

STATE WATER RESOURCES CONTROL BOARD
RESOLUTION NO. 2002 - 0151

APPROVING WITH PARTIAL DISAPPROVAL OF AN
AMENDMENT TO THE WATER QUALITY CONTROL PLAN FOR
THE SAN FRANCISCO BAY REGION ADOPTING SITE-SPECIFIC
WATER QUALITY OBJECTIVES FOR COPPER AND NICKEL IN
THE LOWER SOUTH SAN FRANCISCO BAY AND
IMPLEMENTATION PROVISIONS

WHEREAS:

1. The San Francisco Bay Regional Water Quality Control Board (Regional Board) adopted a revised Water Quality Control Plan (Basin Plan) for the San Francisco Bay Region on June 21, 1995 which was approved by the State Water Resources Control Board (SWRCB) on July 20, 1995, by the Office of Administrative Law (OAL) on November 13, 1995, and the water quality standards and standards implementation provisions were approved by the U.S Environmental Protection Agency (USEPA) on May 29, 2000.
2. On May 22, 2002, the Regional Board adopted Resolution R2-2002-0061 (Attachment 1) amending the Basin Plan to establish site-specific water quality objectives for copper and nickel in the lower south San Francisco Bay and to establish implementation provisions contained in existing National Pollutant Discharge Elimination System (NPDES) permits issued to dischargers in the affected area.
3. SWRCB finds that provisions of the amendment as adopted warranted minor clarification. Specific clarifications needed include: deletion of language that expanded the amendment beyond the Regional Board's original intent, clarification of a footnote and amendment language, and correction of typographic errors.
4. Regional Board Resolution R2-2002-0061 delegated to the Regional Board Executive Officer authority to make minor, non-substantive corrections to the adopted amendment if needed for clarity or consistency. The Regional Board Executive Officer has made the necessary corrections to the amendment.
5. SWRCB finds that the section "Project Element 4" and two paragraphs on page 13 in "Project Element 5" lack clarity and would have unintended consequences if approved.
6. Regional Board staff prepared documents and followed procedures satisfying environmental documentation requirements in accordance with the California Environmental Quality Act, scientific peer review, and other State laws and regulations.
7. This Basin Plan amendment does not become effective until approved by SWRCB and until the regulatory provisions are approved by OAL, and the site-specific water quality objectives are approved by USEPA.

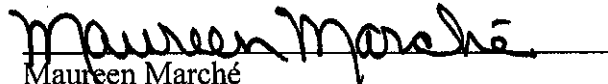
THEREFORE BE IT RESOLVED THAT:

SWRCB:

1. Approves the amendment to the Basin Plan setting site-specific water quality objectives for copper and nickel in the lower south San Francisco Bay with implementation provisions adopted under Regional Board Resolution R2-2002-0061 as corrected by the Regional Board Executive Officer (Attachment 3), except for Project Element 4 on page 11 of the amendment and the first two paragraphs addressing beneficial uses on page 13 of the amendment (as indicated by double strike-through in Attachment 3) which are disapproved.
2. Authorizes the Executive Director to submit the amendment adopted under the Regional Board Resolution R2-2002-0061 as corrected by the Regional Board Executive Officer and as approved by SWRCB to OAL and USEPA for approval.

CERTIFICATION

The undersigned, Clerk to the Board, does hereby certify that the foregoing is a full, true, and correct copy of a resolution duly and regularly adopted at a meeting of the State Water Resources Control Board held on October 17, 2002.


Maureen Marché
Clerk to the Board

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

RESOLUTION R2-2002-0061

Amending the Water Quality Control Plan For the San Francisco Bay Region

to Adopt Site-Specific Objectives for Copper and Nickel

in the Lower South San Francisco Bay and an Implementation Plan

WHEREAS, the California Regional Water Quality Control Board, San Francisco Bay Region (Regional Board), finds that:

1. An updated Water Quality Control Plan for the San Francisco Bay Region (Basin Plan) was adopted by the Regional Board on June 21, 1995, approved by the State Water Resources Control Board (State Board) on July 20, 1995, and approved by the Office of Administrative Law (OAL) on November 13, 1995.
2. The proposed Basin Plan Amendment, which was developed in accordance with California Water Code (CWC) § 13240, consists of the following: adoption of site-specific water quality objectives (SSOs) for copper and nickel in the Lower South San Francisco Bay south of the Dumbarton Bridge (Lower South SF Bay); adoption of an implementation plan for the SSOs referred to as a Water Quality Attainment Strategy (WQAS), including the selection of metal translators to be used to compute water quality-based effluent limits in permits; and minor changes and updates to Chapter 4 of the Basin Plan to reflect more accurately current conditions and Regional Board policy concerning Lower South SF Bay (collectively, the Basin Plan Amendment). The proposed Basin Plan Amendment, including specifications on its physical placement in the Basin Plan, is set forth in Exhibit A hereto. Only the SSOs for copper and nickel in the Lower South SF Bay and the selection of metal translators are regulatory.
3. On May 18, 2000, the United States Environmental Protection Agency (USEPA) promulgated the California Toxics Rule (CTR) prescribing numeric water quality criteria for priority toxic pollutants, including copper and nickel, that apply to the Lower South SF Bay.
4. On March 2, 2000, the State Board adopted the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP) to be effective as of May 22, 2000. Among other things, the SIP establishes implementation provisions for priority pollutant criteria promulgated by USEPA, including the CTR.
5. The SIP authorizes the Regional Board to adopt SSOs in lieu of the CTR criteria whenever the Regional Board determines, in the exercise of its professional judgment, that it is appropriate to do so. Under the SIP, SSOs are appropriate if

(a) a priority pollutant criterion or objective is not achieved in the receiving water, or a National Pollutant Discharge Elimination System (NPDES) permit holder demonstrates that they do not, or may not in the future, meet an existing or potential effluent limitation based on the priority pollutant criterion or objective and (b) there is a demonstration that the discharger cannot be assured of achieving the criterion or objective and/or effluent limitation through reasonable treatment, source control and pollution prevention measures.

6. The proposed Basin Plan Amendment proposes SSOs in the Lower South SF Bay of 6.9 µg/l for a 4-day average and 10.8 for a one-hour average for dissolved copper and 11.9 µg/l for a 4-day average and 62.4 µg/l for a one-hour average for dissolved nickel. These SSOs are necessary and appropriate for this waterbody because: (a) despite the performance of reasonable treatment, source control and pollution prevention measures, the current objectives are not being consistently met; (b) the chemical features of Lower South SF Bay reduce the toxicity and bioavailability of copper and nickel through a variety of mechanisms; (c) an impairment assessment conducted for Lower South SF Bay demonstrated that the current water quality objectives for copper and nickel for Lower South SF Bay could be relaxed while still fully protecting beneficial uses; and (d) ambient concentrations and loading of copper and nickel to Lower South SF Bay have been significantly reduced over the last two decades and further reductions in loading will be difficult and costly and will not provide corresponding water quality improvements.
7. The proposed SSOs for copper and nickel in the Lower South San Francisco Bay were derived through USEPA-approved methods and are fully protective of the most sensitive aquatic life beneficial uses in Lower South SF Bay.
8. The proposed SSOs are currently being achieved and must be maintained. Therefore, the site-specific objectives are supported by the WQAS, which contains strong pollution prevention and source control actions designed to prevent water quality degradation and ensure ongoing attainment of site-specific objectives. The WQAS also includes a selection of metal translators to be used to calculate water-quality based effluent limits in permits. This regulatory action is necessary to avoid inefficient selection of metal translators on a permit-by-permit basis. The WQAS satisfies the requirement for a program of implementation for achieving water quality objectives under CWC § 13242.
9. The proposed SSOs for copper and nickel in the Lower South SF Bay and the corresponding WQAS comply with state and federal antidegradation requirements as set forth in the Staff Report dated May 15, 2002 (Staff Report).
10. The Board has considered those CWC § 13241 factors to be considered when establishing water quality objectives such as SSOs, as set forth in the Staff Report.
11. The Board has considered the impacts of the proposed Basin Plan Amendment on those affected by the proposed Basin Plan Amendment, namely publicly owned treatment works (POTWs) and urban stormwater runoff programs, including economic impacts. There are minimal economic impacts that would result from the proposed Basin Plan Amendment. As stated above, the SSOs for copper and nickel are currently being met in

receiving waters; thus, no additional treatment measures are necessary to achieve compliance with the proposed objectives. Moreover, implementation of most of the WQAS actions is already required of POTWs and urban runoff programs such that no additional expenditures are required as a result of the proposed Basin Plan Amendment.

12. Regulatory elements of the proposed Basin Plan Amendment were reviewed and endorsed by external peer reviewers Drs. David Jenkins and Alex Horne from the University of California at Berkeley.
13. On May 22, 2002, the Regional Board held a public hearing to consider this Basin Plan Amendment. Notice of the public hearing was given to all interested persons and was published in accordance with CWC § 13244 and 40 CFR § 25.5. Additionally, on April 17, 2002, the Regional Board held a duly noticed informational workshop on the proposed Basin Plan Amendment.
14. Regional Board staff prepared and distributed a draft Staff Report, dated April 5, 2002, regarding adoption of the proposed Basin Plan Amendment in accordance with applicable state and federal environmental regulations (California Code of Regulations, §3775, Title 23 and 40 CFR Parts 25 and 131).
15. The process of basin planning has been certified by the Secretary for Resources as exempt from the requirement of the California Environmental Quality Act (Public Resources Code Section 21000 et seq.) to prepare an Environmental Impact Report or Negative Declaration. The Basin Plan Amendment package includes a staff report, an Environmental Checklist, an assessment of the potential environmental impacts of the Basin Plan amendments, and a discussion of alternatives. The Basin Plan Amendment, Environmental Checklist, Staff Report, and supporting documentation are functionally equivalent to an Environmental Impact Report or Negative Declaration. The Board has duly considered the Environmental Checklist, staff report and supporting documentation with respect to environmental impacts and finds that proposed Basin Plan Amendment will not have a significant impact on the environment. The Board further finds, based on consideration of the record as a whole, that there is no potential for adverse effect, either individually or cumulatively, on wildlife as a result of the proposed Basin Plan Amendment.
16. The Basin Plan Amendment must be submitted for review and approval by the State Board, the Office of Administrative Law (OAL), and USEPA. Once approved by the State Board, the amendment is submitted to OAL and USEPA. The Basin Plan Amendment will become effective upon approval by OAL and USEPA. Additionally, for the SSOs to apply over the CTR criteria for copper and nickel, USEPA must also amend the CTR to remove the applicability of the copper and nickel criteria in the Lower South SF Bay, which amendment can and should be done concurrently with USEPA approval of the Basin Plan amendment. A Notice of Decision will be filed.

NOW, THEREFORE BE IT RESOLVED THAT:

1. The Regional Board adopts the SSOs and WQAS for copper and nickel in Lower South SF Bay to the Basin Plan as set forth in the Exhibit A hereto. The Regional Board also

adopts those minor changes and updates to Chapter 4 of the Basin Plan as set forth in Exhibit A hereto.

2. The Executive Officer is directed to forward copies of the Basin Plan Amendment to the State Board in accordance with the requirement of CWC Section 13245.
3. The Regional Board requests that the State Board approve the Basin Plan Amendment in accordance with the requirements of CWC Sections 13245 and 13246 and forward it to the OAL and USEPA for approval.
4. If, during the approval process, 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.
5. Since the Basin Plan Amendment will involve no potential for adverse effect, either individually or cumulatively, on wildlife, the Executive Officer is directed to sign a Certificate of Fee Exemption for a "De Minimis" Impact Finding.

THEREFORE BE IT FURTHER RESOLVED THAT:

The Regional Board commends the Santa Clara Basin Watershed Management Initiative and its participants for their collaborative efforts and commitment of time and resources that contributed to the success of this project. Provision for stakeholder involvement, generation of high quality and reliable studies and data, and scientific peer review of findings are hallmarks of this project that serve as a model for successful resolution of complex technical and policy issues.

I, Loretta K. Barsamian, 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, San Francisco Bay Region, on May 22, 2002.

/s/

LORETTA K. BARSAMIAN
Executive Officer

Exhibit A

(underline strikethrough versions) to Incorporate the Lower South SF Bay SSOs for Copper and Nickel and Associated Water Quality Attainment Strategy.

Project Element 1 – Merge with Chapter 3 Section on Water Quality Objectives for Toxic Pollutants

TABLE 3-3A WATER QUALITY OBJECTIVES FOR COPPER AND NICKEL IN LOWER SOUTH SAN FRANCISCO BAY

All values in µg/L dissolved unless otherwise noted:

Compound	4-day average (CCC) ¹	1-hr average (CMC) ²	Extent of applicability
Copper	6.9	10.8	Marine and Estuarine ³ Waters Contiguous to SF Bay, South of Dumbarton Bridge
Nickel	11.9	62.4 [*]	Marine and Estuarine Waters Contiguous to SF Bay, South of Dumbarton Bridge

~~* Handbook of WQS, 2nd ed. 1994 in Section 3.7.6 states that the CMC = Final Acute Value/2; 62.4 is the Final Acute Value (resident species database)/2; so the site-specific CMC 1 hour average objective is lower than the California Toxics Rule value because we are using the resident species database instead of the National Species Database.~~

~~¹ Criteria Continuous Concentration~~

~~² Criteria Maximum Concentration~~

~~³ Marine and Estuarine Waters are distinguished from freshwater by a salinity threshold that is currently 5 ppt but is subject to modification those specified on page 4-13 of the Basin Plan under subsection Fresh Water vs. Marine Water.~~

Project Element 2 – Add at end of section called “THE WATERSHED MANAGEMENT APPROACH” (Page 4-1):

Water Quality Attainment Strategies Including Total Maximum Daily Loads

The Regional Board intends to establish Water Quality Attainment Strategies (WQAS) including Total Maximum Daily Loads (TMDLs) where necessary and appropriate to ensure attainment and maintenance of water quality standards. Section 303(d) of the federal Clean Water Act requires states to identify water bodies that are not attaining water quality standards, and to establish TMDLs for pollutants causing the impairment (non-attainment of water quality standards) of listed water bodies. As such, TMDLs are the pollutant load levels necessary to attain the applicable water quality standards. A complete TMDL refers to the process and elements associated with establishing a TMDL that include, but are not limited to, problem statement, numeric target(s), source analysis, linkage analysis, wasteload and load allocations, implementation plan, and monitoring plan.

Water Quality Attainment Strategies are development and implementation actions associated with implementing (attaining) water quality standards. Complete TMDLs are WQAS, but WQAS are not limited to 303(d)-list pollutants. For example, they may be developed for pollutants for which threat of impairment provides cause for pollution prevention actions and related activities. WQAS may contain, but not necessarily include, all or some of the complete TMDL elements.

The Regional Board will establish Water Quality Attainment Strategies including TMDLs at the level (larger San Francisco Estuary, smaller segments within the Estuary, or individual watersheds) deemed most appropriate in terms of effectiveness and efficiency relative to the applicable water quality standard, types and locations of pollutant sources, and type and scale of implementation actions.

Project Element 2 (continued) – Add to end of section called “TOXIC POLLUTANT MANAGEMENT IN SEGMENTS OF THE SAN FRANCISCO ESTUARY” (Page 4-45):

Water Quality Attainment Strategies Including Total Maximum Daily Loads

Water Quality Attainment Strategies (WQAS) including Total Maximum Daily Loads (TMDLs) deemed necessary and appropriate to ensure attainment and maintenance of water quality standards in segments of the San Francisco Estuary are presented herein this section.

Project Element 3 – insert new Section in Chapter 4 - Add to end of section called “TOXIC POLLUTANT MANAGEMENT IN SEGMENTS OF THE SAN FRANCISCO ESTUARY” (Page 4-45):

Water Quality Attainment Strategies including Total Maximum Daily Loads

Project Element 3 – insert new Section in Chapter 4 Add to end of section called “TOXIC POLLUTANT MANAGEMENT IN SEGMENTS OF THE SAN FRANCISCO ESTUARY” (Page 4-4):

Water Quality Attainment Strategies including Total Maximum Daily Loads

A WATER QUALITY ATTAINMENT STRATEGY TO SUPPORT COPPER AND NICKEL SITE-SPECIFIC OBJECTIVES SOUTH OF THE DUMBARTON BRIDGE

The Water Quality Attainment Strategy (WQAS) for copper and nickel in San Francisco Bay south of the Dumbarton Bridge (Lower South SF Bay) is designed to prevent water quality degradation and ensure the ongoing maintenance of the site-specific objectives both for copper and nickel in Lower South SF Bay. This section describes the details of the WQAS and how the Regional Board will use its regulatory authority to implement this strategy.

The four elements of the WQAS for copper and nickel in Lower South SF Bay are:

- Current control measures/actions to minimize copper and nickel releases (from municipal wastewater treatment plants and urban runoff programs) to Lower South SF Bay;

- Statistically-based water quality "triggers" and a receiving water monitoring program that would initiate additional control measures/actions if the "triggers" are met;
- A proactive framework for addressing increases to future copper and nickel concentrations in Lower South SF Bay, if they occur; and
- Metal translators that will be used to compute copper and nickel effluent limits for the municipal wastewater treatment plants discharging to Lower South SF Bay.

Except for the specification of metal translators, all actions and monitoring obligations described in this section have been required by the National Pollutant Discharge Elimination System (NPDES) permits for the three municipal wastewater dischargers and the municipal urban runoff (stormwater) dischargers in Lower South SF Bay since October 2000 and March 2001, respectively.

I. Background

Lower South SF Bay has been listed as impaired due to point source discharges of generic metals since 1990 (USEPA Clean Water Act §304(l) listing) and most recently for copper and nickel from point and urban runoff sources in the State of California's 1998 Clean Water Act §303(d) list. The primary reason for the copper and nickel impairment listings had been that ambient water concentrations of dissolved copper and nickel exceeded Basin Plan water quality objectives or US EPA national water quality criteria for the protection of aquatic life. Despite significant reductions in wastewater loadings over the past two decades, ambient concentrations at stations monitored through the San Francisco Estuary Regional Monitoring Program for Trace Substances (RMP) or the City of San Jose monitoring program still approach or exceed the previously-applicable federal criteria or water quality objectives in Lower South SF Bay. The Regional Board has now adopted site-specific water quality objectives. As discussed below, it is likely that these new objectives are being attained.

I (a). Sources

The external sources of copper and nickel to Lower South SF Bay include a minor contribution from atmospheric deposition and substantial discharges from tributaries/urban runoff and municipal wastewater. The dischargers responsible for the urban runoff discharges are the Santa Clara Valley Water District, County of Santa Clara, City of Campbell, City of Cupertino, City of Los Altos, Town of Los Altos Hills, Town of Los Gatos, City of Milpitas, City of Monte Sereno, City of Mountain View, City of Palo Alto, City of San Jose, City of Santa Clara, City of Saratoga, and City of Sunnyvale. These cities have joined together to form the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP). The municipal wastewater dischargers are the Cities of San Jose and Santa Clara, Sunnyvale, and Palo Alto. Each of these cities owns and operates a wastewater treatment plant (Publicly-Owned Treatment Works or POTW) that discharges into San Francisco Bay South of the Dumbarton Bridge.

On an annual basis, about 1100 kg of copper and 1500 kg nickel enters Lower South SF Bay from POTWs. From tributaries, roughly 3800 kg copper and 6000 kg nickel enters this Bay segment each year. During the dry season (June-November), POTW loading is dominant, and tributary loading is dominant during the wet season (December-May). Substantial amounts of

copper (about 1.9 million kg) and nickel (about 50 million kg) already existing in the sediments of Lower South SF Bay can also contribute to water concentrations when the sediments are resuspended by waves, winds, tides, and currents. The metals deposited in the sediments consist of those deposited historically (higher than current levels) and those currently deposited metals. The historical and current external loadings have elevated the total copper and possibly the total nickel concentrations of Lower South SF Bay sediments above what they would be in the absence of anthropogenic sources.

I (b). Stakeholder Involvement

The stakeholder group recognized by the Regional Board to assist in developing watershed-based programs to address both short and long-term water quality issues in Lower South SF Bay is the Santa Clara Basin Watershed Management Initiative (SCBWMI). The SCBWMI, formed in 1996, is a collaborative effort of representatives from business and industrial sectors, professional and trade organizations, civic, environmental, resource conservation and agricultural groups, regional and local public agencies, resource agencies, and the general public. These groups have joined forces to address all sources of pollution that threaten the water bodies draining into the South Bay. A major aim of the SCBWMI is to coordinate existing watershed activities on a basin-wide scale, ensuring that environmental protection efforts are addressed efficiently and cost-effectively. The Regional Board will continue to recognize and rely on the leadership of the SCBWMI to ensure the ongoing success of the WQAS.

A working subgroup of the SCBWMI, the Bay Monitoring and Modeling Subgroup, took the lead to address the water quality issues and to provide the basic strategy and information necessary to address both the water quality technical and related regulatory questions. In 1998, the Copper and Nickel TMDL Work Group (Workgroup) was formed by the SCBWMI to provide guidance for the development of the TMDLs for copper and nickel in Lower South SF Bay. A broad group of stakeholders was represented on the Workgroup including several environmental groups, local wastewater dischargers, local public agencies responsible for the urban runoff program, state and federal regulators, industry and local business representatives, and national organizations such as the Copper Development Association.

II. Overview of the TMDL project for copper and nickel in Lower South SF Bay

In 1996, the State of California included the South San Francisco Bay on the §303(d) impaired water body list as a high priority impaired water body. In 1998, the list was updated and specifically identified copper, nickel, mercury and selenium as the metal pollutants of concern. The listing triggered the Clean Water Act §303(d) mandate for the State of California, specifically the Regional Board, to establish TMDLs for these pollutants of concern. To address NPDES permit issues for its wastewater treatment plant, the City of San Jose and other local municipalities took the lead in providing funding for the development of the copper and nickel TMDLs for Lower South SF Bay, and other Lower South SF Bay communities contributed to related SCBWMI activities.

The TMDL effort focused on:

1. Conducting an Impairment Assessment to determine if ambient concentrations of copper and nickel were negatively impacting the designated beneficial uses of Lower South SF Bay;
2. Developing a range of scientifically defensible water quality objectives for copper and nickel;
3. Developing a conceptual model of copper and nickel cycling to evaluate attainment of the range of objectives; and
4. Characterizing sources and identifying pollution prevention and control actions.

The Workgroup oversaw the preparation and review of several technical reports. These reports provide the basis of the conclusions and recommendations of the Workgroup regarding the effects of ambient concentrations of copper and nickel on the beneficial uses of Lower South SF Bay.

II (a). Impairment Assessment and Site-Specific Objectives

The Impairment Assessment Report was finalized in June 2000 to present new information and to re-evaluate the determination that the beneficial uses of Lower South SF Bay were impaired due to ambient concentrations of copper and nickel. Specifically, the goals of the assessment were to:

- Compile and evaluate data on ambient concentrations and toxicity information for copper and nickel in Lower South SF Bay;
- Identify, evaluate and select indicators of beneficial use impairment. The categories of parameters and criteria considered included toxicity (acute and chronic), biological (biota composition, health, abundance, and physical habitat vs. a reference site), chemical (numeric values), and physical (capacity to support uses);
- Develop endpoints for the selected indicators that can be used to assess the existence of impairment and compare these values to ambient concentrations in Lower South SF Bay. The intent of this assessment was to provide policy makers, regulators, and other stakeholders with the best technical laboratory and ambient information currently available to compare with known threshold impact levels on selected indicators;
- Assess the level of certainty with which it can be shown ambient concentrations of copper and nickel are or are not resulting in beneficial use impairment; and
- Recommend numeric values for site-specific objectives (SSOs) for dissolved copper and nickel in Lower South SF Bay in lieu of TMDL development upon finding the Lower South SF is not impaired due to these metals.

The final results of the impairment assessment indicated that impairment to beneficial uses of Lower South SF Bay due to ambient copper and nickel concentrations is unlikely. There are

several lines of evidence to support the finding for each metal, and these are discussed at length in the Impairment Assessment Report. One important factor in the impairment decision was the recognition that the chemical features of Lower South SF Bay reduce the toxicity and bioavailability of copper and nickel. These chemical features include binding of copper and nickel by dissolved organic compounds and the abundance of dissolved metals like manganese and iron that compete with copper and nickel for receptor sites on aquatic organisms.

From the established ranges of acute and chronic values of copper and nickel site-specific objectives developed through the Impairment Assessment Report, the Regional Board selected specific values for copper and nickel that it deemed protective of beneficial uses and incorporated them into Chapter 3 of this Basin Plan. The acute and chronic site-specific water quality objectives in Lower South SF Bay for dissolved copper are 10.8 µg/L and 6.9 µg/L, respectively. The acute and chronic site-specific water quality objectives in Lower South SF Bay for dissolved nickel are 62.4 µg/L and 11.9 µg/L, respectively.

While the conclusions of the Impairment Assessment Report are scientifically sound, like most statements about complex environmental systems, its conclusions on the lack of impairment have some degree of uncertainty. The existence of these uncertainties underscores the need for continued monitoring and studies that are described below. The four primary areas of uncertainty are the toxicity of copper to phytoplankton, copper and nickel cycling in Lower South SF Bay, sediment toxicity, and uncertainties in loading estimates.

III. Implementation Plan

This section discusses the actions that will be taken to maintain the copper and nickel site-specific objectives. The underlying goal of these actions is to ensure that ambient levels do not increase due to increases in loading of copper and nickel to Lower South SF Bay. Except for the specification of metal translators, all actions and monitoring obligations described in this section are already required in the NPDES permits for the three municipal wastewater dischargers and the municipal urban runoff (stormwater) dischargers in Lower South SF Bay. Other non-regulatory, collaborative actions discussed here will be implemented via the SCBWMI and its participants on a voluntary basis.

III (a). Monitoring Program and Triggers

Fundamental to the monitoring program is the concept of a water quality indicator. An indicator is a measurable quantity that is so strongly associated with particular environmental conditions that the value of the measurable quantity can be used to indicate the existence and maintenance of these conditions. The indicators used in the monitoring program to support the site-specific objectives are dissolved copper and nickel concentrations in Lower South SF Bay. The monitoring program described here has been required by the NPDES permits for the three municipal wastewater dischargers since October 2000. (Order No. 00-108). The monitoring program consists of monthly dissolved copper and nickel measurements at the ten stations shown in Table 4-1a. ~~As of the adoption of this WQAS, the municipal wastewater dischargers defined~~ Under the monitoring programs, dissolved metals as are those metal constituents that pass through a 0.45 µm filter prior to chemical analysis. Any changes to this operational definition of dissolved metal or details of the monitoring program will be addressed through amendments to the NPDES permits

Table 4-1a List of sampling stations that form the monitoring network for copper and nickel in Lower South SF Bay

SBS Site ID	Reference Location	Longitude	Latitude	RMP site ID
SB01	Channel Marker #14	37° 30.782'	122° 8.036'	BA30
SB02	Channel Marker #16	37° 29.595'	122° 5.243'	BA20
SB03	Channel Marker #20	37° 27.437'	122° 3.033'	BA10
SB04	Coyote Creek Railroad Bridge	37° 27.600'	121° 58.540'	C-3-0
SB05	Coyote Creek at Guadalupe River confluence	37° 27.875'	122° 1.406'	NA
SB06	Between Channel Markers #17 & #18	37° 28.390'	122° 4.180'	NA
SB07	Mouth of Mowry Slough	37° 29.499'	122° 3.110'	NA
SB08	Mouth of Newark Slough	37° 30.066'	122° 5.231'	NA
SB09	North of Cooley Landing	37° 28.959'	122° 7.068'	NA
SB10	Old Palo Alto Yacht Club Channel Mouth	37° 28.087'	122° 5.846'	NA
SB11	Standish Dam in Coyote Creek	37° 27.150'	121° 55.501'	BW10
SB12	Alviso Yacht Club Dock	37° 25.574'	121° 58.778'	BW15

The purpose of the monitoring component of the WQAS is to assess ambient conditions compared to the specific trigger levels described below. The ambient data collected through the WQAS monitoring program may be considered along with other ambient monitoring data to determine whether additional controls are necessary.

Trigger Values

The NPDES permits for municipal wastewater and stormwater dischargers contain a series of trigger values and corresponding actions that are required to be taken by the dischargers if the triggers are reached. For copper, an increase in dry season dissolved copper concentration of 0.8 µg/L can be reliably detected despite inherent variability, and this specific increase is used to define the copper trigger levels. The copper Phase I trigger is reached and copper-specific Phase I actions will be conducted if the average dry season dissolved copper concentration at stations SB3, SB4, SB5, SB7, SB8, SB9 increases from 3.2 µg/L (overall dry season mean from indicator stations during the period June 1997 to November 1998) to 4.0 µg/L. The copper Phase II trigger is reached and Phase II actions will be conducted if the dry season mean concentration of the indicator stations increases further to 4.4 µg/L. This 0.4 µg/L change can still be detected with reasonable statistical certainty to justify the more aggressive Phase II actions.

For nickel, an increase in dry season dissolved concentration of 2.0 µg/L can be reliably detected despite inherent variability, and this increase is used to define the trigger levels for nickel. The nickel Phase I trigger is reached and Phase I actions will be conducted if the average dry season dissolved nickel concentration at stations SB3, SB6, SB7, SB8, SB9, SB10 increases from 4.0 µg/L (overall dry season mean from indicator stations during the period June 1997 to November 1998) to 6.0 µg/L. The nickel Phase II trigger is reached and Phase II actions will be conducted if the dry season mean dissolved concentration from the indicator stations increases another 2.0 µg/L to 8.0 µg/L. Note that the copper and nickel Phase I and Phase II triggers are well below the site-specific objectives for these metals and reaching the triggers indicates a negative trend in water quality but not impairment of beneficial uses.

The Executive Officer will review the monitoring program results annually and determine whether the trigger values have been reached. The Executive Officer will report findings to the

Regional Board and will notify interested agencies and interested persons of these findings and will provide them with an opportunity to submit their views and recommendations concerning the findings either in written form or at a public hearing.

If the trigger values for ambient copper and nickel concentrations have not been exceeded, the monitoring program will continue to provide information for the next review period. The Regional Board shall evaluate performance of the monitoring program during the annual review to determine if the necessary information is being provided.

III (b). Baseline Actions

These actions are already being implemented through the NPDES permits and will continue until the Regional Board directs otherwise through the permitting process. These actions include: 1) pollution prevention and control actions by public agencies; 2) actions to conduct or track special studies that address specific technical areas of uncertainty (the toxicity of copper to phytoplankton, copper and nickel cycling in Lower South SF Bay, sediment toxicity, and uncertainties in loading estimates); and 3) planning-type studies to track, evaluate, and/or develop additional indicators and associated triggers (i.e., indicators for growth, development, or increased use or discharge of copper and nickel in the watershed).

Baseline Actions Conducted by Municipal Wastewater Dischargers

Baseline actions applicable to municipal wastewater dischargers are actions associated with implementation of reasonable treatment, source control, and pollution prevention measures to limit discharges of copper and/or nickel.

In the consideration of the site-specific objectives for copper and nickel, the “Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California” (SIP) requires that dischargers demonstrate that they are implementing reasonable treatment, source control, and pollution prevention measures for these metals. The Regional Board found that continuation of baseline actions satisfies this requirement as long as the copper and nickel trigger levels are not reached in Lower South SF Bay. Pollution prevention and minimization are a significant part of these dischargers’ efforts to limit the discharges of copper and nickel. These dischargers have approved Pretreatment Programs and have established Pollution Prevention Programs under the requirements specified by the Regional Board in their NPDES permits.

These findings and specific baseline actions are already being implemented through the NPDES permits for these dischargers (Order No. 00-108, October 2000). The municipal wastewater dischargers are required by their permits to maintain these baseline actions and review and report to the Regional Board on their implementation on an annual basis. Modifications to the current baseline actions may be considered through the permit process, provided that these dischargers demonstrate to the Regional Board that such modifications are consistent with maintaining reasonable treatment, source control, and pollution prevention measures.

Baseline Actions Conducted by Urban Runoff (Municipal Stormwater) Dischargers

The Urban Runoff Management requirements (see later section titled “Urban Runoff Management”) and specific copper and nickel baseline actions have been required by the NPDES permit for these dischargers since March 2001 (Order No. 01-024). These

requirements include actions associated with implementation of controls to reduce copper and/or nickel in discharges to the maximum extent practicable, actions associated with prohibiting discharges other than stormwater to storm drain systems and waterways, and actions associated with monitoring to evaluate effectiveness of controls, identify sources of pollutants, and to measure or estimate pollutant concentrations and loads. On an annual basis, these dischargers are required to describe the controls that they are implementing and any additional controls that will be implemented. These dischargers are required to provide to the Regional Board detailed descriptions of activities in each fiscal year in annual workplans and associated evaluations and results in annual reports. Modifications to the current baseline actions may be considered through the NPDES permit, provided that the Dischargers demonstrate to Regional Board that such modifications are consistent with maintaining programs that control copper and nickel discharges to the maximum extent practicable in accordance with the requirements of the Regional Board's Comprehensive Control Program for Urban Runoff Management and the Clean Water Act. As long as Lower South SF Bay ambient concentrations of copper and nickel remain below the established Phase I trigger levels, the Regional Board has determined that the baseline actions applicable to urban runoff (municipal stormwater) dischargers satisfy the copper- and nickel-specific requirements of the Comprehensive Control Program for Urban Runoff Management and federal regulations (40 CFR 122.26).

Baseline Actions Conducted by Santa Clara Basin Watershed Management Initiative

As described above, the SCBWMI is a collaborative, stakeholder-participation forum that seeks integration of regulatory and watershed management actions that affect Lower South SF Bay and its tributaries. In addition to the actions required in the NPDES permits for the three municipal wastewater dischargers and the municipal urban runoff dischargers, there are other non-regulatory, collaborative actions that the SCBWMI and participants have committed to implement. These collaborative actions are described in attachments to the NPDES permit for the SCVURPPP and include: establishing a forum on transportation issues and impervious surfaces and for reviewing the appropriateness of transportation control measures with a view toward reducing traffic congestion; implementing measures to improve classification and assessment of watersheds; establishing an environmental clearinghouse of information related to tracking and disseminating new scientific information related to copper toxicity, loadings, fate and transport, and impairment of aquatic ecosystems; and planning-type studies to track, evaluate, and/or develop additional indicators to use and future potential indicators and triggers (i.e., indicators for growth, development, or increased use or discharge of copper and nickel in the watershed). In addition, the SCBWMI serves as a stakeholder participation forum to track, review, and evaluate the baseline actions required by the NPDES permits.

III (c). Phase I Actions

Phase I actions are already specified in the NPDES permits for municipal wastewater and stormwater dischargers. These actions are implemented when the mean value of selected monitoring parameters exceeds specified Phase I water quality triggers. The exceedance of the Phase I trigger indicates a negative trend in water quality and not impairment. Phase I actions consist of both specific remedial actions and planning for implementation of future actions if the Phase II triggers are exceeded.

If the Phase I copper or nickel triggers are exceeded, the Regional Board will consider execution of Phase I and Baseline actions as satisfying both the SIP requirement that municipal wastewater dischargers are implementing reasonable treatment, source control, and pollution prevention measures for copper and nickel and the Basin Plan requirement that municipal stormwater dischargers are implementing controls to reduce copper and/or nickel in discharges to the maximum extent practicable. Within 90 days after the determination of Phase I trigger exceedance, the Regional Board expects both the municipal wastewater and municipal stormwater dischargers to submit, for Executive Officer concurrence, their proposed Phase I plans with implementation schedules to implement additional measures to limit their relative cause or contribution to the exceedance. This submittal should, at a minimum, include evaluation of the Phase I actions and development of a Phase II plan. If the submittal is not received within 90 days of the determination of Phase I trigger exceedance or is not being implemented in accordance with the dischargers' implementation schedule following the Executive Officer's concurrence, the Regional Board may consider enforcement action to enforce the terms of the dischargers' permits.

III (d). Phase II Actions

Phase II actions are already specified in the NPDES permits for municipal wastewater and stormwater dischargers. Phase II actions are implemented when the mean value of selected monitoring parameters exceeds specified Phase II water quality triggers. Phase II actions are intended to reduce controllable sources further to maintain compliance with the site-specific water quality objectives.

If the Phase II copper or nickel triggers are exceeded, the Regional Board will consider execution of Phase II, Phase I and Baseline actions as satisfying both the SIP requirement that municipal wastewater dischargers are implementing reasonable treatment, source control, and pollution prevention measures for copper and nickel and the Basin Plan and Clean Water Act requirement that municipal stormwater dischargers are implementing controls to reduce copper and/or nickel in discharges to the maximum extent practicable. Within 90 days after the determination of Phase II trigger exceedance, the Regional Board expects the dischargers to submit, for Executive Officer concurrence, the proposed Phase II plans with implementation schedules to implement additional measures to limit their relative cause or contribution to the exceedance. If the submittal is not received within 90 days of the determination of Phase II trigger exceedance or is not being implemented in accordance with the dischargers' implementation schedule upon the Executive Officer's concurrence, the Regional Board may consider enforcement action to enforce the terms of the dischargers' permits.

III(e). Metal Translators Applicable to Lower South SF Bay Municipal Wastewater Dischargers

An important regulatory element of the WQAS is the specification of metal translators applicable to the three Lower South SF Bay municipal wastewater dischargers. When the NPDES permits are re-issued, concentration-based effluent limits for these three facilities will be calculated from the chronic copper and nickel SSOs. Water quality objectives for copper and nickel are expressed as dissolved metal concentrations. Effluent limits for the POTWs are expressed as total metal concentrations and must be calculated according to the procedure outlined in the SIP.

Therefore, for metals like copper and nickel, the calculation of the effluent limit requires the use of a ratio of total to dissolved metal called the metal translator.

Analyses of data from 12 monitoring stations in Lower South SF Bay (Dumbarton to sloughs) collected from February 1997 to August 2000 and including dissolved and total copper and nickel, total suspended solids (TSS), and tidal data, showed a strong TSS dependence. The statistical analyses explored relationships between translator values and TSS, tide, site, and season. Linear regression with log-transformed dissolved fraction (translator) and TSS data provided the best regression fit. The best-fit regression line and its 95% confidence intervals provided the basis for translator values for copper and nickel.

USEPA guidance (USEPA Office of Water, June 1996. The Metals Translator: Guidance for Calculating a Total Recoverable Permit Limit from a Dissolved Criterion. EPA 823-B-96-007) states that, when there is a relationship between the translator and TSS, regression equations should be used to develop translator values using representative TSS values for the site under consideration. There is a fairly wide variation in TSS, and the guidance on translator development suggests using a representative TSS value. In Lower South SF Bay, a median TSS value may not account for the higher translator values and dissolved metal levels that result during high TSS episodes. For this reason, copper and nickel translators computed from 95% confidence interval TSS values were used to develop the POTW effluent limits. A copper translator of 0.53, and a nickel translator of 0.44 resulted from this procedure. Using the 95% confidence interval translator provides an additional measure of beneficial use protection in that effluent limits, expressed at total metal, will be lower using a higher value for metal translators. These translators shall be used to compute copper and nickel effluent limits for POTWs discharging to the Lower South SF Bay when NPDES permits for Lower South SF municipal wastewater dischargers are reissued.

~~Project Element 4 – page 4-13 under section ‘BACKGROUND CONCENTRATIONS’~~

~~Discharges to the South Bay south of the Dumbarton Bridge face unique challenges owing to the physical and chemical features of this southern portion of San Francisco Bay. As such, the Regional Board may be willing to consider alternative effluent limits for these discharges. are not obligated to comply with the effluent limits contained in Table 4-3 because of their unique situations as described in Chapter 3. However, in such cases, the discharger would be they are obligated to perform specific, detailed work identified in the Municipal Facilities section of this chapter that will result in the development of site-specific water quality objectives, effluent limits, and other control measures.~~

~~When appropriate, The the Regional Board will adopt schedules for developing site-specific water quality objectives and for possibly revising effluent limits when it considers the requests of the South Bay dischargers for exemptions from the discharge prohibitions for their current locations.~~

Project Element 5 – after page 4-18 under section ‘SOUTH BAY MUNICIPAL DISCHARGERS (SAN JOSE/SANTA CLARA, PALO ALTO, AND SUNNYVALE)’

In 1988, the Regional Board identified the following issues that needed further study in the South Bay. As part of the reissuance of the South Bay NPDES permits, the Regional Board required the three South Bay dischargers to address these issues.

- Identify the sources of metals to the WPCPs;
- Assure the quality of WPCP laboratory measurements;
- Evaluate existing WPCP performance relative to the removal of metals and evaluate the feasibility and cost effectiveness of new processes;
- Initiate laboratory and field investigations relative to establishing site-specific numerical receiving water objectives for copper, nickel, and mercury;
- Monitor conversion of saltwater marshes to freshwater marshes adjacent to the point of discharges;
- Evaluate the City of San Jose and Sunnyvale WPCP sludge lagoons;
- Establish an avian botulism monitoring and control program for the City of Sunnyvale treatment ponds and discharge area in the slough; and
- Evaluate WPCP ammonia removals.

Based on the results of these studies, the Regional Board amended the NPDES permits for the three South Bay dischargers on several occasions.

In 1989, San Francisco Bay south of the Dumbarton Bridge (South Bay) was designated by U.S. EPA as an impaired water body under Section 304(l) of the Clean Water Act due to anthropogenic inputs of seven metals. The three municipal plants and stormwater runoff were designated as sources contributing to the impairment. As of 1994, the wastewater effluents of the three plants routinely exceeded the concentration limit for copper and occasionally exceed the limits for other metals, such as nickel. South Bay monitoring data collected by the dischargers from 1989 to 1992 indicate that U.S. EPA water quality criteria for copper, nickel, and mercury ~~are-were~~ regularly violated in the receiving waters south of the Dumbarton Bridge.

~~The Basin Plan prohibits the discharge of wastewater to San Francisco Bay south of the Dumbarton Bridge, as well as prohibiting the following:~~

- ~~• Discharge without initial dilution of at least 10 to 1;~~
- ~~• Discharge into any dead-end slough; and~~
- ~~• Discharge of any conservative toxic and deleterious substances above the levels that can be achieved by a program acceptable to the Regional Board.~~

~~The beneficial uses of San Francisco Bay, South Bay (south of the Dumbarton Bridge) and contiguous water bodies are defined in the to be:~~

- ~~Water-contact recreation~~
- ~~Non-contact water recreation~~
- ~~Wildlife habitat~~

~~Preservation of rare and endangered species
Estuarine habitat
Fish migration
Fish spawning (potential use)
Industrial service supply
Shellfish harvesting
Navigation
Commercial and sport fishing~~

~~Contiguous water bodies of the South Bay in the vicinity of the discharge include freshwater and saltwater sloughs such as Artesian Slough, Coyote Slough, Mud Slough and Coyote Creek. Beneficial uses of the sloughs have been established based on the beneficial uses formally identified for the South Bay. However, beneficial uses specific to the sloughs need to be assessed to determine which uses exist or potentially could exist. Until such determination is made, Regional Board policy has been to use the tributary rule to interpret which beneficial uses are currently or potentially supported where beneficial uses have not been specifically designated.~~

The existing discharge locations for Lower South SF Bay municipal wastewater dischargers are contrary to Basin Plan policy concerning discharge prohibitions (listed in Table 4-1). Exceptions to the first three of these prohibitions are discussed in the later section “Discharge Prohibitions Applicable Throughout the Region”.

State Board Order WQ 90-5 (1990) found that a net environmental benefit exception to these prohibitions could not be made for the three South Bay municipal dischargers. However, the order found that a finding of equivalent protection can be made if water quality-based concentration limits for metals and revised mass loading limits for metals are placed in the dischargers’ NPDES permits, if Sunnyvale and San Jose/Santa Clara continue avian botulism control programs, and if San Jose/Santa Clara implements mitigation for loss and degradation of endangered species habitat. Order 90-5 also included provisions that would prevent increases in flows that would adversely impact endangered species habitats.

In an effort to demonstrate net environmental benefit, the three South Bay municipal dischargers participated in a five-year Water Quality Monitoring Study conducted by the South Bay Dischargers Authority. Based on that study, the Regional Board found that water quality enhancement occurs due to localized increase of receiving water dissolved oxygen and the flushing effects of the discharge. These effects enhance beneficial uses of non-contact recreation, estuarine habitat, commercial and sport fishing. A finding of net environmental benefit was denied by the State Board, however, based on the impacts of fresh water flow on salt marsh habitat and the uncertainties of the impacts of nutrient and metals loading on beneficial uses. The conversion of salt marsh to brackish or fresh water marsh threatens the habitat of two endangered species (California clapper rail and salt marsh harvest mouse). State Board Order WQ 90-5 directed the San Jose/Santa Clara treatment plant to mitigate for degradation of endangered species habitat. As of December 2001, the three principal issues of WQ 90-5 have been addressed in the following fashion.

Water-Quality Based Effluent Limits

The Regional Board has amended and reissued permits to the South Bay municipal dischargers to provide equivalent protection. On April 17, 1991, the NPDES permits of the three South Bay Municipal Dischargers were amended to include water quality-based concentration limits and revised mass loading limits for metals, as directed by State Board Order WQ 90-5.

Avian Botulism

Annual avian botulism control program reports are provisions of the Sunnyvale and San Jose/Santa Clara permits. These two dischargers have conducted an avian botulism control program by monitoring Artesian Slough, Guadalupe Slough, Coyote Creek, and Alviso Slough for the presence of avian botulism since 1982. Outbreaks of avian botulism as well as other diseases have been controlled by the prompt removal of sick and dead vertebrates. The discharger also supports the collection of bird and other wildlife data, in conjunction with the avian botulism program, to better understand the potential beneficial and detrimental impacts of the discharge on the associated habitat.

Mitigation for loss of endangered species habitat and prevention of flow increases

On March 6, 1991 the San Jose/Santa Clara treatment plant submitted an "Action Plan", with a request that the Action Plan be accepted by the Regional Board as fulfillment of the State Board requirement for a discharge flow limit. In Resolution 91-152, the Regional Board stated that the Action Plan (revised), dated September 30, 1991, fulfilled the intent of the State Board Order WQ 90-5 requirement to limit flows from the San Jose/Santa Clara Water Pollution Control Plant to a level that will halt any further loss or degradation of endangered species habitat. The Resolution contained a provision requiring a Regional Board hearing to consider adopting a 120 million gallon per day average dry weather effluent flow (MGD ADWEF) discharge limit if delays occur that threatened the timely completion or implementation of reclamation projects, or if ADWEF exceed 120 MGD. By letter dated November 26, 1991, the State Board found Resolution 91-152 to be consistent with Order WQ 90-5.

On September 18, 1996 the Regional Board adopted Resolution 96-137, which accepted the discharger's proposal for wetland loss mitigation as required by Provision 6.1 of Order No. 93-117 and requested State Board concurrence that the proposal fulfilled mitigation requirements contained in WQ 90-5. By letter dated October 10, 1996, the State Board concurred that the proposal satisfied requirements of Order WQ 90-5 pertaining to salt marsh conversion.

In 1996, the ADWEF of 132 MGD triggered the requirement in Resolution 91-152 for the Regional Board to hold a hearing. On December 18, 1996 the Regional Board held a hearing on this issue. It considered three options: 1) amend the NPDES permit to limit flows to 120 MGD ADWEF; 2) direct the discharger to propose an alternative solution by June 1997; and 3) no action. The Regional Board adopted the second option (Order No. 97-111). Also at the December 1996 hearing, the Regional Board directed the discharger to conduct a wetland conversions assessment in 1997.

Responding to the 120 MGD ADWEF flow limit, On May 28, 1997, the San Jose/Santa Clara treatment plant submitted the South Bay Action Plan (SBAP) to the Regional Board. The SBAP proposed both near and long-term solutions to reduce the discharge: 1) two projects to begin in the near term (1997-98), (i.e. public education aimed at water conservation and on-site reuse) 2) A third near term project of wastewater diversion to the Sunnyvale treatment plant is under investigation. 3) Seven long-term projects to be completed between 1997 and 2002: indoor water conservation, two expanded water recycling projects, industrial water recycling, inflow/infiltration reduction, and two environmental enhancement projects. Total costs of these projects were estimated to be \$150 million and were expected to reduce effluent flows by up to 60 MGD.

The results of a wetlands conversions assessment were submitted on November 30, 1997. The assessment indicated that there were no significant additional salt marsh conversions between 1996 and 1997 and if data are compared to the baseline period of 1989-1991, an increase of 1.3 acres of salt marsh conversion had occurred. It is the intent of the Regional Board to require appropriate mitigation for any wetland losses due to the discharge. Appropriate mitigation shall be determined after consultation with appropriate resource agencies and other interested parties.

Recent Developments for copper and nickel

Starting in 1998, technical studies were initiated to assess the impairment status of South San Francisco Bay south of the Dumbarton Bridge with respect to copper and nickel and determine appropriate site-specific objectives for dissolved ambient concentrations of these two metals. It was determined that impairment of beneficial uses due to these metals is unlikely and recommended ranges of site-specific objectives were established. The site-specific objectives resulting from this work are given in Table 3-3, and the Water Quality Attainment Strategy to support these objectives is described earlier in this Chapter.

~~On September 30, 1991, the City of San Jose proposed the “Action Plan,” which was developed to fulfill the endangered species habitat protection requirement. The Action Plan consists of programs for salt marsh conversion mitigation as well as ambitious water conservation and reclamation projects. The Action Plan was accepted by the Regional Board in Resolution 91-152 in lieu of the 120 MGD flow restriction. However, Resolution 91-152 allows for reconsideration of the flow cap if certain conditions of the Action Plan are not met by the discharger. Provisions of the Action Plan are included in the San Jose/Santa Clara NPDES permit as conditions for an exception to the Basin Plan prohibitions.~~

~~In 1991, water quality based permit limits were included in the dischargers’ NPDES permits. These new limits were based on continuing concern regarding ambient and discharged levels of copper, nickel, mercury, and other metals. Because the new limits were frequently exceeded, the Regional Board also adopted enforcement orders concurrent with the adoption of revised NPDES permits in 1993. The enforcement orders establish schedules and a pollution prevention program to achieve compliance with the permit limits for copper, nickel, and cyanide.~~

~~The pollution prevention programs specified in the enforcement order were developed through negotiations between Clean South Bay (a coalition of environmental groups) and the dischargers. Board staff and industrial representatives also participated in the negotiations. These programs~~

represent a second phase of implementation of pollution prevention by the three dischargers. Since the first phase of programs was begun in early 1989, the dischargers have reduced their combined discharge of copper mass by approximately 25 percent, and no longer violate effluent limits for silver. The second phase of programs was designed to control the sources of copper and nickel to the treatment plants from industry, commercial establishments, residences, and copper corrosion from water supply pipes.

In the industrial sector, the dischargers will require industrial firms that contribute the majority of copper and nickel to the treatment plants to conduct (or have conducted for them) pollution prevention audits and to identify cost-effective measures for reducing those discharges. Additionally, the enforcement orders require the dischargers to adopt new local discharge limits for commercial and industrial facilities. All three dischargers are also required to continue and expand their existing source control programs in the commercial and residential sectors, which have focused on best management practices and public education. To address contributions of copper from the water supply, the dischargers have worked cooperatively with a steering committee comprised of water distributors, suppliers, and retailers and (1) evaluated alternative native corrosion inhibitors to reduce copper corrosion from pipes, and (2) examined the feasibility of eliminating the use of copper sulfate as an algicide in drinking water reservoirs.

The negotiations with the largest of the three dischargers, the San Jose/Santa Clara plant (75 percent of the three combined flows), resulted in landmark funding arrangements for pollution prevention. As part of the settlement agreement with Clean South Bay, the City of San Jose will establish a capital fund of \$2 million to assist small businesses with their investment in cost-effective pollution prevention measures identified by the required audits. The city will also pay \$375,000 to establish a Pollution Prevention Center, which accounts for any violations of copper, nickel, or silver that may have occurred or may occur between April 17, 1991, and October 20, 1998. The Center will function as an information clearinghouse for best available pollution prevention technologies. These measures will facilitate pollution prevention strategies that will benefit both the economy (cost-effective control strategies) and the environment (reduced mass discharge) in the long term.

The enforcement orders contain compliance schedules for specific mass and concentration limits. The compliance schedules were developed to correspond with the required pollution prevention measures and to provide sufficient time for the measures to be implemented and subsequent reductions in mass and concentration to be realized. As of 1994, effluent data from all three plants continue to show substantial improvements with regard to both mass and concentration of metals discharged. These effluent quality improvements may be related to a combination of successful pollution prevention efforts and innovative experimentation with treatment plant operations. In addition, monitoring results from the 1993 Regional Monitoring Program indicated that ambient water concentrations of mercury and copper in the lower portion of the South Bay did not exceed levels of concern. Water column levels of nickel did exceed the objective at one South Bay station. The Regional Board will continue to assess the long-term trends in ambient levels of metals in this segment of the Bay.