POTWs, PSD, and Agricultural Dischargers	Within 1 year after the effective date of the amendment
14b	Submit results of Special Study #2 – Identification of selenium Contaminated Groundwater Sources	POTWs, PSD, and Agricultural Dischargers	Within 1 year of approval of workplan by Executive Officer
15a	Submit work plan for Special Study #3 – Investigation of Metals' "Hot Spot" and Natural Soil	PSD and Agricultural Discharger	Within 1 year after the effective date of the amendment
15b	Submit results of Special Study #3 – Investigation of metals' "Hot Spot" and Natural Soil	PSD and Agricultural Discharger	Within 2 years of approval of workplan by Executive Officer
16	Special Study #4 (Optional) – Determination of WER for copper in Revolon Slough	PSD and Agricultural Dischargers	If necessary, prior to end of the implementation period
17	Special Study #5 (Optional) – Determination of Site Specific Objective for Mercury and Selenium	PSD and Agricultural Dischargers	If necessary, prior to end of the implementation period
18	Evaluate effectiveness of BMPs implemented under the AWQMP and UWQMP in controlling metals and selenium discharges	PSD and Agricultural Dischargers	6 years after the effective date of the amendment
19	Evaluate the results of implementation actions 14 and 15 (Special Study #2 & #3) and implement actions identified by the studies	POTWs, PSD, and Agricultural Dischargers	Within 1 year after the completion of the studies
20	If needed, implement additional BMPs or revise existing BMPs to address any issues not covered by	Agricultural Dischargers	7 years after the effective date of the amendment

Item	Implementation Action[1]	Responsible Party	Completion Date
	implementation efforts of related Calleguas Creek watershed TMDLs (Nutrients, Toxicity, OC Pesticides, PCBs, and Siltation) and the Conditional Waiver Program		
21	Consider nickel SSO proposed by stakeholders	Regional Board	1 years after the effective date of the amendment
22	Publicly notice tentative copper water effects ratio for Regional Board consideration, if deemed appropriate based on peer review	Regional Board Staff	Within 2 months of receipt of peer review comments
23	Based on the result from items 1-23, Regional Board will consider re-evaluation of the TMDLs, WLAs, and LAs if necessary	Regional Board	2 years from submittal of information necessary for re-evaluation
24	POTWs will be required to reduce loadings by 50%, and 100% of the difference between the current loading and the WLAs at- 8~~,~~ and 10 years after the effective date, respectively.	POTWs	8~~,~~ and 10 years after the effective date of the amendment
25	Re-evaluation of Agricultural and Urban load and waste load allocations for copper, mercury, nickel, and selenium based on the evaluation of BMP effectiveness. Agricultural and urban dischargers will have a required 25%, 50%, and 100% reduction in the difference between the current loadings and the load allocations at 5, 10, and 15 years after the effective date, respectively.	Agricultural and ~~Urban Dischargers~~PSDs	5, 10, and 15 years after the effective date of the amendment
26	Stakeholders and Regional Board staff will provide information items to the Regional Board, including: progress toward meeting TMDL load reductions, water quality data, and a summary of implementation activities completed to date	Regional Board	2 years after the effective date, and every 2 years following
27	Achievement of Final WLAs and attainment of water quality standards for copper, mercury, nickel, and selenium	POTWs	Within 10 years after the effective date of the amendment[3]
28	Achievement of Final WLAs and LAs and attainment of water quality standards for copper, nickel, mercury and selenium	Agricultural Dischargers, PSD	Within 15 years after the effective date of the amendment[3]

[3] Date of achievement of WLAs and LAs based on the estimated timeframe for educational programs, special studies, and implementation of appropriate BMPs and associated monitoring. The Conditional Waiver Program will set timeframes for the BMP management plans.