Draft

# Substitute Environmental Document

Total Residual Chlorine and
Chlorine-Produced Oxidants Policy of California

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STATE WATER RESOURCES CONTROL BOARD
CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

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**ACRONYMS**

| | |
|---|---|
| ACL | Administrative Civil Liability |
| AMEL | Average Monthly Effluent Limits |
| BAT | Best Available Technology |
| BMP | Best Management Practices |
| CCC | Criterion Continuous Concentration |
| CCR | California Code of Regulations |
| CEQA | California Environmental Quality Act |
| CFR | Code of Federal Regulations |
| CIWQS | California Integrated Water Quality System |
| CMC | Criteria Maximum Concentration |
| CPO | Chlorine Produced Oxidants |
| CTR | California Toxics Rule |
| CV | Coefficient of Variation |
| CWA | Clean Water Act |
| CWC | California Water Code |
| CWEPPA | Clean Water Enforcement and Pollution Prevention Act |
| EIR | Environmental Impact Report |
| HOBr | Hypobromous Acid |
| HOCL | Hypochlorous Acid |
| MDEL | Maximum Daily Effluent Limits |
| mg/L | Milligrams Per Liter |
| MP | Management Practices |
| MMPs | Mandatory Minimum Penalties |
| MS4 | Municipal Separate Storm Sewer Systems |
| ND | Non-Detect |
| NPDES | National Pollutant Discharge Elimination System |
| NPS | Nonpoint Source |
| NPS Policy | Policy for Implementation and Enforcement of the Nonpoint Source Pollution Control Program |
| O & M | Operations and Management |
| OAL | Office of Administrative Law |
| OBr- | Hypobromous Ion |
| Ocean Plan | California Ocean Plan |
| OCL- | Hypochlorite Ion |
| POTW | Publicly Owned Treatment Works |
| ppb | Parts Per Billion |
| ppm | Parts Per Million |
| PVC | Poly(vinyl chloride) |
| ~~QRL~~ | ~~Quantification Reporting Limit~~ |
| SAIC | Science Applications International Corporation |
| SB 709 | Senate Bill 709 (CWC Section 13385) |
| SED | Substitute Environmental Document (formally known as the Functional Equivalent Document (FED)) |
| SIP | Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California |
| $SO_2$ | Sulfur Dioxide |
| SSOs | Site-Specific Objectives |
| SWIM | System for Water Information Management |
| SWMP | Storm Water Management Plan |
| TALU | Tiered Aquatic Life Uses |

| | |
|---|---|
| TMDL | Total Maximum Daily Load |
| TRC | Total Residual Chlorine |
| TSD | Technical Support Document for Water Quality-Based Toxics Control |
| Ug/L | Micrograms Per Liter |
| USFS | United States Forest Service |
| U.S.C. | United States Code |
| U.S. EPA | United States Environmental Protection Agency |
| UV | Ultra Violet |
| WDR | Waste Discharge Requirement |
| WQO | Water Quality Objective |
| WET | Whole Effluent Toxicity |
| WQBEL | Water Quality-Based Effluent Limitations |

# DRAFT SUBSTITUTE ENVIRONMENTAL DOCUMENT

TOTAL RESIDUAL CHLORINE AND
CHLORINE-PRODUCED OXIDANTS POLICY OF CALIFORNIA

## INTRODUCTION

Chlorine is often used to eliminate harmful microorganisms in drinking water and in sewage treatment plants. Chlorine is also used widely as a sanitizer for cooling systems/towers, ammonia plants, pulp mills, textile mills, oil fields, scrubbing systems, and odor-control systems. Although chlorine is a cost-effective means of disinfection in water treatment and in industrial processes, chlorine residual in water discharges has detrimental effects on aquatic life both in freshwater and saltwater environments. Additionally, chlorine residual is known to have injurious long-term effects on overall aquatic ecosystems. Thus, every discharger that uses chlorine has the potential to cause acute toxicity. Therefore, a chlorination-dechlorination process must be used and maintained.

When chlorine gas is added to freshwater, it undergoes hydrolysis to produce two forms of free chlorine: hypochlorous acid (HOCL) and hypochlorite ion (OCl-). Free chlorine reacts readily with ammonia, which then forms combined chlorine: monochloramine and dichlormine. Both free and combined chlorine may be present simultaneously. Therefore, the term "total residual chlorine" (TRC) is used to describe the sum of free chlorine and combined chlorine (U.S. Environmental Protection Agency [U.S. EPA], 1984).

A review of available literature reveals considerable amounts of information supporting TRC effects on aquatic organisms. Many toxicity values are less than or equal to 1 milligram per liter (mg/L) (U.S. EPA, 1994). Specifically, concentrations less than 0.1 mg/L were found to be toxic to Fathead minnows, *Daphnia magna, Daphnia pulex, Nitocra spinipes*, rainbow trout, brook trout, small mouth bass, and green sunfish (Bureau of Water Management, 1971; Brungs, 1973; AQUIRE, 1994; and Wan et.al., 2000). Further studies revealed that sensitive species such as brook and brown trout were no longer found in waters with residual concentrations of 0.02 mg/L. *Daphnia magna* died at concentrations of 0.014 mg/L and *Nitorcra spinipes* reproduction was reduced at 0.012 mg/L. (Brungs, 1973).

To clarify, it is not the amount of chlorine added to a process, but the concentration of residual chlorine that is released into receiving waters that causes toxicity to aquatic life. Coldwater species such as trout, salmon, and some fish food organisms are more sensitive to TRC than those warm water species such as snails and crayfish. Chlorine toxicity depends on water temperature, pH levels, nitrogenous compounds, and the presences of organic matter. In the 1996 study, it was shown that concentrations of TRC at night could be 3 times greater than those measured during midday and can be driven by a combination of sunlight and periphyton (Steward et. al., 1996). This is further discussed in Chapter 2 of this document.

In saltwater, chlorine atoms can be completely or partially replaced by bromine atoms. This reaction produces three reactive compounds: hypobromous acid (HOBr), hypobromous ion

(OBr), and bromamines. Therefore, the term "chlorine-produced oxidants" (CPO) is used to describe the sum of oxidative products in saltwater (U.S. EPA, 1984).

Many migratory species such as striped bass, king salmon, American shad, and steelhead populations move through the Bay Delta watersheds to spawn. Available literature reveals that chlorinated seawater affects osmoregulatory and respiratory functions in these species. Further, CPO can damage gill filaments and energy output. Gill, liver, kidney, and haematologic damage can be witnessed, and further evidence shows that an avoidance response does not always protect marine fish from toxic effects of CPO (Hose, 1983). Exposure to chlorinated effluent in saltwater has shown reductions of hemoglobin and hematocrit to levels indicative of anemia due to the oxidative nature of chlorine. Fish show a response to lethal levels of CPO with erratic body and respiratory movements, loss of fright response, and lethargy of movement before eventually losing equilibrium (Buckley, 1976).

Based on oyster embryo survival from fertilization to the straight-hinge stage, the Lethal Concentration 50 (LC50) for CPO in estuarine water is estimated to be 0.023 mg/L (Roberts and Casey, 1985). High salinity and CPO exposure increases toxicity to invertebrates and vertebrates. During cooler seasons, chlorine sensitive species may actually be attracted to the heated effluent of power plants, further increasing mortality in aquatic organisms. Chlorine residual has severe adverse effects on overall water ecosystems. Chlorination at low levels or 0.05 to 0.15 mg/L has been shown to result in significant species shifts and overall composition of marine phytoplankton communities (HSDB, 1994).

Dechlorination is used to reduce environmental risk and when done correctly eliminates residual toxicity caused by the use of chlorine. It is the Water Boards intent that, it its operations, the discharger will control processes to reduce chlorine residual processes as close to zero as practicable in order to protect the beneficial ~~The~~uses. The use of sodium bisulfite, sodium thiosulfate, and sulfur dioxide are all compounds that can be used to eliminate toxicity of chlorine residual. Dechlorination minimizes the effect of potentially releasing disinfection byproducts by removing the free or total combined chlorine residual remaining in the wastewater after chlorination. There are chlorine-free alternatives to many chlorine applications.

The use of ultraviolet light (UV) or ozone in water purification can be a viable alternative to chlorine dioxide use. Many industries and wastewater treatment plants in California have already discontinued the use of chlorine in their treatment process. Some industries that use chlorine in the production of Polyvinyl chloride (PVC) for bottling beverages have converted use to a chlorine-free plastic. Many Publicly Owned Treatment Works (POTW's) are moving to UV disinfection to eliminate chlorine residual toxicity all together. Although many chlorine-free alternatives are viable, some alternatives can be more costly than others. However, all environmental options should be explored to decrease chlorine residual toxicity to ensure aquatic life beneficial uses are being met.

There are several approved analytical methods that are suitable to use for measuring chlorine residual. Currently, U.S. EPA allows methods 330.1 – 330.5 to be used for measuring chlorine residual. Quantification limits depend on several factors: (1) quality of the sample; (2) size of burette; (3) strength of titrant; and (4) the end point. The range of equipment sensitivity can be from 0.2 mg/L (200 parts per billion [ppb]) to 0.0051 mg/L (5.1 ppb). Continuous monitoring is

already in use for some dischargers located throughout the State. Standards Method 4500-Cl E enables monitoring with methods that are more sensitive than the measurement capabilities of Part 136 methods.

Due to chlorine and chlorine residual's acute toxicity to aquatic life, the Regional Water Quality Control Boards (Regional Water Boards) have regulated chlorine discharges. Chlorine regulation became more complex when the Legislature enacted the Clean Water Enforcement and Pollution Prevention Act of 1999 (Senate Bill [SB] 709), which became effective on January 1, 2001. SB 709 added several provisions to Division 7 of the California Water Code (CWC) that address pollution prevention plans (CWC §13263.3), Mandatory Minimum Penalties (MMPs) (CWC §13385), recovery of economic benefits in assessing civil liabilities (CWC §13385), and a requirement to prescribe effluent limitations (CWC §13263.6). These provisions presented challenges for the enforcement programs of the Regional Water Boards. The approach for determining violations of chlorine residual requirements for National Pollutant Discharge Elimination System (NPDES) permittees, who are required to conduct continuous monitoring, is a main concern of the Regional Water Boards.

Currently, interpretation of a violation and determination of MMPs is difficult for both dischargers and Regional Water Board staff. In many cases, monitoring systems used for chlorine residual compliance and control purposes are subject to occasional spikes, which may be an artifact. In the past, Regional Water Boards exercised their discretion to not institute enforcement actions for minor chlorine residual violations where the dischargers demonstrated that the violation was due to a spike occurrence of the equipment and not an actual chlorine excursion. However, with the implementation of SB 709, the ability to interpret violations has been greatly limited for the Regional Water Boards, subjecting dischargers to multiple MMP enforcement actions when, in fact, the violations may be a monitoring artifact.

Today dischargers are required to provide grab samples only once a day, week, or, in some cases, even just once a year, to identify chlorine residual in their effluent. This approach does not yield data that is representative of the discharge and could result in adverse impacts on aquatic life beneficial uses. All nine Regional Water Boards use different methods for establishing chlorine residual limits. Permits may contain different language for addressing chlorine, leading to a lack of consistency. A statewide chlorine Policy for TRC and CPO is needed to promote consistency and improve clarity.

***Public Participation***

On December 1, 1999, the State Water Resources Control Board (State Water Board) received a copy of a letter from Bay Area Dischargers Association with concerns over the passage of SB 709 and the dischargers' ability to comply with chlorine residual permit requirements. SB 709 limits the Regional Water Boards enforcement discretion when considering violations and minimum fines. Additional letters were sent directly to the State Water Board from Tri-TAC and CASA member agencies with similar concerns and suggested solutions for addressing the problem. A final letter was sent from Loretta Barsamian, former Executive Officer of the San Francisco Bay Regional Water Board, supporting the preparation of a statewide Policy to address all issues associated with chlorine residual.

In response to the letters received, in September 2002, the State Water Board began to prepare statewide chlorine residual standards and an implementation Policy.

***Interested Parties***

In March 2003, a workgroup was organized to identify viable options to regulate TRC and CPO. The workgroup consisted of representatives from the Regional Water Boards, the State Water Board, dischargers, and environmental participants, as well as U.S. EPA and the California Department of Fish and Game. The discussions centered on statewide consistency, aquatic life protection, implementing U.S. EPA's 304(a) criteria recommendations, and methods for determining compliance with chlorine discharges.

The purpose of the workgroup was to gain a shared understanding of some of the general issues surrounding the development of an implementation Policy for chlorine discharges, as well as to discuss options for addressing the identified issues. There were no set guidelines for these discussions so that all ideas could be considered. The group was designed solely for information gathering. The discussion group examined the issues related to the challenges of determining compliance with effluent limits. Input from each Regional Water Board was requested to develop a balanced implementation Policy that would address statewide concerns. The suggested ideas had to take into consideration issues such as interpretation of a violation, enforcement of MMPs, equipment and lab capabilities, dechlorination practices, and meeting aquatic life beneficial uses.

***Scoping Meeting***

A California Environmental Quality Act (CEQA) scoping meeting was conducted to provide a forum for early public consultation on the preparation of this Substitute Environmental Document (SED). The scoping meeting was held on July 7, 2005 at the Cal/EPA Headquarters Building in Sacramento. Comments both written and oral were provided by stakeholders to help determine the scope and content of the environmental information required by federal and state regulations. The scoping meeting helped to identify the range of actions, alternatives, mitigation measures, and significant effect found within this document.

***Additional Stakeholder Meetings***

During the CEQA scoping meeting, stakeholders requested additional stakeholder meetings to discuss further alternatives to the proposed Policy. State Water Board members Tam Doduc and Peter Silva concurred. Meetings were held on September 26, 2005 in Northern California at East Bay Municipal Utility District located in Oakland and on September 29, 2005 at Metropolitan Water District Headquarters in Los Angeles. Further alternatives were discussed adding additional information to this document.

***"Test Drive"***

On December 13, 2005, the State Water Board released an informal "test drive" version of the *Total Residual Chlorine and Chlorine-Produced Oxidants Policy of California* (proposed Policy). The purpose of the "test drive" was to provide the public with an informal review of the revised proposed draft and to provide an opportunity for interested parties to "test drive" the proposed Policy prior to, but <u>not</u> in lieu of, the official public process and prior to a State Water Board hearing.

Test-driving the draft proposed Policy allowed each discharger an opportunity to understand the aspects of implementation specific to their facility and provide a better understanding of the requirements that may be imposed on chlorine users. Additionally, this informal process allowed dischargers that currently have continuous monitoring capabilities to supply supporting monitoring data with all comments to help further refine the proposed Policy. State Water Board staff received 13 comment letters in response to the informal test drive.

***Purpose of the SED***

This document presents the State Water Board analysis of the need and alternatives for the proposed Policy. This draft SED discusses alternatives for TRC and CPO objectives, as well as implementation of those objectives for inland surface water, enclosed bays, and estuaries of California[1]. The State Water Board is subject to CEQA when adopting sState pPolicy for water quality control. CEQA authorizes the Secretary of the Resources Agency to certify a regulatory program of a sState agency to be exempt from the requirements of preparing an Environmental Impact Report (EIR), Negative Declaration, and an Initial Study, if certain conditions are met. The process that the State Water Board is using to adopt the proposed Policy has received certification from the Resources Agency to be "functionally equivalent" to the CEQA process (Title 14, California Code of Regulations (CCR), §15251 (g)). Thise report fulfills the requirements of CEQA for preparation of an environmental document. The environmental documents required are described in section 3777, tTitle 23, California Code of Regulations (CCR) 3720 et. seq. The environmental impacts that could occur as a result of the proposed actions are addressed in "Environmental Effects of the Proposed Policy," and summarized in "Environmental Check Form," of this document.

***Background of Regulations***

In 1972, Congress enacted the Clean Water Act (CWA) to restore and maintain the chemical, physical, and biological integrity of the Nation's waters (United States Code (U.S.C.) § 1251(a)). To achieve this goal, Congress created the NPDES permit program to regulate point source discharges of pollutants to surface waters. Permits must contain effluent limitations reflecting pollution reduction achievable through technology. They also must include any more stringent limitations that are necessary to ensure that receiving waters meet water quality standards (33 U.S.C. §1311(b)(1)(A), (B), and (C)).

Water quality standards consist of designated uses for State waters, water quality criteria to protect those uses, and an anti-degradation pPolicy. Under the CWA, the states are primarily responsible for the adoption and periodic review of water quality standards.

All water bodies have various uses associated with human activity and other life forms, e.g. aquatic life. These uses are referred to as beneficial uses. Under the CWC, designation of beneficial uses is required in both rRegional wWater qQuality cControl pPlans (Basin Plans) and statewide plans (CWC § 13050 (j)). The CWC defines beneficial uses of water as including, but not limited to: "domestic, municipal, agricultural, and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves" (CWC § 13050 (f)). CWA §303 requires that the states

[1] Surface waters, enclosed bays, and estuaries of California are each defined in "Definition of Terms" section of this document. It is important to note that this proposed Policy does not apply to ocean water, which is also defined in this document.

designate beneficial uses for surface waters, taking into consideration their use for public water supplies and agricultural, industrial, and navigational purposes. Section 101 creates a rebuttable presumption that all waters support recreational uses and the protection and propagation of fish, shellfish, and wildlife.

In 1973, the U.S. EPA authorized the State Water Board and Regional Water Boards to issue NPDES permits. In addition, the State Legislature designated ~~appointed~~ the State Water Board as the State water pollution control agency for all purposes under the CWA. The State Water Board is authorized to adopt water quality control plans for surface waters, for which water quality standards are required under the CWA. Basin Plans are water quality control plans that provide the basis for protecting water quality in California. Water quality standards are mandated by both the CWA and the s~~S~~tate Porter-Cologne Water Quality Control Act (Porter-Cologne).

In addition, the State Water Board is required to adopt s~~S~~tate p~~P~~olicy for water quality control. All Regional Water Board Basin Plans must conform to these policies. State p~~P~~olicy for water quality control includes one or more of: (a) water quality principles and guidelines for long-range resource planning; (b) water quality objectives at key locations for, among other uses, water quality control activities; and (c) other principles and guidelines deemed essential by the State Water Board for water quality control.

**EXISTING REGULATORY CONDITIONS**

The CWA and State law require that the State adopt water quality standards. Currently, there are no statewide standards for TRC or CPO that apply to inland surface waters or enclosed bays and estuaries. Three Regional Water Boards have numeric objectives for chlorine residual in their Basin Plans. The chlorine residual objective for inland surface waters and enclosed bays and estuaries in the Basin Plans for the Los Angeles and Santa Ana regions is 0.1 mg/L. The Basin Plan for the Lahontan region contains a total chlorine residual objective of 0.002 mg/L, as a median value, and a maximum value of 0.003 mg/L. The remaining six Regional Water Boards do not have numeric objectives but rather have narrative toxicity objectives, which provide the basis for regulating chlorine residual discharges. The Basin Plan for the San Francisco Bay region does not include a numeric objective, but Table 4-2, entitled~~:~~ Effluent Limitations for Conventional Pollutants, does include an effluent limit, applicable to all treatment plants, for chlorine residual of 0.0 mg/L as an instantaneous maximum.

The CWA and implementing federal regulations require that NPDES permits include effluent limitations to control all pollutants, including chlorine, where necessary to meet water quality standards. These pollutants are any that may be discharged at a level that will cause, or have the reasonable potential to cause, or contribute to an excursion above any standard, including both narrative and numeric criteria (40 Code of Federal Regulations (CFR) §122.44(d)(1)); see CWA §301(b)(1)(C)). Thus, current law requires that permits include effluent limits for TRC and CPO whenever the discharge of these pollutants can cause or contribute to violation of either a numeric chlorine objective or a narrative objective.

All Regional Water Boards include numeric effluent limits for TRC in NPDES permits with numeric water quality-based effluent limits, where necessary. There are no established procedures for calculating effluent limits for these pollutants that apply statewide. Only the

Basin Plan for the San Francisco Bay region contains a specific limit for TRC that must be included in treatment plant permits. The remaining Regional Water Boards can use available guidance in calculating permit limits; e.g., the *Technical Support Document for Water Quality-Based Toxics Control* (TSD) or the *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (SIP). According to a Science Applications International Corporation (SAIC) survey, the chlorine limits in existing permits range from 0.0 to 650 mg/L.

The NPDES permit regulations require that permit limits for continuous discharges be expressed as maximum daily and average monthly, unless impracticable to do so, for all dischargers other than POTWs. (40 CFR §122.45(d)). Effluent limits in permits for POTWs must be stated, unless impracticable, as average weekly and average monthly. (Ibid.)

Mixing zones are authorized under the CWA if a state's water quality standards or implementation procedures allow them. (40 CFR §131.13). Four of the nine Regional Water Boards have mixing zone provisions in their Basin Plans. In these Regions, chlorine limits can be calculated taking into account dilution, if appropriate.

Similarly, under the CWA, compliance schedules can be included in permits to comply with new, newly revised, or interpreted water quality standards if authorized in a state's standards or implementation procedures. (See *In re Star-Kist Caribe, Inc.* (NPDES Appeal No. 88.5 (May 26, 1992). Several Regional Water Boards, including the North Coast, San Francisco Bay, Santa Ana, Los Angeles, and Central Valley Regional Water Boards, have compliance schedule provisions in their respective Basin Plans. Assuming that a discharger meets the specified conditions to obtain a compliance schedule, the Basin Plans can allow up to ten years for compliance.

The NPDES permit regulations generally require permits to include monitoring requirements for limited pollutants. The permits must specify a monitoring frequency that is "sufficient to yield data which are representative of the monitored activity including, when appropriate, continuous monitoring" (40 CFR §122.48(b)). At present, the Central Valley Regional Water Board typically requires mandatory, continuous monitoring for TRC. The remaining Regional Water Boards may require continuous monitoring on a case-by-case basis.

In addition, monitoring must generally be conducted using test procedures approved in 40 CFR part 136. Approved test methods for chlorine are found in 40 CFR §136.3(a), Table IB, 17 (methods 330.1-330.5). The federal regulations do not explicitly require a back-up monitoring system for TRC or CPO when the existing system is off-line for calibration or maintenance.

The regulatory approach for NPDES-permitted storm water discharges varies from that described above. Section 402(p) of the CWA addresses storm water discharges. In general, permits are required for storm water from industries, construction activities, municipalities, and State and federal facilities. In accordance with U.S. EPA policy and the State Water Board decisive orders, the storm water permits have generally reliedy on an iterative process for implementation of best management practices (BMPs) to achieve water quality standards.

Likewise, the nonpoint source pollution program typically relies on discharger implementation of management practices (MP) to control pollution sources. Nonpoint source pollution results from contact between pollutants and land runoff, precipitation, atmospheric deposition, drainage, seepage, or hydrologic modification. Generally, preventing or minimizing generation of nonpoint source discharges most effectively controls nonpoint source pollution.

In 2004, the State Water Board adopted a Policy for Implementation and Enforcement of the Nonpoint Source Pollution Control Program (NPS Policy). The NPS Policy explains the five key elements that must be included in a nonpoint source pollution implementation program. One key element is a description of the management practices and other program elements that will be implemented to achieve and maintain water quality standards.

***MMPs***

CWC §13385 requires MMPs for specified violations of NPDES permits. For a violation that is subject to a MMP, the Regional Water Board must either assess an a~~A~~dministrative c~~C~~ivil ~~L~~liability (ACL) for the MMP or assess an ACL for a greater amount. CWC § 13385(h) requires that the Regional Water Board for each serious violation assess a MMP of $3,000. A serious violation is any waste discharge that exceeds the effluent limitation for a Group I pollutant by 40 percent or more or a Group II pollutant by 20 percent or more. Groups I and II pollutants are specified in ~~based on~~ Appendix A to Section 123.45 of Title 40 of the CFR. Chlorine is listed as a Group II pollutant.

The CWC contains several exceptions to the MMP requirements. These include exceptions for violations that are caused by acts of war or by an unanticipated, grave natural disaster or other natural phenomenon of an exceptional, inevitable, and irresistible character, or by an intentional act of a third party. Such exceptions do not apply if the violation could have been prevented or avoided by the exercise of due care or foresight by the discharger. Additional exceptions are provided under certain circumstances where the waste discharge complies with a cease and desist order or time schedule order. Likewise, POTWs serving a small community can be exempted from the MMPs.

The Regional Water Boards are required by CWC §13385(i) to assess MMPs of $3,000 per non-serious violation, not counting the first three violations. A non-serious violation occurs if the discharger does any of the following four or more times in any period of six consecutive months:

a. violates a w~~W~~aste d~~D~~ischarge r~~R~~equirement (WDR) effluent limitation~~s~~;
b. fails to file a report of waste discharge pursuant to CWC § 13260;
c. files an incomplete report of waste discharge pursuant to CWC § 13260; or
d. violates a toxicity effluent limitation where the WDRs do not contain pollutant specific effluent limitations for toxic pollutants.

***Water Quality Enforcement Policy***

On February 19, 2002, the State Water Board adopted Resolution No. 2002-0040 approving the revised Water Quality Enforcement Policy (Enforcement Policy). The revised Policy was approved by the Office of Administrative Law (OAL) and became effective on July 30, 2002. The primary goal of the Enforcement Policy is to create a framework for identifying and investigating instances of noncompliance, for taking enforcement actions that are appropriate in

relation to the nature and severity of the violation, and for prioritizing enforcement resources to achieve maximum environmental benefits.

The proposed Policy implements and provides guidance regarding the use by the State Water Board and Regional Water Boards of enforcement powers set forth in Division 7 of the Water Code (commencing at CWC § 13000) and related statutes.

Section III.A.a.ii of the Enforcement Policy states:

> "For discharges of pollutants that are not subject to the State Water Board's "Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California," (SIP) or the California Ocean Plan (Ocean Plan) (e.g., pollutants that are not addressed by the applicable plan) where the effluent or receiving water limitation for a pollutant is lower than the applicable quantitation limit[2], any discharge that: 1) equals or exceeds the quantitation limit; and 2) exceeds the effluent or receiving water limitation by 40 percent or more for a Group 1 pollutant or by 20 percent or more for a Group 2 pollutant, is a priority violation. For violations of effluent limitations only, such discharges would be considered to be serious violations pursuant to CWC §13385(h)(2)(a)."[3]

***The Regional Water Board Basin Plans***

The following Table is a summary of each Regional Water Board Basin Plan regarding water quality criteria for chlorine residual. It is important to note that each permit is tailored to account for the details of a specific discharge. Therefore, Basin Plan language and permit language may differ. Where specific criteria are present, an attempt was made to present them as written in the Basin Plan.



**Table 1.**
**Regional Water Board's applicable water quality standards for Chlorine**

| Regional Board | Criteria | Range of Existing Permit Limits (mg/L)[1] |
|---|---|---|
| North Coast (Region 1) | No specific criteria for chlorine; however, a narrative toxicity objective states that all waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. | 0.0 – 1.5 |
| San Francisco Bay (Region 2) | Instantaneous maximum effluent limit for all treatment facilities of 0.0 mg/L. In most permits, the limit is defined as below the detection limit of methods defined in the latest U.S. EPA approved edition of "Standard Methods for the Examination of Water and Wastewater." | 0.0 |

[2] There are also multiple definitions for the term "quantitation limit." One generally accepted definition for the quantitation limit is the concentration at which a State certified laboratory has determined, with a specified degree of confidence, that the actual concentration of the pollutant present in the sample is within a specified percentage of the concentration reported. For the purpose of this proposed Policy, the applicable quantitation limit is the quantitation limit specified or authorized in the applicable WDRs.

[3] Note that the correct citation is now CWC section 13385(h)(2).

| | | |
|---|---|---|
| Central Coast (Region 3) | No specific criteria for chlorine; however, a narrative toxicity objective states that all waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. | 0.0 – 2.0 |
| Los Angeles (Region 4) | Chlorine should not be present in surface water discharges in concentrations that exceed 0.1 mg/L, and shall not persist in receiving waters at concentrations that impair designated uses. | 0.1 – 0.5 |
| Central Valley (Region 5) | No specific criteria for chlorine; however, a narrative toxicity objective states that all waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. | 0.01 – 4.6 |
| Lahontan (Region 6) | TRC shall not exceed either a median value of 0.002 mg/L or a maximum value of 0.003 mg/L (median values should be based on daily measurements taken during any 6-month period). | 0.011 – 0.019 |
| Colorado River Basin (Region 7) | No specific criteria for chlorine; however, a narrative toxicity objective states that all waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. | 0.01 – 0.02 |
| Santa Ana (Region 8) | Chlorine residual shall not exceed 0.1 mg/L for discharges to inland surface waters, enclosed bays, and estuaries. | 0.01 – 5.0 |
| San Diego (Region 9) | No specific criteria for chlorine; however, a narrative toxicity objective states that all waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. | 0.2 – 650 |
| 1. Source: U.S. EPA (2004).<br>mg/L = milligrams per liter. | | |

## PROJECT DESCRIPTION

This project is a State Water Quality Control Policy that includes adoption of water quality objectives, based on U.S. EPA's 304(a) criteria guidance, for TRC and CPO for the State's inland surface waters and enclosed bays and estuaries. The project also includes provisions that apply to ~~non-storm water~~ NPDES permits for:

1. Establishing effluent limitations for TRC and CPO;
2. Compliance schedules;
3. Monitoring and reporting requirements;
4. Compliance determination.

The proposed Policy is applicable to inland surface waters, enclosed bays, and estuaries, excluding ocean waters of California. Discharges into the ocean should be addressed through the California Ocean Plan (Ocean Plan) 2005~~1~~.

### *Statement of Goals*

The State Water Board's goals for this project are to:

1. Protect aquatic life beneficial uses throughout the State;
2. Provide consistency throughout the State on procedures to regulate TRC and CPO;

3. Provide a basis for equitable enforcement.

## ENVIRONMENTAL SETTING

California encompasses a variety of environmental conditions ranging from the Sierra Nevada to deserts (with a huge variation in between these two extremes) to the Pacific Ocean.

For water quality management, section 13200 of Porter-Cologne divides the State into nine different hydrologic regions. Brief descriptions of the Regions and the water bodies addressed by this draft FED are presented below. The information provided in this section is extracted from the Basin Plans.

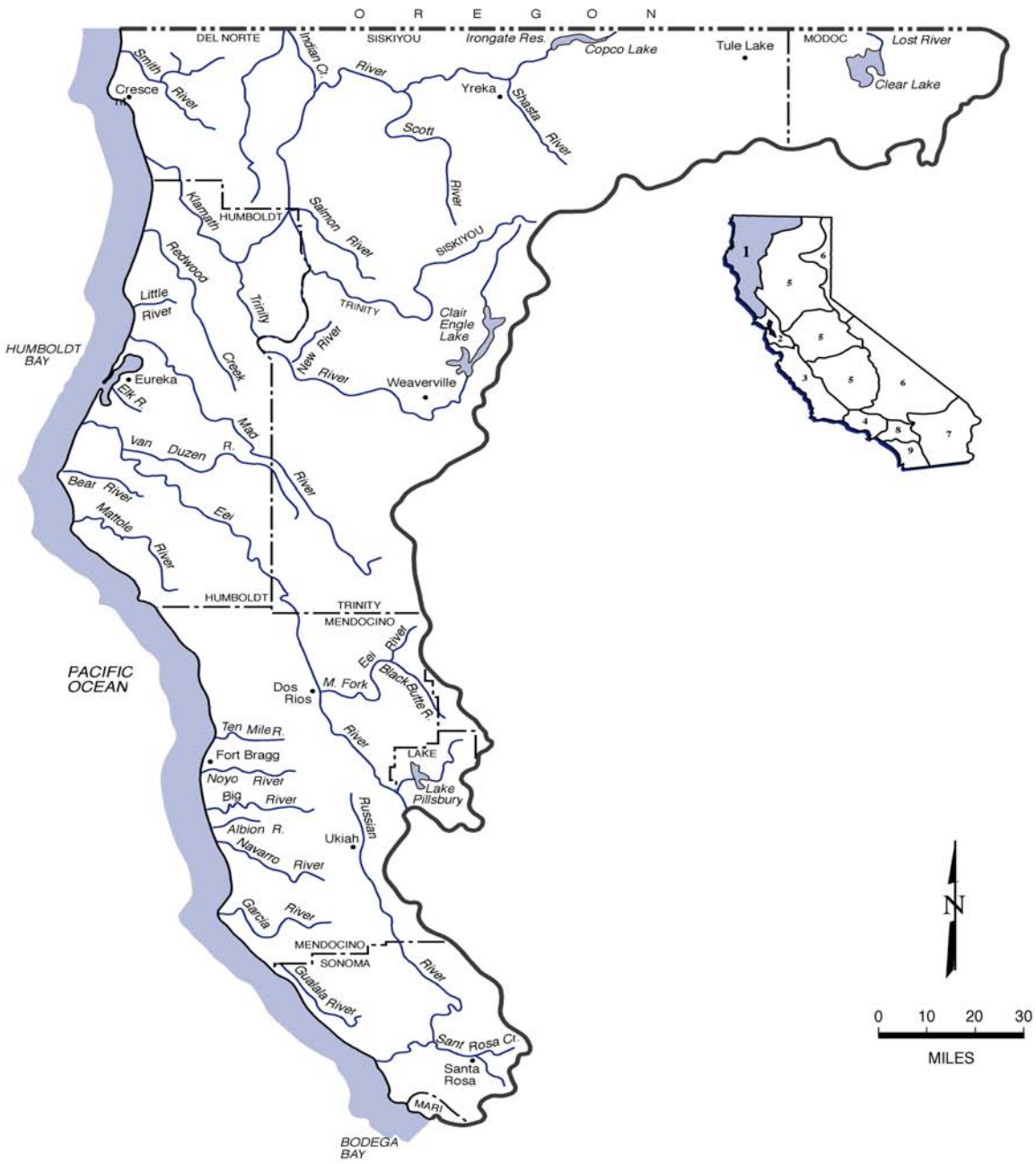
### *North Coast Region (Region 1)*

The North Coast Region comprises all regional basins, including Lower Klamath Lake and Lost River Basins, draining into the Pacific Ocean from the California-Oregon state line southern boundary and includes the watershed of the Estero de San Antonio and Stemple Creek in Marin and Sonoma Counties (Figure 1). Two natural drainage basins, the Klamath River Basin and the North Coastal Basin, divide the Region. The Region covers all of Del Norte, Humboldt, Trinity, and Mendocino Counties, major portions of Siskiyou and Sonoma Counties, and small portions of Glenn, Lake, and Marin Counties. It encompasses a total area of approximately 19,390 square miles, including 340 miles of coastline and remote wilderness areas, as well as urbanized and agricultural areas.

Beginning at the Smith River in northern Del Norte County and heading south to the Estero de San Antonio in northern Marin County, the Region encompasses a large number of major river estuaries. Other North Coast streams and rivers with significant estuaries include the Klamath River, Redwood Creek, Little River, Mad River, Eel River, Noyo River, Navarro River, Elk Creek, Gualala River, Russian River, and Salmon Creek (this creek mouth also forms a lagoon). Northern Humboldt County coastal lagoons include Big Lagoon and Stone Lagoon. The two largest enclosed bays in the North Coast Region are Humboldt Bay and Arcata Bay (both in Humboldt County). Another enclosed bay, Bodega Bay, is located in Sonoma County near the southern border of the Region.

Distinct temperature zones characterize the North Coast Region. Along the coast, the climate is moderate and foggy with limited temperature variation. Inland, however, seasonal temperature ranges in excess of 100°F (Fahrenheit) have been recorded. Precipitation is greater than for any other part of California, and damaging floods are a fairly frequent hazard. Particularly devastating floods occurred in the North Coast area in December 1955, December 1964, and February 1986. Ample precipitation in combination with the mild climate found over most of the North Coast Region has provided a wealth of fish, wildlife, and scenic resources. The mountainous nature of the Region, with its dense coniferous forests interspersed with grassy or chaparral covered slopes, provides shelter and food for deer, elk, bear, mountain lion, fur bearers, and many upland bird and mammal species. The numerous streams and rivers of the Region contain anadromous fish, and the reservoirs, although few in number support both cold water and warm water fish.

Tidelands and marshes are extremely important to many species of waterfowl and shore birds, both for feeding and nesting. Cultivated land and pasturelands also provide supplemental food for many birds, including small pheasant populations. Tideland areas along the north coast




Base map prepared by the Division of Water Rights, Graphics Services Unit

**Figure 1: North Coast Region Hydrologic Basin**

provide important habitat for marine invertebrates and nursery areas for forage fish, game fish, and crustaceans. Offshore coastal rocks are used by many species of seabirds as nesting areas.

Major components of the economy are tourism and recreation, logging and timber milling, aggregate mining, commercial and sport fisheries, sheep, beef and dairy production, and vineyards and wineries. In all, the North Coast Region offers a beautiful natural environment with opportunities for scientific study and research, recreation, sport, and commerce.

Approximately two percent of California's total population resides in the North Coast Region. The largest urban centers are Eureka in Humboldt County and Santa Rosa in Sonoma County.

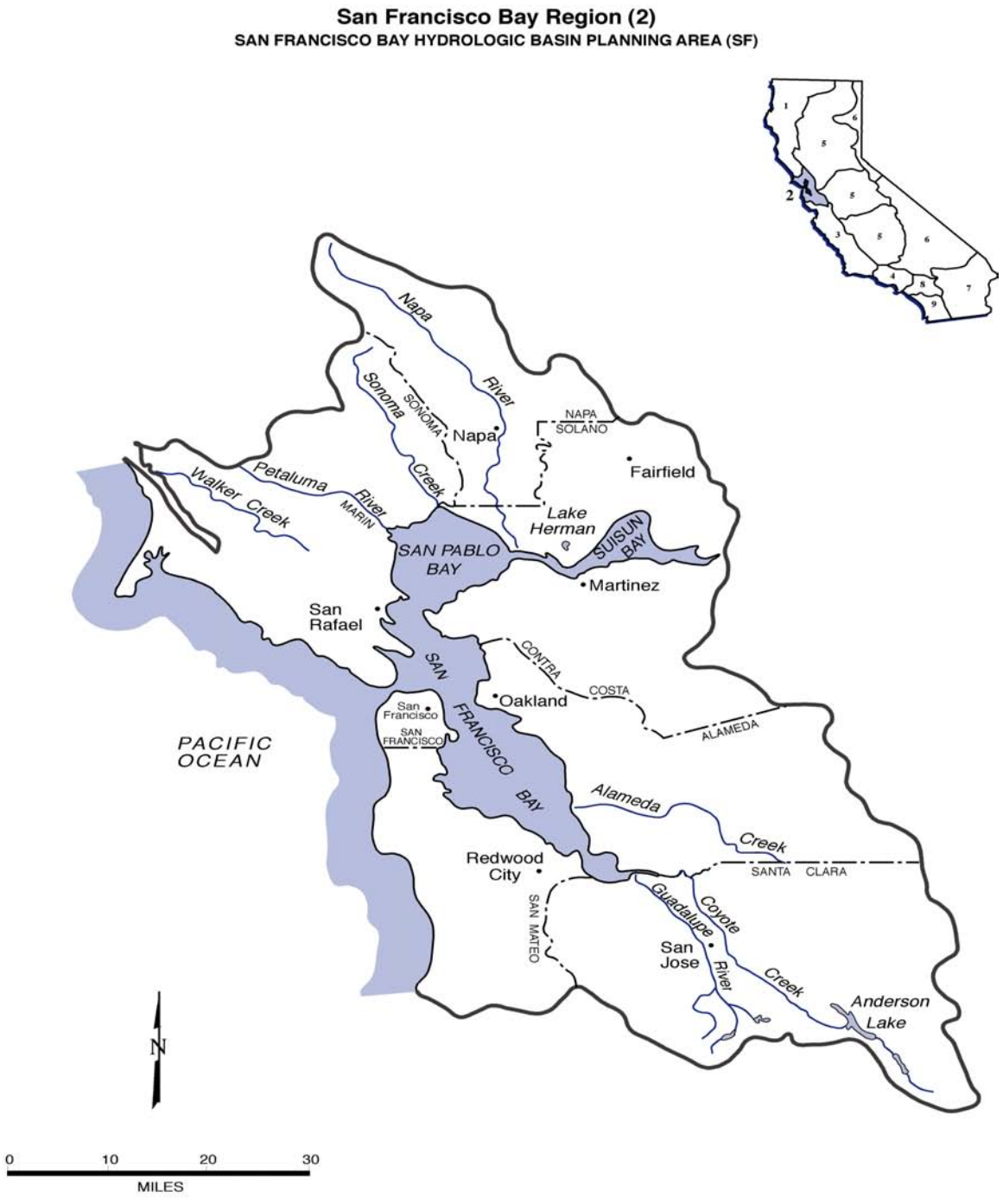
***San Francisco Bay Region (Region 2)***

The San Francisco Bay Region comprises San Francisco Bay, Suisun Bay beginning at the Sacramento River, and San Joaquin River westerly, from a line which passes between Collinsville and Montezuma Island (Figure 2). The Region's boundary follows the borders common to Sacramento and Solano Counties and Sacramento and Contra Costa Counties west of the Markely Canyon watershed in Contra Costa County. All basins west of the boundary, described above, and all basins draining into the Pacific Ocean between the southern boundary of the North Coast Region and the southern boundary of the watershed of Pescadero Creek in San Mateo and Santa Cruz Counties are included in the Region.

The Region comprises most of the San Francisco Estuary to the mouth of the Sacramento-San Joaquin Delta. The San Francisco Estuary conveys the waters of the Sacramento and San Joaquin Rivers to the Pacific Ocean. Located on the central coast of California, the Bay system functions as the only drainage outlet for waters of the Central Valley. It also marks a natural topographic separation between the northern and southern coastal mountain ranges. The Region's waterways, wetlands, and bays form the centerpiece of the fourth largest metropolitan area in the United States, including all or major portions of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma Counties.

The San Francisco Bay Regional Water Board has jurisdiction over the part of the San Francisco Estuary, which includes all of the San Francisco Bay segments extending east to the Delta (Winter Island near Pittsburg). The San Francisco Estuary sustains a highly dynamic and complex environment. Within each section of the Bay system lie deepwater areas that are adjacent to large expanses of very shallow water. Salinity levels range from hypersaline to fresh water and water temperature varies widely. The Bay system's deepwater channels, tidelands, marshlands, fresh water streams and rivers provide a wide variety of habitats within the Region. Coastal embayments including Tomales Bay and Bolinas Lagoon are also located in this Region. The Central Valley Regional Water Board has jurisdiction over the Delta and rivers extending further eastward.

The Sacramento and San Joaquin Rivers enter the Bay system through the Delta at the eastern end of Suisun Bay and contribute almost all of the fresh water inflow into the Bay. Many smaller rivers and streams also convey fresh water to the Bay system. The rate and timing of these fresh water flows are among the most important factors influencing physical, chemical, and biological conditions in the Estuary. Flows in the region are highly seasonal, with more than 90 percent of the annual runoff occurring during the winter rainy season between November and April.




Base map prepared by the Division of Water Rights, Graphics Services Unit

**Figure 2: San Francisco Bay Region Hydrologic Basin**

The San Francisco Estuary is made up of many different types of aquatic habitats that support a great diversity of organisms. Suisun Marsh in Suisun Bay is the largest brackish-water marsh in the United States. San Pablo Bay is a shallow embayment strongly influenced by runoff from the Sacramento and San Joaquin Rivers.

The Central Bay is the portion of the Bay most influenced by oceanic conditions. The South Bay, with less freshwater inflow than the other portions of the Bay, acts more like a tidal lagoon. Together these areas sustain rich communities of aquatic life and serve as important wintering sites for migrating waterfowl and spawning areas for anadromous fish.

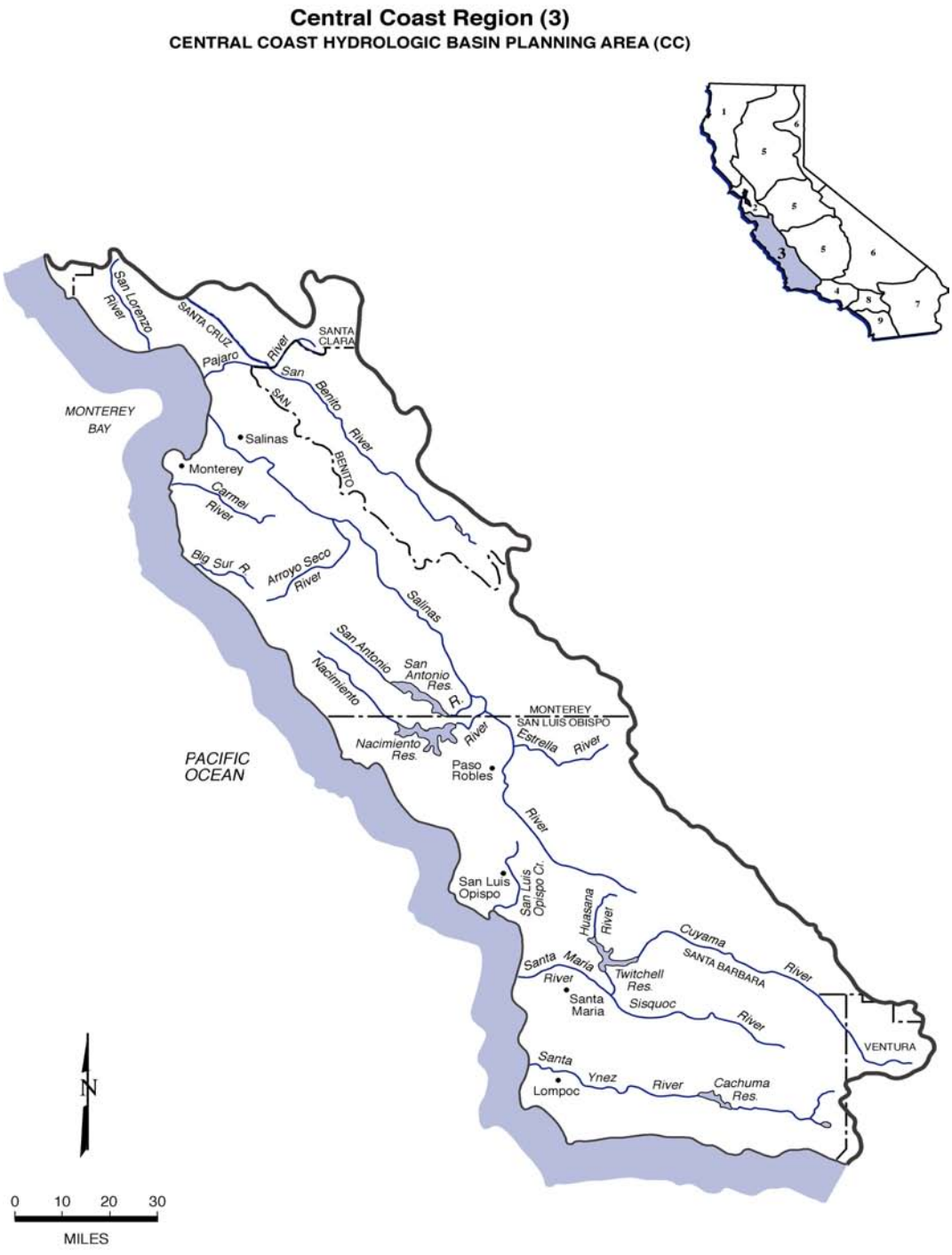
***Central Coast Region (Region 3)***

The Central Coast Region comprises all basins (including Carrizo Plain in San Luis Obispo and Kern Counties) draining into the Pacific Ocean from the southern boundary of the Pescadero Creek watershed in San Mateo and Santa Cruz Counties; to the southeastern boundary of the Rincon Creek watershed, located in western Ventura County (Figure 3). The Region extends over a 300-mile long by 40-mile wide section of the State's central coast. Its geographic area encompasses all of Santa Cruz, San Benito, Monterey, San Luis Obispo, and Santa Barbara Counties as well as the southern one-third of Santa Clara County, and small portions of San Mateo, Kern, and Ventura Counties. Included in the region are urban areas such as the Monterey Peninsula and the Santa Barbara coastal plain; prime agricultural lands such as the Salinas, Santa Maria, and Lompoc Valleys; National Forest lands; extremely wet areas such as the Santa Cruz Mountains; and arid areas such as the Carrizo Plain.

Water bodies in the Central Coast Region are varied. Enclosed bays and harbors in the Region include Morro Bay, Elkhorn Slough, Tembladero Slough, Santa Cruz Harbor, Moss Landing Harbor, San Luis Harbor, and Santa Barbara Harbor. Several small estuaries also characterize the Region, including the Santa Maria River Estuary, San Lorenzo River Estuary, Big Sur River Estuary, and many others. Major rivers, streams, and lakes include San Lorenzo River, Santa Cruz River, San Benito River, Pajaro River, Salinas River, Santa Maria River, Cuyama River, Estrella River and Santa Ynez River, San Antonio Reservoir, Nacimiento Reservoir, Twitchel Reservoir, and Cuchuma Reservoir. The economic and cultural activities in the basin have been primarily agrarian. Livestock grazing persists but has been combined with hay cultivation in the valleys. Irrigation, with pumped local groundwater, is very significant in intermountain valleys throughout the basin. Mild winters result in long growing seasons and continuous cultivation of many vegetable crops in parts of the basin.

While agriculture and related food processing activities are major industries in the Region, oil production, tourism, and manufacturing contribute heavily to its economy. The northern part of the Region has experienced a significant influx of electronic manufacturing; while offshore oil exploration and production have heavily influenced the southern part. Total population of the Region is estimated at 1.22 million people.

Water quality problems frequently encountered in the Central Coastal Region include excessive salinity or hardness of local groundwater. Increasing nitrate concentration is a growing problem in a number of areas, in both groundwater and surface water. Surface waters suffer from bacterial contamination, nutrient enrichment, and siltation in a number of watersheds. Pesticides are a concern in agricultural areas and associated downstream water bodies.




Base map prepared by the Division of Water Rights, Graphics Services Unit

Figure 3: Central Coast Region Hydrologic Basin

***Los Angeles Region (Region 4)***

The Los Angeles Region comprises all basins draining into the Pacific Ocean between the southeastern boundary of the watershed of Rincon Creek, located in western Ventura County, and a line which coincides with the southeastern boundary of Los Angeles County, from the Pacific Ocean to San Antonio Peak, and follows the divide, between the San Gabriel River and Lytle Creek drainages to the divide between Sheep Creek and San Gabriel River drainages (Figure 4).

The Region encompasses all coastal drainages flowing into the Pacific Ocean between Rincon Point (on the coast of western Ventura County) and the eastern Los Angeles County line, as well as the drainages of five coastal islands (Anacapa, San Nicolas, Santa Barbara, Santa Catalina and San Clemente). In addition, the Region includes all coastal waters within three miles of the continental and island coastlines. Two large deepwater harbors (Los Angeles and Long Beach Harbors) and one smaller deepwater harbor (Port Hueneme) are contained in the Region. There are small craft marinas within the harbors, as well as tank farms, naval facilities, fish processing plants, boatyards, and container terminals. Several small-craft marinas also exist along the coast (Marina del Ray, King Harbor, Ventura Harbor); these contain boatyards, other small businesses, and dense residential development.

Several large, primarily concrete-lined rivers (Los Angeles River, San Gabriel River) lead to unlined tidal prisms which are influenced by marine waters. Salinity may be greatly reduced following rains since these rivers drain large urban areas composed of mostly impermeable surfaces. Some of these tidal prisms receive a considerable amount of freshwater throughout the year from POTWs discharging tertiary-treated effluent. Lagoons are located at the mouths of other rivers draining relatively undeveloped areas (Mugu Lagoon, Malibu Lagoon, Ventura River Estuary, and Santa Clara River Estuary). There are also a few isolated coastal brackish water bodies receiving runoff from agricultural or residential areas.

Santa Monica Bay, which includes the Palos Verdes Shelf, dominates a large portion of the open coastal water bodies in the Region. The Region's coastal water bodies also include the areas along the shoreline of Ventura County and the waters surrounding the five offshore islands in the region.

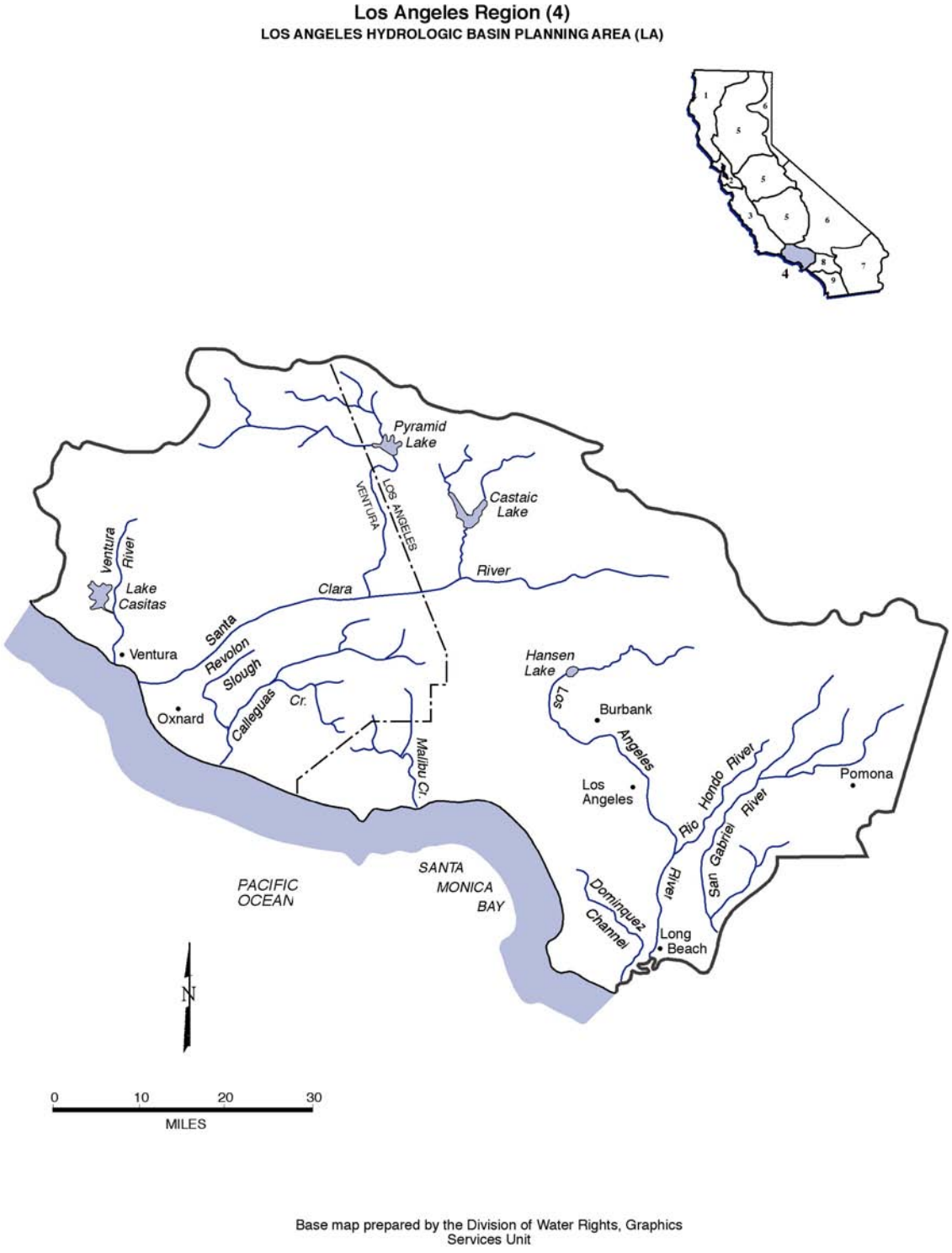



Figure 4: Los Angeles Region Hydrologic Basin

***Central Valley Region (Region 5)***

The Central Valley Region includes approximately 40 percent of the land in California stretching from the Oregon border to the Kern County/ Los Angeles County line. The Region is divided into three basins. For planning purposes, the Sacramento River Basin and the San Joaquin River basin are covered under one Basin Plan and the Tulare Lake Basin is covered under a separate distinct one.

The Sacramento River Basin covers 27,210 square miles and includes the entire area drained by the Sacramento River (Figure 5). The principal streams are the Sacramento River and its larger tributaries: the Pitt, Feather, Yuba, Bear, and American Rivers to the East; and Cottonwood, Stony, Cache, and Putah Creek to the west. Major reservoirs and lakes include Shasta, Oroville, Folsom, Clear Lake, and Lake Berryessa.

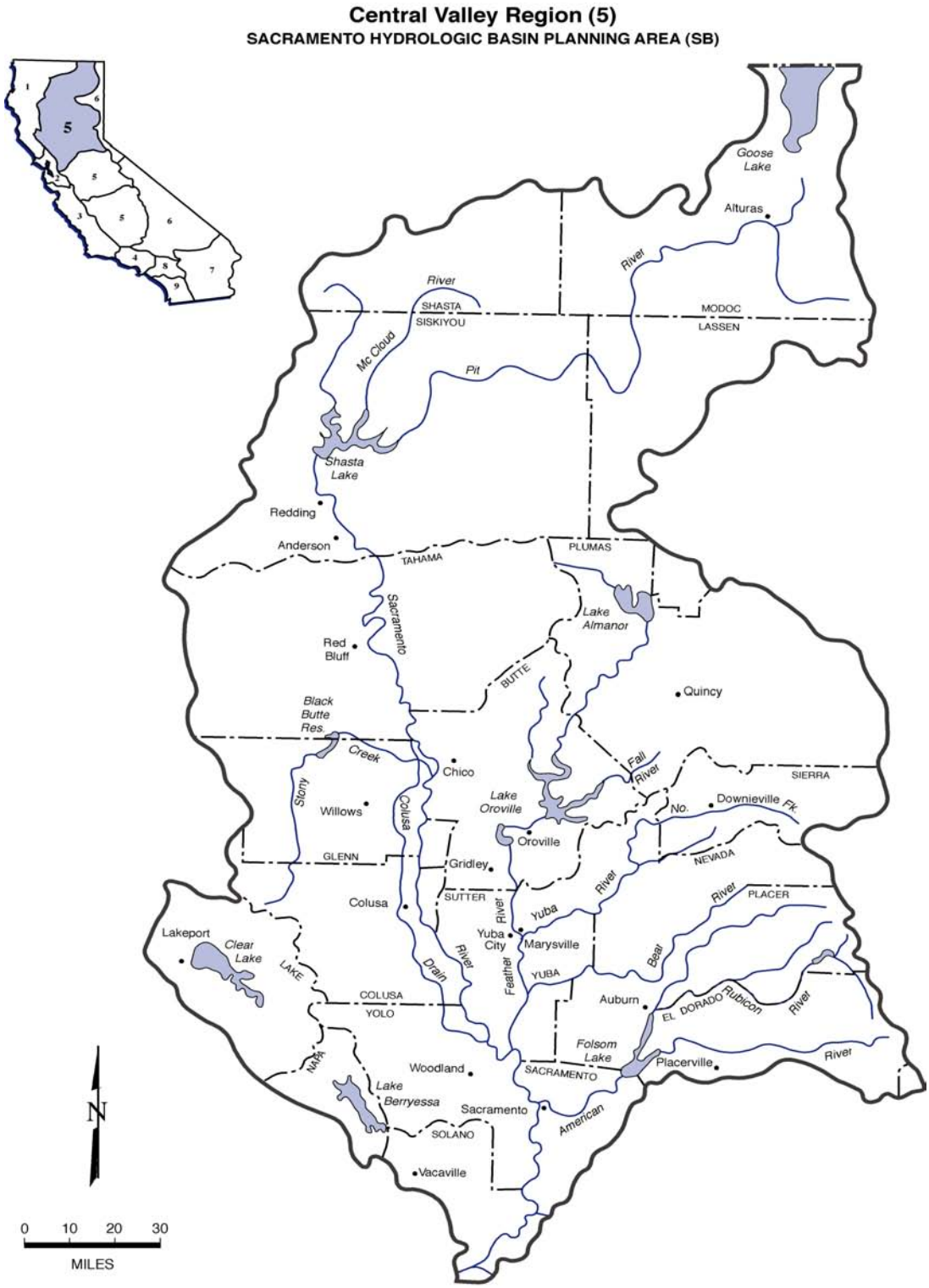
The San Joaquin River Basin covers 15,880 square miles and includes the entire area drained by the San Joaquin River (Figure 6). Principal streams in the basin are the San Joaquin River and its larger tributaries: the Consumnes, Mokelumne, Calaveras, Stanislaus, Tuolumne, Merced, Chowchilla, and Fresno Rivers. Major reservoirs and lakes include Pardee, New Hogan, Millerton, McClure, Don Pedro, and New Melones.

The Tulare Lake Basin covers approximately 16,406 square miles and comprises the drainage area of the San Joaquin Valley south of the San Joaquin River (Figure 7). The planning boundary between the San Joaquin River Basin and the Tulare Lake Basin is defined by the northern boundary of Little Pinoche Creek basin eastward along the channel of the San Joaquin River to Millerton Lake in the Sierra Nevada foothills, and then along the southern boundary of the San Joaquin River drainage basin. Main Rivers within the basin include the King, Kaweah, Tule, and Kern Rivers, which drain to the west face of the Sierra Nevada Mountains. Imported surface water supplies enter the basin through the San Luis Drain- California Aqueduct System, Friant- Kern Channel, and the Delta Mendota Canal.

The two northern most basins are bound by the crests of the Sierra Nevada on the east and the Coast Range and Klamath Mountains on the west. They extend about 400 miles from the California-Oregon border southward to the headwaters of the San Joaquin River. These two river basins cover about one fourth of the total area of the State and over 30 percent of the State's irrigable land. The Sacramento and San Joaquin Rivers furnish roughly 50 percent of the State's water supply.

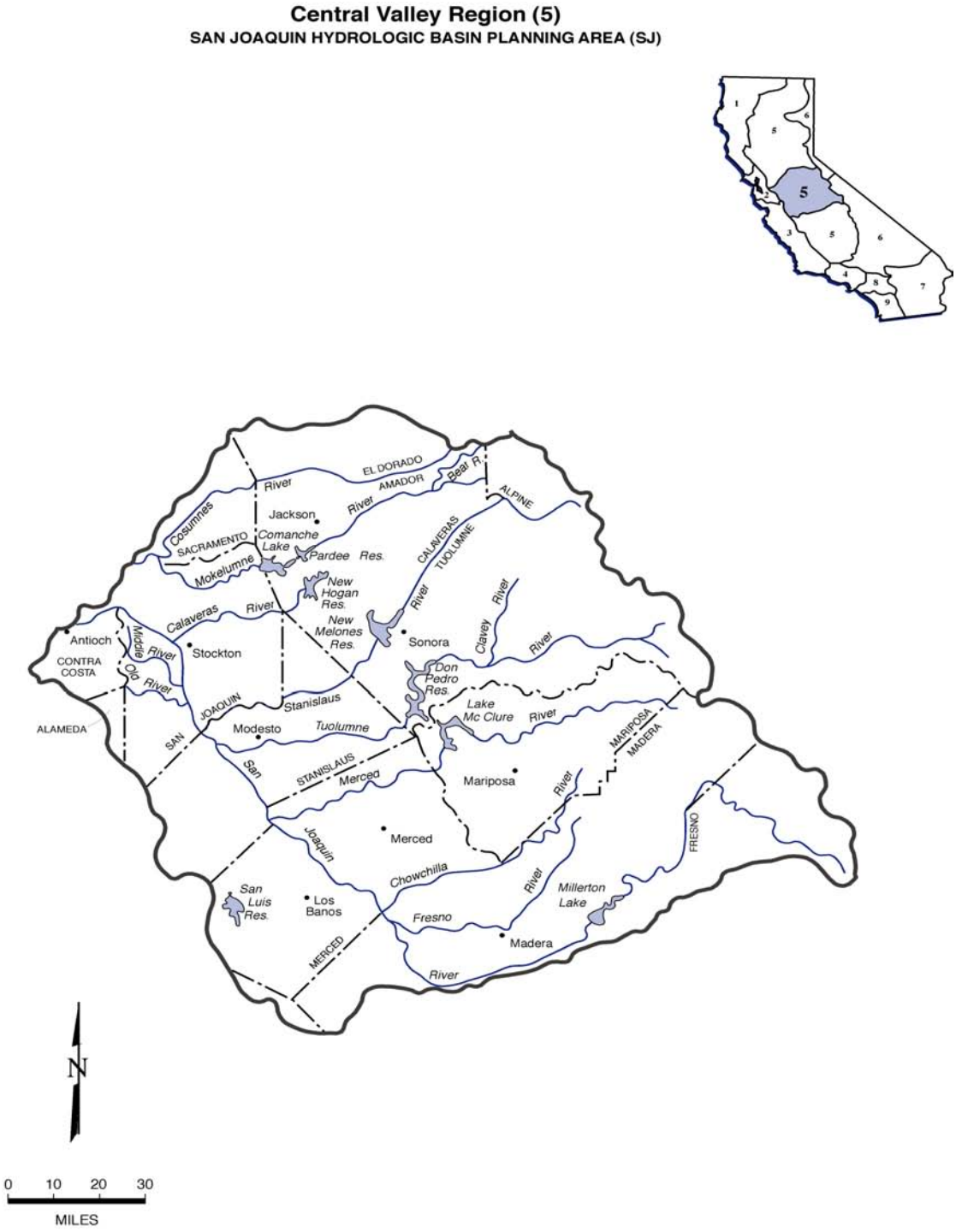
Surface water from the two drainage basins meet and form the Delta, which ultimately drains into the San Francisco Bay.

The Delta is a maze of river channels and diked islands covering roughly 1,150 square miles, including 78 square miles of water area. Two major water projects located in the South Delta, the Federal Central Valley Project and the State Water Project, deliver water from the Delta to Southern California, the San Joaquin Valley, Tulare Lake Basin, the San Francisco Bay Area, as well as within the Delta boundaries. The legal boundary of the Delta is described in CWC section 12220.



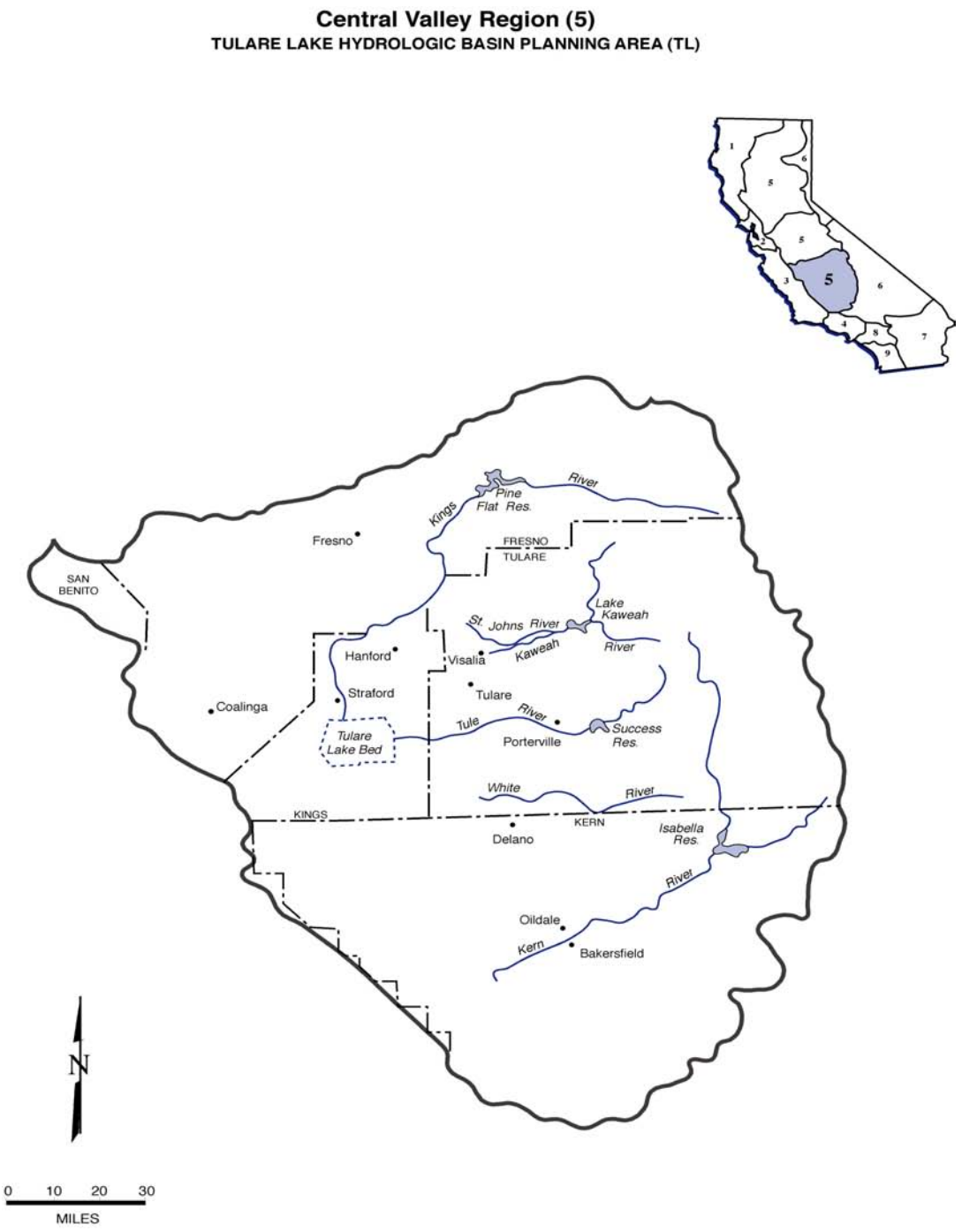

Base map prepared by the Division of Water Rights, Graphics Services Unit

**Figure 5: Central Valley Region, Sacramento Region Hydrologic Basin**




Base map prepared by the Division of Water Rights, Graphics Services Unit

**Figure 6: Central Valley Region, San Joaquin Hydrologic Basin**




Base map prepared by the Division of Water Rights, Graphics Services Unit

**Figure 7: Central Valley Region, Tulare Lake Hydrologic Basin**

***Lahontan Region (Region 6)***

The Lahontan Region has historically been divided into North and South Lahontan Basins at the boundary between the Mono Lake and East Walker River watersheds (Figure 8 and 9). It is about 570 miles long and has a total area of 33,131 square miles. The Lahontan Region includes the highest (Mount Whitney) and lowest (Death Valley) points in the contiguous United States. The topography of the remainder of the Region is diverse. The Region includes the eastern slopes of the Warner, Sierra Nevada, San Bernardino, Tehachapi and San Gabriel Mountains, and all or part of other ranges including the White, Providence, and Granite Mountains. Topographic depressions include the Madeline Plains, Surprise, Honey Lake, Bridgeport, Owens, Antelope, and Victor Valleys.

The Region is generally in a rain shadow; however, annual precipitation amounts can be high (up to 70 inches) at higher elevations. Most precipitation in the mountainous areas falls as snow. Desert areas receive relatively little annual precipitation (less than 2 inches in some locations) but this can be concentrated and lead to flash flooding. Temperature extremes recorded in the Lahontan Region range from –45$^{o}$F at Boca (Truckee River watershed) to 134 $^{o}$F in Death Valley. The varied topography, soils, and microclimates of the Lahontan Region support a corresponding variety of plant and animal communities. Vegetation ranges from sagebrush and creosote bush scrub in the desert areas to pinyon-juniper and mixed conifer forest at higher elevations. Subalpine and alpine communities occur on the highest peaks. Wetland and riparian plant communities, including marshes, meadows, “sphagnum” bogs, riparian deciduous forest, and desert washes, are particularly important for wildlife, given the general scarcity of water in the Region.

The Lahontan Region is rich in cultural resources (archaeological and historic sites), ranging from remnants of Native American irrigation systems to Comstock mining era ghost towns, such as Bodie, and 1920s resort homes at Lake Tahoe and Death Valley (Scotty's Castle).

Much of the Lahontan Region is in public ownership, with land use controlled by agencies, such as the U.S. Forest Service (USFS), National Park Service, Bureau of Land Management, various branches of the military, the California State Department of Parks and Recreation, and the City of Los Angeles Department of Water and Power. While the permanent resident population (about 500,000 in 1990) of the Region is low, most of it is concentrated in high-density communities in the South Lahontan Basin. In addition, millions of visitors use the Lahontan Region for recreation each year. Rapid population growth has occurred in the Victor and Antelope Valleys and within commuting distance of Reno, Nevada. Principal communities of the North Lahontan Basin include Susanville, Truckee, Tahoe City, South Lake Tahoe, Markleeville, and Bridgeport. The South Lahontan Basin includes the communities of Mammoth Lakes, Bishop, Ridgecrest, Mojave, Adelanto, Palmdale, Lancaster, Victorville, and Barstow. Recreational and scenic attractions of the Lahontan Region include Eagle Lake, Lake Tahoe, Mono Lake, Mammoth Lakes, Death Valley, and portions of many wilderness areas. Segments of the East Fork Carson and West Walker Rivers are included in the State Wild and Scenic River system. Both developed (e.g., camping, skiing, day use) and undeveloped (e.g., hiking, fishing) recreation is important components of the Region's economy. In addition to tourism, other major sectors of the economy are resource extraction (mining, energy production, and silviculture), agriculture (mostly livestock grazing), and defense-related

activities. There is relatively little manufacturing industry in the Region, in comparison to major urban areas of the State. Economically valuable minerals, including gold, silver, copper, sulfur, tungsten, borax, and rare earth metals, have been or are being mined at various locations within the Lahontan Region.

The Lahontan Region includes over 700 lakes, 3,170 miles of streams and 1,581 square miles of groundwater basins. There are twelve major watersheds (called “hydrologic units” under the Department of Water Resources' mapping system) in the North Lahontan Basin. Among these are the Eagle Lake, Susan River/Honey Lake, Truckee, Carson, and Walker River watersheds. The South Lahontan Basin includes three major surface water systems (the Mono Lake, Owens River, and Mojave River watersheds) and a number of separate closed groundwater basins. Water quality problems in the Lahontan Region are largely related to nonpoint sources (including erosion from construction, timber harvesting, and livestock grazing), storm water, and acid drainage from inactive mines, and individual wastewater disposal systems.

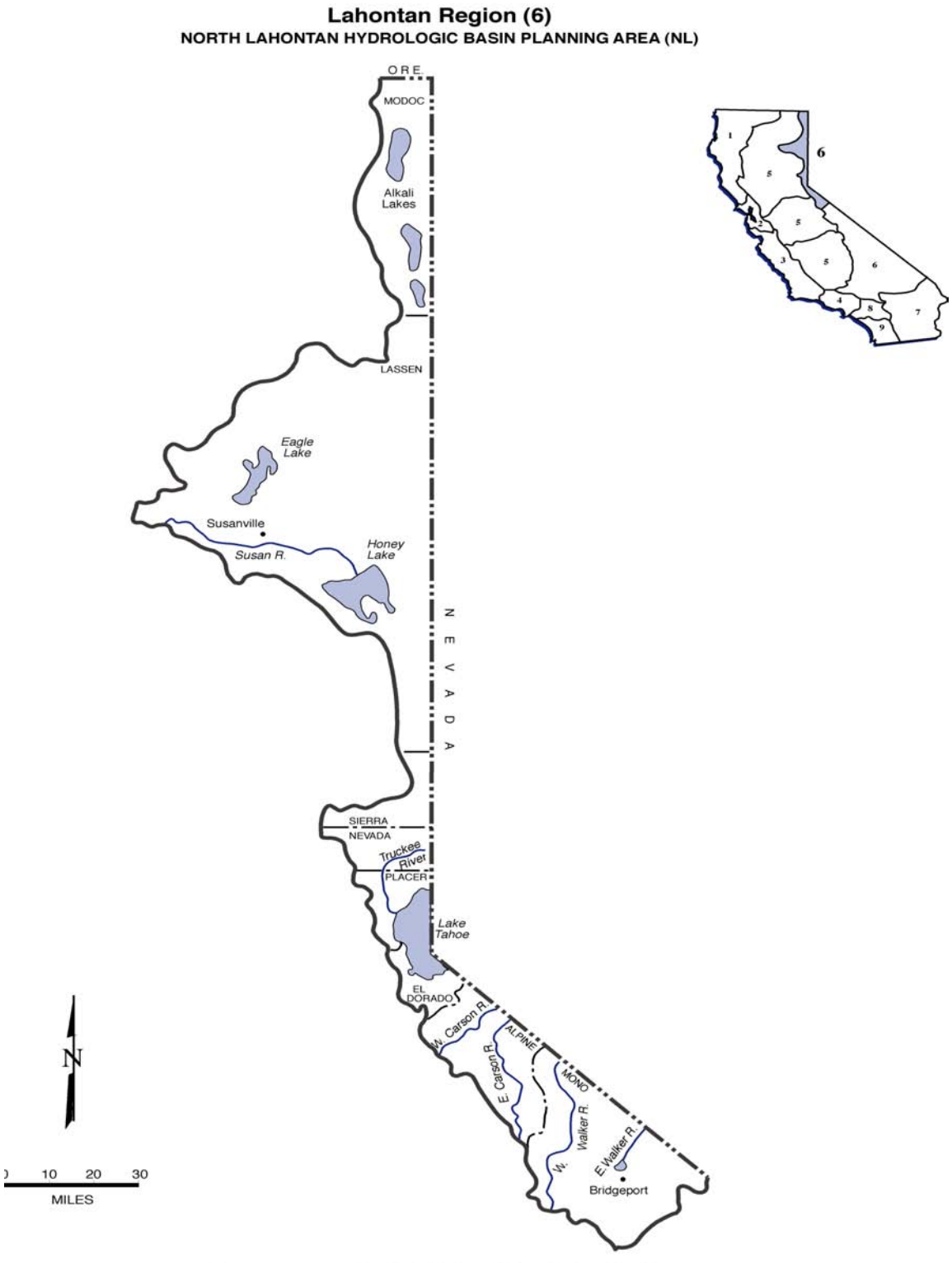



**Figure 8: Lahontan Region, North Lahontan Hydrologic Basin**

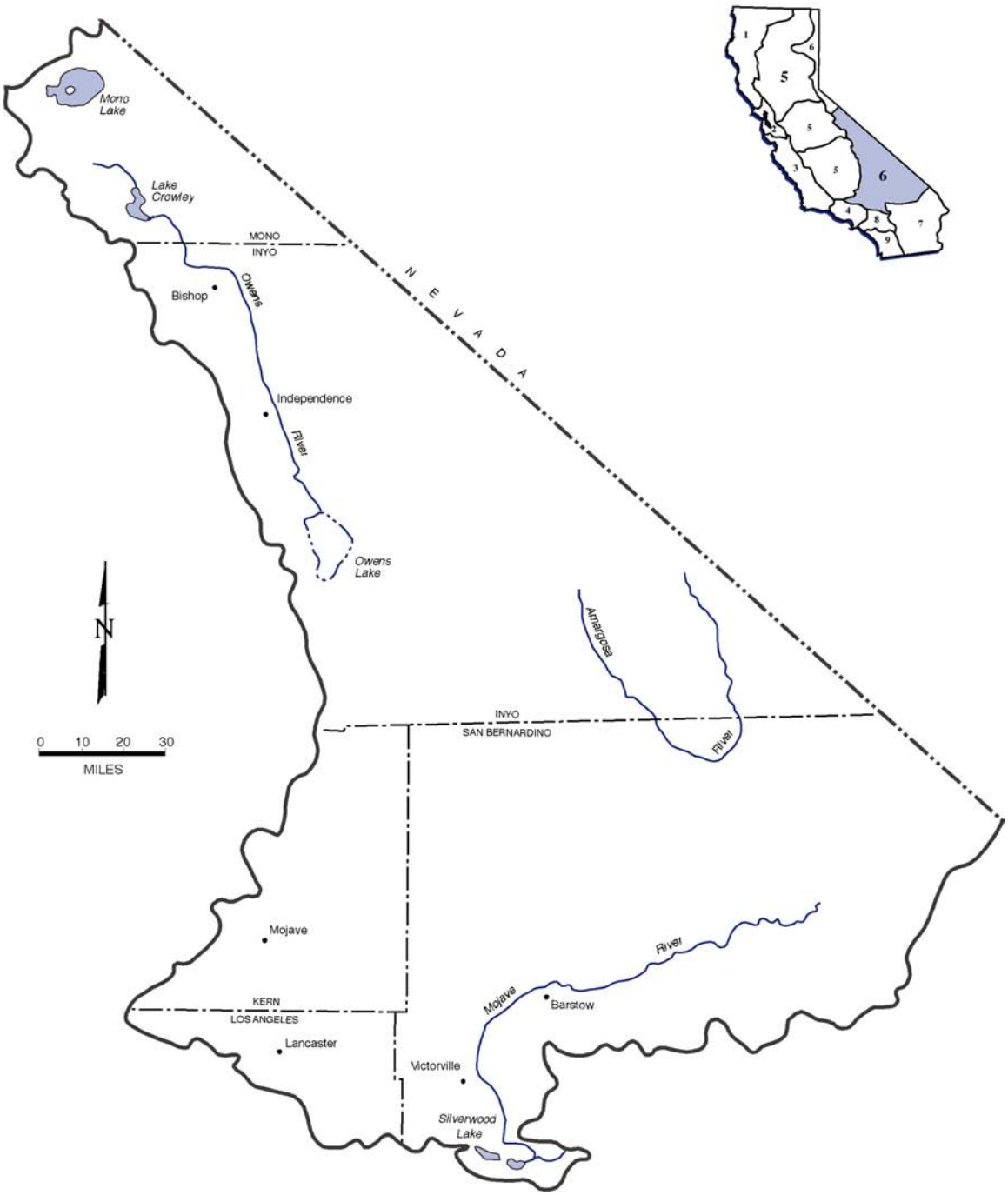


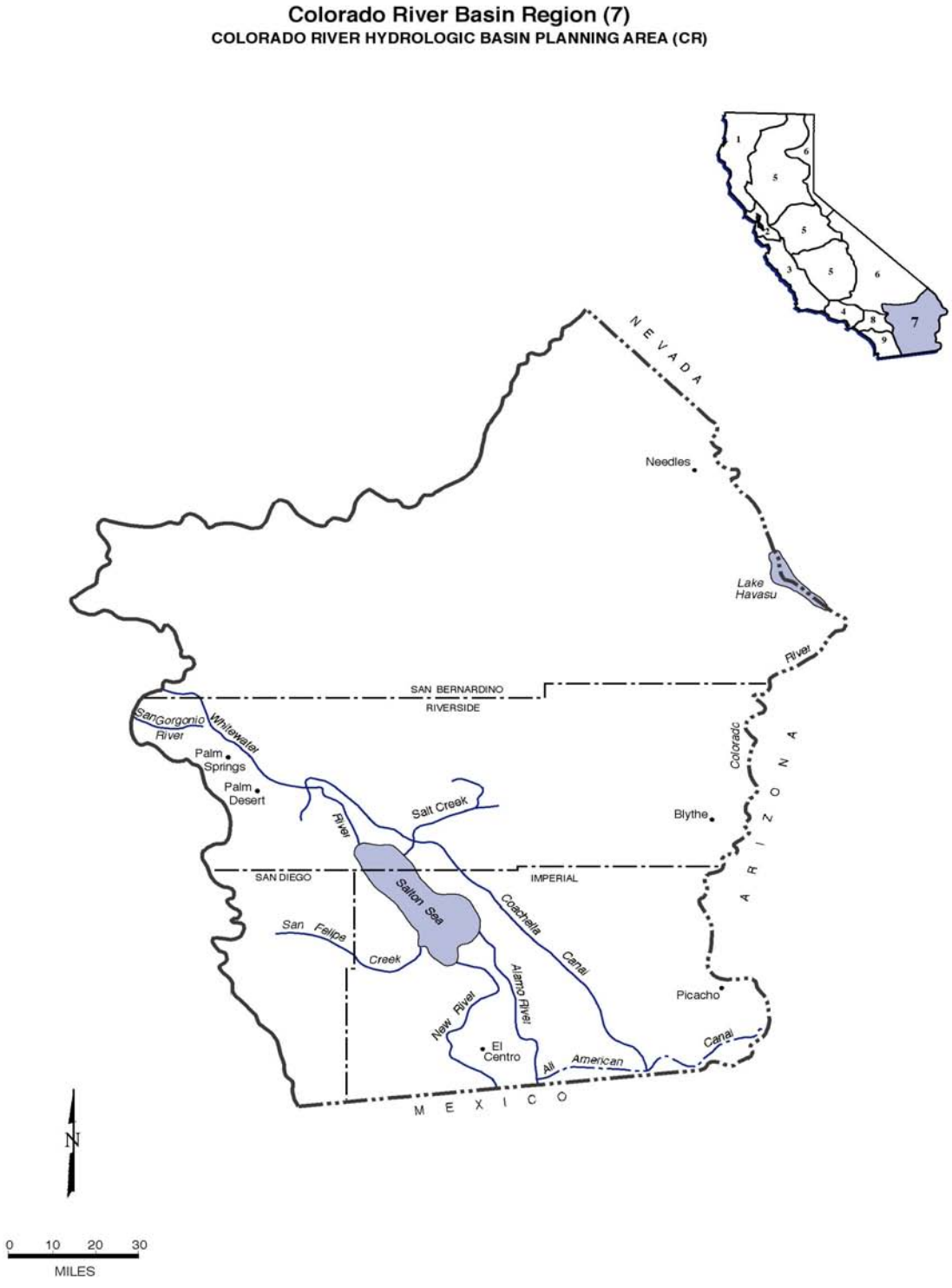

**Figure 9: Lahontan Region, South Lahontan Hydrologic Basin**

***Colorado River Basin Region (Region 7)***

The Colorado River Basin Region covers approximately 13 million acres (20,000 square miles) in the southeastern portion of California (Figure 10). It includes all of Imperial County and portions of San Bernardino, Riverside, and San Diego Counties. It shares a boundary for 40-miles on the northeast with the State of Nevada, on the north by the New York, Providence, Granite, Old Dad, Bristol, Rodman, and Ord Mountain ranges, on the west by the San Bernardino, San Jacinto, and Laguna Mountain ranges, on the south by the Republic of Mexico, and on the east by the Colorado River and State of Arizona. Geographically the Region represents only a small portion of the total Colorado River drainage area, which includes portions of Arizona, Nevada, Utah, Wyoming, Colorado, New Mexico, and Mexico. A significant geographical feature of the Region is the Salton Trough, which contains the Salton Sea and the Coachella and Imperial Valleys. The two valleys are separated by the Salton Sea, which covers the lowest area of the depression. The trough is a geologic structural extension of the Gulf of California.

Much of the agricultural economy and industry of the Region is located in the Salton Trough. There are also industries associated with agriculture, such as sugar refining as well as increasing development of geothermal industries. In the future, agriculture is expected to experience little growth in the Salton Trough, but there will likely be increased development of other industries (such as construction, manufacturing, and services). The present Salton Sea, located on the site of a prehistoric lake, was formed between 1905 and 1907 by overflow of the Colorado River. The Salton Sea serves as a drainage reservoir for irrigation return water and storm water from the Coachella Valley, Imperial Valley, and Borrego Valley, and also receives drainage water from the Mexicali Valley in Mexico. The Salton Sea is California's largest inland body of water and provides a very important wildlife habitat and sport fishery. Development along California's 230 mile reach of the Colorado River, which flows along the eastern boundary of the Region, include agricultural areas in Palo Verde Valley and Bard Valley, urban centers at Needles, Blythe, and Winterhaven, several transcontinental gas compressor stations, and numerous small recreational communities. Some mining operations are located in the surrounding mountains. Also the Fort Mojave, Chemehuevi, Colorado River, and Yuma Indian Reservations are located along the River.

The Region has the driest climate in California. The winters are mild and summers are hot. Temperatures range from below freezing to over 120°F. In the Colorado River valleys and the Salton Trough, frost is a rare occurrence and crops are grown year round. Snow falls in the Region's higher elevations, with mean seasonal precipitation ranging from 30 to 40 inches in the upper San Jacinto and San Bernardino Mountains. The lower elevations receive relatively little rainfall. An average four inches of precipitation occurs along the Colorado River, with much of this coming from late summer thunderstorms moving north from Mexico. Typical mean seasonal precipitation in the desert valleys is 3.6 inches at Indio and 3.2 inches at El Centro. Precipitation over the entire area occurs mostly from November through April, and August through September, but its distribution and intensity are often sporadic. Local thunderstorms may contribute all the average seasonal precipitation at one time, or only a trace of precipitation may be recorded at any locale for the entire season.




Base map prepared by the Division of Water Rights, Graphics Services Unit

**Figure 10: Colorado River Region Hydrologic Basin**

The Region provides habitat for a variety of native and introduced species of wildlife. Increased human population and its associated development have adversely affected the habitat for some species, while enhancing it for others. Animals tolerant of arid conditions, including small rodents, coyotes, foxes, birds, and a variety of reptiles, inhabit large areas within the Region. Along the Colorado River and in the higher elevations of the San Bernardino and San Jacinto Mountains where water is more abundant, deer, bighorn sheep, and a diversity of small animals exist. Practically all of the fishes inhabiting the Region are introduced species. The most abundant species in the Colorado River and irrigation canals include largemouth bass, smallmouth bass, flathead and channel catfish, yellow bullhead, bluegill, redear sunfish, black crappie, carp, striped bass, threadfin shad, red shiner, and, in the colder water above Lake Havasu, rainbow trout. Grass carp have been introduced into sections of the All American Canal system for aquatic weed control. Fish inhabiting agricultural drains in the Region generally include mosquito fish, mollies, red shiners, carp, and tilapia, although locally significant populations of catfish, bass, and sunfish occur in some drains. A considerable sport fishery exists in the Salton Sea, with orangemouth corvina, gulf croaker, sargo, and tilapia predominating. The Salton Sea National Wildlife Refuge and state waterfowl management areas are located in or near the Salton Sea. The refuge supports large numbers of waterfowl in addition to other types of birds. Located along the Colorado River are the Havasu, Cibola and Imperial National Wildlife Refuges. The Region provides habitat for certain endangered/threatened species of wildlife including desert pupfish, razorback sucker, Yuma clapper rail, black rail, least Bell's vireo, yellow billed cuckoo, desert tortoise, and peninsular bighorn sheep.

***Santa Ana Region (Region 8)***

The Santa Ana Region comprises all basins draining into the Pacific Ocean between the southern boundary of the Los Angeles Region and the drainage divide between Muddy and Moro Canyons, from the ocean to the summit of San Joaquin Hills; along the divide between lands draining into Newport Bay and Laguna Canyon to Niguel Road; along Niguel Road and Los Aliso Avenue to the divide between Newport Bay and Aliso Creek drainages; and along the divide and the southeastern boundary of the Santa Ana River drainage to the divide between Baldwin Lake and Mojave Desert drainages; to the divide between the Pacific Ocean and Mojave Desert drainages (Figure 11). The Santa Ana Region is the smallest of the nine regions in the state (2800 square miles) and is located in southern California, roughly between Los Angeles and San Diego. Although small geographically, the region's four-plus million residents (1993 estimate) make it one of the most densely populated regions. The climate of the Santa Ana Region is classified as Mediterranean: generally dry in the summer with mild, wet winters. The average annual rainfall in the region is about fifteen inches, most of it occurring between November and March. The enclosed bays in the Region include Newport Bay, Bolsa Bay (including Bolsa Chica Marsh), and Anaheim Bay. Principal rivers include Santa Ana, San Jacinto and San Diego. Lakes and reservoirs include Big Bear, Hemet, Mathews, Canyon Lake, Lake Elsinore, Santiago Reservoir, and Perris Reservoir.

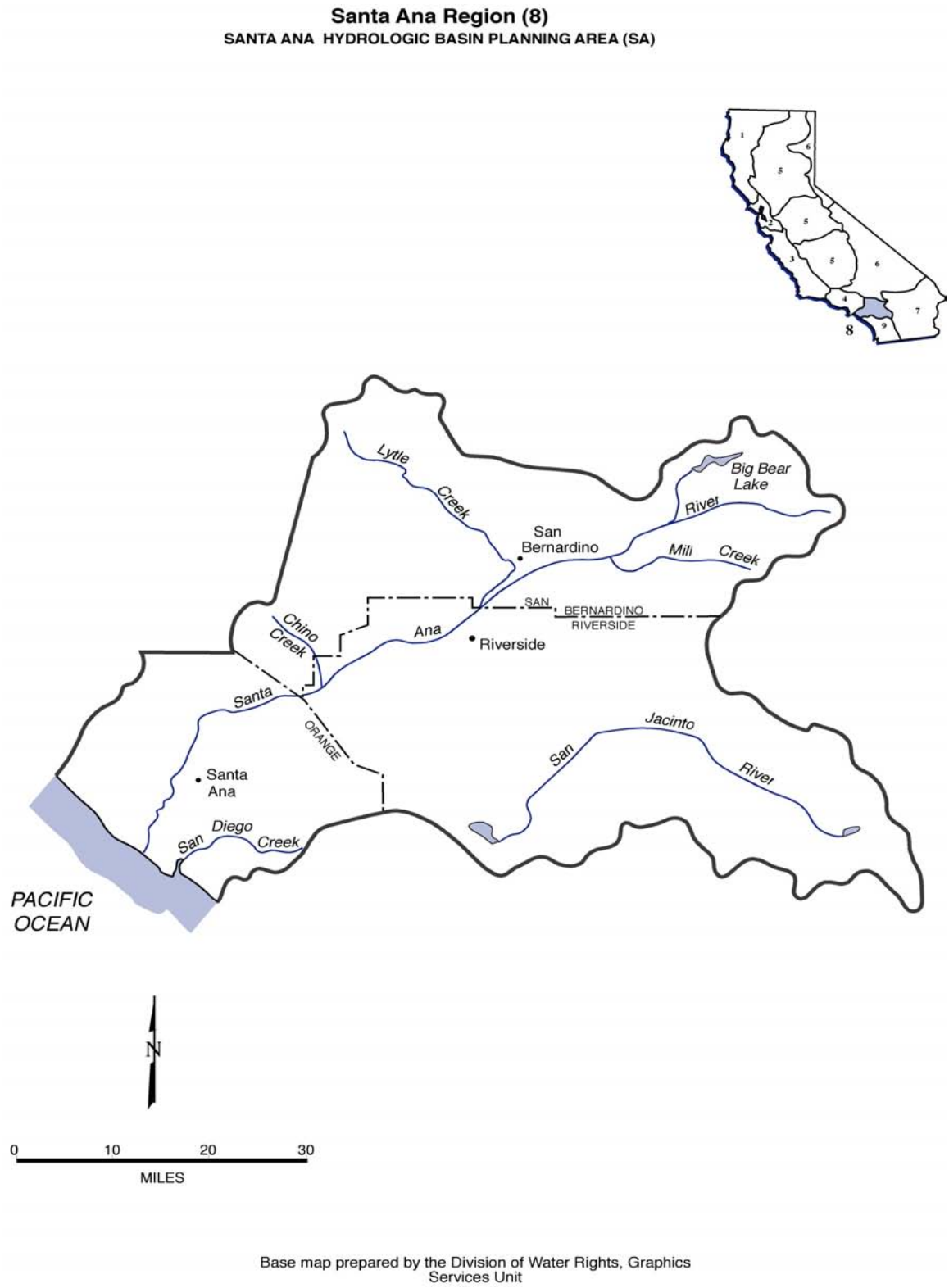



**Figure 11: Santa Ana Region Hydrologic Basin**

***San Diego Region (Region 9)***

The San Diego Region comprises all basins draining into the Pacific Ocean between the southern boundary of the Santa Ana Region and the California-Mexico boundary (Figure 12). The San Diego Region is located along the coast of the Pacific Ocean from the Mexican border to north of Laguna Beach. The Region is rectangular in shape and extends approximately 80-miles along the coastline and 40 miles east to the crest of the mountains. The Region includes portions of San Diego, Orange, and Riverside Counties. The population of the Region is heavily concentrated along the coastal strip. Six deepwater sewage outfalls and one across the beach discharge from the new border plant at the Tijuana River and empties into the ocean. Two harbors, Mission Bay and San Diego Bay, support major recreational and commercial boat traffic. Coastal lagoons are found along the San Diego County coast at the mouths of creeks and rivers.

Weather patterns are Mediterranean in nature with an average rainfall of approximately ten inches per year occurring along the coast. Almost all the rainfall occurs during wet cool winters. The Pacific Ocean generally has cool water temperatures due to upwelling. This nutrient-rich water supports coastal beds of giant kelp. The cities of San Diego, National City, Chula Vista, Coronado, and Imperial Beach surround San Diego Bay in the southern portion of the Region.

San Diego Bay is long and narrow, 15 miles in length and approximately one mile across. A deep-water harbor, San Diego Bay has experienced waste discharge from former sewage outfalls, industries, and urban runoff. Up to 9,000 vessels may be moored there. San Diego Bay also hosts four major U.S. Navy bases with approximately 80 surface ships and submarines. Coastal waters include bays, harbors, estuaries, beaches, and open ocean.

Deep draft commercial harbors include San Diego Bay and Oceanside Harbor and shallower harbors include Mission Bay and Dana Point Harbor. Tijuana Estuary, Sweetwater Marsh, San Diego River Flood Control Channel, Kendal-Frost Wildlife Reserve, San Dieguito River Estuary, San Elijo Lagoon, Batiquitos Lagoon, Agua Hedionda Lagoon, Buena Vista Lagoon, San Luis Rey Estuary, and Santa Margarita River Estuary are the important estuaries of the Region.

There are thirteen principal stream systems in the Region originating in the western highlands and flowing to the Pacific Ocean. From north to south these are Aliso Creek, San Juan Creek, San Mateo Creek, San Onofre Creek, Santa Margarita River, San Luis Ray River, San Marcos Creek, Escondido Creek, San Dieguito River, San Diego River, Sweetwater River, Otay River, and the Tijuana River. Most of these streams are interrupted in character having both perennial and ephemeral components due to the rainfall pattern in the Region. Surface water impoundments capture flow from almost all the major streams.

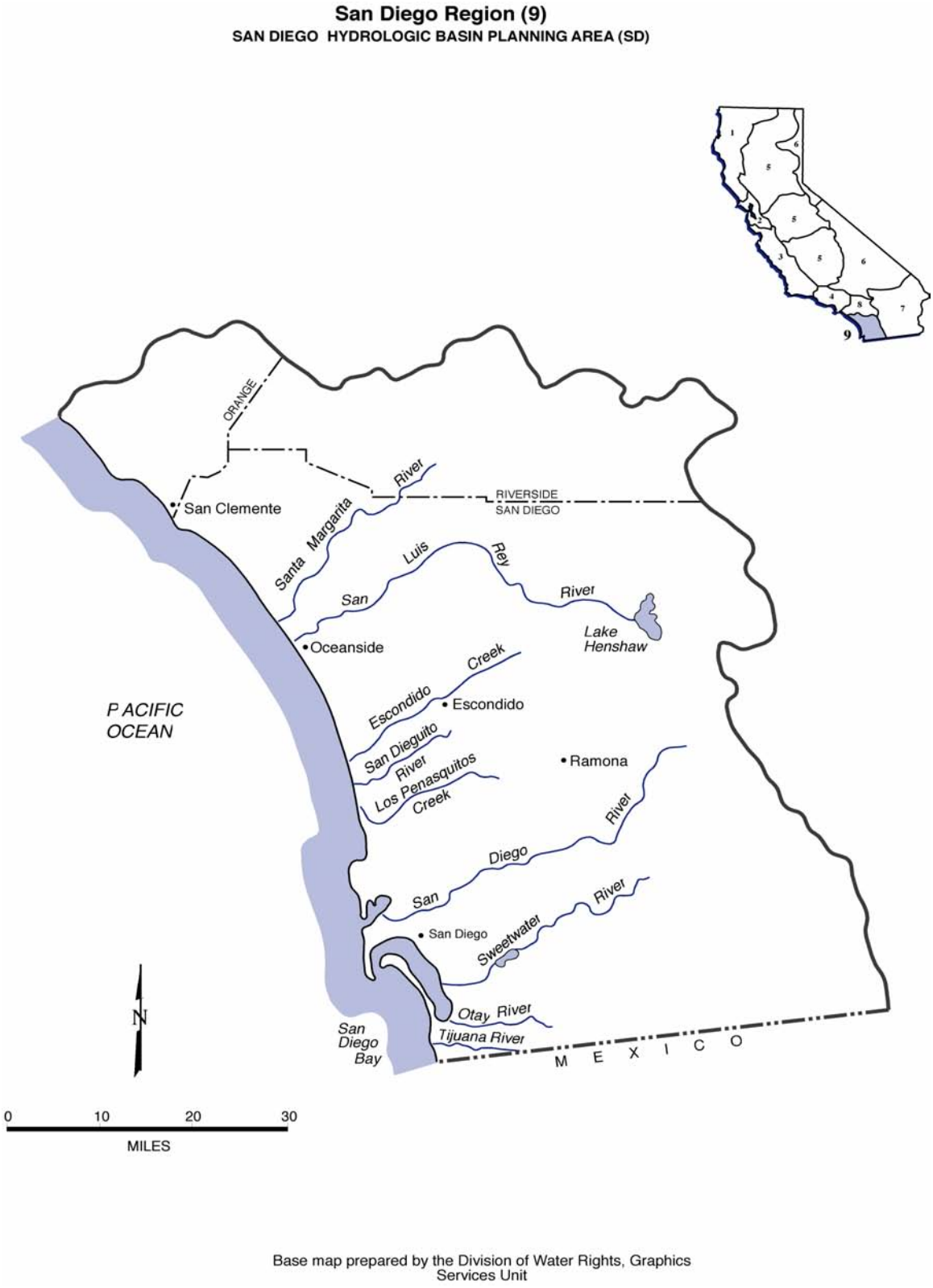



**Figure 12: San Diego Region Hydrologic Basin**

## ANALYSES OF ISSUES AND ALTERNATIVES
*Chapter 1 - Water Quality Objectives*

### Present Statewide Policy
Currently, there is no statewide Policy that establishes uniform TRC or CPO objectives for the inland surface waters or enclosed bays and estuaries of California. However, Regional Water Boards have numeric or narrative objectives in their Basin Plans for TRC. These objectives provide the basis for regulating discharges of TRC and CPO in NPDES permits although permit limits may vary between dischargers.

### Issue Description
Both the CWA and State law require that the State adopt water quality objectives (or criteria in federal parlance) to protect the beneficial uses of surface waters in the State (CWA §303(c); CWC § 13050(h), (j); §13241). A water quality objective is the limit or level of a constituent or characteristic that is established for the reasonable protection of beneficial uses of the water or the prevention of a nuisance in a specific area (CWC §13050(h)). Objectives to protect designated beneficial uses must be based on peer reviewed scientific rationale. Water quality objectives can be either numeric values, based upon CWA §304(a) criteria guidance or other scientifically defensible methods, or narrative requirements. (40 CFR §§131.3(b), 131.11(b)). Federal regulations require that criteria (water quality objectives) protect the most sensitive beneficial uses (40 CFR 131.11(a)).

Chlorine is used for a variety of purposes, including wastewater disinfection, odor control, and corrosion prevention. TRC and CPO resulting from these uses are toxic to aquatic life. To protect aquatic life, it is appropriate for the State Water Board to adopt uniform objectives for TRC and CPO that apply statewide to inland surface waters and enclosed bays and estuaries. Aquatic life should be protected against chlorine's short-term (acute) and long-term (chronic) effects. The national criteria recommendations published by U.S. EPA under section 304(a) of the CWA for chlorine include values for both acute and chronic aquatic life protection. These values can be adopted on a statewide basis, thereby providing statewide consistency and ensuring aquatic life protection.

### Alternatives for State Water Board Action
**1. No action.** This alternative would continue the status quo. The Regional Water Boards would continue to base TRC and CPO effluent limits in permits on their Basin Plan objectives. This approach has led to inconsistency in regulating chlorine in NPDES permits statewide and difficulty with enforcement. If the State Water Board does not act and the Regional Water Boards are required to amend their respective Basin Plans to achieve consistent regulation of chlorine in NPDES permits, the workload for the Regional Water Boards will be significant. Amendments require research, fieldwork, and preparation of necessary documents, CEQA compliance, and an extensive public process. This alternative does not seem practicable. Because of the inconsistency throughout the State, Regional Water Board permit writers and dischargers are having difficulty setting and interpreting chlorine permit provisions. A Policy that addresses TRC and CPO statewide could address the issues surrounding chlorine -without

putting further burden on the Regional Water Boards. Further, the State Water Board is adhering to the request of stakeholders including CASA/Tri-TAC and San Francisco Bay Regional Water Board to supply the State of California with chlorine objectives and a supporting implementation Policy.

**2. Adopt U.S. EPA 304(a) criteria for chlorine.** Under this alternative, the State Water Board would adopt water quality objectives for TRC and CPO based on U.S. EPA's water quality criteria guidance, *Ambient Water Quality Criteria for Chlorine 1984 (EPA 440/5-84-030)*, for freshwater and saltwater[4] aquatic life protection. The State Water Board can adopt these values as objectives for all rRegions and water bodies in the State. U.S. EPA's recommended criteria are 0.011 mg/L for a 4-day average and 0.019 mg/L for a 1-hour average TRC in freshwater and 0.0075 mg/L for a 4-day average and 0.013 mg/L for a 1-hour average CPO in saltwater.

U.S. EPA's 304(a) criteria will provide appropriate protection for aquatic life beneficial uses and ensure statewide consistency. The above criteria are scientifically based and are derived using the methods for calculating the criterion maximum concentration (CMC) and criterion continuous concentration (CCC) describedpresented in *Guidelines for Deriving Numerical National Water Quality Criteria for the Protection of Aquatic Organisms and Their Uses*, 1985. Thirty-three freshwater species in twenty-eight genera were used in the acute toxicity data set and two invertebrates and one fish species were used in the chronic toxicity data set. Acute sensitivities of twenty-four species of saltwater animals in twenty-one genera have been determined for CPO, and one chronic test was conducted with the species *Menidia peninsulae.* U.S. EPA's recommended criteria are based on over 20 years of chlorine toxicity studies from 1959 to 1983. However, additional related testing has been conducted since 1984, which confirms earlier identification of the acutely toxic nature of chlorine both in fresh and saltwater (See References at the end of this document).

It is also important to note that many other states such as Virginia, Illinois, Delaware, and Connecticut, just to name a few, have already adopted U.S. EPA's recommended criteria. Arizona is currently in the process of adopting chlorine criteria in June 2006 and is considering 11 ug/L and 16 ug/L. Therefore, the proposed criteria show a solid scientific foundation and are a logical choice for protecting aquatic life from TRC and CPO toxicity.

**3. Derive new criteria.** The State could develop new criteria if scientific acute and chronic toxicity studies on various aquatic species found within California waters were conducted. This alternative would consume a great deal of resources and time to achieve results that would likely resemble U.S. EPA's recommendations found above in Alternative 2. The time needed to conduct the appropriate toxicity tests may leave aquatic life unprotected for several years and would continue enforcement confusion for dischargers and inconsistency throughout the State. Funding for additional studies is currently unattainable due to budget constraints and staff reduction. Again, it is necessary to point out that there has been additional chlorine toxicity testing conducted since 1984, which confirms earlier identification of the acutely toxic nature of chlorine both in fresh and saltwater, and confirms the need for objectives to be set at

[4] U.S. EPA definition for freshwater and saltwater will apply and can be found in "Definition of Terms" at the end of this document.

.011 mg/L for a 4-day average and .019 mg/L for a 1-hour average TRC in freshwater and .0075 mg/L for a 4-day average and .013 mg/L for a 1-hour average CPO in saltwater.

**4. Use of a statistical measurement similar to the Ocean Plan.** The Ocean Plan contains water quality objectives for total chlorine residual for continuous and intermittent discharges (Ocean Plan, 2001). These objectives were based on a summarization of chlorine toxicity data to marine organisms (Mattice and Zittel 1976). When log-transformed chorine exposure concentrations were plotted against log-transformed exposure times, the data distribution appeared to be biphasic, containing an acute exposure phase and a chronic exposure phase.

Mattice and Zittel (1976) presented chlorine toxicity data for freshwater and marine organisms and showed that marine organisms were more susceptible to acute doses of chlorine, whereas freshwater organisms appeared to be more susceptible to chronic doses.

The equation used is: $C = \frac{1070}{T^{0.740}}$

Where $C$ is the chlorine concentration in micrograms per liter (ug/L) and $T$ is the chlorine exposure time in minutes. The following table shows a comparison of two potential chlorine water quality objectives using the above equation for time periods associated with U.S. EPA (1984) chlorine criteria (Saiz, 2003):

| **Exposure Time** | **Chlorine Objective from above equation (ug/L)** | **U.S. EPA Chlorine Criteria (ug/L)** |
|---|---|---|
| 1 hour = 60 min. | 52 | 19 |
| 4 days = 5760 min. | 1.8 | 11 |

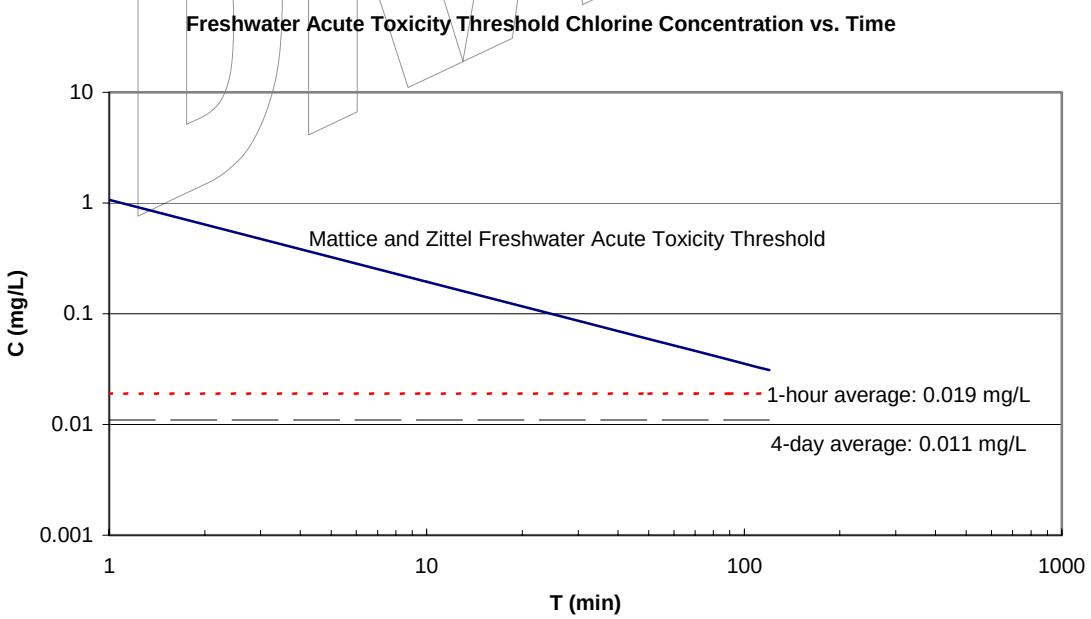
Although this equation is appropriate for the ocean discharges, it is important to note that the Ocean Plan provides dilution and is used only for intermittent discharges not exceeding two hours. Mixing zones for chlorine residual are not recommended for inland surface waters, enclosed bays, and estuaries in most cases. Additionally, ~~U.S. EPA's one-hour and four-day averages are explicitly for continuous discharges. T~~the above equation will exceed the one-hour criteria recommended by U.S. EPA. Therefore, exposure time would not be protective of aquatic life. The U.S. EPA criteria have been recommended based on decades of scientific research, which demonstrates acute toxicity to freshwater and saltwater organisms at concentrations lower than this method would indicate. However, the 4-day average limit would be much more stringent (about an order of magnitude lower) than U.S. EPA's recommendations. Realistic attainment of this objective without dilution would be difficult.

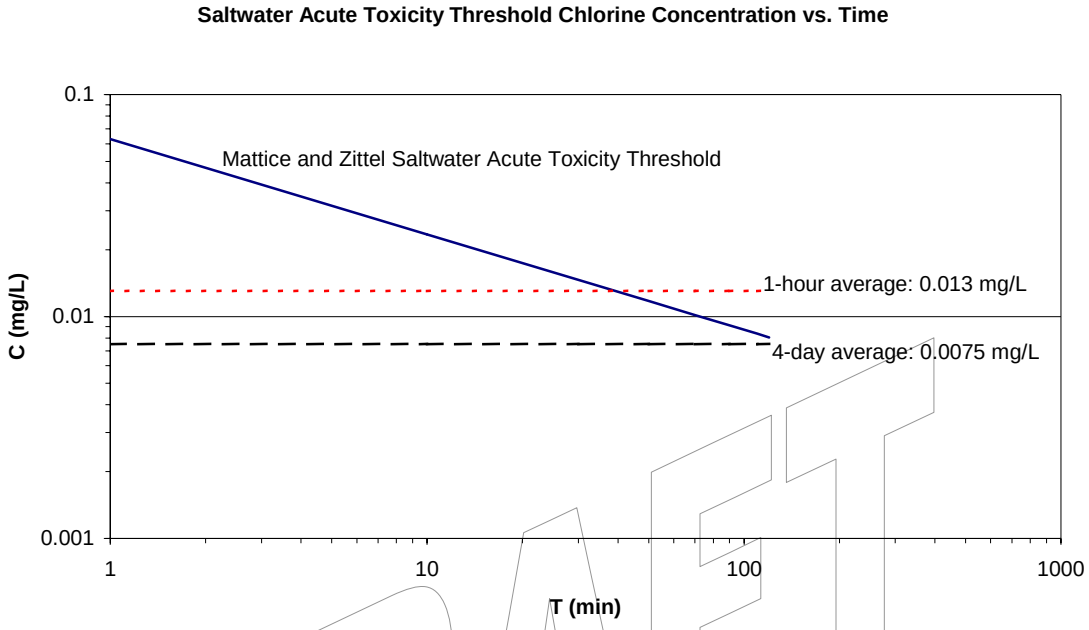
However, the Ocean Plan's method could be ~~incorporated into the chlorine Policy~~considered for use with inland intermittent discharges lasting less than two hours. ~~and can be used for freshwater and saltwater intermittent discharges. While U.S. EPA's one-hour and four-day averages are not precluded from applying to all types of discharges containing chlorine, there may be difficulty applying the criteria to distinct intermittent discharges. In addition, U.S. EPA's criteria for chlorine were intended to apply to situations of continuous exposure, "not to~~

~~situations of specially controlled intermittent exposures when more appropriate data are available" (Mattice and Zittel, 1976).~~

~~As a means of controlling biological growth (defouling), many power plants intermittently inject chlorine into condenser tubes. These intermittent discharges typically last less than two hours per day (Mattice, 1984). In addition, CFR, Title 40, Part 423 best available technology (BAT) economically achievable effluent limitations guidelines for steam electric power generation facilities, limit free available and total residual chlorine discharge durations from a power generation unit to two hours per day.~~

~~As described above, Mattice and Zittel (1976) estimated freshwater and saltwater time dependent acute toxicity thresholds for intermittent discharges of chlorine from power plants. These thresholds have been determined using toxicity data for freshwater and marine species, and they represent chlorine levels below which zero mortality is expected for a given duration of intermittent discharge.~~ Since the acute toxicity thresholds for chlorine presented in Mattice and Zittel (1976) have been developed specifically for intermittent discharges, these data ~~are~~may be appropriate for establishing objectives for intermittent discharges from power plants and other intermittent chlorine discharges that are less than two hours in duration per day (or 24-hour period). The following graphs show the freshwater and saltwater acute toxicity thresholds for intermittent ~~discharges~~ exposures lasting one minute to 120 minutes. Also shown on the following graphs are U.S. EPA's one-hour and four-day criteria.






As defined, the acute toxicity thresholds are chlorine concentration levels below which zero mortality is expected for a given ~~discharge~~ exposure duration. The "threshold" values represent ceiling concentrations that should not be exceeded. Therefore, the acute toxicity thresholds ~~should~~ could be applied as instantaneous maximum objectives for the sum of the intermittent chlorine ~~discharge~~ exposure periods throughout each day. ~~For example, a facility that discharges chlorine four times per day in 15-minute intervals would need to meet the acute toxicity threshold for a discharge totaling one hour in duration. This conservative method for determining objectives for intermittent discharges should be used for the following reasons:~~

~~a. Without specific information about a discharge and the receiving water body, it is impossible to determine how much time is required in between intermittent chlorine discharges to consider them separate discharges for purposes of setting protective receiving water objectives.~~

~~b. Requiring that intermittent discharges meet instantaneous maximum objectives, based on the sum of discharge times during a 24-hour period, provides a straightforward method for determining objectives that can be applied on a statewide basis and that are protective of water quality.~~

~~c.~~a. ~~Establishing instantaneous maximum objectives based on intermittent discharges that occur throughout a 24-hour period is consistent with the two-hour per day intermittent discharge time period limitation, and provides a smooth transition from the intermittent objectives to U.S. EPA's one-hour and four-day averages (applying to discharges of chlorine lasting more than two hours per day).~~

~~It is proposed that the acute toxicity thresholds be used as instantaneous maximum objectives for intermittent discharges lasting two hours or less per 24-hour period. The proposed~~

~~f~~Freshwater and saltwater time dependent instantaneous maximum objective relationships for chlorine ~~are summarized below~~could be formulated as shown below:

| | **Instantaneous Maximum (µg/L)** |
|---|---|
| TRC (freshwater) | $C = \frac{1070}{T^{0.740}}$ |
| CPO (saltwater) | $C = \frac{63.1}{T^{0.43}}$ |

~~The use of the above relationships for establishing objectives for intermittent discharges would protect receiving waters from toxic effects and provide flexibility for dischargers that use chlorine for short periods of time.~~

~~Where~~In these equations *C* is the chlorine concentration in micrograms per liter (ug/L) and *T* is the chlorine exposure time in minutes. Very high levels of dilution and mixing allow for the reasonable substitution of discharge time for exposure time *T* in the above calculations for ocean discharges of chlorine residual. However, this substitution would not be reasonable for typical inland discharges. Determination of the exposure time to organisms in the discharge plume would be required for each facility. This approach is not feasible for a statewide p~~P~~olicy. In addition, Mattice and Zittel (1976) did not address the impacts of chronic exposure to intermittent discharges. For these reasons, the application of the ocean method to inland intermittent discharges is not considered to be a viable option for this Policy.

**5. Whole effluent toxicity (WET) approach, in lieu of criteria.** The measurement of WET defines *"the aggregate toxic effect of an effluent measured directly by an aquatic toxicity test"*(54 Federal Register 23868 at 23895, June 2, 1989). WET testing is an important tool for the detection and control of unknown toxicants and aggregate effects of several toxicants. However, WET testing is not appropriate to measure the effects of a single known toxicant within an unknown mixture of toxicants. Any detected toxicity could be due to a number of potential toxicants (including ammonia) and could not automatically be linked to chlorine. Therefore, the use of WET testing is not a viable option to quantify the specific effects of chlorine.

**6. Adopt Lahontan Regional Water Board Objectives.** Lahontan Regional Water Board's Basin Plan states "TRC shall not exceed either a median value of 0.002 mg/L or a maximum value of 0.003 mg/L (median values should be based on a daily measurement taken during any 6-month period)." These objectives are more stringent than the suggested U.S. EPA objectives and attainment of the objectives may prove to be difficult. However, the Lahontan Region has not implemented the above numbers in any permits but, rather, uses U.S. EPA's 304(a) criteria guidance. Therefore, adopting U.S. EPA's 304(a) criteria guidance as objectives provides ~~the~~ scientifically defensible objectives, which are ~~criteria and is~~ already being used by several Regional Water Boards.

**7. Adopt Subcategories of Objectives.** This alternative would propose the adoption of subcategories of objectives to address different types of water bodies and/or categorize

objectives for different beneficial use designations (e.g., warm water habitat, exceptional warm water, modified warm water, cold water habitat, limited resource water, and seasonal salmonid habitat – based on Ohio Regulation 3745-1-07, Table 7-1, effective 12-31-2002).

Currently, a Tiered Aquatic Life Uses (TALU) pilot study is being conducted in Southern California's coastal arid and semi-arid streams to identify precise aquatic life uses, allowing better consistency and management of California waters. The goal of the pilot study is to recommend appropriate tiered aquatic life uses, evaluate potential reference conditions for each tier, and ~~to~~ develop appropriate biocriteria for each tier. ~~Although this is a complicated undertaking, it is a positive way to find accuracy of appropriate biocriteria for each aquatic life tier.~~ Unfortunately, there are still many technical issues to be resolved. Evaluation of TALU applicability to other water body types such as lakes, lagoons, estuaries, and intermittent streams is ~~are~~ still needed. Also, a framework for evaluating appropriate biocriteria and water quality objectives for ~~of~~ each tier has not been fully established. ~~formed.~~

This option is intriguing ~~with the benefit of implementing a precise TALU~~; however, the initial pilot study has not yet been completed and ~~is~~ lacks ~~ing~~ specifics for addressing chlorine use. But, this alternative should be maintained as a future option for addressing aquatic life beneficial uses and can ~~should~~ be revisited in a triennial review forum.

**Recommendation**
Adopt Alternative 2 ~~and portions of Alternative 4~~.

**Present State Policy**

There is no statewide Policy authorizing mixing zones for TRC or CPO in inland surface waters or enclosed bays and estuaries. However, the Central Valley Regional Water Board's Basin Plan states, "In conjunction with the issuance of NPDES and storm water permits, the Regional Water Board may designate mixing zones within which water quality objectives will not apply provided the discharger has demonstrated to the satisfaction of the Regional Water Board that the mixing zone will not adversely impact beneficial uses." Three other Regional Water Boards' basin plans also allow mixing zones.

**Issue Description**

Mixing zones are a volume of water that is allocated for mixing with a wastewater discharge where applicable water quality criteria or objectives can be exceeded without causing adverse effects to the overall water body. The SIP allows dilution credits, which are used in the calculation of effluent limitations and two types of mixing zone determinations; completely mixed and incompletely mixed. The SIP, however, does not apply to TRC or CPO discharges. In addition, the TSD stipulates that acutely toxic conditions must not be present in any mixing zone. Exposure to chlorine residual has been shown to cause toxicity in aquatic organisms on the order of minutes (see Table 2 and additional references at the end of this document).

In many regions of California, there is no assimilative capacity for dilution due to lack of flow in receiving water. Chlorine residual can decay in natural waters; however, the TSD states that *"Continuous discharges continually can introduce toxic pollutants into a receiving water. Although these pollutants can decay over time, this decay will occur downstream or away from the discharge. The receiving water concentrations at the point of discharge continually are being refreshed. In these instances, toxicity can be considered conservative and persistent (nondecaying) in the near field."* ~~In addition, TRC and CPO are acutely toxic to aquatic life. The Department of Fish and Game has a Policy that no acutely toxic concentration of pollutant shall be present at the discharge point prior to dilution.~~ Any amount of chlorine without neutralization prior to surface waters, bays, and estuaries discharge may increase the potential of ~~downstream~~ near field fish kills and harm to aquatic biota.

**Alternatives for State Water Board Action**

**1. ~~Prohibit~~Prohibitif mixing zones.** Under this alternative, chlorine residual objectives would have to be met at end-of-pipe. This approach would be most protective of water quality and beneficial uses and the integrity of the water body. Statewide consistency could be achieved, and permit writers would not have to determine if mixing zones are appropriate for each different receiving water body.

**2. Allow mixing zones for TRC and CPO in a small area near an outfall.** Under this alternative, mixing zone language found in section 2.2.2 of the TSD could be adopted. Mixing zone studies could be developed for use by dischargers and Regional Water Boards in the

permitting process. It would offer flexibility to dischargers and assist them in meeting water quality-based effluent limitations.

Mixing zone allowances will increase the mass loading of the pollutant to the water body and decrease treatment requirements. They adversely impact immobile species, such as benthic communities. Further, studies specifically show the higher concentrations of chlorine residual cause~~s~~ an overall reduction on periphyton, which is a primary food source for most species. Periphyton serves as the basis of the food web, and its reduction can have strong indirect effects on the receiving water, which can actually exacerbate TRC toxicity (Stewart, 1996). Due to the lethality chlorine has on aquatic life and considering the integrity of a water body, a mixing zone would have to be limited to a very small area at the outfall point. This seems counter-productive economically and in addressing protection of aquatic life. All considerations should be observed if allowing mixing zones such as pH and temperature. These and other factors can contribute to overall toxicity. Site-specific objectives might be a more productive solution for addressing the possibility of having instantaneous consumption of excess chlorine residual.

**3. Policy should remain silent in regards to mixing zones.** In this alternative, the proposed Policy would remain silent to allow the Regional Water Boards the discretion of using their Basin Plan mixing zone provisions, if applicable.

The Regional Water Boards are most knowledgeable in the waters they regulate. Therefore, if mixing zones are authorized in a Basin Plan and do not cause acutely toxic conditions to aquatic life or adversely impact benthic organisms, it is appropriate for the Regional Water Board to exercise its discretion on this issue.

**Recommendation**
Adopt Alternative ~~1 or~~ 3.

**Table 2. Examples of the Fast Acting Toxicity of Chlorine in Aquatic Organisms**

| Species | Duration (minutes) | Effect Level | Concentration (ppb) | Reference |
|---|---|---|---|---|
| Brown Trout | 2 | Total Mortality | 40 | Pike, 1971 |
| Trout Fry | Instantly | Lethal | 300 | Conventry, et al., 1935 |
| White Sucker | 30-60 | Lethal | 1,000 | Fobes, 1971 |
| Oligochaete worm | 34<br>30 | 100% Mortality<br>Disintegration | 1,000 | Collins & Deaner, 1973<br>Hart, 1957 |
| Coho salmon | <48<br><1 | 100% Mortality<br>Immediate Distress | 620 | Holland, et al., 1960 |
| Chinook salmon fry | 12 | 100% Mortality | 150 | Collins & Deaner, 1973 |
| Rainbow trout | 50 | 50% Mortality | 200 | Merkens, 1958 |
| Grass pickerel | 60 | 100% Mortality after 24 hours | 1,000 | Hubbs, 1970 |
| Common shiner | 76 | 100% Mortality | 1,000 | Hubbs, 1970 |
| Minnow bluntnose | 61 | 100% Mortality | 720 | Hubbs, 1970 |
| Minnow | 79 | 100% Mortality | 700 | Hubbs, 1970 |
| Oyster larvae | 2 | Swimming Stopped | 700 | Waugh, 1964 |
| Copepod | 2<br>2 | 30% Mortality<br>70% Mortality | 700 | Dressel, 1971 |
| Pink Salmon | 7.5<br>15 | 50% Mortality<br>50% Mortality | 500 | Stober & Hanson, 1974 |
| Chinook salmon | 7.5 | 50% Mortality | 750 | Stober & Hanson, 1974 |

**Present State Policy**

Currently, no statewide Policy exists that stipulates how wWater qQuality-bBased eEffluent lLimits (WQBELs) should be calculated for TRC and CPO discharges to inland surface waters, enclosed bays, and estuaries of California. Most Regional Water Boards use the U.S. EPA's TSD or the SIP as guidance to calculate WQBELs for TRC and CPO. Regional Water Board provisions can be viewed in detail in the Economic Analysis section of this document.

**Issue Description**

WQBELs are required for all pollutants in a point source discharge that cause, have the reasonable potential to cause, or contribute to an excursion above a water quality criterion (40 CFR 122.44 (d)(1)(iii)). Federal regulations (40 CFR 122.44 (d)(1)(vii)(A)(B)) require that WQBELs be derived from and comply with all applicable water quality standards, and be consistent with the assumptions and requirements of applicable, approved wasteload allocations. The effluent limitation must protect against both acute and chronic impacts. Federal NPDES regulations ~~40 CFR 122.44(d) and the CCR, Title 23, Chapters 3 and 4,~~ provide the overall framework for establishing WQBELs. The regulations, however, do not include specific procedures for calculating WQBELs.

**Alternatives for State Water Board Action**

**1. No action.** This non-action would defer calculation decisions to the Regional Water Board permit writer. However, this alternative promotes inconsistency throughout the State. The problem with identifying exceedances and taking enforcement action would still remain. This alternative does not rectify issues that currently exist with chlorine discharges.

**2. Apply the objectives as end-of-pipe effluent limits.** The national criteria procedure and recommendation of scientifically based numerical criteria can be found within the *Ambient Water Quality Criteria for Chlorine, 1984,* for both freshwater and saltwater. The *Ambient Water Quality Criteria for Chlorine,* shown in the following table, can be directly applied as effluent limitations to continuous discharges containing chlorine.

| | **1-hr average (mg/L)** | **4-day average (mg/L)** |
|---|---|---|
| TRC (freshwater) | 0.019 | 0.011 |
| CPO (saltwater) | 0.013 | 0.0075 |

~~For intermittent discharges lasting two-hours or less, the Mattice and Zittel (1976) acute toxicity thresholds can be directly applied as instantaneous maximum effluent limitations for chlorine instead of the U.S. EPA one-hour and four-day averages. Following are the proposed intermittent discharge instantaneous maximum concentration equations:~~

| | ~~Instantaneous Maximum (µg/L)~~ |
|---|---|
| ~~TRC (freshwater)~~ | ~~$C = \frac{1070}{T^{0.740}}$~~ |
| ~~CPO (saltwater)~~ | ~~$C = \frac{63.1}{T^{0.43}}$~~ |
| ~~C = TRC or CPO instantaneous maximum objective (µg/L).~~ | |
| ~~T = Sum of intermittent discharge times (in minutes) during a 24-hour period, never to exceed 120 minutes.~~ | |

NPDES procedure dictates that criteria are applied at the end of pipe when dilution is not allowed for a specific constituent. This policy does not incorporate dilution into effluent limits for TRC and CPO, due to the acute toxicity of chlorine to aquatic organisms.

The State Water Board has adopted regulations (23 CCR sec 2235.2), which incorporate the NPDES permit regulations. The federal regulations ~~say for POTWs, use~~specify weekly and monthly ~~averages~~averages for POTWs and; ~~for industries, use~~ daily maximum and monthly averages for industries, unless impracticable. Unlike other pollutants requiring WQBELs that hit the treatment plant at the intake and whose fate is affected by the whole treatment process, additives near the end of the treatment train control chlorine disinfection and dechlorination. Thus, the effect of a process failure for chlorination or dechlorination is abrupt and immediately impacts effluent quality and in turn is best regulated in shorter averaging periods. Conversely, other pollutants introduced to a collection system become spread out by pipe wall friction and other contributory waste streams, so they will more likely not hit the treatment plant as a slug flow, and are best regulated under a weekly and monthly average. The SIP also uses daily maxima ~~ums~~ and monthly averages for priority pollutant criteria and numeric objectives. However, these types of averaging periods will not protect aquatic life beneficial uses regarding chlorine residual concentrations.

~~The *Department of Fish and Game Guidelines on Chlorine Residual Limitations for Protection of Aquatic Life, 1985* concurs with U.S. EPA's recommendations.~~ Further the TSD states that *"Continuous discharges continually can introduce toxic pollutants into a receiving water. Although these pollutants can decay over time, this decay will occur downstream or away from the discharge. The receiving water concentrations at the point of discharge continually are being refreshed. In these instances, toxicity can be considered conservative and persistent (nondecaying) in the near field."* ~~Department of Fish and Game has a Policy that "no acutely toxic concentration of pollutant shall be present at the discharge point prior to dilution" and specifically states that, "chlorine is highly toxic to aquatic life and discharge of concentrations above 0.019 parts per million (ppm) in receiving waters is a violation of Fish and Game Code 5650."~~ Therefore, effluent limitations should remain expressed as the above ~~instantaneous maximas, and~~ 1-hour and 4-day averages. Chlorine residual can be acutely toxic within minutes of exposure to fish and other aquatic life; weekly and monthly limits are not protective and are, therefore, impracticable (see Table 2 and additional references at the end of this document).

**3. Use of Santa Ana Water Board criteria based on 99 percent compliance for TRC.** This option provides both effluent limit numbers and properties for their compliance. This method

is based on a regulation for determining compliance with pH effluent limitations under continuous monitoring (40 CFR 401.17). Currently, Santa Ana Water Board includes this type of specific language for compliance with chlorine limits, with a few minor language changes. To determine 99 percent compliance with the effluent limitation specified for TRC, the Santa Ana Water Board uses the following conditions:

a. The total time during which the total chlorine residual values are above 0.1 mg/L (instantaneous maximum value) shall not exceed 7 hours and 26 minutes in any calendar month;
b. No individual excursion above 0.1 mg/L shall exceed 30 minutes; and
c. No individual excursion shall exceed 2 mg/L.

The Santa Ana Water Board uses this language in NPDES permits for chlorine discharges. Under this approach, NPDES dischargers are required to comply with a chlorine residual concentration requirement 99 percent of the time, while concurrently not exceeding specified maximum concentration and duration threshold values.

The values used, however, do not provide adequate protection for aquatic life. Because the 99 percent compliance language is based on a regulation for pH effluent limitations under continuous monitoring, it is not directly applicable to chlorine residual effects. Further, there is no apparent scientific basis for using the pH approach for attaining chlorine residual compliance. A more protective approach specific to TRC and CPO is necessary. Many studies provide evidence of the lethality of chlorine residual to aquatic life in very short or instantaneous intervals of time (e.g., DeGraeve et al., 1978 and Roberts et al. 1975; see Table 2). Compliance 99 percent of the time allows for seven hours and twenty-six minutes a month of exceedances and does not reflect the real toxicity chlorine has on aquatic life.

**4. Adopt TSD/SIP language.** The TSD contains methodologies for developing WQBELs for toxic pollutants ~~are contained in the TSD~~. The SIP also has detailed procedures for calculating WQBELs for numeric priority pollutant criteria and objectives. The TSD describes several methods for calculating effluent limits that rely on mass balance equations to calculate the effluent quality required to meet water quality criteria. The SIP builds on the technical guidance in the TSD by providing some additional flexibility. However, the SIP is slightly more stringent than the TSD.

Unfortunately, the SIP would not be an appropriate tool for calculating effluent limitations when continuous monitoring is being used. The SIP better accommodates grab sample monitoring rather than continuous monitoring. The SIP accounts for effluent variability by using a Coefficient of Variation (CV) and the number of grab samples collected. The consideration of effluent variability in effluent limit calculation is employed to predict the long-term performance of the effluent. In other words, the variability of daily, weekly or monthly data points is evaluated in an attempt to predict the potential effluent performance between sampling points, over time. Consideration of effluent variability is imbedded within the continuous monitoring process. The concentration of Cl in effluents will be measured every minute, which leaves a negligible interval of unknown performance. Rather than estimating the potential that an effluent may exceed the objective at some point, the policy

requires dischargers to determine whether or not the effluent exceeds the objectives based on a minute--by--minute quantification of the effluent. ~~Accordingly, the CV may be meaningless if there are infrequent toxic spikes of concentration.~~ The SIP also uses the number of samples to generate the average monthly effluent limits (AMELs) from its Table 2, and this number is based on grab samples, not continuous monitoring. Further, NPDES procedure dictates that criteria are applied at the end of pipe when dilution is not allowed for a specific constituent. This policy does not incorporate dilution into effluent limits for TRC and CPO, due to the acute toxicity of chlorine to aquatic organisms. Therefore, the equations and procedures found within the SIP will not appropriately address current chlorine issues.

~~If, however, the recommended continuous monitoring is not a factor in this process and CV is used to calculate AMELs and maximum daily effluent limits (MDEL), the average monthly limit would most likely always be less than U.S. EPA's recommended 4-day average criteria. At higher CVs, the AMEL is more stringent compared to the 4-day average criteria. Again the one-hour and four-day averaging periods are appropriate for chlorine residual concentrations.~~

**Recommendation**
Adopt Alternative 2.

**Present State Policy**

There is no statewide Policy authorizing schedules to comply with WQBELs for TRC or CPO in NPDES permits for discharges to inland surface waters or enclosed bays and estuaries. Several Regional Water Board Basin Plans contain general compliance schedule provisions that allow schedules in NPDES permits for new, revised, or newly interpreted water quality standards.

The following are summaries of the Regional Water Boards' Basin Plan compliance schedules provisions.

***North Coast Region (Region 1)***

The Regional Water Board may establish a Schedule of Compliance in an NPDES permit under the following circumstances:

1) Where an existing discharger has demonstrated, to the Regional Water Board's satisfaction, that it is infeasible to achieve immediate compliance with effluent and/or receiving water limitations specified to implement new, revised, or newly interpreted water quality objectives, criteria, or prohibitions;

2) Where a discharger currently operating under a non-NPDES permit who under new interpretation of law, is newly required to comply with NPDES permitting requirements – demonstrates to the Regional Board's satisfaction that it is infeasible to achieve immediate compliance with newly imposed effluent and/or receiving water limitations specified to implement objectives, criteria, or prohibitions adopted, revised, or reinterpreted after July 1, 1977, and that were not included in the non-NPDES permit; or

3) Where a discharger is required to comply with TMDLs adopted as a single permitting action, and demonstrates that it is infeasible to achieve immediate compliance with effluent and/or receiving water limits that are specified to implement new, revised, or newly interpreted objectives, criteria, or prohibitions.

***San Francisco Bay Region (Region 2)***

Immediate compliance will be required for effluent limitations that are met by current performance. The Regional Water Board may consider dischargers' proposals for longer compliance schedules for newly adopted objectives or standards in NPDES permit conditions for particular substances where revised effluent limitations are not currently being met and where justified. Schedules cannot exceed ten years from the new standard's effective date.

***Central Coast Region (Region 3)***

None.

***Los Angeles Region (Region 4)***

Where the Regional Water Board determines that it is infeasible for an existing discharger to achieve immediate compliance with an effluent limitation specified to implement a new, revised, or newly interpreted water quality standard, whether numeric or narrative, adopted by the Regional Water Board, State Water Board, or U.S. EPA, the Regional Water Board may establish a compliance schedule in a discharger's Waste Discharge Requirements (NPDES

permit). In addition, the Regional Water Board may establish a compliance schedule to implement a total maximum daily load (TMDL) adopted as a single permitting action, but the compliance schedule must be as short as possible as determined in the TMDL based on the TMDL's support document, and may only be used when implementing new, revised, or newly interpreted water quality standards.

***Central Valley Region (Region 5)***
Where the Regional Water Board determines it is infeasible to achieve immediate compliance with water quality objectives adopted by the Regional Water Board, or the State Water Board, or with water quality criteria adopted by U.S. EPA, or with an effluent limitation based on these objectives or criteria, the Regional Water Board may establish in NPDES permits a schedule of compliance. The schedule cannot exceed ten years from the effective date of the new objective or criteria.

***Lahontan Region (Region 6)***
None.

***Colorado River Basin Region (Region 7)***
None.

***Santa Ana Region (Region 8)***
In some circumstances, dischargers may be unable to comply immediately with effluent limitations through no fault of their own. In these cases, it is reasonable and appropriate to include a schedule for compliance in the NPDES permit. The schedule cannot exceed ten years from the effective date of the new, newly revised, or newly interpreted criteria or objective.

***San Diego Region (Region 9)***
None.

**Issue Description**
Unless compliance schedule authorization is specifically included in a water quality standard or regulations implementing the standard, the permit writer cannot include a compliance schedule in an NPDES permit implementing the standard. In these circumstances, any schedule must be included in a separate enforcement order.

When immediate compliance with federal or s~~S~~tate water quality standards is not feasible in certain circumstances, a schedule for compliance may be warranted. The State Water Board's economic analysis indicates that some NPDES dischargers may need to implement process optimization or to install dechlorination equipment, a continuous monitoring system, or a back-up monitoring system, or some combination of these, to comply with this proposed Policy. These activities, particularly the optimization of continuous monitoring systems for low-level detection, are expected to ~~may~~ take time to accomplish.

**Alternatives for State Water Board Action**

**1. No action.** Those Regional Water Boards that do not have compliance schedule authorization in their Basin Plans must issue permits requiring immediate compliance with effluent limitations implementing the proposed TRC or CPO objectives. Those Regional Water Boards that do have this authority can allow up to ten years to achieve compliance in appropriate cases. Some facilities may need time to acquire the necessary continuous monitoring equipment, become proficient in its use, hire staff to run the necessary equipment, and other necessary actions.

~~**2. Adopt compliance schedule of two years.** Not all dischargers can comply immediately with effluent limits implementing the proposed TRC or CPO objectives. Likewise, some dischargers may not have the capability to monitor continuously or access to a back-up monitoring system. Therefore, it is appropriate to adopt compliance schedule provisions that allow the Regional Water Boards to include schedules in permits to achieve the proposed new requirements. Consistency in the length of the schedules is also desirable on a statewide basis. A two-year time frame seems reasonable for acquiring the necessary continuous monitoring equipment, for training personnel with its use, and beginning necessary protocols to comply with the chlorine effluent limits.~~

~~3~~2. **Adopt compliance schedule of two years with Regional Water Board discretion to establish compliance schedules up to five years.** ~~Since dischargers have to address only one constituent, t~~Two years ~~seems to~~may be an adequate amount of time to obtain compliance, and adequate compliance determination methods, for some dischargers. However, some dischargers are expected to require further time to optimize continuous monitoring equipment.~~situations may exist where further time might be necessary.~~ In ~~some unforeseen~~such cases, ~~it may be appropriate to allow the~~ Regional Water Boards ~~to~~ should provide longer compliance schedules, if appropriate, with proper justification.

~~4~~3. **Adopt compliance schedule of ~~5~~ five years.** This alternative would allow dischargers that may have problems complying with the protocols of the effluent limits, ~~5~~ five years to optimize continuous monitoring equipment and consider new treatment processes. This alternative is currently used in the SIP and in some Basin Plans. The allowance of ~~5~~five-years could be acceptable as long as compliance is obtained in the shortest time practicable and justification is submitted to the Regional Water Boards that: (1) diligent efforts have been made to comply with this proposed Policy, and (2) documentation of source control, ~~and~~ pollution minimization efforts and progress toward full compliance with the Policy ~~are~~ is in place.

**Recommendation**
Adopt Alternative~~s~~ ~~3~~ 2 or ~~4~~3.

*Chapter 5 – Monitoring and Reporting Frequency*

**Present State Policy**

There is no statewide Policy that establishes the monitoring frequency for TRC or CPO monitoring that applies to NPDES permits regulating discharges to inland surface waters or enclosed bays and estuaries. U.S. EPA regulations implementing the NPDES permit program generally provide that NPDES permits must require monitoring at a "frequency sufficient to yield data which are representative of the monitored activity including, when appropriate, continuous monitoring." (40 CFR §122.48(c)).

**Issue Description**

Currently, permits contain varied language to address monitoring for chlorine residual for inland surface waters, enclosed bays, and estuaries. Some dischargers are required to have continuous monitoring and some dischargers are required to provide a daily, monthly, or even quarterly grab sample. It is essential to have consistent monitoring requirements statewide that protect against chlorine acute toxicity.

**Alternatives for State Water Board Action**

**1. No action.** Under this alternative, Regional Water Boards will continue to establish monitoring frequencies in permits, which may vary from permit to permit and from region to region. This alternative does not address statewide consistency or ensure that monitoring requirements foster aquatic life protection.

**2. Use continuous monitoring.** Continuous monitoring of chlorine residual or a dechlorination agent ~~should~~ could be required ~~with~~ for all facilities, with the exception of small facilities where the Regional Water Board determines that continuous monitoring is inappropriate. Continuous monitoring ~~can be~~is used to monitor directly for chlorine residual or indirectly for a dechlorination agent. A residual dechlorinating agent in the effluent ~~can~~ indicates that chlorine residual is not present ~~and can validate a zero residual reading~~.

The Water Boards could define ~~C~~continuous monitoring for the policy as~~can be defined as~~ one data point or more every minute. The collection of a large number of results allows for two important evaluations to occur. The first is the ability to average a collection of data in order to "smooth out" small, short-term, or intermittent measurements of chlorine. The extent of smoothing is dependent on the averaging process. For example: a single measurement of 1 mg/L of chlorine within one hour worth of data (60 values) would provide an average discharge of chlorine for the hour of 0.0167 mg/L (assuming a zero for the 59 reported non-detects [ND]). The term "average" can be considered a discrete average when calculating a one-hour or four-day average. Use of a one-hour averaging period rather than an instantaneous or daily maximum will allow for small ~~continuous~~ anomalies with the continuous monitoring ~~anomalies with the~~ equipment while still protecting aquatic life beneficial uses.

The other value in collecting data every minute is the ability to detect short-term discharges of significant concentration. Since most wastewater treatment plants add chlorine at levels of

10 to 20 mg/L, monitoring every minute would detect a catastrophic failure in even as short as 2 minutes. Such failures must be detected as quickly as possible in order to prevent significant degradation of water quality. Catastrophic failures may not be noticed if chlorine measurements are not frequent.

Both NDs and ~~negative~~ positive values of dechlorination agent residual ~~values could~~ ~~should~~could be considered zero for averaging purposes. When continuous monitoring of both chlorine residual and dechlorination agent residual is used, ~~In cases of equipment~~ intermittent spikes in TRC or CPO equipment ~~can be shown to be~~will be considered false-positive readings if ~~,~~ positive values of dechlorination agent residual ~~were~~are simultaneously measured. ~~negative values could then be used as~~ The dechlorination agent data provides a justification that water quality is being met, allowing Regional Water Board staff to identify a true violation. However, in all other instances, positive values of dechlorination agent residual~~negative values~~ should be considered zero.

~~The quantification/reporting limit (QRL) shall not exceed the facilities effluent limitation. However, if the Regional Water Board determines on a case-by-case basis that a discharger cannot meet the QRL set at the effluent limitation and that it is infeasible for the discharger to show compliance via the presence of residual dechlorination agent or by another means, an alternative QRL could be established providing the discharger completes and submits a QRL study.~~

To be effective, ~~O~~on-line chlorine residual devices ~~must~~would need to be able to ~~have the ability to~~ record measurements at no less than one per minute and record concentrations in parts per billion (ug/L or ppb). On-line devices must have a manufacturer-stated sensitivity corresponding to 10 ppb. ~~Facilities~~Dischargers should also utilize manufacturer's recommendations regarding reagent replenishment, reagent shelf life, and calibration. ~~Facilities must~~ Dischargers should verify the concentration of all standard solutions used for calibration and quality control purposes for TRC or CPO continuous monitoring devices using Method 4500-Cl E as found in Standard Methods for the Examination of Water and Wastewater, 20th edition, whose stated detection limit is 10 ppb.

The ~~Regional Water Board~~permitting authority could exempt facilities on a case-by-case basis from the continuous monitoring requirement where the discharger demonstrates, and the ~~Regional Water Board~~permitting authority would need to determines, that continuous monitoring does not appropriately characterize the discharge. The ~~Regional Water Board~~permitting authority would need to ~~should~~ explain its determination in an appropriate finding in the discharger's NPDES permit. For example, facilities with intermittent chlorine residual discharges could be exempted from the continuous monitoring requirement, if appropriate. In such cases, the Regional Water Boards must require that dischargers conduct monitoring that is appropriate for the discharge.

Use of continuous monitoring instrumentation for chlorine residual and dechlorination residual in the effluent is an appropriate method of process control. This option is representative of a discharge, protective of aquatic life, and can be considered an accurate way of showing

compliance and addressing enforcement concerns while providing permitting consistency throughout the State.

**3. Use grab sampling.** This is a provision that is currently being used in most permits in California. The language ranges from grab samples daily, weekly, monthly, and even quarterly. It is necessary to increase grab samples to every few minutes within a 24-hour day to provide adequate representation of a discharge. Grab samples taken between long intervals will not protect aquatic life from chlorine residual toxicity. Use of grab samples for the primary determination of compliance is not a cost-effective way to address chlorine violations or enforcement. Grab samples need to be taken more frequently to be protective, such as every 15 minutes. This type of sampling would become burdensome and almost impossible over long periods of time.

**Recommendation**
Adopt Alternative 2.

**Present State Policy**

Chlorine regulation became complex when the Legislature enacted the Clean Water Enforcement and Pollution Prevention Act of 1999 (SB 709), effective on January 1, 2001. SB 709 added several provisions to Division 7 of the CWC that addresses pollution prevention plans (CWC §13263.3), MMPs (CWC §13385), recovery of economic benefits in assessing civil liabilities (CWC §13385), and a requirement to prescribe effluent limitations (CWC §13263.6). These provisions presented challenges for the Regional Water Boards' enforcement programs. The approach for determining violations of chlorine residual requirements for NPDES permittees, who are required to conduct continuous monitoring, is a main concern of the Regional Water Boards.

**Issue Description**

Currently, interpretation of a violation and determination of MMPs is difficult for both dischargers and Regional Water Board staff. In many cases, monitoring systems used for chlorine residual compliance and control purposes are subject to occasional spikes, which may be an artifact. In the past, Regional Water Boards exercised their discretion to not institute enforcement actions for minor chlorine residual violations where the dischargers demonstrated that the violation was due to a spike occurrence. However, with the implementation of SB 709, the ability to interpret violations has been greatly limited for the Regional Water Boards, subjecting dischargers to multiple MMP enforcement actions when, in fact, the violations may be a monitoring artifact.

**Alternatives for State Water Board Action**

1. **No Action.** Allow each Regional Water Board to decide how compliance is met.

2. **Provide Compliance Determination Language.** Use of continuous monitoring analyzers for chlorine or ~~and~~ dechlorination agent residual in the effluent is an appropriate method of process control. A positive residual dechlorination agent in the effluent indicates that chlorine is not present in the discharge~~, which can validate a zero residual reading on the chlorine analyzer~~. ~~This type of~~Continuous monitoring of dechlorination agent can also prove that some chlorine residual exceedances are false-positives. Reporting ~~of these two constituents, when~~either a positive dechlorination agent residual ~~is present and~~or chlorine residual below the effluent limit ~~is zero,~~ sufficiently e~~i~~nsures compliance with the chlorine residual effluent limit, as long as the instruments are maintained and calibrated in accordance with the manufacturers' recommendations.

When continuous monitoring systems are off-line, such as for calibration, ~~and~~ maintenance, and troubleshooting, a back-up system must be in place to show compliance. These systems can include, but are not limited to, monitoring for dechlorination residual (bisulfite or sulfite analyzer), redundant analyzers, stoichiometry, or grab samples (according to 40 CFR 136.3 Table 1B) using U.S. EPA approved methods. Grab samples must adequately characterize the

discharge. This means at least one sample in 15-minute intervals of the discharge prior to its release into the receiving water and until the continuous monitoring system is back on-line. ~~If grab samples taken at the end-of-pipe show chlorine residual above the stated effluent limit, then it would be necessary to begin monitoring the receiving water as well as the discharge to adequately characterize and assess impacts to aquatic life within the receiving water.~~

If grab samples taken at the end-of-pipe show chlorine residual above the stated effluent limit, the discharger would be required to begin monitoring ~~must begin~~ receiving waters ~~monitoring~~ to adequately characterize and assess impacts to aquatic life within the receiving water. During situations where sampling the receiving water becomes a safety hazard, such as during the night in a swift moving river, the discharger can develop an alternative method to assess impacts to the receiving water and aquatic life. The ~~Regional Water Board~~permitting authority ~~must~~would need to approve the alternative method, however, prior to the exceedance.

Any excursion over the 1-hour average or 4-day average should be a violation. This proposed Policy does not address specific enforcement penalties. This will be governed by the *Clean Water Enforcement and Pollution Prevention Act of 1999* (CWC Sections 13263 and 13385). If a discharger conducts continuous monitoring and the discharger can demonstrate, through data collected from the discharger's back-up monitoring system, that a chlorine spike recorded by the continuous monitoring was not actually due to chlorine, then any excursion resulting from the recorded spike ~~will~~ would not be considered an actual exceedance, but rather would be reported as a false-positive. Any exceedance that cannot be reasonably explained should be a violation, including short duration excursions.

**Recommendation**
Adopt Alternative 2.

## *Chapter 7 - Storm Water Discharges* ~~[NEEDS TO BE CHECKED BY SHEILA V.]~~

**Present State Policy**

There is no statewide p~~P~~olicy that specifically addresses regulation of storm water discharges under the NPDES permit program, nor any p~~P~~olicy that addresses NPDES-permitted storm water discharges containing TRC or CPO. A statewide storm water p~~P~~olicy is in the very preliminary stages of development. The State Water Board has, however, adopted several precedential ~~decisive~~ orders on storm water permits. These orders have upheld storm water permit limits that rely on an iterative process using BMPs, rather than numeric effluent limits, to achieve water quality standards. ~~In these orders, the State Water Board has concluded that numeric effluent limits in storm water permits are infeasible at this time. For this reason, the SIP, which specifies procedures to develop numeric WQBELs for priority pollutant criteria and objectives, does not apply to storm water discharges.~~

**Issue Description**

Under Phase I of the U.S. EPA storm water program, NPDES permits regulating storm water discharges were issued to industry and medium and large municipalities. Phase II of the program covers storm water discharges from small municipalities, small construction, and State and federal facilities. Both ~~This~~ phases ~~is~~ are currently being implemented. ~~It is intended to further reduce adverse impacts to water quality and aquatic habitat by instituting the use of controls on unregulated storm water discharges that can cause environmental degradation.~~

The State Water Board has adopted statewide general NPDES permits for storm water discharges from various industrial activities and construction projects and from California Department of Transportation activities. Municipal storm water discharges and some individual industrial discharges are regulated under ~~individual or general~~ NPDES permits adopted by the Regional Water Boards. All current storm water permits, except for some individual industrial permits, are based on BMPs rather than numeric effluent limitations.

Discharges other than storm water (non-storm water discharges) to municipal storm drains are only allowed in specified cases that are defined in these storm water permits. Discharges of non-storm water that contain chlorine are not allowed except in emergencies. Non-storm water chlorine issues sometimes arise when chlorinated water is discharged into a storm water conveyance system. This water, in most cases, flows directly into a surface water body, enclosed bay, or estuary. ~~Identification of storm water and non-storm water discharges is part of a discharger's maintenance program.~~ A non-storm water discharge into a storm water conveyance system could include swimming pool or fountain water containing chlorine or backwash water from pools or fountains. Municipal storm water dischargers are required to institute best management practices to prevent discharges of chlorine. ~~However, these types of discharges are not allowed. Dechlorinated swimming water or fountain water is considered non-storm water when discharged.~~

Fire protection systems frequently contain chemical additives including chlorine. Storm water permits listed above allow ~~contain protocols for dealing with~~ emergency non-storm water

discharges. These permits require implementation of best management practices ~~Any "protocols"~~ for non-emergency firefighting activities ~~are determined by each permittee through a Storm Water Management Plan (SWMP) and is approved by the Regional Water Board before it is implemented~~.

**Alternatives for State Water Board Action**

**1. No action.** Although the proposed objectives (Part I) apply to all water bodies, the implementation (Part II) of this proposed Policy should not apply to discharges that are regulated under permits that do not contain any numeric water quality-based effluent limitations. Nor should implementation of the proposed Policy apply to NPDES permits for which the State Water Board or Regional Water Boards have determined that numeric effluent limits for chlorine are infeasible, as provided in the Calculation section of Part II of the proposed Policy. The State Water Board, through the adoption of this policy, ~~has~~will determine~~d~~ that, at the present time, numeric effluent limits for TRC and CPO are infeasible to regulate potable water discharges that occur in the field due to the activities of drinking water utilities or agencies. These activities include, but are not limited to, dewatering pipelines and reservoirs, flushing distribution system piping, and flushing fire hydrants. Numeric effluent limits are infeasible because these discharges occur at dispersed locations in the field, there are no stationary treatment facilities at these locations, and field monitoring equipment does not currently achieve the necessary level of performance. The ~~Regional Water Boards~~permitting authority ~~must~~ regulates the discharge of TRC and CPO in these discharges through requirements for appropriate best management practices and appropriate monitoring or other measures to ascertain whether the best management practices are effective. In addition, a Regional Water Board may include effluent limitations expressed as best management practices, in lieu of numeric effluent limits, for TRC or CPO for discharges other than the drinking water discharges described in the preceding paragraph, where authorized under 40 C.F.R. §122.44(k), revised as of July 1, 2005.

Thus, under this alternative, the proposed Policy's implementation provisions would not apply to those ~~e existing~~ storm water permits that currently contain only requirements for best management practices. ~~program. The State Water Board would continue to base storm water regulation on BMPs, rather than the suggested Policy provisions.~~ Nor would the implementation provisions apply to certain field activities of potable water utilities or to other discharges for which the Regional Water Board determines that numeric effluent limits for chlorine are infeasible. Existing s~~S~~torm water permits that require only best management practices would continue to prohibit the discharges ~~of non-storm water~~ from swimming pools and fountains without appropriate best management practices. Although it is possible to have excursions of chlorine enter a storm water conveyance system, current provisions for handling such excursions are already in place through the storm water program. Specific narrative language and requirements relative to compliance will continue to be developed on a permit-by-permit basis. ~~Further, intermittent low threat and drinking water discharges are currently regulated with Regional Water Board General Permits or Municipal Separate Storm Sewer Systems (MS4) permits. If these types of discharges are currently regulated and meet the requirements of the General Permit or MS4 permit, then the implementation of this proposed Policy (such as continuous monitoring) should not apply.~~

~~**2. Require storm water discharges to comply with the implementation provisions of the chlorine Policy.** Under this alternative, storm water permits would contain numeric effluent limits for TRC or CPO and would need to comply with this proposed Policy. This approach is contrary to the decisive orders adopted by the State Water Board in which the State Water Board concluded that numeric effluent limits in storm water permits are infeasible at this time. It also conflicts with the State Water Board's conclusion that the iterative approach using BMPs is the preferred method to achieve water quality standards in storm water permits. Further, for storm water, it is likely that impacts would not be significant if the type of discharges that could contain chlorine is already prohibited.~~

**2. Require discharges that are currently regulated through a best management practices approach, including storm water discharges, to comply with the implementation provisions of the chlorine policy.** Under this alternative, permits that currently require only best management practices, including storm water permits, would have to include numeric effluent limits for TRC or CPO. The State Water Board recently received a final report from the Storm Water Panel that contains recommendations regarding including numeric effluent limits in storm water permits. The State Water Board plans to conduct two public meetings on the final report to receive public comments on the recommendations. The State Water Board intends to consider the report and comments before determining an appropriate course of action. It is best to defer this issue at this time. The State Water Board can consider the issue again during a triennial review.

~~**Recommendation**~~**Recommandation**

Adopt Alternative 1.

*Chapter 8 - Nonpoint Source Pollution Discharges*

**Present State Policy**

There is a statewide Policy on the regulation of nonpoint source (NPS) waste discharges. The State Water Board NPS Policy provides policy guidance to the Regional Water Boards and dischargers regarding the prevention and control of NPS waste discharges.[5] NPS discharges are regulated under Porter-Cologne (CWC § 13000 et seq.) through the use of WDRs, waivers of WDRs, or Basin Plan prohibitions. Like the storm water program, the NPS pollution control program relies on the implementation of management practices to control pollution.

**Issue Description**

Approximately 96 percent of all pesticides use chlorine or a variety of chlorinated compounds in its production. However, chlorine originating from pesticides, solvents, or other organic chemicals is not relevant to this proposed Policy. Chlorinated organic compounds undergo dechlorination anaerobically in most situations. Anaerobic conditions are not conducive to the formation of compounds that are measurable as TRC or CPO.

The issue then becomes whether or not NPS discharges should be covered under the implementation provisions of this proposed Policy or the NPS Policy, which contemplates MPs. TRC or CPO is not generally a NPS problem, and it would be more efficient to use the MP approach.

**Alternatives for State Water Board Action**

**1. No Action.** Although the proposed objectives apply to all water bodies, the implementation of this proposed Policy should not apply to NPS discharges. Under this alternative, the Regional Water Boards will continue to rely on the NPS Policy to address chlorine excursions in NPS situations.

**2. Require NPS discharges to comply with the implementation provisions of this proposed Policy.** Currently, situations regarding NPS residual chlorine do not pose a threat to surface waters, enclosed bays, and estuaries of California. Additionally, this proposed Policy will not work well for NPS discharges (e.g., numeric effluent limits are not feasible or practicable in general for NPS pollution sources). Therefore, the issue becomes whether the implementation provisions are appropriate for NPS discharges. In recognizing that the proposed Policy provisions suggest the use of continuous monitoring and back-up system monitoring, it would be impossible for NPS discharges to comply. However, it does seem appropriate to allow the NPS Policy to provide guidance to the Regional Water Boards and dischargers to control and prevent chlorine residual excursions, if they exist.

[5] The NPS Policy was adopted by the the State Water Board in May 2004 and became effective in September 2004.

**Recommendation**
Adopt Alternative 1.

## ENVIRONMENTAL EFFECTS OF PROPOSED POLICY

***Regulation.***
When the State Water Board adopts or revises a water quality objective, it must consider several factors, including economics, under CWC section 13241. In addition, under CEQA, when the State Water Board adopts a performance standard or treatment requirement, it must conduct an environmental analysis of the reasonably foreseeable methods of compliance with the standard or requirement. The analysis must take into account economic and other factors (Public Resources Code section 21159).

***Anti-degradation.***
Any relaxation of water quality standards that may occur as a result of this proposed Policy must comply with U.S. EPA's anti-degradation Policy, 40 CFR §131.12. U.S. EPA's Policy requires that all existing uses be fully protected. Where the water quality is better than that necessary to fully protect uses, the water quality may be lowered if the discharger demonstrates that it is necessary to accommodate important economic or social development. Degradation will not be allowed to drop water quality to levels below that necessary to protect existing beneficial uses. Where the anti-degradation Policy does not apply, the change in standards still must comply with all other applicable requirements of State Policy for water quality control and U.S. EPA regulations.

North Coast, Central Coast, and Colorado River Basin Regional Water Boards all have narrative toxicity objectives that state "that all waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life." These Basin Plans currently do not have numeric TRC or CPO objectives, and existing permit limits for these substances vary.

San Francisco Bay Regional Water Board currently lists an instantaneous maximum effluent limit for all treatment facilities of 0.0 mg/L in the Basin Plan. However, in most permits the limit is defined as below the detection limit using U.S. EPA methods. The proposed objectives are based on U.S. EPA recommendations and research, and the effluent limit is based on water quality standards. Additionally, the proposed water quality objectives could be attained at a level that is measurable (accurate and reliable), as well as protective of aquatic life beneficial uses, and consistent throughout all NPDES permits. Further, the proposed Policy requires continuous monitoring to replace daily, weekly, or monthly grab sampling, therefore providing a complete representation of a discharge.

In this case, the Lahontan Regional Water Board has a more stringent objective for addressing TRC. Lahontan Region's Basin Plan states: "TRC shall not exceed either a median value of 0.002 mg/L or a maximum value of 0.003 mg/L (median values should be based on a daily measurements taken during any 6-month period)." However, no permit has implemented the above limits. Currently, the Lahontan Region uses U.S. EPA recommended numbers to address chlorine residual within the NPDES permits for that region. Therefore, degradation will not occur and beneficial uses will continue to be protected.

***Potentially Significant Adverse Environmental Effects.***
The State Water Board has considered whether any adverse environmental impacts will result from adoption of the proposed objectives and proposed implementation Policy. The main purpose of adopting chlorine residual objectives, along with a comprehensive implementation Policy, is to address aquatic life protection and to obtain statewide consistency. The proposed Policy is meant to improve the environment's natural state by reducing the number of chlorine residual violations and, therefore, further reducing toxic impacts to aquatic life.

***Existing Environmental Conditions.***
At the present time, the Regional Water Boards regulate TRC and CPO by referring to each region's Basin Plan. Each Basin Plan has its own objective (narrative or numeric), and permits contain varied language for compliance (refer to Table 1 of this draft SED).

To address whether chlorine acute toxicity is a statewide problem and its potential adverse environmental impacts, staff reviewed the System for Water Information Management (SWIM), for violation and enforcement data. State Water Board and Regional Water Boards have several database modules with applications specific to handling regulatory program activities. SWIM[6] contains compliance and enforcement order documents and can be sorted to list specific violations. Statewide reporting of violations to the Legislature is essential in order to comply with CWC § 13385 (m). It is important to note that staff at the Regional Water Boards must maintain SWIM data. While SWIM provides a comprehensive means of recording and tracking data, the information on violation and enforcement actions contained in SWIM does not constitute an official record of all violations and enforcement actions taken by Regional Water Board staff. Some of the violations and actions shown may not have been final, and this may not be a complete list of all violations and enforcement actions that exist, just the violations reported by the Regional Water Boards.

To identify effects on existing environmental conditions, SWIM was used to compile a list of chlorine residual violations and enforcement actions from the years 2002 through 2004. This information demonstrates chlorine residual limits were exceeded a total of 549 times between 2002 and 2004 (see figures 13 and 14).

The 549 violations listed in SWIM were compiled into four categories: operations and management (O&M) failure, equipment failure, electrical failure, and exceedance of effluent limit (no specific reason listed). (See figure 13). Additionally, all violations were separated into two groups, total chlorine violations and serious violations, regardless of why the violation occurred.

The above violations resulted in recorded fish kills and negative effects on aquatic life, creation of a pollution event, enforcement actions, which resulted in multiple MMP fines, and a need

[6] The SWIM database was merged in July 2005 with the California Integrated Water Quality System (CIWQS) database. CIWQS is a new computer system for the State and Regional Water Boards to track information about places of environmental interest, manage permits and other orders, track inspections, and manage violations and enforcement activities.

for dischargers to take corrective action. This information demonstrates the need to address chlorine with regulatory efforts.

Figure 13
**Chlorine Violations**

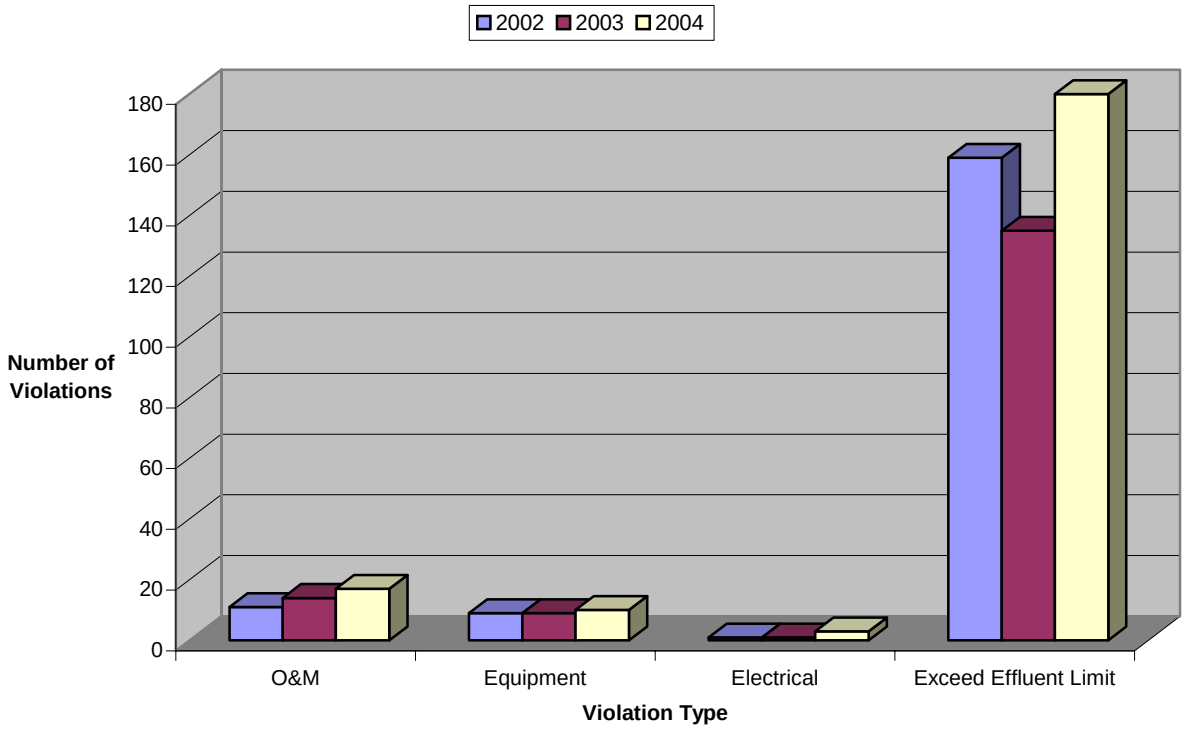



Figure 13 shows a breakdown of each chlorine residual exceedance between the years of 2002 through 2004. Chlorine violations due to O&M practices have risen slightly, whereas equipment malfunction/failure violations have stayed relatively constant. Power outages seem to be a small portion of the overall violations, having only 5 reported since 2002. However, exceedances that do not have any justification have risen by 30 since 2002 and by 51 since 2003.

Figure 14
**Violation Comparison**

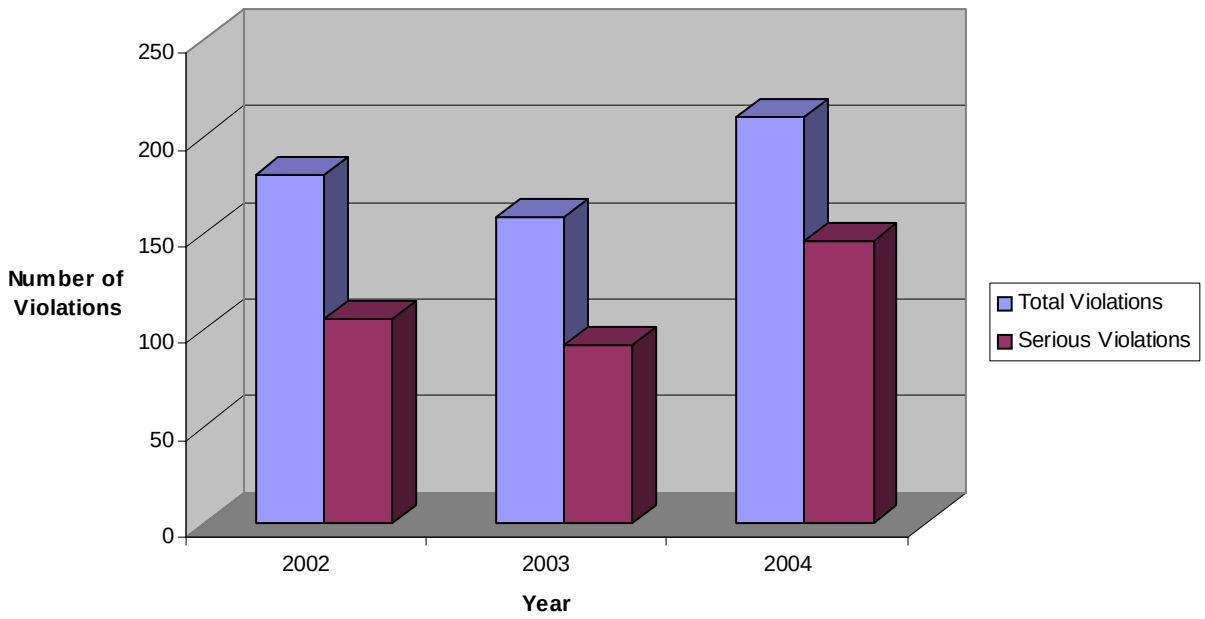



Figure 14 shows the number of overall violations that were labeled serious violation in the SWIM database. In 2004 out of 210 chlorine exceedances, 146 were classified as serious violations.

***Potential significant adverse environmental effects if the proposed Policy is adopted.***
With the adoption of the proposed Policy, current violations of chlorine residual can be minimized. Environmental conditions should improve with the adoption of this proposed Policy by allowing the entire State of California to comply with the U.S. EPA adopted criteria for TRC and CPO.

The proposed Policy also requires continuous monitoring to meet the requirement for monitoring and reporting the chlorine residual effluent limit. This equipment will help Regional Water Boards identify true violations by providing continued monitoring, as well as a back-up system for verification of monitoring data. With this information, chlorine residual excursions can be identified quickly.

Construction or relocation of dechlorination facilities may be warranted. The purpose of dechlorination is to remove chlorine from treated wastewater prior to its discharge into a surface water, enclosed bay, or estuary. Dechlorination relocation should not be expected to have any adverse impacts on the environment.

Permittees can use dechlorination facilities or can choose other alternatives to chlorination (such as Ultra Violet [UV]). Some facilities may want to retrofit existing treatment facilities to replace existing chlorination systems with UV disinfection systems. The chlorine contact basin could be modified for installation of a UV system. Using UV instead of chlorine to meet the water quality criteria would remove dischargers from adhering to the suggested Policy.

***Reasonable Means of Compliance.***
See "Economic Considerations for Proposed Total Residual Chlorine and Chlorine-Produced Oxidants Policy of California," prepared by SAIC.

***Growth-Inducing Impacts.***
Defined under 15126(g)) of the CEQA guidelines, growth inducing impacts are those that could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. The proposed Policy would not affect any of these parameters.

***Cumulative and Long-term Impacts.***
CEQA guidelines Section 15355 provides the following description of cumulative impacts:

" 'Cumulative impacts' refers to two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts.

(a) The individual effects may be changes resulting from a single project or a number of separate projects.
(b) The cumulative impact from several projects is the change in the environment, which result from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time."

A means of complying with CEQA requirements to consider cumulative impacts is to provide a list of past, present, and reasonably foreseeable future projects, which are related to the proposed action.

Currently, there are no projects being adopted that meet the definition for cumulative impacts.

Future projects dealing with chlorine, a non-priority pollutant, would likely have no cumulative impact. NPS and storm water programs currently address chlorine excursions. Therefore, future policies will not have an overlapping effect.

The proposed Policy would not affect the cumulative impact parameters set forth in Section 15355 of the CEQA guidelines.

**ENVIRONMENTAL CHECK FORM**

**BACKGROUND:**

| | |
|---|---|
| Project Title: | Total Residual Chlorine (TRC) and Chlorine-Produced Oxidants (CPO) Policy of California |
| Lead Agency: | State Water Board<br>1001 I Street, Floor 15<br>Sacramento, California 95814 |
| Contact Person: | Dena E. McCann (916) 323-9690 (Regina?) |
| Description: | Adoption of Water Quality Objectives for Total Chlorine Residual and Implementation Policy for the State of California |

**ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:**

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

| | | |
|---|---|---|
| ☐ Aesthetics | ☐ Agriculture Resources | ☐ Air Quality |
| ☐ Biological Resources | ☐ Cultural Resources | ☐ Geology /Soils |
| ☐ Hazards & Hazardous Materials | ☐ Hydrology / Water Quality | ☐ Land Use / Planning |
| ☐ Mineral Resources | ☒ Noise | ☐ Population / Housing |
| ☐ Public Services | ☐ Recreation | ☒ Transportation/Traffic |
| ☒ Utilities / Service Systems | ☐ Mandatory Findings of Significance | |

**ISSUES:**

| | Potentially Significant Impact | Less Than Significant with Mitigation Incorporation | Less Than Significant Impact | No Impact |
|---|---|---|---|---|
| I. AESTHETICS -- Would the project: | | | | |
| a) Have a substantial adverse effect on a scenic vista? | ☐ | ☐ | ☐ | ☒ |
| b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway? | ☐ | ☐ | ☐ | ☒ |
| c) Substantially degrade the existing visual character or quality of the site and its surroundings? | ☐ | ☐ | ☐ | ☒ |
| d) Create a new source of substantial light or glare, which would adversely affect day or nighttime views in the area? | ☐ | ☐ | ☐ | ☒ |
| II. AGRICULTURE RESOURCES: In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. Would the project: | | | | |
| a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use? | ☐ | ☐ | ☐ | ☒ |
| b) Conflict with existing zoning for agricultural use, or a Williamson Act contract? | ☐ | ☐ | ☐ | ☒ |
| c) Involve other changes in the existing environment, which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use? | ☐ | ☐ | ☐ | ☒ |

| | Potentially Significant Impact | Less Than Significant with Mitigation Incorporation | Less Than Significant Impact | No Impact |
|---|---|---|---|---|
| III. AIR QUALITY -- Where available, the significance criteria established by the applicable air quality management or air pollution control district that may be relied upon to make the following determinations. Would the project: | | | | |
| a) Conflict with or obstruct implementation of the applicable air quality plan? | ☐ | ☐ | ☐ | ☒ |
| b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation? | ☐ | ☐ | ☐ | ☒ |
| c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions, which exceed quantitative thresholds for ozone precursors)? | ☐ | ☐ | ☐ | ☒ |
| d) Expose sensitive receptors to substantial pollutant concentrations? | ☐ | ☐ | ☐ | ☒ |
| e) Create objectionable odors affecting a substantial number of people? | ☐ | ☐ | ☐ | ☒ |
| IV. BIOLOGICAL RESOURCES -- Would the project: | | | | |
| a) Has a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service? | ☐ | ☐ | ☐ | ☒ |
| b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, Policy's, and regulations or by the California Department of Fish and Game or US Fish and Wildlife Service? | ☐ | ☐ | ☐ | ☒ |
| c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means? | ☐ | ☐ | ☐ | ☒ |

| | Potentially Significant Impact | Less Than Significant with Mitigation Incorporation | Less Than Significant Impact | No Impact |
|---|---|---|---|---|
| d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites? | ☐ | ☐ | ☐ | ☒ |
| e) Conflict with any local Policy's or ordinances protecting biological resources, such as a tree preservation Policy or ordinance? | ☐ | ☐ | ☐ | ☒ |
| f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan? | ☐ | ☐ | ☐ | ☒ |
| V. CULTURAL RESOURCES -- Would the project: | | | | |
| a) Cause a substantial adverse change in the significance of a historical resource as defined in 15064.5? | ☐ | ☐ | ☐ | ☒ |
| b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to 15064.5? | ☐ | ☐ | ☐ | ☒ |
| c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature? | ☐ | ☐ | ☐ | ☒ |
| d) Disturb any human remains, including those interred outside of formal cemeteries? | ☐ | ☐ | ☐ | ☒ |
| VI. GEOLOGY AND SOILS -- Would the project: | | | | |
| a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving: | ☐ | ☐ | ☐ | ☒ |
| i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42. | ☐ | ☐ | ☐ | ☒ |
| ii) Strong seismic ground shaking? | ☐ | ☐ | ☐ | ☒ |
| iii) Seismic-related ground failure, including liquefaction? | ☐ | ☐ | ☐ | ☒ |

| | Potentially Significant Impact | Less Than Significant with Mitigation Incorporation | Less Than Significant Impact | No Impact |
|---|---|---|---|---|
| iv) Landslides? | ☐ | ☐ | ☐ | ☒ |
| b) Result in substantial soil erosion or the loss of topsoil? | ☐ | ☐ | ☐ | ☒ |
| c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse? | ☐ | ☐ | ☐ | ☒ |
| d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property? | ☐ | ☐ | ☐ | ☒ |
| e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater? | ☐ | ☐ | ☐ | ☒ |
| VII. HAZARDS AND HAZARDOUS MATERIALS Would the project: | | | | |
| a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials? | ☐ | ☐ | ☐ | ☒ |
| b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment? | ☐ | ☐ | ☐ | ☒ |
| c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school? | ☐ | ☐ | ☐ | ☒ |
| d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment? | ☐ | ☐ | ☐ | ☒ |
| e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area? | ☐ | ☐ | ☐ | ☒ |

| | Potentially Significant Impact | Less Than Significant with Mitigation Incorporation | Less Than Significant Impact | No Impact |
|---|---|---|---|---|
| f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area? | ☐ | ☐ | ☐ | ☒ |
| g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan? | ☐ | ☐ | ☐ | ☒ |
| h) Expose people or structures to a significant risk of loss, injury or death involving wild land fires, including where wild lands are adjacent to urbanized areas or where residences are intermixed with wild lands? | ☐ | ☐ | ☐ | ☒ |
| VIII. HYDROLOGY AND WATER QUALITY -- Would the project: | | | | |
| a) Violate any water quality standards or waste discharge requirements? | ☐ | ☐ | ☒ | ☐ |
| b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)? | ☐ | ☐ | ☐ | ☒ |
| c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner, which would result in substantial erosion or siltation on- or off-site? | ☐ | ☐ | ☐ | ☒ |
| d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner, which would result in flooding on- or off-site? | ☐ | ☐ | ☐ | ☒ |
| e) Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff? | ☐ | ☐ | ☐ | ☒ |
| f) Otherwise substantially degrade water quality? | ☐ | ☐ | ☐ | ☒ |
| g) Place housing within a 100-year flood hazard | ☐ | ☐ | ☐ | ☒ |

| | Potentially Significant Impact | Less Than Significant with Mitigation Incorporation | Less Than Significant Impact | No Impact |
|---|---|---|---|---|
| area as mapped on a Federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map? | | | | |
| h) Place within a 100-year flood hazard area structures, which would impede or redirect flood flows? | ☐ | ☐ | ☐ | ☒ |
| i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam? | ☐ | ☐ | ☐ | ☒ |
| j) Inundation by seiche, tsunami, or mudflow? | ☐ | ☐ | ☐ | ☒ |
| IX. LAND USE AND PLANNING - Would the project: | | | | |
| a) Physically divide an established community? | ☐ | ☐ | ☐ | ☒ |
| b) Conflict with any applicable land use plan, Policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect? | ☐ | ☐ | ☐ | ☒ |
| c) Conflict with any applicable habitat conservation plan or natural community conservation plan? | ☐ | ☐ | ☐ | ☒ |
| X. MINERAL RESOURCES -- Would the project: | | | | |
| a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state? | ☐ | ☐ | ☐ | ☒ |
| b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan? | ☐ | ☐ | ☐ | ☒ |
| XI. NOISE ~~¥¥~~ Would the project result in: | | | | |
| a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies? | ☐ | ☐ | ☐ | ☒ |

| | Potentially Significant Impact | Less Than Significant with Mitigation Incorporation | Less Than Significant Impact | No Impact |
|---|---|---|---|---|
| b) Exposure of persons to or generation of excessive ground borne vibration or ground borne noise levels? | ☐ | ☐ | ☐ | ☒ |
| c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project? | ☐ | ☐ | ☐ | ☒ |
| d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project? | ☒ | ☐ | ☐ | ☐ |
| e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels? | ☐ | ☐ | ☐ | ☒ |
| f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels? | ☐ | ☐ | ☐ | ☒ |
| XII. POPULATION AND HOUSING -- Would the project: | | | | |
| a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)? | ☐ | ☐ | ☐ | ☒ |
| b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere? | ☐ | ☐ | ☐ | ☒ |
| c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere? | ☐ | ☐ | ☐ | ☒ |

| | Potentially Significant Impact | Less Than Significant with Mitigation Incorporation | Less Than Significant Impact | No Impact |
|---|---|---|---|---|
| XIII. PUBLIC SERVICES | | | | |
| a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services: | | | | |
| Fire protection? | ☐ | ☐ | ☐ | ☒ |
| Police protection? | ☐ | ☐ | ☐ | ☒ |
| Schools? | ☐ | ☐ | ☐ | ☒ |
| Parks? | ☐ | ☐ | ☐ | ☒ |
| Other public facilities? | ☐ | ☐ | ☐ | ☒ |
| XIV. RECREATION -- | | | | |
| a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated? | ☐ | ☐ | ☐ | ☒ |
| b) Does the project include recreational facilities or require the construction or expansion of recreational facilities, which might have an adverse physical effect on the environment? | ☐ | ☐ | ☐ | ☒ |
| XV. TRANSPORTATION/TRAFFIC -- Would the project: | | | | |
| a) Cause an increase in traffic, which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections)? | ☒ | ☐ | ☐ | ☐ |
| b) Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways? | ☐ | ☐ | ☐ | ☒ |

| | Potentially Significant Impact | Less Than Significant with Mitigation Incorporation | Less Than Significant Impact | No Impact |
|---|---|---|---|---|
| c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks? | ☐ | ☐ | ☐ | ☒ |
| d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)? | ☐ | ☐ | ☐ | ☒ |
| e) Result in inadequate emergency access? | ☐ | ☐ | ☐ | ☒ |
| f) Result in inadequate parking capacity? | ☐ | ☐ | ☐ | ☒ |
| g) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)? | ☐ | ☐ | ☐ | ☒ |
| XVI. UTILITIES AND SERVICE SYSTEMS Would the project: | | | | |
| a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board? | ☐ | ☐ | ☐ | ☒ |
| b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects? | ☒ | ☐ | ☐ | ☐ |
| c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects? | ☒ | ☐ | ☐ | ☐ |
| d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed? | ☐ | ☐ | ☐ | ☒ |
| e) Result in a determination by the wastewater treatment provider, which serves or may serve the project that it has adequate capacity to serve the projects projected demand in addition to the providers existing commitments? | ☐ | ☐ | ☐ | ☒ |
| f) Be served by a landfill with sufficient permitted capacity to accommodate the projects solid waste disposal needs? | ☐ | ☐ | ☐ | ☒ |

| | Potentially Significant Impact | Less Than Significant with Mitigation Incorporation | Less Than Significant Impact | No Impact |
|---|---|---|---|---|
| g) Comply with federal, state, and local statutes and regulations related to solid waste? | ☐ | ☐ | ☐ | ☒ |
| XVII. MANDATORY FINDINGS OF SIGNIFICANCE -- | | | | |
| a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory? | ☐ | ☐ | ☐ | ☒ |
| b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)? | ☐ | ☐ | ☐ | ☒ |
| c) Does the project have environmental effects, which will cause substantial adverse effects on human beings, either directly or indirectly? | ☐ | ☐ | ☐ | ☒ |

**EVALUATION OF ENVIRONMENTAL IMPACTS:**

I.a.,b.,c.,d. There is nothing in the proposed Policy that will impact designated scenic vistas or highways, or have a negative aesthetic affect, or result in increase glare.

II.a.,b.,c. The proposed Policy will not convert any land including farmland, change existing zoning for agricultural use, or change any existing environment due to its location or nature that could result in the conversion of farmland to non-agricultural use.

III.a.,b.,c.,d.,e. The proposed Policy will not adversely affect air quality, result in increase exposure to sensitive species through the air pathway, or result in changes in temperature, humidity, precipitation, winds, cloudiness, or other atmospheric conditions.

IV.a.,b.,c.,d.,e.,f. The proposed Policy is not expected to cause any significant adverse effects to plants and animals, including rare, threatened, or endangered species. The proposed Policy is

based on U.S. EPA recommended criteria to protect aquatic biological resources and has been peer-reviewed.

V.a.,b.,c.,d. The proposed Policy will have no direct or indirect impact on any cultural resources.

VI.a.i.,ii.,iii.,iv.,b.,c.,d.,e. The proposed Policy will not affect any geologic or soil conditions.

VII.a.,b.,c.,d.,e.,f.,g.,h. The proposed Policy will have no impact to the above areas.

VIII.a.,b.,c.,d.,e.,f.,g.,h.,i.,j. The proposed Policy will not affect absorption rates, drainage patterns, surface runoff, flooding, and quantity of surface or groundwater, surface water currents, or groundwater flow or supply. The proposed Policy may have less than a significant impact on water quality standards due to the potential use of the compliance schedule provision. A compliance schedule could allow a facility to continue with current chlorination/dechlorination practices until upgrades can be made to meet the more stringent proposed objectives and implementation.

IX.a.,b.,c. The implementation of the proposed Policy does not require specific property to be used in any way or prohibit property use.

X.a.,b. The proposed Policy will not result in the loss, recovery, or interfere with a plan regarding mineral resources.

XI.a.,b.,c.,d.,e.,f. The proposed Policy may have potentially significant impacts with the possibility of a temporary increase in ambient noise levels during installation or expansion type construction projects. The State Water Board cannot specify means of compliance and therefore any environmental effects due to modifications or any construction. Facilities must address the specifics of each project in subsequent environmental documents as appropriate.

XII.a.,b.,c. The proposed Policy will not affect population growth, development patterns, or affect existing housing.

XIII.a. The proposed Policy will not result in any adverse impacts to fire, police, schools, parks, or other public facilities.

XIV.a.,b. The implementation of the proposed Policy will not increase the use of parks, recreational facilities or require construction or expansion of recreational facilities that would physically effect the environment.

XV.a.,b.,c.,d.,e.,f.,g. The proposed Policy may have potentially significant impacts with the increase of transportation associated with the transport and delivery of additional dechlorination agents.

XVI.a.,b.,c.,d.,e.,f.,g. The proposed Policy may potentially have significant impacts for facilities that may need to install or expand dechlorination areas, additional chlorination equipment

housing, or additional storage projects. This may result in construction activities. The State Water Board cannot specify means of compliance and therefore any environmental effects due to modifications or any construction. Facilities must address the specifics of each project in subsequent environmental documents as appropriate.

XVII.a.,b.,c. The proposed Policy does not have the potential to degrade the quality of the environment, substantially reduce fish or wildlife habitat, cause fish or wildlife population to drop below self-sustaining levels, or threaten to eliminate a plant or animal community. Also the proposed Policy will not cause negative effects on human beings directly or indirectly.

**DEFINITION OF TERMS**

304(a) Criteria

Section 304(a) criteria are developed by U.S. EPA under authority of section 304(a) of the CWA and based on the latest scientific information on the relationship that the effect a constituent concentration has on particular aquatic species and/or human health. This information is issued periodically to the states as guidance for use in developing criteria.

Acute

Refers to a stimulus severe enough to rapidly induce an effect; in aquatic toxicity tests, an effect observed in 96-hours or less is typically considered acute. When referring to aquatic toxicology or human health, an acute affect is not always measured in terms of lethality.

Assimilative Capacity

The ability of a natural body of water to receive wastewaters or toxic materials without harmful effects, and without damage to aquatic life. Assimilative capacity is used to define the ability of a water body to naturally absorb and use a discharged substance without impairing water quality or harming aquatic life.

Chlorine Produced Oxidants (CPO)

Refers to the sum of oxidative products (hypobromous acid (HOBr), hypobromous ion (OBr-), and bromamines) in salt water.

Continuous Discharge

For the purpose of this Policy, continuous discharge of chlorine residual is defined as any discharge of pollutants that occurs without interruption throughout the operation hours of facilities that use chlorine in treatment or industrial processes, except for infrequent shutdowns for maintenance, process changes, or other similar activities.

Continuous Monitoring

For the purpose of this Policy, continuous monitoring is defined as reporting one or more data point(s) every minute .~~For the purpose of this proposed Policy, continuous monitoring is defined as one data point or more every minute.~~

Criterion Continuous Concentration (CCC)

An estimate of the highest concentration of a material in the water column to which an aquatic community can be exposed indefinitely without resulting in an unacceptable effect.

Criterion Maximum Concentration (CMC)

An estimate of the highest concentration of a material in the water column to which an aquatic community can be exposed briefly without resulting in an unacceptable effect.

Dechlorination

A chemical reaction that removes or replaces chlorine atoms contained in hazardous compounds, rendering them less hazardous.

Enclosed Bays

Indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between the headlands or outermost harbor works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. Enclosed bays include, but are not limited to, Humboldt Bay, Bodega Harbor, Tomales Bay, Drake's Estero, San Francisco Bay, Morro Bay, and San Diego Bay. (California Water Code §1339.5(a))~~Indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between the headlands or outermost harbor works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. Enclosed bays include, but are not limited to, Humboldt Bay, Bodega Harbor, Tomales Bay, Drake's Estero, San Francisco Bay, Morro Bay, and San Diego Bay. Enclosed bays do not include inland surface waters or ocean waters.~~

Estuaries

Water, including coastal lagoons, located at the mouths of streams that serve as zones of mixing for fresh and ocean waters. Coastal lagoons and mouths of streams that are temporarily separated from the ocean by sandbars shall be considered estuaries. Estuarine waters shall be considered to extend from a bay or the open ocean to a point upstream where there is no significant mixing of fresh water and sea water. Estuarine waters include, but are not limited to, the Sacramento-San Joaquin Delta, as defined in Water Code Section 12220, Suisan Bay, Carquinez Strait downstream to the Carquinez Bridge, and appropriate areas of the Smith, Mad, Eel, Noyo, Russian, Klamath, San Diego, and Otay rivers. (California Water Code §1339.5(b))~~Water, including coastal lagoons, located at the mouths of streams that serve as areas of mixing for fresh and ocean waters. Coastal lagoon and mouths of streams that are temporarily separated from the ocean by sandbars shall be considered estuaries. Estuarine waters shall be considered to extend from a bay or the open ocean to a point upstream where there is no significant mixing of fresh water and seawater. Estuarine waters include, but are not limited to, the Sacramento-San Joaquin Delta, as defined in Water Code Section 12220, Suisan Bay, Carquinez Strait downstream to the Carquinez Bridge, and appropriate areas of the Smith, Mad, Eel, Noyo, Russian, Klamath, San Diego, and Otay rivers. Estuaries do not include inland surface waters or ocean waters.~~

Four-day Average

An average, whether discrete or rolling, from the data set in four-day intervals.

Freshwater Criteria

For waters in which the salinity is equal to or less than 1 part per thousand 95 percent or more of the time, the applicable criteria are the freshwater criteria.

~~For waters in which the salinity is between 1 and 10 parts per thousand, the applicable criteria are the more stringent of the two or defensible information and data demonstrate that on a site-specific basis the biology of the water body is dominated by freshwater aquatic life and that freshwater criteria are more appropriate; or conversely saltwater.~~

Impact

A change in the chemical, physical, or biological quality or condition of a water body caused by external sources.

Inland Surface Waters

All surface waters of the State that do not include the ocean, enclosed bays, or estuaries.

National Pollutant Discharge Elimination System (NPDES)

A permit program under Section 402 of the CWA that imposes discharge limitations on point sources by basing them on the effluent limitation capabilities of a control technology or on local water quality standards.

Nonpoint Source

A pollution source that cannot be defined as originating from discrete points, such as a pipe discharge. Areas of fertilizer and pesticide applications, atmospheric deposition, manure, and natural inputs from plants and trees are types of nonpoint source pollution.

Non-Storm water

Flow arising from man-induced activities including, but not limited to, industrial processes, domestic irrigation, subdrains, groundwater wells and, municipal water supply systems.

Ocean Waters

The territorial marine waters of the State as defined by California law to the extent that these waters are outside of enclosed bays, estuaries, and coastal lagoons. Dischargers to ocean waters are regulated in accordance with the State Water Board's Ocean Plan.

One-hour Average

For the purpose of this proposed Policy, one-hour average is 60 data points, whether discrete or rolling, from the data set in one-hour intervals.

Saltwater Criteria

For waters in which the salinity is equal to or greater than 10 parts per thousand 95 percent or more of the time, the applicable criteria are the saltwater criteria.

For waters in which the salinity is between 1 and 10 parts per thousand, the applicable criteria are the more stringent of the two or defensible information and data demonstrate that on a site-specific basis the biology of the water body is dominated by freshwater aquatic life and that freshwater criteria are more appropriate; or conversely saltwater.

Storm Water

Storm water runoff, snow melt runoff, and surface runoff and drainage.

Total Residual Chlorine (TRC)

Refers to the sum of free chlorine and combined chlorine in fresh water.

Water Quality Objectives (WQO)

The allowable limits or levels of water quality constituents or characteristics, which are established for the reasonable protection of beneficial uses of water or the prevention of nuisance within a specific area.

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