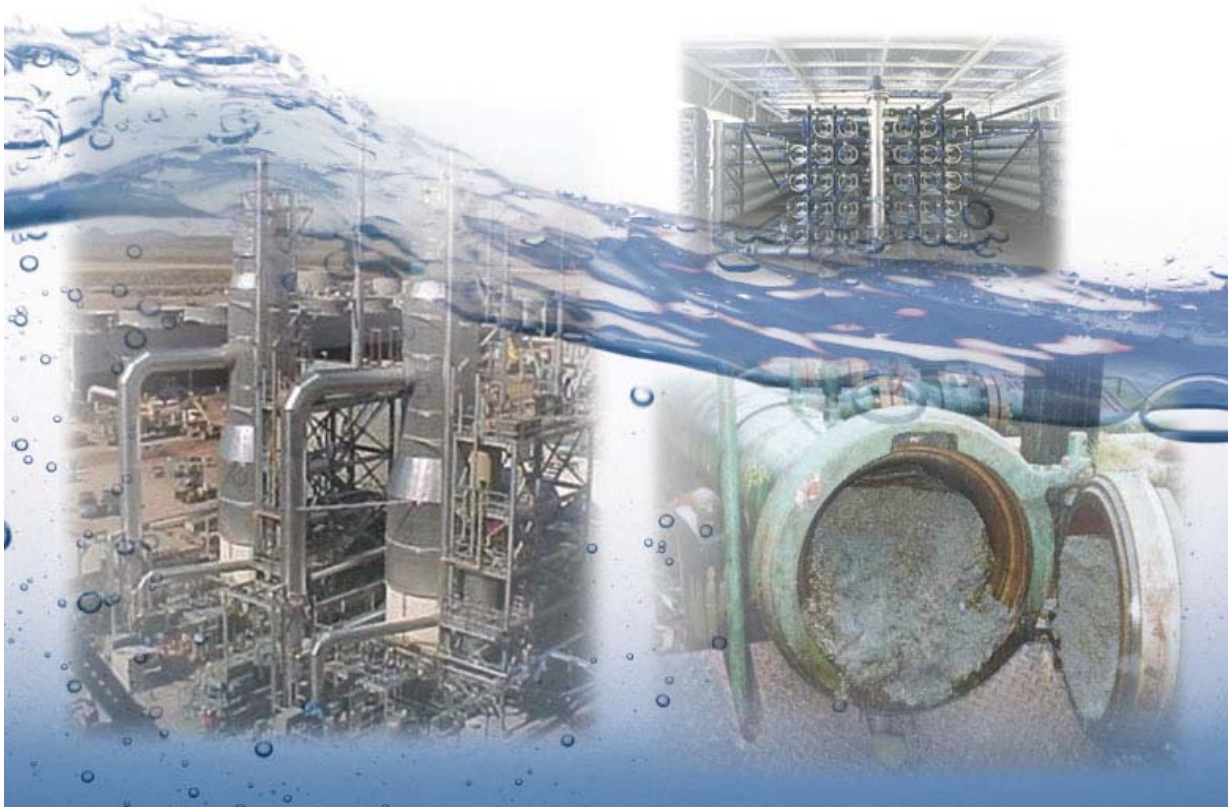
RECLAMATION

Managing Water in the West

Regulatory Issues and Trends Report

Southern California Regional Brine-Concentrate Management Study – Phase I
Lower Colorado Region



U.S. Department of the Interior
Bureau of Reclamation

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Abbreviations and Acronyms

µg/L	micrograms per liter
µg/m	micrograms per meter
afy	acre-feet per year
AL	action level
ASBS	Areas of Special Biological Significance
BEMT	Brine Executive Management Team
C	Celsius
CAA	Clean Air Act
Cal/EPA	California Environmental Protection Agency
CARB	California Air Resource Board
CCA	critical coastal areas
CCC	California Coastal Commission
CCR	California Code of Regulations
CDFG	California Department of Fish and Game
CDPH	California Department of Public Health
CEC	constituent of emerging concern
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CTR	California Toxics Rule
CWC	California Water Code
CZMA	Coastal Zone Management Act
DCB	dichlorobenzene
DCE	dichloroethylene
DDE	dichlorodiphenyldichloroethane
DDT	dichlorodiphenyltrichloroethane
DDWEM	California Department of Public Health Division of Drinking Water

	and Environmental Management
DEHP	Di(2-ethylhexyl)phthalate
DPR	Department of Pesticide Regulation
DTSC	Department of Toxic Substances
DWI	deep well injection
EIR	Environmental Impact Report
EIS	Environmental Impact Study
ESA	Endangered Species Act
g	gram
g/kg	grams per kilogram
GRRP	Groundwater Recharge Reuse Project
I-	Interstate
IWMB	Integrated Waste Management Board
kg	kilogram
LCP	local coastal program
MCL	maximum contaminant level
MFL	million fibers per liter
mg/L	milligrams per liter
mg/m	milligrams per meter
mL	milliliters
MPA	Marine Protected Area
MUN	Municipal
MWD	Metropolitan Water District
N	nitrogen
NAAQS	National Ambient Air Quality Standards
NDMA	n-nitrosodimethylamine
NEPA	National Environmental Protection Act
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollution Discharge Elimination System

NTU	nephelometric turbidity units
Ocean Plan	Water Quality Plan for Ocean Waters of California
OEHHA	Cal/EPA Office of Environmental Health Hazard Assessment
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
pCi/L	picoCuries per liter
PCP	pentachlorophenol
PHG	public health goal
PM_{10}	particulates less than 10 microns
$PM_{2.5}$	particulates less than 2.5 microns
POTW	publicly owned treatment works
ppb	parts per billion
ppm	parts per million
ppt	parts per trillion
Reclamation	United States Department of the Interior Bureau of Reclamation
RWQCB	Regional Water Quality Control Board
SAWPA	Santa Ana Watershed Project Authority
SCCWRP	Southern California Coastal Water Research Project
SDWA	Safe Drinking Water Act
SIP	State Implementation Plan
SLC	California State Lands Commission
SMCA	State Marine Conservation Area
SMP	State Marine Park
SMR	State Marine Reserve
STD	standard
STLC	soluble threshold limit concentration
SWQCB	State Water Quality Control Board
SWQPA	State Water Quality Protection Area
SWRCB	California Environmental Protection Agency, State Water Resources Control Board

TCDD	tetrachlorodibenzo-p-dioxin
TCLP	toxicity characteristic leaching procedure
TDS	total dissolved solids
TMDL	total maximum daily load
TOC	total organic carbon
TT	treatment technique
TTHM	total trihalomethane
TTLC	total threshold limit concentration
TU^a	acute toxicity units
TU^c	chronic toxicity units
U.S.	United States
UAA	Use Attainability Analysis
UIC	underground injection control
USACE	United States Army Corps of Engineers
USDW	underground source of drinking water
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
WDR	Waste Discharge Requirement
WER	water effect ratio
WQBEL	water-quality-based effluent limit

1 Introduction and Study Objectives

This section of the report has the following subsections:

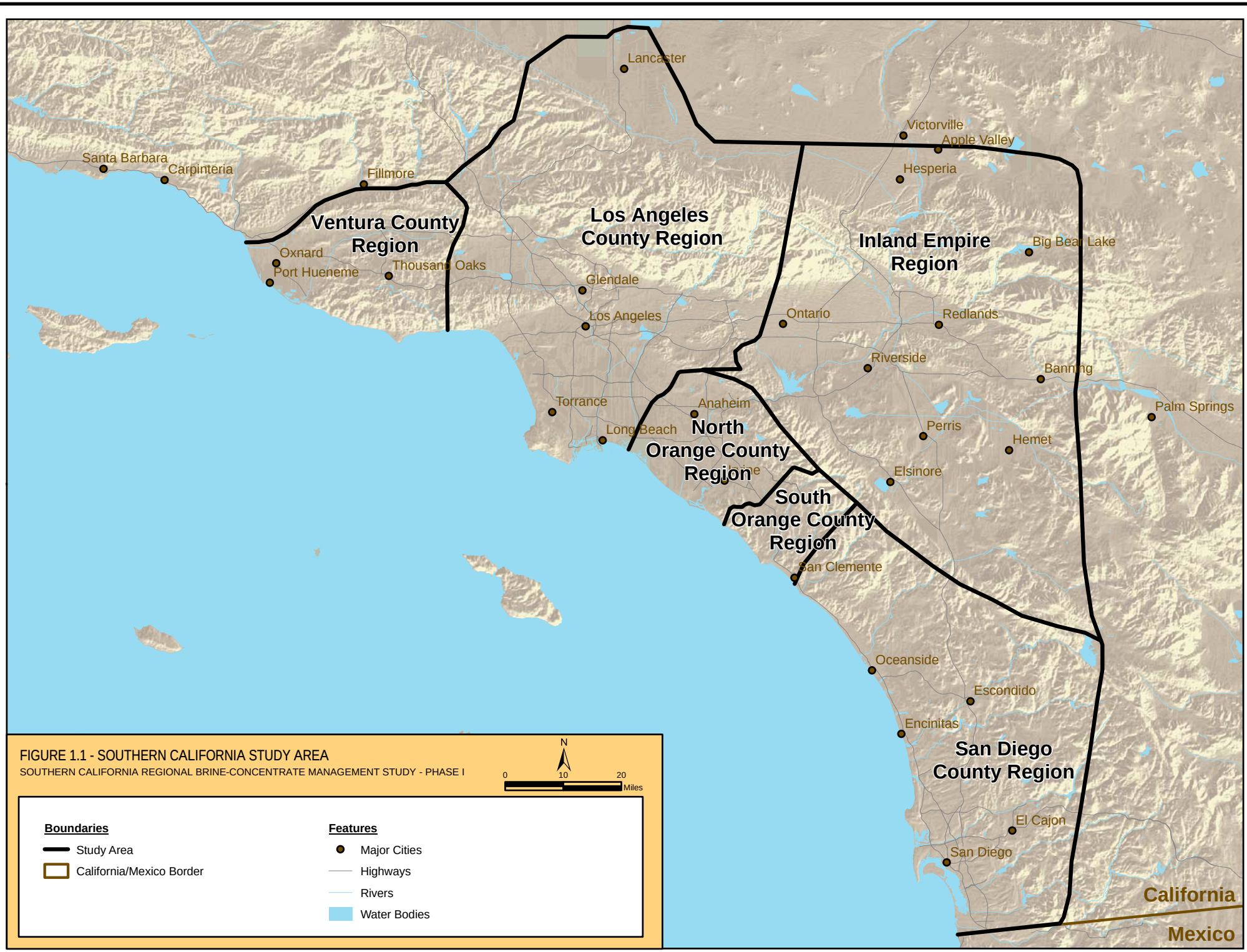
- Introduction
- Study Objectives
- Study Components
- Report Objectives

1.1 Introduction

The Southern California Regional Brine-Concentrate Management Study is a collaboration between the United States (U.S.) Department of the Interior Bureau of Reclamation (Reclamation) and 14 local and state agency partners. Table 1.1 provides a list of the agencies represented on the Brine Executive Management Team (BEMT). The project is funded on a 50/50 cost-sharing basis between Reclamation and the cost-sharing partners, who together form the BEMT. The purpose of the BEMT is to formulate, guide, and manage technical activities of the study. Figure 1.1 shows a map of the study area.

TABLE 1.1
LIST OF BEMT MEMBERS

List of BEMT Members	
City of San Bernardino	Orange County Sanitation District
California Department of Water Resources	Otay Water District
City of San Diego	Rancho California Water District
Inland Empire Utilities Agency	San Diego County Water Authority
Sanitation Districts of Los Angeles County	Santa Ana Watershed Project Authority
Los Angeles Department of Water and Power	U.S. Department of the Interior Bureau of Reclamation
Metropolitan Water District of Southern California	Western Municipal Water District
National Water Resources Institute/ Southern California Salinity Coalition	



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1.2 Study Objectives

The objectives of this study are twofold:

- To assess the brine-concentrate landscape in southern California including brine-concentrate management technologies, regulatory environment, existing infrastructure, and future needs
- To make recommendations for Phase 2 pilot/demonstration projects

To accomplish these objectives, the study will develop six reports that ultimately will be incorporated into a final study report.

1.3 Study Components

The Southern California Regional Brine-Concentrate Management Study has six major components. Each component is focused on providing a piece of the southern California brine-concentrate management landscape. Each component will be summarized in a draft report that will be incorporated into the Final Study Report. The six components of the study are:

- Survey Report – A regional survey to collect data from local agencies about the brine-concentrate landscape in southern California
- Regulatory Issue and Trends Report – A summary of regulatory issues and trends associated with implementing a brine-concentrate project in southern California
- CECs Report – A summary of constituents of emerging concern (CECs) and how regulation of CECs might affect brine-concentrate management in southern California
- Institutional Issues Report – A summary of organizational structures that can be used to foster collaborative relationships between agencies implementing brine-concentrate management projects
- Brine-Concentrate Management Treatment and Disposal Options Report – A summary of brine-concentrate technologies and identification of potential local and regional solutions
- Pilot/Demonstration Project Recommendations Report – A list of recommended pilot/demonstration projects that could be implemented in the inland and coastal areas of southern California

These six reports will be incorporated as appendices in the Final Study Report. The Final Report will provide highlights and conclusions of the six component reports in an executive summary format.

1.4 Report Objectives

This Report presents a summary of the regulations affecting brine-concentrate management in southern California and will provide descriptions of agencies having oversight or consultation roles on projects. Table 1.2 provides an overview of the regulations that will be discussed in this document. This report is organized into three sections:

- Regulatory Agencies
- Policies, Plans, and Regulations
- Regulatory Trends

The regulatory agency section provides a brief description of each agency and its regulatory roles and responsibilities. The Policies, Plans, and Regulations section provides applicable regulations under three major topics—water, air, and environmental. The regulatory trends section discusses ongoing regulatory trends, including proposed regulations and guidance documents.

It is important to note that no current regulations directly apply to brine-concentrate management. Regulations that impact brine-concentrate management projects are focused on setting limits or requirements to satisfy standards for air, water, or environmental quality. This report provides some information on regulations that apply to water recycling.

TABLE 1.2
SUMMARY OF APPLICABLE FEDERAL AND STATE LAWS AND REGULATIONS

Law/Regulation	Description
Federal Water Pollution Control Act (Clean Water Act, 1972)	Establishes structure for regulating pollutant discharges to waters of the U.S.
NPDES	Regulates point sources that discharge pollutants into waters of the U.S. to control water pollution
Section 404	Regulates discharge of dredged or fill material to waters of the U.S.
Section 401	Ensures that pollution prevention and control occurs on projects regulated by the federal government
Section 303(d) and TMDLs	Requires states, territories, and authorized tribes to develop a list of impaired bodies of water and establish limits for the maximum amount of pollutant a body of water can received
Antidegradation Policy	Protects bodies of water with high water quality for beneficial uses and from any adverse impacts to water quality
California Toxics Rule	Lists 126 priority toxic pollutants, establishes numeric aquatic-life criteria for 57 compounds, and describes how these criteria are to be applied
California Ocean Plan	Establishes water quality standards for coastal waters including estuaries and prohibits discharge to ASBS
Federal Safe Drinking Water Act	Protects public health by regulating the public drinking water supply and its sources
Maximum Contaminant Levels	Enforceable standards that define the maximum levels of constituents that can be present in drinking water
Calderon-Sher Safe Drinking Water Act and Public Health Goals	Requires monitoring and limits for contaminants in drinking water. A PHG is a level of contaminant in drinking water that does not pose a significant risk to health.
Action Levels	Describes nonregulatory advisory levels for the level of constituent in drinking water that does not pose a significant health risk
Underground Injection Control Program	Protects the USDW by classifying and then setting standards and permit requirements for different classes of wells
Coastal Zone Management Act	Encourages the preservation, protection, development, and (where possible) the restoration and enhancement of natural coastal resources and wildlife habitat
California Coastal Act	Defines the "coastal zone" and establishes land use control for the zone
California Water Code	Regulates all aspects of water policy in California from quantity, quality to water agency formation

TABLE 1.2
SUMMARY OF APPLICABLE FEDERAL AND STATE LAWS AND REGULATIONS

Law/Regulation	Description
Porter Cologne Water Quality Control Act	Establishes the SWRCB and RWQCBs, the requirement for Basin Plans, and Waste Discharge requirements, and the regulation of groundwater, surface water, and recycled water quality
Waste Discharge Requirements	Establishes process and permit requirements for any waste discharged in California
Recycled Water Policy	Establishes policy and requirements to regulate and encourage the use of recycled water in California
CCR Title 22	Establishes water quality criteria and guidelines applicable to recycled water projects
Clean Air Act	Establishes NAAQ criteria and requires the development of SIPs to comply with those criteria
California Environmental Quality Act	Requires a project proponent to conduct an environmental review of the project in addition to a Negative Declaration or EIR
National Environmental Policy Act	Requires federal agencies to integrate environmental values into a decision-making process by considering the environmental impacts of proposed actions and reasonable alternatives to action in an EIS
Endangered Species Act	Establishes a broad federal interest in identifying, protecting, and providing for the recovery of threatened or endangered species
Title 27 Environmental Protection, Division 2: Solid Waste and U.S. Subtitle D	Governs the construction and operation of landfills including types of waste that can be accepted

2 Regulatory Agencies

In California, public health, regulatory, and resource agencies have authority to approve evaluations and can issue permits for effluent discharges including wastewater discharge, brine-concentrate management, and recycled water use. The number of agencies involved in a given project depends upon the water quality of the discharge, the location of the project, and the local ecosystem. This Report will present a summary of the agencies having oversight or consultation roles on projects. These agencies include the U.S. Army Corps of Engineers (USACE), U.S. Environmental Protection Agency (USEPA), California Department of Public Health (CDPH), the California State Water Resources Control Board (SWRCB) and the California Regional Water Quality Control Boards (RWQCB), California Coastal Commission (CCC), as well as other resource agencies. This section of the report will provide a brief description of the regulatory agencies, as well as the mission of each agency. This section of the report contains the following subsections:

- Federal Agencies
- State Agencies

2.1 Federal Agencies

2.1.1 U.S. Army Corps of Engineers

The USACE is organized into 9 divisions and 42 districts. The South Pacific Division of the USACE has responsibility for California and Southern California is overseen by the Los Angeles District of the USACE. The Los Angeles District of the USACE was established in 1898 and encompasses 226,000 square miles in four states (Arizona, California, southern Nevada, and parts of Utah). The Los Angeles District is responsible for over 420 miles of Southern California shoreline from Morro Bay to the border of Mexico, as well as supporting nine military bases. The core mission of the Los Angeles District includes:

- Flood control
- Navigation
- Military construction
- Regulatory permitting
- Emergency operations
- Engineering design
- Environmental restoration

Also, the Los Angeles District is responsible for operations and maintenance of 16 dams, 14 navigation projects, 13 miles of breakwater, and 54 miles of flood control channels. The primary charge of the USACE is planning, designing, building, and operating water resources and other civil works projects. The USACE

can affect brine-concentrate projects that have to cross U.S. waterways through regulatory permitting.

2.1.2 U.S. Environmental Protection Agency, Region 9

The USEPA is organized into 10 regions with California falling under responsibility of Region 9, which regulates environmental issues in Arizona, California, Nevada, Hawaii, and the Pacific Islands. The USEPA mission is to protect human health and the environment including land, air, and water. The USEPA Office of Water is responsible for regulating surface water and groundwater and the USEPA Office of Air and Radiation regulates air quality. The USEPA Office of Solid Waste and Emergency Response regulates land disposal of solid waste, underground storage tanks, and hazardous wastes. USEPA would regulate the management and disposal of brine-concentrate. In California, USEPA has delegated either full or partial permitting authority for regulating certain requirements to the state. However, USEPA retains the responsibilities for publishing guidance on permitting and regulatory activities.

2.1.3 Resource Agencies

Federal resource agencies are responsible for protecting wildlife, fisheries, and other natural resources. In general, the agencies review National Pollutant Discharge Elimination System (NPDES) permits to ensure that the issuance of the permit will not affect endangered or threatened species. The agencies also are engaged in the National Environmental Protection Act (NEPA) processes and, through consultation, provide comments on proposed projects related to potential impacts on endangered species and other natural resources. In addition, federal resource agencies are involved in regulating and protecting ocean waters. Brine-concentrate management projects that impact NPDES permits, ocean waters, or endangered species or natural resources would be regulated by the resource agencies.

U.S. Fish and Wildlife Service

The U.S. Fish and Wildlife Service (USFWS) is a federal resource agency responsible for national wildlife refuges, federally endangered and threatened species, migratory birds, and other natural resources. The USFWS, which falls within the U.S. Department of the Interior, shares responsibility for administrating the federal Endangered Species Act with the National Marine Fisheries Service (National Oceanic and Atmospheric Administration [NOAA] Fisheries Service).

NOAA Fisheries Service

NOAA Fisheries Service, a division of the U.S. Department of Commerce, is the federal agency responsible for the stewardship of living marine resources and their habitat. NOAA Fisheries Service is responsible for the management, conservation, and protection of living marine resources within the United States Exclusive Economic Zone (water 3 to 200 miles offshore). Therefore, NOAA Fisheries Service would be involved in any brine-concentrate disposal project that discharges brine-concentrate in this zone. NOAA Fisheries Service also has the authority to protect migratory fish that could be found seasonally in inland waters. This authority could affect the ability of local agencies to discharge wastewater as well as brine-

concentrate due to more restrictive requirements on water quality and quantity (such as the impact of mixing zone at ocean outfalls).

2.2 State Agencies

2.2.1 California Department of Public Health

CDPH mission is the optimization of health and well-being of the people of California. For brine-concentrate management projects, CDPH would have authority to protect human health through ensuring safe water and land. CDPH is responsible for implementing the California Safe Drinking Water Act. In this capacity, the role of CDPH is to protect all existing and potential drinking water sources in California, including surface and groundwater supplies. The CDPH Division of Drinking Water and Environmental Management (DDWEM) is the primary agency responsible for regulation of drinking water in California. CDPH collects water quality monitoring reports from water purveyors to ensure that the primary and secondary maximum contaminant levels (MCLs) for listed chemicals. CDPH issues permits for construction of new wells and for domestic drinking water supplies.

2.2.2 California Coastal Commission

The mission of the CCC is to protect, conserve, restore, and enhance environmental and human-based resources of the California coast and ocean for environmentally sustainable and prudent use by current and future generations. The CCC operates under the California Coastal Act, which was updated in January 2009. This act along with the federal Coastal Zone Management Act stipulates the regulatory authority that the CCC has in the coastal zone. The coastal zone is defined as the "area along the state's entire 1,100-mile coastline, starting 3 miles offshore and extending inland at distances ranging from several blocks to about 5 miles from the ocean" (CCC, 2004). For brine-concentrate management projects, the CCC is responsible for making coastal development permitting decisions and reviewing local coastal programs (LCPs) prepared by local governments and submitted for approval.

2.2.3 California Department of Environmental Protection

California Environmental Protection Agency (Cal/EPA) is responsible for developing, implementing, and enforcing the California's environmental protection laws that ensure clean air, clean water, clean soil, safe pesticides, and waste recycling and reduction. The Cal/EPA was created in 1991 and is composed of the following six state agencies:

- California Air Resources Board (CARB)
- Department of Pesticide Regulation (DPR)
- Department of Toxic Substances Control (DTSC)
- Integrated Waste Management Board (IWMB)
- Office of Environmental Health Hazard Assessment (OEHHA)
- State Water Resources Control Board (SWRCB)

These agencies would have oversight on brine-concentrate projects depending on the technology and final disposal method used.

California Air Resources Board

The California Air Resources Board was established in 1967 to attain and maintain healthy air quality, conduct research into the causes of and solutions to air pollution, and to systematically attack the serious problem caused by motor vehicles. Since its formation, the CARB has worked with the public, the business sector, and local governments to protect the public's health, the economy and the state's ecological resources through the most cost-effective reduction of air pollution. CARB's mission is to promote and protect public health, welfare, and ecological resources through the effective and efficient reduction of air pollutants in recognition and consideration of the effects on the economy of the state. The CARB establishes and enforces emission standards for motor vehicles, fuels, and consumer products. It also establishes health-based air quality standards, monitors air quality, and identifies and establishes control measures for toxic air contaminants.

Department of Pesticide Regulation

DPR's mission is to evaluate and mitigate impacts caused by the use of pesticide, maintain the safety of the pesticide workplace, ensure product effectiveness, and encourage the development and use of reduced-risk pest control practices while recognizing the need for pest management in a healthy economy. DPR uses strict oversight including product evaluation and registration, environmental monitoring, residue testing of fresh produce, and local use enforcement. DPR focus is on regulating and controlling use of pesticides to manage risk, but is not solely focused on toxicity.

Department of Toxic Substances Control

DTSC's mission is to restore, protect, and enhance the environment to ensure public health, environmental quality, and economic vitality by regulating hazardous waste, conducting and overseeing cleanups, and developing and promoting pollution prevention. DTSC regulatory authority is from the federal Resource and Recovery Act and the California Health and Safety Code. DTSC regulates hazardous waste, cleans up existing contamination, and looks for ways to reduce the hazardous waste produced in California.

Integrated Waste Management Board

IWMB's mission is to protect the public health, safety, and the environment through waste prevention, waste diversion, and safe waste processing and disposal. IWMB regulates solid waste handling, processing and disposal activities, which include the operation of landfills, transfer processing stations, material recovery facilities, compost facilities and waste to energy facilities. The IWMB permits solid waste handling facilities where brine-concentrate could be disposed.

Office of Environmental Health Hazard Assessment

OEHHA overall mission is to protect and enhance public health and the environment by scientific evaluation of risks posed by hazardous substances. OEHHA does not promulgate environmental regulations directly, but is responsible for developing and

providing toxicological and medical information relevant to decisions involving public health. OEHHA supports Cal/EPA, CDPH, the Department of Food and Agriculture, the Office of Emergency Services, the California Department of Fish and Game (CDFG), and the Department of Justice.

OEHHA also works with federal agencies, the scientific community, industry, and the general public on issues of environmental and public health. Examples of current OEHHA functions and responsibilities include:

- Developing health-protective exposure standards for different media (air, water, land) to recommend to regulatory agencies, including ambient air quality standards for the Air Resources Board and drinking water chemical contaminant standards for the CDPH.
- Carrying out special investigations of potential environmental causes of illness, diseases, and deaths. Current and recent activities include investigation of the health effects of air pollutants, pesticides, and other chemical exposures.
- Continuing public health oversight of environmental regulatory programs within Cal/EPA.
- Making recommendations to the CDFG and the SWRCB about sport and commercial fishing in areas where fish might be contaminated.
- Assessing health risks to the public from air pollution, pesticide and other chemical contamination of food, seafood, drinking water, and consumer products.
- Providing guidance to local health departments, environmental departments, and other agencies with specific public health problems, including appropriate actions to take during emergencies that might involve chemicals.
- Implementing the provisions of the Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65).

State Water Resources Control Board and Regional Water Quality Control Boards

The SWRCB mission is to preserve and enhance the quality of California's water resources, and ensure their proper allocation and efficient use for the benefit of present and future generations. The SWRCB is responsible for regulation of water quality at the state level, as well as for determinations of water rights. The SWRCB develops and reassesses the California Ocean Plan, which governs discharges to the ocean along the coast of California, and the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries, also known as the State Implementation Plan (SIP). These regulations can affect brine-concentrate disposal and management. Through its Office of Water Recycling, the SWRCB emphasizes water recycling as part of its strategy to address water supply needs, but the agency has limited oversight or regulatory approval authority over water recycling projects.

The SWRQB supports and coordinates the activities of the nine RWQCBs, which have direct governance over water quality issues and permitting within their jurisdictions. Of the nine RWQCBs in California, five have all or part of the jurisdictional boundary in Southern California. The boundaries of the Colorado River and Lahontan RWQCBs cover part of Southern California while the Los Angeles, Santa Ana, and San Diego RWQCBs are entirely within Southern California, as shown in Figure 2.1.

The RWQCBs issue NPDES permits for discharges that can be permitted under the federal Clean Water Act, as well as waste discharge requirements for general categories of discharges or for discharges that do not warrant federal permits under the Porter-Cologne Water Quality Control Act, and water recycling requirements for non-federally regulated discharges of recycled water. The RWQCBs are responsible for developing Water Quality Control Plans, also known as Basin Plans, to govern water quality in each region. The Basin Plans outline water quality standards for all bodies of water (surface and groundwater) within a region. The RWQCBs develop total maximum daily loads (TMDLs), or watershed management plans for bodies of water in the region that are not meeting water quality standards.

2.2.4 State Resource Agencies

State resource agencies are responsible for protecting wildlife, fisheries, and other natural resources in California. In general, the agencies review NPDES permits to ensure that the issuance of the permit will not affect endangered or threatened species. These agencies are involved in regulating and protecting ocean waters. Also, these agencies are engaged in the California Environmental Quality Act (CEQA) processes and, through consultation, provide comments on proposed projects related to potential impacts on endangered species and other natural resources.

California Department of Fish and Game

CDFG is responsible for managing and protecting wildlife, fish, plants, and habitat in California. The CDFG is responsible for implementing the California Fish and Game Code, including the California Endangered Species Act and the California Native Plant Protection Act. Section 1601 of the California Fish and Game Code provides the authority for CDFG to require Streambed Alteration Agreements from public agencies for projects that propose to "divert, obstruct, or change the natural flow or bed, channel, or bank of any river, stream or lake" that provides fish or wildlife values. The CDFG would be involved with brine-concentrate management projects that affect bodies of water or other areas where habitat or where state-listed species could be affected.

California State Lands Commission

The State Lands Commission (SLC) is the official trustee of state-owned "sovereign" lands, including the beds of creeks and other inland waters. The SLC also manages most of the state tidelands and lands underlying coastal waters. In the role of trustee, the SLC would be involved in the CEQA process and could require a lease for crossing a stream, including pipeline crossings.

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3 Plans, Policies, and Regulations

In this section of the report, water, air, and other types of plan, policies, and regulations will be discussed under three main headings:

- Plans, Policies, and Regulations for Water
- Plans, Policies, and Regulations for Air Quality
- Miscellaneous Plans, Policies and Regulations

3.1 Plan, Policies, and Regulations for Water

Three main federal acts apply to water regulation; they are the Clean Water Act, Safe Drinking Water Act (SDWA), and the Coastal Zone Management Act (CZMA). Also, California has the California Coastal Act, California Water Code (CWC), and the Calderon-Sher Safe Drinking Water Act to regulate water. These regulations will be discussed in the following sections.

3.1.1 Federal Clean Water Act

The federal Clean Water Act establishes a basic structure for regulating pollutant discharges to waters of the U.S. The goal of the Clean Water Act is to restore and maintain the chemical, physical, and biological integrity of the nation's waters so that they can support "the protection and propagation of fish, shellfish, and wildlife and recreation in and on the water." The Clean Water Act has a number of sections or requirements that could apply to brine-concentrate management projects. Specifically, the Clean Water Act contains requirements to establish standards for water quality for all contaminants in surface waters and requires that any person discharging any pollutant from a point source into navigable waters obtain an NPDES permit. In California, the implementation of the Clean Water Act is primarily delegated by USEPA to the SWRCB and RWQCBs.

National Pollution and Discharge Elimination System Permit

The NPDES permit program regulates point sources that discharge pollutants into waterways to control water pollution. These permits are issued to any point source that discharges pollutants into a waterway of the U.S. Pollutants are defined as “any type of industrial, municipal, and agricultural waste discharged into water.” In California, NPDES permits are issued by the RWQCBs. NPDES permits contain limits on discharge, monitoring and reporting requirements, and other provisions to ensure that no degradation of water quality occurs. These permits are site specific and tailor the requirements to be met based on the discharger’s operation and local conditions. For brine-concentrate management projects, water quality impacts will have to be addressed if higher levels of total dissolved solids (TDS) or other constituents degrade native water qualities or affect water quality at existing dischargers. In California, brine-concentrate disposal to surface waters is permitted

under the NPDES permits issued by each RWQCB. The constituent limits are based on protection of identified beneficial uses and goals of each region's Basin Plan.

Clean Water Act Section 404

Section 404 refers to the pertinent section of the Clean Water Act, and it regulates discharge of dredged or fill material into any "waters of the U.S.," which are defined by code to include navigable waters, interstate waters, and all other waters where the use or degradation or destruction of the waters could affect interstate or foreign commerce. Tributaries of any of these waters and wetlands that meet these criteria or that are adjacent to any of these waters or their tributaries are also included. Any project that involves excavation or fill in waters of the U.S. will require a Section 404 permit from the USACE. The limits of nontidal waters extend to the ordinary high-water line, defined as the line on the shore established by the fluctuation of water and indicated by physical characteristics such as a natural line impressed on the bank, shelving, changes in the character of the soil, destruction of terrestrial vegetation, presence of litter or debris, or other appropriate means.

Determinations on Section 404 permits are made based on balancing public and private needs, evaluating the practicality of using reasonable alternative locations and methods, and considering the extent and permanence of beneficial and/or detrimental effects of the proposed project. Final status of jurisdiction is determined by the USACE on a case-by-case basis. The USACE usually will consult with the resource agencies (such as the Department of Fish and Game) for input on potential impacts to fisheries and wildlife prior to granting a Section 404 permit. A Section 404 permit would be required for any brine-concentrate disposal project that involves construction in waters of the U.S., including construction of brine-concentrate pipelines and outfalls.

Section 401 of the Clean Water Act

Section 401 of the Clean Water Act relates to ensuring that water pollution prevention and control occurs on projects regulated by the federal government. Section 401 requires that an applicant for a federal license or permit provide a certification that any discharges from the facility will comply with the Clean Water Act, including water quality standard requirements. Specifically, any Section 404 permit applicant for an activity that could affect water quality also must apply to the RWQCB for Water Quality Certification under Section 401 of the Clean Water Act. Obtaining a certification of water quality from the RWQCB is a condition of the USACE Section 404 permit, thus any brine-concentrate project needing a Section 404 Permit also will require this certification.

Section 303(d) of the Clean Water Act

In accordance with Section 303(d) of the Clean Water Act, states, territories, and authorized tribes are required to develop lists of impaired waters. Impaired bodies of water are those that do not meet water quality standards, including bodies of water for which data show exceedance of numeric or narrative water quality criteria and bodies of water that do not meet the designated uses. The 303(d) list includes the body of water or particular area of the body of water (e.g., reach of river) that is impaired, the pollutants or water quality stressors for which it is impaired, and

potential sources of the impairment if known. The list is developed by the RWQCB, adopted by the SWRCB, and approved by USEPA every 2 years. The law requires that states, territories, and authorized tribes establish priority rankings for waters on the lists and develop TMDLs for these waters. A TMDL is a calculation of the maximum amount of a pollutant that a body of water can receive and still safely meet water quality standards.

Total Maximum Daily Loads

A TMDL identifies the water quality problem, links the water quality impairment to the pollutant sources, establishes a target pollutant-loading that the body of water can receive without exceeding water quality standards, and then establishes load allocations for non-point sources and waste-load allocations for point sources to meet that loading target. An implementation plan describes how the load and waste load allocations are to be implemented. Waste load allocations for point sources are usually implemented through effluent limits in NPDES permits. TMDLs, including their implementation plans, are adopted into the regional Basin Plan as a Basin Plan Amendment.

In California, the RWQCBs are responsible for implementing and overseeing TMDLs. USEPA Region 9 retains responsibility for publishing guidance on permitting and regulatory activities, as well as approval authority over TMDLs and the listing of bodies of water that are not achieving water quality standards. USEPA Region 9 also approves the 303(d) list. For California, the most recent 303(d) list was completed in 2006 and partially approved by USEPA in June 2007. USEPA's approval was limited based on the omission of 36 waterways and associated 34 pollutants in waters that were not included in the 2006 303(d) list. In southern California, listings for inland rivers and creeks commonly include constituents such as metals (e.g., lead and mercury), selenium, TDS, chlorides, and boron, in addition to toxicity. Table 3.1 provides a list of the 303(d) contaminants in the study area. Attachment A has a complete 303(d) list for bodies of water in southern California, and Figure 3.1 shows the location of 303(d)-listed bodies of water in southern California.

TMDLs and the 303(d) list are important since typically no new discharges are permitted into impaired bodies of water. This is because it is assumed that to be impaired, the body of water already exceeds its assimilative capacity. Also, existing discharges are not permitted to increase mass loading and these discharges are likely to become more stringent for effluent limits on 303(d)-listed constituents as TMDLs are developed. Therefore, brine-concentrate management that affects an impaired body of water under an existing NPDES permit or requires a new NPDES permit would be concerned about complying with these regulations.

TABLE 3.1
SWRCB 303(D) LISTED POLLUTANTS/STRESSORS IN THE SOUTHERN CALIFORNIA STUDY AREA

1,2,4-trimethylbenzene`	Dichloroethylene (1,1-DCE)	p-Dichlorobenzene (DCB)
2-methylnaphthalene	Dieldrin	Pentachlorophenol (PCP)
Algae	Endosulfan	Pesticides
Aluminum	*Enteric Viruses*	pH
Ammonia	Enterococcus	Phenanthrene
Arsenic	Eutrophic	Phosphorus
Bacteria Indicators	Exotic Vegetation	Phosphate
Benthic Community Effects	Fecal Coliform	Priority Organics
Benzo(a) pyrene (PAHs)	Hexachlorocyclohexane	Pyrene
Benzo[a]anthracene	Hydromodification	Salinity/TDS/Chlorides
Benzo(b)fluoranthene	Iron	Scum/Foam-unnatural
Bis(2-ethylhexyl)phthalate/DEHP	Lead	Sediment Toxicity
Boron	Lindane	Sedimentation/Siltation
Cadmium	Low Dissolved Oxygen	Selenium
ChemA	m,p,-Xylenes	Silver
Chlordane	Manganese	Sodium
Chloride	Mercury	Solids
Chloroform	Metals	Specific conductivity
Chlorpyrifos	Nickel	Sulfates
Chromium	Nitrate and Nitrite	Synthetic Organics
Chrysene (C1-C4)	Nitrogen	Thallium
Coliform Bacteria	Noxious aquatic plants	Toluene
Color	Nutrients	TDS
Copper	Odors	Toxaphene
Copper, Dissolved	Oil	Toxicity
Cyanide	Organic Enrichment/Low Dissolved Oxygen	Trace Elements
Dacthal	o-Xylenes	Trash
Dichlorodiphenyldichloroethane (DDE)	Polychlorinated biphenyls (PCBs)	Turbidity
Dichlorodiphenyltrichloroethane (DDT)	polycyclic aromatic hydrocarbons (PAHs)	Vinylidene Chloride
Diazinon	Pathogens	Zinc
Dibenz[a,h]anthracene	p-Cymene	

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Antidegradation Policy

The State of California Antidegradation Policy assists in meeting requirements set by the Clean Water Act as well as the California Water Code. This Policy is a key element in restricting the degradation of surface or groundwaters. The basis for California's Antidegradation Policy is Resolution 68-16, "Policy with Respect to Maintaining Higher Quality Waters in California," and Resolution 88-63, "Sources of Drinking Water Policy." These policies protect bodies of water where existing quality is higher than is necessary for the protection of beneficial uses. Under the Antidegradation Policy, any actions that could adversely affect water quality in all surface and groundwaters must adhere to the following:

- Must be consistent with the maximum benefit to the people of the state
- Must not unreasonably affect existing and anticipated beneficial use of such water
- Must not result in water quality less than that prescribed in water quality plans and policies

The Antidegradation Policy is regulated through the basin plans developed by the RWQCBs and is important because brine-concentrate management projects must comply with Basin Plan water quality objectives under NPDES permit requirements.

California Toxics Rule

The California Toxics Rule (CTR) was promulgated by USEPA on May 18, 2000. The CTR officially was published in the Federal Register as "Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California." The CTR was necessary to comply with section 303(c)(2)(B) of the Clean Water Act, which requires the state to adopt numeric criteria for the priority toxic pollutants. California originally adopted numeric criteria for priority toxic pollutants in 1991 as part of California's Inland Surface Water Plans and Enclosed Bays and Estuaries Plans. In 1994, a state court ordered that these criteria be rescinded, which required the CTR to be developed. The CTR lists 126 priority toxic pollutants and puts forth numeric aquatic-life criteria for fresh water and salt water for 23 of these compounds, and numeric human-health criteria for 57 of these compounds. Overall, the CTR criteria are stringent for many parameters.

The CTR provides some guidance regarding how the criteria are to be applied. For example, the CTR suggests that RWQCBs could use one of several outlined methods involving metal translators to develop water-quality-based permit limits to comply with water quality standards based on dissolved metals criteria. The CTR encourages the development of discharger-specific water-effect ratios (WERs) for metals. A default WER value of 1.0 is assumed if no site-specific WER has been determined.

To implement the CTR, the RWQCB, as the NPDES permitting authority, must determine the need for permit limits based on the reasonable potential of the discharge to cause or contribute to an exceedance of numeric or narrative water

quality criteria. Also, the CTR includes a provision that authorizes the state to issue compliance schedules for new or revised NPDES permit limits for existing discharges if the discharger reasonably believes that it will be infeasible to comply promptly with the new or more restrictive Water-Quality-Based Effluent Limits (WQBELs). If the compliance schedule exceeds 1 year, the CTR requires that the schedule set forth interim requirements and dates for compliance with the criteria. These interim limits can be difficult to meet for some dischargers. WQBELs then are established as necessary to meet water quality standards. WQBELs are established based on the implementation provisions provided in the California SIP.

The Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California, also known as the State Implementation Plan was readopted by the SWRCB in 2000. This SIP outlines the procedures for implementing the CTR and other water quality criteria. The SIP sets forth detailed guidelines for establishing WQBELs for priority pollutants, including steps for determining reasonable potential, as well as procedures and calculations for determining effluent limits. These procedures include discussion of translators for metals and selenium, as well as mixing zones and dilution credits. The SIP procedures outline steps to determine ambient background concentrations. The SIP also addresses determination of compliance with priority pollutant criteria and WQBELs.

California Ocean Plan

The Water Quality Control Plan for Ocean Waters of California (Ocean Plan) was developed to establish water quality standards for coastal waters including estuaries in accordance with Section 303(c)(1) of the Clean Water Act. The Ocean Plan was adopted by the SWRCB in 1972, and the most recent amendments were adopted in 2005. The Ocean Plan is reviewed every 3 years. The Ocean Plan applies to all point-source discharges to the ocean and requires that disposals not cause degradation of a "healthy and diverse marine environment" (SWRCB, 2001). The Ocean Plan establishes bacterial standards for discharge zones, shellfish harvesting standards, and physical characteristics that must be complied with, including requirements that "natural light shall not be significantly reduced at any point outside the initial dilution zone as the result of the discharge of waste" and "the rate of deposition of inert solids and the characteristics of inert solids in ocean sediments shall not be changed such that benthic communities are degraded" (SWRCB, 2001).

The Ocean Plan enumerates chemical characteristics that will be met, including numerical water quality objectives for numerous chemicals that are designed to protect marine aquatic life and human health. These numeric water quality objectives are used to derive effluent limitations for discharge permits. Table 3.2 lists the water quality objectives contained in the Ocean Plan.

TABLE 3.2
OCEAN PLAN WATER QUALITY OBJECTIVES

Chemical	Units of Measurement	Limiting Concentrations		
		6-Month Median	Daily Maximum	Instantaneous Maximum
Objectives for Protection of Marine Aquatic Life				
Arsenic	µg/L	8	32	80
Cadmium	µg/L	1	4	10
Chromium (Hexavalent)[a]	µg/L	2	8	20
Copper	µg/L	3	12	30
Lead	µg/L	2	8	20
Mercury	µg/L	0.04	0.16	0.4
Nickel	µg/L	5	20	50
Selenium	µg/L	15	60	150
Silver	µg/L	0.7	2.8	7
Zinc	µg/L	20	80	200
Cyanide[b]	µg/L	1	4	10
Total Chlorine Residual[c]	µg/L	2	8	60
Ammonia (expressed as nitrogen)	µg/L	600	2400	6000
Acute* Toxicity	TU[a]	N/A	0.3	N/A
Chronic* Toxicity	TU[c]	N/A	1	N/A
Phenolic Compounds (nonchlorinated)	µg/L	30	120	300
Chlorinated Phenolics	µg/L	1	4	10
Endosulfan	µg/L	0.009	0.018	0.027
Endrin	µg/L	0.002	0.004	0.006
Hexachlorocylo-hexane *	µg/L	0.004	0.008	0.012
Radioactivity	Not to exceed limits specified in Title 17, Division 1, Chapter 5, Subchapter 4, Group 3, Article 3, Section 30253 of the CCR. Reference to Section 30253 is prospective, including future changes to any incorporated provisions of federal law, as the changes take effect.			

TABLE 3.2
OCEAN PLAN WATER QUALITY OBJECTIVES

Chemical	30-day Average (μg/L)
Objectives for Protection of Human Health – Noncarcinogens	
acrolein	220
antimony	1,200
bis(2-chloroethoxy) methane	4.4
bis(2-chloroisopropyl) ether	1,200
chlorobenzene	570
chromium (III)	190,000
di-n-butyl phthalate	3,500
dichlorobenzenes*	5,100
diethyl phthalate	33,000
dimethyl phthalate	820,000
4,6-dinitro-2-methylphenol	220
2,4-dinitrophenol	4.0
ethylbenzene	4,100
fluoranthene	15
hexachlorocyclopentadiene	58
nitrobenzene	4.9
thallium	2. 2
toluene	85,000
tributyltin	0.0014
1,1,1-trichloroethane	540,000
Objectives for Protection of Human Health – Carcinogens	
acrylonitrile	0.10
aldrin	2.2×10^{-5}
benzene	5.9
benzidine	6.9×10^{-5}
beryllium	0.033
bis(2-chloroethyl) ether	0.045

TABLE 3.2
OCEAN PLAN WATER QUALITY OBJECTIVES

Chemical	30-day Average (μg/L)
Objectives for Protection of Human Health – Carcinogens	
bis(2-ethylhexyl) phthalate	3.5
carbon tetrachloride	0.90
chlordane*	2.3×10^{-5}
chlorodibromomethane	8.6
chloroform	130
DDT*	0.00017
1,4-dichlorobenzene	18
3,3'-dichlorobenzidine	0.0081
1,2-dichloroethane	28
1,1-dichloroethylene	0.9
dichlorobromomethane	6.2
dichloromethane	450
1,3-dichloropropene	8.9
dieldrin	0.00004
2,4-dinitrotoluene	2.6
1-2-diphenylhydrazine	0.16
halomethanes*	130
heptachlor	0.00005
heptachlor epoxide	0.00002
hexachlorobenzene	0.00021
hexachlorobutadiene	14
hexachloroethane	2.5
isophorone	730
N-nitrosodimethylamine	7.3
N-nitrosodi-N-propylamine	0.38
N-nitrosodiphenylamine	2.5
PAHs*	0.0088
PCBs*	0.000019
Tetrachlorodibenzodioxin (TCDD) equivalents*	$3.9 \times x10^{-9}$
1,1,2,2-tetrachloroethane	2.3

TABLE 3.2
OCEAN PLAN WATER QUALITY OBJECTIVES

Chemical	30-day Average (μg/L)
Objectives for Protection of Human Health – Carcinogens	
Tetrachloroethylene	2.0
Toxaphene	0.00021
Trichloroethylene	27
1,1,2-trichloroethane	9.4
2,4,6-trichlorophenol	0.29
Vinyl chloride	36

Notes:

μg/L = micrograms per liter

[a]Dischargers could at their option meet this objective as a total chromium objective.

[b]If a discharger can demonstrate to the satisfaction of the RWQCB (subject to USEPA approval) that an analytical method is available to reliably distinguish between strongly and weakly complexed cyanide effluent limitations for cyanide could be met by the combined measurement of free cyanide, simple alkali metal cyanide, and weakly complexed organometallic cyanide complexes. For the analytical method to be acceptable, the recovery of free cyanide from metal complexes must be comparable to that achieved by the approved method in 40 Code of Federal Regulations (CFR) Part 136, as revised May 14, 1999.

[c]Water quality objectives for total chlorine residual applying to intermittent discharges not exceeding 2 hours, shall be determined through the use of the following equation:

$$\log y = -0.43 (\log x) + 1.8$$

where:

y = the water quality objective (in μg/L) to apply when chlorine is being discharged

x = the duration of uninterrupted chlorine discharge in minutes.

The Ocean Plan notes that RWQCBs could impose alternative and less restrictive limits than those contained in the list of chemical water quality objectives in Table 3.2 if the permit applicant can demonstrate that (SWRCB, 2001):

- Reasonable control technologies (including source control material substitution, treatment, and dispersion) would not provide for complete compliance
- Any less stringent provisions would encourage water reclamation

These alternative water quality objectives must be below the conservative estimates for chronic toxicity provided in the Ocean Plan and must be protective of the marine environment.

The Ocean Plan prohibits discharges to Areas of Special Biological Significance (ASBS). ASBS are "areas designated by the SWRCB as requiring protection of species or biological communities to the extent that alteration of natural water quality is undesirable. All ASBS are also classified as a subset of State Water Quality Protection Areas." The Ocean Plan further notes that discharges will be

located a sufficient distance from ASBS-designated areas. ASBS-designated areas in southern California are shown in Figure 3.2 and are listed in Table 3.3. The SWRCB has the authority to grant exceptions to the prohibition on ASBS discharges, provided that the exception will not compromise protection of ocean waters for beneficial uses.

The SWRCB adopted the "reasonable potential" concept as an amendment to the Ocean Plan. "Reasonable potential" is described as the likelihood that the concentration of a pollutant in a discharge would cause or contribute to an exceedance of water quality standards. The concept of "reasonable potential" is used to determine if an effluent limit is required for a particular constituent in a discharge permit. Guidelines for establishing "reasonable potential" for discharges into inland surface waters and estuaries are established in the SIP. The Ocean Plan sets analysis procedures for determining which objectives require effluent limitations under the "reasonable potential" concept. Currently, dischargers are allowed to certify that the pollutants for which numeric water quality objectives have been established in the Ocean Plan are not in their effluent. This certification is in lieu of monitoring. "Reasonable potential" can be determined based on a statistical evaluation of effluent data, if sufficient data are available.

In June of 2007, a scoping meeting was conducted for the triennial review of the Ocean Plan. Several proposed changes to the Ocean Plan were recommended by the SWRCB staff. Table 3.4 provides a description of the amendments that were proposed for the 2005 Ocean Plan as part of the 2005-2008 Triennial Review (SWRCB, 2007). As part of the proposed amendments, a water quality criterion is being considered to regulate the dilution of brine or desalination wastes. Initial dilution is defined in the Ocean Plan as "the process which results in the rapid and irreversible turbulent mixing of wastewater with the ocean water around the point of discharge" (SWRCB, 2001). Dilution plays an important role in the determination of permit effluent limits because water quality objectives are applied after mixing has occurred and dilution has been calculated. Therefore, in an ocean environment, the water quality objectives rarely will be applied as end-of-pipe concentration limits. Rapid initial dilution and effective dispersion are important to minimize localization of concentrated materials. The amount of dilution considered to occur for a given outfall is determined through site-specific studies.

All ocean outfalls are typically permitted under NPDES permits which are based on standards set forth in the Ocean Plan. NPDES permits focus primarily on how discharge affects the habitats of marine organisms. For wastewater treatment or brined lines, common permit requirements are for TSS, BOD, toxicity, and residual chlorine. The NPDES limits for refineries and power plants have very stringent requirements for metals and other constituents as water quality objectives in the Ocean Plan for several metal parameters (i.e., Chromium, Copper, Silver, and Mercury) are often well below drinking water quality standards. This is often the limiting factor for an ocean outfall under the Ocean Plan.

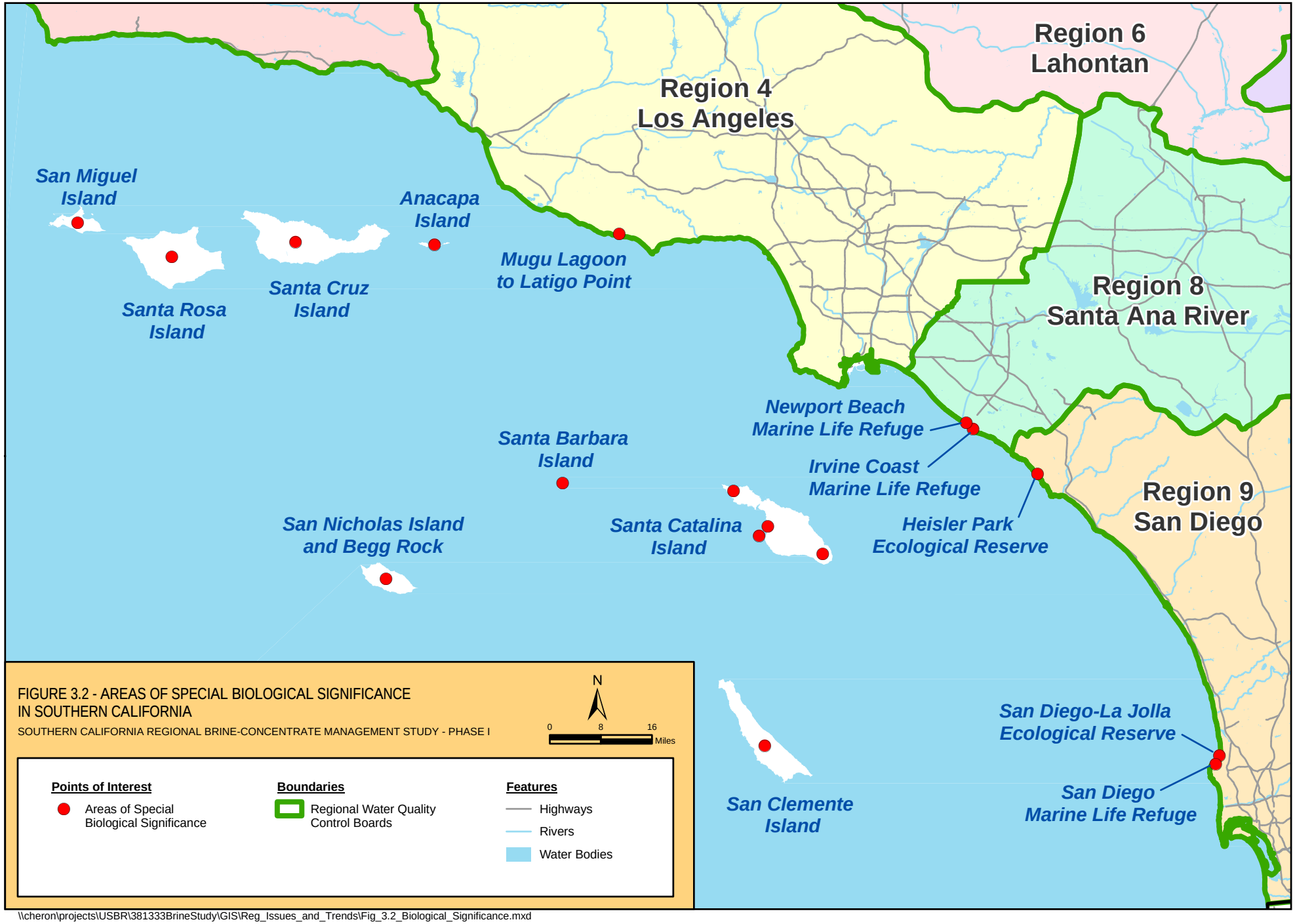

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TABLE 3.3
AREAS OF SPECIAL BIOLOGICAL SIGNIFICANCE IN SOUTHERN CALIFORNIA

Name of Areas of Special Biological Significance	Date Designated	SWRCB Resolution Number	RWQCB Region Number
Heisler Park Ecological Reserve	March 21, 1974	74-28	9
Irvine Coast Marine Life Refuge	April 18, 1974	74-32	8
Laguna Point to Latigo Point	March 21, 1974	74-28	4
Newport Beach Marine Life Refuge – Robert E. Badham	April 18, 1974	74-32	8
San Miguel, Santa Rosa, and Santa Cruz Islands	March 21, 1974	74-28	4
San Nicholas Island and Begg Rock	March 21, 1974	74-28	4
Santa Barbara Island, Santa Barbara County and Anacapa Island	March 21, 1974	74-28	4
Santa Catalina Island – Area One, Isthmus Cove to Catalina Head	March 21, 1974	74-28	4
Santa Catalina Island – Area Two, North End of Little Harbor to Ben Weston Point	March 21, 1974	74-28	4
Santa Catalina Island – Area Three, Farnsworth Bank Ecological Reserve	March 21, 1974	74-28	4
Santa Catalina Island – Area Four, Binnacle Rock to Jewfish Point	March 21, 1974	74-28	4
San Clemente Island	March 21, 1974	74-28	4
San Diego – La Jolla Ecological Reserve	March 21, 1974	74-28	9
San Diego Marine Life Refuge	March 21, 1974	74-28	9

TABLE 3.4
PROPOSED CHANGES TO THE CALIFORNIA OCEAN PLAN DURING TRIENNIAL REVIEW

Issue	Summary	Alternatives	Recommendations
Fecal Coliform Standard for Shellfish	There is no standard for fecal coliform in areas where mariculture is a designated beneficial use and shellfish are harvested for human consumption. CDPH has suggested that the Ocean Plan be amended to add a fecal coliform standard of 14 organisms per 100 milliliters (mL) for waters of all areas where shellfish could be harvested for human consumption	No Action Alternative – No change to existing Ocean Plan standard for bacteria. Alternative 2 – Amend Ocean Plan – Add CDPH fecal coliform standard of 14 organisms per 100 mL for waters where shellfish could be harvested for human consumption. Amend Ocean Plan to address non-human sources of indicator bacteria for all beneficial uses. Alternative 3 – Add CDPH fecal coliform standard of 14 organisms per 100 mL in all areas.	Alternative 2 – This change would make the Ocean Plan consistent with recreational and/or commercial shellfish growing water requirements of other coastal states, and is consistent with California's regulations for commercial shellfish growing waters and would also make the Ocean Plan consistent with National Shellfish Sanitation Program guidelines.
Vessel Discharges	Waste streams discharged by cruise ships and large oceangoing vessels have been mostly unregulated. There has been interest in regulating the discharges under international treaties, the federal Clean Water Act, and state law. The California Public Resources Code prohibits cruise ships and other oceangoing ships from discharging hazardous wastes and wastes from other sources (e.g., oily bilge-water, medical wastes, and dry-cleaning wastes). Gray water discharges from cruise ships are also banned; however, those from other large commercial vessels are subject to discharge restrictions.	No Action Alternative – No change to existing Ocean Plan. Alternative 2 – Amend the Ocean Plan to delete the exclusion for vessel wastes and to reflect current state and federal requirements governing vessel wastes. Alternative 3 – Prohibit all waste discharges from all vessels, regardless of size or type (e.g., commercial, private recreational, barges, military vessels), with the exception of passive discharges from hulls.	Alternative 2 – This option provides a much greater degree of protection for beneficial uses than is currently required in the Ocean Plan. It would not be disruptive to the State's marine economy.
Desalination Facilities and Brine Disposal	No current Ocean Plan objective applies specifically to brine waste discharges from desalination plants or groundwater desalination facilities. These wastes could form dense plumes when discharged into the ocean which tend to settle to the ocean floor prior to eventual mixing with ocean water exposing benthic marine life to a dense, highly saline plume that could potentially have harmful effects.	No Action Alternative – No change in the existing Ocean Plan. Alternative 2 – Establish a narrative water quality objective where salinity should not exceed a certain percentage of natural background. Alternative 3 – Establish a numeric water quality objective.	Alternative 2 – This alternative would protect benthic marine organisms and other beneficial uses while also providing flexibility to RWQCBs for addressing the natural background, or setting a site-specific desalination water quality objective where it is needed.
Review Water Quality Objectives for radioactivity	The radioactivity objective in the water quality objectives of the 2005 Ocean Plan (e.g., Table B of Ocean Plan) has been considered inadequate because it is more applicable to human health and might not provide adequate protection for aquatic life.	No Action Alternative – Do not amend the numeric radioactivity objective in the Ocean Plan. Alternative 2 – Adopt human health based objectives for radioactivity. Alternative 3 – Adopt water quality objectives for aquatic life based on standards proposed by the U.S. Department of Energy in 10 Code of Federal Regulations (CFR) Part 834. Alternative 4 – Review literature and independently develop standards.	Alternative 3 – This approach is most directly applicable to aquatic life and is scientifically sound.

TABLE 3.4
PROPOSED CHANGES TO THE CALIFORNIA OCEAN PLAN DURING TRIENNIAL REVIEW

Issue	Summary	Alternatives	Recommendations
Ocean Monitoring including: Regional Ambient Water Quality Monitoring Standard Monitoring and Reporting Requirements Stormwater Discharges Non-point Source	Additional consistent monitoring elements are under consideration to be included in Appendix III of the Ocean Plan. Appendix III includes standard monitoring procedures that provide direction to the RWQCBs in developing monitoring programs to accompany discharge permits. The USEPA has recommended that any modifications to the Appendix III standard monitoring requirements should be worded carefully so as not to lock in sampling, monitoring, or data management protocols that could quickly become outdated. A model monitoring approach is suggested to be recommended.	No Action Alternative – Do not change the existing monitoring procedures in the Ocean Plan. Alternative 2 – Use a Model Monitoring Approach providing flexibility in implementing standard monitoring procedures, but without minimum requirements. Alternative 3 – Use a Model Monitoring Approach providing flexibility in implementing standard monitoring procedures, with minimum requirements to provide consistent statewide ocean monitoring. Alternative 5 – Use a prescriptive approach to all ocean discharges from all sources.	Alternative 3 – This approach would provide information to effectively manage discharges in order to protect valuable marine resources.
Expression of Metals in Ocean Plan	The Ocean Plan does not explicitly specify whether metal concentrations (in Ocean Plan Tables B, C, and D) apply as total recoverable metals or as the dissolved metals fraction resulting in this proposed amendment. Amending the Ocean Plan to clearly state that all metals are expressed as total recoverable concentrations would accurately reflect the historic record.	No Action Alternative – Do not amend the Ocean Plan. Alternative 3 – Amend the Ocean Plan to clarify that metals are expressed as total recoverable concentrations.	Alternative 2 – Ocean Plan should be amended with the statement "unless otherwise specified, all metal concentrations are expressed as total recoverable concentrations". This approach would allow for more explicit direction for the users to ensure the correct analyses of metals are conducted
Suspended Solids Regulation in Table A	The suspended solids effluent limitation (in Table A of the Ocean Plan), adopted in 1983 is applicable to both publicly owned treatment works (POTWs) and industrial discharges. However, the USEPA promulgated secondary treatment standards for suspended solids at 40 CFR 133 applicable to all municipal wastewater plants which the current suspended solids limitation does not satisfy.	No Action Alternative – Do not change the Ocean Plan suspended solids effluent limitations (in Table A). Alternative 2 – Amend the Ocean Plan (in Table A) for suspended solids effluent limitations using the 40 CFR 133.102 treatment standards. These changes would be effectively upon adoption. Alternative 3 – Amend the Ocean Plan (in Table A) for suspended solids effluent limitations using the 40 CFR 133.102 treatment standards. These changes would be effective within five years after adoption. Alternative 4 – Clarify that suspended solids effluent limitations (in Table A) do not apply to POTWs. Alternative 5 – Delete the Ocean Plan suspended solids effluent limitations entirely (in Table A).	Alternative 3 – The Ocean Plan would be amended to modify suspended solids effluent limitation for secondary treatment consistent with 40 CFR 133, but compliance would be required within five years of adoption. The revised suspended solids effluent limitation would continue to be applicable to both POTWs and industrial dischargers.
Plastic Debris Regulation	The Ocean Plan has water quality objectives (in Table B) for specific phthalate compounds that might be used as additives to plastic products and also has some narrative objectives for floating particulates and inert solids with some corresponding implementation provisions. However, the water quality objectives set forth in the Ocean Plan do not specifically address plastic debris or other trash.	No Action Alternative – Do not amend the Ocean Plan. Alternative 2 – Amend the Ocean Plan narrative objectives to state that ocean water shall not contain trash including, but not limited to, plastic debris to the extent that it would cause nuisance or adversely affect beneficial uses, and require that all waste streams be essentially free of trash including plastic debris. Alternative 3 – Amend the Ocean Plan narrative objectives to state that ocean water shall absolutely not contain trash including, but not limited to, plastic debris, and require an absolute prohibition of trash, including plastic debris, in all waste streams (i.e., zero discharge).	Alternative 2 – This alternative would require that trash, including plastic debris shall not be present in our marine environment. Levels of trash in ocean waters and on the beach that affect aesthetics or provide a danger to marine life would not be allowed. The requirement that all waste streams be essentially free of trash would implement that objective. However, "Essentially free" does not mean a zero discharge prohibition. Also, very low levels of trash would not result in violations if the RWQCBs find that such levels do not cause a nuisance or impact beneficial uses.
Acute Toxicity Definition	The equation for acute toxicity (TUa) of the Ocean Plan (in Appendix I) does not account for mortality in the control concentration. In addition, the equation produces a TUa value of zero when survival in undiluted effluent is greater than 99 percent which creates computation problems.	No Action Alternative – Do not change the definition of acute toxicity in Appendix I of the Ocean Plan. Alternative 2 – Revise the acute toxicity definition.	Alternative 2 – This approach would correct the problem. The revision would include defining the adjusted survival first in the 100 percent effluent then entering it into the existing equation. Also, adjusted percent survivals greater than 98 percent will result in a TUa value of "<0.18".

For example, the Hyperion outfall system has a dilution ratio of 84 parts seawater to 1 part waste discharged. Further, the brine-concentrate discharge from the West Basin Water Recycling Facility that is discharged through the Hyperion outfall is diluted by the Hyperion effluent at a ratio of 120 parts effluent to 1 part waste brine. Therefore, the dilution ratio applied to the West Basin brine-concentrate stream is approximately 10,000:1. No reasonable potential exists to exceed Ocean Plan objectives, and no numerical effluent limitations are prescribed in the permit. In addition, a 2004 Santa Ana Watershed Project Authority (SAWPA) report stated that the dilution ratio at the Orange County Sanitation District Outfall No. 2 was 180:1 (SAWPA, 2004). The SWRCB might be changing the view of dilution as it is associated with brine desalination facilities. The SWRCB is considering an amendment to the Ocean Plan that establishes a limit for salinity based on a percentage of salinity that is naturally present (background salinity level). The impetus for this amendment is a concern that brine from desalination facilities could create a dense, highly saline plume that could affect benthic organisms. This concern is based on a Southern California Coastal Water Research Project (SCCWRP) that found 56 to 75 percent reduction of purple sea urchin embryos in waters with a salinity of 36.5 grams per kilograms (g/kg) or greater. This amendment is currently under review by the SWRCB.

3.1.2 Federal Safe Drinking Water Act

The federal Safe Drinking Water Act was developed to protect public health by regulating the nation's public drinking water supply and its sources–rivers, lakes, reservoirs, springs, and groundwater wells. The SDWA authorized USEPA to establish national health-based standards for drinking water to protect against both naturally occurring and man-made contaminants that might be found in drinking water. For brine-concentrate management projects, the SDWA is important because it regulates water quality objectives including MCLs, Public Health Goals (PHGs), and Action Levels (ALs) that impact discharge requirements and regulate activities that might degrade drinking water sources. In addition, the SDWA establishes requirements for Underground Injection Control (UIC), which regulates deep well injection applications.

Maximum Contaminant Levels

Maximum contaminant levels are enforceable standards set by USEPA that define the maximum levels of constituents that can be present in drinking water. MCLs are set as close as possible to the levels known to protect public health, while taking into account best available treatment and costs. Also, the CDPH has established MCLs in the Calderon-Sher Safe Drinking Water Act. CDPH establishes these MCLs, which are in many cases more stringent than those set by USEPA, through a formal regulatory process. MCLs designate maximum levels for constituents including inorganics (lead, arsenic, and selenium), radionuclides, organic chemicals, microbial contaminants, and disinfection by-products. Secondary MCLs are established for other constituents along with characteristics including TDS, copper, sulfate, corrosivity, and color. Table 3.5 shows USEPA and California MCLs for constituents in milligrams per liter (mg/L).

TABLE 3.5
MAXIMUM CONTAMINANT LEVELS AND PUBLIC HEALTH GOALS

Constituent	USEPA MCL (mg/L)	California MCL (mg/L)	California PHG (ppb)
Inorganics			
Aluminum	0.05 to 2[a]	1 0.2	600
Antimony	0.006	0.006	20
Arsenic	0.01	0.05	4 parts per trillion (ppt)
Asbestos	7 MFL[b]	7 MFL[b]	7 MFL[b]
Barium	2	1	2,000
Beryllium	0.004	0.004	1
Cadmium	0.005	0.005	0.07
Chloride	250[a]	--	--
Chromium (total)	0.1	0.05	Withdrawn
Copper	1[a] 1.3[d]	1[a] 1.3[c]	170
Cyanide	0.2	0.15	150
Fluoride	4 2[a]	2	1,000
Iron	0.3[a]	0.3[a]	--
Lead	0.015	0.015	2
Manganese	0.05[a]	0.05[a]	--
Mercury	0.002	0.002	1.2
Nickel	Remanded	--	12
Nitrate (as Nitrogen, N)	10	10	10,000
Nitrite (as N)	1	1	1,000
Perchlorate	--	--	6
Selenium	0.05	0.05	--
Silver	0.1[a]	0.1	--
Sulfate	250[a]	250[a]	250,000
Thallium	0.002	0.002	0.1
Zinc	5[a]	5[a]	--

TABLE 3.5
MAXIMUM CONTAMINANT LEVELS AND PUBLIC HEALTH GOALS

Constituent	USEPA MCL (mg/L)	California MCL (mg/L)	California PHG (ppb)
VOCS			
Benzene	0.005	0.001	0.15
Carbon Tetrachloride	0.005	0.0005	0.1
1,2-Dichlorobenzene	0.6	0.6	600
1,4-Dichlorobenzene	0.075	0.005	6
1,1-Dichloroethane	--	0.005	3
1,2-Dichloroethane	0.005	0.0005	0.4
1,1-Dichloroethylene	0.007	0.006	10
cis-1,2-Dichloroethylene	0.07	0.006	--
trans- 1,2-Dichloroethylene	0.1	0.01	--
Dichloromethane	0.005	0.005	4
2,4 Dichlorophenoxyacetic acid	--	--	70
1,3-Dichloropropene	--	0.0005	0.2
1,2-Dichloropropane	0.005	0.005	0.5
Ethylbenzene	0.7	0.3	300
Methyl-tertiary-butyl ether (MTBE)	--	0.005[a] 0.013	13
Monochlorobenzene	0.1	0.07	200
Styrene	0.1	0.1	--
1,1,2,2-Tetrachloroethane	--	0.001	0.1
Tetrachloroethylene	0.005	0.005	0.06
Toluene	1	0.15	150
1,2,4 Trichlorobenzene	0.07	0.005	5
1,1,1-Trichloroethane	0.200	0.200	--
1,1,2-Trichloroethane	0.005	0.005	--
Trichloroethylene	0.005	0.005	0.8
Trichlorofluoromethane	--	0.15	700
1,1,2-Trichloro-1,2,2-Trifluoroethane	--	1.2	4,000
Vinyl chloride	0.002	0.0005	0.05
Xylenes	10	1.750	1,800

TABLE 3.5
MAXIMUM CONTAMINANT LEVELS AND PUBLIC HEALTH GOALS

Constituent	USEPA MCL (mg/L)	California MCL (mg/L)	California PHG (ppb)
Radionuclides			
Uranium	30 μg/L	20 picoCuries per liter (pCi/L)	0.5
Combined radium-226 & 228	5 pCi/L	5 pCi/L	--
Gross Alpha article activity	15 pCi/L	15 pCi/L	--
Gross Beta particle activity	dose of 4 millirem/yr	50 pCi/L[d]	--
Strontium-90	8 pCi/L	8 pCi/L[d]	--
Tritium	20,000 pCi/L	20,000 pCi/L[d]	--
Synthetic Organic Compounds (SOCs)			
Alachlor	0.002	0.002	4
Atrazine	0.003	0.001	0.15
Bentazon	--	0.018	200
Benzo(a) Pyrene	0.0002	0.0002	0.004
Carbofuran	0.04	0.018	1.7
Chlordane	0.002	0.0001	0.03
Dalapon	0.2	0.2	790
Dibromochloropropane	0.0002	0.0002	0.0017
Di(2-ethylhexyl)adipate	0.4	0.4	0.2 ppm
Di(2-ethylhexyl)phthalate	0.006	0.004	12
2,4-D	0.07	0.07	--
Dinoseb	0.007	0.007	14
Diquat	0.02	0.02	15
Endothall	0.1	0.1	580
Endrin	0.002	0.002	1.8
Ethylene Dibromide	0.00005	0.00005	0.01
Glyphosate	0.7	0.7	1,000
Heptachlor	0.0004	0.00001	0.008
Heptachlor Epoxide	0.0002	0.00001	0.006
Hexachlorobenzene	0.001	0.001	0.03
Hexachlorocyclopentadiene	0.05	0.05	50
Lindane	0.0002	0.0002	0.032
Methoxychlor	0.04	0.03	30

TABLE 3.5
MAXIMUM CONTAMINANT LEVELS AND PUBLIC HEALTH GOALS

Constituent	USEPA MCL (mg/L)	California MCL (mg/L)	California PHG (ppb)
SOCS			
Molinate	--	0.02	--
Oxamyl	0.2	0.05	50
Pentachlorophenol	0.001	0.001	0.4
Picloram	0.5	0.5	500
Polychlorinated Biphenyls	0.0005	0.0005	--
Simazine	0.004	0.004	4
Thiobencarb	--	0.07 0.001[a]	70
Toxaphene	0.003	0.003	0.03
2,3,7,8-TCDD Dioxin	$3x10^{-8}$	$3x10^{-8}$	--
2,4,5-TP (Silvex)	0.05	0.05	25
Disinfection By-Products			
Total trihalomethanes (TTHMs)	0.08	0.100	--
Total haloacetic acids	0.060	--	--
Bromate	0.010	--	--
Chlorite	1.0	--	--
Other Parameters			
Color	15 Color Units[a]	15 Color Units[a]	--
Corrosivity	Noncorrosive[a]	Noncorrosive[a]	--
Foaming Agents	0.5[a]	0.5[a]	--
Odor	3 Threshold Odor Number[a]	3 Threshold Odor Number[a]	--
pH	6.5-8.5[a]	--	--
Total Dissolved Solids	500[a]	--	--
Turbidity	--	5 NTU[a]	--

TABLE 3.5
MAXIMUM CONTAMINANT LEVELS AND PUBLIC HEALTH GOALS

Constituent	USEPA MCL (mg/L)	California MCL (mg/L)	California PHG (ppb)
Treatment Technique			
Acrylamide	TT[e]	TT[e]	--
Epichlorohydrin	TT[e]	TT[e]	--

Notes:

NTU = Nephelometric turbidity units
pCi/L = pico Curies per liter
ppb = parts per billion
ppm = parts per million

[a]Secondary MCL

[b]MFL = million fibers per liter, with fiber length > 10 microns

[c]Regulatory Action Level. If system exceeds, it must take certain actions such as additional monitoring, corrosion control studies and treatment. For lead, a public education program replaces MCL

[d]MCLs – to ensure that exposure above 4 millirem/year does not occur

[e]TT = treatment technique, because an MCL is not feasible

Public Health Goals

The Calderon-Sher Safe Drinking Water Act was passed in 1996 and brought California in compliance with the federal Safe Drinking Water Act. This act required that CDPH monitor and set limits for contaminants in drinking water. In addition, this legislation required the OEHHA to set PHGs. A PHG is the level of a chemical contaminant in drinking water that does not pose a significant risk to health. PHGs are not regulatory standards but guidance standards developed before an MCL is established. When CDPH develops an MCL, the PHG is considered, and the MCL is set as close to the PHG as possible, considering the availability and cost of treatment. A list of applicable PHGs in parts per billion (ppb) is included in Table 3.5.

Action Levels

Action Levels are health-based advisory levels established by CDPH for chemicals lacking MCLs but which are found in drinking water. Generally, CDPH has established ALs in response to actual contamination of drinking water supplies, or in anticipation of possible contamination, such as from a hazardous waste site. Chemicals for which ALs have been established eventually could be regulated by MCLs, depending on the extent of contamination, the levels observed, and the risk to human health. ALs are nonregulatory and are defined as the level of chemical in drinking water that does not pose a significant health risk to people ingesting that water on a daily basis. ALs are set conservatively, with no consideration of attainability. Table 3.6 is a list of ALs.

TABLE 3.6
SELECTED CALIFORNIA ACTION LEVELS

Constituent	AL (mg/L)
Boron	1
n-Butylbenzene	0.26
sec-Butylbenzene	0.26
tert-Butylbenzene	0.26
Carbon disulfide	0.16
Chlorate	0.8
2-Chlorotoluene	0.14
4-Chlorotoluene	0.14
Dichlorodifluoromethane	1
1,4-Dioxane	0.003
Ethylene glycol	14
Formaldehyde	0.1
Isopropylbenzene (Cumene)	0.77
Manganese	0.5
Methyl isobutyl ketone	0.12
Naphthalene	0.17
NDMA	0.00001
Perchlorate	0.006
n-Propylbenzene	0.26
Tertiary butyl alcohol	0.012
1,2,3-Trichloropropane	0.000005
1,2,4-Trimethylbenzene	0.33
1,3,5-Trimethylbenzene	0.33
Vanadium	0.05

RWQCB staff have expressed concern related to "emerging contaminants" including perchlorate, NDMA, and 1.4 dioxane, as well as endocrine disrupters and other xenobiotics. Because MCLs do not exist yet for these compounds, ALs are expected to begin appearing. RWQCB Region 4 (Los Angeles Region) is the most apt to include ALs in permits and already has done so in several cases. The WateReuse Association, California Section, released a Concept Paper outlining the problems associated with using ALs as enforceable limits. Because ALs are conservative and are developed without regard for attainability, their use as effluent limits might necessitate costly additional treatment without additional benefits to water quality. The Concept Paper urges the SWRCB to issue a policy directing RWQCBs to not include ALs as enforceable limits in permits for wastewater treatment plants. Instead, ALs could be included as performance goals and be subject to monitoring and reporting requirements.

Underground Injection Control Program

The Underground Injection Control program was developed to protect Underground Source of Drinking Water (USDW) and is administered by the USEPA and RWQCBs. In Title 40 of the Code of Federal Regulations (CFR) Part 146 of the UIC program lays out a classification system for injection wells. The UIC provides standards, technical assistance, and grants to state governments to regulate injection wells to prevent contamination of drinking water sources. Five classes of wells are described in Table 3.7 and shown in Figure 3.3. The different classes of wells are categorized by the origin and characteristics of the liquid waste.

TABLE 3.7
CLASSES OF INJECTION WELLS

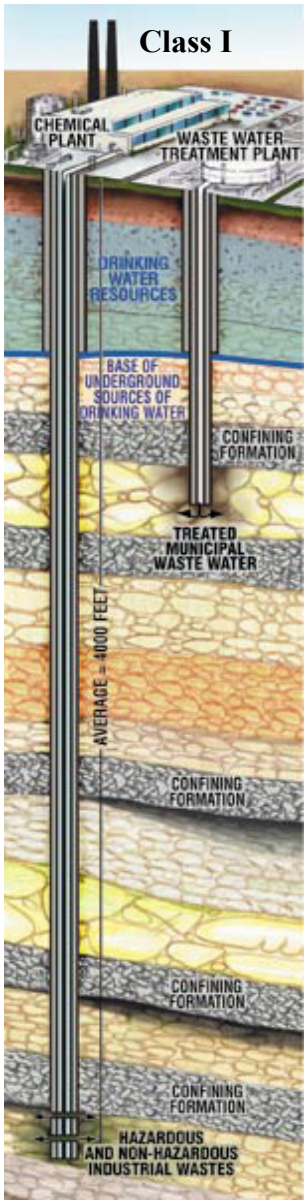
Class	Description
I	Injectate equal to or greater than 10,000 mg/L TDS Geologic confining layer present to prevent contamination of upper level USDW Injectate could have a poorer quality than the USDW into which it is being injected
II	Wells used in the recovery of natural gas or oil
III	Wells used to inject super heated steam, water, or other fluids into formation to extract minerals
IV	Wells used to dispose of radioactive waste (banned under UIC Program)
V	Wells used to inject fluids not classified in other well classes (e.g., advanced wastewater disposal systems, disposal of septic systems, or stormwater, agricultural, and industrial drainage wells) Injectate is of greater quality than the water into which it is being injected Injectate is less than 10,000 mg/L TDS

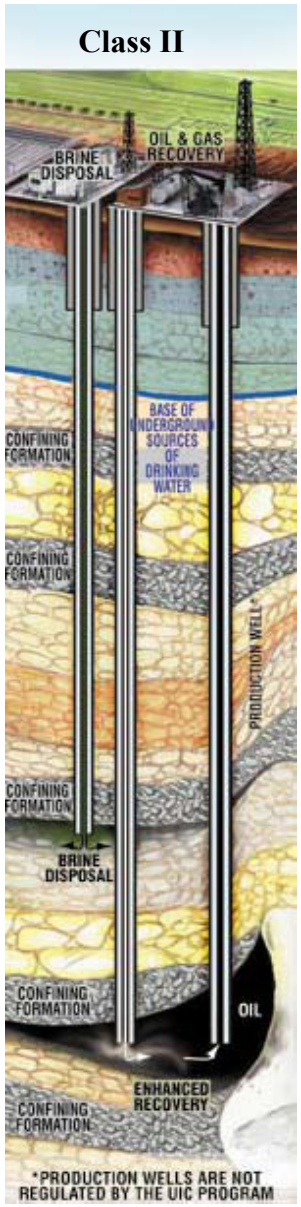
Class I, II, and III wells are required to:

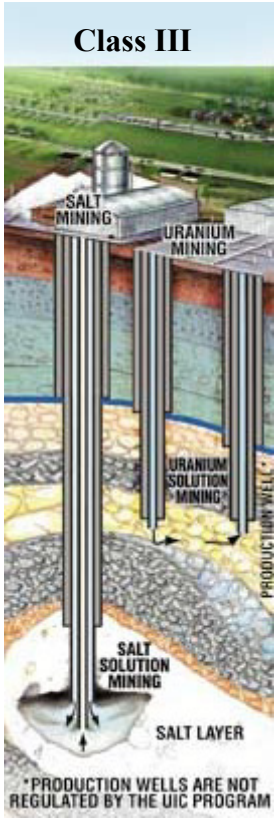
- Be in a location that is free of faults or other adverse geologic features
- Be drilled to a depth that injected fluids do not impact potential USDW and must be confined from any formation that potentially could be a USDW
- Be tested for integrity of the well at the time of completion and every 5 years thereafter
- Be monitored continuously to assure well integrity

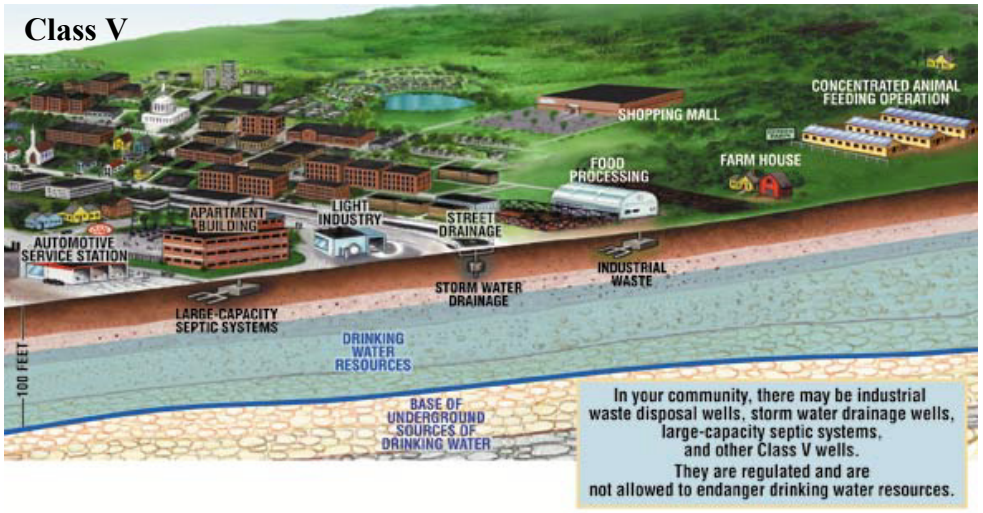
In California, the California Department of Conservation, Division of Oil, and Geothermal Resources regulate Class II wells and the USEPA regulates Class I, III, IV, and V wells. Brine-concentrate disposal can be done using Class I or V wells. However, permitting a Class V well could be difficult because these are typically low technology wells and use gravity to supply the well. In addition, it is unlikely that in southern California a Class V well would be permitted because brine-concentrate would contaminate potential USDW. A USDW is defined as any underground aquifer containing water with TDS less than 10,000 mg/L.

FIGURE 3.3
CLASSES OF INJECTION WELLS









Source: USEPA, 2008b

To permit a Class I well, the project proponent has to show, through extensive geologic testing and modeling, that injected water quality will not degrade the USDW. Class I injection wells must have special protection against contamination of the USDW. The permitting process for an injection well can be a labor-intensive process. The permitting process involves drilling a test well that is completed to Class I standards. Permit requirements for a Class I injection well as stipulated under Subpart B, Section 146.12, of the UIC regulations state:

> *All Class I wells shall be sited in such a fashion that they inject into a formation which is beneath the lowermost formation containing, within 0.25 mile of the well bore, an underground source of drinking water.*

In addition, an impermeable geologic stratum must be located above the injection zone to prevent the migration of the injectate into an overlying USDW. Extensive geologic modeling might be required to demonstrate the effectiveness of the impermeable strata in preventing migration. In many cases, geologic investigations are required to collect data used for modeling purposes.

USEPA also requires that Class I wells be placed in areas free of vertically transmissive faults and fissures and that the region be characterized by low seismicity and a low probability of earthquakes. In California, locating a site that could be shown to have no faults or fissures and a low probability of earthquakes would be difficult to locate. In other regions, deep well injection (DWI) has resulted in a rise in pore pressures and activation of faults, causing increased seismicity, and proving that this would not happen on any given project would be difficult. Figures 3.4 through 3.9 show the locations of groundwater basins and major fault lines in southern California. Figure 3.10 shows the locations of oil and gas wells in southern California. These wells can potentially be used for DWI if site-specific hydrogeological conditions meet regulatory requirements.

If suitable geology is determined to be present, a test well is drilled, completed, and used to confirm adequate injection capacity. The test well typically is completed to Class I standards, but initially permitted as a Class II well to expedite the permit process.

A typical Class I injection well consists of concentric pipes that extend several thousand feet below the ground surface into a highly saline, permeable, injection zone that is confined vertically by impermeable strata. The outermost pipe or surface casing extends below the base of any USDW and is cemented to the surface to prevent contamination of the USDW. Directly inside the surface casing is a long string casing that extends to and sometimes into the injection zone. This casing is cemented to the surface to seal off the injected waste from the formations above the injection zone. If the well is determined suitable for DWI, it can be reclassified as a Class I well. Figure 3.11 is a schematic of a deep injection well.

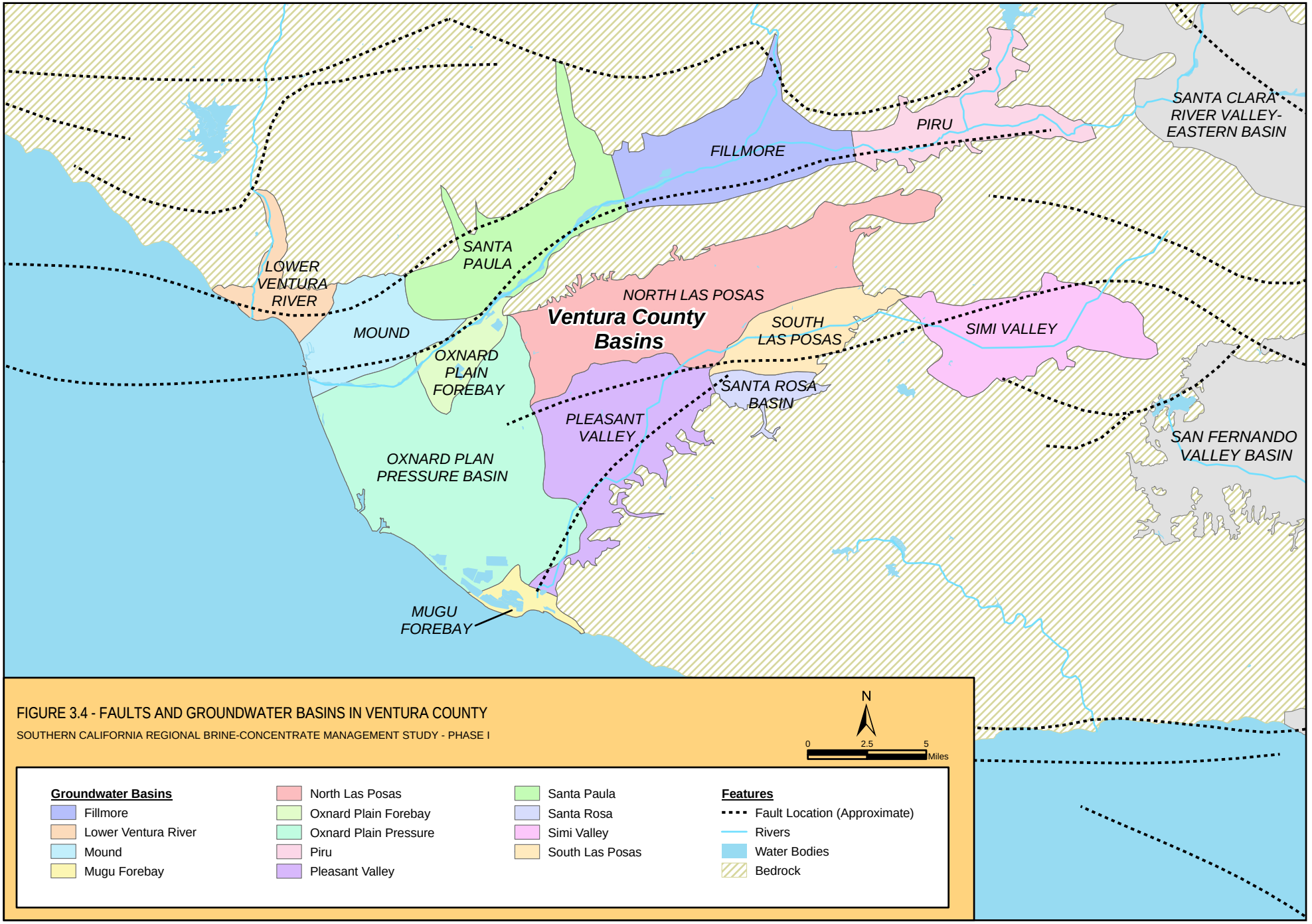


FIGURE 3.4 - FAULTS AND GROUNDWATER BASINS IN VENTURA COUNTY

SOUTHERN CALIFORNIA REGIONAL BRINE-CONCENTRATE MANAGEMENT STUDY - PHASE I

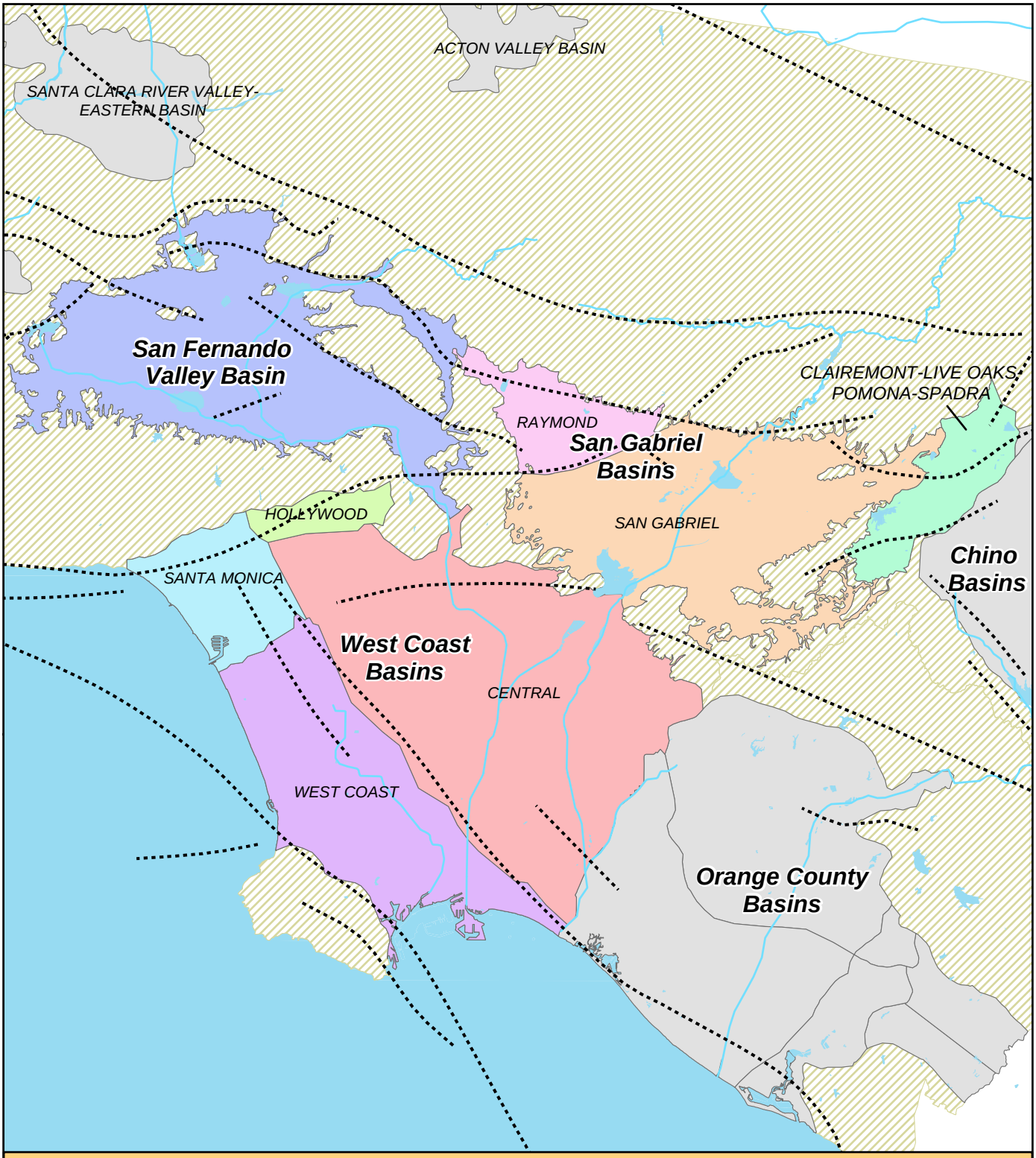


FIGURE 3.5 - FAULTS AND GROUNDWATER BASINS IN LOS ANGELES COUNTY REGION

SOUTHERN CALIFORNIA REGIONAL BRINE-CONCENTRATE MANAGEMENT STUDY - PHASE 1

N

0 4 8 Miles

Groundwater Basins

- Central
- Claremont-Live Oaks-Pomona-Spadra
- Hollywood
- Raymond
- San Fernando Valley
- San Gabriel
- Santa Monica
- West Coast

Features

- Fault Location (Approximate)
- Rivers
- Water Bodies
- Bedrock

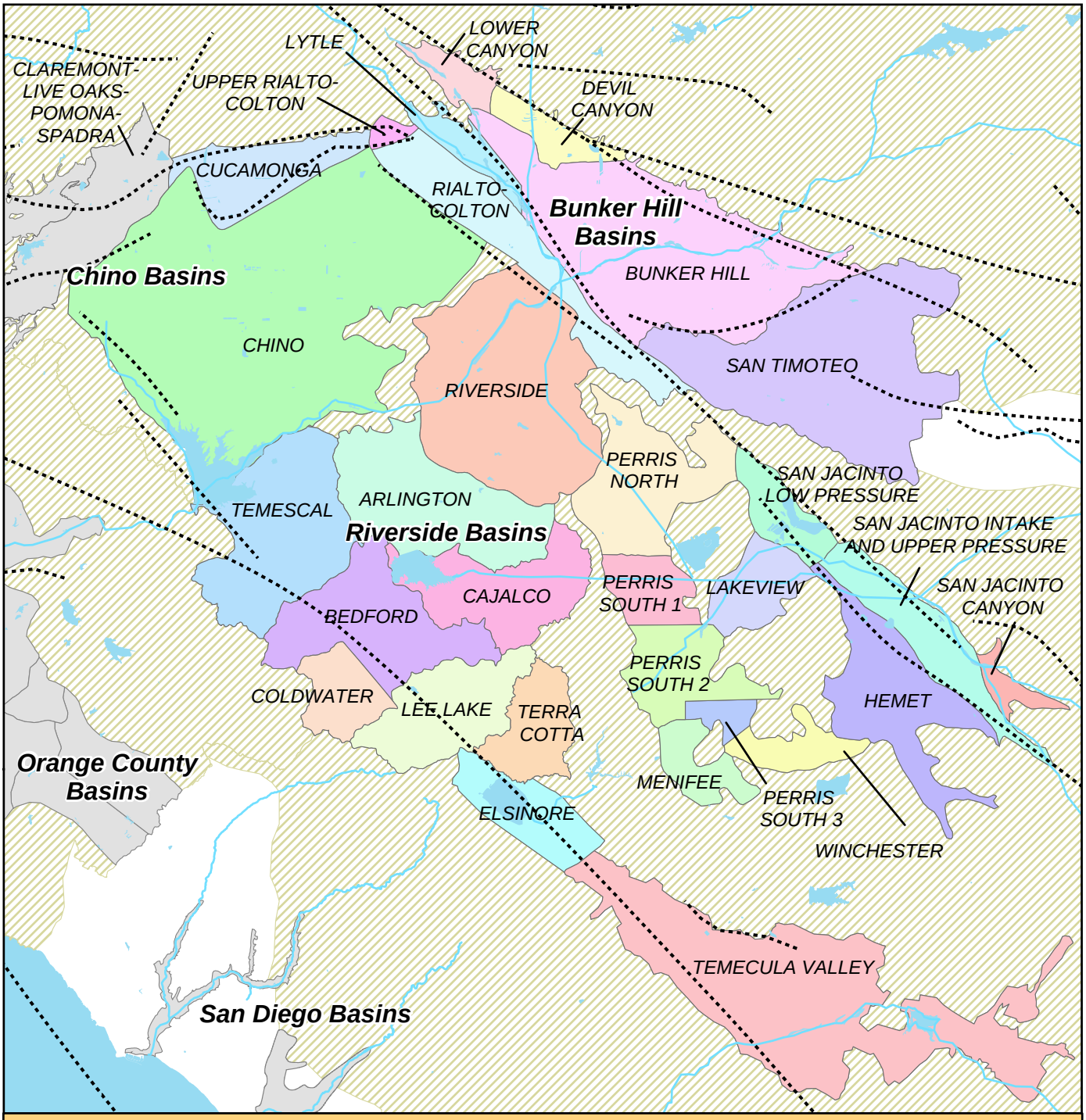


FIGURE 3.6 - FAULTS AND GROUNDWATER BASINS IN INLAND EMPIRE REGION

SOUTHERN CALIFORNIA REGIONAL BRINE-CONCENTRATE MANAGEMENT STUDY - PHASE 1

N

0 4 8 Miles

Groundwater Basins

- Arlington
- Bedford
- Bunker Hill
- Cajalco
- Chino
- Claremont-Live Oaks-Pomona-Spadra
- Coldwater
- Cucamonga
- Devil Canyon
- Elsinore
- Hemet
- Lakeview
- Lee Lake
- Lower Canyon
- Lytle
- Menifee
- Perris North
- Perris South 1
- Perris South 2
- Perris South 3
- Rialto-Colton
- Riverside
- San Jacinto Canyon
- San Jacinto Intake and Upper Pressure
- San Jacinto Low Pressure
- San Timoteo
- Temecula Valley
- Temescal
- Terra Cotta
- Upper Rialto-Colton
- Winchester

Features

- Fault Location (Approximate)
- Rivers
- Water Bodies
- Bedrock

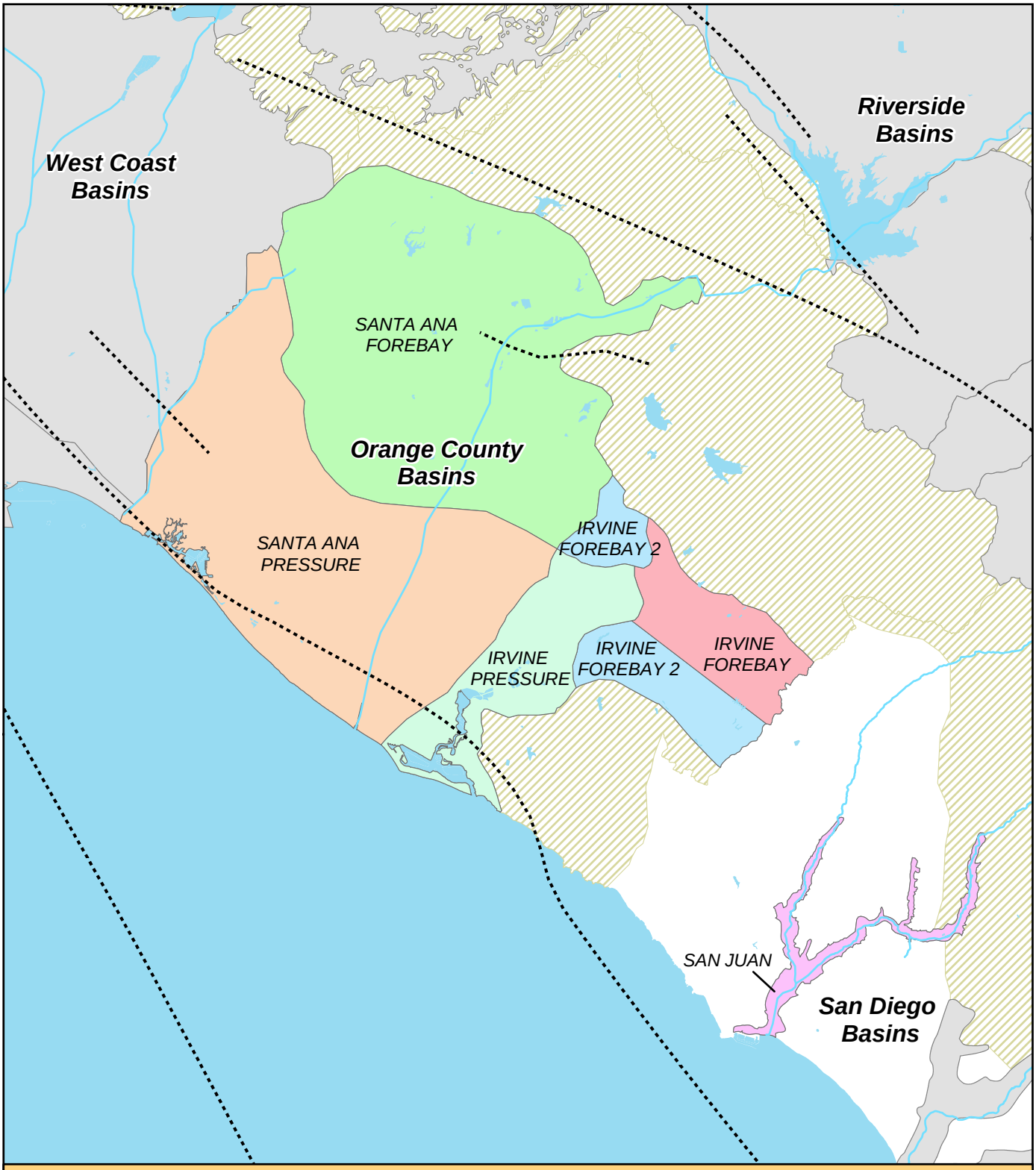


FIGURE 3.7 - FAULTS AND GROUNDWATER BASINS IN ORANGE COUNTY REGION

SOUTHERN CALIFORNIA REGIONAL BRINE-CONCENTRATE MANAGEMENT STUDY - PHASE 1

N

0 2.5 5 Miles

Groundwater Basins

- Irvine Forebay
- Irvine Forebay 2
- Irvine Pressure
- San Juan
- Santa Ana Forebay
- Santa Ana Pressure

Features

- Fault Location (Approximate)
- Rivers
- Water Bodies
- Bedrock

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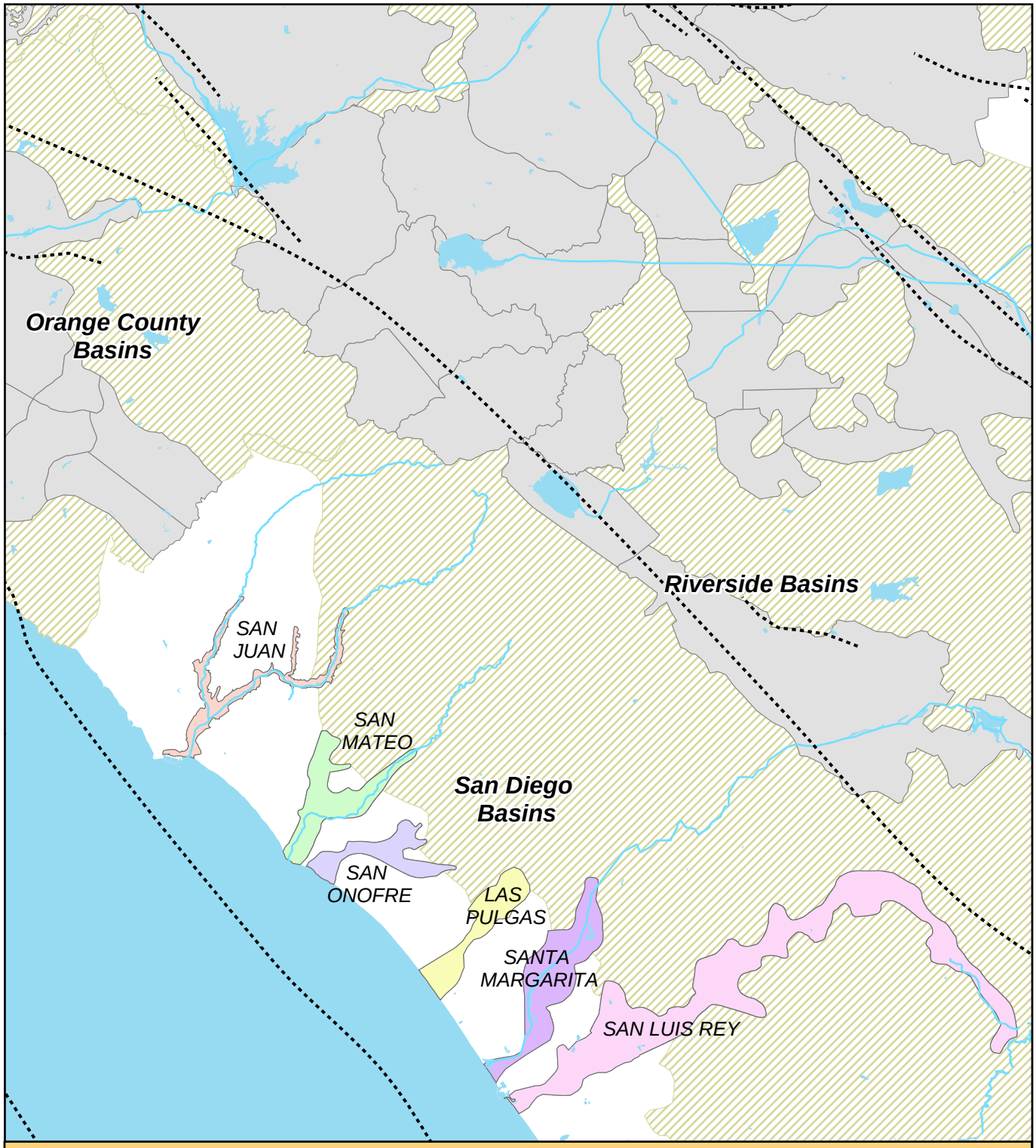


FIGURE 3.8 - FAULTS AND GROUNDWATER BASINS IN NORTH SAN DIEGO COUNTY

SOUTHERN CALIFORNIA REGIONAL BRINE-CONCENTRATE MANAGEMENT STUDY - PHASE 1

N

0 3 6 Miles

Groundwater Basins
- Las Pulgas
- San Juan
- San Luis Rey
- San Mateo
- San Onofre
- Santa Margarita

Features
- Fault Location(Approximate)
- Rivers
- Water Bodies
- Bedrock

\\cheron\projects\USBR\381333BrineStudy\GIS\Reg_Issues_and_Trends\Fig_3.8_GW_Basins_North_SanDiego.mxd

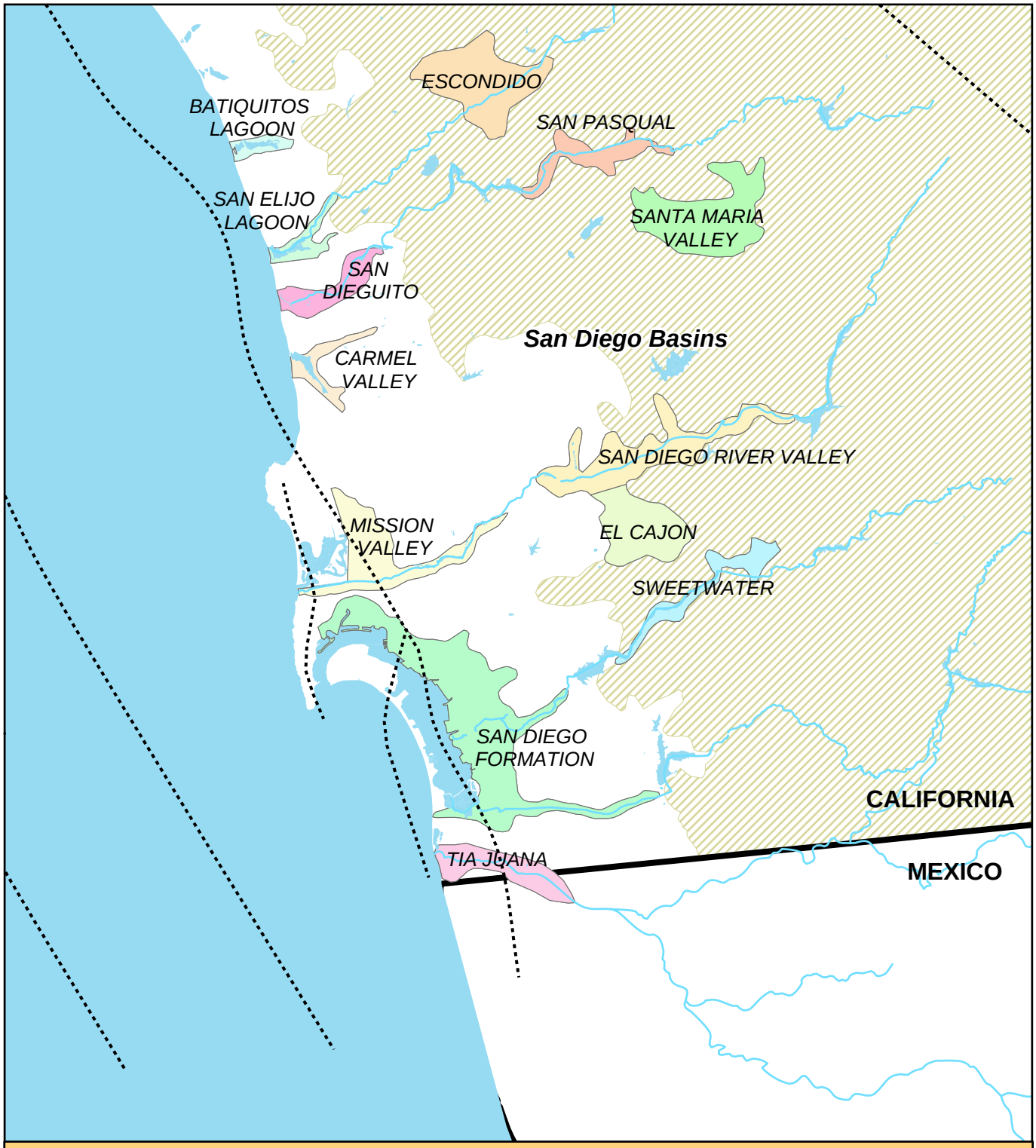


FIGURE 3.9 - FAULTS AND GROUNDWATER BASINS IN SOUTH SAN DIEGO REGION

SOUTHERN CALIFORNIA REGIONAL BRINE-CONCENTRATE MANAGEMENT STUDY - PHASE 1

N

0 3 6 Miles

Groundwater Basins

- Batiquitos Lagoon
- Carmel Valley
- El Cajon
- Escondido
- Mission Valley
- San Diego Formation
- San Diego River Valley
- San Dieguito
- San Elijo Lagoon
- San Pasqual
- Santa Maria Valley
- Sweetwater
- Tia Juana
- Warner

Features

- Fault Location (Approximate)
- Rivers
- Water Bodies
- Bedrock

\\cheron\projects\USBR\381333BrineStudy\GIS\Reg_Issues_and_Trends\Fig_3.9_GW_Basins_South_SanDiego.mxd

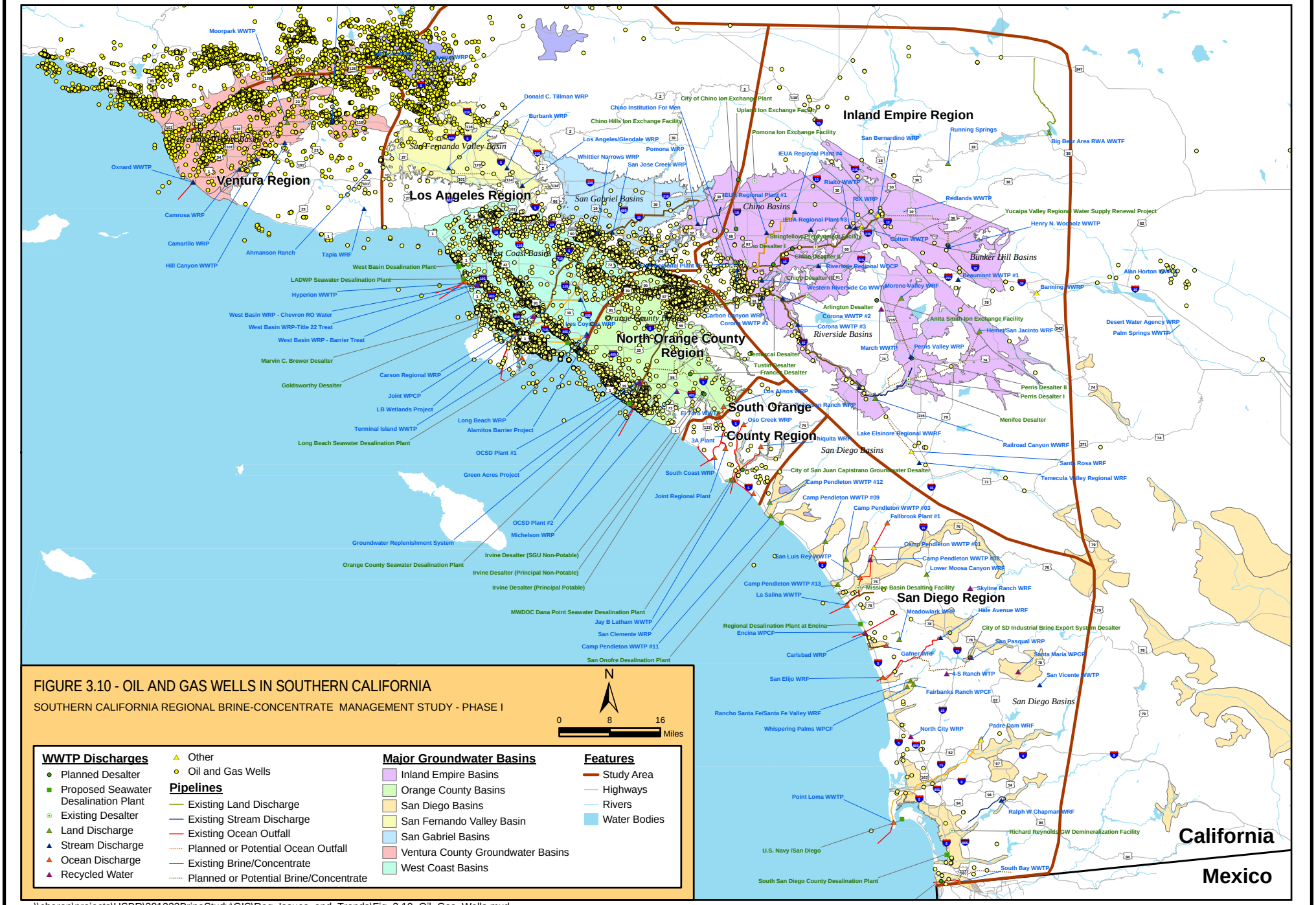


FIGURE 3.10 - OIL AND GAS WELLS IN SOUTHERN CALIFORNIA

SOUTHERN CALIFORNIA REGIONAL BRINE-CONCENTRATE MANAGEMENT STUDY - PHASE I

N

0 8 16 Miles

WWTP Discharges
- Planned Desalter
- Proposed Seawater Desalination Plant
- Existing Desalter
- Land Discharge
- Stream Discharge
- Ocean Discharge
- Recycled Water
- Other
- Oil and Gas Wells

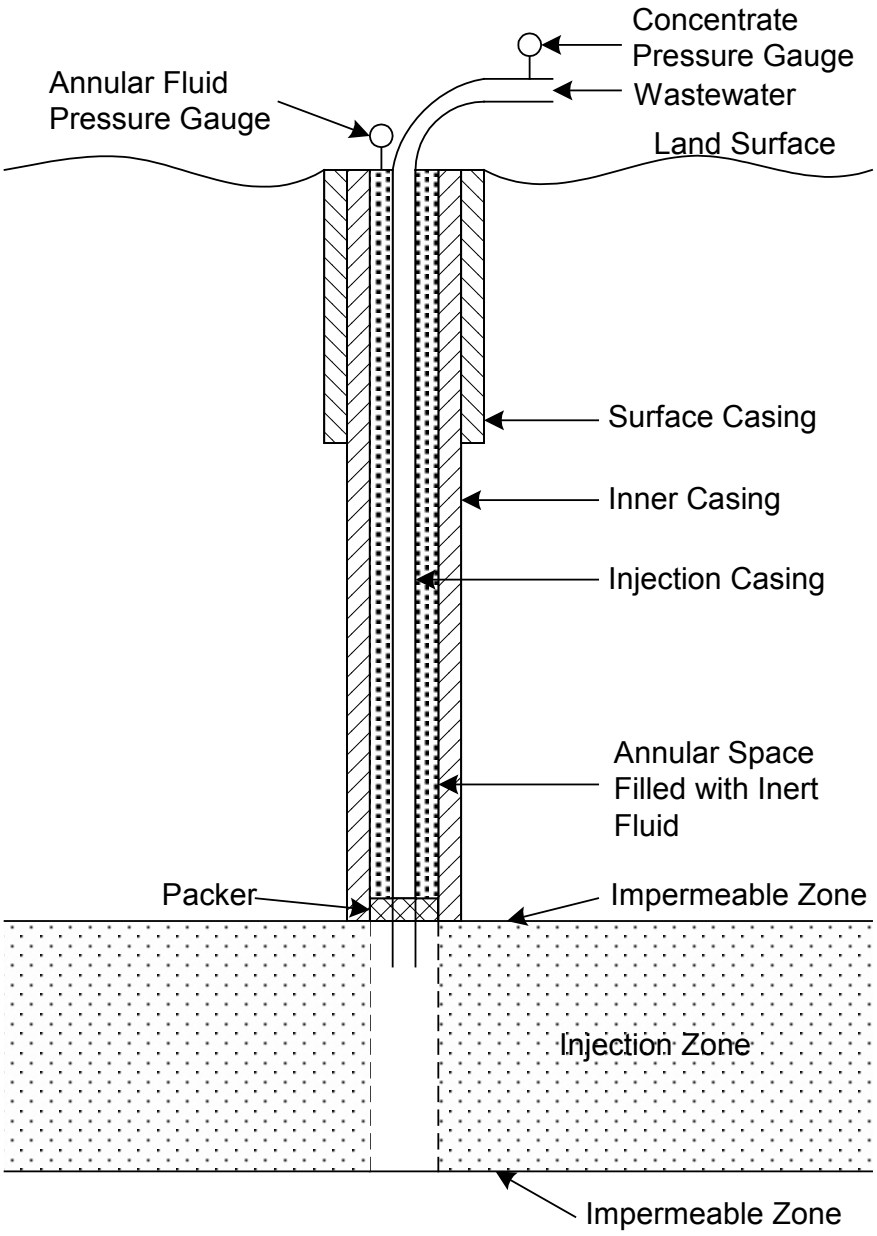
Pipelines
- Existing Land Discharge
- Existing Stream Discharge
- Existing Ocean Outfall
- Planned or Potential Ocean Outfall
- Existing Brine/Concentrate
- Planned or Potential Brine/Concentrate

Major Groundwater Basins
- Inland Empire Basins
- Orange County Basins
- San Diego Basins
- San Fernando Valley Basin
- San Gabriel Basins
- Ventura County Groundwater Basins
- West Coast Basins

Features
- Study Area
- Highways
- Rivers
- Water Bodies

\\cheron\projects\USBR\381333BrineStudy\GIS\Reg_Issues_and_Trends\Fig_3.10_Oil_Gas_Wells.mxd

FIGURE 3.11
SCHEMATIC OF A DEEP INJECTION WELL



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3.1.3 Coastal Zone Management Act

The Coastal Zone Management Act encourages the state and its tribes to preserve, protect, develop, and where possible, to restore or enhance valuable natural coastal resources such as wetlands, floodplains, estuaries, beaches, dunes, barrier islands, and coral reefs, as well as the fish and wildlife using those habitats. The CZMA requires all federal permittees who affect a state coastal zone to comply with state guidelines regarding coastal zone management. These guidelines could affect any ocean discharge requiring one or more federal permits. The coastal zone includes states adjacent to the Great Lakes, and all east, west, and Gulf coast states. The CZMA includes regulation and implementation of nonpoint source control plans in coastal areas under Section 6217 of the CZMA. This section of the act is administered by the USEPA and NOAA.

3.1.4 California Coastal Act

The California Coastal Commission was created by, and implements, the California Coastal Act. Under this act, the CCC is responsible for issuing Coastal Development Permits. Permits are required in the Coastal Zone for development that includes the placement of any solid material or structure, a change in land use density or intensity (including any land division), a change in the intensity of water use or access to water, or removal of major vegetation. The Coastal Zone reaches from 3 miles at sea to an inland boundary that varies from a few blocks in urban areas to about 5 miles in less developed regions (CCC, 2004). Therefore, construction of any project on the coast, including a brine-concentrate facility or an outfall for effluent or brine-concentrate disposal, would require a CCC permit. Permitting determinations are based on protecting public shoreline access, sensitive habitats, farmlands, and scenic landscapes. The CCC also has regulatory authority over all federal activities, licenses, and funding approvals that affect coastal resources through the federal CZMA.

The CCC also implements the Critical Coastal Areas (CCA) Program. Under this program, the CCC has designated 80 CCAs along the California coastline. Many of these areas are on the 303(d) list of impaired bodies of water that do not meet water quality standards, or are designated by the SWRCB as State Water Quality Protection Areas (SWQPAs). The CCA Program is intended to encourage collaboration among local stakeholders and government agencies to better coordinate resources and focus efforts on protection from polluted runoff in coastal-zone watershed areas. CCAs in southern California include Malibu Creek, Upper Newport Bay, Newport Beach, Irvine Coast Marine Life Refuges, San Diego-La Jolla Ecological Reserve, and San Diego Marine Life Refuge. Figure 3.12 shows the locations of the CCAs in southern California.

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Seawater and the California Coastal Act

The CCC does not have a formal policy or position on brine-concentrate management or on water recycling. However, in March 2004, CCC released a report that outlined issues related to seawater desalination and provided insights into potential positions regarding ocean outfalls. Growth inducement was a potential concern related to desalination as noted in the Seawater Desalination Report. The report states that "in some areas along the coast, desalination could remove what could be the single largest constraint to growth, a limited supply of potable water. In turn, this additional supply of water could result in new and unanticipated pressures on local populations and infrastructure" (CCC, 2004).

The Seawater Desalination Report also identified brine-concentrate discharge as potentially having adverse effects on local species. The report notes that while local species are able to adapt to natural variations in ambient salinity, few are likely to be unaffected by the much higher salinity in brine-concentrate. Also, the report states that chemicals remaining in brine-concentrate discharges are of concern. The CCC thereby suggests that disposal of brine-concentrate and chemicals on land should be considered as an alternative and states that the feasibility of alternatives to in-water disposal will depend on a number of factors, including the volume and constituents of the discharge stream (CCC, 2004).

3.1.5 California Water Code

The California Water Code regulates all aspects of water policy in California from water quantity and quality to water management agency formation. The California Water Code outlines:

- The power and duties of the State Water Quality Control Board (SWQCB) and RWQCBs
- Enforcement, protection, and implementation responsibilities in the Water Code
- Financial assistance available for projects including a number of clean water and water conservation or reclamation bond laws
- Regulation of wastewater treatment, water reuse, gray water systems, discharges from houseboats, and other special water quality provisions including shellfish protection, and the San Joaquin Valley drainage

For brine-concentrate management, the CWC includes the Waste Discharge Requirement Permit, Porter-Cologne Water Quality Control Act including RWQCB Basin Plans, and the Title 22 Water Recycling Regulations.

Porter Cologne Water Quality Control Act

The Porter Cologne Water Quality Control Act, also known as Division 7 of the California Water Code, regulates water quality in California. The Porter-Cologne Act includes the establishment of the SWRCBs and RWQCBs as well as Basin Plans and waste discharge requirements (WDRs). A number of sections of the Water Code

are pertinent to the implementation of brine-concentrate management projects including:

- Division 7, Chapter 3, Article 3 § 13141 California Water Plan.
- Division 7, Chapter 3 Article 3 § 13142 State Policy for Water Quality Control.
- Division 7, Chapter 3 Article 3 § 13142.5 Coastal Marine Environment. This section sets non-numeric requirements that wastewater, recycled water, industrial, and power plants that discharge into coastal marine environments must meet.
- Division 7, Chapter 3 Article 4 § 13169 Groundwater Protection Programs.
- Division 7, Chapter 3 Article 4 §13172-13173.2 Waste Disposal Standards and Regulations.
- Division 7, Chapter 3 Article 4 §13181 Water Quality Monitoring.
- Division 7, Chapter 4 Article 4 §13260-13274 Waste Discharge Requirements. This section sets WDRs for liquid and solid wastes.
- Division 7, Chapter 7 § 13500 to 13583 Water Reclamation.
  - Section § 13523 provides that the RWQCB, after consulting with and receiving the recommendations of CDPH and any party who has requested in writing to be consulted, which could include resource agencies, shall issue water reclamation requirements if it is necessary to protect the public health, safety, or welfare.
  - Section §13523 requires that recycling requirements include or be in conformance with the statewide water recycling criteria established by CDPH.
  - Section §13540 requires that recycled water be injected into an aquifer used as a source of domestic water supply only if CDPH finds that the recharge will not degrade the quality of the receiving aquifer.
  - Section §13550 requires that "the use of recycled water…will not adversely affect downstream water rights, will not degrade water quality, and is determined not to be injurious to plant life, fish, and wildlife."

Regional Water Quality Boards Basin Plans

Five RWQCBs are either fully or partially within southern California. The Colorado River RWQCB and Lahontan RWQCB boundaries cover part of southern California while the Los Angeles RWQCB, Santa Ana RWQCB, and San Diego RWQCB lie entirely within southern California as seen in Figure 2.1. Each RWQCB develops a Basin Plan that governs water quality for the region. The Basin Plan for each region is reviewed every 3 years in a triennial review process, and revisions are made as necessary. The date of the most recent revision of each RWQCB Basin Plan is shown in Table 3.8.

TABLE 3.8
RWQCB BASIN PLAN REVISION DATES

RWQCB Basin Name	Basin Plan Revision Date	Notes
Lahontan	December 2005	Triennial Review completed in 2007
Los Angeles	June 1995	Triennial review ongoing (2008)
Santa Ana	February 2008	Triennial Review completed in 2008
San Diego	April 2007	Triennial review ongoing (2009)
Colorado River	June 2006	Triennial review ongoing (2007)

The RWQCB Basin Plans specify water quality requirements in inland waterways, estuaries, groundwater, and the Pacific Ocean based on beneficial uses. Each Basin Plan contains narrative language indicating that beneficial uses could not be impaired or degraded as a result of a discharge. The beneficial uses listed for the bodies of water in each RWQCB are attached in Attachment B. For example, the Los Angeles Region (Region 4) Basin Plan states, "Surface waters shall not contain concentrations of chemical constituents in amounts that adversely affect any designated beneficial use." Offshore coastal areas typically do not have numeric water quality objectives other than those referenced from the Ocean Plan. The objectives from the Ocean Plan are for near-shore and offshore coastal zones that commonly include industrial service supply, navigation, contact and noncontact recreation, commercial and sport fishing, marine habitat, wildlife habitat, endangered species, migration of aquatic organisms, spawning, and shellfish harvesting.

Of particular concern to the RWQCBs in southern California is the issue of salinity. Each Basin Plan has water quality objectives for TDS, chlorides, sulfate, and boron for surface and groundwaters. The increase in salinity due to (1) the importation of water higher in salinity than natural groundwater, (2) the impacts of home water softeners, and (3) increased water recycling has prompted the RWQCBs to focus attention on salinity and tighten salinity-related water quality objectives, particularly for the protection of agricultural uses and groundwater supplies. Attachment C shows the Basin Plan Objectives for all bodies of water in southern California by RWQCB.

In inland surface waters, these objectives are intended to protect agricultural uses, which can result in stringent limits on salinity-related constituents. For example, effluent limits for TDS considered to be unachievable have been included in wastewater discharge permits to protect avocado and strawberry crops. In some cases, these effluent limits are driven by chloride TMDLs. The TMDLs, designed to protect agricultural uses, result in extremely low waste load allocations for point dischargers. The TMDL in the Santa Clara River for chloride, adopted in 2002, called for a waste-load allocation of 100 mg/L as an instantaneous maximum—a

number that Sanitation Districts of Los Angeles County have difficulty meeting in their effluent discharges.

In addition, many inland surface waters are designated for domestic or municipal drinking water supply (MUN); therefore, MCLs are the water quality objectives used to calculate effluent limits. In the Los Angeles Region, for instance, almost 200 bodies of water are designated as having potential or existing MUN uses including the San Gabriel River, Calleguas Creek, Santa Clara River, and Ventura River. Basin Plans include a provision that allows for a Use Attainability Analysis (UAA). If a site-specific study is done to show that due to naturally occurring conditions or other unique considerations, the designated use is unachievable for a reach of the body of water, the use can be removed. A UAA requires a Basin Plan Amendment; however, very few have been completed and approved in California.

For groundwaters that are designated for use as MUN, most discharge permits reference the standards contained in Basin Plans and incorporate, by reference, the MCLs as water quality objectives. For groundwaters designated for agricultural use, the Basin Plans typically specify that concentrations of chemical constituents must be such that they do not adversely affect the beneficial use. Region 8, the Santa Ana Region, for example specifies that boron concentrations shall not exceed 0.75 mg/L in groundwater because concentrations in excess of this level could be deleterious to certain crops, particularly citrus.

A summary of each of the five RWQCB Basin Plans is provided in the following subsections.

Lahontan Region Basin Plan

The southern portion of the Lahontan Region extends from Mono Lake in the north to Lake Arrowhead at its southern boundary. The Lahontan Region also contains the area between the California coast and the Nevada border. The portion of the Lahontan RWQCB region within the study boundary is the area south of Interstate (I-) 10 and west of I-15. Figure 2.1 shows the boundary of the Lahontan Basin. Beneficial uses have been designated for surface waters and groundwater within the basin and are summarized in Table 3.9. Selected water quality objectives (including effluent limitations) that apply the Lahontan Region are provided in Table 3.10. The Lahontan Region Basin completed the triennial review in 2007. Specific issues identified in the 2006 work plan for the most recent triennial review that are relevant to the portion of the basin within the study area include:

- Add policy language including general authority and under what specific conditions mixing zones can be granted
- Revise water quality objectives for the Mojave Basin to set site-specific requirements for the segment immediately downstream of the Victor Valley Wastewater Reclamation Authority discharge
- Modify waste discharge prohibitions to include provisions for protection of additional prime groundwater recharge areas of arid basins

TABLE 3.9
LIST OF BENEFICIAL USES FOR WATER BODIES IN THE LAHONTAN REGION BASIN

Type of Water Body	Beneficial Uses
Surface Waters	Municipal and Domestic Supply, Agricultural Supply, Industrial Process Supply, Industrial Service Supply, Groundwater Recharge, Freshwater Replenishment, Contact Water Recreation, Non-Contact Water Recreation, Commercial and Sport Fishing, Warm Freshwater Habitat, Cold Freshwater Habitat, Wildlife Habitat, Rare, Threatened, or Endangered Species, Migration of Aquatic Organisms, Spawning, Reproduction, and/or Early Development, Water Quality Enhancement, Flood Peak Attenuation/Flood Water Storage.
Groundwater	Municipal, Agricultural Supply, Industrial Process Supply, Freshwater Replenishment, Aquaculture, Wildlife Habitat.

Source: *Water Quality Control Plan – Lahontan Region,* Lahontan RWQCB, 1995

TABLE 3.10
SELECTED LAHONTAN REGION BASIN PLAN OBJECTIVES

Type of Body of Water	Constituent	Water Quality Objective/Effluent Limitation[a]	Notes
Surface Waters	Chemical Constituents	Per Title 22 of California Code of Regulations (CCR)[b]	
	pH	To remain between 6.5 – 8.5 for most waters Changes in pH should not exceed 0.5 for waters designated WARM or COLD	Compliance to be determined on a case-by-case basis.
	Suspended Materials	Total suspended materials should not be altered such that they are discernible at the 10% significance level	Should not contain suspended materials that adversely affect beneficial uses of waters.
	Toxicity	Waters must remain free of concentrations detrimental to human, plant, animal or aquatic life.	Compliance will be determined by use of indicator organisms
	Turbidity	Waters to remain free of changes in turbidity causing adverse effects on their beneficial uses.	
Mojave Hydrologic Unit[c]	TDS	245 – 560 mg/L	
	NO_3-N	1 – 11 mg/L	

TABLE 3.10
SELECTED LAHONTAN REGION BASIN PLAN OBJECTIVES

Type of Body of Water	Constituent	Water Quality Objective/Effluent Limitation[a]	Notes
San Bernardino Mountains Area, Mojave Hydrologic Unit[c]	TDS	56-220/72-440[d] mg/L	
	Chloride	6-75/7.8-110[d] mg/L	
	Sulfate	1.3-40/3-110[d] mg/L	
	Fluoride	0.07 – 1.66/0.09 – 2.6[d] mg/L	
	Boron	0.01 – 0.3/0.02 – 0.3[d] mg/L	
	Nitrate-N	-[d]	
	Nitrogen	-[d]	
	Phosphate	-[d]	

Notes:

[a] Refer to Attachment C-1: Lahontan Region Basin Plan for specific limits. Limits provided here might be typical values or a selected sample objective.

[b] Refer to Attachment C-1: Lahontan Region Basin Plan for Title 22 CCR sections for specific chemical constituents.

[c] Range for Hydrologic Units. Refer to Attachment C-1: Lahontan Basin Plan for specific objectives.

[d] Annual Average Value/90th Percentile Value

Los Angeles Region Basin Plan

The Los Angeles Region encompasses all coastal drainages flowing to the Pacific Ocean between Rincon Point (on the western Ventura County coast), and the eastern Los Angeles County line, as well as the drainages of five coastal islands (Anacapa, San Nicolas, Santa Barbara, Santa Catalina, and San Clemente). Beneficial uses have been designated for inland surface waters, groundwater, and coastal waters in the Los Angeles RWQCB Basin. Table 3.11 lists the existing and potential beneficial uses for bodies of water in the Los Angeles RWQCB Basin. Selected water quality objectives (including effluent limitations) that apply to the Los Angeles Region are provided in Table 3.12. The Los Angeles Region is currently in the process of developing a work plan for the triennial review.

TABLE 3.11
LIST OF BENEFICIAL USES FOR WATER BODIES IN THE LOS ANGELES COUNTY BASIN

Type of Water Body	Beneficial Uses
Inland Surface Waters	Municipal and Domestic Supply, Agricultural Supply, Industrial Process Supply, Industrial Service Supply, Groundwater Recharge, Freshwater Replenishment, Navigation, Hydropower Generation, Contact Water Recreation, Non-Contact Water Recreation, Commercial, Aquaculture, Warm Freshwater Habitat, Cold Freshwater Habitat, Inland Saline Water Habitat, Estuarine Habitat, Marine Habitat, Wildlife Habitat, Preservation of Biological Habitats of Special Significance, Rare, Threatened, or Endangered Species, Migration of Aquatic Organisms, Spawning, Reproduction, and/or Early Development, Shellfish Harvesting, Wetland Habitat
Groundwater	Municipal, Agricultural Supply, Industrial Process Supply, Industrial Service Supply, Aquaculture
Coastal Waters	Municipal and Domestic Supply, Industrial Process Supply, Industrial Service Supply, Navigation, Hydropower Generation, Contact Water Recreation, Non-Contact Water Recreation, Commercial, Warm Freshwater Habitat, Cold Freshwater Habitat, Estuarine Habitat, Marine Habitat, Wildlife Habitat, Preservation of Biological Habitats of Special Significance, Rare, Threatened, or Endangered Species, Migration of Aquatic Organisms, Spawning, Reproduction, and/or Early Development, Shellfish Harvesting, Wetland Habitat

Source: *Water Quality Control Plan – Los Angeles Region,* Los Angeles RWQCB, 1994

TABLE 3.12
SELECTED LOS ANGELES REGION BASIN PLAN OBJECTIVES

Type of Water Body	Constituent	Water Quality Objective	Notes
Inland Surface Waters	TDS[a]	225 – 1,500 mg/L	
	Sulfate[a]	25 – 500 mg/L	
	Chloride[a]	10 – 500 mg/L	
	Boron[a]	0.5 – 2 mg/L	
	Nitrogen[a]	2 -10 mg/L	
Groundwaters	TDS[a]	400 – 2,500 mg/L	
	Sulfate[a]	20 – 1,200 mg/L	
	Chloride[a]	20 – 500 mg/L	
	Boron[a]	0.5 – 3 mg/L	

Notes:

[a] Values provided are ranges over all bodies of water in the Basin. Refer to Attachment C-2: Water Quality Control Plan for Los Angeles Basin

Santa Ana Region Basin Plan

The Santa Ana Region is located in southern California between Los Angeles and San Diego and encompasses most of Orange County. The Los Angeles County line approximates the boundary between the Los Angeles and Santa Ana Regions with part of the Pomona area draining into the Santa Ana Region. In addition, part of La Habra in Orange County drains into the Los Angeles Region. The east-west alignment of the crest of the San Gabriel and San Bernardino Mountains separates the Santa Ana River Basin from the Mojave Desert, which is part of the Lahontan Basin. To the south, the regional boundary divides the Santa Margarita River drainage area from that of the San Jacinto River, which drains into Lake Elsinore. The Pacific coast of the Santa Ana Region extends from immediately north of Laguna Beach northward to Seal Beach and the Los Angeles County line. Beneficial uses have been designated for inland surface waters, coastal waters, reservoirs and lakes, and groundwater within the basin and a summary is presented in Table 3.13. Selected water quality objectives (including effluent limitations) that apply the Santa Ana Region are provided in Table 3.14. The Santa Ana Region Basin Plan completed its last triennial review in 2008.

TABLE 3.13
LIST OF BENEFICIAL USES FOR WATER BODIES IN THE SANTA ANA RIVER BASIN

Type of Water Body	Beneficial Uses
Inland Surface Waters	Municipal, Agricultural Supply, Industrial Process Supply, Industrial Service Supply, Groundwater Recharge, Navigation, Hydropower Generation, Contact Water Recreation, Non-Contact Water Recreation, Commercial and Sport Fishing, Limited Warm Freshwater Habitat, Warm Freshwater Habitat, Cold Freshwater Habitat, Preservation of Biological Habitats of Special Significance, Wildlife Habitat, , Rare, Threatened, or Endangered Species, Spawning, Reproduction, and/or Early Development, Estuarine Habitat.
Wetlands	Municipal, Agricultural Supply, Industrial Process Supply, Industrial Service Supply, Groundwater Recharge, Navigation, Hydropower Generation, Contact Water Recreation, Non-Contact Water Recreation, Commercial and Sport Fishing, Limited Warm Freshwater Habitat, Warm Freshwater Habitat, Cold Freshwater Habitat, Preservation of Biological Habitats of Special Significance, Wildlife Habitat, , Rare, Threatened, or Endangered Species, Spawning, Reproduction, and/or Early Development, Estuarine Habitat.
Reservoirs and Lakes	Municipal, Agricultural Supply, Industrial Process Supply, Industrial Service Supply, Groundwater Recharge, Navigation, Hydropower Generation, Contact Water Recreation, Non-Contact Water Recreation, Commercial and Sport Fishing, Limited Warm Freshwater Habitat, Warm Freshwater Habitat, Cold Freshwater Habitat, Preservation of Biological Habitats of Special Significance, Wildlife Habitat, , Rare, Threatened, or Endangered Species, Spawning, Reproduction, and/or Early Development, Estuarine Habitat.
Groundwater	Municipal, Agricultural Supply, Industrial Process Supply, Industrial Service Supply, Groundwater Recharge, Navigation, Hydropower Generation, Contact Water Recreation, Non-Contact Water Recreation, Commercial and Sport Fishing, Limited Warm Freshwater Habitat, Warm Freshwater Habitat, Cold Freshwater Habitat, Preservation of Biological Habitats of Special Significance, Wildlife Habitat, , Rare, Threatened, or Endangered Species, Spawning, Reproduction, and/or Early Development, Estuarine Habitat.

Source: *Water Quality Control Plan for the Santa Ana River Basin,* Santa Ana RWQCB, 1994

TABLE 3.14
SELECTED SANTA ANA RIVER BASIN WATER QUALITY OBJECTIVES

Type of Water Body	Constituent	Objective Range/Effluent Limitation	Notes
Ocean Waters	-	-	Provisions of the Ocean Plan and Thermal Plan apply to ocean waters within this Region.
Enclosed Bays and Estuaries[a]	pH	7-8.6	Ambient pH levels not to be changed more than 0.2 units
	Suspended and Settleable Solids	Not to be contained in amounts adversely affecting beneficial uses	
	Sulfides	Not to be increased as a result of controllable water quality factors	
	Toxic Substances	Not to adversely affect beneficial uses	
	Turbidity	Increases resulting from controllable water quality factors to comply with the following: 0-50 NTU – 20% maximum increase 50-100 NTU – 10 NTU maximum increase >100 NTU – 10% maximum increase	To be free of changes in turbidity that adversely affect beneficial uses
Inland Surface Streams[b]	TDS	110 – 1,500 mg/L	
	Hardness	70 – 400 mg/L	
	Sodium	10 – 110 mg/L	
	Chloride	4 – 250 mg/L	
	TIN	1 – 13 mg/L	
	Sulfate	4 – 275 mg/L	
	COD	5 – 90 mg/L	
	Boron[c]	0.75 mg/L	
Lakes and Reservoirs[b]	TDS	135 – 1,050 mg/L	
	Hardness	70 – 360 mg/L	
	Sodium	10 – 110 mg/L	
	Chloride	10-130 mg/L	
	TIN	0.15 – 8 mg/L	
	Sulfate	10 – 310 mg/L	
	COD	-	
	Phosphorous[c]	0.15 mg/L	

TABLE 3.14
SELECTED SANTA ANA RIVER BASIN WATER QUALITY OBJECTIVES

Type of Water Body	Constituent	Objective Range/Effluent Limitation	Notes
Wetlands[b]	TDS	2,000 mg/L	
	Hardness		
	Sodium		
	Chloride		
	TIN	13 mg/L	
	Sulfate		
	COD	90 mg/L	
Ground-water[b]	TDS	210 – 1,260 mg/L	
	Hardness	100 – 225 mg/L	
	Sodium	20 – 65 mg/L	
	Chloride	10 – 30 mg/L	
	Nitrate-N	1 – 10 mg/L	
	Sulfate	20 – 40 mg/L	

Notes:

[a] Numerical objectives not established. Narrative objectives apply. Refer to Attachment C-3, Santa Ana River Basin Plan Water Quality Objectives

[b] Numerical objectives range (low-high) provided. For specific objectives, refer to Attachment C-3: Santa Ana River Basin Plan Water Quality Objectives

San Diego Region Basin Plan

The San Diego Region is in the southwest corner of California and occupies approximately 3,900 square miles of surface area. The western boundary of the Region consists of the Pacific Ocean coastline. The northern boundary of the Region is formed by the hydrologic divide starting near Laguna Beach, extending inland along the ridge of the Elsinore Mountains into Cleveland National Forest. The eastern boundary is formed by the Laguna Mountains and other lesser known mountains in the Cleveland National Forest, and the southern boundary is formed by the border between the United States and Mexico. The San Diego Region encompasses most of San Diego County and parts of southwestern Riverside County.

Beneficial uses have been designated for inland surface waters, coastal waters, reservoirs and lakes, and groundwater in the basin; a summary is presented in Table 3.15. Selected water quality objectives (including effluent limitations) that apply to the San Diego Region are provided in Table 3.16. The San Diego Region is currently in the triennial review of the Basin Plan. Draft proposed changes to the Basin Plan should be published in the spring of 2009 with adoption of the amendments to the Basin Plan occurring in late summer 2009.

TABLE 3.15
LIST OF BENEFICIAL USES FOR WATER BODIES IN THE SAN DIEGO COUNTY BASIN

Type of Water Body	Beneficial Uses
Inland Surface Waters	Municipal, Agricultural Supply, Industrial Process Supply, Industrial Service Supply, Groundwater Recharge, Freshwater Replenishment, Hydropower Generation, Contact Water Recreation, Non-Contact Water Recreation, Warm Freshwater Habitat, Cold Freshwater Habitat, Wildlife Habitat, Preservation of Biological Habitats of Special Significance, Rare, Threatened, or Endangered Species, Spawning, Reproduction, and/or Early Development
Coastal Waters	Industrial Service Supply, Navigation, Contact Water Recreation, Non-Contact Water Recreation, Commercial and Sport Fishing, Preservation of Biological Habitats of Special Significance, Estuarine Habitat, Wildlife Habitat, Rare, Threatened, or Endangered Species, Marine Habitat, Aquaculture, Migration of Aquatic Organisms, Spawning, Reproduction, and/or Early Development, Warm Freshwater Habitat, Shellfish Harvesting
Reservoirs and Lakes	Municipal, Agricultural Supply, Industrial Process Supply, Industrial Service Supply, Groundwater Recharge, Freshwater Replenishment, Contact Water Recreation, Non-Contact Water Recreation, Warm Freshwater Habitat, Cold Freshwater Habitat, Wildlife Habitat, Rare, Threatened, or Endangered Species, Hydropower Generation
Groundwater	Municipal, Agricultural Supply, Industrial Process Supply, Industrial Service Supply, Groundwater Recharge, Freshwater Replenishment

Source: *Water Quality Control Plan for the San Diego Basin,* San Diego RWQCB, 1994

TABLE 3.16
SELECTED SAN DIEGO REGION BASIN PLAN OBJECTIVES

Type of Water Body	Constituent	Water Quality Objective	Notes
Inland Surface Waters	TDS[a]	500 – 2,100 mg/L	
	Chloride[a]	250 – 500 mg/L	
	Sulfate[a]	65 – 500 mg/L	
	Iron[a]	0.3 – 1 mg/L	
	Manganese[a]	0.05 – 1 mg/L	
	Boron[a]	0.75 – 1 mg/L	
	Turbidity[a]	20 NTU	
	Fluoride[a]	1 mg/L	
	Phosphorous	Threshold total phosphorus concentrations not to exceed 0.05 mg/L (for any stream at the point where it enters a standing body of water) Not to exceed 0.025 mg/L in any standing body of water Desired goal of 0.1 mg/L total phosphorous in streams and other flowing waters	
	Nitrogen	Natural N: P = 10:1 if data not available	Analogous threshold values have not been set
Groundwater	TDS[a]	250 – 3,000 mg/L	
	Chloride[a]	250 – 800 mg/L	
	Sulfate[a]	250 – 900 mg/L	
	Iron[a]	0.3 – 0.85 mg/L	
	Manganese[a]	0.05 – 0.15 mg/L	
	Boron[a]	0.75 – 2 mg/L	
	Turbidity[a]	5 NTU	
	Fluoride[a]	1 mg/L	

Notes:

[a] Values provided are ranges over all bodies of water in Basin. Refer to Attachment C-4, Water Quality Control Plan for San Diego Basin

Colorado River Region Basin Plan

The Colorado River Basin covers approximately 13 million acres in the southeastern portion of California. It includes all of Imperial County and portions of San Bernardino, Riverside, and San Diego counties. It is bounded on the northeast by Nevada. The northern boundary consists of the New York, Providence, Granite, Old Dad, Bristol, Rodman, and Ord mountain ranges. The boundary on the west consists of the San Bernardino, San Jacinto, and Laguna mountain ranges,. Boundaries on the south are defined by the border of Mexico, and on the east by the Colorado River and border of Arizona. Only the western portion of the Colorado River Region is in the study area. Agricultural use is the predominant use of water in the Colorado River Basin Region with a majority of the irrigation being used in the Coachella, Imperial, and Palo Verde Valleys. The second largest water use is for municipal and industrial purposes. Recreational use of surface waters represents another important use. Beneficial uses designated for the waters in the Colorado River Basin as of the 1993 Basin Plan are listed in Table 3.17.

TABLE 3.17
LIST OF BENEFICIAL USES FOR WATER BODIES IN THE COLORADO RIVER BASIN

Type of Water Body	Beneficial Uses
Surface Waters	Municipal, Agricultural Supply, Aquaculture, Freshwater Replenishment, Industrial Service Supply, Groundwater Recharge, Contact Water Recreation, Non-Contact Water Recreation, Warm Freshwater Habitat, Cold Freshwater Habitat, Wildlife Habitat, Hydropower Generation, Preservation of Rare, Threatened, or Endangered Species.
Springs	Municipal, Agricultural Supply, Freshwater Replenishment, Industrial Service Supply, Groundwater Recharge, Contact Water Recreation, Non-Contact Water Recreation, Warm Freshwater Habitat, Cold Freshwater Habitat, Wildlife Habitat, Preservation of Rare, Threatened, or Endangered Species.
Groundwaters	Municipal, Agricultural Supply, Industrial Service Supply.

Source: *Water Quality Control Plan for the Colorado River Basin,* Colorado River RWQCB, 1993

Beneficial uses of surface water and groundwater in the region were expected to change little through the year 2000 according to the 1993 Colorado River Region Basin Plan. However, the 2007 Triennial Review Final Workplan has proposed to conduct a region-wide surface water survey to evaluate beneficial uses and water quality standards (Colorado River RWQCB, 2007). This review is in progress. The water quality objectives designated in the 1993 Colorado River Basin Plan are provided in Table 3.18 for some selected objectives/effluent limitations.

TABLE 3.18
COLORADO RIVER BASIN PLAN OBJECTIVES

Type of Water/Specific Body of Water	Constituent	Objective/Effluent Limitation[a]	Notes
General	pH	6.0 – 9.0	Discharges not to cause detrimental changes with respect to water uses.
	Suspended/ Settleable Solids	Not specified	Discharges subject to board approval.
	TDS	Annual Avg.: 4,000 mg/L Max: 4,500 mg/L	Discharges subject to board approval. All discharges except from agricultural sources not to exceed limits specified in Basin Plan.
	Turbidity	Free of changes in turbidity adversely affecting beneficial uses.	
	Chemical Constituents	Arsenic – 0.05 mg/L Barium – 1 mg/L Cadmium – 0.01 mg/L Chromium – 0.05 mg/L Lead – 0.005 mg/L Mercury – 0.002 mg/L Nitrate-N – 10 mg/L Selenium – 0.01 mg/L Silver – 0.05 mg/L Endrin – 0.002 mg/L Lindane – 0.004 mg/L Methoxchlor – 0.1 mg/L Toxaphene – 0.005 mg/L 2,4-D – 0.1 mg/L 2,4,5-TP Silvex – 0.001 mg/L	Individual/combinations of chemicals are not to adversely affect beneficial uses. MCLs for waters designated for domestic or municipal use.
Specific Surface Water Objectives – Salton Sea	TDS	Reduce present level of salinity, and stabilize it at 35,000 mg/L	Unless it can be demonstrated that a different level of salinity is optimal for the wild and aquatic life (CDFG to determine this).
Groundwater Objectives	Chemical and Physical Quality	Chemical constituent concentrations not to exceed limits specified in CCR Title 22, Chapter 15, Article 4, Section 64435	For groundwaters designated for use as domestic or municipal supply.
	Brines	Disposal of brines, mineralized wastes, and toxic wastes prohibited if wastes can percolate into groundwaters.	

Notes:

[a]: Refer to Attachment C-5, Colorado River Basin Plan for specific limits. Limits provided here might be typical values or a selected sample objective.

The Triennial Workplan also lists the following as potential changes to the Basin Plan:

- Revise the Basin Plan to: 1) rectify the current limitations of having three bacteria indicator organisms; 2) clarify which indicator organisms apply to which surface waters of the Region; and, as necessary, 3) provide for the development of site-specific objectives.
- Develop a Policy Statement or Basin Plan Amendment to recognize critical flow rates in the Coachella Valley stormwater channel and their temporal impacts on certain beneficial uses of the channel
- Develop a region-wide policy to address discharges of agricultural wastewater
- Develop guidance regarding how to apply the SWRCB antidegradation policy for discharges of pollutants into effluent-dominated waters in the Region.
- Update RWQCB Order 97-500, General Waste Discharge Requirements for On-Site Subsurface Wastewater Disposal Systems for Mobile Home and Recreational Vehicle Parks and Other Similar Facilities, to effectively address the threat that discharges of wastes from septic systems pose to water quality.
- Develop policy to 1) address the proliferation of package plants in the high desert areas of the Region, and 2) develop and adopt interim policy to address discharges of wastes from proposed septic systems.
- Develop guidance to implement and enforce water quality standards for sediment and turbidity for surface waters without sediment TMDLs and incorporate guidance into the Basin Plan.
- Review water quality criteria for ammonia and develop Basin Plan water quality objectives
- Review water quality criteria for residual chlorine and develop Basin Plan water quality objective
- Evaluate the need for criteria for biological objectives and to develop Basin Plan water quality objectives

Waste Discharge Requirements

Division 7, Chapter 3, Article 13260 to 13274 of the California Water Code outline the requirements for waste discharge in California. The WDRs require any agency discharging a waste to file a report outlining the character, volume, and location of the discharge. Waste discharge regulated under this permit includes groundwater injection and discharges to surface water. The WDRs, regulated by the RWQCB, will prescribe water quality requirements based on Basin Plan beneficial uses, state and federal water quality objectives, and local conditions.

Recycled Water Policy

On February 3, 2009, the SWRCB approved an updated Recycled Water Policy and Draft Certified Regulatory Program Environmental Analysis. The new Policy goals are (SWRCB, 2009a):

- Increase the use of recycled water over 2002 levels by at least 1 million acre-feet per year (afy) by 2020 and by at least 2 million afy by 2030
- Increase the use of stormwater over use in 2007 by at least 500,000 afy by 2020 and by at least 1 million afy by 2030
- Increase the amount of water conserved in urban and industrial uses by comparison to 2007 by at least 20 percent by 2020
- Included in these goals is the substitution of as much recycled water for potable water as possible by 2030

This Policy focuses on increasing the use of recycled water from municipal wastewater sources in a manner that implements state and federal water quality laws. The State Water Board expects to develop additional policies to encourage the use of stormwater, encourage water conservation, encourage the conjunctive use of surface and groundwater, and improve the use of local water supplies. When used in compliance with this Policy, Title 22 and all applicable state and federal water quality laws, the State Water Board finds that recycled water is safe for approved uses, and strongly supports recycled water as a safe alternative to potable water for such approved uses.

The updated policy has provisions for protecting existing water supplies through an antidegradation policy, monitoring, and potential future regulation of CECs. The policy includes the establishment of a blue ribbon panel to "guide future actions relating to CECs." This panel will develop recommendations based on current knowledge for future policies or regulations of CECs.

The updated policy includes requirements for the adoption of salt/nutrient management plans in every groundwater basin in California. These plans are expected to include size and complexity of the basin, source water quality, stormwater recharge, hydrogeology, and aquifer water quality, as well as site-specific issues. The plans need to address the impacts of recycled water use for groundwater recharge and irrigation as well as stormwater recharge on the underlying groundwater quality. Salt/nutrient management plans need to be developed only in basins where a salt or nutrient plan has not been previously developed. Also, in some basins, plans might need to be developed for other water quality constituents. Each salt/nutrient plan should include a monitoring plan that specifies:

- Location of groundwater monitoring wells
- Responsible agency for performing monitoring
- Provision for annual monitoring of CECs in compliance with Blue Ribbon Panel recommendations

- Water recycling and stormwater recharge/use goals and objectives
- Salt/nutrient source
- Groundwater basin assimilative capacity and loading estimates, as well as fate/transport of salts/nutrients
- Implementation measures to manage salt/nutrient loading on a sustainable basis
- An antidegradation analysis

The requirements of salt/nutrient management plans could directly affect the ability to dispose and manage brine-concentrate. This policy will likely push brine-concentrate management to downstream users or final disposal mechanisms because returning brine-concentrate into a basin might not be possible due to increased salinities in imported water. Also, additional brine-concentrate waste could be created by projects developed to address salt/nutrient loading.

3.1.6 California Code of Regulations Title 22

Title 22 of the California Code of Regulations (CCR) is focused on protecting environmental health. Within this title, regulations governing CEQA, water recycling, water treatment, and water quality are provided. Title 22, adopted in its current form in 2000, provides water quality criteria and guidelines applicable for all recycled water projects. The criteria prescribe recycled water quality and wastewater treatment requirements for the various types of allowed uses, use area requirements pertaining to the location of use of the recycled water, and reliability features that must be present at treatment facilities to ensure safe performance. Title 22 also codifies the MCLs set by CDPH for constituents in drinking water. Title 22 of the California Health and Safety Code of Regulations establishes the criteria for water quality standards and treatment reliability related to use of recycled water. These criteria were developed and are regulated by CDPH.

There are four levels of treatment, which are set based on the associated use of the recycled water. They are nondisinfected secondary treatment, disinfected "23-standard" secondary treatment, disinfected "2.2 standard" secondary treatment, and tertiary treatment. These levels of required treatment were incorporated as revisions to the Title 22 standards in 2000. This update made the use of primary effluent unacceptable even for previously acceptable uses like irrigation of fodder, fiber, and seed crops. The updated regulations require this type of irrigation to be supplied with at least nondisinfected secondary treated effluent. The new secondary standards are based on the amount and type of possible human contact with the effluent or use area requirements. Uses with a lower potential for incidental human contact require less stringent treatment before reuse than uses with human contact. In the water recycling community, Title 22 is associated with the Water Recycling Criteria in Chapter 3 of Title 22 Division 4, known simply as Title 22.

Before any water-recycling project is implemented, Title 22 requires that an engineering report be submitted to RWQCB and CDPH describing the manner in which the project will comply with Title 22. The engineering report for a proposed groundwater recharge project must include an assessment of potential impacts on

underlying groundwater aquifers and must be prepared by a registered hydrogeologist.

CDPH is in the process of revising the sections of Title 22 that relate to groundwater recharge using recycled water. Draft Groundwater Recharge Reuse Regulations were last released on August 5, 2008. The draft defines a groundwater recharge reuse project (GRRP) as:

> *. . . a project that uses recycled water and has been planned and is operated for the purpose of recharging a groundwater basin designated in the Water Quality Control Plan for use as a source of domestic water supply and has been identified as a GRRP by the RWQCB. . .*

Requirements for GRRPs include control of pathogenic microorganisms and nitrogen compounds. Requirements include control of regulated chemicals and physical characteristics for compliance with primary MCLs for inorganics, radionuclides, organic chemicals, and disinfection by-products; action levels for lead and copper; and secondary MCLs for other constituents and characteristics. Sampling is required to show compliance with this section. The draft also regulates total organic carbon (TOC) for GRRPs. Monitoring is required for TOC, total nitrogen, organics, inorganics, total coliform, and any other water quality constituents specified by CDHS between the GRRP and downgradient drinking water supply wells. These draft regulations are aimed primarily at regulation of groundwater recharge using recycled water.

3.2 Plan, Policies, and Regulations for Air Quality

Air quality is regulated federally through the Clean Air Act (CAA) and in California by the Air Resources Control Board that complies with the CAA through the California State Implementation Plan for air quality. Air quality is important to the implementation of brine-concentrate management because a number of technologies are energy intensive, require pumping, or could create waste that impacts air quality.

3.2.1 Clean Air Act and National Ambient Air Quality Standards

Pursuant to the federal CAA of 1970, USEPA established the National Ambient Air Quality Standards (NAAQS). The NAAQS were established for several major pollutants, termed "criteria" pollutants because the standards adopted for NAAQS must be supported by specific medical evidence. The NAAQS are two tiered– primary, to protect public health, and secondary, to prevent degradation to the environment. The six criteria pollutants are ozone, carbon monoxide, particulates less than ten microns (PM_{10}), nitrogen dioxide, sulfur dioxide, and lead. In July 1997, USEPA adopted new NAAQS for particulates less than 2.5 microns ($PM_{2.5}$) and new ozone standards, which became fully effective in 2003. Table 3.19 shows the NAAQS for each pollutant.

TABLE 3.19
NATIONAL AMBIENT AIR QUALITY STANDARDS FOR CRITERIA POLLUTANTS

Pollutant	Primary Standards		Secondary Standards	
	Level	Averaging Time	Level	Averaging Time
Carbon Monoxide	9 ppm (10 milligram per meter, mg/m)[c]	8-hour[a]	None	
	35 parts per million (ppm) or (40 mg/m)[c]	1-hour[a]		
Lead	0.15 micrograms per meter (µg/m)[c,b]	Rolling 3-Month Average	Same as Primary	
	1.5 µg/m[c]	Quarterly Average		
Nitrogen Dioxide	0.053 ppm (100 µg/m)[c]	Annual (Arithmetic Mean)	Same as Primary	
Particulate Matter (PM_{10})	150 µg/m[c]	24-hour[c]	Same as Primary	
Particulate Matter ($PM_{2.5}$)	15 µg/m[c]	Annual[4] (Arithmetic Mean)	Same as Primary	
	35 µg/m[c]	24-hour[e]	Same as Primary	
Ozone	0.075 ppm (2008 std)	8-hour[f]	Same as Primary	
	0.08 ppm (1997 standard, std)	8-hour[g]	Same as Primary	
	0.12 ppm	1-hour[h] (Applies only in limited areas)	Same as Primary	
Sulfur Dioxide	0.03 ppm	Annual (Arithmetic Mean)	0.05 ppm (1,300 µg/m^3)	3-hour[a]
	0.14 ppm	24-hour[a]		

Notes:
[a] Not to be exceeded more than once per year.
[b] Final rule signed October 15, 2008.
[c] Not to be exceeded more than once per year on average over 3 years.
[d]:To attain this standard, the 3-year average of the weighted annual mean PM2.5 concentrations from single or multiple community-oriented monitors must not exceed 15.0 micrograms per cubic meter (µg/m^3).
[e] To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 35 µg/m^3 (effective December 17, 2006).
[f] To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.075 ppm (effective May 27, 2008).
[g] (a) To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.08 ppm.
(b) The 1997 standard – and the implementation rules for that standard – will remain in place for implementation purposes as EPA undertakes rulemaking to address the transition from the 1997 ozone standard to the 2008 ozone standard.
[h] (a) The standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is less than or equal to 1.
(b) As of June 15, 2005, EPA revoked the 1-hour ozone standard in all areas except the 8-hour ozone non-attainment Early Action Compact Areas.
Source: USEPA, 2009

3.2.2 California State Implementation Plan for Air Quality

In 1994, the CARB adopted the State Implementation Plan, a detailed plan to clean up air pollution region by region over a 5- to 15-year period. The CARB SIP will affect the implementation of brine-concentrate management projects by requiring projects to comply with standards that protect against air quality degradation.

Under the SIP, California areas with unhealthy levels of ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, and inhalable particulate matter must develop a plan describing how NAAQS will be attained. The CFR Title 40, Chapter I, Part 52, Subpart F, Section 52.220 lists all of the items that are included in the California SIP.

Geographical areas in the state that exceed the federal air quality standards are called non-attainment areas. There are six existing and two proposed non-attainment areas for the federal ozone standard and one non-attainment area for the particulate matter standard ($PM_{2.5}$), all of which are listed in Table 3.20. In addition, four non-attainment areas for PM_{10} are in southern California. The CARB SIP must show how each of these areas will attain the federal standards. To do this, the SIP will identify the pollution emission concentrations that must be reduced. For each area that violates federal air quality standards, local air districts and the CARB will craft a plan that will include measures to reduce emissions from sources under local government authority, as well as a strategy for emission reductions from sources under state and federal agency jurisdictions.

TABLE 3.20
FEDERAL NON-ATTAINMENT AREAS FOR OZONE, $PM_{2.5}$ AND PM_{10} IN SOUTHERN CALIFORNIA

Non-attainment Area	Area Included
8-hour Ozone	
Northeast San Bernardino County (Proposed)	Mojave Desert portion of San Bernardino County outside the Western Mojave ozone non-attainment area
South Coast Air Basin	Western Los Angeles (including Catalina and San Clemente islands), Orange, Southwestern San Bernardino, and Western Riverside counties
Ventura County	Continental portion of Ventura County (excluding Anacapa and San Nicolas islands)
Western Mojave Desert	Central San Bernardino County
Coachella Valley	Central Riverside County
San Diego County	San Diego County
Imperial County	Imperial County
Particulate Matter ($PM_{2.5}$)	
South Coast Air Basin	Western Los Angeles (including Catalina and San Clemente islands), Orange, Southwestern San Bernardino, and Western Riverside Counties
Particulate Matter (PM_{10})	
Southeast Desert	San Bernardino County
Coachella Valley	Central San Bernardino County
Imperial County	Imperial County
South Coast Air Basin	Western Los Angeles (including Catalina and San Clemente islands), Orange, Southwestern San Bernardino, and Western Riverside Counties

Source: CARB, 2009

3.3 Miscellaneous Plan, Policies, and Regulations

There are a number of plans, policies, and regulations not related to water and air that can impact implementation of brine-concentrate management projects. These include regulations protecting species and the environment, as well as regulations of solid waste disposal.

3.3.1 California Environmental Quality Act and National Environmental Policy Act

The California Environmental Quality Act applies to all discretionary activities proposed to be carried out by California public and private agencies including state, regional, county, and local agencies unless an exemption applies. CEQA requires the project proponent agency to conduct an environmental review and prepare a Negative Declaration or Environmental Impact Report (EIR) that meets procedural requirements outlined by CEQA. These requirements include public scoping and noticing, response to public comments, and consultation of appropriate resource and regulatory agencies. Agencies proposing a project must avoid or minimize environmental damage when feasible and must propose mitigation measures for any environmental impacts from the proposed project. As trustees of the resources of California, CDFG and the SLC are key participants in the CEQA process and will be involved significantly in consulting on protection of the resources under their charge. In addition, the resource agencies including USFWS and NOAA Fisheries Service will be involved if federal species under their jurisdiction are affected. The CCC or USACE might be involved if coastal or wetland resources are affected.

If a project receives federal funding, NEPA would apply. NEPA requires federal agencies to integrate environmental values into their decision making processes by considering the environmental impacts of their proposed actions and reasonable alternatives to those actions. To comply with NEPA requirements federal agencies prepare a detailed statement known as an Environmental Impact Statement (EIS). USEPA reviews and comments on EIS documents prepared by other federal agencies, maintains a national filing system for all EIS documents, and assures that its own actions comply with NEPA.

3.3.2 Special-Status Species Protection

The 1973 Endangered Species Act (ESA), as amended, establishes a broad public and federal interest in identifying, protecting, and providing for the recovery of threatened or endangered species. The USFWS and NOAA Fisheries Service are charged with implementing and enforcing the ESA. The USFWS has authority over terrestrial and continental aquatic species, and the NOAA Fisheries Service has authority over species that spend all or part of their life cycle at sea, including steelhead trout. USFWS also oversees the implementation of the Migratory Bird Treaty Act of 1918, which prohibits the destruction or possession of individual birds, eggs, or nests in active use without a scientific collecting or special purpose permit from the service.

Section 7.A.1 of the ESA directs federal agencies to use their legal authorities to further the purposes of the ESA by carrying out conservation programs for listed species. Section 7.A.2 requires these agencies to ensure that any actions (e.g., development projects) they fund, have permit authority over, or carry out are not likely to jeopardize the survival of a listed species. Therefore, any project that receives a permit from a federal agency, such as a 404 Permit from the USACE, is subject to Section 7.

If a federal agency finds that one of its activities, including a permit decision, could affect a listed species, the agency is required to consult with either the USFWS or the NOAA Fisheries Service to obtain a Biological Opinion describing the effects of the project on any endangered or threatened species or their critical habitat. The Biological Assessment and subsequent review required to obtain a Biological Opinion could take 6 to 12 months. For species that are proposed for listing, federal agencies could confer with the USFWS or NOAA Fisheries Service, resulting in a conference opinion that can be transformed administratively to a Biological Opinion if the species is later listed.

The California Endangered Species Act, incorporated as part of the Fish and Game Code, is administered by the CDFG. Under the California Endangered Species Act, the term "endangered species" is defined as a species of plant, fish, or wildlife that is "in serious danger of becoming extinct throughout all, or a significant portion of its range" and is limited to species or subspecies native to California. The California Endangered Species Act prohibits the "taking" of listed species except as otherwise provided in state law. Section 86 of the Fish and Game Code defines "take" as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." The CEQA process requires consultation with CDFG to ensure that any project will not jeopardize any endangered or threatened species or result in destruction or adverse modification of essential habitat.

Species protection is a major driver in regulation of ocean discharges. In their protection of listed marine and coastal species under the federal and California Endangered Species Acts, the resource agencies likely would take an interest in a proposed brine-concentrate discharge project. Through authority granted by the federal ESA, as well as the Marine Mammal Protection Act, which mirrors the federal ESA but applies specifically to marine mammals, NOAA Fisheries Service will consult as part of the CEQA process if federally listed species could be present. CDFG also will participate in the CEQA process under their authority in the California Fish and Game Code if state-listed fish, birds, or other species could be present. For a new outfall, because a Section 404 Permit from the USACE likely would be required, Endangered Species Act Section 7 consultation could be necessary.

CDFG also implements the Marine Life Protection Act. This act requires CDFG to designate Marine Protected Areas (MPAs) where marine life and habitat warrants extra protection. MPAs include marine life reserves; State Marine Parks (SMPs), which allow recreational fishing and prohibit commercial extraction; and State Marine Conservation Areas (SMCA), which allow for specified commercial and

recreational activities. Within MPAs, "take" of species generally is prohibited or strictly limited. Table 3.21 lists the MPAs in southern California. In addition, CDFG maps of the MPAs in southern California are shown in Figure 3.13.

TABLE 3.21
MARINE PROTECTED AREAS IN SOUTHERN CALIFORNIA

Abalone Cove Ecological Reserve
Agua Hedionda Lagoon State Marine Reserve (SMR)
Batiquitos Lagoon SMP
Big Sycamore Canyon Marine Resource Protection Act Ecological Reserve
Bolsa Chica
Buena Vista Lagoon SMP
Cabrillo National Monument
Cardiff and San Elijo State Beaches
Catalina Marine Science Center Marine Life Refuge
City of Encinitas Marine Life Refuge
Crystal Cove State Park
Dana Point Marine Life Refuge
Doheny Beach Marine Life Refuge and Doheny State Beach
Farnsworth Bank Ecological Reserve
Heisler Park Ecological Reserve
Irvine Coast Marine Life Refuge
Laguna Beach Marine Life Refuge
Lovers Cove Ecological Reserve
Mia J. Tegner SMCA
Mugu Lagoon to Latigo Point ASBS
Newport Beach Marine Life Refuge – Robert E. Badham
Niguel Marine Life Refuge
Point Fermin Marine Life Refuge
Point Loma Reserve
San Clemente Island ASBS
San Diego Marine Life Refuge
San Diego-La Jolla Ecological Reserve
San Diego-La Jolla Underwater Park

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3.3.3 Regulation for Solid Waste

Regulations in California governing landfills are compiled under Title 27 – Environmental Protection, Division 2: Solid Waste and U.S. Subtitle D. These regulations govern the construction of landfills and the restrictions to landfills for what they can accept from dischargers. Wastes are divided into inert (e.g., concrete), household, special, and hazardous wastes. Each of these wastes must be disposed of at specific types of landfills that are constructed to contain the waste. Table 3.22 provides a list of the different classes of landfills and a description of what can be disposed of in each class.

TABLE 3.22
LANDFILL CLASSES IN CALIFORNIA

Landfill Class	Description of Waste Accepted at Landfill	Number of Landfills in California
Class I	Hazardous and non-hazardous waste	4
Class II	"Designated" and non-hazardous wastes	22
Class III	Non-hazardous waste	163
Unclassified	Inert wastes only	21

Brine-concentrate management results in need to dispose of either a liquid/slurry or brine-concentrate precipitated solid to a landfill. Brine-concentrate is designated by USEPA as an industrial waste, which is significant because this designation limits disposal to a Class I landfill. Class I landfills are facilities that can accept industrial wastes as defined in 23 CCR 2531, municipal solid waste, construction debris, and yard waste. The designation of brine-concentrate by USEPA as an industrial waste occurred because USEPA has only two waste designation categories–(1) domestic discharge (discharged from a wastewater treatment plant, which contains coliform bacteria), and (2) industrial discharge (everything else). Not all Class I landfills have the same permit requirements, and at this time, most RWQCBs do not allow disposal of materials that have high TDS concentrations. A number of factors must be taken into account when identifying potential disposal sites including:

- Disposal of liquid waste might not be permitted at every facility and could be significantly more expensive because liquid waste is most commonly required to be in drums prior to disposal.
- Landfills have restrictions regarding the acceptance of liquid waste. Some landfills cannot accept any liquid waste. Landfills that accept liquid waste must be lined. For Class III landfills the waste-to-liquid ratio is typically 5:1 or 20 percent moisture content.

- Not all Class I landfills have the same permit requirements, and at this time, most RWQCBs do not allow disposal of materials that have high TDS content.
- High transport and disposal costs are associated with disposing material in landfills. Also, disposal fees can vary dramatically by landfill facility. Transportation cost will vary based on the location and might be costly.

Table 3.23 provides a list of potential industrial waste management facilities in the region.

TABLE 3.23
CALIFORNIA COMMERCIAL OFFSITE INDUSTRIAL WASTE MANAGEMENT FACILITIES

Facility Name	Location	Type of Waste Streams Permitted
Waste Management Kettleman Hills	Kettleman City	Wide range
Clean Harbors Buttonwillow	Buttonwillow	Wide range
Clean Harbors Westmoreland	Westmoreland	Wide range
Clean Harbors Wilmington	Wilmington	Wide range (Wastewater)

This list includes commercial hazardous-waste-permitted recycling, treatment, storage, and disposal facilities that accept offsite waste for a fee and perform treatment and/or disposal at the facility.

Figure 3.14 shows the location of landfills in California. In addition to the California facilities, the ECDC Environmental Sanitary Landfill in Carbon County, Utah (approximately 139 miles west of Salt Lake City), could be suitable for disposal of the brine-concentrate wastes. The facility in Utah can be reached by truck or railroad transport. In addition, a dedicated spur of the Southern Pacific Railroad main line provides a continuous link to the site. Other locations that can take waste include:

- Clean Harbors Phoenix Facility
- Clean Harbors Grassy Mountain Facility
- U.S. Ecology Beatty Facility

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Classification of a Waste

Brine-concentrate has to be disposed of at a Class I landfill. This class of landfill can take hazardous and nonhazardous wastes. Nonhazardous wastes are defined as:

> *. . . all putrescible and non-putrescible solid, semi-solid, and liquid wastes including garbage, trash, refuse, paper, rubbish, ashes, industrial wastes, demolition and construction wastes, abandoned vehicles and parts thereof, discarded home and industrial appliances, manure, vegetable or animal solid and semi solid wastes and other discarded waste (whether of solid or semi solid consistency); provided that such wastes do not contain wastes which must be managed as hazardous wastes, or wastes which contain soluble pollutants in concentrations which exceed applicable water quality objectives, or could cause degradation of waters of the state (i.e., designated waste). . .*

For hazardous wastes, Title 22 Division 4.5 sets criteria for defining the characteristics of a hazardous waste. The waste designation classification is important because different waste designations incur different disposal fees

There are two hazardous waste classifications–listed and characteristic. Listed wastes are specific wastes that can be from specific or nonspecific sources. Listed wastes are identified in the CCR and CFR. Because listed wastes are considered hazardous despite their characteristics, dilution does not change a listed waste classification to a hazardous waste; dilution simply creates a larger amount of listed hazardous waste. Because of this characteristic of listed wastes, the brine-concentrate waste discussed in this report is not likely to consist of listed wastes.

A waste is considered a characteristic hazardous waste if it exhibits any one of four characteristics–toxicity, corrosivity, reactivity, or ignitability. From initial comparisons of brine-concentrate constituents from the West Basin Municipal Water District (MWD) West Basin Barrier Project, brine-concentrate would not appear to be classified as a hazardous waste. However, this classification would be site specific and dependent upon the discharges to the wastewater or recycled water treatment plant and would be determined on a case-by-case basis. For this reason, each of these waste characteristics is described in detail below.

Toxicity

The toxicity characteristic is determined by a series of analytical tests. If the waste will be disposed of in California, the CCR applies, and total threshold limit concentrations (TTLC) and soluble threshold limit concentrations (STLC) are used to determine if a waste has the toxicity characteristic. If the waste will be disposed of outside California, the CFR applies, and the TTLC and the toxicity characteristic leaching procedure (TCLP) are used to determine if a waste has the toxicity characteristic. Figure 3.15 is a process flow diagram of how to determine if a waste has a toxicity characteristic.

The TTLC test is performed first. If the results of the TTLC test are less than 10 times the TTLC or 20 times the TCLP limits, the waste does not exhibit the toxicity characteristic. If the results exceed 10 times the TTLC or 20 times the TCLP limits, the STLC or the TCLP test is performed. If the results of the STLC or the TCLP test exceed the STLC or TCLP limits, the waste is considered hazardous based on the toxicity characteristic. Based on current concentrations provided by the West Basin MWD West Basin Barrier Project and accounting for brine-concentrate concentrations related to the technologies discussed in this report, the brine-concentrate is not expected to be classified as hazardous based on the toxicity characteristic (see the determination process in Figure 3.15 and the information in Table 3.24 from the West Basin MWD).

Corrosivity

The corrosivity characteristic generally is determined by a pH less than 2 or greater than 12.5. Based on the pH data of brine provided from the West Basin MWD West Basin Barrier Project, the pH of the brine-concentrate is expected to be between 2 and 12.5 (as seen in Table 3.24). Therefore, the brine-concentrate is not expected to be classified as hazardous waste based on the corrosivity characteristic.

Reactivity

The reactivity characteristic generally applies to wastes that are unstable, react violently, create explosive mixtures or generate toxic gases or fumes when mixed with water, or are capable of detonation. Based on the aqueous and stable nature of the brine-concentrate, the brine-concentrate is not expected to be classified as hazardous due to a reactivity characteristic.

Ignitability

The ignitability characteristic generally applies to wastes with flashpoints less than 60 degrees Celsius (°C). Because brine-concentrate does not exhibit the ignitability characteristic and the concentration processes discussed in this report are not expected to increase the ignitability of the brine-concentrate, the brine-concentrate is not expected to exhibit the ignitability characteristic. Therefore, the brine-concentrate is not expected to be classified as hazardous waste based on the ignitability characteristic.

FIGURE 3.15
FLOW PROCESS DIAGRAM FOR TOXICITY CHARACTERISTIC

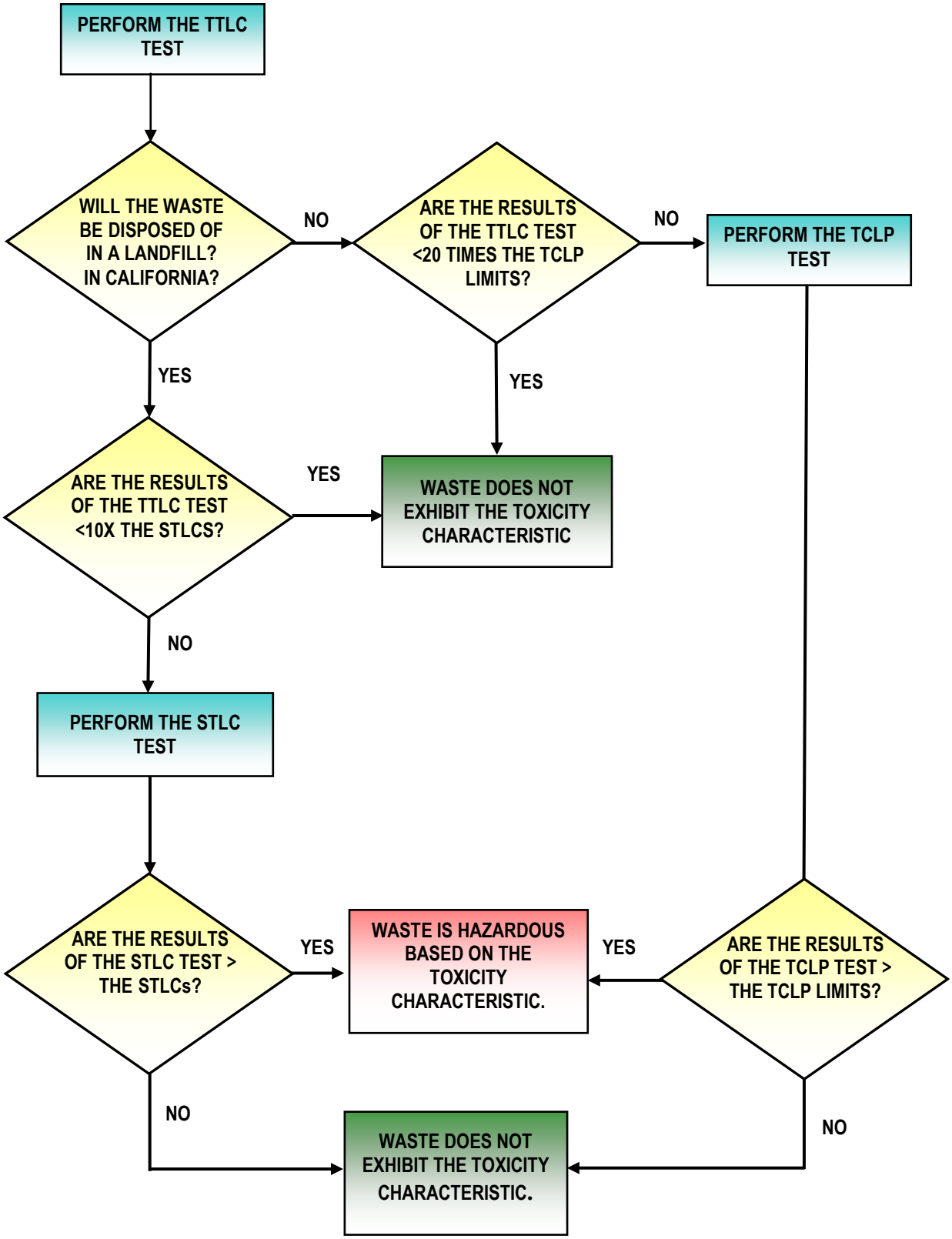

TABLE 3.24
SUMMARY OF WEST BASIN MUNICIPAL WATER DISTRICT BARRIER PROJECT BRINE CONCENTRATIONS

Constituent	Units	TCLP Limit[a]	STLC	TTLC	Maximum Concentration				
					2000	2001	2002	2003	2004
					6.8	7	7.1	7.5	7.2
Arsenic	µg/L	5,000	5,000	500,000	14.9	28.8	30	36.5	31
Antimony	µg/L	-	15,000	500,000	6.57	5.77	6.37	6.8	6.68
Beryllium	µg/L	-	750	75,000	<1	0.1	0.1	0.14	0.2
Cadmium	µg/L	1,000	1,000	100,000	<1	5.6	0.95	1.47	1.12
Chromium III	µg/L		5,000	250,000	45	29	47.2	95	87
Chromium IV	µg/L	-	5,000	500,000	<5	0.25	2.9	1.5	1.4
Total Chromium	µg/L	5,000	5,000	2,500,000	44.9	51.7	87.1	111	122
Copper	µg/L	-	25,000	2,500,000	158	95	45.2	51.5	98.4
Lead	µg/L	5,000	5,000	1,000,000	34.2	19	2.1	1.52	1.33
Mercury	µg/L	200	200	20,000	1.27	1.31	1.24	1.09	1.12
Nickel	µg/L	-	20,000	2,000,000	123	96	78	99.9	59.3
Selenium	µg/L	1,000	1,000	100,000	23.2	23	22.8	38.3	32.4
Silver	µg/L	5,000	5,000	500,000	<5	2.1	1.66	2.27	2.96
Thallium	µg/L	-	7,000	700,000	<1	<0.11	-	<0.18	<0.18
Zinc	µg/L	-	250,000	5,000,000	144	160	90.6	123	249
Lindane	µg/L	400	400	4,000	0.04	<0.063	<0.063	<0.063	<0.063
Endrin	µg/L	20	20	200	0.05	<0.031	<0.031	<0.031	<0.031
Heptachlor	µg/L	8b	470	4,700	<0.01	<0.03	<0.03	<0.03	<0.03
Heptachlor Epoxide	µg/L	8[b]	-	-	-	<0.03	<0.03	<0.03	<0.03
Total PCBs	µg/L	-	5,000	50,000	0.25	-	-	-	-
1,1-Dichloroethene	µg/L	700	-	-	<1	<0.32	<0.32	<0.32	<0.32
1,2-Dichloroethane	µg/L	500	-	-	<1	<0.35	<0.35	<0.35	<0.35
1,4-Dichlorobenzene	µg/L	7,500	-	-	3	9.7	12	10.5	9.9
Benzene	µg/L	500	-	-	<1	<0.09	<0.09	<0.09	<0.09
Trichloromethane	µg/L	6,000	-	-	13	25	30	33	29
Carbon Tetrachloride	µg/L	500	-	-	<1	<0.29	<0.29	<0.29	<0.29
Chlorobenzene	µg/L	100,000	-	-	<1	<0.14	<0.14	<0.14	<0.14
Tetrachloroethene	µg/L	700	-	-	10	7.8	12	14	33
Trichloroethene	µg/L	500	20,400	204,000	<1	0.46	<0.26	0.5	1.2

TABLE 3.24
SUMMARY OF WEST BASIN MUNICIPAL WATER DISTRICT BARRIER PROJECT BRINE CONCENTRATIONS

Constituent	Units	TCLP Limit[a]	STLC	TTLC	Maximum Concentration				
					2000	2001	2002	2003	2004
Vinyl Chloride	µg/L	200	-	-	<5	<0.24	<0.24	<0.24	<0.24
2,4,6-Trichlorophenol	µg/L	2,000	-	-	<1	<2.2	<2.2	1.9	1.3
2,4-Dinitrotoluene	µg/L	130	-	-	<1	<2.2	<2.2	<0.4	<0.4
Hexachlorobutadiene	µg/L	500	-	-	<1	<1.2	<1.2	<0.48	<0.48
Hexachloroethane	µg/L	3,000	-	-	<1	-	-	-	<0.51
Nitrobenzene	µg/L	2,000	-	-	<1	<1.3	<1.3	<0.46	<0.46

Note:
[a]TCLP limits apply where California-specific concentration limits are not identified.
[b]Concentration limit applies to the total concentration of heptachlor and its epoxide.
< Indicates that the parameter was not detected, and the given value is the method detection limit.
- Indicates that the parameter was not analyzed.

4 Regulatory Trends

A number of ongoing issues could affect the regulatory outlook in the future related to brine-concentrate management. The continuing drought in California and the southwestern United States is putting increasing pressure on local agencies to further develop local sources of water supplies including groundwater (potable and brackish) and seawater desalination. The increasing competition for historic imported supply sources such as the State Water Project and Colorado River are making these supplies more scarce and valuable than in the past. The inter-basin transfer regulatory landscape is making importation increasingly difficult. The incremental cost of water above the traditional supply sources is allowing local supply development to become more cost competitive. This will lead to development of increased level of recycled water use, brackish groundwater production, and seawater desalination. Increased levels of production from these sources will eventually result in higher levels and/or more concentrated waste streams and in the need for management of brine-concentrate.

This is tempered by regulatory trends that appear to more stringently manage a number of constituents to protect human and environmental health. RWQCBs are in the process of or have just completed conducting the triennial review of Basin Plans. The general expectation is that there will be more stringent requirements on discharges of Title 22 recycled water into and over groundwater basins. However, the RWQCBs are recognizing the need to streamline permit processes to ease the ability of water and wastewater agencies to produce and beneficially use recycled water.

As discussed in Section 3, the State Water Resources Control Board has issued an updated Recycled Water Policy. The purpose of the policy focuses on the increased use of recycled water from municipal wastewater sources. The plan includes the requirement that every groundwater basin/sub-basin in California should have consistent salt/nutrient management plans, streamlined permitting processes to accelerate typical reuse projects, implementing monitoring programs for constituents of concern, and clauses for anti-degradation of groundwater basins from landscape irrigation projects. Adoption of the policy was approved on February 3, 2009.

A pending legislation is aimed at protecting the marine ecosystem. This legislation would affect the ability of agencies to discharge brine into the ocean. On January 6, 2009, Congressman Farr (D. California) introduced H.R. 21. This bill directs federal agencies to (1) implement the National Ocean Policy established in H.R. 21 and (2) within 2 years issue regulations to ensure that actions authorized, funded, carried out, permitted, or licensed by such agencies are consistent with the bills National Ocean Policy.

The National Ocean Policy shall be implemented to "protect, maintain, and restore marine ecosystem health." The bill defines marine ecosystem health as the ability of

an ecosystem to sustain a complete diversity of species and the physical, chemical, geological, and microbial environment necessary to maintain that complete diversity. The bill also provides that the Policy shall be implemented so that the lack of scientific certainty will not be used as justification for postponing action to prevent negative environmental impacts. Agencies discharging directly to the oceans, or engaged in activities that result in runoff or other discharges to rivers and streams that empty into oceans, will be regulated under H.R. 21.

For this reason, implementing traditional ocean discharge for brine-concentrate management and disposal might become more difficult in the future as CECs and impacts on benthic organisms of mixing zones are investigated and regulated.

5 Summary of Regulations

With the worsening drought in California and increasing competition for water from traditional supply sources, the trend to identify and develop additional water supply sources will continue. This expansion will result in increased concentrations and quantities of brine-concentrate in southern California. Currently, no regulations directly apply to the production or disposal of brine-concentrate; however, a number of regulations could impact brine-concentrate management projects as shown in Table 5.1. With increased production of brine-concentrate, as well as a better understanding of constituents' impact on human and environmental health, it is likely that regulation will continue to become more stringent.

TABLE 5.1
SUMMARY OF APPLICABLE FEDERAL AND STATE LAWS AND REGULATIONS

Law/Regulation	Description
Federal Water Pollution Control Act (Clean Water Act, 1972)	Establishes structure for regulating pollutant discharges to waters of the U.S.
NPDES	Regulates point sources that discharge pollutants into waters of the U.S. to control water pollution
Section 404	Regulates discharge of dredged or fill material to waters of the U.S.
Section 401	Ensures that pollution prevention and control occurs on projects regulated by the federal government
Section 303(d) and TMDLs	Requires states, territories, and authorized tribes to develop list of impaired bodies of water and establish limits for the maximum amount of pollutant a body of water can received
Antidegradation Policy	Protects bodies of water with high water quality for beneficial uses and from any adverse impacts to water quality
California Toxics Rule	Lists 126 priority toxic pollutants and establishes numeric aquatic-life criteria for 57 compounds and describes how these criteria are to be applied
California Ocean Plan	Establishes water quality standards for coastal waters including estuaries and prohibits discharge to ASBS
Federal Safe Drinking Water Act	Protects public health by regulating the public drinking water supply and its sources
Maximum Contaminant Levels	Enforceable standards that define the maximum levels of constituents that can be present in drinking water
Calderon-Sher Safe Drinking Water Act and Public Health Goals	Requires monitoring and limits for contaminants in drinking water. A PHG is a level of contaminant in drinking water that does not pose a significant risk to health.

TABLE 5.1
SUMMARY OF APPLICABLE FEDERAL AND STATE LAWS AND REGULATIONS

Law/Regulation	Description
Action Levels	Describes nonregulatory advisory levels for the level of constituent in drinking water that does not pose a significant health risk
Underground Injection Control Program	Protects the USDW by classifying and then setting standards and permit requirements for different classes of wells
Coastal Zone Management Act	Encourages the preservation, protection, development, and (where possible) the restoration and enhancement of natural coastal resources and wildlife habitat
California Coastal Act	Defines the "coastal zone" and establishes land use control for the zone
California Water Code	Regulates all aspects of water policy in California from quantity, quality to water agency formation
Porter Cologne Water Quality Control Act	Establishes the SWRCB and RWQCBs, the requirement for Basin Plans, and Waste Discharge requirements, and the regulation of groundwater, surface water, and recycled water quality
Waste Discharge Requirements	Establishes process and permit requirements for any waste discharged in California
Recycled Water Policy	Establishes policy and requirements to regulate and encourage the use of recycled water in California
CCR Title 22	Establishes water quality criteria and guidelines applicable to recycled water projects
Clean Air Act	Establishes NAAQ criteria and requires the development of SIPs to comply with those criteria
California Environmental Quality Act	Requires a project proponent to conduct an environmental review of the project in addition to a Negative Declaration or EIR
National Environmental Policy Act	Requires federal agencies to integrate environmental values into a decision-making process by considering the environmental impacts of proposed actions and reasonable alternatives to action in an EIS
Endangered Species Act	Establishes a broad federal interest in identifying, protecting, and providing for the recovery of threatened or endangered species
Title 27 Environmental Protection, Division 2: Solid Waste and U.S. Subtitle D	Governs the construction and operation of landfills including types of waste that can be accepted

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