

# **INFORMATIONAL DOCUMENT**

Public Scoping Meeting for the Proposed  
Total Residual Chlorine and Chlorine-Produced  
Oxidants Policy of California

May 2005

DIVISION OF WATER QUALITY  
**STATE WATER RESOURCES CONTROL BOARD**  
CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

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## ACRONYMS AND ABBREVIATIONS

ACL	Administrative Civil Liability
AMEL	Average Monthly Effluent Limits
BMP	Best Management Practices
CCC	California Coastal Commission
CCR	California Code of Regulations
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
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
FED	Functional Equivalent Document
FSU	Freshwater Standards Unit
MDEL	Maximum Daily Effluent Limits
MP	Management Practices
MMPs	Mandatory Minimum Penalties
ND	Non-Detect
NPDES	National Pollutant Discharge Elimination System
NPS	Non-Point Source
OAL	Office of Administrative Law
OSI	Office of Sustainable Industries
POTW	Publicly Owned Treatment Works
SB 709	Senate Bill 709 (CWC Section 13385)
SIP	Policy for Implementation of Toxics Standards for Inland Surface waters, Enclosed Bays, and Estuaries of California
SSO	Site-Specific Objective
SWIM	System for Water Information Management
SWMP	Storm Water Management Plan
SWRCB	State Water Resources Control Board
TRC	Total Residual Chlorine
TSD	Technical Support Document for Water Quality-Based Toxics Control
UAA	Use Attainability Analysis
USEPA	United States Environmental Protection Agency
WDR	Waste Discharge Requirement
WER	Water Effect Ratio
WET	Whole Effluent Toxicity
WQBEL	Water Quality-Based Effluent Limitations

## INTRODUCTION

Chlorine is often used in sewage treatment plants to protect water sources. An example of chlorine use can be found in many publicly owned treatment works (POTWs). Most often, chlorine gas is used as a disinfectant to rid the waters of harmful microorganisms. Chlorine is extremely toxic to aquatic life. 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<sup>-</sup>). Free chlorine reacts readily with ammonia, which then forms combined chlorine; monochloramine and dichloramine. 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 (USEPA 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) (USEPA 1994). Specifically, concentrations less than 0.1 mg/L were found toxic to Fathead minnows, *Daphnia magna*, *Daphnia pulex*, *Nitocra spinipes*, rainbow trout, brook trout, and green sunfish (Bureau of Water Management 1971; Brungs 1973; AQUIRE 1994; and Wan *et al.* 2000b).

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<sup>-</sup>), and bromamines. Therefore, the term “chlorine-produced oxidants (CPO)” is used to describe the sum of oxidative products in saltwater (USEPA 1984).

Saltwater amphipods, a main food staple for fish, and larger invertebrates, may show 20 percent mortality at 0.3 mg/L CPO (Wan *et al.* 2000a). Many migratory species such as striped bass, king salmon, American shad and steelhead move through the Bay and Delta to spawning grounds within the watersheds of the rivers that drain to the Delta.

There are several approved analytical methods that are suitable to use for measuring chlorine residual. Currently, USEPA 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 ppb) to 0.0051 mg/l (5.1 ppb). Continuous monitoring is also suggested for some dischargers located throughout the State. The concentration of both TRC and CPO depends chiefly on pH, temperature, initial chlorine-to-nitrogen ratio, absolute chlorine demand, and an overall reaction time. TRC and CPO are both acutely toxic to aquatic life.

Due to chlorine and chlorine residual’s acute toxicity to aquatic life, the Regional Water Quality Control Boards (Regional Water Boards) have regulated discharges to ensure that no chlorine or chlorine residual toxicity will occur in California’s inland surface waters, enclosed bays, and estuaries. Chlorine regulation became more complex when the Legislature enacted the Clean Water Enforcement and Pollution Prevention Act of 1999 (SB 709; Chapter 93, Statutes of

1999), 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 are 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 of the monitoring procedures. 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.

Some dischargers are required to provide grab samples only once a day, or in some cases once a week to identify chlorine residual in their effluent. This sampling procedure may not be representative of the discharge and could have adverse impacts on aquatic life beneficial uses. All nine Regional Water Boards have used different methods for establishing chlorine residual limits. Permits may contain different language for addressing chlorine leading to lack of consistency. A statewide chlorine policy for TRC and CPO is needed to promote consistency and improve clarity.

## **Background**

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 (USC) §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 USC §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 antidegradation policy. 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 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 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 USEPA authorized the State and Regional Water Boards to issue NPDES permits. In addition, the State Legislature 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. Basin Plans are mandated by both the CWA and the State Porter-Cologne Water Quality Act (Porter-Cologne).

In addition, the State Water Board is required to adopt state policy for water quality control. All Regional Water Board Basin Plans must conform to these policies. State policy for water quality control includes one or more of the following: (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.

### **Public Participation**

A workgroup was organized to identify viable options to regulate TRC and CPO. The workgroup consisted of representatives from the State and Regional Water Boards, dischargers, and environmental participants, as well as USEPA and California Department of Fish and Game. The discussions centered on statewide consistency, aquatic life protection, implementing USEPA’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 for development of 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.

### **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 River 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: 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, which 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 (and CPO?) in non-storm water NPDES permits, 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 permits limits, e.g. the TSD or the SIP. According to a Scientific Applications International Corporation (SAIC) (2005) 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. Effluent limits in permits for POTWs must be stated, unless impracticable, as average weekly and average monthly.

Mixing zones are authorized under the CWA if a state's water quality standards or implementation procedures allow them. 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. Several of the Regional Water Boards, including the San Francisco Bay, Santa Ana, and Central Valley regions, include compliance schedule provisions in their respective Basin Plans. The North Coast and Los Angeles regions are in the process of adopting compliance schedule provisions. Assuming that a discharger meets the specified conditions to obtain a compliance schedule, the Basin Plans generally 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 under 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 vary 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 accord with USEPA policy and State Water Board precedential orders, storm water permits rely on an iterative process for implementation of best management practices (BMPs) to achieve water quality standards.

Likewise, the non-point source pollution program typically relies on discharger implementation of management practices (a term that also means best management practices) to control pollution sources. Non-point source pollution results from contact between pollutants and land runoff, precipitation, atmospheric deposition, drainage, seepage, or hydrologic modification. Generally, preventing or minimizing the generation of non-point source discharges most effectively control non-point source pollution.

In 2004, the State Water Board adopted a Policy for Implementation and Enforcement of the Non-point Source Pollution Control Program. The policy explains the five key elements that must be included in a non-point 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.

#### Mandatory Minimum Penalties (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 Administrative Civil Liability (ACL) for the MMP or assess an ACL for a greater amount. CWC §13385(h) requires that a MMP of \$3,000 be assessed by the Regional Water Board for each serious violation. 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 based on Appendix A to Section 123.45 of Title 40 of the Code of Federal Regulations. Chlorine is listed as a Group II pollutant.

The CWC contains several exceptions to the mandatory minimum penalty 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, a publicly owned treatment works serving a small community can be excepted from the mandatory penalties.

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 Waste Discharge Requirement (WDR) effluent limitations;
- 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. 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 policy implements and provides guidance regarding the use by the State 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 (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<sup>1</sup>, 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).”<sup>2</sup>

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<sup>1</sup> There are 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 policy, the applicable quantitation limit is the quantitation limit specified or authorized in the applicable waste discharge requirements.

<sup>2</sup> Note that the correct citation is now California Water Code section 13385(h)(2).

### 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) <sup>1</sup>
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 a most permits, the limit is defined as below the detection limit of methods defined in the latest EPA approved edition of “Standard Methods for the Examination of Water and Wastewater.”	0.0
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
Lahotan (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 a daily measurements taken during any 6-month period).	0.011 – 0.019
Colorado River (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 dischargers 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: USEPA (2004). mg/L = milligrams per liter.		

## CEQA Analysis and Impact of the Proposed Policy

State agencies are subject to the environmental impact assessment requirements of the California Environmental Quality Act (CEQA) (Public Resource Code, §21000 *et seq.*). However, CEQA authorizes the Secretary of the Resources Agency to exempt specific State regulatory programs from the requirements to prepare Environmental Impact Reports (EIRs), Negative Declarations, and Initial Studies, if certain conditions are met (Public Resources Code, §21080.5). The Water Quality Control (Basin)/208 Planning Program (which includes the California Ocean Plan) of the State Water Board has been certified by the Secretary for Resources as a regulatory program (California Code of Regulations (CCR), Title 14, §15251(g)). As such, the policy, with supporting documentation, may be submitted in lieu of an EIR as long as the appropriate environmental information is contained therein (Public Resources Code, §21080.5(a)). Accordingly, the State Water Board prepares Functional Equivalent Documents (FEDs) in lieu of the more commonly used EIR. A Draft Functional Equivalent Document (DFED) is prepared by the agency and circulated for public review and comment. Responses to comments and consequent revisions to the information in the DFED are subsequently presented in a draft Final Functional Equivalent Document (draft FFED) for consideration by the State Water Board. After the State Water Board has certified the document as adequate, the title of the document becomes the Final FED (FFED).

## Project Description

This project is a State Water Quality Control Policy that includes adoption of water quality objectives, based on USEPA'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 requirements;

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 2001 California Ocean Plan.

## Statement of Goals

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

1. Provide consistency throughout the State on procedures to regulate TRC and CPO;
2. Protect aquatic life beneficial uses throughout the State.
3. Provide a basis for equitable enforcement.

## Chapter 1 - Water Quality Objectives

### I. 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 regions.

### II. 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 USEPA 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.

### III. Staff Recommendation

Adopt U.S.EPA 304(a) criteria for chlorine: The State Water Board would adopt water quality objectives for TRC and CPO based on USEPA's water quality criteria guidance, *Ambient Water Quality Criteria for Chlorine - 1984*, for freshwater and saltwater<sup>3</sup> aquatic life protection. The State Water Board can adopt these values as objectives for all Regions and water bodies in the State. USEPA's recommended criteria are .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.

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<sup>3</sup> USEPA's definition for freshwater and saltwater will apply and can be found in "Definition of Terms" at the end of this document.

USEPA'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) described in *Guidelines for Deriving Numerical National Water Quality Criteria for the Protection of Aquatic Organisms and their Uses* (USEPA 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. Twenty-four species of saltwater animals in twenty-one genera have been determined for CPO and used for acute sensitivities, and one chronic test was conducted with the species *Menidia peninsulae*.

This alternative has a solid scientific foundation and has been peer reviewed. It is a logical choice for protecting aquatic life from TRC and CPO toxicity.

## **Chapter 2 - Mixing Zones**

### **I. 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, Central Valley Region'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."

### **II. 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 Policy for Implementation of Toxics Standards for Inlands Surface Waters Enclosed Bays and Estuaries of California (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 many regions of California, there is no assimilative capacity for dilution due to lack of flow in receiving water. In addition TRC and CPO is acutely toxic to aquatic life. 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 discharge into surface waters, bays and estuaries may increase the potential of downstream fish kills and harm to aquatic biota.

### **III. Staff Recommendation**

Prohibit mixing zones: 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.

## Chapter 3 - Calculation of Effluent Limitations

### I. Present State Policy

Currently, no statewide policy exists that stipulates how Water Quality Based Effluent Limits (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 USEPA's (1991) *Technical Support Document for Water Quality-based Toxics Control* (TSD) or the SIP as guidance to calculate WQBELs for TRC and CPO.

### II. 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 waste load 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.

### III. Staff Recommendation

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.

Water Type	1-hour	4-day
Freshwater	19-ug/l	11 ug/l
Saltwater	13 ug/l	7.5 ug/l

The State Water Board has adopted regulations (23 CCR sec 2235.2), which incorporate the NPDES permit regulations. The regulations say for POTWs, use weekly and monthly averages; for industries, daily maximum and monthly averages, unless impracticable. The SIP also uses daily maximums and monthly averages for priority pollutant criteria and numeric objectives. However, this type of averaging periods will not protect aquatic life beneficial uses. The *Department of Fish and Game Guidelines on Chlorine Residual Limitations for Protection of Aquatic Life* (CDFG 1985) recommends similar practices. Therefore, effluent limitations should remain expressed as the above 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 therefore, impracticable.

## **Chapter 4 - Compliance Schedules**

### **I. 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 Board Basin Plan compliance schedule provisions.

#### North Coast Region (Region 1)

Where the RB determines that it is infeasible for an existing discharger to comply with effluent limitations or where appropriate, receiving water limitations, specified to implement new, revised or newly interpreted water quality objectives, criteria or prohibitions; issuance of a schedule of compliance may be appropriate.

#### 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)

Currently, this Region is in the process of adopting compliance schedule provisions.

#### 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 the USEPA, 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 River Basin 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.

**II. 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 State water quality standards is not feasible in certain circumstances, a schedule for compliance may be warranted. 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 (SAIC 2005). These activities may take time to accomplish.

**III. Staff Recommendation**

Adopt compliance schedule of 2 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, train personnel with its use, and to begin necessary protocols to comply with the chlorine effluent limits.

## **Chapter 5 - Monitoring Frequency**

### **I. Present State Policy**

There is no state 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. USEPA 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)).

### **II. 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.

### **III. Staff Recommendation**

Use continuous monitoring: Continuous monitoring should be required of all facilities, with the exception of small facilities where the Regional Water Board determines that continuous monitoring is inappropriate (such as facilities with very small, intermittent discharges that last for minutes).

Continuous monitoring is defined here 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 zero for the 59 reported non-detects).

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 a time 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 non-detects (ND) and negative values could be considered zero for averaging purposes. In cases of equipment spikes, negative values could then be used as justification that water quality is being met, allowing Regional Water Board staff to identify a true violation. However, in all other instances negative values should be considered zero.

The term “average” can be considered a rolling average or a discrete average when calculating a one-hour or four-day average. Either a rolling or discrete value can be allowed, if monitoring equipment is set up that way.

Any excursion over the one-hour average or four-day average should be considered a violation. However, due to continuous monitoring equipment spikes or maintenance requirements, a violation could be a false/positive. When continuous monitoring systems are off-line for calibration and maintenance, a back-up system could be in place to show compliance. These systems could include, but are not limited too; monitoring SO<sub>2</sub> or bisulfite residual, redundant analyzer, grab samples, and WET.

## **Chapter 6 – Storm Water**

### **I. Present State Policy**

There is no state policy that specifically addresses regulation of storm water discharges under the NPDES permit program, nor any policy that addresses NPDES-permitted storm water discharges containing TRC or CPO. A statewide storm water policy is in the very preliminary stages of development. The State Water Board has, however, adopted several precedential orders on storm water permits. These orders have upheld storm water permit limits that rely on an iterative process using best management practices (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. 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.

### **II. Issue Description**

Under Phase I of the USEPA 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. This phase is 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 Caltrans activities. Municipal storm water discharges and some industrial discharges are regulated under individual NPDES permits adopted by the Regional Water Boards. All storm water permits, except for some individual 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. 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 contain protocols for dealing with emergency non-storm water discharges. Any "protocols" for non-emergency firefighting activities is determined by each permittee

through a Storm Water Management Plan (SWMP) and is approved by the Regional Water Board before it is implemented.

### **III. Staff Recommendation**

No action: Although the suggested objective applies to all waterbodies and storm water discharges cannot be exempt, the implementation of this policy should not apply to storm water discharges. In adhering to this alternative there would be no changes in the existing storm water program. The State Water Board would continue to base storm water regulation on BMPs, rather than the suggested policy provisions. Storm water permits would continue to prohibit the discharge of non-storm water from swimming pools and fountains. 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.

## **Chapter 7 - Non-point Source Pollution Discharges**

### **I. Present State Policy**

There is a statewide policy on the regulation of non-point source waste discharges. The State Water Board *Policy for Implementation and Enforcement of the Non-point Source Pollution Control Program* (NPS Policy) provides policy guidance to the Regional Water Boards and dischargers regarding the prevention and control of NPS waste discharges.<sup>4</sup> Non-point source (NPS) discharges are regulated under the Porter-Cologne Water Quality Control Act (CWC § 13000 et seq.) through the use of waste discharge requirements (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.

### **II. 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 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 policy or the NPS policy, which contemplates Management Practices (MPs). TRC or CPO is not generally a NPS problem, and it would be more efficient to use the MP approach.

### **III. Staff Recommendation**

No Action: Although the suggested objective applies to all waterbodies and NPS discharges cannot be exempt, the implementation of this 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 non-point source situations.

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<sup>4</sup> The NPS Policy was adopted by the The State Water Board in May 2004 and became effective in September 2004.

## **Environmental Effects of Proposed Policy**

The State Water Board is required to consider the economic impacts of water quality planning decisions under certain circumstances. When the State Water Board adopts or revises a water quality objective, it must consider several factors, including economics, under CWC section 13241. Second, 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 factors. (Public Resources Code section 21159). Finally, the CEQA Guidelines provide that a project's economic effects shall not be treated as significant environmental effects but that they may be used to determine whether a project's physical changes are significant (California Code of Regulations, title 14, section 15131).

### **Antidegradation**

Any relaxation of effluent limits that may occur as a result of this policy must comply with USEPA's antidegradation policy, 40 CFR §131.12. USEPA'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 antidegradation policy does not apply, the change in standards still must comply with all other applicable requirements of State policy for water quality control and USEPA regulations.

In this case, the Lahontan Regional Water Quality Control Board has a more stringent objective for addressing TRC. Lahontan 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 USEPA 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 economic 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 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.

#### Baseline 1 - Effects on Existing Environmental Conditions.

At the present time TRC and CPO is observed by Regional Water Boards by referring to each region's Basin Plan. Each Basin Plan has its own objective and within each permit there is various language for compliance (refer to Table 1).

The State and Regional Water Boards have several database modules with applications specific to handling regulatory program activities. System for Water Information Management (SWIM)<sup>5</sup> 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).

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 and 2003. This information demonstrates chlorine residual limits were violated a total of 128 times in 2002, and a total of 207 times in the year 2003. 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.

The 335 violations listed in SWIM were grouped into six categories; operations and management (O&M), equipment, power failure, debris, exceedence of effluent limit, and not yet reviewed. All violations compiled by SWIM were placed in one of these categories.

Results of these various violations consist of repeated fish kills or other effects to aquatic life, cause of a pollution event, enforcement actions, which resulted in multiple MMP fines, and a need for the discharger to take corrective action.

Baseline 2 - Adverse effects on the potential future environmental conditions under the proposed policy.

With the adoption of the proposed policy, current violations of chlorine residual can be minimized. Environmental conditions should improve with the adoption of this policy by allowing the entire state of California to comply with the USEPA adopted criteria for TRC and CPO.

The policy also requires continuous monitoring to meet the requirement for monitoring and reporting the chlorine residual effluent limit. This requirement 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 de-chlorination 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 is not expected to have any adverse impacts on the environment

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<sup>5</sup> The SWIM database will be 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.

Permittees can use dechlorination facilities or can choose other alternatives to chlorination (such as 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.

### **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, which meet the definition for cumulative impacts.

Future projects dealing with chlorine, a non-priority pollutant, would likely have no cumulative impact. Non-point source 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 CHECKLIST

### BACKGROUND:

Project Title: Total Residual Chlorine (TRC) and Chlorine-Produced Oxidants (CPO) Policy of California

Lead Agency: State Water Board  
1001 I Street, Floor 15  
Sacramento, California 95814

Contact Person: Dena E. McCann (916) 323-9690

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.

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

**ISSUES:**

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
<b>I. AESTHETICS -- Would the project:</b>				
a) Have a substantial adverse effect on a scenic vista?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Create a new source of substantial light or glare, which would adversely affect day or nighttime views in the area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>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:</b>				
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
<p>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:</p>				
a) Conflict with or obstruct implementation of the applicable air quality plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	✓
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	✓
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)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	✓
d) Expose sensitive receptors to substantial pollutant concentrations?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	✓
e) Create objectionable odors affecting a substantial number of people?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	✓
<p>IV. BIOLOGICAL RESOURCES -- Would the project:</p>				
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	✓
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	✓
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	✓

	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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	✓
e) Conflict with any local policy's or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	✓
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	✓
<b>V. CULTURAL RESOURCES -- Would the project:</b>				
a) Cause a substantial adverse change in the significance of a historical resource as defined in ' 15064.5?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	✓
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to ' 15064.5?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	✓
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	✓
d) Disturb any human remains, including those interred outside of formal cemeteries?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	✓
<b>VI. GEOLOGY AND SOILS -- Would the project:</b>				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	✓
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.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	✓
ii) Strong seismic ground shaking?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	✓

	<b>Potentially Significant Impact</b>	<b>Less Than Significant with Mitigation Incorporation</b>	<b>Less Than Significant Impact</b>	<b>No Impact</b>
iii) Seismic-related ground failure, including liquefaction?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	✓
iv) Landslides?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	✓
b) Result in substantial soil erosion or the loss of topsoil?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	✓
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	✓
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	✓
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	✓
<b>VII. HAZARDS AND HAZARDOUS MATERIALS</b> Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	✓
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	✓
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	✓
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	✓

	<b>Potentially Significant Impact</b>	<b>Less Than Significant with Mitigation Incorporation</b>	<b>Less Than Significant Impact</b>	<b>No Impact</b>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	✓
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	✓
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	✓
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	✓
<b>VIII. HYDROLOGY AND WATER QUALITY -</b>				
- Would the project:				
a) Violate any water quality standards or waste discharge requirements?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	✓
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)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	✓
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	✓
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	✓

	<b>Potentially Significant Impact</b>	<b>Less Than Significant with Mitigation Incorporation</b>	<b>Less Than Significant Impact</b>	<b>No Impact</b>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Otherwise substantially degrade water quality?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g) Place housing within a 100-year flood hazard area as mapped on a Federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
h) Place within a 100-year flood hazard area structures, which would impede or redirect flood flows?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
j) Inundation by seiche, tsunami, or mudflow?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>IX. LAND USE AND PLANNING - Would the project:</b>				
a) Physically divide an established community?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>X. MINERAL RESOURCES -- Would the project:</b>				
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	<b>Potentially Significant Impact</b>	<b>Less Than Significant with Mitigation Incorporation</b>	<b>Less Than Significant Impact</b>	<b>No Impact</b>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>XI. NOISE -- Would the project result in:</b>				
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>XII. POPULATION AND HOUSING -- Would the project:</b>				
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)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	✓

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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	✓
Police protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	✓
Schools?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	✓
Parks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	✓
Other public facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	✓

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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	✓
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	✓

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
<b>XV. TRANSPORTATION/TRAFFIC -- Would the project:</b>				
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)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	✓
b) Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	✓
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	✓
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	✓
e) Result in inadequate emergency access?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	✓
f) Result in inadequate parking capacity?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	✓
g) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	✓
<b>XVI. UTILITIES AND SERVICE SYSTEMS</b>				
Would the project:				
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	✓
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	✓
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	✓

	<b>Potentially Significant Impact</b>	<b>Less Than Significant with Mitigation Incorporation</b>	<b>Less Than Significant Impact</b>	<b>No Impact</b>
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	✓
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	✓
f) Be served by a landfill with sufficient permitted capacity to accommodate the projects solid waste disposal needs?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	✓
g) Comply with federal, state, and local statutes and regulations related to solid waste?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	✓

**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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	✓
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)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	✓
c) Does the project have environmental effects, which will cause substantial adverse effects on human beings, either directly or indirectly?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	✓

**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 demonstratable 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 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, quantity or quality of surface or groundwater, surface water currents, or groundwater flow or supply.

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 will not result in an increase in existing noise levels or cause exposure of people to severe noise levels.

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 will not impact existing transportation or traffic circulation patterns.

XVI.a.,b.,c.,d.,e.,f.,g. The proposed policy will not directly impact any utility or service system. Even though the proposed policy may have more stringent water quality objectives and implementation provisions, permitted dischargers can, in most cases, attain the effluent limit based on the proposed objective. However, a site-specific objective could be adopted, which would become the effluent limit and allow a small sum of chlorine residual to be instantaneously consumed by a water body without causing impacts to aquatic life or beneficial uses.

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 policy will not cause effects on human beings directly or indirectly.

## DEFINITION OF TERMS

### 304(a) Criteria

Section 304(a) criteria are developed by EPA under authority of section 304(a) of the Clean Water Act 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 Demand

The difference between the amounts of chlorine added to water and the amount of residual chlorine remaining after a given contact time. Chlorine demand may change with dosage, time, temperature, pH, nature, and amount of impurities in the water. Chlorine Demand, mg/L = Chlorine Applied, mg/L – Residual, mg/L.

### Chlorine Produced Oxidants (CPO)

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

### Chronic

A stimulus that lingers or continues for a relatively long period of time, often one-tenth of the life span or more. The measurement of a chronic effect can reduce growth, reduced reproduction, etc., in addition to lethality.

### Continuous Monitoring

For the purpose of this 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.

#### Dynamic Model

Can be used for calculating effluent limitations to predict the effect of receiving water, effluent flow, and concentration variability. The outputs of dynamic models can be used to base effluent limitations on probability estimates of receiving water concentrations rather than critical conditions (which are used in the steady state model). The three dynamic modeling techniques recommended by the U.S.EPA for calculating effluent limitations that are continuous simulation, Monte Carlo simulation, and lognormal probability modeling.

#### 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, Humbolt 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 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% 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 Clean Water Act 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.

#### Non-point 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 non-point 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 Boards - California Ocean Plan.

#### One-hour Average

For the purpose of this 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% 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.

#### Steady-state Models

Mathematical models of fate and transport that uses constant values of input variables to predict constant values of receiving water quality concentrations.

**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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