

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

RESOLUTION R5-2017-0106

AMENDMENTS TO REFORMAT THE WATER QUALITY CONTROL PLAN
FOR THE SACRAMENTO RIVER AND SAN JOAQUIN RIVER BASINS
AND THE WATER QUALITY CONTROL PLAN FOR THE TULARE LAKE BASIN

WHEREAS, the California Regional Water Quality Control Board, Central Valley Region (Central Valley Water Board) finds that:

1. In 1975, the Central Valley Water Board adopted the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins and the Water Quality Control Plan for the Tulare Lake Basin (Basin Plans), which have been amended occasionally.
2. The Basin Plans may be amended in accordance with Water Code section 13240, et seq.
3. To facilitate current use and future amendments, proposed amendments have been prepared to change the format of the Basin Plans from double column to single column, to add numbering to the headers, to add a new chapter for a glossary, and to replace the hard copies of the State Water Board's plans and policies located in the appendices with links to the State Water Board's website.
4. Central Valley Water Board staff prepared a staff report dated 1 August 2017. The staff report included a description of the proposed amendments.
5. The Central Valley Water Board finds that the proposed amendments are format changes and do not have scientific elements requiring independent, external scientific peer review in accordance with Health and Safety Code section 57004.
6. The Central Valley Water Board finds that the proposed amendments will improve clarity. The proposed action meets the "Necessity" standard of the Administrative Procedures Act, Government Code section 11353, subdivision (b).
7. The basin planning process has been certified by the Resources Agency as an exempt regulatory program because its process adequately fulfills the purposes of the California Environmental Quality Act (CEQA). (Pub. Resources Code, § 21000 et seq.) The Central Valley Water Board is therefore exempt from CEQA's requirements to prepare an environmental impact report, negative declaration, or initial study for the proposed amendments. Instead, the Central Valley Water Board prepares substitute environmental documents under the certified regulatory program. However, the proposed amendments are exempt from the certified regulatory program requirements because those requirements do not apply if the proposed amendments themselves are exempt from CEQA. (Pub. Res. Code § 21080, subdivision (b)(1); Cal. Code of Regs., tit. 14, §§ 15060, subdivision (c) and 15378, subdivision (b)(5); Cal. Code of Regs., tit. 23, § 3720, subd. (b).)
8. Central Valley Water Board staff has circulated a Notice of Public Hearing and a written staff report, including draft proposed amendments, to interested individuals and public agencies, for review and comment in accordance with state requirements. (Wat. Code, § 13245.)
9. Responses to all comments have been prepared and the draft amendment and staff report have been revised as appropriate in response to comments.

10. After circulating draft proposed amendments, the United States Environmental Protection Agency approved the Amendments to the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins for the Control of Diazinon and Chlorpyrifos Discharges (Resolution R5-2014-0041). The draft amendments were revised to include the approved Diazinon and Chlorpyrifos Control Program which are not marked as changes.
11. In Resolutions R5-2017-0032, R5-2017-0057, R5-2017-0062 and R5-2017-0088, the Central Valley Water Board adopted amendments to one or both Basin Plans that have not been fully approved. The adopted amendments include references to Basin Plan chapters, tables, figures, and other page numbers. Following their final approval, these amendments will be reformatted to be consistent with the amendments adopted by this resolution.
12. The Central Valley Water Board held a public hearing on 20 October 2017, for the purpose of receiving testimony on the draft Basin Plan amendments. Notice of the public hearing was sent to all interested persons and published in accordance with California Water Code section 13244.
13. A Basin Plan amendment must be approved by the State Water Board and the Office of Administrative Law (OAL). The proposed amendments become effective under State law after OAL approval.
14. The Central Valley Water Board finds that the amendments to the Basin Plans were developed in accordance with Water Code section 13240, et seq.

THEREFORE BE IT RESOLVED:

1. Pursuant to Water Code section 13240, et seq., the Central Valley Water Board, after considering the entire record, including oral testimony at the hearing, hereby approves the staff report and adopts the amendments to the Basin Plans as set forth in Attachments 1a, 1b, 2a and 2b.
2. Should the amendment adopted in Resolution R5-2017-0032 become approved and effective, language referencing Table II-3 and Figure II-3 are amended to reference Table 2-3 and Figure 2-3.
3. Should the amendment adopted in Resolution R5-2017-0057 become approved and effective, new tables that reference Chapter IV will be amended to reference Chapter 4, references to other parts of the Basin Plan by page numbers are amended to reference the other parts of the Basin Plan by section heading number, and paragraph numbers are amended so that the first level subsection will be Arabic numbers enclosed in parentheses, the second level subsection will be lower case letters enclosed in parentheses and the third level subsection will be lower case Roman numerals enclosed in parentheses.
4. Should the amendment adopted in Resolution R5-2017-0062 become approved and effective, language referencing Table IV-4.1 are amended to reference Table 4-5, the new Footnote 2 in Chapter 4 will be renumbered as Footnote 3, and numbered paragraphs are amended to enclose the numbers in parentheses.
5. Should the amendments adopted in Resolution R5-2017-0088 become approved and effective, language referencing Section IV and Table II-1 are amended to reference Chapter 4 and Table 2-1.

6. The Executive Officer is directed to forward copies of the Basin Plan amendments to the State Water Board in accordance with the requirements of Water Code section 13245.
7. The Central Valley Water Board requests that the State Water Board approve the Basin Plan amendments in accordance with the requirements of Water Code sections 13245 and 13246 and forward it to OAL.
8. If during its approval process the Central Valley Water Board staff, State Water Board or OAL determines that minor, non-substantive corrections to the language of the amendments are needed for clarity or consistency, the Executive Officer may make such changes, and shall inform the Central Valley Water Board of any such changes.
9. Following approval of the Basin Plan amendments by the OAL, the Executive Officer shall file a Notice of Decision with the Secretary for Natural Resources in accordance with Public Resources Code section 21080.5, subsection (d)(2)(E), and California Code of Regulations, title 23, section 3781.

I, PAMELA C. CREEDON, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of a Resolution adopted by the California Regional Water Quality Control Board, Central Valley Region, on 20 October 2017.

Original Signed by
PAMELA C. CREEDON, Executive Officer

Attachments:

Attachment 1a: Reformat Amendments to the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins

Attachment 1b: Reformat Amendments to the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins – Revised Appendices

Attachment 2a: Reformat Amendments to the Water Quality Control Plan for the Tulare Lake Basin

Attachment 2b: Reformat Amendments to the Water Quality Control Plan for the Tulare Lake Basin – Revised Appendices

Attachment 1a

Reformat Amendments to the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins

Changes shown in **red** and ~~strikeout~~ and underline

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FOREWORD TO THE FOURTH EDITION (1998)

The preparation and adoption of water quality control plans (Basin Plans) is required by the California Water Code (Section 13240) and supported by the Federal Clean Water Act. Section 303 of the Clean Water Act requires states to adopt water quality standards which "consist of the designated uses of the navigable waters involved and the water quality criteria for such waters based upon such uses." According to Section 13050 of the California Water Code, Basin Plans consist of a designation or establishment for the waters within a specified area of beneficial uses to be protected, water quality objectives to protect those uses, and a program of implementation needed for achieving the objectives. State law also requires that Basin Plans conform to the policies set forth in the Water Code beginning with Section 13000 and any state policy for water quality control. Since beneficial uses, together with their corresponding water quality objectives, can be defined per federal regulations as water quality standards, the Basin Plans are regulatory references for meeting the state and federal requirements for water quality control (40 CFR 131.20). One significant difference between the state and federal programs is that California's basin plans establish standards for ground waters in addition to surface waters.

Basin Plans are adopted and amended by Regional Water Boards under a structured process involving full public participation and state environmental review. Basin Plans and amendments thereto, do not become effective until approved by the State Water Resources Control Board (State Water Board). Regulatory provisions must be approved by the Office of Administrative Law. Adoption or revision of surface water standards are subject to the approval of the U.S. Environmental Protection Agency.

Basin Plans complement water quality control plans adopted by the State Water Board, such as the Water Quality Control Plans for Temperature Control and Ocean Waters. It is the intent of the State and Regional Water Boards to maintain the Basin Plans in an updated and readily available edition that reflects the current water quality control program.

This Basin Plan covers the entire Sacramento and San Joaquin River Basins. A separate Basin Plan covers the Tulare Lake Basin. The Basin Plan was first adopted in 1975. In 1989, a second edition was published. The second edition incorporated all the amendments which were adopted and approved since 1975, updated the Basin Plan to include new state policies and programs, restructured and edited the Basin Plan for clarity, and incorporated the results of triennial reviews conducted in 1984 and 1987. The Third Edition - 1994 incorporated all amendments approved between 1989 and 1994, included new state policies and programs, edited and restructured the Basin Plan to make it consistent with other regional and state plans, and substantively amended sections dealing with beneficial uses, objectives, and implementation programs.. The current edition (Fourth Edition - 1998) incorporates two new amendments approved since 1994. One amendment deals with compliance schedules in permits and the other addresses agricultural subsurface drainage discharges.

In this Basin Plan, "Regional Water Board" refers to the Central Valley Regional Water Quality Control Board and "State Water Board" refers to the State Water Resources Control Board.

1.1 BASIN DESCRIPTION

This Basin Plan covers the entire area included in the Sacramento and San Joaquin River drainage basins (see maps in pocket* and Figure H2-1). The basins are bound by the crests of the Sierra Nevada on the east and the Coast Range and Klamath Mountains on the west. They extend some 400 miles from the California - Oregon border southward to the headwaters of the San Joaquin River.

*NOTE: The planning boundary between the San Joaquin River Basin and the Tulare Lake Basin follows the southern watershed boundaries of the Little Panoche Creek, Moreno Gulch, and Capita Canyon to boundary of the Westlands Water District. From here, the boundary follows the northern edge of the Westlands Water District until its intersection with the Firebaugh Canal Company's Main Lift Canal. The basin boundary then follows the Main Lift Canal to the Mendota Pool and continues eastward along the channel of the San Joaquin River to the southern boundary of the Little Dry Creek watershed (Hydrologic Subareas No. 540.70 and 545.30) and then follows along the southern boundary of the San Joaquin River drainage basin.

The Sacramento River and San Joaquin River Basins cover about one fourth of the total area of the State and over 30% of the State's irrigable land. The Sacramento and San Joaquin Rivers furnish roughly 51% of the State's water supply. Surface water from the two drainage basins meet and form the Delta, which ultimately drains to San Francisco Bay. Two major water projects, the Federal Central Valley Project and the State Water Project, deliver water from the Delta to Southern California, the San Joaquin Valley, Tulare Lake Basin, the San Francisco Bay area, as well as within the Delta boundaries.

The Delta is a maze of river channels and diked islands covering roughly 1,150 square miles, including 78 square miles of water area. The legal boundary of the Delta is described in Section 12220 of the Water Code (also see Figure H3-1 of this Basin Plan).

Ground water is defined as subsurface water that occurs beneath the ground surface in fully saturated zones within soils and other geologic formations. Where ground water occurs in a saturated geologic unit that contains sufficient permeability and thickness to yield significant quantities of water to wells or springs, it can be defined as an aquifer (USGS, Water Supply Paper 1988, 1972). A ground water basin is defined as a hydrogeologic unit containing one large aquifer or several connected and interrelated aquifers (Todd, *Groundwater Hydrology*, 1980).

Major ground water basins underlie both valley floors, and there are scattered smaller basins in the foothill areas and mountain valleys. In many parts of the Region, usable ground waters occur outside of these currently identified basins. There are water-bearing geologic units within ground water basins in the Region that do not meet the definition of an aquifer. Therefore, for basin planning and regulatory purposes, the term "ground water" includes all subsurface waters that occur in fully saturated zones and fractures within soils and other geologic formations, whether or not these waters meet the definition of an aquifer or occur within identified ground water basins.

1.1.1 Sacramento River Basin

The Sacramento River Basin covers 27,210 square miles and includes the entire area drained by the Sacramento River. For planning purposes, this includes all watersheds tributary to the Sacramento River that are north of the Cosumnes River watershed. It also includes the closed basin of Goose Lake and drainage sub-basins of Cache and Putah Creeks.

The principal streams are the Sacramento River and its larger tributaries: the Pit, Feather, Yuba, Bear, and American Rivers to the east; and Cottonwood, Stony, Cache, and Putah Creeks to the west. Major reservoirs and lakes include Shasta, Oroville, Folsom, Clear Lake, and Lake Berryessa.

DWR Bulletin 118-80 identifies 63 ground water basins in the Sacramento watershed area. The Sacramento Valley floor is divided into 2 ground water basins. Other basins are in the foothills or mountain valleys. There are areas other than those identified in the DWR Bulletin with ground waters that have beneficial uses.

1.1.2 San Joaquin River Basin

The San Joaquin River Basin covers 15,880 square miles and includes the entire area drained by the San Joaquin River. It includes all watersheds tributary to the San Joaquin River and the Delta south of the Sacramento River and south of the American River watershed. The southern planning boundary is described in the first paragraph of the previous page.

The principal streams in the basin are the San Joaquin River and its larger tributaries: the Cosumnes, Mokelumne, Calaveras, Stanislaus, Tuolumne, Merced, Chowchilla, and Fresno Rivers. Major reservoirs and lakes include Pardee, New Hogan, Millerton, McClure, Don Pedro, and New Melones.

DWR Bulletin 118-80 identifies 39 ground water basins in the San Joaquin watershed area. The San Joaquin Valley floor is divided into 15 separate ground water basins, largely based on political considerations. Other basins are in the foothills or mountain valleys. There are areas other than those identified in the DWR Bulletin with ground waters that have beneficial uses.

1.1.2.1 Grassland Watershed

The Grassland watershed is a valley floor sub-basin of the San Joaquin River Basin. The portion of the watershed for which agricultural subsurface drainage policies and regulations apply covers an area of approximately 370,000 acres and is bounded on the north by the alluvial fan of Orestimba Creek and by the Tulare Lake Basin to the south. The San Joaquin River forms the eastern boundary and Interstate Highway 5 forms the approximate western boundary. The San Joaquin River forms a wide flood plain in the region of the Grassland watershed.

The hydrology of the watershed has been irreversibly altered due to water projects and is presently governed by land uses. These uses are primarily, managed wetlands and agriculture. The wetlands form important waterfowl habitat for migratory waterfowl using the Pacific Flyway. The alluvial fans of the western and southern portions of the watershed contain salts and selenium which can be mobilized through irrigation practices and can impact beneficial uses of surface waters and wetlands if not properly regulated.

1.1.2.2 Lower San Joaquin River Watershed and Subareas

Technical descriptions of the Lower San Joaquin River (LSJR) and its component subareas are contained in Appendix 41. General descriptions follow: The LSJR watershed encompasses approximately 4,580 square miles in Merced County and portions of Fresno, Madera, San Joaquin, and Stanislaus counties. For planning purposes, the LSJR watershed is defined as the area draining to the San Joaquin River downstream of the Mendota Dam and upstream of the Airport Way Bridge near Vernalis, excluding the areas upstream of dams on the major Eastside reservoirs: New Don Pedro, New Melones, Lake McClure, and similar Eastside reservoirs in the LSJR system. The LSJR watershed excludes all lands within Calaveras, Tuolumne, San Benito, and Mariposa Counties. The LSJR watershed has been subdivided into seven major sub areas. In some cases major subareas have been further subdivided into minor subareas to facilitate more effective and focused water quality planning (Table [1-1](#)).

TABLE H-1 LOWER SAN JOAQUIN RIVER SUBAREAS

Major Subareas		Minor Subareas	
1	LSJR upstream of Salt Slough	1a	Bear Creek
		1b	Fresno-Chowchilla
2	Grasslands	-- --	
3	East Valley Floor	3a	Northeast Bank
		3b	North Stanislaus
		3c	Stevinson
		3d	Turlock Area
4	Northwest Side	4a	Greater Orestimba
		4b	Westside Creeks
		4c	Vernalis North
5	Merced River	-- --	
6	Tuolumne River	-- --	
7	Stanislaus River	-- --	

1. Lower San Joaquin River upstream of Salt Slough

This subarea drains approximately 1,480 square miles on the east side of the LSJR upstream of the Salt Slough confluence. The subarea includes the portions of the Bear Creek, Chowchilla River and Fresno River watersheds that are contained within Merced and Madera Counties. The northern boundary of the subarea generally abuts the Merced River Watershed. The western and southern boundaries follow the San Joaquin River from the Lander Avenue Bridge to Friant, except for the lands within the Columbia Canal Company, which are excluded. Columbia Canal Company lands are included in the Grassland Subarea. This subarea is composed of the following drainage areas:

1a. Bear Creek (effective drainage area)

This minor subarea is a 620 square mile subset of lands within the LSJR upstream of Salt Slough Subarea. The Bear Creek Minor Subarea is predominantly comprised of the portion of the Bear Creek Watershed that is contained within Merced County.

1b. Fresno-Chowchilla

The Fresno-Chowchilla Minor Subarea is comprised of approximately 860 square miles of land within the southern portion of the LSJR upstream of Salt Slough Subarea. This minor subarea is located in southeastern Merced County and western Madera County and contains the land area that drains into the LSJR between Sack Dam and the Bear Creek confluence, including the drainages of the Fresno and Chowchilla Rivers.

2. Grassland

The Grassland Subarea drains approximately 1,370 square miles on the west side of the LSJR in portions of Merced, Stanislaus, and Fresno Counties. This subarea includes the Mud Slough, Salt Slough, and Los Banos Creek watersheds. The eastern boundary of this subarea is generally formed by the LSJR between the Merced River confluence and the Mendota Dam. The Grassland Subarea extends across the LSJR, into the east side of the San Joaquin Valley, to include the lands within the Columbia Canal Company. The western boundary of the subarea generally follows the crest of the Coast Range with the exception of lands within San Benito County, which are excluded.

3. East Valley Floor

This subarea includes approximately 413 square miles of land on the east side of the LSJR that drains directly to the LSJR between the Airport Way Bridge near Vernalis and the Salt Slough confluence. The subarea is largely comprised of the land between the major east-side drainages of the Tuolumne, Stanislaus, and Merced Rivers. This subarea lies within central Stanislaus County and north-central Merced County. Numerous drainage canals,

including the Harding Drain and natural drainages, drain this subarea. The subarea is comprised of the following minor subareas:

3a. Northeast Bank

This minor subarea of the East Valley Floor contains all of the land draining the east side of the San Joaquin River between the Maze Boulevard Bridge and the Crows Landing Road Bridge, except for the Tuolumne River subarea. The Northeast Bank covers approximately 123 square miles in central Stanislaus County.

3b. North Stanislaus

The North Stanislaus minor subarea is a subset of lands within the East Valley Floor Subarea. This minor subarea drains approximately 68 square miles of land between the Stanislaus and Tuolumne River watersheds that flows into the San Joaquin River between the Airport Way Bridge near Vernalis and the Maze Boulevard Bridge.

3c. Stevinson

This minor subarea of the East Valley Floor contains all of the land draining to the LSJR between the Merced River confluence and the Lander Avenue (Highway 165) Bridge. The Stevinson Minor Subarea occupies approximately 44 square miles in north-central Merced County.

3d. Turlock Area

This minor subarea of the East Valley Floor contains all of the land draining to the LSJR between the Crows Landing Road Bridge and the Merced River confluence. The Turlock Area Minor Subarea occupies approximately 178 square miles in south-central Stanislaus County and northern Merced County.

4. Northwest Side

This 574 square mile area generally includes the lands on the West side of the LSJR between the Airport Way Bridge near Vernalis and the Newman Waste way confluence. This subarea includes the entire drainage area of Orestimba, Del Puerto, and Hospital/Ingram Creeks. The subarea is primarily located in Western Stanislaus County except for a small area that extends into Merced County near the town of Newman and the Central California Irrigation District Main Canal.

4a. Greater Orestimba

The Greater Orestimba Minor Subarea is a 285 square mile subset of the Northwest Side Subarea located in southwest Stanislaus County and a small portion of western Merced County. It contains the entire Orestimba Creek watershed and the remaining area that drains into the LSJR from the west between the Crows Landing Road Bridge and the confluence of the Merced River, including Little Salad and Crow Creeks.

4b. Westside Creeks

This Minor Subarea is comprised of 277 square miles of the Northwest Side Subarea in western Stanislaus County. It consists of the areas that drain into the west side of the San Joaquin River between Maze Boulevard and Crows Landing Road, including the drainages of Del Puerto, Hospital, and Ingram Creeks.

4c. Vernalis North

The Vernalis North Minor Subarea is a 12 square mile subset of land within the most northern portion of the Northwest Side Subarea. It contains the land draining to the San Joaquin River from the west between the Maze Boulevard Bridge and the Airport Way Bridge near Vernalis.

5. Merced River

This 294 square mile subarea is comprised of the Merced River watershed downstream of the Merced-Mariposa county line and upstream of the River Road Bridge. The Merced River subarea includes a 13-square-mile "island" of land (located between the East Valley Floor and the Tuolumne River Subareas) that is hydrologically connected to the Merced River by the Highline Canal.

6. Tuolumne River

This 294 square mile subarea is comprised of the Tuolumne River watershed downstream of the Stanislaus-Tuolumne county line, including the drainage of Turlock Lake, and upstream of the Shiloh Road Bridge.

7. Stanislaus River

This 157 square mile subarea is comprised of the Stanislaus River watershed downstream of the Stanislaus-Calaveras county line and upstream of Caswell State Park.

II.2 EXISTING AND POTENTIAL BENEFICIAL USES

Beneficial uses are critical to water quality management in California. State law defines beneficial uses of California's waters that may be protected against quality degradation to include (and not be limited to) "...domestic; municipal; agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves" (Water Code Section 13050(f)). Protection and enhancement of existing and potential beneficial uses are primary goals of water quality planning.

Significant points concerning the concept of beneficial uses are:

1. All water quality problems can be stated in terms of whether there is water of sufficient quantity or quality to protect or enhance beneficial uses.
2. Beneficial uses do not include all of the reasonable uses of water. For example, disposal of wastewaters is not included as a beneficial use. This is not to say that disposal of wastewaters is a prohibited use of waters of the State; it is merely a use which cannot be satisfied to the detriment of beneficial uses. Similarly, the use of water for the dilution of salts is not a beneficial use although it may, in some cases, be a reasonable and desirable use of water.
3. The protection and enhancement of beneficial uses require that certain quality and quantity objectives be met for surface and ground waters.
4. Fish, plants, and other wildlife, as well as humans, use water beneficially.

Beneficial use designation (and water quality objectives, see Chapter **III.3**, or variance of a water quality standard, see Chapter **IV.4**) must be reviewed at least once during each three-year period for the purpose of modification as appropriate (40 CFR 131.20).

The beneficial uses, and abbreviations, listed below are standard basin plan designations.

Municipal and Domestic Supply (MUN) - Uses of water for community, military, or individual water supply systems including, but not limited to, drinking water supply.

Agricultural Supply (AGR) - Uses of water for farming, horticulture, or ranching including, but not limited to, irrigation (including leaching of salts), stock watering, or support of vegetation for range grazing.

Industrial Service Supply (IND) - Uses of water for industrial activities that do not depend primarily on water quality including, but not limited to, mining, cooling water supply, hydraulic conveyance, gravel washing, fire protection, or oil well repressurization.

Industrial Process Supply (PRO) - Uses of water for industrial activities that depend primarily on water quality.

Ground Water Recharge (GWR) - Uses of water for natural or artificial recharge of ground water for purposes of future extraction, maintenance of water quality, or halting of saltwater intrusion into freshwater aquifers.

Freshwater Replenishment (FRSH) - Uses of water for natural or artificial maintenance of surface water quantity or quality.

Navigation (NAV) - Uses of water for shipping, travel, or other transportation by private, military, or commercial vessels.

Hydropower Generation (POW) - Uses of water for hydropower generation.

Water Contact Recreation (REC-1) - Uses of water for recreational activities involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, swimming, wading, water-skiing, skin and scuba diving, surfing, white water activities, fishing, or use of natural hot springs.

Non-contact Water Recreation (REC-2) - Uses of water for recreational activities involving proximity to water, but where there is generally no body contact with water, nor any likelihood of ingestion of water. These uses include, but are not limited to, picnicking, sunbathing, hiking, beachcombing, camping, boating, tidepool and marine life study, hunting, sightseeing, or aesthetic enjoyment in conjunction with the above activities.

Commercial and Sport Fishing (COMM) - Uses of water for commercial or recreational collection of fish, shellfish, or other organisms including, but not limited to, uses involving organisms intended for human consumption or bait purposes.

Aquaculture (AQUA) - Uses of water for aquaculture or mariculture operations including, but not limited to, propagation, cultivation, maintenance, or harvesting of aquatic plants and animals for human consumption or bait purposes.

Warm Freshwater Habitat (WARM) - Uses of water that support warm water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates.

Cold Freshwater Habitat (COLD) - Uses of water that support cold water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates.

Estuarine Habitat (EST) - Uses of water that support estuarine ecosystems including, but not limited to, preservation or enhancement of estuarine habitats, vegetation, fish, shellfish, or wildlife (e.g., estuarine mammals, waterfowl, shorebirds).

Wildlife Habitat (WILD) - Uses of water that support terrestrial or wetland ecosystems including, but not limited to, preservation and enhancement of terrestrial habitats or wetlands, vegetation, wildlife (e.g., mammals, birds, reptiles, amphibians, invertebrates), or wildlife water and food sources.

Preservation of Biological Habitats of Special Significance (BIOL) - Uses of water that support designated areas or habitats, such as established refuges, parks, sanctuaries, ecological reserves, or Areas of Special Biological Significance (ASBS), where the preservation or enhancement of natural resources requires special protection.

Rare, Threatened, or Endangered Species (RARE) - Uses of water that support aquatic habitats necessary, at least in part, for the survival and successful maintenance of plant or animal species established under state or federal law as rare, threatened or endangered.

Migration of Aquatic Organisms (MIGR) - Uses of water that support habitats necessary for migration or other temporary activities by aquatic organisms, such as anadromous fish.

Spawning, Reproduction, and/or Early Development (SPWN) - Uses of water that support high quality aquatic habitats suitable for reproduction and early development of fish.

Shellfish Harvesting (SHELL) - Uses of water that support habitats suitable for the collection of filter-feeding shellfish (e.g., clams, oysters, and mussels) for human consumption, commercial, or sports purposes.

2.1 SURFACE WATERS

Existing and potential beneficial uses which currently apply to surface waters of the basins are presented in Figure H2-1 and Table H2-1. The beneficial uses of any specifically identified water body generally apply to its tributary streams, except as provided below:

- MUN, COLD, MIGR and SPWN do not apply to Old Alamo Creek (Solano County) from its headwaters to the confluence with New Alamo Creek

- MUN and the human consumption of aquatic organisms do not apply to Sulphur Creek (Colusa County) from Schoolhouse Canyon to the confluence with Bear Creek

In some cases a beneficial use may not be applicable to the entire body of water. In these cases the Regional Water Board's judgment will be applied.

It should be noted that it is impractical to list every surface water body in the Region. For unidentified water bodies, the beneficial uses will be evaluated on a case-by-case basis.

Water Bodies within the basins that do not have beneficial uses designated in Table H2-1 are assigned MUN designations in accordance with the provisions of State Water Board Resolution No. 88-63 which is, by reference, a part of this Basin Plan, except as provided below:

- Old Alamo Creek (Solano County) from its headwaters to the confluence with New Alamo Creek
- Water bodies listed in Appendix 44, Water Bodies That Meet One or More Sources of Drinking Water Policy (Resolution 88-63) Exceptions

These MUN designations in no way affect the presence or absence of other beneficial use designations in these water bodies.

In making any exemptions to the beneficial use designation of MUN, the Regional Board will apply the exceptions listed in Resolution 88-63 (Appendix Item 8) and the excepted water bodies will be listed in Appendix 44.

2.2 GROUND WATERS

Beneficial uses of ground waters of the basins are presented below. For the purposes of assigning beneficial uses, the term ground water is defined in Chapter 1.

Unless otherwise designated by the Regional Water Board, all ground waters in the Region are considered as suitable or potentially suitable, at a minimum, for municipal and domestic water supply (MUN), agricultural supply (AGR), industrial service supply (IND), and industrial process supply (PRO).

2.2.1 Beneficial Use De-designations

Ground waters at the Royal Mountain King Mine Site are de-designated for MUN and AGR in the de-designation area shown in Figure H2-2.

In making any exceptions to the beneficial use designation of municipal and domestic supply (MUN), the Regional Water Board will apply the criteria in State Water Board Resolution No. 88-63, 'Sources of Drinking Water Policy'. The criteria for exceptions are:

- "The total dissolved solids (TDS) exceed 3,000 mg/l (5,000 & mhos/cm, electrical conductivity) and it is not reasonably expected by the Regional Water Board [for the ground water] to supply a public water system, or
- "There is contamination, either by natural processes or by human activity (unrelated to a specific pollution incident), that cannot reasonably be treated for domestic use using either Best Management Practices or best economically achievable treatment practices, or
- "The water source does not provide sufficient water to supply a single well capable of producing an average, sustained yield of 200 gallons per day, or

- "The aquifer is regulated as a geothermal energy producing source or has been exempted administratively pursuant to 40 CFR, Section 146.4 for the purpose of underground injection of fluids associated with the production of hydrocarbon or geothermal energy, provided that these fluids do not constitute a hazardous waste under 40 CFR Section 261.3."

To be consistent with State Water Board Resolution No. 88-63 in making exceptions to beneficial use designations other than municipal and domestic supply (MUN), the Regional Water Board will consider criteria for exceptions, parallel to Resolution No. 88-63 exception criteria, which would indicate limitations on those other beneficial uses as follows:

In making any exceptions to the beneficial use designation of agricultural supply (AGR), the Regional Water Board will consider the following criteria:

- There is pollution, either by natural processes or by human activity (unrelated to a specific pollution incident), that cannot reasonably be treated for agricultural use using either Best Management Practices or best economically achievable treatment practices, or
- The water source does not provide sufficient water to supply a single well capable of producing an average, sustained yield of 200 gallons per day, or
- The aquifer is regulated as a geothermal energy producing source or has been exempted administratively pursuant to 40 CFR, Section 146.4 for the purpose of underground injection of fluids associated with the production of hydrocarbon or geothermal energy, provided that these fluids do not constitute a hazardous waste under 40 CFR Section 261.3.

In making any exceptions to the beneficial use designation of industrial supply (IND or PRO), the Regional Water Board will consider the following criteria:

- There is pollution, either by natural processes or by human activity (unrelated to a specific pollution incident), that cannot reasonably be treated for industrial use using either Best Management Practices or best economically achievable treatment practices, or
- The water source does not provide sufficient water to supply a single well capable of producing an average, sustained yield of 200 gallons per day.

FIGURE H2-1: SURFACE WATER BODIES AND BENEFICIAL USES

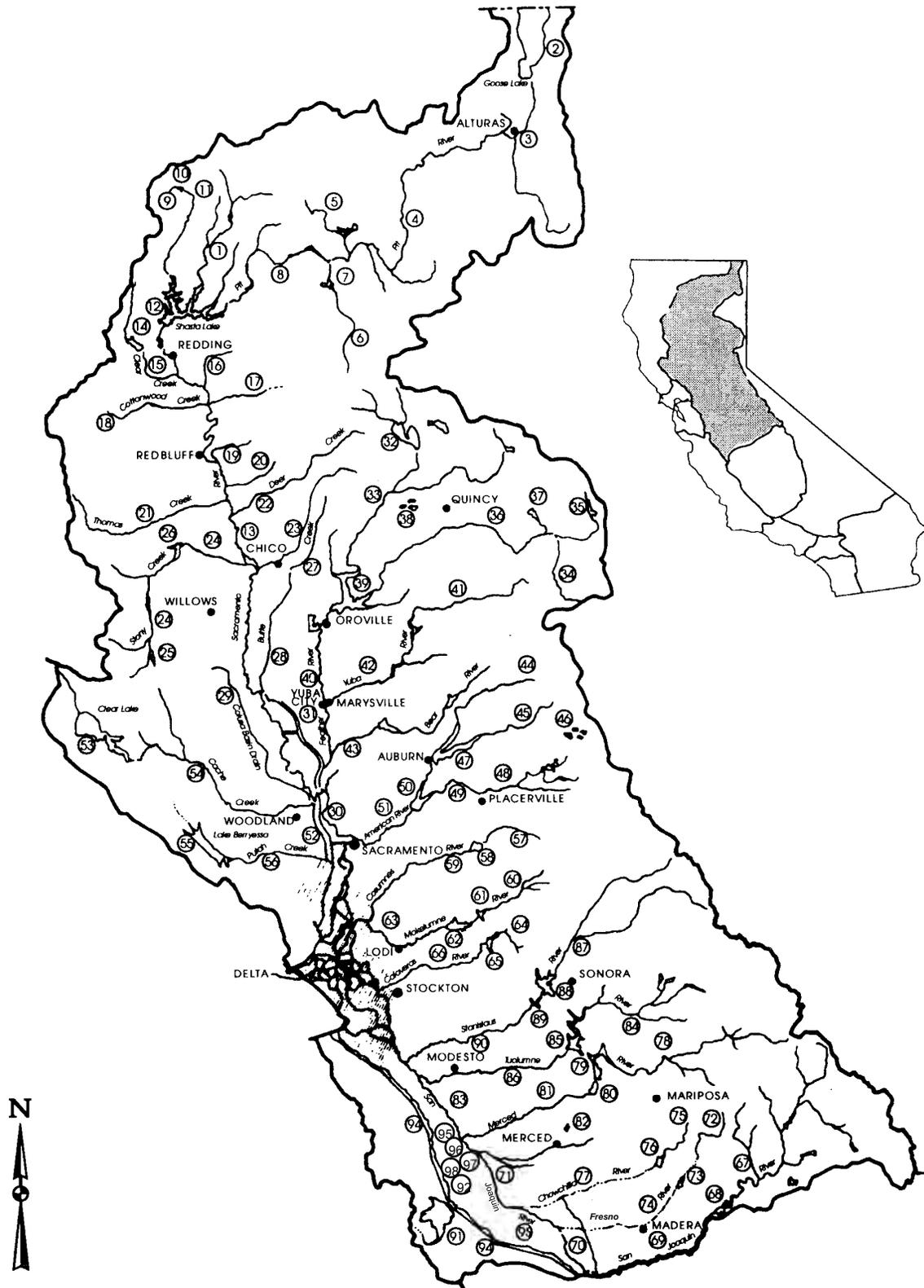


TABLE #2-1

SURFACE WATER BODIES AND BENEFICIAL USES

	SURFACE WATER BODIES	HYDRO UNIT NUMBER	AGRICULTURE		INDUSTRY			RECREATION		FRESHWATER HABITAT (2)		MIGRATION		SPAWNING		WILD	NAV
			MUN	AGR	PROC	IND	POW	REC-1	REC-2	WARM	COLD	MIGR	SPWN				
			MUNICIPAL AND DOMESTIC SUPPLY	IRRIGATION	STOCK WATERING	PROCESS	SERVICE SUPPLY	POWER	CONTACT	CANOEING AND RAFTING (1)	OTHER NONCONTACT	WARM	COLD	WARM (3)	COLD (4)		
1	McCLOUD RIVER	505.	E					E	E	P	E				E	E	
2	GOOSE LAKE	527.2		E	E				E		E	E					E
	PIT RIVER																
3	NORTH FORK, SOUTH FORK, PIT RIVER	526.00	E	E	E				E	P	E	E	E		E	E	E
4	CONFLUENCE OF FORKS TO HAT CREEK	526.35	E	E	E			E	E	E	E	E	E		E		E
5	FALL RIVER	526.41	E	E	E			E	E	E	E	E	E				E
6	HAT CREEK	526.30		E				E	E	E	E	E	E			E	E
7	BAUM LAKE	526.34						E	E		E					P	E
8	MOUTH OF HAT CREEK TO SHASTA LAKE	526.	E	E	E			E	E	E	E	P	E		E	E	E
	SACRAMENTO RIVER																
9	SOURCE TO BOX CANYON RESERVOIR	525.22		E	E				E		E		E				E
10	LAKE SISKIYOU	525.22							E		E	E	E			P	E
11	BOX CANYON DAM TO SHASTA LAKE	525.2		E	E				E	E	E	E	E		E	E	E
12	SHASTA LAKE	506.10	E	E				E	E	E	E	E	E		E	E	E
13	SHASTA DAM TO COLUSA BASIN DRAIN		E	E	E		E	E	E	E	E	E	E	E	E	E	E
14	WHISKEY TOWN RESERVOIR	524.61	E	E	E			E	E		E	E	E		E		E
15	CLEAR CREEK BELOW WHISKEYTOWN RESERVOIR	524.62	E	E	E				E	E	E	E	E		E	E	E
16	COW CREEK	507.3	P	E	E			E	E	P	E		E		E	E	E
17	BATTLE CREEK	507.12		E	E			E	E	E	E	E	E		E	E	E
18	COTTONWOOD CREEK	524.3	E	E	E	P	P	P	E	E	E	E	E		E	E	E
19	ANTELOPE CREEK	509.63	E	E	E				E		E	E	E		E	E	E
20	MILL CREEK	509.42	E	E	E				E		E	E	E		E	E	E
21	THOMES CREEK	523.10		E	E			P	E		E	E	E		E	E	E
22	DEER CREEK	509.20	E	E	E				E	E	E	E	E		E	E	E
23	BIG CHICO CREEK	509.14		E	E				E	E	E	E	E		E	E	E
24	STONY CREEK	522.00		E	E				E	E	E	E	P		E	E	E
25	EAST PARK RESERVOIR	522.33							E		E	E	P		E		E
26	BLACK BUTTE RESERVOIR	522.12		E	E				E		E	E			E		E

Notes are located after the table.

SURFACE WATER BODIES AND BENEFICIAL USES

	SURFACE WATER BODIES	HYDRO UNIT NUMBER	AGRICULTURE		INDUSTRY			RECREATION		FRESHWATER HABITAT (2)		MIGRATION		SPAWNING		WILD	NAV
			MUN	AGR	PROC	IND	POW	REC-1	REC-2	WARM	COLD	MIGR	SPWN				
			MUNICIPAL AND DOMESTIC SUPPLY	IRRIGATION	STOCK WATERING	PROCESS	SERVICE SUPPLY	POWER	CONTACT	CANOEING AND RAFTING (1)	OTHER NONCONTACT	WARM	COLD	WARM (3)	COLD (4)		
	BUTTE CREEK																
27	SOURCES TO CHICO	521.30	E	E	E			E	E			E	E		E	E	E
28	BELOW CHICO, INCLUDING BUTTE SLOUGH	520.40		E	E				E	E		E	E		E	E	E
29	COLUSA BASIN DRAIN	520.21		E	E				E	E		E	P		E		E
30	COLUSA BASIN DRAIN TO EYE ("I") STREET BRIDGE	520.00	E	E					E	E	E	E	E	E	E	E	E
31	SUTTER BYPASS	520.3		E					E					E		E	E
	FEATHER RIVER																
32	LAKE ALMANOR	518.41						E	E			E	E		E		E
33	NORTH FORK, FEATHER RIVER	518.4	E					E	E	E	E		E		E		E
	MIDDLE FORK, FEATHER RIVER																
34	SOURCE TO LITTLE LAST CHANCE CREEK	518.35		E	E				E	E	E	E	E			E	E
35	FRENCHMAN RESERVOIR	518.36							E		E	P	E			E	E
36	LITTLE LAST CHANCE CREEK TO LAKE OROVILLE	518.3	E						E	E	E	E	E			E	E
37	LAKE DAVIS	518.34							E		E	P	E			E	E
38	LAKES BASIN LAKES	518.5							E		E		E			E	E
39	LAKE OROVILLE	518.12	E	E				E	E		E	E	E		E	E	E
40	FISH BARRIER DAM TO SACRAMENTO RIVER	515.	E	E					E	E	E	E	E	E	E	E	E
	YUBA RIVER																
41	SOURCES TO ENGLEBRIGHT RESERVOIR	517	E	E	E			E	E	E	E		E			E	E
42	ENCLEBRIGHT DAM TO FEATHER RIVER	515.3		E	E			E	E	E	E	E	E	E	E	E	E
43	BEAR RIVER	515.1	E	E	E			E	E	E	E	E	E	P	P	P	P
	AMERICAN RIVER																
44	NORTH FORK, SOURCE TO FOLSOM LAKE	514.5	E	E					E	E	E	P	E			E	E
45	MIDDLE FORK, SOURCE TO FOLSOM LAKE	514.4	E	E	E			E	E	E	E	P	E			E	E
46	DESOLATION VALLEY LAKES	514.4							E		E		E			E	E
	SOUTH FORK																
48	SOURCE TO PLACERVILLE	514.3	E					E	E	E	E	P	E			E	E
49	PLACERVILLE TO FOLSOM LAKE	514.32	E	E				E	E	E	E	E	E				E
50	FOLSOM LAKE	514.23	E	E			P	E	E	E	E	E	E		E		E
51	FOLSOM DAM TO SACRAMENTO RIVER	519.21	E	E			E	E	E	E	E	E	E	E	E	E	E
52	YOLO BYPASS (87)	510.		E	E				E		E	E	P	E	E	E	E
	CACHE CREEK																

Notes are located after the table.

	SURFACE WATER BODIES	HYDRO UNIT NUMBER	AGRICULTURE		INDUSTRY			RECREATION		FRESHWATER HABITAT (2)		MIGRATION		SPAWNING		WILD	NAV	
			MUN	AGR	PROC	IND	POW	REC-1	REC-2	WARM	COLD	MIGR	SPWN					
			MUNICIPAL AND DOMESTIC SUPPLY	IRRIGATION	STOCK WATERING	PROCESS	SERVICE SUPPLY	POWER	CONTACT	CANOEING AND RAFTING (1)	OTHER NONCONTACT	WARM	COLD	WARM (3)	COLD (4)			WARM (3)
53	CLEAR LAKE (a)	513.52	E	E	E				E		E	E	P			E		E
54	CLEAR LAKE TO YOLO BYPASS (d)	511/513	E	E	E	E	E		E	E	E	E	P			E	E	E
	PUTAH CREEK																	
55	LAKE BERRYESSA	512.21	E	E	E			P	E		E	E	E			E		E
56	LAKE BERRYESSA TO YOLO BYPASS	510/511	E	E	E				E	E	E	E	P			E		E
	OTHER LAKES AND RESERVOIRS IN SACRAMENTO R. BASIN 5A (65)		E	E	E	E		E	E		E	E	E			E		E
	COSUMNES RIVER																	
57	SOURCES TO NASHVILLE RESERVOIR (PROPOSED)	532.	E	E					E		E		E			E		E
58	NASHVILLE RESERVOIR (PROPOSED)	532.	P					P	P		P	P	P			P	P	P
59	SOURCE TO DELTA	531/532	E	E	E				E	E	E	E	E	E	E	E	E	E
	MOKELUMNE RIVER																	
60	SOURCES TO PARDEE RESERVOIR	532.6	E					E	E	E	E	E	E	E		E	E	E
61	PARDEE RESERVOIR (76)	532.6	E					E	E		E	E	E			E	E	E
62	CAMANCHE RESERVOIR	531.2	E	E	E				E		E	E	E			E	E	E
63	CAMANCHE RESERVOIR TO DELTA	531.2		E	E				E	E	E	E	E	E	E	E	E	E
	CALAVERAS RIVER																	
64	SOURCE TO NEW HOGAN RESERVOIR	533.							E	E	E	E	E	E		E	E	E
65	NEW HOGAN RESERVOIR	533.1							E		E	E	E	E		E	E	E
66	NEW HOGAN RESERVOIR TO DELTA	531.3	E	E	E	P	P		E	E	E	E	E	E	E	E	E	E
	OTHER LAKES AND RESERVOIRS IN HYDRO UNIT NOS. 531, 532, 533, 543, 544 (65)		E	E	E	E		E	E		E	E	E			E		E
	SAN JOAQUIN RIVER																	
67	SOURCES TO MILLERTON LAKE	540.	E	E	E			E	E	E	E	E	E					E
68	MILLERTON LAKE	540.12	P	E	E				E		E	E	P					E
69	FRIANT DAM TO MENDOTA POOL	545.	E	E	E	E			E	E	E	E	E	E	E	E	P	E
70	MENDOTA DAM TO SACK DAM	545.1	P	E	E	E			E	E	E	E		E	E	E	P	E
71	SACK DAM TO MOUTH OF MERCED RIVER	535.7	P	E	E	E			E	E	E	E		E	E	E	P	E
	FRESNO RIVER																	
72	SOURCE TO HIDDEN RESERVOIR A/	539.31	E	E	E				E		E	E	E					E
73	HIDDEN RESERVOIR A/	539.32	E		E				E		E	E						E
74	HIDDEN RESERVOIR TO SAN JOAQUIN RIVER	545.	P	E	E				E	P	E	E						E
	CHOWCHILLA RIVER																	

Notes are located after the table.

SURFACE WATER BODIES AND BENEFICIAL USES

	SURFACE WATER BODIES	HYDRO UNIT NUMBER	AGRICULTURE		INDUSTRY			RECREATION		FRESHWATER HABITAT (2)		MIGRATION		SPAWNING		WILD	NAV	
			MUN	AGR	PROC	IND	POW	REC-1	REC-2	WARM	COLD	MIGR	SPWN					
			MUNICIPAL AND DOMESTIC SUPPLY	IRRIGATION	STOCK WATERING	PROCESS	SERVICE SUPPLY	POWER	CONTACT	CANOEING AND RAFTING (1)	OTHER NONCONTACT	WARM	COLD	WARM (3)	COLD (4)			WARM (3)
75	SOURCE TO BUCHANAN RESERVOIR B/	539.11							E		E	E	E				E	
76	BUCHANAN RESERVOIR B/	539.12	E	E	E				E		E	E	E				E	
77	BUCHANAN RESERVOIR TO SAN JOAQUIN RIVER	535/545	P	E		E			E	P	E	E					E	
	MERCED RIVER																	
78	SOURCE TO McCLURE LAKE	537.	P	E				E	E	E	E	E	E				E	
79	McCLURE LAKE	537.22	P	E				E	E		E	E	E				E	
80	McSWAIN RESERVOIR	537.1	P	E				E	E		E	E	E				E	
81	McSWAIN RESERVOIR TO SAN JOAQUIN RIVER	535.	E		E	E	E	E	E	E	E	E	E	E	E	E	E	E
82	YOSEMITE LAKE	535.9							E		E	E	E				E	
83	MOUTH OF MERCED RIVER TO VERNALIS	535/541	P	E	E	E			E	E	E	E		E	E	E	E	E
	TUOLUMNE RIVER																	
84	SOURCE TO (NEW) DON PEDRO RESERVOIR	536.	E	E	E			E	E	E	E	E	E				E	
85	NEW DON PEDRO RESERVOIR	536.32	P					E	E		E	E	E				E	
86	NEW DON PEDRO RESERVOIR TO SAN JOAQUIN RIVER	535.	P	E	E				E	E	E	E	E	E	E	E	E	E
	STANISLAUS RIVER																	
87	SOURCE TO NEW MELONES RESERVOIR (PROPOSED)	534.	E	E	E			E	E	E	E	E	E				E	
88	NEW MELONES RESERVOIR	534.21	E	E	E			E	E		E	E	E				E	
89	TULLOCH RESERVOIR	534.22	P	E	E			E	E		E	E					E	
90	GOODWIN DAM TO SAN JOAQUIN RIVER	535.	P	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
91	SAN LUIS RESERVOIR	542.32	E	E	E		E	E	E		E	E					E	
92	O'NEILL RESERVOIR	541.2	E	E	E				E		E	E						
93	OTHER LAKES AND RESERVOIRS IN SAN JOAQUIN R. BASIN (EXCLUDING HYDRO UNIT NOS. 531-533, 543, 544) (65)		E					E	E		E	E	E			E	E	
94	CALIFORNIA AQUEDUCT	541.	E	E	E	E	E	E	E		E						E	
95	DELTA-MENDOTA CANAL	541/543	E	E	E				E		E	E					E	
	GRASSLAND WATERSHED (a)	541.2																
96	MUD SLOUGH (NORTH)			L (b)	E				E		E	E			E		E	
97	SALT SLOUGH			E	E				E		E	E			E		E	
98	WETLAND WATER SUPPLY CHANNELS (499)			L (b)	E						L (c)						E	
C	SACRAMENTO SAN JOAQUIN DELTA (87, 98)	544.	E	E	E	E	E		E		E	E	E	E	E	E	E	E

Notes are located after the table.

SURFACE WATER BODIES AND BENEFICIAL USES

LEGEND

E = EXISTING BENEFICIAL USES

P = POTENTIAL BENEFICIAL USES

L = EXISTING LIMITED BENEFICIAL USE

NOTE:

Surface waters with the beneficial uses of Groundwater Recharge (GWR), Freshwater Replenishment (FRSH), and Preservation of Rare and Endangered Species (RARE) have not been identified in this plan. Surface waters of the Sacramento and San Joaquin River Basins falling within these beneficial use categories will be identified in the future as part of the continuous planning process to be conducted by the State Water Resources Control Board.

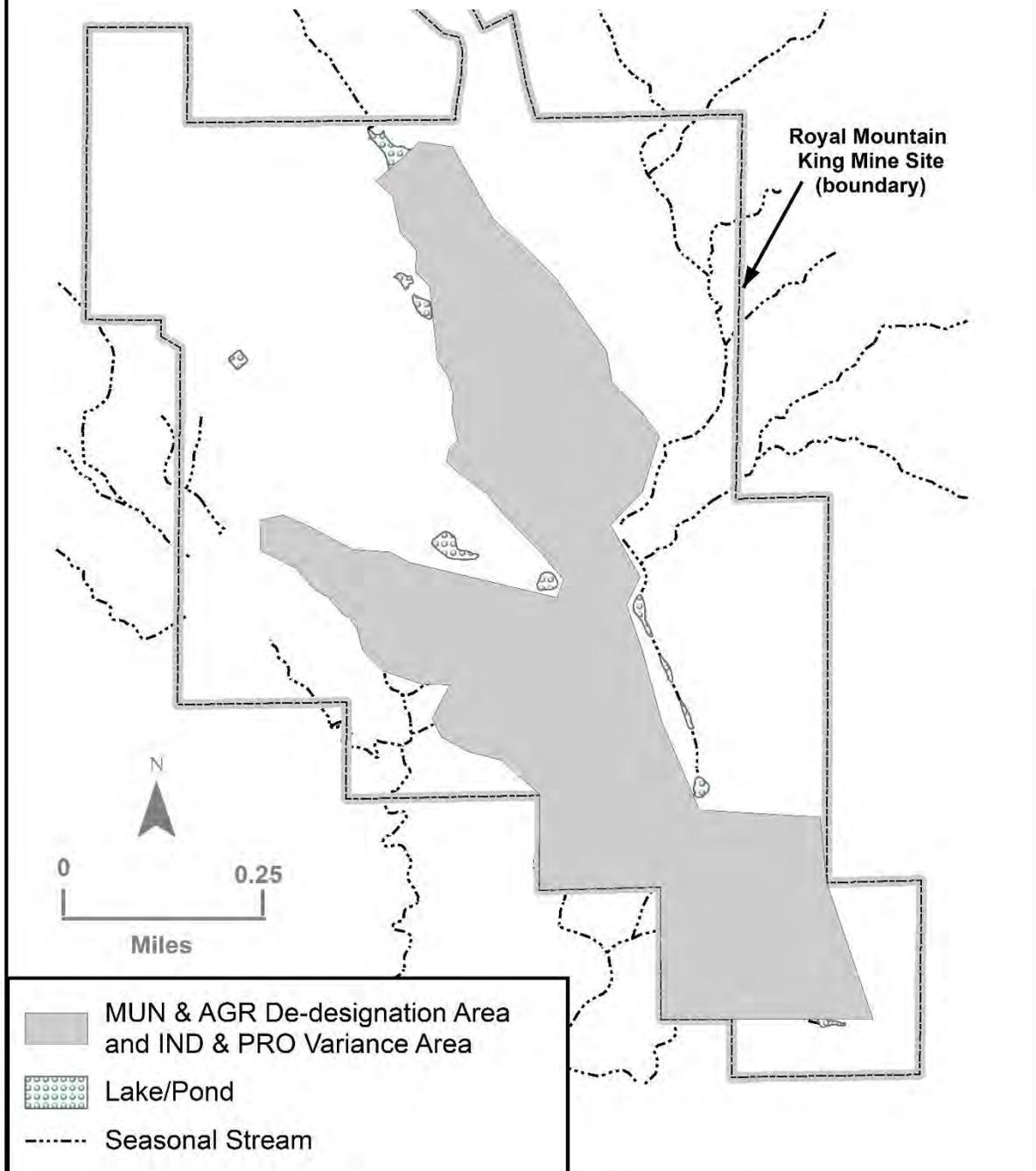
- (1) Shown for streams and rivers only with the implication that certain flows are required for this beneficial use.
- (2) Resident does not include anadromous. Any Segments with both COLD and WARM beneficial use designations will be considered COLD water bodies for the application of water quality objectives.
- (3) Striped bass, sturgeon, and shad.
- (4) Salmon and steelhead
- (~~65~~) The indicated beneficial uses are to be protected for all waters except in specific cases where evidence indicates the appropriateness of additional or alternative beneficial use designations.
- (~~76~~) Sport fishing is the only recreation activity permitted.
- (~~87~~) Beneficial uses vary throughout the Delta and will be evaluated on a case-by-case basis. COMM is a designated beneficial use for the Sacramento San Joaquin Delta and Yolo Bypass waterways listed in Appendix 43 and not any tributaries to the listed waterways or portions of the listed waterways outside of the legal Delta boundary unless specifically designated.
- (~~98~~) Per State Water Board Resolution No. 90-28, Marsh Creek and Marsh Creek Reservoir in Contra Costa County are assigned the following beneficial uses: REC1 and REC2 (potential uses), WARM, WILD and RARE. COMM is a designated beneficial use for Marsh Creek and its tributaries listed in Appendix 43 within the legal Delta boundary.
- (~~109~~) Wetland water supply channels for which beneficial uses are designated are defined in Appendix 40

A/ Hidden Reservoir = Hensley Lake

B/ Buchanan Reservoir = Eastman Lake

- (a) The following beneficial uses EXIST in addition to those noted in Table ~~H2~~-1
 - Mud Slough (north): COMM and SHELL
 - Salt Slough: COMM, BIOL, and SHELL
 - Wetland Water Supply Channels: BIOL
 - Clear Lake: COMM
- (b) Elevated natural salt and boron concentrations may limit this use to irrigation of salt and boron tolerant crops. Intermittent low flow conditions may also limit this use.
- (c) Wetland channels can sustain aquatic life, but due to fluctuating flow regimes and habitat limitations, may not be suitable for nesting and/or propagation.
- (d) In addition to the beneficial uses noted in Table ~~H2~~-1, COMM exists for Cache Creek from Clear Lake to Yolo Bypass and in the following tributaries only: North Fork Cache Creek and Bear Creek.

**FIGURE H2-2: ROYAL MOUNTAIN KING MINE SITE
GROUNDWATER DE-DESIGNATION AND VARIANCE**



III.3 WATER QUALITY OBJECTIVES

The Porter-Cologne Water Quality Control Act defines water quality objectives as "...the limits or levels of water quality constituents or characteristics which are established for the reasonable protection of beneficial uses of water or the prevention of nuisance within a specific area" [Water Code Section 13050(h)]. It also requires the Regional Water Board to establish water quality objectives, while acknowledging that it is possible for water quality to be changed to some degree without unreasonably affecting beneficial uses. In establishing water quality objectives, the Regional Water Board must consider, among other things, the following factors:

- Past, present, and probable future beneficial uses;
- Environmental characteristics of the hydrographic unit under consideration, including the quality of water available thereto;
- Water quality conditions that could reasonably be achieved through the coordinated control of all factors which affect water quality in the area;
- Economic considerations;
- The need for developing housing within the region;
- The need to develop and use recycled water. (Water Code Section 13241)

The Federal Clean Water Act requires a state to submit for approval of the Administrator of the U.S. Environmental Protection Agency (USEPA) all new or revised water quality standards which are established for surface and ocean waters. As noted earlier, California water quality standards consist of both beneficial uses (identified in Chapter H2) and the water quality objectives based on those uses.

There are **seven important points** that apply to water quality objectives.

The **first point** is that water quality objectives can be revised through the basin plan amendment process. Objectives may apply region-wide or be specific to individual water bodies or parts of water bodies. Site-specific objectives may be developed whenever the Regional Water Board believes they are appropriate. As indicated previously, federal regulations call for each state to review its water quality standards at least every three years. These Triennial Reviews provide one opportunity to evaluate changing water quality objectives, because they begin with an identification of potential and actual water quality problems, i.e., beneficial use impairments. Since impairments may be associated with water quality objectives being exceeded, the Regional Water Board uses the results of the Triennial Review to implement actions to assess, remedy, monitor, or otherwise address the impairments, as appropriate, in order to achieve objectives and protect beneficial uses. If a problem is found to occur because, for example, a water quality objective is too weak to protect beneficial uses, the Basin Plan should be amended to make the objective more stringent. (Better enforcement of the water quality objectives or adoption of certain policies or redirection of staff and resources may also be proper responses to water quality problems. See the Implementation chapter for further discussion.)

Changes to the objectives can also occur because of new scientific information on the effects of specific constituents. A major source of information is the USEPA which develops data on the effects of chemical and other constituent concentrations on particular aquatic species and human health. Other information sources for data on protection of beneficial uses include the National Academy of Science which has published data on bioaccumulation and the Federal Food and Drug Administration which has issued criteria for unacceptable levels of chemicals in fish and shellfish used for human consumption. The Regional Water Board may make use of those and other state or federal agency information sources in assessing the need for new water quality objectives.

The **second point** is that achievement of the objectives depends on applying them to controllable water quality factors. Controllable water quality factors are those actions, conditions, or circumstances resulting from human

activities that may influence the quality of the waters of the State, that are subject to the authority of the State Water Board or the Regional Water Board, and that may be reasonably controlled. Controllable factors are not allowed to cause further degradation of water quality in instances where uncontrollable factors have already resulted in water quality objectives being exceeded. The Regional Water Board recognizes that man made changes that alter flow regimes can affect water quality and impact beneficial uses.

The **third point** is that objectives are to be achieved primarily through the adoption of waste discharge requirements (including permits) and cleanup and abatement orders. When adopting requirements and ordering actions, the Regional Water Board considers the potential impact on beneficial uses within the area of influence of the discharge, the existing quality of receiving waters, and the appropriate water quality objectives. It can then make a finding as to the beneficial uses to be protected within the area of influence of the discharge and establish waste discharge requirements to protect those uses and to meet water quality objectives. The objectives contained in this plan, and any State or Federally promulgated objectives applicable to the basins covered by the plan, are intended to govern the levels of constituents and characteristics in the main water mass unless otherwise designated. They may not apply at or in the immediate vicinity of effluent discharges, but at the edge of the mixing zone if areas of dilution or criteria for diffusion or dispersion are defined in the waste discharge specifications.

The **fourth point** is that the Regional Water Board recognizes that immediate compliance with water quality objectives adopted by the Regional Water Board or the State Water Board, or with water quality criteria adopted by the USEPA, may not be feasible in all circumstances. Where the Regional Water Board determines it is infeasible for a discharger to comply immediately with such objectives or criteria, compliance shall be achieved in the shortest practicable period of time (determined by the Regional Water Board), not to exceed ten years after the adoption of applicable objectives or criteria. This policy shall apply to water quality objectives and water quality criteria adopted after the effective date of this amendment to the Basin Plan [25 September 1995]. The Regional Water Board will establish compliance schedules in NPDES permits consistent with the provisions of the State Water Board's Compliance Schedule Policy (Resolution 2008-0025). Time schedules in waste discharge requirements are established consistent with Water Code Section 13263.

The **fifth point** is that in cases where water quality objectives are formulated to preserve historic conditions, there may be insufficient data to determine completely the temporal and hydrologic variability representative of historic water quality. When violations of such objectives occur, the Regional Water Board judges the reasonableness of achieving those objectives through regulation of the controllable factors in the areas of concern.

The **sixth point** is that the State Water Board adopts policies and plans for water quality control which can specify water quality objectives or affect their implementation. Chief among the State Water Board's policies for water quality control is State Water Board Resolution No. 68-16 (Statement of Policy with Respect to Maintaining High Quality of Waters in California). It requires that wherever the existing quality of surface or ground waters is better than the objectives established for those waters in a basin plan, the existing quality will be maintained unless as otherwise provided by Resolution No. 68-16 or any revisions thereto. This policy and others establish general objectives. The State Water Board's water quality control plans applicable to the Sacramento and San Joaquin River Basins are the Thermal Plan and Water Quality Control Plan for Salinity. The Thermal Plan and its water quality objectives are in the Appendix. ~~The Water Quality Control Plan for Salinity water quality objectives are listed as Table III-5.~~ The State Water Board's plans and policies that the Basin Plan must conform to are addressed in Chapter ~~IV~~4, Implementation.

The **seventh point** is that water quality objectives may be in numerical or narrative form. The enumerated milligram-per-liter (mg/l) limit for copper is an example of a numerical objective; the objective for color is an example of a narrative form.

Information on the application of water quality objectives is contained in the section, *Policy for Application of Water Quality Objectives*, in Chapter ~~IV~~4.

3.1 WATER QUALITY OBJECTIVES FOR INLAND SURFACE WATERS

The objectives below are presented by categories which, like the Beneficial Uses of Chapter H2, were standardized for uniformity among the Regional Water Boards. The water quality objectives apply to all surface waters in the Sacramento and San Joaquin River Basins, including the Delta, or as noted. (*The legal boundary of the Delta is contained in Section 12220 of the Water Code and identified in Figure H2-1.*) The numbers in parentheses following specific water bodies are keyed to Figure H2-1.

3.1.1 Bacteria

In waters designated for contact recreation (REC-1), the fecal coliform concentration based on a minimum of not less than five samples for any 30-day period shall not exceed a geometric mean of 200/100 ml, nor shall more than ten percent of the total number of samples taken during any 30-day period exceed 400/100 ml.

For Folsom Lake (50), the fecal coliform concentration based on a minimum of not less than five samples for any 30-day period, shall not exceed a geometric mean of 100/100 ml, nor shall more than ten percent of the total number of samples taken during any 30-day period exceed 200/100 ml.

3.1.2 Biostimulatory Substances

Water shall not contain biostimulatory substances which promote aquatic growths in concentrations that cause nuisance or adversely affect beneficial uses.

3.1.3 Chemical Constituents

Waters shall not contain chemical constituents in concentrations that adversely affect beneficial uses.*

The chemical constituent objectives in Tables H3-1 and H3-1A-2 apply to the water bodies specified. Metal objectives in the table are dissolved concentrations.

Selenium, molybdenum, and boron objectives are total concentrations. Water quality objectives are also contained in the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta, adopted by the State Water Board in May 1995 and revised in 2006.

At a minimum, water designated for use as domestic or municipal supply (MUN) shall not contain concentrations of chemical constituents in excess of the maximum contaminant levels (MCLs) specified in the following provisions of Title 22 of the California Code of Regulations, which are incorporated by reference into this plan: Tables 64431-A (Inorganic Chemicals) and 64431-B (Fluoride) of Section 64431, Table 64444-A (Organic Chemicals) of Section 64444, and Tables 64449-A (Secondary Maximum Contaminant Levels-Consumer Acceptance Limits) and 64449-B (Secondary Maximum Contaminant Levels-Ranges) of Section 64449. This incorporation-by-reference is prospective, including future changes to the incorporated provisions as the changes take effect. At a minimum, water designated for use as domestic or municipal supply (MUN) shall not contain lead in excess of 0.015 mg/l. The Regional Water Board acknowledges that specific treatment requirements are imposed by state and federal drinking water regulations on the consumption of surface waters under specific circumstances. To protect all beneficial uses the Regional Water Board may apply limits more stringent than MCLs.

**This includes drinking water chemical constituents of concern, such as organic carbon.*

**TABLE H3-1
TRACE ELEMENT WATER QUALITY OBJECTIVES**

<u>CONSTITUENT</u>	<u>MAXIMUM CONCENTRATION</u> ^a (mg/l)	<u>APPLICABLE WATER BODIES</u>
Arsenic	0.01	Sacramento River from Keswick Dam to the I Street Bridge at City of Sacramento (13, 30); American River from Folsom Dam to the Sacramento River (51); Folsom Lake (50); and the Sacramento-San Joaquin Delta.
Barium	0.1	As noted above for Arsenic.
Boron	2.0 (15 March through 15 September) 0.8 (monthly mean, 15 March through 15 September)	San Joaquin River, mouth of the Merced River to Vernalis
	2.6 (16 September through 14 March) 1.0 (monthly mean, 16 September through 14 March)	
	1.3 (monthly mean, critical year ^b)	
	5.8 2.0 (monthly mean, 15 March through 15 September)	
Cadmium	0.00022 ^c	Sacramento River and its tributaries above State Hwy 32 bridge at Hamilton City
Copper	0.0056 ^c	As noted above for Cadmium.
	0.01 ^d	As noted above for Arsenic. ^d
Cyanide	0.01	As noted above for Arsenic.
Iron	0.3	As noted above for Arsenic.
Manganese	0.05	As noted above for Arsenic.
Molybdenum	0.015 0.010 (monthly mean)	San Joaquin River, mouth of the Merced River to Vernalis
	0.050 0.019 (monthly mean)	
	0.020 0.005 (4-day average)	
Selenium	0.012 0.005 (4-day average)	San Joaquin River, mouth of the Merced River to Vernalis
	0.020 0.005 (4-day average)	
	0.020 0.002 (monthly mean)	
Zinc	0.1 ^d	As noted above for Arsenic. ^d
	0.016 ^c	As noted above for Cadmium.

a Metal objectives in this table are dissolved concentrations. Selenium, molybdenum, and boron objectives are total concentrations.

b See Table IV4-3.

**TABLE H3-1
TRACE ELEMENT WATER QUALITY OBJECTIVES**

- c The effects of these concentrations were measured by exposing test organisms to dissolved aqueous solutions of 40 mg/l hardness that had been filtered through a 0.45 micron membrane filter. Where deviations from 40 mg/l of water hardness occur, the objectives, in mg/l, shall be determined using the following formulas:

$$C_u = e^{(0.905)(\ln \text{hardness}) - 1.612} \times 10^{-3}$$

$$Z_n = e^{(0.830)(\ln \text{hardness}) - 0.289} \times 10^{-3}$$

$$C_d = e^{(1.160)(\ln \text{hardness}) - 5.777} \times 10^{-3}$$

- d Does not apply to Sacramento River above State Hwy. 32 bridge at Hamilton City. See relevant objectives (c) above.

**TABLE H3-1A2
ORGANIC CHEMICAL WATER QUALITY OBJECTIVES**

<u>CONSTITUENT</u>	<u>MAXIMUM CONCENTRATION (µg/l)</u>	<u>APPLICABLE WATER BODIES</u>
Chlorodibromomethane (DCBM)	4.9	New Alamo Creek, from Old Alamo Creek to Ulatis Creek; Ulatis Creek, from New Alamo Creek to Cache Slough
Dichlorobromomethane (DCBM)	16	New Alamo Creek, from Old Alamo Creek to Ulatis Creek; Ulatis Creek, from New Alamo Creek to Cache Slough
Chloroform	46	New Alamo Creek, from Old Alamo Creek to Ulatis Creek; Ulatis Creek, from New Alamo Creek to Cache Slough

3.1.4 Cryptosporidium and Giardia

Waters shall not contain *Cryptosporidium* and *Giardia* in concentrations that adversely affect the public water system component¹ of the MUN beneficial use. This narrative water quality objective for *Cryptosporidium* and *Giardia* shall be applied within the Sacramento-San Joaquin Delta and its tributaries below the first major dams (shown in Figure A44-1) and should be implemented as specified in [Section IV Chapter 4](#) of the Basin Plan. Compliance with this objective will be assessed at existing and new public water system intakes.

¹ Public water system as defined in Health and Safety Code, section 116275, subdivision (h)

3.1.5 Color

Water shall be free of discoloration that causes nuisance or adversely affects beneficial uses.

3.1.6 Dissolved Oxygen

Within the legal boundaries of the Delta, the dissolved oxygen concentration shall not be reduced below:

7.0 mg/l in the Sacramento River (below the I Street Bridge) and in all Delta waters west of the Antioch Bridge; 6.0 mg/l in the San Joaquin River (between Turner Cut and Stockton, 1 September through 30 November); and 5.0 mg/l in all other Delta waters except for those bodies of water which are constructed for special purposes and from which fish have been excluded or where the fishery is not important as a beneficial use.

For surface water bodies outside the legal boundaries of the Delta, the monthly median of the mean daily dissolved oxygen (DO) concentration shall not fall below 85 percent of saturation in the main water mass, and the 95 percentile concentration shall not fall below 75 percent of saturation. The dissolved oxygen concentrations shall not be reduced below the following minimum levels at any time:

- Waters designated WARM 5.0 mg/l
- Waters designated COLD 7.0 mg/l
- Waters designated SPWN 7.0 mg/l

The more stringent objectives in Table [HH-23-3](#) apply to specific water bodies in the Sacramento and San Joaquin River Basins:

**TABLE [HH-23-3](#)
SPECIFIC DISSOLVED OXYGEN WATER QUALITY OBJECTIVES**

<u>AMOUNT</u>	<u>TIME</u>	<u>PLACE</u>
9.0 mg/l *	1 June to 31 August	Sacramento River from Keswick Dam to Hamilton City (13)
8.0 mg/l	1 September to 31 May	Feather River from Fish Barrier Dam at Oroville to Honcut Creek (40)
8.0 mg/l	all year	Merced River from Cressy to New Exchequer Dam (78)
8.0 mg/l	15 October to 15 June	Tuolumne River from Waterford to La Grange (86)
* When natural conditions lower dissolved oxygen below this level, the concentrations shall be maintained at or above 95 percent of saturation.		

3.1.6 Floating Material

Water shall not contain floating material in amounts that cause nuisance or adversely affect beneficial uses.

3.1.7 Mercury

For Sulphur Creek (Colusa County), waters shall be maintained free of mercury from anthropogenic sources such that beneficial uses are not adversely affected. During low flow conditions, defined as flows less than 3 cfs, the instantaneous maximum total mercury concentration shall not exceed 1,800 ng/l. During high flow conditions, defined as flows greater than 3 cfs, the instantaneous maximum ratio of mercury to total suspended solids shall not exceed 35 mg/kg. Both objectives apply at the mouth of Sulphur Creek.

3.1.8 Methylmercury

For Clear Lake (53), the methylmercury concentration in fish tissue shall not exceed 0.09 and 0.19 mg methylmercury/kg wet weight of tissue in trophic level 3 and 4 fish, respectively.

For Cache Creek (Clear Lake to Yolo Bypass) (54), North Fork Cache Creek, and Bear Creek (tributary to Cache Creek), the average methylmercury concentration shall not exceed 0.12 and 0.23 mg methylmercury/ kg wet weight of muscle tissue in trophic level 3 and 4 fish, respectively. For Harley Gulch (tributary to Cache Creek), the average methylmercury concentration shall not exceed 0.05 mg methylmercury/ kg wet weight in whole, trophic level 2 and 3 fish.

For the Sacramento-San Joaquin Delta and Yolo Bypass waterways listed in Appendix 43, the average methylmercury concentrations shall not exceed 0.08 and 0.24 mg methylmercury/kg, wet weight, in muscle tissue of

trophic level 3 and 4 fish, respectively (150-500 mm total length). The average methylmercury concentrations shall not exceed 0.03 mg methylmercury/kg, wet weight, in whole fish less than 50 mm in length.

Compliance with the methylmercury fish tissue objectives shall be determined by analysis of fish tissue as described in Chapter ~~V~~⁵, Surveillance and Monitoring.

3.1.9 Oil and Grease

Waters shall not contain oils, greases, waxes, or other materials in concentrations that cause nuisance, result in a visible film or coating on the surface of the water or on objects in the water, or otherwise adversely affect beneficial uses.

3.1.10 pH

The pH shall not be depressed below 6.5 nor raised above 8.5.

The following site-specific objectives replace the general pH objective, above, in its entirety for the listed water bodies.

For Goose Lake (2), pH shall be less than 9.5 and greater than 7.5 at all times.

3.1.11 Pesticides

- No individual pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses.
- Discharges shall not result in pesticide concentrations in bottom sediments or aquatic life that adversely affect beneficial uses.
- Total identifiable persistent chlorinated hydrocarbon pesticides shall not be present in the water column at concentrations detectable within the accuracy of analytical methods approved by the Environmental Protection Agency or the Executive Officer.
- Pesticide concentrations shall not exceed those allowable by applicable antidegradation policies (see State Water Resources Control Board Resolution No. 68-16 and 40 C.F.R. Section 131.12.).
- Pesticide concentrations shall not exceed the lowest levels technically and economically achievable.
- Waters designated for use as domestic or municipal supply (MUN) shall not contain concentrations of pesticides in excess of the Maximum Contaminant Levels set forth in California Code of Regulations, Title 22, Division 4, Chapter 15.
- Waters designated for use as domestic or municipal supply (MUN) shall not contain concentrations of thiobencarb in excess of 1.0 µg/l.

Pesticide concentrations shall not exceed the levels identified in Table ~~III-2A~~³⁻⁴. Where more than one objective may be applicable, the most stringent objective applies.

For the purposes of this objective, the term pesticide shall include: (1) any substance, or mixture of substances which is intended to be used for defoliating plants, regulating plant growth, or for preventing, destroying, repelling, or mitigating any pest, which may infest or be detrimental to vegetation, man, animals, or households, or be present in any agricultural or nonagricultural environment whatsoever, or (2) any spray adjuvant, or (3) any breakdown

products of these materials that threaten beneficial uses. Note that discharges of "inert" ingredients included in pesticide formulations must comply with all applicable water quality objectives.

TABLE ~~III-2A3-4~~
SPECIFIC PESTICIDE OBJECTIVES

<u>PESTICIDE</u>	<u>MAXIMUM CONCENTRATION AND AVERAGING PERIOD</u>	<u>APPLICABLE WATER BODIES</u>
Chlorpyrifos	0.025 µ g/L ; 1-hour average (acute) 0.015 µ g/L ; 4-day average (chronic) Not to be exceeded more than once in a three year period.	<p>San Joaquin River from Mendota Dam to Vernalis (Reaches include Mendota Dam to Sack Dam (70), Sack Dam to Mouth of Merced River (71), Mouth of Merced River to Vernalis (83)), Delta Waterways listed in Appendix 42. Sacramento River from Shasta Dam to Colusa Basin Drain (13) and the Sacramento River from the Colusa Basin Drain to I Street Bridge (30). Feather River from Fish Barrier Dam to Sacramento River (40).</p> <p>Bear Creek (San Joaquin and Calaveras Counties), Bear River (43), Lower (below Camp Far West Reservoir), Berenda Creek (Madera County), Berenda Slough (Madera County), Colusa Basin Drain (29), Coon Creek, Lower (Sutter County), Deadman Creek (Merced County), Del Puerto Creek, Dry Creek (tributary to Tuolumne River at Modesto, E Stanislaus County), Duck Creek (San Joaquin County), French Camp Slough, Gilsizer Slough, Ingram Creek, Jack Slough, Live Oak Slough, Lone Tree Creek, Main Drainage Canal (Butte County), Merced River, Lower (McSwain Reservoir to San Joaquin River) (81), Mormon Slough (from Stockton Diverting Canal to Bellota Weir), Morrison Slough (Sutter County), Orestimba Creek, Pixley Slough (San Joaquin County), Salt Slough, Spring Creek (Colusa County), Stanislaus River, Lower (Goodwin Dam to San Joaquin River) (90), Tuolumne River, Lower (Don Pedro Dam to San Joaquin River) (86), Ulati Creek (Solano County), Wadsworth Canal, Westley Wasteway (Stanislaus County), Winters Canal (Yolo County), Yankee Slough (Placer and Sutter Counties)</p> <p>Waters with designated or existing¹ WARM and/or COLD beneficial uses that are not upstream of the major dams in Table III-2B3-5.</p>
Diazinon	0.16 µ g/L ; 1-hour average (acute) 0.10 µ g/L ; 4-day average (chronic) Not to be exceeded more than once in a three year period.	As noted above for chlorpyrifos

¹ Existing as defined in Title 40 of the Code of Federal Regulations, section 131.3(e)

TABLE ~~III-2B3-5~~**MAJOR DAMS DEMARKING THE UPSTREAM EXTENT OF THE WATER BODIES WITH DIAZINON AND CHLORPYRIFOS WATER QUALITY OBJECTIVES**

Dam	Associated Reservoir	River System
Monticello Dam	Lake Berryessa (55)	Putah Creek
Black Butte Dam	Black Butte Reservoir (26)	Stony Creek
Camanche Dam	Camanche Reservoir (62)	Mokelumne River
Camp Far West Dam	Camp Far West Reservoir	Bear River
Cache Creek Dam	Clear Lake (53)	Cache Creek
New Don Pedro Dam	Don Pedro Reservoir (85)	Tuolumne River
Buchanan Dam	Eastman Lake (Buchanan Reservoir) (76)	Chowchilla River
Folsom Dam	Folsom Lake (50)	American River
Englebright Dam	Harry L. Englebright Reservoir	Yuba River
Hidden Dam	Hensley Lake (Hidden Reservoir) (73)	Fresno River
Keswick Dam	Keswick Reservoir	Sacramento River
New Exchequer Dam	McClure Lake (Exchequer Reservoir) (79)	Merced River
Friant Dam	Millerton Lake (68)	San Joaquin River
New Hogan Dam	New Hogan Reservoir (65)	Calaveras River
Oroville Dam	Lake Oroville (39)	Feather River
San Luis Dam	San Luis Reservoir (91)	-
Scotts Flat Dam	Scotts Flat Reservoir	Deer Creek
Goodwin Dam	Tulloch Reservoir (89)	Stanislaus River
Whiskeytown Dam	Whiskeytown Reservoir (14)	Clear Creek

3.1.12 Radioactivity

Radionuclides shall not be present in concentrations that are harmful to human, plant, animal or aquatic life nor that result in the accumulation of radionuclides in the food web to an extent that presents a hazard to human, plant, animal or aquatic life.

At a minimum, waters designated for use as domestic or municipal supply (MUN) shall not contain concentrations of radionuclides in excess of the maximum contaminant levels (MCLs) specified in Table 64442 of Section 64442 and Table 64443 of Section 64443 of Title 22 of the California Code of Regulations, which are incorporated by reference into this plan. This incorporation-by-reference is prospective, including future changes to the incorporated provisions as the changes take effect.

3.1.13 Salinity

3.1.13.1 Electrical Conductivity and Total Dissolved Solids--Special Cases in the Sacramento and San Joaquin River Basins Other Than the Delta

The objectives for electrical conductivity and total dissolved solids in Table ~~HH-33-6~~ apply to the water bodies specified. To the extent of any conflict with the general Chemical Constituents water quality objectives, the more stringent shall apply.

**TABLE ~~HH-33-6~~
ELECTRICAL CONDUCTIVITY AND TOTAL DISSOLVED SOLIDS**

<u>PARAMETER</u>	<u>WATER QUALITY OBJECTIVES</u>	<u>APPLICABLE WATER BODIES</u>
Electrical Conductivity (at 25°C)	Shall not exceed 230 micromhos/cm (50 percentile) or 235 micromhos/cm (90 percentile) at Knights Landing above Colusa Basin Drain; or 240 micromhos/cm (50 percentile) or 340 micromhos/cm (90 percentile) at I Street Bridge, based upon previous 10 years of record.	Sacramento River (13, 30)
	Shall not exceed 150 micromhos/cm (90 percentile) in well-mixed waters of the Feather River.	North Fork of the Feather River (33); Middle Fork of the Feather River from Little Last Chance Creek to Lake Oroville (36); Feather River from the Fish Barrier Dam at Oroville to Sacramento River (40)
	Shall not exceed 150 micromhos/cm from Friant Dam to Gravelly Ford (90 percentile).	San Joaquin River, Friant Dam to Mendota Pool (69)
Total Dissolved Solids	Shall not exceed 125 mg/l (90 percentile)	North Fork of the American River from the source to Folsom Lake (44); Middle Fork of the American River from the source to Folsom Lake (45); South Fork of the American River from the source to Folsom Lake (48, 49); American River from Folsom Dam to Sacramento River (51)
	Shall not exceed 100 mg/l (90 percentile)	Folsom Lake (50)
	Shall not exceed 1,300,000 tons	Goose Lake (2)

3.1.13.2 Electrical Conductivity, Total Dissolved Solids, and Chloride--Delta Waters

See the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary, 2006, for salinity objectives applicable in the Delta.

3.1.14 Sediment

The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses.

3.1.15 Settleable Material

Waters shall not contain substances in concentrations that result in the deposition of material that causes nuisance or adversely affects beneficial uses.

3.1.16 Suspended Material

Waters shall not contain suspended material in concentrations that cause nuisance or adversely affect beneficial uses.

3.1.17 Tastes and Odors

Water shall not contain taste- or odor-producing substances in concentrations that impart undesirable tastes or odors to domestic or municipal water supplies or to fish flesh or other edible products of aquatic origin, or that cause nuisance, or otherwise adversely affect beneficial uses.

3.1.18 Temperature

The natural receiving water temperature of intrastate waters shall not be altered unless it can be demonstrated to the satisfaction of the Regional Water Board that such alteration in temperature does not adversely affect beneficial uses.

Temperature objectives for COLD interstate waters, WARM interstate waters, and Enclosed Bays and Estuaries are as specified in the *Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays of California* including any revisions. There are also temperature objectives for the Delta in the State Water Board's *2006 Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary*.

At no time or place shall the temperature of COLD or WARM intrastate waters be increased more than 5°F above natural receiving water temperature.

Temperature changes due to controllable factors shall be limited for the water bodies specified as described in Table [III-43-7](#). To the extent of any conflict with the above, the more stringent objective applies.

In determining compliance with the water quality objectives for temperature, appropriate averaging periods may be applied provided that beneficial uses will be fully protected.

**TABLE [III-43-7](#)
SPECIFIC TEMPERATURE OBJECTIVES**

<u>DATES</u>	<u>APPLICABLE WATER BODY</u>
From 1 December to 15 March, the maximum temperature shall be 55°F.	Sacramento River from its source to Box Canyon Reservoir (9); Sacramento River from Box Canyon Dam to Shasta Lake (11)
From 16 March to 15 April, the maximum temperature shall be 60°F.	
From 16 April to 15 May, the maximum temperature shall be 65°F.	
From 16 May to 15 October, the maximum temperature shall be 70°F.	
From 16 October to 15 November, the maximum temperature shall be 65°F.	
From 16 November to 30 November, the maximum temperature shall be 60°F.	

TABLE ~~III-43-7~~
SPECIFIC TEMPERATURE OBJECTIVES

<u>DATES</u>	<u>APPLICABLE WATER BODY</u>
The temperature in the epilimnion shall be less than or equal to 75°F or mean daily ambient air temperature, whichever is greater.	Lake Siskiyou (10)
The temperature shall not be elevated above 56°F in the reach from Keswick Dam to Hamilton City nor above 68°F in the reach from Hamilton City to the I Street Bridge during periods when temperature increases will be detrimental to the fishery.	Sacramento River from Shasta Dam to I Street Bridge (13, 30)

The following site-specific objective replaces the general temperature objective, above, in its entirety for the listed water body:

For Deer Creek, source to Cosumnes River, temperature changes due to controllable factors shall not cause creek temperatures to exceed the objectives specified in Table ~~III-4A3-8~~.

TABLE ~~III-4A3-8~~
DEER CREEK TEMPERATURE OBJECTIVES

Date	Daily Maximum (°F) ^a	Monthly Average (°F) ^b
January and February	63	58
March	65	60
April	71	64
May	77	69
June	81	74
July through Sept.	81	77
October	77	72
November	73	65
December	65	58

a Maximum not to be exceeded.

b Defined as a calendar month average

3.1.19 Toxicity

All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life. This objective applies regardless of whether the toxicity is caused by a single substance or the interactive effect of multiple substances. Compliance with this objective will be determined by analyses of indicator organisms, species diversity, population density, growth anomalies, and biotoxicity tests of appropriate duration or other methods as specified by the Regional Water Board.

The Regional Water Board will also consider all material and relevant information submitted by the discharger and other interested parties and numerical criteria and guidelines for toxic substances developed by the State Water Board, the California Office of Environmental Health Hazard Assessment, the State Water Board Division of Drinking Water Programs, the U.S. Food and Drug Administration, the National Academy of Sciences, the U.S. Environmental Protection Agency, and other appropriate organizations to evaluate compliance with this objective.

The survival of aquatic life in surface waters subjected to a waste discharge or other controllable water quality factors shall not be less than that for the same water body in areas unaffected by the waste discharge, or, when necessary, for other control water that is consistent with the requirements for "experimental water" as described in *Standard Methods for the Examination of Water and Wastewater*, latest edition. As a minimum, compliance with this objective as stated in the previous sentence shall be evaluated with a 96-hour bioassay.

In addition, effluent limits based upon acute biotoxicity tests of effluents will be prescribed where appropriate; additional numerical receiving water quality objectives for specific toxicants will be established as sufficient data become available; and source control of toxic substances will be encouraged.

3.1.20 Turbidity

Waters shall be free of changes in turbidity that cause nuisance or adversely affect beneficial uses. Increases in turbidity attributable to controllable water quality factors shall not exceed the following limits:

- Where natural turbidity is less than 1 Nephelometric Turbidity Unit (NTU), controllable factors shall not cause downstream turbidity to exceed 2
- Where natural turbidity is between 1 and 5 NTUs, increases shall not exceed 1 NTU.
- Where natural turbidity is between 5 and 50 NTUs, increases shall not exceed 20 percent.
- Where natural turbidity is between 50 and 100 NTUs, increases shall not exceed 10 NTUs.
- Where natural turbidity is greater than 100 NTUs, increases shall not exceed 10 percent.

In determining compliance with the above limits, appropriate averaging periods may be applied provided that beneficial uses will be fully protected.

Exceptions to the above limits will be considered when a dredging operation can cause an increase in turbidity. In those cases, an allowable zone of dilution within which turbidity in excess of the limits may be tolerated will be defined for the operation and prescribed in a discharge permit.

For Folsom Lake (50) and American River (Folsom Dam to Sacramento River) (51), except for periods of storm runoff, the turbidity shall be less than or equal 10 NTUs. To the extent of any conflict with the general turbidity objective, the more stringent applies.

For Delta waters, the general objectives for turbidity apply subject to the following: except for periods of storm runoff, the turbidity of Delta waters shall not exceed 50 NTUs in the waters of the Central Delta and 150 NTUs in other Delta waters. Exceptions to the Delta specific objectives will be considered when a dredging operation can cause an increase in turbidity. In this case, an allowable zone of dilution within which turbidity in excess of limits can be tolerated will be defined for the operation and prescribed in a discharge permit.

For Deer Creek, source to Cosumnes River:

- When the dilution ratio for discharges is less than 20:1 and where natural turbidity is less than 1 Nephelometric Turbidity Unit (NTU), discharges shall not cause the receiving water daily average turbidity to exceed 2 NTUs or daily maximum turbidity to exceed 5 NTUs. Where natural turbidity is between 1 and 5 NTUs, dischargers shall not cause receiving water daily average turbidity to increase more than 1 NTU or daily maximum turbidity to exceed 5 NTUs
- Where discharge dilution ratio is 20:1 or greater, or where natural turbidity is greater than 5 NTUs, the general turbidity objectives shall apply.

3.2 WATER QUALITY OBJECTIVES FOR GROUND WATERS

The following objectives apply to all ground waters of the Sacramento and San Joaquin River Basins, as the objectives are relevant to the protection of designated beneficial uses. These objectives do not require improvement over naturally occurring background concentrations. The ground water objectives contained in this plan are not required by the federal Clean Water Act.

3.2.1 Bacteria

In ground waters used for domestic or municipal supply (MUN) the most probable number of coliform organisms over any seven-day period shall be less than 2.2/100 ml.

3.2.2 Chemical Constituents

Ground waters shall not contain chemical constituents in concentrations that adversely affect beneficial uses.

At a minimum, ground waters designated for use as domestic or municipal supply (MUN) shall not contain concentrations of chemical constituents in excess of the maximum contaminant levels (MCLs) specified in the following provisions of Title 22 of the California Code of Regulations, which are incorporated by reference into this plan: Tables 64431-A (Inorganic Chemicals) and 64431-B (Fluoride) of Section 64431, Table 64444-A (Organic Chemicals) of Section 64444, and Tables 64449-A (Secondary Maximum Contaminant Levels- Consumer Acceptance Limits) and 64449-B (Secondary Maximum Contaminant Levels-Ranges) of Section 64449. This incorporation-by-reference is prospective, including future changes to the incorporated provisions as the changes take effect. At a minimum, water designated for use as domestic or municipal supply (MUN) shall not contain lead in excess of 0.015 mg/l. To protect all beneficial uses, the Regional Water Board may apply limits more stringent than MCLs.

3.2.3 Radioactivity

At a minimum, ground waters designated for use as domestic or municipal supply (MUN) shall not contain concentrations of radionuclides in excess of the maximum contaminant levels (MCLs) specified in Table 4 (MCL Radioactivity) of Section 64443 of Title 22 of the California Code of Regulations, which are incorporated by reference into this plan. This incorporation-by-reference is prospective, including future changes to the incorporated provisions as the changes take effect.

3.2.4 Tastes and Odors

Ground waters shall not contain taste- or odor-producing substances in concentrations that cause nuisance or adversely affect beneficial uses.

3.2.5 Toxicity

Ground waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life associated with designated beneficial use(s). This objective applies regardless of whether the toxicity is caused by a single substance or the interactive effect of multiple substances.

The Porter-Cologne Water Quality Control Act states that basin plans consist of beneficial uses, water quality objectives and a program of implementation for achieving their water quality objectives [Water Code Section 13050(j)]. The implementation program shall include, but not be limited to:

- ~~(1)~~ A description of the nature of actions which are necessary to achieve the objectives, including recommendations for appropriate action by any entity, public or private;
- ~~(2)~~ A time schedule for the actions to be taken; and,
- ~~(3)~~ A description of surveillance to be undertaken to determine compliance with the objectives (Water Code Section 13242).

In addition, State law requires that basin plans indicate estimates of the total cost and identify potential sources of funding of any agricultural water quality control program prior to its implementation. (Water Code Section 13141). This chapter of the Basin Plan responds to all but the surveillance requirement. That is described in Chapter ~~V5~~.

This chapter is organized as follows: The first section contains a general description of water quality concerns. These are organized by discharger type (e.g., agriculture, silviculture, mines, etc.). The second section lists programs, plans and policies which should result in the achievement of most of the water quality objectives in this plan. This section includes descriptions of State Water Board policies, statewide plans, statewide programs dealing with specific waste discharge problems (e.g., underground tanks, storm water, solid waste disposal sites, etc.), memoranda of understanding, management agency agreements, memoranda of agreement, Regional Water Board policies, a listing of Regional Water Board prohibition areas, and Regional Water Board guidelines addressing specific water quality problems. The third section contains recommendations for appropriate action by entities other than the Regional Water Board. The fourth section describes how; within the framework of the programs, plans and policies discussed in the second section; the Regional Water Board integrates water quality control activities into a continuing planning process. The fifth section identifies the current actions and the time schedule for future actions of the Regional Water Board to achieve compliance with water quality objectives where the programs, plans and policies in the second section are not adequate. The last section lists the estimated costs and funding sources for agricultural water quality control programs that are implemented by the Regional Water Board.

4.1 WATER QUALITY CONCERNS

Water quality concerns are existing or potential water quality problems, i.e., impairments of beneficial uses or degradations of water quality. At any given time, water quality problems generally reflect the intensity of activities of key discharge sources and the volume, quality, and uses of the receiving waters affected by the discharges.

Historic and ongoing point and nonpoint source discharges impact surface waters. Significant portions of major rivers and the Delta are impaired, to some degree, by discharges from agriculture, mines, urban areas and industries. Upstream, small streams and tributaries to the Rivers are impaired or threatened because of discharges from mines, silviculture activities, and urban development activities. Control approaches may differ depending on the source of the problem.

A variety of historic and ongoing point and non-point industrial, urban, and agricultural activities degrade the quality of ground water. Discharges to ground water associated with these activities include industrial and agricultural chemical use and spills; underground and above ground tank and sump leaks; landfill leachate and gas releases; septic tank failures; improper animal waste management; and chemical seepage via shallow drainage wells and abandoned wells. The resulting impacts on ground water quality from these discharges are often long-term and costly to treat or remediate. Consequently, as discharges are identified, containment and cleanup of source areas and plumes must be undertaken as quickly as possible. Furthermore, activities that may potentially impact ground water must be managed to ensure that ground water quality is protected.

Improper management of waste materials and spillage of industrial fluids have degraded or polluted ground water resources beneath military bases, rail yards, wood treating facilities, aerospace manufacturing and testing operations, municipal gas plants, fuel tank farms, pesticide formulators, dry cleaners, and other industrial facilities. Many of the sites contain high concentrations of contaminants in soils, which continue to be sources of ground water degradation and pollution, until remediated.

Our knowledge of amounts and types of problems associated with discharge activities change over time. Early federal and state control efforts tended to focus on the most understood or visible problems such as the discharge of raw sewage to rivers and streams. As these problems were controlled and as pollutant detection and measurement methods improved, regulatory emphasis shifted. For example, control of toxic discharges is now a major concern. Toxicity can be associated with many discharge activities. Its effects may be first expressed as acute or chronic reductions in the number of organisms in receiving waters. Minute amounts of toxic materials may also impair beneficial uses from accumulation in tissues or sediments.

Discharges are sometimes sorted into point source and nonpoint source categories. A point source discharge usually refers to waste emanating from a single, identifiable place. A nonpoint source discharge usually refers to waste emanating from diffused locations. The Regional Water Board may control either type of discharge, but the control approaches may differ.

Salt management is becoming increasingly important in the San Joaquin Valley for urban and agricultural interests. If current practices for discharging waters containing elevated levels of salt continue unabated, the San Joaquin Valley can have a large portion of its ground water severely degraded within a few decades. Therefore, the Regional Water Board will pursue strategies that will achieve the availability of a valley-wide drain for the discharge of agricultural wastewaters and drain waters degraded by elevated levels of salt and in which nutrient and toxic material concentrations meet applicable standards.

Following is a brief description of the water quality impacts associated with basin discharge activities along with some general control considerations.

4.1.1 Agriculture

Agricultural activities affect water quality in a number of ways. There are unique problems associated with irrigated agriculture, agricultural support activities, and animal confinement operations because of the volume of water used and the diffused nature of many of the discharges.

4.1.1.1 Irrigated Agriculture

Irrigated agriculture accounts for most water use in the two sub-basins. Both the San Joaquin and the Sacramento Rivers carry substantial amounts of agricultural return water or drainage. Agricultural drainage contributes salts, nutrients, pesticides, trace elements, sediments, and other by-products that affect the water quality of the rivers and the Delta.

There is a Memorandum of Understanding between the State Water Board and Department of Pesticide Regulation describing the role of each agency with regard to pesticide regulation.

Salt management is critical to agriculture in the Central Valley. Evaporation and crop transpiration remove water from soils which can result in an accumulation of salts in the root zone of the soils at levels that retard or inhibit plant growth. Additional amounts of water often are applied to leach the salts below the root zones. The leached salts can reach ground or surface water. The movement of the salts to surface waters may be a natural occurrence of subsurface flows or it can result from the surface water discharge of subsurface collection systems (often called tile drains) which are routinely employed in areas of the Central Valley where farm lands have poor drainage capabilities. The tile drainage practice consists of installing collection systems below the root zone of the crops to drain soils that would otherwise stay saturated because of subsurface conditions that restrict drainage. Tile drain installation may result in TDS concentrations in drainage water many times greater than in the irrigation water that was applied to the crops. Tile drain water can also contain pesticides, trace elements, and nutrients.

Pesticides and nutrients are also major ingredients of surface agricultural drainage. They have found their way to ground and surface waters in many areas of the basins. Fish and aquatic wildlife deaths attributable to pesticide contamination of surface water occur periodically.

Nitrate and DBCP (1,2-Dibromo-3-chloropropane) levels exceeding the State drinking water standards occur extensively in ground water in the basins and public and domestic supply wells have been closed because of DBCP, EDB, nitrates, and other contaminants in several locations.

Discharge of sediment is another problem encountered with agriculture. Sedimentation impairs fisheries and, by virtue of the characteristics of many organic and inorganic compounds to bind to soil particles, it serves to distribute and circulate toxic substances through the riparian, estuarine, and marine systems. Sedimentation also increases the costs of pumping and treating water for municipal and industrial use. An additional significant impact of sediment in runoff is the sediment's direct smothering effect on bottom dwelling communities.

The Regional Water Board approaches problems related to irrigated agriculture as it does other categories of problems. Staff are assigned to identify and evaluate beneficial use impairments associated with agricultural discharges. Control actions are developed and implemented as appropriate per the schedules identified through the continuous planning process (see section titled, "ACTIONS AND SCHEDULE TO ACHIEVE WATER QUALITY OBJECTIVES").

4.1.1.2 Agricultural Support Activities

These are the activities associated with the application of pesticides, disposal of pesticide rinse waters, and formulation of pesticides and fertilizers. Major water quality problems connected with all of these operations stem from the discharge of waters used to clean equipment or work areas. The Region has confirmed cases of ground water contamination as a result of improper containment and disposal of rinse water.

Many of the application facilities fall under Regional Water Board regulatory programs. When appropriate, best management practices are recommended. Regional Water Board staff also inspects high risk sites to evaluate compliance. Enforcement strategies are implemented as warranted.

4.1.1.3 Animal Confinement Operations

Runoff from animal confinement facilities (e.g., stockyards, dairies, poultry ranches) can impair both surface and ground water beneficial uses. The animal wastes may produce significant amounts of coliform, ammonia, nitrate, and TDS contamination. The greatest potential for water quality problems has historically stemmed from the overloading of the facilities' waste containment and treatment ponds during the rainy season and inappropriate application of wastewater and manure. Most of these facilities are not operating under waste discharge requirements (WDRs). However, waste management at all confined animal facilities must comply with specific regulations and large facilities must obtain an NPDES storm water permit.

4.1.2 Silviculture

Forest management activities, principally timber harvesting and application of herbicides, have the potential to impact beneficial uses. Timber harvest activities annually take place on tens of thousands of acres of private and federal land in the Central Valley Region and they may affect water quality throughout the area being harvested. Erosion can result from road construction, logging, and post-logging operations. Logging debris may be deposited in streams. Landslides and other mass soil movements can also occur as a result of timber operations.

Herbicides may be used in silviculture to reduce commercial timber competition from weeds, grasses, and other plants or to prepare a site for planting of commercial species by eliminating existing vegetation. Use of herbicides has caused concern among regulatory agencies and the public because of the possibility of transport from target sites to streams by wind and water runoff.

The State and Regional Water Boards entered into agreements with both the U.S. Forest Service and the California Department of Forestry and Fire Protection which require these agencies to control nonpoint source discharges by

implementing control actions certified by the State Water Board as best management practices (BMPs). The Regional Water Board enforces compliance with BMP implementation and may impose control actions above and beyond what is specified in the agreements if the practices are not applied correctly or do not protect water quality. Point source discharges on federal and state and private forest lands are regulated through waste discharge limits.

4.1.3 Municipalities and Industries

Municipal and industrial point source discharges to surface waters are generally controlled through National Pollutant Discharge Elimination System (NPDES) permits. Although the NPDES program was established by the Clean Water Act, the permits are prepared and enforced by the Regional Water Boards per California's authority for the Act. The number of cases of ground water pollution attributable to industrial or municipal sources has increased steadily. For example, the Region's inventory of underground storage tanks indicates the number of leaking tanks is high. Ground water contamination from other industrial sources generally occurs from practices of disposing of fluids or other materials used in production processes. Waste compounds have been discharged directly to unlined sumps, pits, or depressions and spread on soils. In some cases, these disposal practices went on many years before they were discovered or discontinued. Leaking municipal or industrial sewer lines also contribute to ground water pollution.

The promulgation of EPA sludge regulations under section 503 of the Clean Water Act and the adoption of water quality objectives for toxic pollutants pursuant to section 303(c)(2)(B) will require that NPDES permits, upon renewal, be updated to reflect these new regulations. Once effluent limitations sufficient to comply with sludge requirements and water quality objectives for toxic pollutants have been placed into NPDES permits, POTWs subject to pretreatment program requirements will be required to update their local limits consistent with EPA pretreatment program regulations and guidance.

4.1.4 Storm Water

Runoff from residential and industrial areas also contributes to water quality degradation. Urban storm water runoff contains pesticides, oil, grease, heavy metals, polynuclear aromatic hydrocarbons, other organics, and nutrients. Because these pollutants accumulate during the dry summer months, the first major autumn storm can flush a highly concentrated load to receiving waters and catch basins. Combined storm and sanitary systems may result in some runoff to sewage treatment plants. In other cases, storm water collection wells can produce direct discharges to ground water. Impacts of storm water contaminants on surface and ground waters are an important concern.

The "Control Action Considerations of the State Water Board" section in Chapter ~~IV~~4 provides more detail on how the Regional Water Board regulates storm water.

4.1.5 Mineral Exploration and Extraction

Mineral exploration and extraction discharges are associated with several ore, geothermal, and petroleum/natural gas activities. The discharge of greatest concern in the Sacramento and San Joaquin River Basins is the result of ore exploration and extraction.

Drainage and runoff from mines and various operations associated with mining can result in serious impacts to ground and surface water beneficial uses, if not properly managed. Along much of the east side of the Coast Range, runoff, drainage, and erosion from old mercury mines is a problem that has resulted in high levels of mercury in aquatic environments and fish tissue. There are also major metal and acid discharges associated with abandoned copper mines in the Sierra/ Cascades drainages. Sedimentation can be a problem in the construction and operation of many mines.

Within the past decade there has been a significant increase in the amount of gold extraction and processing in the Sierra foothills and in the Coast Ranges. Most of these operations have been made possible by advances in technology, permitting the economical extraction of minute quantities of gold from large volumes of ore with the use of cyanide and other reagents by heap and vat leach methods, and by the current high price of gold on world markets. Advances in ore and waste rock handling techniques have made open pit mining more profitable and

common. These mining operations involve the handling and management of large quantities of ore, potentially-toxic chemical reagents, tailings, waste rock, and spent leaching solutions in piles, tailings ponds, and impoundments. If not carefully managed, these operations have the potential to leach toxic reagents, heavy metals, salts, and acidic drainage waters into surface and ground water resources. Mining waste management facilities and associated mining operations are regulated through the issuance of waste discharger requirements under the State and Regional Water Boards' hazardous and solid waste regulatory program (Title 23, California Code of Regulations (CCR), Division 3, Chapter 15 and Title 27, CCR, Division 2, Subdivision 1).

Efforts to control drainage have gradually expanded over the years. Staff assessments of mine water quality problems done in 1979 and 1992 helped direct the Regional Water Board's approach to the problems. When other options were exhausted, the Regional Water Board has used public funds to abate pollution from these mines.

Geothermal operations in the basins are centered in the Geysers Area of Lake County. Potential impacts to water quality are caused by soil erosion from road construction and site preparation, high pressure steam blowouts, and accidental spills of materials from drilling operations, power plants, steam condensate lines, and waste transport accidents. Bentonite clay, boron, ammonia, sodium hydroxide, sulfur compounds, heavy metals, and petroleum products are found in various concentrations in mud sumps, steam condensate lines, and sulfide abatement sludge. Operational failures can release these substances into waterways.

4.1.6 Hazardous and Non-Hazardous Waste Disposal

Discharges of solid, semi-solid, and liquid wastes to landfills, waste piles, surface impoundments, pits, trenches, tailings ponds, natural depressions and land treatment facilities (collectively called "waste management units") have the potential to create sources of pollution affecting the quality of waters of the State. Unlike surface waters which often have the capacity to assimilate discharged waste constituents, ground waters have little or no assimilative capacity, due to their slow migration rate, lack of aeration, lower biological activity, and laminar flow patterns. If the concentrations of constituents in the land-discharged waste are sufficiently high to prevent the waste from being classified as "inert waste" under 27 CCR, Section 20230, discharges of such wastes to waste management units require long term containment or active treatment following the discharge in order to prevent waste or waste constituents from migrating to and impairing the beneficial uses of waters of the State. Pollutants from such discharges may continue to affect water quality long after the discharge of new waste to the unit has ceased, either because of continued leachate or gas discharges from the unit, or because pollutants have accumulated in underlying soils from which they are gradually released to ground water.

Landfills for disposal of municipal or industrial solid waste (solid waste disposal sites) are the major categories of waste management units in the region, but there are also surface impoundments used for storage or evaporative treatment of liquid wastes, waste piles for the storage of solid wastes, and land treatment units for the biological treatment of semi-solid sludges from wastewater treatment facilities and liquid wastes from cannery and other industrial operations. Sumps, trenches, and soil depressions have been used in the past for liquid waste disposal. Mining waste management units (tailings ponds, surface impoundments, and waste piles) also represent a significant portion of the waste management units in the Region. The Regional Water Board issues waste discharge requirements to ensure that these discharges are properly contained to protect the Region's water resources from degradation, and to ensure that dischargers undertake effective monitoring to verify continued compliance with requirements.

These discharges, and the waste management units at which the wastes are discharged, are subject to concurrent regulation by other State and local agencies responsible for land use planning, solid waste management, and hazardous waste management. "Local Enforcement Agencies" (mainly cities and counties) implement the State's solid waste management laws and local ordinances governing the siting, design, and operation of solid waste disposal facilities (usually landfills) with the concurrence of the California Integrated Waste Management Board (CIWMB). The CIWMB also has direct responsibility for review and approval of plans for closure and post-closure maintenance of solid waste landfills. The Department of Toxic Substance Control (DTSC) issues permits for all hazardous waste treatment, storage, and disposal facilities (which include hazardous waste incinerators, tanks, and warehouses where hazardous wastes are stored in drums as well as landfills, waste piles, surface impoundments, and land treatment units). The State Water Board, Regional Water Boards, CIWMB, and DTSC have entered into a Memoranda of Understanding to coordinate their respective roles in the concurrent regulation of these discharges. In

addition, the Toxic Pits Cleanup Act of 1984 precludes the storage or disposal of liquid hazardous wastes or hazardous wastes containing free liquids. The Regional Water Board is responsible for enforcing this Act under the authority of the Health and Safety Code, Section 25208 et seq. (See [page IV-13 section 4.2.1.2.3](#) for further description).

The statutes and regulations governing the discharges of both hazardous and non-hazardous wastes have been revised and strengthened in the last few years. The discharge of municipal solid wastes to land are closely regulated and monitored; however, some water quality problems have been detected and are being addressed. Recent monitoring efforts under the State and Regional Water Boards' Title 23, CCR Division 3, Chapter 15; Title 27 CCR, Division 2, Subdivision 1; and SWAT programs have revealed that discharges of municipal solid wastes to unlined and single clay lined landfills have resulted in ground water degradation and pollution by volatile organic constituents (VOCs) and other waste constituents. VOCs are components of many household hazardous wastes and certain industrial wastes that are present within municipal solid waste streams. VOCs can easily migrate from landfills either in leachate or by vapor-phase transport. Clay liners and natural clay formations between discharged wastes and ground waters are largely ineffective in preventing water quality impacts from municipal solid waste constituents. In a recently adopted policy for water quality control, the State Water Board found that "[r]esearch on liner systems for landfills indicates that (a) single clay liners will only delay, rather than preclude, the onset of leachate leakage, and (b) the use of composite liners represents the most effective approach for reliably containing leachate and landfill gas" (State Water Board Resolution No. 93-62, *Policy for Regulation of Discharges of Municipal Solid Waste*).

As a result of similar information on a national scale, the U.S. Environmental Protection Agency (USEPA) has adopted new regulations under Subtitle D of the Resource Conservation and Recovery Act (RCRA) which require the containment of municipal solid wastes by composite liners and leachate collection systems. Composite liners consist of a flexible synthetic membrane component placed above and in intimate contact with a compacted low-permeability soil component. This liner system enhances the effectiveness of the leachate collection and removal system and provides a barrier to vapor-phase transport of VOCs from the unit. Regional Water Boards and the CIWMB are implementing these new regulations in California under a policy for water quality control from the State Water Board (Resolution No. 93-62, discussed above) and new regulations from CIWMB. While a single composite liner of the type that can be approved under Subtitle D regulations is a significant improvement over past municipal solid waste containment systems, it should be noted, however, that single composite liners will not necessarily provide complete protection for ground water resources.

4.1.7 Contaminated Sites Threatening Ground Water Quality

The Regional Water Board has identified over 7000 sites with confirmed releases of constituents of concern which have adversely impacted or threaten to impact the quality of ground water resources. Sources of pollution at these sites include: leaking underground storage tanks and sumps; leaking above ground tanks; leaking pipelines; leaking waste management units, such as landfills, disposal pits, trenches and ponds; surface spills from chemical handling, transfer or storage; poor housekeeping; and illegal disposal. A policy for investigation and cleanup of such sites is contained in the section of this chapter titled "Policy for Investigation and Cleanup of Contaminated Sites."

4.1.8 Drinking Water Policy

The Regional Water Board supports protection of the MUN beneficial use in surface waters of the Sacramento-San Joaquin Delta and its tributaries. The Delta provides drinking water to over 25 million people in the Southern California, Central Valley, Central Coast, and San Francisco Bay regions, and several million people obtain their water supply from the tributaries of the Delta. The tributaries of the Sacramento and San Joaquin Rivers that originate in the Cascades and Sierra Nevada Mountains generally have high water quality. However, as the tributaries flow into lower elevations, they are affected by natural processes, urban, industrial, and agricultural land uses, and a highly managed water supply system. This Policy pertains to the following drinking water constituents of concern: organic carbon, *Cryptosporidium*, *Giardia*, salt and nutrients. Work on the Policy was initiated in 2000 in response to concerns that these constituents might pose significant drinking water risks and result in significant additional treatment costs for water agencies due to the potential increased loading as a result of population growth in the watershed. Source control evaluations conducted in 2011 show that the load of organic carbon and nutrients

will not likely increase in the future as a result of current regulatory actions. Monitoring of *Cryptosporidium* at public water system intakes from 2006 to 2011, as required by USEPA regulations, has not resulted in additional treatment requirements for public water systems treating water from the Delta and its tributaries. The *Cryptosporidium* and *Giardia* narrative objective and associated implementation program are to maintain existing conditions for public water systems, to comply with the Policy with Respect to Maintaining High Quality of Water in California and the Antidegradation Implementation Policy.

Other elements of the Drinking Water Policy include the following:

- The Basin Plan contains the following elements that address the protection of the MUN beneficial use:
 - All water quality objectives are developed to protect the MUN beneficial use unless otherwise stated. The Basin Plan also includes specific narrative and numeric objectives to protect the MUN beneficial use.
 - The existing narrative water quality objective for chemical constituents includes drinking water chemical constituents of concern, such as organic carbon.
 - The Implementation Chapter of the Basin Plan contains the following Policies relevant to the protection of the MUN beneficial use:
 - Resolution No. 68-16, Policy with Respect to Maintaining High Quality of Water in California (~~IV-8.00~~[Section 4.2.1.1.2](#)).
 - Resolution No. 88-63, Sources of Drinking Water Policy (~~IV-9.00~~[Section 4.2.1.1.8](#)).
 - Antidegradation Implementation Policy (~~IV-15.01~~[Section 4.2.2.1.7](#)).
 - Policy for Application of Water Quality Objectives (~~IV-16.00~~[Section 4.2.2.1.9](#)).
 - Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California; a.k.a. State Implementation Plan or SIP (~~IV-26.02~~[Section 4.2.1.1.15](#)).
 - Continued coordinated monitoring and modeling of the identified drinking water constituents of concern is necessary to confirm that concentrations will not likely increase to levels that adversely affect beneficial uses. Monitoring completed to support the implementation of the Drinking Water Policy shall be coordinated with other monitoring programs already in place as well as the Delta Regional Monitoring Program. The Delta Regional Monitoring Program is a Regional Water Board initiated stakeholder effort to address the need for a comprehensive monitoring, assessment and reporting program.
- To further protect the public health, drinking water utilities employ a multibarrier approach to control contaminants that includes source water protection, water treatment, and protection of distribution system water quality.
- Source evaluations based on 2011 permit conditions for publically owned treatment works, urban runoff, and irrigated agriculture, indicate that concentrations of organic carbon at public water system intakes are not expected to increase over time.
- Drinking water constituents of concern shall continue to be considered when NPDES facilities conduct their Antidegradation analysis.
- If there are significant changes to the characteristics of the project area, drinking water treatment standards based on source water quality, or knowledge regarding drinking water constituents of concern, the Central Valley Water Board may consider the need to reevaluate the Drinking Water Policy. The Drinking Water Policy will be reviewed by the Regional Water Board in 2023 to determine if the provisions should be revised.
- The Regional Water Board supports and recognizes the importance of USEPA's efforts to refine analytical methods to measure *Cryptosporidium* and *Giardia* in water.
- The Regional Water Board supports refinement of analytical modeling efforts to improve understanding of the fate and transport of drinking water constituents of concern.

- It is appropriate to use *Cryptosporidium* concentrations as an indicator of compliance with the *Cryptosporidium* and *Giardia* objective since *Cryptosporidium* is not as readily treated as *Giardia* when conventional drinking water treatment processes are employed, and USEPA promulgated new drinking water requirements specifically to address *Cryptosporidium*.

4.1.9 Other Discharge Activities

Some remaining discharges of major concern include sedimentation from land development activities in the foothills and mountains, leachate from septic tank/individual wastewater disposal systems, and dredging and dredging spoils runoff.

Many of the foothill/mountain counties in the sub-basins face high growth rates. Sedimentation from the land disturbances associated with residential and commercial development is an increasing problem that, when added to the sedimentation resulting from farming and silvicultural operation, may require establishment of a region-wide erosion control program. The Regional Water Board's current practice is to emphasize local government control of erosion caused by residential development. Erosion control guidelines are included in the erosion/sedimentation action plan which is in the Appendix.

Improperly located, designed, constructed and/or maintained on-site wastewater treatment and disposal systems can result in ground and surface water degradation and public health hazards. The Regional Water Board's approach is that the control of individual wastewater treatment and disposal systems is best accomplished by local environmental health departments enforcing county ordinances designed to provide protection to ground and surface waters. Consistent with this approach, the Regional Water Board implements the State Water Board's *Water Quality Control Policy for Siting, Design, Operation, and Maintenance of Onsite Wastewater Treatment Systems* (OWTS Policy).

The energy crisis of the 1970s resulted in a surge of small hydroelectric facility development in the mountains and foothills. Impairments to beneficial uses may occur because of erosion from construction and changes in water temperature. The Regional Water Board has published guidelines for small hydro-electric facilities (see Guidelines section of this chapter and Appendix) to help address some of the problems associated with small hydroelectric plants.

Dredging is a problem because the process can result in turbidity and the reintroduction and resuspension of harmful metal or organic materials. This latter effect occurs directly as a result of the displacement of sediment at the dredging site and indirectly as a result of erosion of dredge spoil to surface waters at the deposition site. Another major concern is water quality problems associated with the dredge spoils disposal site. There is much dredging of the Sacramento and San Joaquin Rivers and the Delta because of the need to maintain the ship channels to the Ports of Sacramento and Stockton. The Regional Water Board regulates dredging operations on a case-by-case basis. Operational criteria may result from permits or the water quality certification requirements stemming from Section 401(a) of the Clean Water Act.

In addition to the problems described above, the Regional Water Board responds to spontaneous discharges such as spills, leaks and overflows. These can have cumulatively or individually significant effects on beneficial uses of ground and surface waters.

4.1.10 Water Bodies with Special Water Quality Problems

Water quality management may require the identification and ranking of water bodies with regard to certain quality parameters. Water Quality Limited Segments (WQLSs) are one example of expressing water quality problems by water bodies. WQLSs are those sections of lakes, streams, rivers or other fresh water bodies where water quality does not meet (or is not expected to meet) water quality standards even after the application of appropriate effluent limitations for point sources (40 CFR 130, et seq.).

Additional treatment beyond minimum federal requirements will be imposed on dischargers to WQLSs. Dischargers will be assigned or allocated a maximum allowable load of critical pollutants so that water quality objectives can be met in the segment.

The Regional Water Board's list of WQLSs is updated biennially as required by Clean Water Act Section 303(d). The current list may be obtained by contacting the Regional Water Board office.

4.2 THE NATURE OF CONTROL ACTIONS IMPLEMENTED BY THE REGIONAL WATER BOARD

The nature of actions to achieve water quality objectives consists of Regional Water Board efforts:

- ~~(1)~~ to identify potential water quality problems;
- ~~(2)~~ to confirm and characterize water quality problems through assessments for source, frequency, duration, extent, fate, and severity;
- ~~(3)~~ to remedy water quality problems through imposing or enforcing appropriate measures; and
- ~~(4)~~ to monitor problem areas to assess effectiveness of the remedial measures.

Generally, the actions associated with the first step consist of surveys or reviews of survey information and other data sources to isolate possible impairments of beneficial uses or water quality.

The characterization step usually involves studies that attempt to answer questions about a water quality problem's source, extent, duration, frequency, and severity. Information on these parameters is essential to confirm a problem and prepare for remedy. The Regional Water Board may gain this information through its own work or through data submittals requested of actual or potential dischargers under Section 13267 of the California Water Code.

Problem remedy calls for the Regional Water Board to prevent or clean up problems. A common means of prevention is through the issuance of National Pollutant Discharge Elimination System (NPDES) permits, waste discharge requirements (WDRs), discharge prohibitions, and other discharge restrictions. Cleanup is implemented through enforcement measures such as Cease and Desist (C&D) and Cleanup and Abatement (C&A) orders. The NPDES is a requirement of the Federal Clean Water Act (Section 402) and California has implementing responsibility. The national permit system only applies to certain surface water discharges. WDRs, which encompass permits, are called for by State law, Water Code Section 13260, et seq. The WDRs system is not as restricted as the Federal NPDES. As practical, WDRs may be used to control any type of discharge to ground or surface waters. C&D and C&A orders are two of the enforcement tools available to the Regional Water Board to correct actual or potential violations of WDRs, NPDES permits, prohibitions, and other water quality control obligations.

The details of the monitoring step are explained in Chapter ~~V~~5. In general, the Regional Water Board has wide latitude to require actual and potential dischargers to submit monitoring and surveillance information, in addition to using State Water Board data or collecting its own.

Whatever actions the Regional Water Board implements must be consistent with the Basin Plan's beneficial uses and water quality objectives, as well as certain State and Regional Water Boards' policies, plans, agreements, prohibitions, guidance, and other restrictions or requirements. These considerations are described below and included in the Appendix when noted.

4.2.1 Control Action Considerations of the State Water Board

4.2.1.1 Policies and Plans

The State Water Board adopts water quality control policies and water quality control plans to which Regional Water Board actions must conform. Sections 13146 and 13247 of the California Water Code generally require that, in carrying out activities which affect water quality, all state agencies, departments, boards and offices must comply with all policies for water quality control and with applicable water quality control plans approved or adopted by the State Water Board. Two of the plans, the Ocean Plan and the Tahoe Plan, do not affect the Sacramento and San Joaquin River Basins. The policies and plans that are applicable are described below.

4.2.1.1.1- *The State Policy for Water Quality Control*

This policy declares the State Water Board's intent to protect water quality through the implementation of water resources management programs and serves as the general basis for subsequent water quality control policies. The policy was adopted by the State Water Board in 1972. See Appendix Item 1.

4.2.1.1.2- *State Water Board Resolution No. 68-16, Statement of Policy with Respect to Maintaining High Quality of Water in California*

The State Water Board adopted this policy on 28 October 1968. The policy generally restricts the Regional Water Board and dischargers from reducing the water quality of surface or ground waters even though such a reduction in water quality might still allow the protection of the beneficial uses associated with the water prior to the quality reduction. The goal of the policy is to maintain high quality waters.

Changes in water quality are allowed only if the change is consistent with maximum benefit to the people of the State; does not unreasonably affect present and anticipated beneficial uses; and, does not result in water quality less than that prescribed in water quality control plans or policies.

USEPA water quality standards regulations require each state to adopt an “antidegradation” policy and specify the minimum requirements for the policy (40 CFR 131.12). The State Water Board has interpreted State Water Board Resolution No. 68-16 to incorporate the federal antidegradation policy. The Regional Water Board implements Resolution No. 68-16 consistent with the federal antidegradation policy where the federal regulations apply. Resolution No. 68-16 applies to both ground and surface waters of the state. Resolution No. 68-16 is Appendix Item 2; the federal policy is Appendix Item 39.

4.2.1.1.3- *State Water Board Resolution No. 74-43, The Water Quality Control Policy for the Enclosed Bays and Estuaries of California*

This policy was adopted by the State Water Board on 16 May 1974 and provides water quality principles and guidelines for the prevention of water quality degradation in enclosed bays and estuaries to protect the beneficial uses of such waters. The Regional Water Board must enforce the policy and take actions consistent with its provisions. (This policy does not apply to wastes from boats or land runoff except as specifically indicated for siltation and combined sewer flows.) See Appendix Item 3.

4.2.1.1.4- *State Water Board Resolution No. 75-58, Water Quality Control Policy on the Use and Disposal of Inland Waters Used for Powerplant Cooling*

This policy was adopted by the State Water Board in June 1975. Its purpose is to provide consistent principles and guidance for supplementary waste discharge requirements or other water quality control actions for thermal powerplants using inland waters for cooling. The Regional Water Board is responsible for its enforcement. See Appendix Item 4.

4.2.1.1.5- *State Water Board Resolution No. 77-1, Policy and Action Plan for Water Reclamation in California*

The policy was adopted 6 January 1977. Among other things, the policy requires the Regional Water Boards to conduct reclamation surveys and specifies reclamation actions to be implemented by the State and Regional Water Boards and other agencies. The policy and action plan are contained in the State Water Board report titled, *Policy and Action Plan for Water Reclamation in California*. See Appendix Item 5.

4.2.1.1.6- *State Water Board Resolution No. 87-22, Policy on the Disposal of Shredder Waste*

This State Water Board Resolution, adopted 19 March 1987, permits the disposal into certain landfills of wastes, produced by the mechanical destruction of car bodies, old appliances and similar castoffs, under specific conditions designated and enforced by the Regional Water Boards. See Appendix Item 6.

4.2.1.1.7- *State Water Board Resolution No. 88-23, Policy Regarding the Underground Storage Tanks Pilot Program*

The State Water Board adopted this policy on 18 February 1988. The policy implements a pilot program to fund oversight of remedial action at leaking underground storage tank sites, in cooperation with the California Department of Public Health (formerly the California Department of Health Services). Oversight may be deferred to the Regional Water Boards. See Appendix Item 7.

4.2.1.1.8- *State Water Board Resolution No. 88-63, Sources of Drinking Water Policy*

This policy for water quality control, adopted on 19 May 1988, is essential to the designation of beneficial uses. The policy specifies that, except under specifically defined exceptions, all surface and ground waters of the state are to be protected as existing or potential sources of municipal and domestic supply. The specific exceptions include waters with existing high total dissolved solids concentrations (greater than 3000 mg/l), low sustainable yield (less than 200 gallons per day for a single well), waters with contamination that cannot be treated for domestic use using best management practices or best economically achievable treatment practices, waters within particular municipal, industrial and agricultural wastewater conveyance and holding facilities, and regulated geothermal ground waters. Where the Regional Water Board finds that one of the exceptions applies, it may remove the municipal and domestic supply beneficial use designation for the particular body of water through a formal Basin Plan amendment and a public hearing, followed by approval of such an amendment by the State Water Board and the Office of Administrative Law. See Appendix Item 8 for Resolution 88-63 exceptions and Appendix 44 for water bodies that meet one or more of the exceptions.

4.2.1.1.9- *State Water Board Resolution No. 90-67, Pollutant Policy Document (PPD)*

The PPD was adopted by the State Water Board in 1990, as part of their overall Delta water rights proceedings. The PPD establishes state policy for water quality control to be used by the San Francisco Bay Regional Water Board and the Central Valley Regional Water Board in updating basin plans. The PPD requires the Central Valley Regional Water Board to develop a mass emission strategy for limiting loads of heavy metals, PAHs and selenium entering the Delta. It also requires that specific actions be taken to eliminate the discharge of chlorinated dibenzodioxins and dibenzofurans to the Delta. The PPD describes other actions for controlling antifouling compounds used on boats and for regulating dredging.

4.2.1.1.10- *State Water Board Resolution No. 92-49, Policies and Procedures for Investigation and Cleanup and Abatement of Discharges Under Water Code Section 13304*

This resolution contains policies and procedures for Regional Water Boards to follow for the oversight and regulation of investigations and cleanup and abatement activities from all types of discharge or threat of discharge subject to Section 13304 of the Water Code. It directs Regional Water Boards to ensure that dischargers are required to cleanup and to abate the effect of discharges. This cleanup and abatement shall be done in a manner that promotes attainment of background water quality, or the highest water quality which is reasonable if background levels of water quality cannot be restored. Any cleanup less stringent than background water quality shall be consistent with maximum benefit to the people of the state and not unreasonably affect present and anticipated beneficial uses of such water. See Appendix Item 9.

4.2.1.1.11- *State Water Board Resolution No. 93-62, Policy for Regulation of Discharges of Municipal Solid Waste*

The policy for water quality control, adopted by State Water Board on 17 June 1993, directs Regional Water Boards to amend waste discharge requirements for municipal solid waste landfills to incorporate pertinent provisions of the federal "Subtitle D" regulations under the Resource Conservation and Recovery Act (40 CFR Parts 257 & 258). The majority of the provisions of the Subtitle D regulations become effective on 9 October 1993. Landfills which are subject to the Subtitle D regulations and the Policy are those which have accepted municipal solid waste on or after 9 October 1991. See Appendix Item 10.

4.2.1.1.12- *The Thermal Plan*

The Water Quality Control Plan for the Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California was adopted by the State Water Board on 18 May 1972 and amended 18 September 1975. The plan specifies water quality objectives, effluent quality limits, and discharge prohibitions related to thermal characteristics of interstate waters and waste discharges. See Appendix Item 11. (Note: the State Water Board adopted Resolution No. 92-82 on 22 October 1992, approving an exception to the Thermal Plan for Sacramento Regional County Sanitation District. See Appendix Item 12.)

4.2.1.1.13- *The Delta Plan, Water Right Decision 1485, and the Water Quality Control Plan for Salinity*

In August 1978, the State Water Board adopted the Delta Plan and Water Right Decision 1485 (D-1485). The Delta Plan contained water quality standards, Delta outflow requirements and export constraints for the Delta. These standards, requirements, and constraints were then implemented in D-1485 by making them conditions of the water right permits for the Central Valley Project and the State Water Project.

When the Delta Plan and accompanying D-1485 were originally issued, the State Water Board committed itself to review the Delta Plan in about ten years. In 1986, the State Court of Appeal issued a decision addressing legal challenges to the Delta Plan and D-1485. The Court directed the State Water Board to take a global view toward its dual responsibilities (water quality and water rights) to the State's water resources.

In response to the Court's decision, the State Water Board adopted the Water Quality Control Plan for Salinity in May 1991. The May 1991 Plan was superceded in May 1995 when the State Water Board adopted the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary. This Plan was revised in 2006. The State Water Board's Plan includes water quality objectives for salinity, temperature and dissolved oxygen that are applicable in the Delta.

In December 1999 the State Water Board adopted, and in March 2000 per Order WR 2000-02 revised, Water Right Decisions 1641. This decision amended certain water rights by assigning responsibilities to water right holders to help meet flow objectives intended to implement certain water quality objectives contained in the 1995 Bay-Delta Plan.

Rather than taking any water right action to meet the dissolved oxygen objectives in the 1995 Bay-Delta Plan, the State Water Board directed the Regional Water Board to first prepare a TMDL to achieve the dissolved oxygen objectives and implement it.

4.2.1.1.14- *Nonpoint Source Management Plan and the Nonpoint Source Implementation and Enforcement Policy*

In December 1999, the State Water Board, in its continuing efforts to control nonpoint source (NPS) pollution in California, adopted the Plan for California's Nonpoint Source Pollution Control Program (NPS Program Plan). The NPS Program Plan upgraded the State's first Nonpoint Source Management Plan adopted by the State Water Board in 1988 (1988 Plan). Upgrading the 1988 Plan with the NPS Program Plan brought the State into compliance with the requirements of Section 319 of the Clean Water Act and Section 6217 of the Coastal Zone Act Reauthorization Amendments of 1990.

The NPS Implementation and Enforcement Policy, adopted by the State Water Board on 20 May 2004 (State Water Board Resolution No. 2004-0030), explains how the Porter-Cologne Act mandates and authorities, delegated to the State Water Board and Regional Water Boards by the California Legislature, will be used to implement and enforce the NPS Program Plan. The policy also provides a bridge between the NPS Program Plan and the SWRCB Water Quality Enforcement Policy.

4.2.1.1.15: Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California” (a.k.a. State Implementation Policy or SIP)

The State Water Board adopted a policy that establishes:

- (1) Implementation provisions for priority pollutant criteria promulgated by the U.S. Environmental Protection Agency (U.S. EPA) through the National Toxics Rule (40 CFR 131.36) (promulgated on 22 December 1992 and amended on 4 May 1995) and through the California Toxics Rule (40 CFR 131.38) (promulgated on 18 May 2000 and amended on 13 February 2001), and for priority pollutant objectives established by Regional Water Boards in their basin plans; and
- (2) Monitoring requirements for 2,3,7,8-TCDD equivalents; and
- (3) Chronic toxicity control provisions.

In addition, the SIP includes special provisions for certain types of discharges and factors that could affect the application of other provisions in the SIP. The SIP, including future revisions, is incorporated into this Basin Plan and shall be implemented according to the policy’s provisions.

4.2.1.1.16: Water Quality Enforcement Policy (Enforcement Policy) and Policy on Supplemental Environmental Projects (SEP Policy)

The State Water Board adopted the Enforcement Policy to create a framework for identifying and investigating instances of noncompliance, for taking enforcement actions that are appropriate in relation to the nature and severity of the violation, and for prioritizing enforcement resources to achieve maximum environmental benefits. The State Water Board adopted the SEP Policy as an adjunct to the Water Boards’ enforcement program and allows for the inclusion of a supplemental environmental project in administrative civil liability actions as long as certain criteria are met to ensure that such a project has environmental value, furthers the goals of the State Water Board and Regional Water Boards, and are subject to appropriate input and oversight by the Water Boards. Both the Enforcement Policy and the SEP Policy, including future revisions, are incorporated into this Basin Plan and shall be implemented according to the policies’ provisions.

4.2.1.1.17: Water Quality Control Policy for Developing California’s Clean Water Act Section 303(d) List

Pursuant to California Water Code section 13191.3(a), this State policy for water quality control describes the process by which the State Water Board and the regional water boards will comply with the listing requirements of section 303(d) of the federal Clean Water Act. The objective of this policy is to establish a standardized approach for developing California’s section 303(d) list in order to achieve the overall goal of achieving water quality standards and maintaining beneficial uses in all of California’s surface waters.

4.2.1.1.18: Water Quality Control Policy for Addressing Impaired Waters: Regulatory Structure and Options

Section 303(d) of the Clean Water Act requires states to identify waters within their borders that are not attaining water quality standards. This State policy for water quality control describes the existing tools and mechanisms that the regional water boards will use to address the water bodies listed as impaired under section 303(d) of the federal Clean Water Act.

4.2.1.1.19: Policy for Compliance Schedules in National Pollutant Discharge Elimination System Permits

The Policy authorizes the Regional Water Board to include a compliance schedule in a permit for an existing discharger to implement a new, revised, or newly interpreted water quality objective or criterion in a water quality standard that results in a permit limitation more stringent than the limitation previously imposed.

4.2.1.1.20- *Water Quality Control Policy for Siting, Design, Operation, and Maintenance of Onsite Wastewater Treatment Systems (OWTS Policy)*

This Policy implements Water Code, Chapter 4.5, Division 7, sections 13290 through 13291.7 by establishing statewide regulations and standards for permitting onsite wastewater systems. The OWTS Policy specifies criteria for existing, replacement, and new onsite systems and establishes a conditional waiver of waste discharge requirements for onsite systems that comply with the policy. The OWTS Policy, including future revisions, is incorporated into this Basin Plan and shall be implemented according to the policy's provisions.

4.2.1.1.21- *Policy for Water Quality Control for Recycled Water (Recycled Water Policy)*

The Recycled Water Policy establishes requirements to increase the use of recycled water in California. These requirements include the development and adoption of salt/nutrient management plans, regulation of incidental runoff from landscape irrigation with recycled water, criteria and procedures for streamlined permitting of recycled water landscape irrigation projects, procedures for permitting groundwater recharge projects including procedures for demonstrating compliance with the Resolution No. 68-16 (the State Antidegradation Policy), and provisions for addressing constituents of emerging concern. The Recycled Water Policy, including future revisions, is incorporated into this Basin Plan and shall be implemented according to the policy's provisions.

4.2.1.2 **Programs**

4.2.1.2.1- *Discharges of Hazardous Waste to Land, California Code of Regulations Title 23, Division 3, Chapter 15 and Consolidated Regulations for Treatment, Storage, Processing or Disposal of Solid Waste, California Code of Regulations Title 27, Division 2, Subdivision*

Title 23, CCR, Division 3 Chapter 15 and Title 27 CCR, Division 2, Subdivision 1 includes regulations governing discharges of hazardous and solid waste to land for treatment, storage, or disposal. The regulations cover landfills, surface impoundments, waste piles, land treatment units, mining waste management units and confined animal facilities. In addition, actions to clean up and abate conditions of pollution or nuisance at contaminated sites are covered by relevant portions of the regulations where contaminated materials are taken off-site for treatment, storage, or disposal and, as feasible, where wastes are contained or remain on-site at the completion of cleanup actions. The regulations classify wastes according to their threat to water quality, classify waste management units according to the degree of protection that they provide for water quality, and provide siting, construction, monitoring, corrective action, closure and post closure maintenance criteria. Chapter 15 requirements are minimum standards for proper management of each waste category. These regulations require the complete containment of wastes which, if discharged to land for treatment, storage or disposal, have the potential to degrade the quality of water resources. Regional Water Boards may impose more stringent requirements to accommodate regional and site-specific conditions.

4.2.1.2.2- *Solid Waste Assessment Test (SWAT)*

Section 13273, added to the Water Code in 1985 (Assembly Bill 3525), required all owners of both active and inactive nonhazardous landfills to complete a Solid Waste Assessment (SWAT) to determine if hazardous waste constituents have migrated from the landfill into ground water. Pursuant to a list adopted by the State Water Board, 150 site owners statewide per year would complete this evaluation by 2001.

The Regional Water Board must review the SWAT report to determine whether any hazardous waste has migrated into ground water. If so, the Regional Water Board must notify the Department of Toxic Substances Control and the Integrated Waste Management Board, and take appropriate remedial action [CA Water Code Section 13273(e)].

4.2.1.2.3- *Toxic Pits Cleanup Act (TPCA)*

The Toxic Pits Cleanup Act of 1984 (Section 25208 et seq. of the Health and Safety Code) established a program to ensure that existing surface impoundments are either made safe or closed so that they do not pollute the waters of the state. The Act requires that all impoundments containing liquid hazardous wastes or hazardous wastes containing

free liquids be retrofitted with a liner/leachate collection system, or closed by 1 July 1988. Surface impoundments containing hazardous wastes are prohibited within one-half mile upgradient from a potential source of drinking water. The law provided for certain exemptions.

4.2.1.2.4- *Underground Storage Tank (UST) Program*

The Central Valley UST Program is implemented under Division 20, Chapters 6.7 and 6.75 of the California Health and Safety Code and Title 23, Division 3, Chapter 16 of the California Code of Regulations. The program has two elements: leak prevention, which is implemented statewide by Local Implementing Agencies in 58 counties and 49 cities; and leak investigation and cleanup which is implemented by the Regional Water Board with assistance from the Local Implementing Agencies. Some Counties in the Central Valley Region are under contract with the State Water Board to provide investigation and cleanup oversight on some sites. These Counties are required to implement the requirements of the Basin Plan.

4.2.1.2.5- *Aboveground Petroleum Storage Act*

The Aboveground Petroleum Storage Act (Chapter 6.67, Division 20, Health and Safety Code) requires owners or operators of aboveground petroleum storage tanks to file a storage statement and pay a fee every two years (beginning 1 July 1990), to take specific actions to prevent spills, and, in certain instances, to implement a ground water monitoring program. Fees are used by staff to inspect facilities and review spill prevention plans. If a site is contaminated, staff oversee cleanup and the tank owner or operator is required to reimburse the Regional Water Board for reasonable costs for that oversight. There are approximately 8000 tank facilities in the region which have filed storage statements.

4.2.1.2.6- *Storm Water Regulations*

The 1987 Clean Water Act amendments required the USEPA to establish regulations to control storm water discharges associated with industrial activity; discharges from large (serving a population of 250,000 or more) and medium (serving a population of greater than 100,000 but less than 250,000) municipal separate storm sewer systems; and discharges from construction sites.

Federal regulations for storm water discharges were promulgated by the USEPA on 16 November 1990 (40 CFR Parts 122, 123, and 124). The regulations require large and medium size municipalities and specific categories of facilities, which discharge storm water associated with industrial activity, to obtain NPDES permits and to implement Best Available Technology Economically Achievable (BAT) and Best Conventional Pollutant Control Technology (BCT) to reduce or eliminate industrial storm water pollution. Municipal permits establish controls to reduce/eliminate pollutants to the maximum extent possible (MEP) and to effectively prohibit illicit discharges to storm sewer systems.

In 1991 (amended in 1992), the State Water Board adopted a statewide general NPDES permit (Order No. 91-13-DWQ, General Permit No. CAS000001) for storm water discharges associated with industrial activities. The Order applies to facilities which discharge storm water to surface waters, either directly or through a storm drain system, excluding construction activities.

The State Water Board also adopted a statewide general NPDES permit (Order No. 92-08-DWQ, General Permit No. CAS000002) in 1992, which applies to construction projects resulting in land disturbance of five acres or greater.

4.2.1.2.7- *U.S. Department of Defense (DOD) Program*

The State and Regional Water Board's DOD Program provides regulatory oversight for the restoration and protection of surface and ground water quality during environmental cleanup of military facilities listed in the DOD/State Memorandum of Agreement (DSMOA). The State Water Board will enter into an interagency agreement with the Department of Toxic Substances Control (DTSC) which, in turn, will enter into the DSMOA with DOD for cleanup oversight reimbursement. The State and Regional Water Boards provide regulatory oversight by their authority pursuant to Division 7 of the Water Code and Section 120(f) of the Comprehensive Environmental

Response, Compensation, and Liability Act (CERCLA), Title 42, U.S.C., Section 9620 (f). The DOD enters into a two-year cooperative agreement with DTSC to support DTSC's mandated mission to protect public health and the environment. The DOD Program should continue until DSMOA facility cleanups are completed (20 to 30 years) or Congress decides to terminate State oversight funding.

The cleanup of military facilities is required to be consistent with the applicable provisions of CERCLA (Section 120 relating to Federal Facilities), the Superfund Amendments and Reauthorization Act of 1986 (SARA), the National Contingency Plan, and State laws.

4.2.1.3 State Water Board Management Agency Agreements (MAAs), Memorandum of Agreement (MOA), and Memoranda of Understanding (MOUs)

The Regional Water Board abides by State Water Board agreements with federal and State agencies which have been formalized with either an MAA, MOA, or an MOU signed by the State Water Board.

4.2.1.3.1- U.S. Forest Service Agreement

On 26 February 1981 the State Water Board Executive Director signed an MAA with the U.S. Forest Service (USFS) which waives discharge requirements for certain USFS nonpoint source discharges provided that the Forest Service implements State Water Board approved best management practices (BMPs) and procedures and the provisions of the MAA. The MAA covers all USFS lands in California. Implementation of the BMPs, in conjunction with monitoring and performance review requirements approved by the State and Regional Water Boards, is the primary method of meeting the Basin Plan's water quality objectives for the activities to which the BMPs apply. The MAA does not include USFS point source discharges and in no way limits the authority of the Regional Water Board to carry out its legal responsibilities for management or regulation of water quality. See Appendix Item 13.

4.2.1.3.2- Department of Toxic Substances Control

On 27 January 1986, the State Water Board Chairperson signed an MOA with the Department of Health Services (later renamed to the Department of Toxic Substances Control) regarding the implementation of the hazardous waste program. The agreement covers surveillance and enforcement related to water quality at landfills, surface impoundments, waste piles, and land treatment facilities that treat, store, or dispose of hazardous waste. It also covers the issuance, modification, or denial of permits to facilities, including the revision of the water quality aspects of hazardous waste management facility siting, design, closure, post-closure, and surface and ground water monitoring and protection. See Appendix Item 14.

4.2.1.3.3- State Water Board Division of Drinking Water Programs

In 1988, the Chairman of the State Water Board signed an MOA with the Department of Health Services (later named the State Water Board Division of Drinking Water Programs) regarding the use of reclaimed water.

The MOA outlines the basic activities of the agencies, allocates primary areas of responsibility and authority between these agencies, and provides for methods and mechanisms to assure coordination for activities related to the use of reclaimed water. See Appendix Item 15.

4.2.1.3.4- California Department of Forestry Agreement

In February 1988, the State Water Board signed an MAA with the California Department of Forestry and Fire Protection (CDFFP) and the California Board of Forestry (BOF), for the purpose of carrying out, pursuant to Section 208 of the Federal Clean Water Act, those portions of the State's Water Quality Management Plan (WQMP) related to controlling water quality impacts caused by silvicultural activities on nonfederal forest lands. As with the USFS MAA, the CDFFP agreement requires the Department to implement certain BMPs to protect water quality from timber harvest and associated activities. Approval of the MAA as a WQMP component by the USEPA results in the Regional Water Boards relinquishing some authority to issue WDRs for State timber operations (Public Resources Code Section 4514.3). However, CDF and the Regional and State Water Boards must still ensure that the operations incorporate BMPs and comply with applicable water quality standards. Appendix F of the MAA also calls for the

preparation of a Memorandum of Understanding (MOU) for the Regional Water Boards, the State Water Board, and the CDFFP to prescribe interagency procedures for implementing BMPs. See Appendix Item 16.

4.2.1.3.5- *Department of Conservation Agreement*

In March 1988, the State Water Board amended a February 1982 MOA with the State Department of Conservation, Division of Oil and Gas (CDOG), to regulate oil, gas, and geothermal fields' discharges. The agreement requires CDOG to notify the Regional Water Boards of all new operators, all pollution problems associated with operators, and proposed discharges. CDOG and Regional Water Boards must also work together, within certain time-lines, to review and prepare discharge permits. See Appendix Item 17.

4.2.1.3.6- *Department of Toxic Substances Control*

In July 1990, the State Water Board and the Department of Health Services, Toxic Substances Control Program (later reorganized into the Department of Toxic Substances Control) signed an MOU which explains the roles of the agencies (and of the Regional Water Boards) in the cleanup of hazardous waste sites. The MOU describes the protocol the agencies will follow to determine which agency will act as lead and which will act as support, the responsibilities of the agencies in their respective roles, the procedures the agencies will follow to ensure coordinated action, the technical and procedural requirements which each agency must satisfy, the procedures for enforcement and settlement, and the mechanism for dispute resolution. This MOU does not alter the Board's responsibilities with respect to water quality protection. See Appendix Item 18.

4.2.1.3.7- *Soil Conservation Service, U.S. Department of Agriculture*

On 31 July 1990, the State Water Board Executive Director signed an MOU with Soil Conservation Service (SCS), a technical agency for the U.S. Department of Agriculture. Through this MOU, State Water Board seeks to utilize the personnel and expertise of SCS in the development and implementation of water quality programs and projects. The goal is to accelerate implementation of best management practices and other nonpoint source pollution prevention measures. See Appendix Item 19.

4.2.1.3.8- *Environmental Affairs Agency, Air Resources Board, and California Integrated Waste Management Board*

On 27 August 1990, the State Water Board Executive Director signed an MOU with the Environmental Affairs Agency, Air Resources Board, and California Integrated Waste Management Board to enhance program coordination and reduce duplication of effort. This MOU consists of provisions describing the scope of the agreement (including definitions of the parties and issues to which the MOU applies), the principles which will govern the conduct of the parties, and the existing statutory framework. See Appendix Item 20.

4.2.1.3.9- *California Department of Pesticide Regulation*

On 23 December 1991, the State Water Board Chairman signed a MOU with the California Department of Pesticide Regulation (DPR) to ensure that pesticides registered in California are used in a manner that protects water quality and the beneficial uses of water while recognizing the need for pest control.

The State Water Board and nine Regional Water Boards are responsible for protecting the beneficial use of water in California and for controlling all discharges of waste into waters of the state while DPR is the lead agency for pesticide regulation in California.

This will be accomplished by implementing Best Management Practices (BMPs) initially upon voluntary compliance to be followed by regulatory-based encouragement of BMPs as circumstances dictate. Mandatory compliance will be based, whenever possible, on DPR's implementation of regulations and/or pesticide use permit requirements. However, the State Water Board and Regional Water Boards retain ultimate responsibility for compliance with water quality objectives. The agreement was revised on 19 January 1993 to facilitate implementation of the original agreement. See Appendix Item 21.

4.2.1.3.10- *Implementation of the San Joaquin Valley Drainage Program's Recommended Plan*

In January 1992, the State Water Board Chairman signed a MOU with the U.S. Bureau of Reclamation, the U.S. Fish and Wildlife Service, the U.S. Soil Conservation Service, the U.S. Geological Survey, the California Department of Fish and Game (later renamed the California Department of Fish and Wildlife), and the Department of Food and Agriculture. The MOU is an agreement by the agencies to use the management plan described in the September 1990 final report of the San Joaquin Valley Drainage Program as a guide for remedying subsurface drainage and related problems. See Appendix Item 22.

4.2.1.3.11- *California Integrated Waste Management Board*

On 16 December 1992, the State Water Board Executive Director signed a MOU to address the Regional Water Board's review of Solid Waste Assessment Test reports. See Appendix Item 23.

4.2.1.3.12- *Bureau of Land Management*

On 27 January 1993, the State Water Board Vice Chairman signed a MOU to address nonpoint source water quality issues on public lands managed by the Bureau. See Appendix Item 24.

4.2.2 Control Action Considerations of the Central Valley Regional Water Board

4.2.2.1 Policies and Plans

The following are the Regional Water Board's policies to protect water quality in the Central Valley:

4.2.2.1.1- *Urban Runoff Policy*

~~a.~~(1) Subregional municipal and industrial plans are required to assess the impact of urban runoff on receiving water quality and consider abatement measures if a problem exists.

~~b.~~(2) Effluent limitations for storm water runoff are to be included in NPDES permits where it results in water quality problems.

4.2.2.1.2- *Wastewater Reuse Policy*

The Regional Water Board encourages the reclamation and reuse of wastewater, including treated ground water resulting from a cleanup action, where practicable and requires as part of a Report of Waste Discharge an evaluation of reuse and land disposal options as alternative disposal methods. Reuse options should include consideration of the following, where appropriate, based on the quality of the wastewater and the required quality for the specific reuses: industrial and municipal supply, crop irrigation, landscape irrigation, ground water recharge, and wetland restoration. Where studies show that Year-round or continuous reuse or land disposal of all of the wastewater is not practicable, the Regional Water Board will require dischargers to evaluate how reuse or land disposal can be optimized, such as consideration of reuse/disposal for part of the flow and seasonal reuse/disposal options (e.g., dry season land disposal).

4.2.2.1.3- *Controllable Factors Policy*

Controllable water quality factors are not allowed to cause further degradation of water quality in instances where other factors have already resulted in water quality objectives being exceeded. Controllable water quality factors are those actions, conditions, or circumstances resulting from human activities that may influence the quality of the waters of the State, that are subject to the authority of the State Water Board or Regional Water Board, and that may be reasonably controlled.

4.2.2.1.4- *The Water Quality Limited Segment Policy*

Additional treatment beyond minimum federal requirements will be imposed on dischargers to Water Quality Limited Segments. Dischargers will be assigned or allocated a maximum allowable load of critical pollutants so that water quality objectives can be met in the segment.

To determine an allowable load for dischargers, the “Loading Capacity” must be determined. The “Loading Capacity” is the maximum amount of pollution that can be present in a water body without violating water quality objectives. The Loading Capacity can be established to address multiple pollutants or a single pollutant. The Loading Capacity can be allocated to NPDES permitted sources (point sources) as waste load allocations and to non-NPDES permitted sources (nonpoint sources) and background as load allocations. Part of the Loading Capacity may also be set aside or not assigned to account for any uncertainty in the Loading Capacity calculation.

The Loading Capacity and allocations are established to meet Clean Water Act Section 303(d) requirements. In addition, the Loading Capacity and allocations can provide a framework for actions to be taken by the Regional Water Board for achieving pollutant reductions and attaining water quality objectives.

4.2.2.1.5- *Regional Water Board Resolution No. 70-118, Delegation of Duties and Powers to the Regional Water Board's Executive Officer*

In January 1970, the Regional Water Board adopted Resolution No. 70-118 which delegates certain duties and powers of the Board to its Executive Officer pursuant to Section 13223 of the California Water Code. See Appendix Item 25.

4.2.2.1.6- *Regional Water Board Resolution No. 96-147, San Joaquin River Agricultural Subsurface Drainage Policy*

- a.(1) The control of toxic trace elements in agriculture subsurface drainage, especially selenium, is the first priority.
- b.(2) The control of agricultural subsurface drainage will be pursued on a regional basis.
- c.(3) The reuse of agricultural subsurface drainage will be encouraged, and actions that would limit or prohibit reuse discouraged.
- d.(4) Of the two major options for disposal of salts produced by agricultural irrigation, export out of the basin has less potential for environmental impacts and, therefore, is the favored option. The San Joaquin River may continue to be used to remove salts from the basin so long as water quality objectives are met.
- e.(5) The valley-wide drain to carry the salts generated by agricultural irrigation out of the valley remains the best technical solution to the water quality problems of the San Joaquin River and Tulare Lake Basin. The Regional Water Board, at this time, feels that a valley-wide drain will be the only feasible, long-range solution for achieving a salt balance in the Central Valley. The Regional Water Board favors the construction of a valley-wide drain under the following conditions:
 - All toxicants would be reduced to a level which would not harm beneficial uses of receiving waters.
 - The discharge would be governed by specific discharge and receiving water limits in an NPDES permit.
 - Long-term, continuous biological monitoring would be required.
- f.(6) Optimizing protection of beneficial uses on a watershed basis will guide the development of actions to regulate agricultural subsurface drainage discharges.

~~§(7)~~ For regulation of selenium discharges, actions need to be focused on selenium load reductions.

4.2.2.1.7- *Antidegradation Implementation Policy*

The antidegradation directives of Section 13000 of the Water Code and State Water Board Resolution No. 68-16 ("Statement of Policy With Respect to Maintaining High Quality Waters in California") require that high quality waters of the State shall be maintained "consistent with the maximum benefit to the people of the State." The Regional Water Board applies these directives when issuing a permit, or in an equivalent process, regarding any discharge of waste which may affect the quality of surface or ground waters in the region.

Implementation of this policy to prevent or minimize surface and ground water degradation is a high priority for the Board. In nearly all cases, preventing pollution before it happens is much more cost-effective than cleaning up pollution after it has occurred. Once degraded, surface water is often difficult to clean up when it has passed downstream. Likewise, cleanup of ground water is costly and lengthy due, in part, to its relatively low assimilative capacity and inaccessibility. The prevention of degradation is, therefore, an important strategy to meet the policy's objectives.

The Regional Water Board will apply 68-16 in considering whether to allow a certain degree of degradation to occur or remain. In conducting this type of analysis, the Regional Water Board will evaluate the nature of any proposed discharge, existing discharge, or material change therein, that could affect the quality of waters within the region. Any discharge of waste to high quality waters must apply best practicable treatment or control not only to prevent a condition of pollution or nuisance from occurring, but also to maintain the highest water quality possible consistent with the maximum benefit to the people of the State.

Pursuant to this policy, a Report of Waste Discharge, or any other similar technical report required by the Board pursuant to Water Code Section 13267, must include information regarding the nature and extent of the discharge and the potential for the discharge to affect surface or ground water quality in the region. This information must be presented as an analysis of the impacts and potential impacts of the discharge on water quality, as measured by background concentrations and applicable water quality objectives. The extent of information necessary will depend on the specific conditions of the discharge. For example, use of best professional judgment and limited available information may be sufficient to determine that ground or surface water will not be degraded. In addition, the discharger must identify treatment or control measures to be taken to minimize or prevent water quality degradation.

4.2.2.1.8- *Drinking Water Policy Implementation*

As a part of the Drinking Water Policy, a narrative objective has been established for *Cryptosporidium* and *Giardia* to protect the public water system component of the MUN beneficial use. Although it is unclear what levels of *Cryptosporidium* and *Giardia* will impair this use, the goal of implementation is to maintain existing levels of pathogens at public water system intakes. This will be achieved by addressing controllable sources that are shown to cause or substantially contribute to *Cryptosporidium* levels increasing to the trigger level of the next highest bin classification. In accordance with the USEPA Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR), public water systems are required to monitor for *Cryptosporidium* at their intakes; the monitoring results are used to establish the bin classification for the water system. To assure that *Cryptosporidium* levels at public water systems stay within the range of their existing bin classifications, triggers at public water system intakes are included below based on USEPA LT2ESWTR bin classifications. The triggers and the changes to LT2ESWTR bin levels do not indicate a violation of the narrative water quality objective for *Cryptosporidium* and *Giardia* nor are the triggers and the LT2ESWTR bin levels to be used for numeric effluent limits. Instead, the proposed numeric triggers may prompt action by the Regional Water Board.

4.2.2.1.8.1 *Cryptosporidium Ambient Trigger Exceedance*

If *Cryptosporidium* monitoring data from an existing public water system intake indicate that the maximum running annual average has reached 80 percent of the next highest bin, as existed in 2013, the affected public water system may request that the Regional Water Board initiate the investigation described below and shown in Figure ~~IV-14-1~~. Table ~~IV-14-1~~ shows the 2013 LT2ESWTR bin classifications and the 80 percent trigger levels.

TABLE IV-1.14-1. BIN LEVELS AND 80 PERCENT TRIGGERS		
Bin Classification	Maximum Running Annual Average (oocysts/L)	80 Percent Trigger (oocysts/L)
1	< 0.075	0.06
2	0.075 to < 1.0	0.8
3	1.0 to < 3.0	2.4

If the affected public water system requests assistance, the Regional Water Board should coordinate with CDPH, the affected public water system and potential sources (e.g., storm water management entities, wastewater treatment or wetland managers, etc.) to assess the data and evaluate the need to conduct source evaluations and implement control options. The affected public water system may decline assistance from the Regional Water Board in addressing their compliance with the LT2ESWTR. The coordination and investigation effort should include the steps represented by the schematic overview in Figure IV4-1.

4.2.2.1.8.2 Antidegradation Analysis

In addressing *Cryptosporidium* and *Giardia* in an antidegradation analysis for evaluating the public water system component of the MUN beneficial use, the monitoring results of the nearest impacted public water system intake shall be considered. In cases where a trigger (Section IV4.2.2.1.8.1) at the nearest public water system intake has not been exceeded, the analysis should be simplified and may be curtailed, depending on the magnitude of the discharge in question and the likelihood of potential impact at public water system intakes. If a trigger has been exceeded, information from the resulting investigation should be considered in the antidegradation analysis.

4.2.2.1.8.3 Reasonable Potential

The Regional Water Board evaluated data representing 2013 conditions. An evaluation of this data indicates that the narrative water quality objective for *Cryptosporidium* and *Giardia* is being attained in surface waters at all public water system intakes in the Delta and its tributaries. The triggers and the changes between LT2ESWTR bin levels do not indicate a violation of the narrative water quality objective for *Cryptosporidium* and *Giardia* nor are the triggers and the LT2ESWTR bin levels to be used for numeric effluent limits.

The Regional Water Board will determine reasonable potential in accordance with the applicable state and federal regulatory requirements. For NPDES permittees, the numeric triggers as applied at the public water system intakes are part of the Regional Water Board's procedures under 40 CFR § 122.44(d)(1)(ii) for determining whether a discharge has reasonable potential. At the request of an affected public water system, implementation of the trigger provisions described in (Figure IV4-1, flowchart) will help to ensure that management measures prevent violations of the narrative objective. As a result, NPDES dischargers are not expected to have a reasonable potential to cause or contribute to an excursion above the narrative objective, and NPDES permits are not expected to include effluent limitations to implement the narrative objective.

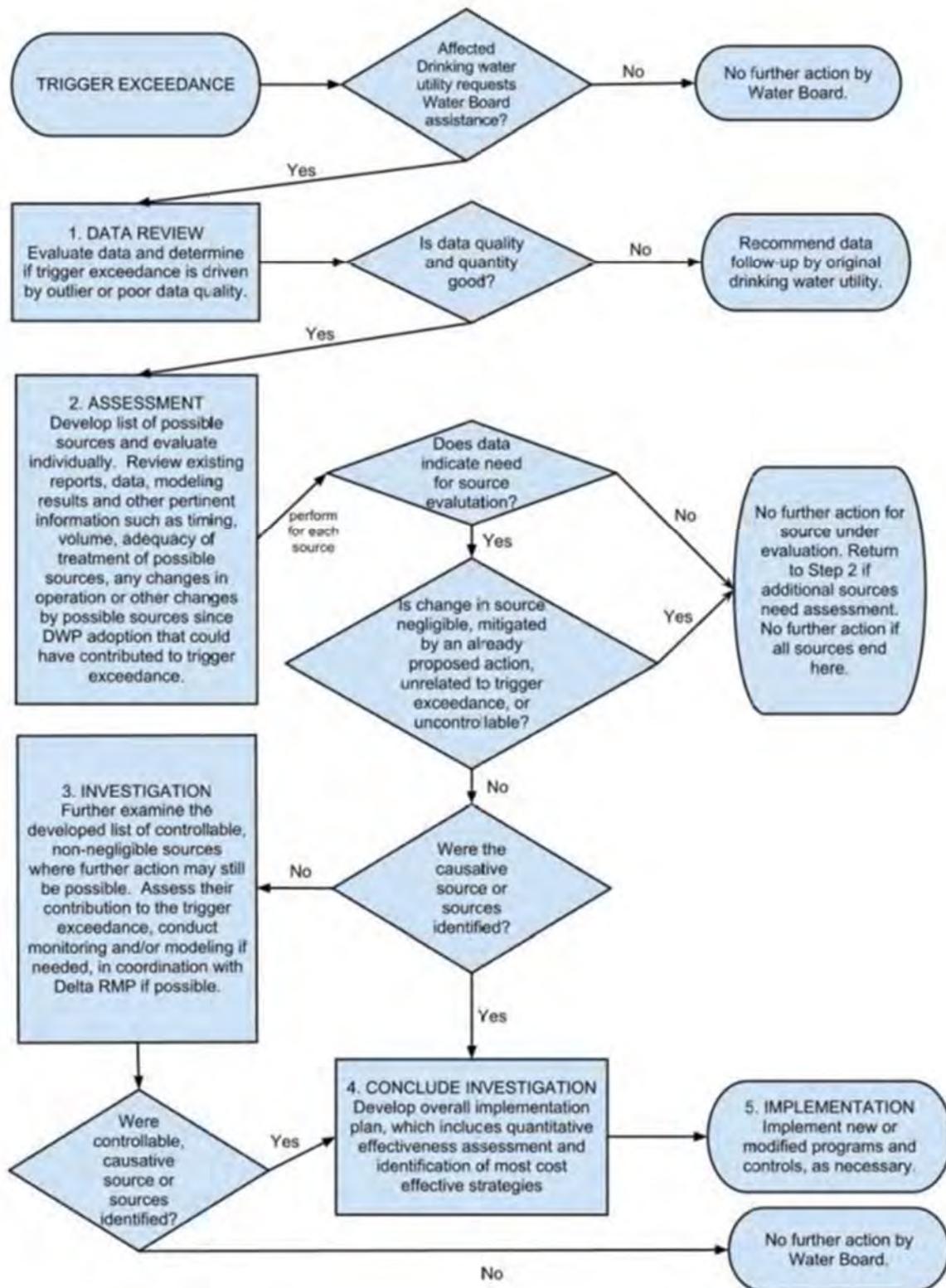


FIGURE IV-4-1: SCHEMATIC OVERVIEW OF ACTIONS PROMPTED BY CRYPTOSPORIDIUM TRIGGER EXCEEDANCE

4.2.2.1.98 Policy for Application of Water Quality Objectives

Water quality objectives are defined in the Water Code as "the limits or levels of water quality constituents or characteristics which are established for the reasonable protection of beneficial uses of water or the prevention of nuisance within a specific area". (see Chapter [H3](#)). Water quality objectives may be stated in either numerical or narrative form. Water quality objectives apply to all waters within a surface water or ground water resource for which beneficial uses have been designated, rather than at an intake, wellhead or other point of consumption.

In conjunction with the issuance of NPDES and storm water permits, the Regional Water Board may designate mixing zones within which water quality objectives will not apply provided the discharger has demonstrated to the satisfaction of the Regional Water Board that the mixing zone will not adversely impact beneficial uses. If allowed, different mixing zones may be designated for different types of objectives, including, but not limited to, acute aquatic life objectives, chronic aquatic life objectives, human health objectives, and acute and chronic whole effluent toxicity objectives, depending in part on the averaging period over which the objectives apply. In determining the size of such mixing zones, the Regional Water Board will consider the applicable procedures and guidelines in EPA's Water Quality Standards Handbook and the Technical Support Document for Water Quality-based Toxics Control. Pursuant to EPA guidelines, mixing zones designated for acute aquatic life objectives will generally be limited to a small zone of initial dilution in the immediate vicinity of the discharge.

Where the Regional Water Board determines it is infeasible to achieve immediate compliance with water quality objectives adopted by the Regional Water Board or the State Water Board, or with water quality criteria adopted by the USEPA, or with an effluent limitation based on these objectives or criteria, the Regional Water Board may establish in NPDES permits a schedule of compliance. The schedule of compliance shall include a time schedule for completing specific actions that demonstrate reasonable progress toward the attainment of the objectives or criteria and shall contain a final compliance date, based on the shortest practicable time (determined by the Regional Water Board) required to achieve compliance. In no event shall an NPDES permit include a schedule of compliance that allows more than ten years (from the date of adoption of the objective or criteria) for compliance with water quality objectives, criteria or effluent limitations based on the objectives or criteria. Schedules of compliance are authorized by this provision only for those water quality objectives or criteria adopted after the effective date of this provision [25 September 1995]. The Regional Water Board will establish compliance schedules in NPDES permits consistent with the provisions of the State Water Board's Compliance Schedule Policy (Resolution 2008-0025). Time schedules in waste discharge requirements are established consistent with Water Code Section 13263.

State Water Board Resolution No. 68-16 requires the maintenance of the existing high quality of water (i.e., "background") unless a change in water quality "will be consistent with maximum benefit to the people of the State...". This policy explains how the Regional Water Board applies numerical and narrative water quality objectives to ensure the reasonable protection of beneficial uses of water and how the Regional Water Board applies Resolution No. 68-16 to promote the maintenance of existing high quality waters.

The numerical and narrative water quality objectives define the least stringent standards that the Regional Water board will apply to regional waters in order to protect beneficial uses. Numerical receiving water limitations will be established in Board orders for constituents and parameters which will, at a minimum, meet all applicable water quality objectives. However, the water quality objectives do not require improvement over naturally occurring background concentrations. In cases where the natural background concentration of a particular constituent exceeds an applicable water quality objective, the natural background concentration will be considered to comply with the objective. Consistent with Resolution No. 68-16, the Regional Water Board will impose more stringent numerical limitations (or prohibitions) which will maintain the existing quality of the receiving water, unless, pursuant to Resolution No. 68-16, some adverse change in water quality is allowed. Maintenance of the existing high quality of water means maintenance of "background" water quality conditions, i.e., the water quality found upstream or upgradient of the discharge, unaffected by other discharges. Therefore, the water quality objectives will define the least stringent limits which will be imposed and background defines the most stringent limits which will be imposed on ambient water quality.

This Basin Plan contains numerical water quality objectives for various constituents and parameters in Chapter [H3](#). Where numerical water quality objectives are listed, these are the limits necessary for the reasonable protection of beneficial uses of the water. In many instances, the Regional Water Board has not been able to adopt numerical

water quality objectives for constituents or parameters, and instead has adopted narrative water quality objectives (e.g., for bacteria, chemical constituents, taste and odor, and toxicity). Where compliance with these narrative objectives is required (i.e., where the objectives are applicable to protect specified beneficial uses), the Regional Water Board will, on a case-by-case basis, adopt numerical limitations in orders which will implement the narrative objectives.

To evaluate compliance with the narrative water quality objectives, the Regional Water Board considers, on a case-by-case basis, direct evidence of beneficial use impacts, all material and relevant information submitted by the discharger and other interested parties, and relevant numerical criteria and guidelines developed and/or published by other agencies and organizations (e.g., State Water Board, State Water Board Division of Drinking Water Programs, California Office of Environmental Health Hazard Assessment, California Department of Toxic Substances Control, University of California Cooperative Extension, California Department of Fish and Wildlife, USEPA, U.S. Food and Drug Administration, National Academy of Sciences, U.S. Fish and Wildlife Service, Food and Agricultural Organization of the United Nations). In considering such criteria, the Board evaluates whether the specific numerical criteria, which are available through these sources and through other information supplied to the Board, are relevant and appropriate to the situation at hand and, therefore, should be used in determining compliance with the narrative objective. For example, compliance with the narrative objective for taste and odor may be evaluated by comparing concentrations of pollutants in water with numerical taste and odor thresholds that have been published by other agencies. This technique provides relevant numerical limits for constituents and parameters which lack numerical water quality objectives. To assist dischargers and other interested parties, the Regional Water Board staff has compiled many of these numerical water quality criteria from other appropriate agencies and organizations in the Central Valley Regional Water Board's staff report, *A Compilation of Water Quality Goals*. This staff report is updated regularly to reflect changes in these numerical criteria.

Where multiple toxic pollutants exist together in water, the potential for toxicologic interactions exists. On a case by case basis, the Regional Water Board will evaluate available receiving water and effluent data to determine whether there is a reasonable potential for interactive toxicity. Pollutants which are carcinogens or which manifest their toxic effects on the same organ systems or through similar mechanisms will generally be considered to have potentially additive toxicity. The following formula will be used to assist the Regional Water Board in making determinations:

$$\sum_{i=1}^n \frac{[\text{Concentration of Toxic Substances}]_i}{[\text{Toxicological Limit for Substances in Water}]_i} < 1.0$$

The concentration of each toxic substance is divided by its toxicologic limit. The resulting ratios are added for substances having similar toxicologic effects and, separately, for carcinogens. If such a sum of ratios is less than one, an additive toxicity problem is assumed not to exist. If the summation is equal to or greater than one, the combination of chemicals is assumed to present an unacceptable level of toxicologic risk. For example, monitoring shows that ground water beneath a site has been degraded by three volatile organic chemicals, A, B, and C, in concentrations of 0.3, 0.4, and 0.04 µg/l, respectively. Toxicologic limits for these chemicals are 0.7, 3, and 0.06 µg/l, respectively. Individually, no chemical exceeds its toxicologic limit. However, an additive toxicity calculation shows:

$$\frac{0.3}{0.7} + \frac{0.4}{3} + \frac{0.04}{0.06} = 1.2$$

The sum of the ratios is greater than unity (>1.0); therefore, the additive toxicity criterion has been violated. The concentrations of chemicals A, B, and C together present a potentially unacceptable level of toxicity.

For permitting purposes, it is important to clearly define how compliance with the narrative toxicity objectives will be measured. Staff is currently working with the State Water Board to develop guidance on this issue.

4.2.2.1.109 Policy for Investigation and Cleanup of Contaminated Sites

The Regional Water Board's strategy for managing contaminated sites is guided by several important principles, which are based on Water Code Sections 13000 and 13304, the Title 23, CCR, Division 3, Chapter 15 and Title 27, CCR, Division 2, Subdivision 1 regulations and State Water Board Resolution Nos. 68-16 and 92-49:

~~a~~(1) State Water Board Policy & Regulation

The Regional Water Board will require conformance with the provisions of State Water Board Resolution No. 68-16 in all cases and will require conformance with applicable or relevant provisions of 23 CCR, Division 3, Chapter 15 and 27 CCR, Division 2, Subdivision 1 to the extent feasible. These provisions direct the Regional Water Board to ensure that dischargers are required to clean up and abate the effect of discharges in a manner that promotes attainment of background water quality, or the highest water quality which is reasonable and protective of beneficial uses if background levels of water quality cannot be restored.

~~b~~(2) Site Investigation

An investigation of soil and ground water to determine full horizontal and vertical extent of pollution is necessary to ensure that cleanup plans are protective of water quality. The goal of the investigation shall be to determine where concentrations of constituents of concern exceed beneficial use protective levels (water quality objectives) and, additionally, where constituents of concern exceed background levels (the zero-impact line). Investigations shall extend off-site as necessary to determine the full extent of the impact.

~~c~~(3) Source Removal/Containment

Immediate removal or containment of the source, to the extent practicable, should be implemented where necessary to prevent further spread of pollution as well as being among the most cost-effective remediation actions. The effectiveness of ground water cleanup techniques often depends largely on the completeness of source removal or containment efforts (e.g., removal of significantly contaminated soil or pockets of dense non-aqueous phase liquids).

~~d~~(4) Cleanup Level Approval

Ground water and soil cleanup levels are approved by the Regional Water Board. The Executive Officer may approve cleanup levels as appropriately delegated by the Board.

~~e~~(5) Site Specificity

Given the extreme variability of hydrogeologic conditions in the Region, cleanup levels must reflect site-specific factors.

~~f~~(6) Discharger Submittals

The discharger must submit the following information for consideration by the Regional Water Board in establishing cleanup levels which meet the criteria contained in 23 CCR Section 2550.4(c) through (g):

~~i~~(a) water quality assessment to determine impacts and threats to the quality of water resources;

~~ii~~(b) risk assessment to determine impacts and threats to human health and the environment; and

~~iii~~(c) feasibility study of cleanup alternatives which compare effectiveness, cost, and time to achieve cleanup levels. Cleanup levels covered by this study shall include, at a minimum, background levels, levels which meet all applicable water quality objectives and which do not pose significant risks to health or the environment, and an alternate cleanup level which is above background

levels and which also meets the requirements as specified in paragraphs ~~g-(v)(7)(e)~~ and ~~(vi)f~~ below.

~~g-(7)~~ Ground Water Cleanup Levels

Ground water cleanup levels shall be established based on:

- ~~i-(a)~~ background concentrations of individual pollutants;
- ~~ii-(b)~~ applicable water quality objectives to protect designated beneficial uses of the water body, as listed in Chapters ~~H-2~~ and ~~H-3~~;
- ~~iii-(c)~~ concentrations which do not pose a significant risk to human health or the environment, considering risks from toxic constituents to be additive across all media of exposure and, in the absence of scientifically valid data to the contrary, additive for all constituents having similar toxicologic effects or having carcinogenic effects; and
- ~~iv-(d)~~ technologic and economic feasibility of attaining background concentrations and of attaining concentrations lower than defined by ~~(ii)b~~ and ~~(iii)c~~ above.

Factors in ~~(ia)~~ through ~~(ivd)~~ above are used to establish ground water cleanup levels according to the following principles:

- ~~v-(e)~~ Pursuant to 23 CCR Section 2550.4, the Regional Water Board establishes cleanup levels that are protective of human health, the environment and beneficial uses of waters of the state, as measured by compliance with ~~(ii)b~~ and ~~(iii)c~~ above, and are equal to background concentrations if background levels are technologically and economically feasible to achieve. If background levels are infeasible to achieve, cleanup levels are set between background concentrations and concentrations that meet all criteria in ~~(ii)b~~ and ~~(iii)c~~ above. Within this concentration range, cleanup levels must be set at the lowest concentrations that are technologically and economically achievable. In no case are cleanup levels established below natural background concentrations.
- ~~vi-(f)~~ Technologic feasibility is determined by assessing the availability of technologies which have been shown to be effective in reducing the concentrations of the constituents of concern to the established cleanup levels. Bench-scale and/or pilot-scale studies may be necessary to make this feasibility assessment in the context of constituent, hydrogeologic, and other site-specific factors. Economic feasibility does not refer to the subjective measurement of the ability of the discharger to pay the costs of cleanup, but rather to the objective balancing of the incremental benefit of attaining more stringent levels of constituents of concern as compared with the incremental cost of achieving those levels. Factors to be considered in the establishment of cleanup levels greater than background are listed in 23 CCR, Section 2550.4(d). The discharger's ability to pay is one factor to be considered in determining whether the cleanup level is reasonable. However, availability of economic resources to the discharger is primarily considered in establishing reasonable schedules for compliance with cleanup levels.
- ~~vii-(g)~~ Compliance with ~~(iii)c~~ above shall be determined through risk assessments performed by the discharger, using the most current procedures authorized by the Department of Toxic Substances Control, the Office of Environmental Health Hazard Assessment, or the USEPA. The Regional Water Board is not the lead agency for specifying risk assessment procedures or for reviewing risk assessments. The Board will assist the discharger, as necessary, in obtaining the appropriate, most current procedures from the above listed agencies. To prevent duplication of effort, the Board will rely on the Department of Toxic Substances Control, the Office of Environmental Health Hazard Assessment, or appropriately designated local health agencies to review and evaluate the adequacy of health and environmental risk assessments. The Board will assist the discharger, as necessary, in determining which of these agencies will review the risk assessments for a particular site.

Priority will be given to those agencies that are already involved with the assessment and cleanup of the site.

~~h~~(8) Compliance with Ground Water Cleanup Levels

To protect potential beneficial uses of the water resource as required by Water Code Sections 13000 and 13241, compliance with ground water cleanup levels must occur throughout the pollutant plume.

~~i~~(9) Modifying Ground Water Cleanup Levels

The Regional Water Board may consider modifying site-specific ground water cleanup levels (that have been determined pursuant to subsection (~~g~~7) above) that are more stringent than applicable water quality objectives, only when a final remedial action plan has been pursued in good faith, and all of the following conditions are met:

~~i~~(a) Modified cleanup levels meet the conditions listed in (~~g~~7)(~~ii~~b) and (~~iii~~c) above

~~ii~~(b) An approved cleanup program has been fully implemented and operated for a period of time which is adequate to understand the hydrogeology of the site, pollutant dynamics, and the effectiveness of available cleanup technologies;

~~iii~~(c) Adequate source removal and/or isolation is undertaken to eliminate or significantly reduce future migration of constituents of concern to ground water;

~~iv~~(d) The discharger has demonstrated that no significant pollutant migration will occur to other underlying or adjacent aquifers;

~~v~~(e) Ground water pollutant concentrations have reached asymptotic levels using appropriate technology;

~~vi~~(f) Optimization of the existing technology has occurred and new technologies have been evaluated and applied where economically and technologically feasible; and

~~vii~~(g) Alternative technologies for achieving lower constituent levels have been evaluated and are inappropriate or not economically feasible.

~~j~~(10) Soil Cleanup Levels

For soils which threaten the quality of water resources, soil cleanup levels should be equal to background concentrations of the individual leachable/mobile constituents, unless background levels are technologically or economically infeasible to achieve. Where background levels are infeasible to achieve, soil cleanup levels are established to ensure that remaining leachable/mobile constituents of concern will not threaten to cause ground water to exceed applicable ground water cleanup levels, and that remaining constituents do not pose significant risks to health or the environment. The Regional Water Board will consider water quality, health, and environmental risk assessment methods, as long as such methods are based on site-specific field data, are technically sound, and promote attainment of all of the above principles.

~~k~~(11) Verification of Soil Cleanup

Verification of soil cleanup generally requires verification sampling and follow-up ground water monitoring. The degree of required monitoring will reflect the amount of uncertainty associated with the soil cleanup level selection process. Follow-up ground water monitoring may be limited where residual concentrations of leachable/mobile constituents in soils are not expected to impact ground water quality.

~~4.12~~ Remaining Constituents

Where leachable/mobile concentrations of constituents of concern remain on-site in concentrations which threaten water quality, the Regional Water Board will require implementation of applicable provisions of Title 23, CCR, Division 3 Chapter 15 and Title 27, CCR, Division 2, Subdivision 1. Relevant provisions of Title 23, CCR, Division 3 Chapter 15 and Title 27, CCR, Division 2, Subdivision 1 which may not be directly applicable, but which address situations similar to those addressed at the cleanup site will be implemented to the extent feasible, in conformance with Title 23, CCR, Section 2511(d)/27 CCR, Section 20090(d). This may include, but is not limited to, surface or subsurface barriers or other containment systems, waste immobilization, toxicity reduction, and financial assurances.

~~4.2.2.1.1110~~ Policy for Obtaining Salt Balance in the San Joaquin Valley

It is the policy of the Regional Water Board to encourage construction of facilities to convey agricultural drain water from the San Joaquin and Tulare Basins. A valley-wide conveyance facility for agricultural drain waters impaired by high levels of salt is the only feasible, long-range solution for achieving a salt balance in the Central Valley.

~~4.2.2.1.1211~~ Watershed Policy

The Regional Water Board supports implementing a watershed based approach to addressing water quality problems. The State and Regional Water Boards are in the process of developing a proposal for integrating a watershed approach into the Board's programs. The benefits to implementing a watershed based program would include gaining participation of stakeholders and focusing efforts on the most important problems and those sources contributing most significantly to those problems.

~~4.2.2.1.1312~~ Policy for the Royal Mountain King Mine Site in Calaveras County

~~a.1~~ Groundwater Management Strategy at the Royal Mountain King Mine Site, in Calaveras County

The owner of the Royal Mountain King Mine Site shall continue to implement a groundwater management strategy to manage poor-quality groundwater at the Site and to protect good-quality groundwater. The strategy is to maintain the lowest practicable level of water in Skyrocket Pit Lake and prevent any measurably significant degradation of current water quality in groundwater downgradient of the MUN and AGR de-designation area shown in Figure H2-2. In addition, saline leachate that emerges as springs at the base of the Gold Knoll Overburden Disposal Site and the West Overburden Disposal Site, as well as the Flotation Tailings Reservoir leachate collection and recovery system, shall be collected in sumps and transferred by pumping to Skyrocket Pit Lake or regulated with an NPDES permit or WDRs.

~~b.2~~ Variance for IND and PRO Uses in Groundwaters at the Royal Mountain King Mine site, in Calaveras County

Groundwaters within the area shown in Figure H2-2 at the Royal Mountain King Mine Site are subject to a variance for the IND and PRO uses based on high background levels of total dissolved solids. The variance exempts the constituents listed in the table, below, from regulatory limits that would otherwise be determined from the IND and PRO beneficial uses.

Constituents in groundwater subject to the variance for IND and PRO include:
Total Dissolved Solids
Arsenic
Chloride
Nitrate
Selenium
Sulfate

~~4.2.2.1.14.3~~ Variance Policy for Surface Waters

As part of its state water quality standards program, states have the discretion to include variance policies. (40 C.F.R., §131.13.) This policy provides the Regional Water Board with the authority to grant a variance from application of water quality standards under certain circumstances.

4.2.2.1.14.1 Variances from Surface Water Quality Standards for Point Source Dischargers

~~A~~(1) A permit applicant or permittee subject to an NPDES permit may apply to the Regional Water Board for a variance from a surface water quality standard for a specific constituent(s), as long as the constituent is not a priority toxic pollutant identified in 40 C.F.R., §131.38(b)(1). A permit applicant or permittee may not apply to the Regional Water Board for a variance from a surface water quality standard for temperature. The application for such a variance shall be submitted in accordance with the requirements specified in section ~~II~~ of this Policy ~~4.2.2.1.14.2~~. The Central Valley Water Board may adopt variance programs that provide streamlined approval procedures for multiple dischargers that share the same challenges in achieving their water quality based effluent limitation(s) (WQBELs) for the same pollutant(s). The *Variance Program for Salinity Water Quality Standards* in section ~~III~~~~4.2.2.1.14.3~~, below, is a multiple discharger variance program. Permittees that qualify for the *Variance Program for Salinity Water Quality Standards* by meeting the criteria in section ~~4.2.2.1.14.3(1)~~~~III.A~~, may submit a salinity variance application in accordance with the requirements specified in section ~~4.2.2.1.14.3~~~~III~~ of this Policy.

~~B~~(2) The Regional Water Board may not grant a variance if:

- ~~(1a)~~ Water quality standards addressed by the variance will be achieved by implementing technology-based effluent limitations required under sections 301(b) and 306 of the Clean Water Act, or
- ~~(2b)~~ The variance would likely jeopardize the continued existence of any endangered species under section 4 of the Endangered Species Act or result in the destruction or adverse modification of such species' critical habitat.

~~C~~(3) The Regional Water Board may approve all or part of a requested variance, or modify and approve a requested variance, if the permit applicant demonstrates a variance is appropriate based on at least one of the six following factors:

- ~~(1a)~~ Naturally occurring pollutant concentrations prevent the attainment of the surface water quality standard; or
- ~~(2b)~~ Natural, ephemeral, intermittent, or low flow conditions or water levels prevent the attainment of the surface water quality standard, unless these conditions may be compensated for by the discharge of sufficient volume of effluent discharges without violating state water conservation requirements to enable surface water quality standards to be met; or
- ~~(3c)~~ Human caused conditions or sources of pollution prevent the attainment of the surface water quality standard and cannot be remedied or would cause more environmental damage to correct than to leave in place; or
- ~~(4d)~~ Dams, diversions, or other types of hydrologic modifications preclude the attainment of the surface water quality standard, and it is not feasible to restore the waterbody to its original condition or to operate such modification in a way that would result in the attainment of the surface water quality standard; or
- ~~(5e)~~ Physical conditions related to the natural features of the waterbody, such as the lack of a proper substrate, cover, flow, depth, pools, riffles, and the like, unrelated to water quality preclude attainment of aquatic life protection of surface water quality standards; or
- ~~(6f)~~ Controls more stringent than those required by sections 301(b) and 306 of the Clean Water Act would result in substantial and widespread economic and social impact.

~~D~~(4) In making a determination on a variance application that is based on factor ~~(3c)~~ in paragraph ~~(C-3)~~, above, the Regional Water Board may consider the following:

- (1a) Information on the type and magnitude of adverse or beneficial environmental impacts, including the net impact on the receiving water, resulting from the proposed methodologies capable of attaining the adopted or proposed WQBEL.
- (2b) Other relevant information requested by the Regional Water Board or supplied by the applicant or the public.

~~F(5)~~ In making a determination on a variance application that is based on factor ~~(6f)~~ in paragraph ~~C(3)-a~~ above, the Regional Water Board may consider the following:

- (1a) The cost and cost-effectiveness of pollutant removal by implementing the methodology capable of attaining the adopted or proposed WQBEL for the specific constituent(s) for which a variance is being requested.
- (2b) The reduction in concentrations and loadings of the pollutant(s) in question that is attainable by source control and pollution prevention efforts as compared to the reduction attainable by use of the methodology capable of attaining the adopted or proposed WQBEL.
- (3c) The overall impact of attaining the adopted or proposed WQBEL and implementing the methodologies capable of attaining the adopted or proposed WQBEL.
- (4d) The technical feasibility of installing or operating any of the available methodologies capable of attaining the WQBEL for which a variance is sought.
- (5e) Other relevant information requested by the Regional Water Board or supplied by the applicant or the public.

~~F(6)~~ A determination to grant or deny a requested variance shall be made in accordance with the procedures specified in section ~~H4.2.2.1.14.2~~, below. Procedures specified in section ~~4.2.2.1.14.3H~~, below, will be used for applicants that qualify for the *Variance Program for Salinity Water Quality Standards*.

~~G(7)~~ A variance applies only to the permit applicant requesting the variance and only to the constituent(s) specified in the variance application.

~~H(8)~~ A variance or any renewal thereof shall be for a time as short as feasible and shall not be granted for a term greater than ten years.

~~I(9)~~ Neither the filing of a variance application nor the granting of a variance shall be grounds for the staying or dismissing of, or a defense in, a pending enforcement action. A variance shall be prospective only from the date the variance becomes effective.

~~J(10)~~ A variance shall conform to the requirements of the State Water Board's Antidegradation Policy (State Water Board Resolution 68-16).

~~H-4.2.2.1.14.2~~ Variance Application Requirements and Processes

~~A(1)~~ An application for a variance from a surface water quality standard for a specific constituent(s) subject to this Policy may be submitted at any time after the permittee determines that it is unable to meet a WQBEL or proposed WQBEL based on a surface water quality standard, and/or an adopted wasteload allocation. The variance application may be submitted with the renewal application (i.e., report of waste discharge) for a NPDES permit. If the permittee is seeking to obtain a variance after a WQBEL has been adopted into a NPDES permit, the WQBEL shall remain in effect until such time that the Regional Water Board makes a determination on the variance application.

~~B(2)~~ The granting of a variance by the Regional Water Board is a discretionary action subject to the requirements of the California Environmental Quality Act. As such, the Regional Water Board may require the variance applicant to prepare such documents as are necessary so that the Regional Water Board can ensure that its action complies with the requirements set forth in the California Environmental Quality Act, or the Regional Water Board may use any such documents that have been prepared and certified by another state or local agency that address the potential environmental impacts associated with the project and the granting of a variance.

~~6~~(3) A complete variance application must contain the following:

- ~~(1)~~(a) Identification of the specific constituent(s) and water quality standard(s) for which a variance is sought;
- ~~(2)~~(b) Identification of the receiving surface water, and any available information with respect to receiving water quality and downstream beneficial uses for the specific constituent;
- ~~(3)~~(c) Identification of the WQBEL(s) that is being considered for adoption, or has been adopted in the NPDES permit;
- ~~(4)~~(d) List of methods for removing or reducing the concentrations and loadings of the pollutants with an assessment of technical effectiveness and the costs and cost effectiveness of these methods. At a minimum, and to the extent feasible, the methods must include source control measures, pollution prevention measures, facility upgrades and end-of-pipe treatment technology. From this list, the applicant must identify the method(s) that will consistently attain the WQBELs and provide a detailed discussion of such methodologies;
- ~~(5)~~(e) Documentation of at least one of the following over the next ten years. Documentation that covers less than ten years will limit the maximum term that the Regional Water Board can consider for the variance:
 - (i) That naturally occurring pollutant concentrations prevent the attainment of the surface water quality standard or
 - (ii) That natural, ephemeral, intermittent, or low flow conditions or water levels prevent the attainment of the surface water quality standard, unless these conditions may be compensated for by the discharge of sufficient volume of effluent discharges to enable surface water quality standards to be met; or
 - (iii) That human caused conditions or sources of pollution prevent the attainment of the surface water quality standard from which the WQBEL is based, and it is not feasible to remedy the conditions or sources of pollution; or
 - (iv) That dams, diversions, or other types of hydrologic modifications preclude the attainment of the surface water quality standard from which the WQBEL is based, and it is not feasible to restore the water body to its original condition or to operate such modification in a way that would result in attainment of the surface water quality standard; or
 - (v) Physical conditions related to the natural features of the water body, such as the lack of a proper substrate, cover, flow, depth, pools, riffles, and the like, unrelated to water quality, preclude attainment of aquatic life protection of surface water quality standards from which the WQBEL is based; or
 - (vi) That installation and operation of each of the available methodologies capable of attaining the WQBEL would result in substantial and widespread economic and social impact.
- ~~(6)~~(f) Documentation that the permittee has reduced, or is in the process of reducing, to the maximum extent practicable, the discharge of the pollutant(s) for which a variance is sought through implementation of local pretreatment, source control, and pollution prevention efforts; and,
- ~~(7)~~(g) A detailed discussion of a proposed interim discharge limitation(s) that represents the highest level of treatment that the permittee can consistently achieve during the term of the variance. Such discussion shall also identify and discuss any drought, water conservation, and/or water recycling efforts that may cause certain constituents in the effluent to increase, or efforts that will cause certain constituents in the effluent to decrease with a sufficient amount of certainty. When the permittee proposes an interim discharge limitation(s) that is higher than the current level of the constituent(s) in the effluent due to the need to account for drought, water conservation or water recycling efforts, the permittee must provide appropriate information to show that the increase in the level for the proposed interim discharge limitation(s) will not adversely affect beneficial uses, is consistent with state and federal antidegradation policies (State Water Board Resolution No. 68-16 and 40 C.F.R., § 131.12.), and is consistent with anti-backsliding provisions specified in section 402(o) of the Clean Water Act. If the permittee indicates that certain constituents in the effluent are likely to decrease during the term of the variance due to recycling efforts or management measures, then the proposed interim discharge limitation(s) shall account for such decreases.

~~(8h)~~ Copies of any documents prepared and certified by another state or local agency pursuant to Public Resources Code section 21080 et seq.; or, such documents as are necessary for the Regional Water Board to make its decision in compliance with Public Resources Code section 21080 et seq.

~~D(4)~~ Within 60 days of the receipt of a variance application, the Regional Water Board shall determine that the variance application is complete, or specify in writing any additional relevant information, which is deemed necessary to make a determination on the variance request. Such additional information shall be submitted by the applicant within a time period agreed upon by the applicant and the Regional Water Board Executive Officer. Failure of an applicant to submit any additional relevant information requested by the Regional Water Board Executive Officer within the agreed upon time period may result in the denial of the variance application.

~~E(5)~~ The Regional Water Board shall provide a copy of the variance application to USEPA Region 9 within 30 days of finding that the variance application is complete.

~~F(6)~~ Within a reasonable time period after finding that the variance application is complete, the Regional Water Board shall provide public notice, request comment, and schedule and hold a public hearing on the variance application. When the variance application is submitted with the NPDES permit renewal application (i.e., report of waste discharge), the notice, request for comment and public hearing requirement on the variance application may be conducted in conjunction with the Regional Water Board's process for the renewal of the NPDES permit.

~~G(7)~~ The Regional Water Board may approve the variance, either as requested, or as modified by the Regional Water Board. The Regional Water Board may take action to approve a variance and renew and/or modify an existing NPDES permit as part of the same Board meeting. The permit shall contain all conditions needed to implement the variance, including, at a minimum, all of the following:

- ~~(1a)~~ An interim effluent limitation for the constituent(s) for which the variance is sought. The interim effluent limitation(s) must be consistent with the current level of the constituent(s) in the effluent and may be lower based on anticipated improvement in effluent quality. The Regional Water Board may consider granting an interim effluent limitation(s) that is higher than the current level if the permittee has demonstrated that drought, water conservation, and/or water recycling efforts will cause the quality of the effluent to be higher than the current level and that the higher interim effluent limitation will not adversely affect beneficial uses. When the duration of the variance is shorter than the duration of the permit, compliance with effluent limitations sufficient to meet the water quality criterion upon the expiration of the variance shall be required;
- ~~(2b)~~ A requirement to prepare and implement a pollution prevention plan pursuant to Water Code section 13263.3 to address the constituent(s) for which the variance is sought;
- ~~(3c)~~ Any additional monitoring that is determined to be necessary by the Regional Water Board to evaluate the effects on the receiving water body of the variance from water quality standards;
- ~~(4d)~~ A provision allowing the Regional Water Board to reopen and modify the permit based on any revision to the variance made by the Regional Water Board during the next revision of the water quality standards or by EPA upon review of the variance; and
- ~~(5e)~~ Other conditions that the Regional Water Board determines to be necessary to implement the terms of the variance.

~~H(8)~~ The variance, as adopted by the Regional Water Board in section ~~G(7)~~, is not in effect until it is approved by U.S. EPA.

~~I(9)~~ Permit limitations for a constituent(s) contained in the applicant's permit that are in effect at the time of the variance application shall remain in effect during the consideration of a variance application for that particular constituent(s).

~~J(10)~~ The permittee may request a renewal of a variance in accordance with the provisions contained in paragraphs ~~A, B and C(1), (2) and (3)~~ and this section. For variances with terms greater than the term of the permit, an application for renewal of the variance may be submitted with the renewal application for the NPDES permit in order to have the term of the variance begin concurrent with the term of the permit. The renewal application shall

also contain information concerning its compliance with the conditions incorporated into its permit as part of the original variance and shall include information to explain why a renewal of the variance is necessary. As part of its renewal application, a permittee shall also identify all efforts the permittee has made, and/or intends to make, towards meeting the standard(s). Renewal of a variance may be denied if the permittee did not comply with any of the conditions of the original variance.

~~K(11)~~ All variances and supporting information shall be submitted by the Regional Water Board to the U.S. EPA Regional Administrator within 30 days of the date of the Regional Water Board's final variance decision for approval and shall include the following:

- ~~(1a)~~ The variance application and any additional information submitted to the Regional Water Board;
- ~~(2b)~~ Any public notices, public comments, and records of any public hearings held in conjunction with the request for the variance;
- ~~(3c)~~ The Regional Water Board's final decision; and
- ~~(4d)~~ Any changes to NPDES permits to include the variance.

~~L(12)~~ All variances shall be reviewed during the Regional Water Board's triennial review process of this Basin Plan. For variances with terms that are greater than the term of the permit, the Regional Water Board may also review the variance upon consideration of the permit renewal.

HH.4.2.2.1.14.3

Variance Program for Salinity Water Quality Standards

The State Water Board and the Regional Water Board recognize that salt is impacting beneficial uses in the Central Valley and management of salinity in surface and ground waters is a major challenge for dischargers. In response, the Water Boards initiated the Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS) in 2006. The State Water Board *Recycled Water Policy* requires the development of salt and nutrient management plans protective of ground water and submittal of these plans to the Regional Water Board by May 2016. These plans are to become the basis of basin plan amendments to be considered by the Regional Water Board by May 2017. CV-SALTS is the stakeholder effort working to develop comprehensive salt and nitrate management plans (SNMPs) that will satisfy the *Recycled Water Policy's* salt and nutrient management plans. CV-SALTS is undertaking technical work to analyze salt and nitrate conditions in surface and ground water in the Central Valley, identify implementation measures, and develop monitoring strategies to ensure environmental and economic sustainability. The technical work under development includes developing the models for loading and transport of salt, development and evaluation of effective management practices, and implementing activities to ensure beneficial uses are protected. Participation by all stakeholders is necessary to assure that the work is scientifically justified, supported by broad stakeholder representation, and completed in a timely fashion. The Regional Water Board has indicated its support for the comprehensive effort through CV-SALTS in Resolutions R5-2006-0024, R5-2010-0024, and R5-2013-0149 and the March 2010 Memorandum of Agreement between the Regional Water Board, the Central Valley Salinity Coalition and the State Water Board.

~~A(1)~~ During the development and initial implementation of the SNMPs by CV-SALTS, permittees who qualify may apply for a variance from salinity water quality standards if they have or will have WQBELs for salinity that they are unable to meet by submitting a salinity variance application. The *Salinity Variance Program* as described specifically herein is for municipal and domestic wastewater dischargers that have or will implement local pretreatment, source control, and pollution prevention efforts to reduce the effluent concentrations of salinity constituents and are now faced with replacing the municipal water supply with a better quality water or installing costly improvements, such as membrane filtration treatment technology, such that widespread social and economic impacts are expected consistent with the justification provided for the case study cities in the *Staff Report for the Amendments to the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins and the Water Quality Control Plan for the Tulare Lake Basin to add Policies for Variances from Surface Water Quality Standards for Point Source Dischargers, Variance Program for Salinity, and Exception from Implementation of Water Quality Objectives for Salinity, June 2014*. Consistent with the planned development and implementation of the SNMPs, no salinity variance under this section shall be approved after 30 June 2019. For the purposes of the Salinity Variance Program, salinity water quality standards are defined to only include water quality standards for the following constituents: electrical conductivity, total dissolved solids, chloride, sulfate and sodium.

~~B~~(2) An application for a variance for a specific salinity water quality standard may be submitted at any time after the permittee determines that it is unable to meet a QBEL or proposed QBEL based on a salinity water quality standard. Preferably, the salinity variance application should be submitted with the renewal application (i.e., report of waste discharge) for a NPDES permit. If the permittee is seeking to obtain a variance after a QBEL has been adopted into a NPDES permit, the QBEL shall remain in effect until such time that the Regional Water Board makes a determination on the variance application.

~~C~~(3) An application for variance from QBELs based on a salinity water quality standard must contain the following:

- ~~(1)~~a Identification of the salinity constituents for which the variance is sought;
- ~~(2)~~b Identification of the receiving surface water, and any available information with respect to receiving water quality and downstream beneficial uses for the specific constituent;
- ~~(3)~~c Identification of the QBEL that is being considered for adoption, or has been adopted in the NPDES permit;
- ~~(4)~~d A description of salinity reduction/elimination measures that have been undertaken as of the application date, if any;
- ~~(5)~~e A Salinity Reduction Study Work Plan, which at a minimum must include the following:
 - (i) Data on current influent and effluent salinity concentrations,
 - (ii) Identification of known salinity sources,
 - (iii) Description of current plans to reduce/eliminate known salinity sources,
 - (iv) Preliminary identification of other potential sources,
 - (v) A proposed schedule for evaluating sources,
 - (vi) A proposed schedule for identifying and evaluating potential reduction, elimination, and prevention methods.
- ~~(6)~~f An explanation of the basis for concluding that there are no readily available or cost-effective methodologies available to consistently attain the QBELs for salinity.
- ~~(7)~~g A detailed discussion explaining why the permittee's situation is similar to or comparable with the case studies supporting the Salinity Variance Program identified in the *Staff Report for the Amendments to the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins and the Water Quality Control Plan for the Tulare Lake Basin to add Policies for Variances from Surface Water Quality Standards for Point Source Dischargers, Variance Program for Salinity, and Exception from Implementation of Water Quality Objectives for Salinity, June 2014*.
- ~~(8)~~h A detailed discussion of proposed interim discharge limitation(s) that represents the highest level of treatment that the permittee can consistently achieve during the term of the variance. If the permittee indicates that certain constituents in the effluent are likely to decrease during the term of the variance due to efforts, then the proposed interim discharge limitation(s) shall account for such decreases.
- ~~(9)~~i Documentation of the applicant's active participation in CV-SALTS as indicated by a letter of support from CV-SALTS.
- ~~(10)~~j A detailed plan of how the applicant will continue to participate in CV-SALTS and how the applicant will contribute to the development and implementation of the SNMPs.

~~D~~(4) After the receipt of a variance application for salinity, the Regional Water Board shall determine whether the variance application is complete and whether the permittee qualifies for consideration of the variance, or specify in writing any additional relevant information that is deemed necessary to make a determination on the salinity variance request. Such additional information shall be submitted by the applicant within a time period agreed upon by the applicant and the Regional Water Board Executive Officer. Failure of an applicant to submit any additional relevant information requested by the Regional Water Board Executive Officer within the time period specified by the Executive Officer may result in the denial of the variance application for salinity.

~~E~~(5) After determining that the variance application for salinity is complete, the Regional Water Board shall provide notice, request comment, and schedule and hold a public hearing on the variance application for salinity. When the variance application is submitted with the NPDES permit renewal application (i.e., report of waste

discharge), the notice, request for comment and public hearing requirement on the variance application may be conducted in conjunction with the Regional Water Board's process for the renewal of the NPDES permit.

~~F~~(6) The Regional Water Board may approve a salinity variance, either as requested, or as modified by the Regional Water Board, after finding that the permittee qualifies for the salinity variance, the attainment of the WQBEL is not feasible, the permittee has implemented or will implement feasible salinity reduction/elimination measures and the permittee continues to participate in CV-SALTS consistent with the demonstrations based on the case studies identified in the Staff Report for the Amendments to the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins and the Water Quality Control Plan for the Tulare Lake Basin to add Policies for Variances from Surface Water Quality Standards for Point Source Dischargers, Variance Program for Salinity, and Exception from Implementation of Water Quality Objectives for Salinity, June 2014. The Regional Water Board may take action to approve a variance and issue a new, or reissue or modify an existing NPDES permit as part of the same Board meeting. The permit shall contain all conditions needed to implement the variance, including, at a minimum, all of the following:

- (~~1~~a) The interim effluent limitation(s) that are determined to be attainable during the term of the variance. When the duration of the variance is shorter than the duration of the permit, compliance with effluent limitations sufficient to meet the water quality criterion upon the expiration of the variance shall be required;
- (~~2~~b) A requirement to implement the Salinity Reduction Study Work Plan submitted with the variance application as required by paragraph ~~C~~5(3)(e), above;
- (~~3~~c) A requirement to participate in CV-SALTS and contribute to the development and implementation of the SNMPs in accordance with the plan required by paragraph ~~C~~10(3)(j), above.
- (~~4~~d) Any additional monitoring that is determined to be necessary to evaluate the effects on the receiving water body of the variance from water quality standards;
- (~~5~~e) A provision allowing the Regional Water Board to reopen and modify the permit based on any revision to the variance made by the Regional Water Board during the next revision of the water quality standards;
- (~~6~~f) Other conditions that the Regional Water Board determines to be necessary to implement the terms of the variance.

~~G~~(7) Permit limitations for a substance contained in the applicant's permit that are in effect at the time of the variance application shall remain in effect during the consideration of the variance application for that particular substance.

~~H~~(8) The permittee may request a renewal of a salinity variance in accordance with the provisions contained in paragraphs ~~B~~(2) and ~~C~~(3) of this section. For variances with terms greater than the term of the permit, an application for renewal of the salinity variance may be submitted with the renewal application for the NPDES permit in order to have the term of the variance begin concurrent with the term of the permit. The renewal application shall also contain information concerning its compliance with the conditions incorporated into its permit as part of the original variance, and shall include information to explain why a renewal of the variance is necessary. As part of its renewal application, a permittee shall also identify all efforts the permittee has made, and/or intends to make, towards meeting the standard. Renewal of a variance may be denied if the permittee did not comply with the conditions of the original variance.

~~I~~(9) All variances shall be reviewed during the Regional Water Board's triennial review process of this Basin Plan. For variances with terms that are greater than the term of the permit, the Regional Water Board may also review the variance upon consideration of the permit renewal.

~~4.2.2.1.15-14~~ *Limited-Term Exceptions from Basin Plan Provisions and Water Quality Objectives for Groundwater and for non-NPDES Dischargers to Surface Waters*

Pursuant to Water Code sections 13050 and 13240 et seq., the Regional Water Board has adopted beneficial use designations and water quality objectives that apply to surface and ground waters in the basins covered by this Basin Plan as well as programs of implementation. The Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS) is a stakeholder effort to develop comprehensive salt and nitrate management plans (SNMPs) by May

2016 that is expected to result in basin plan amendments that will be considered by the Regional Water Board by May 2017. CV-SALTS is undertaking technical work to analyze salt and nitrate conditions in surface and ground water in the Central Valley, identify implementation measures, and develop monitoring strategies to ensure environmental and economic sustainability. The technical work under development includes developing the models for loading and transport of salt, development and evaluation of effective management practices, and implementing activities to ensure beneficial uses are protected. Participation by all stakeholders is necessary to ensure that the work is scientifically justified, supported by broad stakeholder representation, and completed in a timely fashion. The Regional Water Board has indicated its support for the comprehensive effort through CV-SALTS in Resolutions R5-2006-0024, R5-2010-0024, and R5-2013-0149 and the March 2010 Memorandum of Agreement between the Regional Water Board, the Central Valley Salinity Coalition and the State Water Board. The Regional Water Board finds that it is reasonable to grant exceptions to the discharge requirements related to the implementation of water quality objectives for salinity for non-NPDES dischargers to surface water, and for discharges to groundwater in order to allow for development and implementation of the SNMPs.

4.2.2.1.15.1 Exception to Discharge Requirements Related to the Implementation of Water Quality Objectives for Salinity

- (1)- Any person subject to waste discharge requirements and/or conditional waivers issued pursuant to Water Code 13269 that are not also NPDES permits may apply to the Regional Water Board for an exception to discharge requirements from the implementation of water quality objectives for salinity. The exception may apply to the issuance of effluent limitations and/or groundwater limitations that implement water quality objectives for salinity in groundwater, or to effluent limitations and/or surface water limitations that implement water quality objectives for salinity in surface water. For the purposes of this Program, salinity and its constituents include, and are limited to, the following: electrical conductivity, total dissolved solids, chloride, sulfate and sodium. The application for such an exception(s) shall be submitted in accordance with the requirements specified in paragraph (8), below.
- (2)- An exception to discharge requirements from the implementation of water quality objectives for salinity imposed as limitations in either waste discharge requirements and/or conditional waivers that are not also NPDES permits shall be set for a term not to exceed ten years. For exception terms greater than five years, the Regional Water Board will review the exception five years after approval to confirm that the exception should proceed for the full term. The Regional Water Board review will be conducted during a public hearing. An exception may be renewed beyond the initial term if the SNMPs are still under development, and if a renewal application is submitted in accordance with the requirements specified in paragraph (8), below. A renewal must be considered during a public hearing held in accordance with paragraph 10, below.
- (3)- The Regional Water Board will consider granting an exception to the implementation of water quality objectives for salinity under this Program if the applicant is actively participating in CV-SALTS as indicated by the letter required under paragraph (8)(e), below.
- (4)- When granting an exception to the implementation of water quality objectives for salinity under this Program, the Regional Water Board shall consider including an interim performance-based effluent limitation and/or groundwater limitation that provides reasonable protection of the groundwater or the receiving water, where appropriate. When establishing such a limitation, the Regional Water Board shall take into consideration increases in salinity concentrations due to drought, water conservation, and/or water recycling efforts that may occur during the term of the exception granted.
- (5)- When granting an exception to the implementation of water quality objectives for salinity under this Program, the Regional Water Board shall require the discharger to prepare and implement a Salinity Reduction Study Work Plan, or a salinity-based watershed management plan. A Salinity Reduction Study Work Plan shall at a minimum include the following:
 - (a-) Data on current influent and effluent salinity concentrations;
 - (b-) Identification of known salinity sources;
 - (c-) Description of current plans to reduce/eliminate known salinity sources;
 - (d-) Preliminary identification of other potential sources;

- ~~(e-)~~ A proposed schedule for evaluating sources; and
- ~~(f-)~~ A proposed schedule for identifying and evaluating potential reduction, elimination, and prevention methods.

A salinity-based watershed management plan shall at a minimum include the following :

- ~~(a-)~~ A discussion of the physical conditions that affect surface water or groundwater in the management plan area, including land use maps, identification of potential sources of salinity, baseline inventory of identified existing management practices in use, and a summary of available surface and/or groundwater quality data;
 - ~~(b-)~~ A management plan strategy that includes a description of current management practices being used to reduce or control known salinity sources;
 - ~~(c-)~~ Monitoring methods;
 - ~~(d-)~~ Data evaluation; and,
 - ~~(e-)~~ A schedule for reporting management plan progress.
- ~~(6-)~~ When granting an exception to the implementation of water quality objectives under this Program, the Regional Water Board will include a requirement to participate in CV-SALTS and contribute to the development and implementation of the SNMPs in accordance with the plan submitted under paragraph ~~(8-)(f)~~, below.
- ~~(7-)~~ The granting of an exception to the implementation of water quality objectives for salinity under this Program by the Regional Water Board is a discretionary action subject to the requirements of the California Environmental Quality Act. As such, the Regional Water Board may require the applicant for the exception to prepare such documents as are necessary so that the Regional Water Board can ensure that its action complies with the requirements set forth in the California Environmental Quality Act or the Regional Water Board may use any such documents that have been prepared and certified by another state or local agency that address the potential environmental impacts associated with the project and the granting of an exception from implementation of water quality objectives for salinity in groundwater and/or surface water.
- ~~(8-)~~ A person seeking an exception to the implementation of water quality objectives for salinity under this Program must submit an application to the Regional Water Board. The person's request shall include the following:
- ~~(a-)~~ An explanation/justification as to why the exception is necessary, and why the discharger is unable to ensure consistent compliance with existing effluent and/or groundwater/surface water limitations associated with salinity constituents at this time;
 - ~~(b-)~~ A description of salinity reduction/elimination measures that the discharger has undertaken as of the date of application, or a description of a salinity-based watershed management plan and progress of its implementation;
 - ~~(c-)~~ A description of any drought impacts, irrigation, water conservation and/or water recycling efforts that may be causing or cause the concentration of salinity to increase in the effluent, discharges to receiving waters, or in receiving waters;
 - ~~(d-)~~ Copies of any documents prepared and certified by another state or local agency pursuant to Public Resources Code section 21080 et seq.; or, such documents as are necessary for the Regional Water Board to make its decision in compliance with Public Resources Code section 21080 et seq.
 - ~~(e-)~~ Documentation of the applicant's active participation in CV-SALTS as indicated by a letter of support from CV-SALTS.
 - ~~(f-)~~ A detailed plan of how the applicant will continue to participate in CV-SALTS and how the applicant will contribute to the development and implementation of the SNMPs.
- ~~(9-)~~ Upon receipt of an application for an exception to the implementation of water quality objectives for salinity under this Program, the Regional Water Board shall determine that the exception application is complete, or specify in writing any additional relevant information, which is deemed necessary to make a determination on the exception request. Failure of an applicant to submit any additional relevant

information requested by the Regional Water Board Executive Officer within the applicable time period may result in the denial of the exception application.

~~(10.)~~ Within a reasonable time period after determining that the exception application is complete, the Regional Water Board shall provide notice, request comment, and schedule and hold a public hearing on the application within a timely manner. The notice and hearing requirements shall comply with those set forth in Water Code section 13167.5. The exception shall be issued through a resolution or special order that amends applicable waste discharge requirements and/or conditional waiver requirements.

~~(11.)~~ There will be no new salinity exceptions and salinity exceptions will not be renewed after 30 June 2019.

4.2.2.2 Regional Water Board Memoranda of Understanding (MOU) and Memoranda of Agreement (MOA)

4.2.2.2.1- U.S. Bureau of Land Management

In September 1985, the Regional Water Board Executive Officer signed MOUs with the three U.S. Bureau of Land Management Districts in the Central Valley (i.e., the Ukiah District, the Susanville District, and the Bakersfield District). The MOUs, which are identical for each District, aim at improving coordination between the two agencies for the control of water quality problems resulting from mineral extraction activities on BLM administered lands. See Appendix Items 26 through 28.

4.2.2.2.2- U.S. Bureau of Reclamation Agreement

On 2 July 1969, the Regional Water Board signed an MOA with the Bureau of Reclamation to schedule water releases from the New Melones Unit of the Central Valley Project to maintain an oxygen level at or above 5 mg/l in the Stanislaus River downstream of the unit and to not exceed a mean monthly TDS concentration of 500 mg/l in the San Joaquin River immediately below the mouth of the Stanislaus River. The MOA's water quality requirements are subject to some conditions. See Appendix Item 29.

4.2.2.2.3- California Department of Fish and Wildlife and Mosquito Abatement and Vector Control Districts of the South San Joaquin Valley

On 25 February 1993, the Regional Water Board Executive Officer signed an MOU with the California Department of Fish and Game (later renamed to the California Department of Fish and Wildlife) and 11 mosquito abatement and vector control districts of the south San Joaquin valley regarding vegetation management in wastewater treatment facilities. The MOU designates the Districts as lead agencies in determining the adequacy of vegetation management operations in abating mosquito breeding sources. Included in the MOU are the definition of vegetative management operations and conditions to protect nesting birds, eggs, and nests. See Appendix Item 30.

4.2.2.3 Regional Water Board Waivers

State law allows Regional Water Boards to conditionally waive WDRs for a specific discharge or types of discharges where the waiver is consistent with any applicable state or regional water quality control plan and it is in the public interest. A waiver may not exceed five years in duration, but may be renewed by a Regional Water Board. Waiver conditions must include monitoring requirements unless the Regional Water Board determines that the discharge does not pose a significant threat to water quality. Prior to renewing any waiver for a specific type of discharge, the Regional Water Board shall review the terms of the waiver policy at a public hearing. At the hearing, the Regional Water Board shall determine whether the discharge for which the waiver policy was established should be subject to general or individual waste discharge requirements. (Water Code Section 13269)

The Regional Water Board may, after compliance with the California Environmental Quality Act (CEQA), allow short-term variances from Basin Plan provisions, if determined to be necessary to implement control measures for vector and weed control, pest eradication, or fishery management which are being conducted to fulfill statutory requirements under California's Fish and Game, Food and Agriculture, or Health and Safety Codes. In order for the

Regional Water Board to determine if a variance is appropriate, agencies proposing such activities must submit to the Regional Water Board project-specific information, including measures to mitigate adverse impacts.

4.2.2.4 Regional Water Board Prohibitions

The Porter-Cologne Water Quality Control Act allows the Regional Water Board to prohibit certain discharges (Water Code Section 13243). Prohibitions may be revised, rescinded, or adopted as necessary. The prohibitions applicable to the Sacramento and San Joaquin River Basins are identified and described below.

[NOTE: Costs incurred by any unit of local government for a new program or increased level of service for compliance with discharge prohibitions in the Basin Plan do not require reimbursement by the State per Section 2231 of the Revenue and Taxation Code, because the Basin Plan implements a mandate previously enacted by statute, Chapter 482, Statutes of 1969.]

4.2.2.4.1- Water Bodies

Water bodies for which the Regional Water Board has held that the direct discharge of wastes is inappropriate as a permanent disposal method include sloughs and streams with intermittent flow or limited dilution capacity. The direct discharge of municipal and industrial wastes (excluding storm water discharges) into the following specific water bodies has been prohibited, as noted:

- American River, including Lake Natoma (from Folsom Dam to mouth)
- Clear Lake
- Folsom Lake
- Fourteen Mile Slough at Stockton N.W. and Lincoln Village
- Lake Berryessa
- Middle Fork, Feather River (from Dellecker to Lake Oroville)
- Lake Oroville
- Sacramento River (from confluence with the Feather River to the Freeport Bridge). [Note: There are two exceptions, (1) discharges of combined municipal waste and storm runoff flow from the City of Sacramento, and (2) discharges of treated/disinfected municipal waste from the City of West Sacramento when the City's Clarksburg outfall line is at its maximum hydraulic capacity and when Sacramento River flow is greater than 80,000 cfs, are not subject to the prohibition. The discharges are to be controlled through waste discharge requirements.]
- Sacramento Ship Channel and Turning Basin
- Shasta Lake
- Sugar Cut at Tracy
- Thermalito Forebay and Afterbay
- Tulloch Reservoir
- Whiskeytown Reservoir
- Willow Creek-Bass Lake in Madera County (the prohibition is for sewage effluent only)

4.2.2.4.2- Leaching Systems

Discharge of wastes from new and existing leaching and percolation systems has been prohibited by the Regional Water Board in the following areas:

- Amador City, Amador County (Adopted by Regional Water Board Order No. 73-129; effective as of 12/15/72)
- Martell Area, Amador County (73-129; 12/15/72)
- Shasta Dam Area Public Utilities District, Shasta County (73-129; 12/15/72)
- Vallecito Area, Calaveras County (73-129; 12/15/72)
- West Point Area, Calaveras County (73-129; 12/15/72)
- Celeste Subdivision Area, Merced County (73-129; 12/15/72)
- Snelling Area, Merced County (73-129; 12/15/72, and amended 74-126; 12/14/73)
- North San Juan, Nevada County (74-123; 12/14/73)

- Arnold Area, Calaveras County (74-124, 75-180; 12/14/73, 6/25/75)
- Contra Costa County Sanitation District No. 15, Contra Costa County (74-125; 12/14/73)
- Madera County Service Area No. 2, Bass Lake (74-127; 12/14/73)
- Madera County Service Area No. 3, Parksdale (74-128; 12/14/73)
- Coulterville County Service Area No. 1, Mariposa County (75-070; 3/21/75)
- Midway Community Services District, Merced County (75-072; 3/21/75)
- Adin Community Services District, Modoc County (75-272 11/21/75)
- Fall River Mills, Community Services District, Shasta County (75-273; 11/21/75)
- Bell Road Community, including Panorama and Pearl, Placer County (75-274; 11/21/75)
- Nice and Lucerne, Lake County (76-58; 2/27/76)
- Courtland Sanitation District, Sacramento County (76-59; 2/27/76)
- Six-Mile Village, Calaveras County (76-60; 2/27/76)
- Communities of Clearlake Highlands and Clearlake Park, Lake County (76-89; 3/26/76)
- Taylorsville County Service Area, Plumas County (76-129; 5/28/76)
- Community of South Lakeshore Assessment District, Lake County (76-215; 9/24/76)
- Anderson-Cottonwood Irrigation District, Community of Cottonwood, Shasta County (76-230; 10/22/76)
- Daphnedale Area, Modoc County (76-231; 10/22/76)
- Chico Urban Area, Butte County (90-126; 4/27/90)

4.2.2.4.3- *Petroleum*

The Regional Water Board has prohibited the discharge of oil or any residuary product of petroleum to the waters of the State, except in accordance with waste discharge requirements or other provisions of Division 7, California Water Code.

4.2.2.4.4- *Vessel Wastes*

The Regional Water Board has prohibited the discharge of toilet wastes from the vessels of all houseboat rental businesses on Shasta Lake, Clear Lake, and the Delta.

4.2.2.4.5- *Pesticides*

Effective immediately for molinate and thiobencarb and on 1 January 1991 for carbofuran, malathion and methyl parathion, the discharge of irrigation return flows containing these pesticides is prohibited unless the discharger is following a management practice approved by the Board. Proposed management practices for these pesticides will not be approved unless they are expected to meet the performance goals contained in the following table. Also, the management practices must ensure that discharges of thiobencarb to waters designated as municipal or domestic water supplies will comply with the 1.0 µg/l water quality objective for this pesticide. It is important to note that the performance goals in this timetable are interim in nature and while they are based on the best available information, they are not to be equated with concentrations that meet the water quality objectives. The intent of the performance goals is to bring concentrations being found in surface waters down to levels that approach compliance with the objectives. Future performance goals and numerical objectives will be set using the results of ongoing evaluations of the risks posed by these pesticides. Future performance goals may also be site-specific to take into consideration the additive impacts of more than one pesticide being present in a water body at the same time. The Board will reexamine the progress of the control effort for these pesticides in 1993 and will set performance goals intended to bring concentrations of these five pesticides into full compliance with all objectives by 1995.

Performance Goals¹ for Management Practices
in µg/l

Pesticide	YEAR			
	1990	1991	1992	1993
Carbofuran	D	0.4	0.4	R
Malathion	I	0.1	R	R
Molinate	30.0	20.0	10.0	R
Methyl parathion	D	0.26	0.13	R
Thiobencarb	3.0	1.5	R	R

¹ Performance goals are daily maxima and apply to all waters designated as freshwater habitat.

D = No numerical goal - control practices under development

I = No numerical goal - sources of discharge to be identified by special study

R = The Regional Board will review the latest technical and economic information determine if the performance goal should be adjusted

4.2.2.4.6- *San Joaquin River Subsurface Agricultural Drainage*

- a-(1) The discharge of agricultural subsurface drainage from the Grassland watershed to the San Joaquin River or its tributaries from any on-farm subsurface drain, open drain, or similar drain system is prohibited, unless such discharge began prior to the effective date of this amendment (10 January 1997) or unless such discharge is governed by waste discharge requirements.
- b-(2) The discharge of agricultural subsurface drainage water to Salt Slough and wetland water supply channels identified in Appendix 40 is prohibited after 10 January 1997, unless water quality objectives for selenium are being met.
- c-(3) The discharge of agricultural subsurface drainage water to the San Joaquin River from Sack Dam to Mud Slough (north) is prohibited after 1 October 2010, unless water quality objectives for selenium are being met. The discharge of agricultural subsurface drainage water to Mud Slough (north) and the San Joaquin River from the Mud Slough confluence to the Merced River is prohibited after 31 December 2019 unless water quality objectives for selenium are being met. The prohibition becomes effective immediately upon Board determination that timely and adequate mitigation, as outlined in the 2010-2019 Agreement for Continued Use of the San Luis Drain¹ has not been provided.
- d-(4) The discharge of selenium from agricultural subsurface drainage systems in the Grassland watershed to the San Joaquin River is prohibited in amounts exceeding 8,000 lbs/year for all water year types beginning 10 January 1997.
- e-(5) Activities that increase the discharge of poor quality agricultural subsurface drainage are prohibited.

4.2.2.4.7- *Diazinon and Chlorpyrifos Discharges into the Sacramento and Feather Rivers*

Beginning August 11, 2008, the direct or indirect discharge of diazinon or chlorpyrifos into the Sacramento and Feather Rivers is prohibited if, in the previous year (July-June), any exceedance of the diazinon or chlorpyrifos water quality objectives, or diazinon and chlorpyrifos loading capacity occurred.

¹ United States Department of the Interior, Bureau of Reclamation, Central Valley Project, California and San Luis & Delta-Mendota Water Authority, Los Banos, CA, *Agreement for Continued Use of the San Luis Drain for the period January 1 2010, through December 31, 2019.*

These prohibitions do not apply if the discharge of diazinon or chlorpyrifos is subject to a waiver of waste discharge requirements implementing the diazinon and chlorpyrifos water quality objectives and load allocations for diazinon and chlorpyrifos for the Sacramento and Feather Rivers, or governed by individual or general waste discharge requirements.

These prohibitions apply only to dischargers causing or contributing to the exceedance of the water quality objective or loading capacity.

4.2.2.4.8- *Dissolved Oxygen in the Stockton Deep Water Ship Channel (DWSC)*

The discharge of oxygen demanding substances or their precursors into waters tributary to the DWSC portion of the San Joaquin River is prohibited after 31 December 2011 when net daily flow in the DWSC portion of the San Joaquin River in the vicinity of Stockton is less than 3,000 cubic feet per second, unless dissolved oxygen objectives in the DWSC are being met.

Any increase in the discharge of oxygen demanding substances or their precursors into waters tributary to the DWSC portion of the San Joaquin River is prohibited after 23 August 2006.

These prohibitions do not apply if the discharge is regulated by a waiver of waste discharge requirements, or individual or general waste discharge requirements or NPDES permits, which implement the *Control Program for Factors Contributing to the Dissolved Oxygen Impairment in the Stockton Deep Water Ship Channel* or which include a finding that the discharge will have no reasonable potential to cause or contribute to a negative impact on the dissolved oxygen impairment in the DWSC. These prohibitions will be reconsidered by the Regional Water Board by December 2009 based on:

~~a~~(1) the results of the oxygen demand and precursor studies required in the *Control Program for Factors Contributing to the Dissolved Oxygen Impairment in the Stockton Deep Water Ship Channel*

~~b~~(2) the prevailing dissolved oxygen conditions in the DWSC

4.2.2.4.9- *Control of Diazinon and Chlorpyrifos Runoff into the San Joaquin River*

Beginning 1 December 2010, the direct or indirect discharge of diazinon or chlorpyrifos into the San Joaquin River is prohibited during the dormant season (1 December through 1 March) if any exceedance of the chlorpyrifos or diazinon water quality objectives, or diazinon and chlorpyrifos loading capacity occurred during the previous dormant season.

Beginning 2 March 2011, the direct or indirect discharge of diazinon or chlorpyrifos into the San Joaquin River is prohibited during the irrigation season (2 March through 30 November) if any exceedance of the chlorpyrifos or diazinon water quality objectives, or diazinon and chlorpyrifos loading capacity occurred during the previous irrigation season.

These prohibitions apply only to i) dischargers who discharge the pollutant causing or contributing to the exceedance of the water quality objective or loading capacity; and ii) dischargers located in those subareas not meeting their load allocations.

These prohibitions do not apply if the discharge of diazinon or chlorpyrifos is subject to a waiver of waste discharge requirements implementing the diazinon and chlorpyrifos water quality objectives and load allocations for diazinon and chlorpyrifos for the San Joaquin River, or governed by individual or general waste discharge requirements.

4.2.2.4.10- *Control of Diazinon and Chlorpyrifos Runoff into Delta Waterways (as identified in Appendix 42)*

Beginning December 1, 2011, the direct or indirect discharge of diazinon or chlorpyrifos into Delta Waterways is prohibited during the dormant season (1 December through 1 March) if any exceedance of the chlorpyrifos or

diazinon water quality objectives, or diazinon and chlorpyrifos loading capacity occurred during the previous dormant season.

Beginning March 2, 2012, the direct or indirect discharge of diazinon or chlorpyrifos into Delta Waterways is prohibited during the irrigation season (2 March through 30 November) if any exceedance of the chlorpyrifos or diazinon water quality objectives, or diazinon and chlorpyrifos loading capacity occurred during the previous irrigation season.

These prohibitions do not apply if the discharge of diazinon or chlorpyrifos is subject to a waiver of waste discharge requirements implementing the diazinon and chlorpyrifos water quality objectives and load allocations for diazinon and chlorpyrifos for the Delta Waterways, or governed by individual or general waste discharge requirements.

These prohibitions apply only to dischargers causing or contributing to the exceedance of the water quality objective or loading capacity.

These prohibitions do not apply to direct or indirect discharges to the Sacramento or San Joaquin Rivers upstream of the legal boundary of the Delta (as defined in Section 12220 of the California Water Code).

4.2.2.4.11 *Diazinon and Chlorpyrifos Discharges*

Dischargers are prohibited from discharging chlorpyrifos and/or diazinon at concentrations that exceed water quality objectives to waters with designated or existing² WARM and/or COLD beneficial uses unless:

- The discharge is regulated under a waiver of waste discharge requirements or individual or general waste discharge requirements, or
- The discharge is upstream of one of the dams listed in Table III-2B3-5.

4.2.2.5 **Regional Water Board Guidelines**

The Regional Water Board has adopted guidance for certain types of dischargers which is designed to reduce the possibility that water quality will be impaired. The Regional Water Board may still impose discharge requirements. All of the Guidelines are contained in the Appendix (Items 33 through 37). Currently, the following Guidelines apply to the Sacramento and San Joaquin River Basins:

4.2.2.5.1- *Wineries*

This Guideline contains criteria for protecting beneficial uses and preventing nuisance from the disposal to land of stillage wastes.

4.2.2.5.2- *Erosion and Sedimentation*

This Guideline identifies practices to be implemented by local government to reduce erosion and sedimentation from construction activities.

4.2.2.5.3- *Small Hydroelectric Facilities*

This Guideline specifies measures to protect water quality from temperature, turbidity, and dissolved oxygen effects from the construction and operation of small hydroelectric Facilities.

4. ——— [Deleted 27 March 2014.]

² Existing as defined in Title 40 of the Code of Federal Regulations, section 131.3(e)

4.2.2.5.45 Mining

This Guideline identifies actions that the Regional Water Board takes to address the water quality problems associated with mining. It requires owners and operators of active mines to prepare plans for closure and reclamation, but it does not specify any practices or criteria for mine operators.

4.2.2.6 Nonpoint Source Action Plans

Section 208 of the 1972 Amendments to the Federal Clean Water Act resulted in monies being made available to states to address nonpoint source problems. The Regional Water Board used 208 grant funds to develop its mining and erosion/sedimentation guidelines, among other things. It also encouraged local governments to make use of the 208 program. As a result, several counties in the sub-basins developed action plans to control nonpoint source problems which affected them. The Regional Water Board action plans are described in Table IV4-2

**TABLE IV4-2
NONPOINT SOURCE ACTION PLANS**

<u>LOCATION</u>	<u>RECOMMENDED ACTION</u>
Shasta County	Best Management Practices (BMPs) for control of erosion from land development (adopted 1980)
Nevada County	BMPs for erosion and individual wastewater disposal systems (adopted 1980)
Placer County	BMPs for erosion and installation of individual wastewater disposal systems (adopted 1980)
Lake County	BMPs for erosion and creek bed management (adopted 1979)
Communities of Paradise and Magalia (Butte County)	BMPs for wastewater management (adopted 1979)
Solano County	BMPs for surface water runoff (adopted 1979)
Upper Putah Creek Watershed (Lake, Napa Counties)	Strategies and recommendations for addressing problems from geothermal development, abandoned mines, and individual wastewater disposal systems (adopted 1981)
Fall River (Shasta County)	BMPs for livestock grazing and individual wastewater disposal systems (adopted 1982)
Plumas County	BMPs for erosion control (adopted 1980)
Mariposa County	BMPs for individual wastewater disposal systems for area north of the community of Mariposa; BMPs for erosion and sedimentation in the Stockton Creek Watershed (adopted 1979)
Merced County	Lake Yosemite Area -- BMPs for individual wastewater disposal systems (adopted 1979)

4.3 ACTIONS RECOMMENDED FOR IMPLEMENTATION BY OTHER ENTITIES

Consistent with the Porter-Cologne Water Quality Control Act, the Basin Plan may identify control actions recommended for implementation by agencies other than the Regional Water Board [Water Code Section 13242(a)].

4.3.1 Recommended for Implementation by the State Water Board

4.3.1.1 Interbasin Transfer of Water

Before granting new permits for water storage or diversion which involves interbasin transfer of water, the State Water Board should require the applicant to evaluate the alternatives listed below. Permits should not be approved unless the alternatives have been thoroughly investigated and ruled out for social, environmental, or economic reasons.

- (1-) In situations where wastewater is discharged to marine waters without intervening beneficial use (for example, the San Francisco Bay Area and most of Southern California), increase the efficiency of municipal, industrial, and agricultural water use.
- (2-) Make optimum use of existing water resource facilities.
- (3-) Store what would otherwise be surplus wet-weather Delta outflows in off-stream reservoirs.
- (4-) Conjunctively use surface and ground waters.
- (5-) Give careful consideration to the impact on basin water quality of inland siting of power plants.
- (6-) Make maximum use of reclaimed water while protecting public health and avoiding severe economic penalties to a particular user or class of users.

4.3.1.2 Trans-Delta Water Conveyance

The State Water Board should adopt the position that those proposing trans-Delta water conveyance facilities must clearly demonstrate the following, if such a facility is constructed:

- (1-) Protection of all beneficial uses in the Delta that may be affected by such a facility;
- (2-) Protection of all established water quality objectives that may be affected by such a facility; and,
- (3-) Adherence to the six alternatives previously identified for Interbasin Transfer of Water.

4.3.1.3 Water Quality Planning

A core planning group has been established within the staff of the State Water Board, which has the responsibility to integrate the statewide planning of water quality and water resources management.

4.3.1.4 Water Intake Studies

The State Water Board should coordinate studies to assess the costs and benefits of moving planned diversions from the eastern side of the Central Valley to points further west, probably to the Delta, to allow east side waters to flow downstream for uses of fishery enhancement, recreation, and quality control. Specific study items should include:

- (1-) Possible intake relocations;
- (2-) Conveyance and treatment required to accommodate such relocations;

- (3-) Direct and indirect (including consumer and environmental) costs and benefits of relocation; and,
- (4-) Institutional problems.

The State Water Board should request voluntary participation in the studies by agencies planning diversions, but should take appropriate action through its water rights authority if such participation cannot be obtained. At a minimum, participation would be required of the San Francisco Water Department and East Bay Municipal Utility District.

4.3.1.5 Subsurface Agricultural Drainage

- (1-) The Regional Board will request that the State Water Board use its water rights authority to preclude the supplying of water to specific lands, if water quality objectives are not met by the specified compliance dates and Regional Board administrative remedies fail to achieve compliance.
- (2-) The State Water Board should work jointly with the Regional Water Board in securing compliance with the 2 µg/l selenium objective for managed- wetlands in the Grassland area.
- (3-) The State Water Board should also consider grant funds to implement a cost share program to install a number of flow monitoring stations within the Grassland area to assist in better defining the movement of pollutants through the area.
- (4-) The State Water Board should continue to consider the Drainage Problem Area in the San Joaquin Basin and the upper Panoche watershed (in the Tulare Basin) as priority nonpoint source problems in order to make USEPA nonpoint source control funding available to the area.
- (5-) The State Water Board should seek funding for research and demonstration of advanced technology that will be needed to achieve final selenium loads necessary to meet selenium water quality objectives.

4.3.1.6 Salt and Boron in the Lower San Joaquin River

- (1-) The State Water Board should consider the continued use of its water rights authority to prohibit water transfers if the transfer contributes to low flows and related salinity water quality impairment in the Lower San Joaquin River.
- (2-) The State Water Board should consider the continued conditioning of water rights on the attainment of existing and new water quality objectives for salinity in the Lower San Joaquin River, when these objectives cannot be met through discharge controls alone.

4.3.1.7 Dissolved Oxygen in the Stockton Deep Water Ship Channel (DWSC)

- (1-) The State Water Board should consider amending water right permits for existing activities that reduce flow through the DWSC to require that the associated impacts on excess net oxygen demand conditions in the DWSC be evaluated and their impacts reduced in accordance with the *Control Program for Factors Contributing to the Dissolved Oxygen Impairment in the DWSC*.
- (2-) The State Water Board should consider requiring evaluation and full mitigation of the potential impacts of future water right permits or water transfer applications on reduced flow and excess net oxygen demand conditions in the DWSC.

4.3.1.8 Delta Mercury

- (1-) The State Water Board should consider requiring methylmercury controls for new water management activities that have the potential to increase ambient methylmercury levels as a condition of approval of any water right action required to implement the project. The State Water Board Division of Water Rights

should consider requiring the evaluation and implementation of feasible management practices to reduce or, at a minimum, prevent methylmercury ambient levels from increasing from those changes in water management activities and flood conveyance projects that have the potential to increase methylmercury levels. The State Water Board should consider funding or conducting studies to develop and evaluate management practices to reduce methylmercury production resulting from existing water management activities or flood conveyance projects.

- (2-) During future reviews of the salinity objectives contained in the Bay-Delta Plan, the State Water Board Division of Water Rights should consider conducting studies to determine whether proposed changes to salinity objectives could affect methylmercury production and should consider the results of these studies in evaluating changes to the salinity objectives.

4.3.2 Recommended for Implementation by Other Agencies

4.3.2.1 Water Resources Facilities

- (1-) Consideration should be given to the construction of a storage facility to store surplus wet-weather Delta outflows. Construction should be contingent on studies demonstrating that some portion of wet-weather Delta outflow is truly surplus to the Bay-Delta system.
- (2-) Consideration should be given to the use of excess capacity in west San Joaquin Valley conveyances, or of using a new east valley conveyance to:
 - (a-) Augment flows and improve water quality in the San Joaquin River and southern Delta with the goal of achieving water quality as described in Table IV-3.

TABLE IV-3

<u>TDS MG/L</u>	<u>TYPE PF YEAR¹</u>			
	<u>CRITICAL²</u>	<u>DRY³</u>	<u>NORMAL</u>	<u>WET⁴</u>
Max. 3-day (arith. avg.)	500	500	500	500
Maximum (annual avg.)	385	385	385	285
Max. May-Sep (arith. avg.)	300	250	250	250
Max. 3-Day May-Sep (arith Avg.)	450	350	350	350

¹ Relative to unimpaired runoff to Delta Based on 1922 -1971 period. See definitions in Figure 2 of the 2006 Bay-Delta Plan

² Less than 57% , or less than 70% when preceding year critical

³ Less than 70%, or less than 90% when preceding year critical

⁴ Greater than 125%

- (b-) Prevent further ground water overdrafts and associated quality problems.
- (3-) Agencies responsible for existing water resources facilities that reduce flow through the Stockton Deep Water Ship Channel (DWSC) should evaluate and reduce their impacts on excess net oxygen demand conditions in the DWSC in accordance with the *Control Program for Factors Contributing to the Dissolved Oxygen Impairment in the DWSC*.
- (4-) Agencies responsible for future water resources facilities projects, which potentially reduce flow through the DWSC, should evaluate and fully mitigate the potential negative impacts on excess net oxygen demand conditions in the DWSC.

4.3.2.2 Agricultural Drainage Facilities

Facilities should be constructed to convey agricultural drain water from the San Joaquin and Tulare Basins. It is the policy of the Regional Water Board to encourage construction. The discharge must comply with water quality objectives of the receiving water body.

4.3.2.3 Subsurface Agricultural Drainage

- (1-) The entire drainage issue is being handled as a watershed management issue. The entities in the Drainage Problem Area and entities within the remainder of the Grassland watershed need to establish a regional entity with authority and responsibility for drain water management.
- (2-) The regional drainage entity and agricultural water districts should consider adopting economic incentive programs as a component of their plans to reduce pollutant loads. Economic incentives can be an effective institutional means of promoting on-farm changes in drainage and water management.
- (3-) If fragmentation of the parties that generate, handle and discharge agricultural subsurface drainage jeopardizes the achievement of water quality objectives, the Regional Water Board will consider petitioning the Legislature for the formation of a regional drainage district.
- (4-) The Legislature should consider putting additional bond issues before the voters to provide low interest loans for agricultural water conservation and water quality projects and incorporating provisions that would allow recipients to be private landowners, and that would allow irrigation efficiency improvement projects that reduce drainage discharges to be eligible for both water conservation funds and water quality facilities funds.
- (5-) The San Joaquin Valley Drainage Implementation Program or other appropriate agencies should continue to investigate the alternative of a San Joaquin River Basin drain to move the existing discharge point for poor quality agricultural subsurface drainage to a location where its impact on water quality is less.
- (6-) The selenium water quality objective for the wetland channels can not be achieved without removal of drainage water from these channels. The present use of the Grassland channels has developed over a 30-year period through agreements between the dischargers, water and irrigation districts, the U.S. Bureau of Reclamation, the California Department of Water Resources, the U.S. Fish and Wildlife Service, the California Department of Fish and Game (now the Department of Fish and Wildlife), the Grassland Water District and the Grassland Resource Conservation District. Because each entity shared in the development of the present drainage routing system, each shares the responsibility for implementation of a wetlands bypass.

4.3.2.4 Stockton Deep Water Ship Channel (DWSC)

- (1-) The U.S. Army Corps of Engineers should reduce the impacts of the existing DWSC geometry on excess net oxygen demand conditions in accordance with the *Control Program for Factors Contributing to the Dissolved Oxygen Impairment in the DWSC*.

4.3.2.5 Delta Mercury

- (1-) USEPA and the California Air Resources Board should work with the State Water Board and develop a memorandum of understanding to evaluate local and statewide mercury air emissions and deposition patterns and to develop a load reduction program(s).
- (2-) The State of California should establish the means to fund a portion of the mercury control projects in the Delta and upstream watersheds.
- (3-) Watershed stakeholders are encouraged to identify total mercury and methylmercury reduction projects and propose and conduct projects to reduce upstream non-point sources of methylmercury and total mercury.

The Regional Water Board recommends that state and federal grant programs give priority to projects that reduce upstream non-point sources of methylmercury and total mercury.

- (4-) Dischargers may evaluate imposed administrative civil liabilities projects for total mercury and methylmercury discharge and exposure reduction projects, consistent with Supplemental Environmental Project policies.

4.4 CONTINUOUS PLANNING FOR IMPLEMENTATION OF WATER QUALITY CONTROL

In order to effectively protect beneficial uses, the Regional Water Board updates the Basin Plan regularly in response to changing water quality conditions. The Regional Water Board is periodically apprised of water quality problems in the Sacramento and San Joaquin River Basins, but the major review of water quality is done every three years as part of the Triennial Review of water quality standards.

During the triennial review, the Regional Water Board holds a public hearing to receive comments on actual and potential water quality problems. A workplan is prepared which identifies the control actions that will be implemented over the succeeding three years to address the problems. The actions may include or result in revision of the Basin Plan's water quality standards if that is an appropriate problem remedy. Until such time that a basin plan is revised, the triennial review also serves to reaffirm existing standards.

The control actions that are identified through the triennial review process are incorporated into the Basin Plan to meet requirements to describe actions (to achieve objectives) and a time schedule of their implementation as called for in the Water Code, Section 13242(a) and (b). The actions recommended in the most recent triennial review are described in the following section.

4.5 ACTIONS AND SCHEDULE TO ACHIEVE WATER QUALITY OBJECTIVES

4.5.1 Agricultural Drainage Discharges in the San Joaquin River Basin

Water quality in the San Joaquin River has degraded significantly since the late 1940s. During this period, salt concentrations in the River, near Vernalis, have doubled. Concentrations of boron, selenium, molybdenum and other trace elements have also increased. These increases are primarily due to reservoir development on the east side tributaries and upper basin for agricultural development, the use of poorer quality, higher salinity, Delta water in lieu of San Joaquin River water on west side agricultural lands and drainage from upslope saline soils on the west side of the San Joaquin Valley. Point source discharges to surface waters only contribute a small fraction of the total salt and boron loads in the San Joaquin River.

The water quality degradation in the River was identified in the 1975 Basin Plan and the Lower San Joaquin River was classified as a Water Quality Limited Segment. At that time, it was envisioned that a Valley-wide Drain would be developed and these subsurface drainage water flows would then be discharged outside the Basin, thus improving River water quality. However, present day development is looking more toward a regional solution to the drainage water discharge problem rather than a valley-wide drain.

Because of the need to manage salt and other pollutants in the River, the Regional Water Board began developing a Regional Drainage Water Disposal Plan for the Basin. The development began in FY 87/88 when Basin Plan amendments were considered by the Water Board in FY 88/89. The amendment development process included review of beneficial uses, establishment of water quality objectives, and preparation of a regulatory plan, including a full implementation plan. The regulatory plan emphasized achieving objectives through reductions in drainage volumes and pollutant loads through best management practices and other on-farm methods.

The 88/89 amendment emphasized toxic elements in subsurface drainage discharges. The Regional Water Board however still recognizes salt management as the most serious long-term issue on the San Joaquin River. Salinity impairment in the Lower San Joaquin River remains a persistent problem as salinity water quality objectives continue to be exceeded. The Regional Water Board adopted the following control program for salt and boron in the Lower San Joaquin River to address salt and boron impairment and to bring the river into compliance with water quality objectives. Additionally, the Regional Water Board will continue as an active participant in the San Joaquin River Management Program implementation phase, as authorized by AB 3048, to promote salinity management schemes including time discharge releases, real time monitoring and source control.

Per the amendment to the Basin Plan for San Joaquin River subsurface agricultural drainage, approved by the State Water Board in Resolution No. 96-078, as amended by Resolution No. R5-2010-0046 and incorporated herein, the following actions will be implemented.

- (1-) In developing control actions for selenium, the Regional Board will utilize a priority system which focuses on a combination of sensitivity of the beneficial use to selenium and the environmental benefit expected from the action.
- (2-) Control actions which result in selenium load reduction are most effective in meeting water quality objectives.
- (3-) With the uncertainty in the effectiveness of each control action, the regulatory program will be conducted as a series of short-term actions that are designed to meet long-term water quality objectives.
- (4-) Best management practices, such as water conservation measures, are applicable to the control of agricultural subsurface drainage.
- (5-) Performance goals will be used to measure progress toward achievement of water quality objectives for selenium. Prohibitions of discharge and waste discharge requirements will be used to control agricultural subsurface drainage discharges containing selenium. Compliance with performance goals and water quality objectives for nonpoint sources will occur no later than the dates specified in Table IV4-4 for Mud Slough (north) and the San Joaquin River from the Mud Slough confluence to the Merced River.
- (6-) Waste discharge requirements will be used to control agricultural subsurface drainage discharges containing selenium and may be used to control discharges containing other toxic trace elements.
- (7-) Selenium load reduction requirements will be incorporated into waste discharge requirements as effluent limits as necessary to ensure that the selenium water quality objectives in the San Joaquin River downstream of the Merced River inflow is achieved. The Board adopted a TMDL for selenium in the San Joaquin River in 2001 after public review.

TABLE IV4-4. COMPLIANCE TIME SCHEDULE FOR MEETING THE 4-DAY AVERAGE WATER QUALITY OBJECTIVE FOR SELENIUM

Selenium Water Quality Objectives (in bold) and Performance Goals (in italics)

Water Body	31 December 2015	31 December 2019
Mud Slough (north) and the San Joaquin River from the Mud Slough confluence to the Merced River	<i>15 µg/L monthly mean</i>	5 µg/L 4-day avg.

- (8-) Selenium effluent limits established in waste discharge requirements will be applied to the discharge of subsurface drainage water from the Grassland watershed. In the absence of a regional entity to coordinate

actions on the discharge, the Regional Board will consider setting the effluent limits at each drainage water source (discharger) to ensure that beneficial uses are protected at all points downstream.

- (9-) Upslope irrigations and water facility operators whose actions contribute to subsurface drainage flows will participate in the program to control discharges.
- (10-) Public and private managed-wetlands will participate in the program to achieve water quality objectives.
- (11-) Achieving reductions in the load of selenium discharged is highly dependent upon the effectiveness of individual actions or technology not currently available; therefore, the Regional Board will review the waste discharge requirements and compliance schedule at least every 5 years.
- (12-) All those discharging or contributing to the generation of agricultural subsurface drainage will be required to submit for approval a short-term (5-year) drainage management plan designed to meet interim milestones and a long-term drainage management plan designed to meet final water quality objectives.
- (13-) An annual review of the effectiveness of control actions taken will be conducted by those contributing to the generation of agricultural subsurface drainage.
- (14-) Evaporation basins in the San Joaquin Basin will be required to meet minimum design standards, have waste discharge requirements and be part of a regional plan to control agricultural subsurface drainage.
- (15-) The Regional Board staff will coordinate with US EPA and the dischargers on a study plan to support the development of a site specific selenium water quality objective for the San Joaquin River and other effluent dominated waterbodies in the Grassland watershed.
- (16-) The Regional Board will establish water quality objectives for salinity for the San Joaquin River.

4.5.1.1 Control program for Salt and Boron Discharges into the Lower San Joaquin River (LSJR)

The goal of the salt and boron control program is to achieve compliance with salt and boron water quality objectives without restricting the ability of dischargers to export salt out of the San Joaquin River basin.

For the purpose of this control program, nonpoint source land uses include all irrigated lands and nonpoint source discharges are discharges from irrigated lands.

Irrigated lands are lands where water is applied for producing crops and, for the purpose of this control program, includes, but is not limited to, land planted to row, field and tree crops as well as commercial nurseries, nursery stock production, managed wetlands, and rice production.

This control program is phased to allow for implementation of existing water quality objectives, while providing the framework and timeline for implementing future water quality objectives.

The salt and boron control program establishes salt load limits to achieve compliance at the Airport Way Bridge near Vernalis with salt and boron water quality objectives for the LSJR. The Regional Water Board establishes a method for determining the maximum allowable salt loading to the LSJR. Load allocations are established for nonpoint sources and waste load allocations are established for point sources.

Load allocations to specific dischargers or groups of dischargers are proportionate to the area of nonpoint source land use contributing to the discharge. Control actions that result in salt load reductions will be effective in the control of boron.

The salt and boron control program establishes timelines for: 1) developing and adopting salt and boron water quality objectives for the San Joaquin River upstream of the Airport Way Bridges near Vernalis; 2) a control program to achieve these objectives; and 3) developing and adopting a groundwater control program.

Per the amendment to the Basin Plan for control of salt and boron discharges into the lower San Joaquin River (LSJR) basin, approved by the Regional Water Board in Resolution No. 2004-0108 and incorporated herein, the Regional Water Board will take the following actions, as necessary and appropriate, to implement this control program:

(1-) The Regional Water Board shall use waivers of waste discharge requirements or waste discharge requirements to apportion load allocations to each of the following seven geographic subareas that comprise the LSJR:

- (a-) San Joaquin River Upstream of Salt Slough
- (b-) Grassland
- (c-) Northwest Side
- (d-) East Valley Floor
- (e-) Merced River
- (f-) Tuolumne River
- (g-) Stanislaus River

These subareas are described in Chapter 1 and in more detail in Appendix 41.

(2-) Dischargers of irrigation return flows from irrigated lands are in compliance with this control program if they meet any of the following conditions:

- (a-) Cease discharge to surface water
- (b-) Discharge does not exceed 315µS/cm electrical conductivity (based on a 30-day running average)
- (c-) Operate under waste discharge requirements that include effluent limits for salt
- (d-) Operate under a waiver of waste discharge requirements for salt and boron discharges to the LSJR

(3-) The Regional Water Board will adopt a waiver of waste discharge requirements for salinity management, or incorporate into an existing agricultural waiver, the conditions required to participate in a Regional Water Board approved real-time management program. Load allocations for nonpoint source dischargers participating in a Regional Water Board approved real-time management program are described in Table IV4-4.48. Additional waiver conditions will include use of Regional Water Board approved methods to measure and report flow and electrical conductivity. Participation in a Regional Water Board approved real-time management program and attainment of salinity and boron water quality objectives will constitute compliance with this control program.

(4-) The Regional Water Board will adopt waste discharge requirements with fixed monthly base load allocations specified as effluent limits for nonpoint source discharges that do not meet conditions specified in a waiver of waste discharge requirements for salinity management. Entities operating under WDRs or that will be required to operate under WDRs in order to comply with other programs, may participate in a Regional Water Board approved real-time management program in lieu of additional WDRs for salinity if they meet the conditions specified in the waiver of WDRs for salinity management, as described in item 3.

(5-) Fixed monthly base load allocations and the method used to calculate real-time load allocations are specified in Table IV4-4.48.

(6-) Waste Load Allocations are established for point sources of salt in the basin. NPDES permitted discharges will not exceed the salinity water quality objectives established for the LSJR at the Airport Way Bridge near Vernalis. The Regional Water Board will revise NPDES permits to incorporate TMDL allocations when the permits are renewed or reopened at the discretion of the Regional Water Board.

(7-) Supply water credits are established for irrigators that receive supply water from the Delta Mendota Canal (DMC) or the LSJR between the confluence of the Merced River and the Airport Way Bridge near Vernalis as described in Table [IV4-4.48](#).

(8-) Supply water Load Allocations are established for salts in irrigation water imported to the LSJR Watershed from the Sacramento/San Joaquin River Delta as described in Table [IV4-4.48](#).

The Regional Water Board will attempt to enter into a Management Agency Agreement (MAA) with the U.S. Bureau of Reclamation to address salt imports from the DMC to the LSJR watershed. The MAA shall include provisions requiring the U.S. Bureau of Reclamation to:

- (a-) Meet DMC load allocations; or
- (b-) Provide mitigation and/or dilution flows to create additional assimilative capacity for salt in the LSJR equivalent to DMC salt loads in excess of their allocation

The Regional Water Board shall request a report of waste discharge from the U.S. Bureau of Reclamation to address DMC discharges if a MAA is not established by 28 July 2008.

(9-) The Regional Water Board will review and update the load allocations and waste load allocations by 28 July 2012 and every 6 years thereafter. Any changes to waste load allocations and/or load allocations can be made through subsequent amendment to this control program. Changes to load allocations will be implemented through revisions of the applicable waste discharge requirements or waivers of waste discharge requirements. Changes to waste load allocations will be implemented through revisions of the applicable NPDES permits.

(10-) The Regional Water Board encourages real-time water quality management and pollutant trading of waste load allocations, load allocations, and supply water allocations as a means for attaining salt and boron water quality objectives while maximizing the export of salts out of the LSJR watershed. This control program shall in no way preclude basin-wide stakeholder efforts to attain salinity water quality objectives in the LSJR so long as such efforts are consistent with the control program.

(11-) The established waste load allocations, load allocations, and supply water allocations represent a maximum allowable level. The Regional Water Board may take other actions or require additional reductions in salt and boron loading to protect beneficial uses

(12-) Salt loads in water discharged into the LSJR or its tributaries for the express purpose of providing dilution flow are not subject to load limits described in this control program if the discharge:

- (a-) complies with salinity water quality objectives for the LSJR at the Airport Way Bridge near Vernalis;
- (b-) is not a discharge from irrigated lands; and
- (c-) is not provided as a water supply to be consumptively used upstream of the San Joaquin River at the Airport Way Bridge near Vernalis.

(13-) Entities providing dilution flows, as described in item 12, will obtain an allocation equal to the salt load assimilative capacity provided by this flow. This dilution flow allocation can be used to: 1) offset salt loads discharged by this entity in excess of any allocation or; 2) trade, as described in item 10. The additional dilution flow allocation provided by dilution flows will be calculated as described in Table [IV4-4.48](#).

(14-) It is anticipated that salinity and boron water quality objectives for the San Joaquin River from Mendota Dam to the Airport Way Bridge near Vernalis will be developed and considered for adoption in the second phase of this TMDL, according to time schedule in Table [IV4-4.15](#).

TABLE IV-4.15: SCHEDULE FOR DEVELOPING WATER QUALITY OBJECTIVES FOR SALT AND BORON IN THE LSJR FROM MENDOTA DAM TO THE AIRPORT WAY BRIDGE NEAR VERNALIS

Milestone	Date
Staff report on criteria needed to protect beneficial uses	October 2004
Staff report and Regional Water Board workshop on water quality objectives that can reasonably be achieved	June 2005
Draft second phase TMDL with water quality objectives and program of implementation for LSJR from Mendota Dam to Airport Way Bridge near Vernalis	September 2005
Board Hearing for consideration of adoption	June 2006

(15-) Salinity and boron water quality objectives for the San Joaquin River from Mendota Dam to the Airport Way Bridge near Vernalis will be implemented using the implementation framework described in this ‘Control Program for Salt and Boron Discharges into the Lower San Joaquin River’ or other implementation mechanisms, as appropriate.

(16-) A groundwater control program for sources of salt discharges into the LSJR will be developed by June 2020 if water quality objectives in the LSJR are not being attained.

4.5.1.1.1 *Implementation Priority*

(17-) The Regional Water Board will focus control actions on the most significant sources of salt and boron discharges to the LSJR. Priority for implementation of load allocations to control salt and boron discharges will be given to subareas with the greatest unit area salt loading (tons per acre per year) to the LSJR (Table IV-4.26).

The priorities established in Table IV-4.26 will be reviewed by 28 July 2012 and every 6 years thereafter.

TABLE IV-4.26: PRIORITIES FOR IMPLEMENTING LOAD ALLOCATIONS¹

Subarea	Priority
San Joaquin River Upstream of Salt Slough	Low
Grassland	High
Northwest Side	High
East Valley Floor	Low
Merced River	Low
Tuolumne River	Medium
Stanislaus River	Low
Delta Mendota Canal ²	High
¹ Priorities based on the unit area salt loading from each subarea and mass load from the DMC	
² Delta Mendota Canal is not a subarea	

4.5.1.1.2 *Time Schedules for Implementation*

(18-) The Regional Water Board will incorporate base load allocations into waste discharge requirements and real-time load allocations into conditions of waiver of waste discharge requirements by 28 July 2008. Dischargers regulated under a waiver of waste discharge requirements for dischargers participating in a real-time management program for the control of salt and boron in the LSJR shall comply with the waiver conditions within 1 year of the date of adoption of the waiver.

(19-) Existing NPDES point source dischargers are low priority and subject to the compliance schedules for low priority discharges in Table IV-4.37. New point source discharges that begin discharging after the date of

the adoption of this control program must meet waste load allocations upon the commencement of the discharge.

TABLE IV4-4.37: SCHEDULE FOR COMPLIANCE WITH THE LOAD ALLOCATIONS FOR SALT AND BORON DISCHARGES INTO THE LSJR

Priority	Year to implement ¹	
	Wet through Dry Year Types	Critical Year Types
High	8	12
Medium	12	16
Low	16	20

¹ number of years from the effective date [28 July 2006] of this control program

TABLE IV4-4.48 SUMMARY OF ALLOCATIONS AND CREDITS

BASE SALT LOAD ALLOCATIONS													
Base Load Allocations (thousand tons of salt)													
Year-type ¹	Month / Period												
	Jan	Feb	Mar	Apr 1 to Apr. 14	Pulse Period ²	May 16 to May 31	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Wet	41	84	116	23	72	31	0	0	5	45	98	44	36
Abv. Norm	44	84	64	26	71	14	0	0	0	44	58	35	32
Blw. Norm	22	23	31	11	45	8	0	0	0	38	41	34	30
Dry	28	39	25	5	25	1	0	0	0	25	31	27	28
Critical	18	15	11	0	0	0	0	0	0	19	30	26	23

REAL-TIME SALT LOAD ALLOCATIONS
<p>Nonpoint source dischargers operating under waiver of waste discharge requirements must participate in a Regional Water Board approved real-time management program and meet real-time load allocations. Loading capacity and real-time load allocations are calculated for a monthly time step. The following method is used to calculate real-time load allocations. Flows are expressed in thousand acre-feet per month and loads are expressed in thousand tons per month.</p> <p>Loading Capacity (LC) in thousand tons per month is calculated by multiplying flow in thousand acre-ft per month by the salinity water quality objective in $\mu\text{S}/\text{cm}$, a unit conversion factor of 0.8293, and a coefficient of 0.85 to provide a 15 percent margin of safety to account for any uncertainty.</p> $LC = Q * WQO * 0.8293 * 0.85$ <p>where: LC = total loading capacity in thousand tons per month Q = flow in the San Joaquin River at the Airport way Bridge near Vernalis in thousand acre-feet per month WQO = salinity water quality objective for the LSJR at Airport Way Bridge near Vernalis in $\mu\text{S}/\text{cm}$</p>

TABLE IV-4.48 SUMMARY OF ALLOCATIONS AND CREDITS (continued)

The sum of the real-time Load Allocations (LA) for nonpoint source dischargers are equal to a portion of the LSJR’s total Loading Capacity (LC) as described by the following equation:

$$LA = LC - LBG - LCUA - LGW - \Sigma WLA$$

Where:

- LA = sum of the real-time Load Allocations for nonpoint source dischargers
- LBG = loading from background sources
- LCUA = consumptive use allowance
- LGW = loading from groundwater
- ΣWLA = sum of the waste load allocations for all point sources

Background loading in thousand tons is calculated using the following equation:

$$LBG = Q * 85 \mu S/cm * 0.8293$$

Consumptive use allowance loading is calculated with the following equation:

$$LCUA = Q * 230 \mu S/cm * 0.8293$$

Monthly groundwater Loading (L_{GW}) (in thousand tons)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
15	15	30	32	36	53	46	27	16	13	14	15

Waste load allocations for individual point sources are calculated using the following equation:

$$WLA = QPS * WQO * 0.8293$$

where:

- WLA = waste load allocation in thousand tons per month
- QPS = effluent flow to surface waters from the NPDES permitted point source discharger (in thousand acre-feet per month)
- WQO = salinity water quality objective for the LSJR at Airport Way Bridge near Vernalis in $\mu S/cm$

APPORTIONING OF SALT LOAD ALLOCATION

An individual discharger or group of dischargers can calculate their load allocation by multiplying the nonpoint source acreage drained by the load allocation per acre.

$$LA \text{ per acre} = \frac{LA}{\text{Total nonpoint source acreage}}$$

As of 1 August 2003, the total nonpoint source acreage of the LSJR Basin is 1.21-million acres. Nonpoint source land uses include all irrigated agricultural lands (including managed wetlands). Agricultural land includes all areas designated as agricultural or semi-agricultural land uses in the most recent land use surveys published by the California Department of Water Resources. California Department of Water Resources land use surveys are prepared and published on a county-by-county basis. Multiple counties or portions of counties may overlay a given subarea. The land use surveys must be used in combination with a Geographic Information System to quantify the agricultural land use in each subarea. Nonpoint source land areas will be updated every 6 years though an amendment to the Basin Plan if updated California Department of Water Resources land use surveys have been published. The following land use surveys (or portions thereof) are used to quantify agricultural land use in the LSJR watershed.

TABLE IV-4.48 SUMMARY OF ALLOCATIONS AND CREDITS (continued)

APPORTIONING OF SALT LOAD ALLOCATION (continued)													
County	Year of most recent land use survey ¹												
Merced	1995												
Madera	1995												
San Joaquin	1996												
Fresno	1994												
Stanislaus	1996												
¹ -as of 1 August 2003													
Acreage of managed wetlands is based on the boundaries of the federal, private and state owned wetlands that comprise the Grassland Ecological Area in Merced County. Agricultural lands (as designated in DWR land uses surveys) within the Grassland Ecological Area are counted as a agricultural land use and not as managed wetlands. All other lands within the Grassland Ecological Area are considered to be managed wetlands.													
CONSUMPTIVE USE ALLOWANCE													
In addition to the base load allocations or real-time load allocations shown above, a consumptive use allowance (L _{CUA}) is provided to each discharger:													
L _{CUA} in tons per month = discharge volume in acre-feet per month * 230 μS/cm * 0.8293													
SUPPLY WATER CREDITS													
A supply water credit is provided to irrigators in the Grassland and Northwest Side Subareas that receive water from the DMC. This DMC supply water credit is equal to 50 percent of the added salt load, in excess of background, delivered to Grassland and Northwest Side subareas. The following fixed DMC supply water credits apply to dischargers operating under base load allocations:													
DMC supply water credits (thousand tons)													
Year-type ¹	Month / Period												
	Jan	Feb	Mar	Apr 1 to Apr. 14	Pulse Period ²	May 16 to May 31	Jun	Jul	Aug	Sep	Oct	Nov	Dec
NORTHWEST SIDE SUBAREA													
Wet	0.0	0.2	0.0	0.7	1.4	0.7	2.0	2.6	2.6	1.0	0.9	0.6	0.0
Abv. Norm	0.0	0.0	0.0	0.8	1.9	1.0	2.3	2.3	2.6	1.2	0.8	0.3	0.0
Blw. Norm	0.0	0.0	0.0	1.0	2.6	1.5	3.4	4.2	3.3	2.5	1.9	0.8	0.0
Dry	0.0	0.0	0.0	0.1	0.3	0.2	0.3	0.5	0.5	0.2	0.2	0.0	0.0
Critical	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GRASSLAND SUBAREA													
Wet	2.1	5.9	13.9	7.8	17.3	8.8	22.6	20.8	23.2	17.2	16.0	10.4	3.7
Abv. Norm	1.2	4.8	9.4	10.4	24.7	13.6	27.6	20.3	24.5	23.9	16.6	7.5	2.6
Blw. Norm	1.4	5.7	13.8	12.5	29.5	15.9	32.6	29.2	29.8	32.9	25.3	12.8	4.5
Dry	2.2	6.7	15.9	11.1	23.4	11.2	22.9	23.1	24.0	28.0	23.7	13.0	5.3
Critical	3.3	8.9	17.2	10.2	24.1	13.3	33.3	32.5	31.8	27.5	28.7	13.6	5.9

TABLE IV-4.48 SUMMARY OF ALLOCATIONS AND CREDITS (continued)

The following method is used to calculate real-time DMC supply water credits in thousand tons per month and applies to dischargers operating under real-time load allocations.

$$\text{Real-time CVP Supply Water Credit} = Q_{\text{CVP}} * (C_{\text{CVP}} - C_{\text{BG}}) * 0.8293 * 0.5$$

Where:

Q_{CVP} = volume of water delivered from CVP in thousand acre-feet per month³

C_{CVP} = electrical conductivity of water delivered from CVP in $\mu\text{S}/\text{cm}^3$

C_{BG} = background electrical conductivity of 85 $\mu\text{S}/\text{cm}$

For irrigators in the Northwest Side Subarea an additional supply water credit is provided to account for salts contained in supply water diverted directly from the LSJR (LSJR diversion water credit). The LSJR diversion credit is equal to 50 percent of the added salt load (in excess of background) in supply water diverted from the San Joaquin River between the confluence of the Merced River and the Airport Way Bridge near Vernalis. The following fixed LSJR supply water credits apply to dischargers operating under base load allocations:

LSJR supply water credits (thousand tons)

Year-type ¹	Month / Period												
	Jan	Feb	Mar	Apr 1 to Apr. 14	Pulse Period ²	May 16 to May 31	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Wet	0.0	0.6	9.2	6.2	9.4	11.0	17.2	23.5	20.5	9.5	1.3	0	0
Abv. Norm	0.0	0.8	5.0	7.4	12.3	11.2	21.8	24.9	20.3	10.7	1.5	0	0
Blw. Norm	0.0	0.6	5.5	7.0	14.4	13.4	27.3	33.1	24.9	13.9	2.4	0	0
Dry	0.0	0.7	5.3	6.4	11.1	10.7	27.5	34.0	20.3	11.4	2.4	0	0
Critical	0.0	0.8	4.5	5.1	14.8	10.6	25.2	28.5	22.3	8.7	2.5	0	0

The following method is used to calculate Real-time LSJR supply water credits in thousand tons per month and applies to dischargers operating under real-time load allocations.

$$\text{Real-time LSJR Supply Water Credit} = Q_{\text{LSJR DIV}} * (C_{\text{LSJR DIV}} - C_{\text{BG}}) * 0.8293 * 0.5$$

Where:

$Q_{\text{LSJR DIV}}$ = volume of water diverted from LSJR between the Merced River Confluence and the Airport Way Bridge near Vernalis in thousand acre-feet per month⁴

$C_{\text{LSJR DIV}}$ = electrical conductivity of water diverted from the LSJR in $\mu\text{S}/\text{cm}^4$

C_{BG} = background electrical conductivity of 85 $\mu\text{S}/\text{cm}$

SUPPLY WATER ALLOCATIONS

The U.S. Bureau of Reclamation DMC load allocation (LA_{DMC}) is equal to the volume of water delivered from the DMC (Q_{DMC}) to the Grassland and Northwest side Subareas at a background Sierra Nevada quality of 85 $\mu\text{S}/\text{cm}$.

$$LA_{\text{DMC}} = Q_{\text{DMC}} * 85 \mu\text{S}/\text{cm} * 0.8293$$

TABLE IV-4.48 SUMMARY OF ALLOCATIONS AND CREDITS (continued)

DILUTION FLOW ALLOCATIONS
Entities providing dilution flows obtain an allocation equal to the salt load assimilative capacity provided by this flow, calculated as follows: $A_{dil} = Q_{dil} * (C_{dil} - WQO) * 0.8293$ Where: A _{dil} = dilution flow allocation in thousand tons of salt per month Q _{dil} = dilution flow volume in thousand acre-feet per month C _{dil} = dilution flow electrical conductivity in μS/cm WQO = salinity water quality objective for the LSJR at Airport Way Bridge near Vernalis in μS/cm
¹ The water year classification will be established using the best available estimate of the 60-20-20 San Joaquin Valley water year hydrologic classification (as defined in Footnote 17 for Table 3 in the State Water Resources Control Board's <i>Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary</i> , May 1995) at the 75% exceedance level using data from the Department of Water Resources Bulletin 120 series. The previous water year's classification will apply until an estimate is made of the current water year.
² Pulse period runs from 4/15-5/15. Period and distribution of base load allocation and supply water credits between April 1 and May 31 may change based on scheduling of pulse flow as specified in State Water Board Water Rights Decision 1641. Total base load allocation for April 1 through May 31 does not change but will be redistributed based on any changes in the timing of the pulse period
³ Methods used to measure and report the volume and electrical conductivity of water delivered from the CVP to irrigated lands must be approved by the Regional Water Board as part of the waiver conditions required to participate in a Regional Water Board approved real-time management program
⁴ Methods used to measure and report the volume and electrical conductivity of water diverted from the SJR between the confluence of the Merced and the Airport Way Bridge near Vernalis must be approved by the Regional Water Board as part of the waiver conditions required to participate in a Regional Water Board approved real-time management program

4.5.2 Assessment of Biotoxicity of Major Point and Nonpoint Source Discharges in the Sacramento River and San Joaquin River Basins

In addition to numerical water quality objectives for toxicity, the Basin Plan contains a narrative water quality objective that requires all surface waters to "...be maintained free of toxic substances in concentrations that are toxic to or that produce detrimental physiological responses to human, plant, animal, and aquatic life." To check for compliance with this objective, the Regional Water Board initiated a biotoxicity monitoring program to assess toxic impacts from point and nonpoint sources in FY 86-87.

Toxicity testing monitoring requirements have been placed in NPDES permits, as appropriate. Since 1986-87, ambient toxicity testing (coupled with water quality chemistry to identify toxic constituents) has been concentrated in the Delta and major tributaries. The Regional Water Board will continue to impose toxicity testing monitoring requirements in NPDES permits. The focus of ambient toxicity testing will continue to be the Delta and major tributaries.

4.5.3 Heavy Metals From Point and Nonpoint Sources

Heavy metals such as copper, zinc, mercury, lead, and cadmium impair beneficial uses of surface streams. These metals result from various point and nonpoint sources throughout the region, including mines, urban runoff, agriculture, and wastewater treatment plants. Discharges from abandoned or inactive mines, particularly in the

Sacramento River watershed, severely impair local receiving waters. Available information suggests that such mines are by far the largest contributors of copper, zinc, and cadmium to surface waters in the Sacramento and San Joaquin River Basins.

Because the Delta and San Francisco Bay receive all upstream inputs, the effects of heavy metals may be focused on these water bodies. Although the relationship between cause and effect remains unclear, heavy metals have been implicated as a cause of problems in Delta biota (e.g., there is a health advisory limiting the consumption of striped bass because of elevated levels of mercury) and copper objectives have been exceeded in the Bay. Problems in the Bay and Delta are related to the effects of total metals loadings and dissolved metals concentrations.

The Regional Water Board plans to develop a mass emission strategy to control the loads of metals entering receiving waters and the Delta. Although the strategy will focus on control of discharges from inactive and abandoned mines, reasonable steps will also be taken to limit loads of metals from other significant sources. The Regional Water Board also plans to continue to monitor for metals in the Delta and principal tributaries to the Delta to assess compliance with water quality objectives, to assess impacts on beneficial uses, and to coordinate monitoring and metal reduction programs with the San Francisco Regional Water Quality Control Board.

Where circumstances warrant, the Regional Water Board will support action to clean up and abate pollution from identified sources. Funds from the State Water Pollution Cleanup and Abatement Account have been and are being used to clean up and abate discharges from selected abandoned or inactive mines. Abatement projects are underway at Iron Mountain Mine, Walker Mine, Mammoth Mine, Balaklala Mine, Keystone Mine, Stowell Mine, and Penn Mine, as data show that these mines are the most significant sources in terms of total metals discharged to receiving waters.

However, recent judicial decisions have imposed liability on the Regional Water Board for its cleanup actions at the Penn Mine. As long as the risk of such liability exists, the Regional Water Board will likely choose not to perform cleanup at any additional sites. Action by the State Legislature or the Congress will probably be required to resolve concerns of liability and facilitate the State's role in site remediation.

The Regional Water Board also will seek additional resources to update the Regional Abandoned Mines Inventory, to establish a monitoring program to track metals across the Delta and into the Bay, and to determine what loads the Delta can assimilate without resulting in adverse impacts. Although most of the significant mine portal discharges are in the process of being controlled, others need studies to determine their potential for cleanup. Since a major uncharacterized source of metals are the tailings piles associated with the mines, studies are needed to define the loads from these sources in order to establish priorities for abatement activities.

4.5.4 Mercury Discharges in the Sacramento River and San Joaquin River Basins

Mercury problems are evident region-wide. The main concern with mercury is that, like selenium, it bioaccumulates in aquatic systems to levels that are harmful to fish and their predators. Health advisories have been issued which recommend limiting consumption of fish taken from the Bay/Delta, Clear Lake, Lake Berryessa, Black Butte Reservoir, Lake Pillsbury, and Marsh Creek Reservoir. Concentrations of mercury in other water bodies approach or exceed National Academy of Science (NAS), U.S. Environmental Protection Agency (EPA), and/or U.S. Food and Drug Administration (FDA) guidelines for wildlife and human protection. In addition to these concerns, fish-eating birds taken from some bodies of water in the Basins have levels of mercury that can be expected to cause toxic effects. Bird-kills from mercury also have been documented in Lake Berryessa. (There is also concern for birds in the Delta, but no studies have been completed.) The Regional Water Board has done a preliminary assessment of the mercury situation in the Central Valley Region and concluded that the problem is serious and remedies will be complex and expensive.

The short-term strategy is to concentrate on correcting problems at upstream sites while monitoring the Delta to see whether upstream control activities measurably benefit the Delta. The Regional Water Board will support efforts to fund the detailed studies necessary to define assimilative capacity and to fully define uptake mechanisms in the biota.

In the next few years monitoring is scheduled to be done in the Delta and at upstream sources. The Regional Water Board will continue to support efforts to study how mercury is cycled through the Delta and to further characterize upstream sources.

4.5.4.1 Clear Lake Mercury

The Regional Water Board has a goal to reduce methylmercury concentrations in Clear Lake fish by reducing total mercury loads from various sources within the Clear Lake watershed.

Sources of mercury include past and present discharges from the Sulphur Bank Mercury Mine (SBMM) site, small mercury mines and geothermal sources, natural and anthropogenic erosion of soils with naturally occurring mercury, and atmospheric deposition. The goal of the Clear Lake mercury management strategy is to reduce fish tissue methylmercury concentrations by 60% of existing levels. This will be accomplished by reducing the concentration of total mercury in the surficial layer of lakebed sediment by 70% of existing levels and by further investigation and reduction of other mercury sources believed to have a high potential for mercury methylation. Through a complex process, total mercury is methylated and becomes bioavailable to organisms in the food web. The linkage between (1) the total mercury in the sediments derived from various sources and other sources of total mercury and (2) the concentration of methylmercury in ecological receptors, is complicated and subject to uncertainty. As additional information about these relationships becomes available, the Regional Water Board will revise and refine as appropriate the load allocation and implementation strategy to achieve fish tissue objectives.

4.5.4.1.1 Mercury Load Allocations

The strategy for meeting the fish tissue objectives is to reduce the inputs of mercury to the lake from tributaries and the SBMM site, combined with active and passive remediation of contaminated lake sediments. The load allocations for Clear Lake will result in a reduction in the overall mercury sediment concentration by 70% of existing concentrations. The load allocations are assigned to the active sediment layer of the lakebed, the SBMM terrestrial site, the tributary creeks and surface water runoff to Clear Lake, and atmospheric deposition. Table [IV4-5-9](#) summarizes the load allocations. The load allocation to the active sediment layer is expressed as reducing concentrations of total mercury in the active sediment layer to 30% of current concentrations. The load allocation to the SBMM terrestrial site is 5% of the ongoing loads from the terrestrial mine site. The load allocation for the mine also includes reducing mercury concentrations in surficial sediment to achieve the sediment compliance goals for Oaks Arm shown in Table [IV4-610](#). The load allocation to tributary and surface water runoff is 80% of existing loads. These load allocations account for seasonal variation in mercury loads, which vary with water flow and rainfall. The analysis includes an implicit margin of safety in the reference doses for methylmercury that were used to develop the fish tissue objectives. It also includes an explicit margin of safety of 10% to account for uncertainty in the relationship between fish tissue concentrations and loads of total mercury. The reductions in loads of total mercury from all sources are expected to result in attainment of water quality objectives.

**TABLE [IV4-59](#)
MERCURY LOAD ALLOCATIONS**

Mercury Source	Allocation
Clear Lake Sediment	30% of existing concentration
Sulphur Bank Mine	5% of existing load
Tributaries	80% of existing load
Atmosphere	No change

4.5.4.1.2 Sulphur Bank Mercury Mine

Reducing mercury concentrations in surficial sediment by 70% is an overall goal for the entire lake. To achieve water quality objectives, extremely high levels of mercury in the eastern end of Oaks Arm near SBMM must be

reduced by more than 70%. To evaluate progress in lowering sediment concentrations, the following sediment compliance goals are established at sites that have been sampled previously.

Current and past releases from the Sulphur Bank Mercury Mine are a significant source of total mercury loading to Clear Lake. Ongoing annual loads from the terrestrial mine site to the lakebed sediments occur through groundwater, surface water, and atmospheric routes. Loads from ongoing releases from the terrestrial mine site should be reduced to 5% of existing inputs. Because of its high potential for methylation relative to mercury in lakebed sediments, mercury entering the lake through groundwater from the mine site should be reduced to 0.5 kg/year.

Past releases from the mine site are a current source of exposure through remobilization of mercury that exists in the lakebed sediments as a result of past releases to the lake from the terrestrial mine site. Past active mining operations, erosion and other mercury transport processes at SBMM have contaminated sediment in Oaks Arm. The load allocation assigned to SBMM includes reducing surficial sediment concentrations in Oaks Arm by 70% (more at sites nearest the mine site) to meet the sediment compliance goals in Table [IV4-610](#).

In 1990, the U.S. Environmental Protection Agency (USEPA) placed Sulphur Bank Mercury Mine on the National Priorities List under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). The USEPA has already performed remediation actions to stabilize waste rock piles, reduce erosion, and control surface water on the site.

**TABLE [IV4-610](#)
SEDIMENT COMPLIANCE GOALS FOR MERCURY IN CLEAR LAKE**

Site Designation	Location	Sediment Mercury Goal (a) (mg/kg dry weight)
Upper Arm UA-03	Center of Upper Arm on transect from Lakeport to Lucerne	0.8
Lower Arm LA-03	Center of Lower Arm, North and west of Monitor Point	1
Oaks Arm		
OA-01 (c)	0.3 km from SBMM	16 (b)
OA-02 (c)	0.8 km from SBMM	16 (b)
OA-03 (c)	1.8 km from SBMM	16
OA-04 (c)	3 km from SBMM	10
Narrows O1	7.7 km from SBMM	3

(a) Sediment goals are 30% of existing concentrations. Existing concentrations are taken as the average mercury concentrations in samples collected in 1996-2000 (Clear Lake Basin Plan Amendment Staff Report).

(b) Due to the exceptionally high concentrations existing at the eastern end of Oaks Arm, sediment goals at OA-01 and OA-02 are not 70% of existing concentrations. These goals are equal to the sediment goal established for OA-03.

(c) Sediment goal is part of the load allocation for SBMM.

Estimates of the current annual loads from the terrestrial mine site to the surficial lakebed sediment are under investigation. Existing data indicate that loads of total mercury from the terrestrial mine site are within a broad range of 1 to 568 kg mercury per year. New data may be used to refine the load estimates as discussed below. As part of verifying compliance with the load allocations, remediation activities to address current and past releases from SBMM should be conducted to meet the sediment compliance goals listed in Table [IV4-610](#) for sediments within one kilometer of the mine site, specifically at sites OA-01 and OA-02.

The Regional Water Board anticipates that fish tissue objectives for mercury will not be met unless the load reductions from Sulphur Bank Mercury Mine are attained.

The Regional Water Board will request that USEPA continue remediation activities on the mine site and prepare an implementation plan or plans that address the following: reduction of ongoing releases of mercury from the SBMM site through surface water, groundwater, and the atmosphere; necessary remediation for mercury in lakebed sediments previously deposited through mining, erosion, and other processes at the mine site; and monitoring and review activities. The implementation plans should provide interim sediment goals and explain how control actions will assist in achieving fish tissue objectives for mercury in Clear Lake. The Regional Water Board will request that USEPA submit remediation plans for Regional Board approval for the SBMM site within eight years after the effective date of this amendment and implement the plan two years thereafter. USEPA should complete remediation activities at the mine site and active lakebed sediment remediation within ten years of plan implementation.

USEPA anticipates implementing additional actions to address the ongoing surface and groundwater releases from the SBMM over the next several years. These actions are expected to lead to significant reductions in the ongoing releases from the mine pit, the mine waste piles and other ongoing sources of mercury releases from the terrestrial mine site. USEPA also currently plans to investigate what steps are appropriate under CERCLA to address the existing contamination in the lakebed sediments due to past releases from the SBMM. Regional Water Board staff will continue to work closely with the USEPA on these important activities. In addition, Regional Water Board staff will coordinate monitoring activities to investigate other sources of mercury loads to Clear Lake. These investigations by USEPA and the Regional Water Board should reduce the uncertainty that currently exists regarding the annual load of total mercury to the lake, the contribution of each source to that load, and the degree to which those sources lead to methylmercury exposure to and mercury uptake by fish in the lake. This information should lead to more refined decisions about what additional steps are appropriate and feasible to achieve the applicable water quality criteria.

The sediment compliance goals for Oaks Arm will require USEPA to address both (1) the ongoing releases from the terrestrial mine site and (2) the load of total mercury that currently exists in the active lakebed sediment layer as a result of past releases. Potential options to control the ongoing releases of mercury from the terrestrial mine site include: remediation of onsite waste rock, tailings and ore piles to minimize the erosion of mercury contaminated sediments into the lake; diversion of surface water run-on away from waste piles and the inactive mine pit; control and containment or treatment of surface water runoff; control of groundwater flow into Clear Lake; and reduction of mercury flux from the mine waste piles into the atmosphere.

Meeting the load allocation for the lakebed sediment will require remediation of contaminated sediment. Potential options to address the mercury that currently exists in the lakebed as a result of past releases and is being remobilized may include dredging the contaminated sediment, capping with clean sediments, facilitating natural burial of highly contaminated sediments, or reducing the transport of highly contaminated sediments from the Oaks Arm into the rest of the lake. Monitoring to assess progress toward meeting the load reduction goals from Sulphur Bank Mercury Mine should be planned and conducted as part of specific remediation activities. Baselines for mercury loads from the various ongoing inputs from the mine site should be established in order to evaluate successes of the remediation activities.

In order to refine the load estimates from SBMM, the Regional Water Board recommends that USEPA determine the following information: mercury concentrations and sediment deposition rates for sediment cores collected near the mine site; characterization of porewater in sediments near the mine site to determine sources, magnitude and impacts of mercury-containing fluids/groundwater entering the lake; estimates of total surface water and groundwater fluxes of mercury from SBMM, including transport through the wetlands north of the site; and patterns of sediment transport and deposition within the lake.

If additional information reveals that reaching the 95% reduction in mercury loads from the terrestrial mine site is technically infeasible or cost prohibitive, or otherwise not technically justified, the Regional Water Board will consider internal adjustments to the SBMM load allocation. It may be possible to adjust the allocation among the terrestrial site and the contaminated sediments associated with the SBMM, provided the internal reallocation achieves the same overall reduction in loads from mine-related sources (terrestrial mine site and ongoing

contributions from highly contaminated sediments). Any internal adjustment must achieve the sediment compliance goals in the east end of Oaks Arm.

Although USEPA is currently spending public funds to address the releases from the SBMM, the owner of SBMM is the party that is legally responsible for addressing the past, current and future releases from the SBMM and for developing implementation plans, implementing control activities that result in achievement of the load reduction, and performing monitoring to verify the load reduction.

4.5.4.1.3 *Tributaries and Surface Water Runoff*

Past and current loads of total mercury from the tributaries and direct surface water runoff are also a source of mercury loading to the lake and to the active sediment layer in the lakebed. This section excludes loads from surface water runoff associated with the SBMM because those are addressed separately above. The loads of total mercury from the tributaries and surface water runoff to Clear Lake should be reduced by 20% of existing levels. In an average water year, existing loads are estimated to be 18 kg/year. Loads range from 1 to 60 kg/year, depending upon water flow rates and other factors. The load allocation applies to tributary inputs as a whole, instead of to individual tributaries. Efforts should be focused on identifying and controlling inputs from hot spots. The U.S. Bureau of Land Management, U.S. Forest Service, other land management agencies in the Clear Lake Basin, and Lake County shall submit plans for monitoring and implementation to achieve the necessary load reductions. The Regional Water Board will coordinate with the above named agencies and other interested parties to develop the monitoring and implementation plans. The purpose of the monitoring shall be to refine load estimates and identify potential hot spots of mercury loading from tributaries or direct surface runoff into Clear Lake. Hot spots may include erosion of soils with concentrations of mercury above the average for the rest of the tributary. If significant sources are identified, the Regional Water Board will coordinate with the agencies to develop and implement load reductions. The implementation plans shall include a summation of existing erosion control efforts and a discussion of feasibility and proposed actions to control loads from identified hot spots. The agencies will provide monitoring and implementation plans within five years after the effective date of this amendment and implement load reduction plans within five years thereafter. The goal is to complete the load reductions within ten years of implementation plan approval.

Regional Water Board staff will work with the Native American Tribes in the Clear Lake watershed on mercury reduction programs for the tributaries and surface water runoff. Staff will solicit the Tribe's participation in the development of monitoring and implementation plans.

4.5.4.1.4 *Wetlands*

The Regional Water Board is concerned about the potential for wetland areas to be significant sources of methylmercury. Loads and fate of methylmercury from wetlands that drain to Clear Lake are not fully understood. The potential for production of methylmercury should be assessed during the planning of any wetlands or floodplain restoration projects within the Clear Lake watershed. The Regional Water Board establishes a goal of no significant increases of methylmercury to Clear Lake resulting from such activities. As factors contributing to mercury methylation are better understood, the possible control of existing methylmercury production within tributary watersheds should be examined.

4.5.4.1.5 *Atmospheric Deposition*

Atmospheric loads of mercury originating outside of the Clear Lake watershed and depositing locally are minimal. Global and regional atmospheric inputs of mercury are not under the jurisdiction of the Regional Water Board. Loads of mercury from outside of the Clear Lake watershed and depositing from air onto the lake surface are established at the existing input rate, which is estimated to be 1 to 2 kg/year.

4.5.4.1.6 *Public Education*

An important component of the Clear Lake mercury strategy is public education. Until the effects of all mercury reduction efforts are reflected in fish tissue levels, the public needs to be continually informed about safe fish consumption levels. The Lake County Public Health Department will provide outreach and education to the

community, emphasizing portions of the population that are at risk, such as pregnant women and children. Education efforts may include recommendations to eat smaller fish and species having lower mercury concentrations.

4.5.4.1.7 *Monitoring and Review*

The monitoring plan for Clear Lake will determine whether mercury loads have been reduced to meet sediment compliance goals and fish tissue objectives. Monitoring will include fish tissue, water and sediment sampling. The Regional Water Board will oversee the preparation of detailed monitoring plans and resources to conduct monitoring of sediment, water and fish to assess progress toward meeting the water quality objectives. Chapter ~~V~~5, Surveillance and Monitoring, provides details for monitoring in Clear Lake.

The Regional Water Board will review the progress toward meeting the fish tissue objectives for Clear Lake every five years. The review will be timed to coincide with the five-year review to be conducted by USEPA for the Record of Decision for the Sulphur Bank Mercury Mine Superfund Site. The Clear Lake mercury management strategy was developed with existing information. The Regional Water Board recognizes that there are uncertainties with the load estimates and the correlation between reductions in loads of total mercury, methylmercury uptake by biota, and fish tissue concentrations. Regional Water Board staff will consider any new data to refine load estimates and allocations from sources within the Clear Lake watershed. Estimates of existing loads from SBMM or the tributaries will be refined during the review process. If new data indicate that the linkage analysis or load allocations will not result in attainment of the fish tissue objectives, or the fish tissue objectives or load allocations require adjustment, revisions to the Basin Plan will be proposed.

4.5.4.2 **Cache Creek Watershed Mercury Program**

The Cache Creek watershed methylmercury and total mercury implementation program applies to Cache Creek (from Clear Lake to the Settling Basin outflow and North Fork Cache Creek from Indian Valley Reservoir Dam to the main stem Cache Creek), Bear Creek, Sulphur Creek, and Harley Gulch. This implementation program is intended to reduce loads of methylmercury and total mercury to achieve all applicable water quality standards for mercury and methylmercury, including the site-specific water quality objectives for methylmercury in fish tissue. Guidance for monitoring mercury in fish, water, and sediment is provided in Chapter ~~V~~5, Surveillance and Monitoring.

Historic mining activities in the Cache Creek watershed have discharged and continue to discharge large volumes of inorganic mercury (termed total mercury) to creeks in the watershed. Much of the mercury discharged from the mines is now distributed in the creek channels and floodplain downstream from the mines. Natural erosion processes can be expected to slowly move the mercury downstream out of the watershed over the next several hundred years. However, current and proposed activities in and around the creek channel can enhance mobilization of this mercury. Activities in upland areas, such as road maintenance and grazing and timber activities can add to the mercury loads reaching Cache Creek, particularly when the activities take place in areas that have elevated mercury levels.

Total mercury in the creeks is converted to methylmercury by bacteria in the sediment. The concentration of methylmercury in fish tissue is directly related to the concentration of methylmercury in the water. The concentration of methylmercury in the water column is controlled in part by the concentration of total mercury in the sediment and the rate at which the total mercury is converted to methylmercury. The rate at which total mercury is converted to methylmercury is variable from site to site, with some sites (i.e., wetlands and marshes) having greatly enhanced rates of methylation.

Since methylmercury in the water column is directly related to mercury levels in fish, the following methylmercury load allocations are assigned to tributaries and the main stem of Cache Creek.

4.5.4.2.1 *Methylmercury Load Allocations*

Tables ~~IV~~4-6-11 and 6-212 provide methylmercury load allocations for Cache Creek, its tributaries, and instream methylmercury production. Allocations are expressed as a percent of existing methylmercury loads. The methylmercury allocations will be achieved by reducing the annual average methylmercury (unfiltered) concentrations to site-specific, aqueous methylmercury goals, which are 0.14 ng/L in Cache Creek, 0.06 ng/L in

Bear Creek, and 0.09 ng/L in Harley Gulch. The allocations in Tables [IV4-6.111](#) and [IV4-6.212](#) apply to sources of methylmercury entering each tributary or stream segment. In aggregate, the sources to each tributary or stream segment shall have reductions of methylmercury loads as shown below.

Table [IV4-6.212](#) provides the load allocation within Bear Creek and its tributaries to attain the allocation for Bear Creek described in Table [IV4-6.111](#). The inactive mines listed in Table [IV4-6.414](#) are assigned a 95% total mercury load reduction. Reductions in mercury loads from mines, erosion, and other sources in the Sulphur Creek watershed are expected to reduce in channel production of methylmercury to meet the Sulphur Creek methylmercury allocation.

To achieve the water quality objectives and the methylmercury allocations listed in Tables [IV4-6.111](#) and [IV-6.212](#), the following actions are needed: 1) reduce loads of total mercury from inactive mines, 2) where feasible, implement projects to reduce total mercury inputs from existing mercury-containing sediment deposits in creek channels and creek banks downstream from historic mine discharges, 3) reduce erosion of soils with enriched total mercury concentrations, 4) limit activities in the watershed that will increase methylmercury discharges to the creeks and, where feasible, reduce discharges of methylmercury from existing sources, and 5) evaluate other remediation actions that are not directly linked to activities of a discharger. Because methylmercury is a function of total mercury, reductions in total mercury loads are needed to achieve the methylmercury load allocations. Methylmercury allocations will be achieved in part by natural erosion processes that remove mercury that has deposited in creek beds and banks since the start of mining.

Table [IV4-6.313](#) summarizes implementation actions, affected watersheds, and agencies or persons assigned primary responsibility for mercury load reduction projects, and required completion dates for the projects. For purposes of this Basin Plan Implementation Program, the term "project" refers to actions or activities that result in a discharge of mercury to Cache Creek or are conducted within the 10-year floodplain.

**TABLE [IV4-6.111](#)
CACHE CREEK METHYLMERCURY ALLOCATIONS**

Source	Existing Annual Load (g/yr)	Acceptable Annual Load (g/yr)	Allocation (% of existing load)
Cache Creek (Clear Lake to North Fork confluence)	36.8	11	30%
North Fork Cache Creek	12.4	12.4	100%
Harley Gulch	1.0	0.04	4%
Davis Creek	1.3	0.7	50%
Bear Creek @ Highway 20	21.1	3	15%
Within channel production and ungauged tributaries	49.5	32	65%
		7 (a)	10% (a)
<i>Total of loads</i>	122	66	54%
Cache Creek at Yolo (b)	72.5	39	54%
Cache Creek Settling Basin Outflow (c)	87	12	14%

- a. The allocation includes a margin of safety, which is set to 10% of the acceptable loads. In terms of acceptable annual load estimates, the margin of safety is 7 g/yr.
- b. Cache Creek at Yolo is the compliance point for the tributaries and Cache Creek channel for meeting the allocations and aqueous goals. Agricultural water diversions upstream of Yolo remove methylmercury (50 g/year existing load).
- c. The Settling Basin Outflow is the compliance point for methylmercury produced in the Settling Basin.

TABLE IV4-6-212
BEAR CREEK METHYLMERCURY ALLOCATIONS

Source	Existing Annual Load (g/yr)	Acceptable Annual Load (g/yr)	Allocation (% of existing load)
Bear Creek @ Bear Valley Road	1.7	0.9	50%
Sulphur Creek	8	0.8	10%
In channel production and ungauged tributaries	11.4	1	10%
		0.3 (a)	10% (a)
<i>Total of loads</i>	21.1	3	15%
Bear Creek at Hwy 20 (b)	21.1	3	15%

- a. The allocation includes a margin of safety, which is set to 10% of the acceptable loads. In terms of acceptable annual load estimates, the margin of safety is 0.3 g/yr.
- b. Bear Creek at Highway 20 is the compliance point for Bear Creek and its tributaries.

**TABLE IV-6.313
IMPLEMENTATION SUMMARY**

Implementation Activity	Affected Watersheds	Assigned Responsibility	Action	Completion Date
Inactive Mines	Bear Creek, Harley Gulch, Sulphur Creek	Mine owners and other responsible parties, USBLM	Cleanup mines, sediment, and wetlands	2011
Creek Sediments- Harley Gulch Delta	Harley Gulch	USBLM	Conduct additional studies	2006
			Submit report on engineering options	2008
			Conduct projects, as required	2011
Creek Sediments- Upper Watershed	Bear Creek, Davis Creek, Harley Gulch, Sulphur Creek, and Cache Creek (Harley Gulch to Camp Haswell)	USBLM, SLC, CDFW, Colusa, Lake, and Yolo Counties, private landowners	Conduct additional studies	2007
			Feasibility studies	(Scope and time schedule for plan and reports determined as needed)
			Conduct Projects (as required)	
Erosion Control- Upper Watershed	Sub-watersheds with “enriched” mercury. Includes areas of Bear Creek, Sulphur Creek, and Cache Creek (Harley Gulch to Camp Haswell)	USBLM, SLC, CDFW, Colusa, Lake, and Yolo Counties, private landowners	Conduct additional studies	2006
			Identify activities that increase erosion	2007
			Submit erosion control plans, as required	2009
			Implement erosion control plans, as required	2011
Erosion Control from New Projects, 10-yr Floodplains	Cache Creek (Harley Gulch to Settling Basin), Bear and Sulphur Creeks, Harley Gulch	Yolo County, Reclamation Board, private landowners, US Army Corps of Engineers	Implement management practices and monitoring for erosion control	During and after project construction
New Reservoirs, Ponds, and Wetlands	Cache Creek watershed	Yolo County or project proponents	Submit plans to control methylmercury discharges	Prior to project construction
Anderson Marsh	Cache Creek at Clear Lake	California Department of Parks and Recreation	Conduct additional studies	2006
			Submit report on management options	2008
			Conduct Project (as required)	2011

4.5.4.2.2 *Inactive Mines*

By 6 February 2009, the Regional Water Board shall adopt cleanup and abatement orders or take other appropriate actions to control discharges from the inactive mines (Table IV4-6-413) in the Cache Creek watershed. Responsible parties shall develop and submit for Executive Officer approval plans, including a time schedule, to reduce loads of mercury from mining or other anthropogenic activities by 95% of existing loads consistent with State Water Resources Control Board Resolution 92-49. The goal of the cleanup is to restore the mines to pre-mining conditions with respect to the discharge of mercury. Mercury and methylmercury loads produced by interaction of thermal springs with mine wastes from the Turkey Run and Elgin mines are considered to be anthropogenic loading. The responsible parties shall be deemed in compliance with this requirement if cleanup actions and maintenance activities are conducted in accordance with the approved plans. Cleanup actions at the mines shall be completed by 2011.

The wetland immediately downstream from the Abbott and Turkey Run mines in Harley Gulch contains mercury and is a source of methylmercury. After mine cleanup has been initiated, the responsible parties and owners of the wetland shall develop and submit for Executive Officer approval a cleanup and abatement plan to reduce the wetland's methylmercury loads to meet the Harley Gulch aqueous methylmercury allocation. The wetland cleanup and abatement shall be completed by 2011. Cleanup and abatement at the wetland should not be implemented prior to cleanup actions at the upstream mines.

The Sulphur Creek streambed and flood plain directly below the Central, Cherry Hill, Empire, Manzanita, West End and Wide Awake Mines contains mine waste. After mine cleanup has been initiated, the responsible parties and owners of the streambed and floodplain shall develop and submit for Executive Officer approval a cleanup and abatement plan to reduce anthropogenic mercury loading in the creek.

**TABLE IV4-6-414
CACHE CREEK WATERSHED INACTIVE MINES (a)**

Mine	Average Annual Load Estimate, kg mercury/year (b)
Abbott and Turkey Run Mines	7
Rathburn and Rathburn-Petray Mines	20
Petray North and South Mines	5
Wide Awake Mine	0.8
Central, Cherry Hill, Empire, Manzanita, and West End Mines	5
Elgin Mine	3
Clyde Mine	0.4

- a. The mines are grouped by current landowner. Although cleanup requirements apply to each mine, a single owner or responsible party having adjacent mines may apply the 95% reduction to the total discharge from their mines.
- b. Estimates of average annual loads are preliminary, based on data collected by the California Geological Survey (Rathburn, Rathburn-Petray, Petray North, and Petray South mines) and Regional Water Board staff (other mines). Load estimates do not include mercury that would be discharged in extreme erosional events. Responsible parties may be required to refine the load estimates.

4.5.4.2.3 *Creek Sediment – Upper Watershed*

There are areas downstream from mines in Harley Gulch, Bear Creek, Sulphur Creek, Davis Creek and Cache Creek that have significant deposits of mercury-containing sediment that were derived, at least in part, from historic

discharges from the mines. Where feasible, sediment discharges from these deposits need to be reduced or eliminated.

The Regional Water Board and the USBLM will conduct additional studies to determine the extent of mercury in sediment at the confluence of Harley Gulch and Cache Creek. The Regional Water Board will require the USBLM to evaluate engineering options to reduce erosion of this material to Cache Creek. If feasible projects are identified, the Regional Water Board will require USBLM to cleanup the sediment.

At other sites, further assessments are needed to determine whether responsible parties should be required to conduct feasibility studies to evaluate methods to control sources of mercury and methylmercury. The Executive Officer will, to the extent appropriate, prioritize the need for feasibility studies and subsequent remediation actions based on mercury concentrations and masses, erosion potential, and accessibility. Staff intends to complete the assessments by 6 February 2009. Where applicable, the Executive Officer will notify responsible parties to submit feasibility studies. Following review of the feasibility studies, the Executive Officer will determine whether cleanup actions will be required. Responsible parties that could be required to conduct feasibility studies include the US Bureau of Land Management (USBLM); State Lands Commission (SLC), California Department of Fish and Wildlife (CDFW); Yolo, Lake, and Colusa Counties, mine owners, and private landowners. Assessments are needed of stream beds and banks in the following areas: Cache Creek from Harley Gulch to Camp Haswell, Harley Gulch, Sulphur Creek, and Bear Creek south of the Bear Valley Road crossing.

4.5.4.2.4 *Erosion Control – Upper Watershed*

Activities in upland parts of the watershed (i.e., outside the active floodplain), such as road construction and maintenance, grazing, timber management and other activities, can result in increased erosion and transport of mercury to the creeks, especially in parts of the watershed where the soils have enriched levels of mercury. Enriched soil and sediment is defined as having an average concentration of mercury of 0.4 mg/kg, dry weight in the silt/clay fraction (less than 63 microns). Provisions described below are applicable in the following areas: the Cache Creek watershed (Harley Gulch to Camp Haswell), Harley Gulch and Sulphur Creek watersheds, and the Bear Creek watershed south of the Bear Valley Road crossing. Some projects subject to this implementation plan may be subject to permits, including general stormwater permits. This implementation plan does not preclude the requirement to obtain any applicable federal, state, or local permit applicable to such projects.

4.5.4.2.4.1 Road Construction and Maintenance

Management practices shall be implemented to control erosion from road construction and maintenance activities in parts of the watershed identified above. All California Department of Transportation (Caltrans) road construction projects or maintenance activities that result in soil disturbance shall comply with the Caltrans statewide Storm Water Management Plan and implement best management practices to control erosion, including pre-project assessments to identify areas with enriched mercury and descriptions of additional management practices that will be implemented in these areas. Water quality and sediment monitoring may be required to ensure compliance with these requirements. For paved roads, entities maintaining or constructing road shall implement the Caltrans or equivalent management practices to comply with these requirements. For unpaved roads, entities maintaining or constructing road shall implement all reasonable management practices to control erosion during construction and maintenance activities. By 6 February 2009, county and agency road departments shall submit information describing the management practices that will be implemented to control erosion.

4.5.4.2.4.2 Other Activities

A goal of the Regional Water Board is to minimize erosion from areas with enriched mercury concentrations. Further studies are needed to identify specific upland sites within the watershed areas described above that have enriched mercury concentrations and to evaluate whether activities at these sites could result in increased erosion (i.e., grazing, timber harvest activities, etc.) or contribute to increases in methylmercury production. Staff will identify areas with enriched mercury concentrations by 6 February 2008. After the studies are complete, the Executive Officer will require affected landowners and/or land managers to 1) submit reports that identify anthropogenic activities on their lands that could result in increased erosion and 2) implement management practices to control erosion. As necessary, erosion control plans will be required no later than 6 February 2011. Entities

responsible for controlling erosion include the US Bureau of Land Management (USBLM); State Lands Commission (SLC); California Department of Fish and Wildlife (CDFW); Yolo, Lake, and Colusa Counties; and private landowners.

Landowners implementing new projects or proposing change in land use on land in the enriched areas shall implement practices to control erosion and minimize discharges of mercury and methylmercury. If the dischargers are not implementing management practices to control erosion or methylmercury discharges, the Regional Water Board may consider individual prohibitions of waste discharge. For proposed changes in land use or new projects, landowners shall submit a plan including erosion estimates from the new project, erosion control practices, and, if a net increase in erosion is expected to occur, a remediation plan.

4.5.4.2.5 *Erosion Control in the 10-Year Floodplains*

Sediment and soil in the depositional zone of creeks downstream of mines in the Cache Creek watershed contains mercury. A goal of this plan is to minimize erosion of the mercury-containing sediment and soil due to human activities in order to protect beneficial uses in Cache Creek and to reduce loads of mercury moving downstream to the Settling Basin and the Delta. Some projects subject to this implementation plan may be subject to permits, including general stormwater permits. This implementation plan does not preclude the requirement to obtain any applicable federal, state, or local permit applicable to such projects.

The following requirements for erosion control apply to all projects conducted within the 10 year floodplains of Cache Creek (from Harley Gulch to the Settling Basin outflow), Bear Creek (from tributaries draining Petray and Rathburn Mines to Cache Creek), Sulphur Creek, and Harley Gulch.

Project proponents are required to: 1) implement management practices to control erosion and 2) conduct monitoring programs that evaluate compliance with the turbidity objective, and submit monitoring results to the Regional Water Board. The monitoring program must include monitoring during the next wet season in which the project sites are inundated. In general, there must be monitoring for each project. However, in cases where projects are being implemented as part of a detailed resource management plan that includes erosion control practices, monitoring is not required as a condition of this amendment for individual projects. Instead, the project proponent may conduct monitoring at designated sites up and downstream of the entire management plan area.

Upon written request by project proponents, the Executive Officer may waive the turbidity monitoring requirements for a project, or group of projects, if the project proponents submit an alternative method for assessing compliance with the turbidity objective.

Whenever practicable, proponents should maximize removal of mercury enriched sediment from the floodplain. Sediment removed from the channel or the Settling Basin must be placed so that it will not erode into the creek. For projects related to habitat restoration or erosion control consistent with a comprehensive resource management plan, the project proponent may relocate sediment within the channel if the proponent uses the sediment to enhance habitat and provides appropriate erosion controls.

Some projects may not be able to meet the turbidity objectives even when all reasonable management practices will be implemented to control erosion. These projects may still be implemented if project proponents implement actions (offset projects) in some other part of the watershed that would reduce or otherwise prevent discharges of sediment containing mercury in an amount at least equivalent to the incremental increases expected from the original project. Removal of sediment from the Settling Basin would be an acceptable offset project.

All bridge, culvert, or road construction or maintenance activities that may cause erosion within the 10-year flood plains must follow the Caltrans management practices or equivalent to control erosion.

The Executive Officer may waive, consistent with State and federal law, the requirement for erosion control from a project conducted in the 10-year floodplain for habitat conservation or development activities for bank swallows that are proposed under the State's adopted Bank Swallow Recovery Plan (Department of Fish and Game (later renamed the Department of Fish and Wildlife), 1992).

4.5.4.2.6 *New Reservoirs, Ponds, and Wetlands*

Reservoirs, ponds, impoundments and wetlands generally produce more methylmercury than streams or rivers. Building new impoundments and wetlands that discharge to creeks in the Cache Creek watershed can add to the existing loads of methylmercury in Cache Creek and its tributaries. New impoundments, including reservoirs and ponds, and constructed wetlands shall be constructed and operated in a manner that would preclude an increase in methylmercury concentrations in Cache Creek, Bear Creek, Harley Gulch, or Sulphur Creek. This requirement applies to all new projects in the watershed, including gravel mining pits in lower Cache Creek that are being reclaimed as ponds and wetlands, for which physical construction is started after the approval of this implementation plan. “Preclude an increase in methylmercury concentrations” shall be defined as a measurable increase in aqueous concentration of methylmercury downstream of the discharge relative to upstream of the discharge.

Any entity creating an impoundment or constructed wetland that has the potential through its design to discharge surface water to Cache Creek, Bear Creek, Harley Gulch, or Sulphur Creek (uncontrollable discharge after inundation by winter storm flows is excepted) must submit plans to the Regional Water Board that describe design and management practices that will be implemented to limit the concentration of methylmercury in discharges to the creek.

The Executive Officer will consider granting exceptions to the no net increase requirement in methylmercury concentration if: 1) dischargers provide information that demonstrates that all reasonable management practices to limit discharge concentrations of methylmercury are being implemented and 2) the projects are being developed for the primary purpose of enhancing fish and wildlife beneficial uses. In granting exceptions to the no net increase requirement, the Executive Officer will consider the merits of the project and whether to require the discharger to propose other activities in the watershed that could offset the incremental increases in methylmercury concentration in the creek. The Regional Water Board will periodically review the progress towards achieving the objectives and may consider prohibitions of methylmercury discharge if the plan described above is ineffective.

The Cache Creek Nature Preserve (CCNP), which includes a wetland restored from a gravel excavation, currently minimizes any methylmercury discharges to Cache Creek by holding water within the wetlands. If water management in the CCNP wetlands is changed significantly, the operator must submit plans describing management practices that will be implemented to limit methylmercury discharge to Cache Creek.

4.5.4.2.7 *Anderson Marsh Methylmercury*

The Regional Water Board, in coordination with California Department of Parks and Recreation (DPR), will continue to conduct methylmercury studies in Anderson Marsh. If the Regional Water Board finds that Anderson Marsh is a significant methylmercury source to Cache Creek, the Regional Water Board will require DPR to evaluate potential management practices to reduce methylmercury loads. The Regional Water Board will then consider whether to require DPR to implement a load reduction project.

4.5.4.2.8 *Cache Creek Settling Basin*

Although the Cache Creek settling basin retains about one half of the total mercury attached to sediment that enters the basin, there is a net increase in methylmercury discharged from the settling basin. Methylmercury loads are expected to decrease as inflow mercury concentrations decline. The Regional Water Board will continue to conduct methylmercury studies in the basin and work with the Reclamation Board and the US Army Corps of Engineers to develop settling basin improvements to retain more sediment and reduce methylmercury loads. The Sacramento-San Joaquin Delta mercury implementation plan will include total mercury load reduction requirements for the settling basin.

4.5.4.2.9 *Geothermal and Spring Sources*

In general, geothermal springs that discharge mercury and sulfate may not be controllable. However, geothermal discharges adjacent to Sulphur Creek are potential candidates for remediation or mercury offset projects. As needed, the Executive Officer will make a determination of the suitability of geothermal source controls for offset or remediation projects.

Thermal springs used by the Wilbur Hot Springs resort are a source of mercury and methylmercury to Sulphur Creek. Discharges of mercury or methylmercury from springs used or developed by the Wilbur Hot Springs resort shall not exceed current loads.

4.5.4.2.10 *Potential Actions*

This control plan focuses on reducing mercury discharges from mercury mines, controlling activities that mobilize past discharges from the mines, controlling activities that enhance methylation of mercury, and implementing cleanup and abatement activities at sites where sediment rich in mercury has accumulated. Responsibility for these actions may be assigned to responsible parties. There are a number of other actions that may be considered that would reduce loads of mercury in the creek that are not directly the responsibility of a discharger. The following actions are recommended for further evaluation:

- Construction of a settling basin upstream of Rumsey. The facility could trap mercury enriched sediment, reduce downstream loads and preserve space in the existing settling basin in Yolo Bypass.
- Methylmercury reduction plans for Bear Creek
- Load reductions from Davis Creek

4.5.4.2.11 *Mercury Offset Program and Alternative Load Allocations*

The Regional Water Board recognizes that cleanup of mines and non-point sources will require substantial financial resources. The Regional Water Board, therefore, will allow entities participating in approved mercury offset programs to conduct offset projects in the Cache Creek watershed. Offset programs shall be focused on projects where funding is not otherwise available. Subject to approval by the Executive Officer, entities participating in an offset program may partner with agencies in mercury control actions. The framework for offset programs will be developed in future Basin Plan amendments.

The methylmercury load allocations in Tables IV4-6-11 and 6-212 are assigned to watersheds. To allow offset program proponents to conduct projects within the watersheds to reduce loads, the Regional Water Board may consider alternative load allocations that will achieve the water quality objectives.

4.5.4.2.12 *Public Education*

The local county health departments should provide outreach and education regarding the risks of consuming fish containing mercury, emphasizing portions of the population that are at risk, such as pregnant women and children.

4.5.4.2.13 *Adaptive Implementation*

The Regional Water Board will review the progress toward meeting the water quality objectives and the Basin Plan requirements at least every five years. The Regional Water Board recognizes that it may take hundreds of years to achieve the fish tissue objectives. The Regional Water Board considers entities to be in compliance with this mercury reduction plan if they comply with the above requirements for mercury, methylmercury, and erosion controls. The Regional Water Board recognizes that there are uncertainties with the load estimates and the correlation between reductions in loads of total mercury, methylmercury uptake by biota, and fish tissue concentrations. Using an adaptive management approach, however, the Regional Water Board will evaluate new data and scientific information to determine the most effective control program and allocations to reduce methylmercury and total mercury sources in the watershed.

4.5.4.2.14 *Monitoring and Review*

The monitoring guidance for Cache Creek is described in Chapter V5, Surveillance and Monitoring. Regional Water Board staff will oversee the preparation of detailed monitoring plans and resources to conduct monitoring of sediment, water, and fish to assess progress toward meeting the water quality objectives. Regional Water Board staff will take the lead in determining compliance with fish tissue objectives for Cache Creek. Monitoring for cleanup of

mines or compliance with the erosion control requirements is the responsibility of the entity performing the cleanup or erosion control.

4.5.4.3 Delta Mercury Control Program

The Delta Mercury Control Program applies specifically to the Delta and Yolo Bypass waterways listed in Appendix 43.

This amendment was adopted by the Regional Water Quality Control Board on 22 April 2010, and approved by the U.S. Environmental Protection Agency on 20 October 2011. The Effective Date of the Delta Mercury Control Program shall be 20 October 2011, the date of U.S. EPA approval.

4.5.4.3.1 Program Overview

The Delta Mercury Control Program is designed to protect people eating one meal/week (32 g/day) of trophic levels 3 and 4 Delta fish, plus some non-Delta (commercial market) fish. The Regional Water Board recognizes that some consumers eat four to five meals per week (128-160 g/day) of a variety of Delta fish species. The fish tissue objectives will be re-evaluated during the Phase 1 Delta Mercury Control Program Review and later program reviews to determine whether objectives protective of a higher consumption rate can be attained as methylmercury reduction actions are developed and implemented.

Additional information about methylmercury source control methods must be developed to determine how and if Dischargers can attain load and waste load allocations set by the Board. Information is also needed about the methylmercury control methods' potential benefits and adverse impacts to humans, wildlife, and the environment. Therefore, the Delta Mercury Control Program will be implemented through a phased, adaptive management approach.

Phase 1 spans from 20 October 2011 through the Phase I Delta Mercury Control Program Review, expected to be by 20 October 2020. Phase 1 emphasizes studies and pilot projects to develop and evaluate management practices to control methylmercury. Phase 1 includes provisions for: implementing pollution minimization programs and interim mass limits for inorganic (total) mercury point sources in the Delta and Yolo Bypass; controlling sediment-bound mercury in the Delta and Yolo Bypass that may become methylated in agricultural lands, wetland, and open-water habitats; and reducing total mercury loading to San Francisco Bay, as required by the Water Quality Control Plan for the San Francisco Bay Basin.

Phase 1 also includes: the development of upstream mercury control programs for major tributaries; the development and implementation of a mercury exposure reduction program to protect humans; and the development of a mercury offset program.

At the end of Phase 1, the Regional Water Board shall conduct a Phase 1 Delta Mercury Control Program Review that considers: modification of methylmercury goals, objectives, allocations and/or the Final Compliance Date; implementation of management practices and schedules for methylmercury controls; and adoption of a mercury offset program for dischargers who cannot meet their load and waste load allocations after implementing all reasonable load reduction strategies. The review also shall consider other potential public and environmental benefits and negative impacts (e.g., habitat restoration, flood protection, water supply, fish consumption) of attaining the allocations. The fish tissue objectives, the linkage analysis between objectives and sources, and the attainability of the allocations will be re-evaluated based on the findings of Phase 1 control studies and other information. The linkage analysis, fish tissue objectives, allocations, and time schedules shall be adjusted at the end of Phase 1, or subsequent program reviews, if appropriate.

Phase 2 begins after the Phase 1 Delta Mercury Control Program Review or 20 October 2022, whichever occurs first, and ends in 2030. During Phase 2, dischargers shall implement methylmercury control programs and continue inorganic (total) mercury reduction programs. Compliance monitoring and implementation of upstream control programs also shall occur in Phase 2.

4.5.4.3.2 *Load and Waste Load Allocations*

Final methylmercury waste load allocations for point sources and load allocations for non-point sources are listed in Tables [IV4-7A-15](#) through [IV4-7D-18](#). For each subarea listed in Table [IV4-7A-15](#), the sum of allocations for agricultural drainage, atmospheric wet deposition, open water, urban (nonpoint source), and wetlands and the individual allocations for tributary inputs (Table [IV4-7D-18](#)), NPDES facilities and NPDES facilities future growth (Table [IV4-7B-16](#)), and NPDES MS4 (Table [IV4-7C-17](#)) within that subarea equals that subarea's assimilative capacity. New or expanded methylmercury discharges that begin after 20 October 2011 may necessitate adjustments to the allocations.

Load allocations are specific to Delta subareas, which are shown on Figure A43. The load allocations for each Delta subarea apply to the sum of annual methylmercury loads produced by different types of nonpoint sources: agricultural lands, wetlands, and open-water habitat in each subarea, as well as atmospheric wet deposition to each subarea (Table [IV4-7A-15](#)), and runoff from urban areas outside of Municipal Separate Storm Sewer System (MS4) service areas. The subarea allocations apply to both existing and future discharges.

Waste load allocations apply to point sources, which include individual NPDES permitted facility discharges and runoff from urban areas within MS4 service areas within the Delta and Yolo Bypass (Tables [IV4-7B-16](#) and [IV4-7C-17](#), respectively).

Methylmercury allocations are assigned to tributary inputs to the Delta and Yolo Bypass (Table [IV4-7D-18](#)). Future upstream control programs are planned for tributaries to the Delta through which management practices will be implemented to meet load allocations for tributary inputs assigned by the Delta Mercury Control Program.

Load allocations for the tributary inputs, urban areas outside of MS4 service areas, open-water habitat, and atmospheric deposition, and waste load allocations for the MS4s, are based on water years 2000 through 2003, a relatively dry period. Annual loads are expected to fluctuate with rainfall volume and other factors. As a result, attainment of these allocations shall be assessed as a five-year average annual load. Allocations for these sources will be re-evaluated during review of the Phase 1 Delta Mercury Control Program as wet year data become available.

4.5.4.3.3 *Margin of Safety*

The Delta Mercury Control program includes an explicit margin of safety of 10%.

4.5.4.3.4 *Final Compliance Date*

Methylmercury load and waste load allocations for dischargers in the Delta and Yolo Bypass shall be met as soon as possible, but no later than 2030, unless the Regional Water Board modifies the implementation schedule and Final Compliance Date.

During Phase 1, all dischargers shall implement reasonable, feasible controls for inorganic (total) mercury.

All dischargers should implement methylmercury management practices identified during Phase 1 that are reasonable and feasible. However, implementation of methylmercury management practices identified in Phase 1 is not required for the purposes of achieving methylmercury load allocations for nonpoint sources until the beginning of Phase 2.

The Regional Water Board will, as necessary, include schedules of compliance in NPDES permits for compliance with water quality-based effluent limits based on the waste load allocations. The compliance schedules must be consistent with the requirements of federal laws and regulations, including, USEPA regulations 40 CFR 122.47, State laws and regulations, including State Water Board Policy for Compliance Schedules in National Pollutant Discharge Elimination System Permits, and the Final Compliance Date. The Regional Board will review the feasibility of meeting wasteload allocations based on reliable data and information regarding variability in methylmercury concentrations and treatment efficiencies and time needed to comply with the wasteload allocations. The Phase 1 Control Studies are designed to provide this information. As needed, the Regional Board shall

incorporate the Phase 1 Control Studies into compliance schedules. When Phase 1 studies are complete, the Regional Board will review the need for additional time during Phase 2 for NPDES permittees to comply with the final wasteload allocations.

4.5.4.3.5 *Implementation Program*

4.5.4.3.5.1 Point Sources

The regulatory mechanism to implement the Delta Mercury Control Program for point sources shall be through NPDES permits.

4.5.4.3.5.1.1 *Requirements for NPDES Permitted Facilities*

By 20 April 2012, all facilities listed in Table ~~IV4-7B-16~~ shall submit individual pollutant minimization program workplans to the Regional Water Board. The dischargers shall implement their respective pollutant minimization programs within 30 days after receipt of written Executive Officer approval of the workplans. Until the NPDES permitted facility achieves compliance with its waste load allocation, the discharger shall submit annual progress reports on pollution minimization activities implemented and evaluation of their effectiveness, including a summary of mercury and methylmercury monitoring results.

During Phase 1, all facilities listed in Table ~~IV4-7B-16~~ shall limit their discharges of inorganic (total) mercury to facility performance-based levels. The interim inorganic (total) mercury effluent mass limit is to be derived using current, representative data and shall not exceed the 99.9th percentile of 12-month running effluent inorganic (total) mercury loads (lbs/year). For intermittent dischargers, the interim inorganic (total) mercury effluent mass limit shall consider site-specific discharge conditions. The limit shall be assigned in permits and reported as an annual load based on a calendar year. At the end of Phase 1, the interim inorganic (total) mercury mass limit will be re-evaluated and modified as appropriate.

NPDES permitted facilities that begin discharging to the Delta or Yolo Bypass during Phase 1 shall comply with the above requirements.

4.5.4.3.5.1.2 *Requirements for NPDES Permitted Urban Runoff Discharges*

MS4 dischargers listed in Table ~~IV4-7C-17~~ shall implement best management practices (BMPs) to control erosion and sediment discharges consistent with their existing permits and orders with the goal of reducing mercury discharges.

The Sacramento MS4 (CAS082597), Contra Costa County MS4 (CAS083313), and Stockton MS4 (CAS083470) permittees shall implement pollution prevention measures and BMPs to minimize total mercury discharges. This requirement shall be implemented through mercury reduction strategies required by their existing permits and orders. Annually, the dischargers shall report on the results of monitoring and a description of implemented pollution prevention measures and their effectiveness.

The Sacramento MS4 (CAS082597), Contra Costa County MS4 (CAS083313), and Stockton MS4 (CAS083470) shall continue to conduct mercury control studies to monitor and evaluate the effectiveness of existing BMPs per existing requirements in permits and orders, and to develop and evaluate additional BMPs as needed to reduce their mercury and methylmercury discharges into the Delta and Yolo Bypass.

4.5.4.3.5.2 Nonpoint Sources

Nonpoint sources shall be regulated through the authority contained in State and federal laws and regulations, including State Water Board's Nonpoint Source Implementation and Enforcement Policy.

Table ~~IV4-7A-15~~ contains methylmercury load allocations for non-point sources in the Delta and Yolo Bypass waterways listed in Appendix 43.

During Phase 1, all nonpoint sources in the Delta and Yolo Bypass shall implement reasonable, feasible actions to reduce sediment in runoff with the goal of reducing inorganic mercury loading to the Yolo Bypass and Delta, in compliance with existing Basin Plan objectives and requirements, and Irrigated Lands Regulatory Program requirements.

Attainment of methylmercury load allocations at the end of 2030 will be determined by comparing monitoring data and documentation of methylmercury management practice implementation for each subarea with loads specified in Table [IV4-7A-15](#) and Table [IV4-7D18](#).

For subareas not in compliance with allocations by 2030, the Regional Water Board may develop load allocations for individual sources and require individual monitoring and waste discharge requirements.

In subareas needing reductions in methylmercury, proponents of new wetland and wetland restoration projects scheduled for construction after 20 October 2011 shall (a) participate in Control Studies as described below, or shall implement site-specific study plans, that evaluate practices to minimize methylmercury discharges, and (b) implement methylmercury controls as feasible. New wetland projects may include pilot projects and associated monitoring to evaluate management practices that minimize methylmercury discharges.

[4.5.4.3.5.3](#) Phase 1 Control Studies

Point and nonpoint source dischargers, working with other stakeholders, shall conduct methylmercury control studies (Control Studies) to evaluate existing control methods and, as needed, develop additional control methods that could be implemented to achieve their methylmercury load and waste load allocations. The Regional Water Board will use the Phase 1 Control Studies' results and other information to consider amendments to the Delta Mercury Control Program during the Phase 1 Delta Mercury Control Program Review. A Technical Advisory Committee, described below, will review the Control Studies' designs and results.

[4.5.4.3.5.3.1](#) Study Participants

Control Studies can be developed through a stakeholder group approach or other collaborative mechanism, or by individual dischargers. Individual dischargers are not required to do individual studies if the individual dischargers join a collaborative study group(s).

Control Studies are required for:

- ~~a~~(1) Irrigated agricultural lands that discharge to the Yolo Bypass and Delta subareas that require methylmercury source reductions.
- ~~b~~(2) Managed wetlands and wetland restoration projects that discharge to the Yolo Bypass and Delta subareas that require methylmercury source reductions.
- ~~c~~(3) Existing NPDES permitted facilities in the Delta and the Yolo Bypass (listed in Table [IV4-7B16](#)).
- ~~d~~(4) Sacramento Area MS4, Stockton MS4, and Contra Costa County MS4 service areas within and upstream of the legal Delta boundary.
- ~~e~~(5) State and Federal agencies whose activities affect the transport of mercury and the production and transport of methylmercury through the Yolo Bypass and Delta, or which manage open water areas in the Yolo Bypass and Delta, including but not limited to Department of Water Resources, State Lands Commission, Central Valley Flood Protection Board, U.S. Army Corps of Engineers, and U.S. Bureau of Reclamation. If appropriate during Phase 1, the Executive Officer will require other water management agencies whose activities affect methylmercury levels in the Delta and Yolo Bypass to participate in the Control Studies.
- ~~f~~(6) Other significant sources of methylmercury not listed above, as identified and deemed appropriate by the Executive Officer.

Dischargers in the Central Valley that are not subject to the Delta Mercury Control Program but may be subject to future mercury control programs in upstream tributary watersheds are encouraged to participate in the coordinated Delta Control Studies. Dischargers in and upstream of the Delta who participate in the Control Studies will be exempt from conducting equivalent Control Studies required by future upstream mercury control programs.

4.5.4.3.5.3.2 *Study Objectives*

The Control Studies shall evaluate existing control methods and, as needed, additional control methods that could be implemented to achieve methylmercury load and waste load allocations. The Control Studies shall evaluate the feasibility of reducing sources more than the minimum amount needed to achieve allocations.

Phase 1 studies also may include an evaluation of innovative actions, watershed approaches, offsets projects, and other short and long-term actions that result in reducing inorganic (total) mercury and methylmercury to address the accumulation of methylmercury in fish tissue and to reduce methylmercury exposure.

Dischargers may evaluate the effectiveness of using inorganic (total) mercury controls to control methylmercury discharges.

Dischargers may conduct characterization studies to inform and prioritize the Control Studies. Characterization studies may include, but not be limited to, evaluations of methylmercury and total mercury concentrations and loads in source waters, receiving waters, and discharges, to determine which discharges act as net sources of methylmercury, and which land uses result in the greatest net methylmercury production and loss.

Final reports for Control Studies shall include a description of methylmercury and/or inorganic (total) mercury management practices identified in Phase 1; an evaluation of the effectiveness, and costs, potential environmental effects, and overall feasibility of the control actions. Final reports shall also include proposed implementation plans and schedules to comply with methylmercury allocations as soon as possible.

If the Control Study results indicate that achieving a given methylmercury allocation is infeasible, then the discharger, or an entity representing a discharger, shall provide detailed information on why full compliance is not achievable, what methylmercury load reduction is achievable, and an implementation plan and schedule to achieve partial compliance.

4.5.4.3.5.3.3 *Control Study Workplans*

Control Studies shall be implemented through Control Study Workplan(s). The Control Study Workplan(s) shall provide detailed descriptions of how methylmercury control methods will be identified, developed, and monitored, and how effectiveness, costs, potential environmental effects, and overall feasibility will be evaluated for the control methods.

The Control Study Workplan(s) shall include details for organizing, planning, developing, prioritizing, and implementing the Control Studies.

The Control Studies will be governed using an Adaptive Management approach.

4.5.4.3.5.3.4 *Technical Advisory Committee and Adaptive Management Approach*

The Regional Water Board commits to supporting an Adaptive Management approach. The adaptive management approach includes the formation of a Stakeholder Group(s) and a Technical Advisory Committee (TAC). Regional Water Board staff, working with the TAC and Stakeholder Group(s), will provide a Control Study Guidance Document for stakeholders to reference.

The TAC shall be comprised of independent experts who would convene as needed to provide scientific and technical peer review of the Control Study Workplan(s) and results, advise the Board on scientific and technical issues, and provide recommendations for additional studies and implementation alternatives developed by the dischargers. The Board shall form and manage the TAC with recommendations from the dischargers and other stakeholders, including tribes and community organizations.

Board staff shall work with the TAC and Stakeholder Group(s) to review the Control Study Workplan(s) and results. As new information becomes available from the Control Studies or outside studies that result in redirection and/or

prioritization of existing studies, dischargers may amend the Control Study Workplan(s) with Executive Officer approval.

4.5.4.3.5.3.5 *Mercury Control Studies Schedule*

(1-) By 20 April 2012, entities required to conduct Control Studies shall submit for Executive Officer approval either: (1) a report(s) describing how dischargers and stakeholders plan to organize to develop a coordinated, comprehensive Control Study Workplan(s), or (2) a report describing how individual dischargers will develop individual Control Study Workplans. For dischargers conducting coordinated studies, the report shall include a list of participating dischargers, stakeholders, tribes, and community groups. Dischargers shall be considered in compliance with this reporting requirement upon written commitment to either be part of a group developing a Control Study Workplan or develop an individual Control Study Workplan.

(2-) Control Study Workplans shall be submitted to the Regional Water Board by 20 July 2012. With Executive Officer approval, an additional nine months may be allowed for Workplans being developed by a collaborative stakeholder approach. The Control Study Workplan(s) shall contain a detailed plan for the Control Studies and the work to be accomplished during Phase 1. Regional Water Board staff and the TAC will review the Workplans and provide recommendations for revising Workplans if necessary.

Within four months of submittal, the Executive Officer must determine if the Workplans are acceptable. After four months, Workplans are deemed approved and ready to implement if no written approval is provided by the Executive Officer, unless the Executive Officer provides written notification to extend the approval process.

Dischargers shall be considered in compliance with this reporting requirement upon timely submittal of workplans and revisions.

(3-) By 20 October 2015, entities responsible for Control Studies shall submit report(s) to the Regional Water Board documenting progress towards complying with the Control Study Workplan(s). The report shall include amended workplans for any additional studies needed to address methylmercury reductions. The TAC will review the progress reports and may recommend what additional or revised studies should be undertaken to complete the objectives of the Control Studies. Staff will review the progress reports and recommendations of the TAC and provide a progress report to the Regional Water Board.

(4-) By 20 October 2018, entities responsible for Control Studies shall complete the studies and submit to the Regional Water Board Control Studies final reports that present the results and descriptions of methylmercury control options, their preferred methylmercury controls, and proposed methylmercury management plan(s) (including implementation schedules), for achieving methylmercury allocations. In addition, final report(s) shall propose points of compliance for non-point sources.

If the Executive Officer determines that dischargers are making significant progress towards developing, implementing and/or completing the Phase 1 Control Studies but that more time is needed to finish the studies, the Executive Officer may consider extending a study's deadlines.

The Executive Officer may, after public notice, extend time schedules up to two years if the dischargers demonstrate reasonable attempts to secure funding for the Phase 1 studies but experience severe budget shortfalls.

Annually, staff shall publicly report to the Regional Water Board progress of upstream mercury program development, discharger and stakeholder coordination, Control Study Workplan status, implementation of Control Studies, actions implemented or proposed to meet load and waste load allocations, and the status of the formation and activities of the TAC.

By 20 October 2015, the Executive Officer shall provide a comprehensive report to the Regional Water Board on Phase 1 progress, including progress of upstream mercury control program development, Control Studies, actions

implemented or proposed to meet Delta Mercury Control Program load and waste load allocations, and the status and progress of the TAC.

If dischargers do not comply with Control Study implementation schedules, the Executive Officer shall consider issuing individual waste discharge requirements or ordering the production of technical reports and/or management plans.

4.5.4.3.5.3.6 *Phase 1 Delta Mercury Control Program Review*

By 20 October 2020, at a public hearing, and after a scientific peer review and public review process, the Regional Water Board shall review the Delta Mercury Control Program and may consider modification of objectives, allocations, implementation provisions and schedules, and the Final Compliance Date.

If the Executive Officer allows an extension for the Control Studies' schedule, then the Delta Mercury Control Program Review may be delayed up to two years. If the Delta Mercury Control Program Review is delayed more than one year, the Regional Water Board should consider extending the schedule for Phase 2 implementation of methylmercury controls, and the Final Compliance Date.

The Regional Water Board shall assess: (a) the effectiveness, costs, potential environmental effects, and technical and economic feasibility of potential methylmercury control methods; (b) whether implementation of some control methods would have negative impacts on other project or activity benefits; (c) methods that can be employed to minimize or avoid potentially significant negative impacts to project or activity benefits that may result from control methods; (d) implementation plans and schedules proposed by the dischargers; and (e) whether methylmercury allocations can be attained.

The Regional Water Board shall use any applicable new information and results of the Control Studies to adjust the relevant allocations and implementation requirements as appropriate. Interim limits established during Phase 1 and allocations will not be reduced as a result of early actions that result in reduced inorganic (total) mercury and/or methylmercury in discharges.

As part of the Phase 1 Delta Mercury Control Program Review and subsequent program reviews, the Regional Water Board may consider adjusting the allocations to allow methylmercury discharges from existing and new wetland restoration and other aquatic habitat enhancement projects if dischargers provide information that demonstrates that 1) all reasonable management practices to limit methylmercury discharges are being implemented and 2) implementing additional methylmercury management practices would negatively impact fish and wildlife habitat or other project benefits. The Regional Water Board will consider the merits of the project(s) and whether to require the discharger(s) to propose other activities in the watershed that could offset the methylmercury. The Regional Water Board will periodically review the progress towards achieving the allocations and may consider additional conditions if the plan described above is ineffective.

The Regional Water Board shall conduct the Phase 1 Delta Mercury Program Review based on information received in Phase 1. If the Regional Water Board does not receive timely information to review and update the Delta Mercury Control Program, then allocations shall not be raised but may be lowered and the 2030 Final Compliance Date shall not be changed for those individual dischargers who did not complete the Phase 1 requirements.

The Regional Water Board shall require implementation of appropriate management practices. The methylmercury management plan(s) developed in Phase 1 shall be initiated as soon as possible, but no later than one (1) year after Phase 2 begins.

The Regional Water Board shall review this control program two years prior to the end of Phase 2, and at intervals no more than 10 years thereafter.

4.5.4.3.5.4 Compliance Monitoring

Within two years after the start of Phase 2, entities responsible for meeting load and waste load allocations shall monitor methylmercury loads and concentrations and submit annual reports to the Regional Water Board. The points

of compliance for waste load allocations for NPDES facilities shall be the effluent monitoring points described in individual NPDES permits. The points of compliance for MS4s required to conduct methylmercury monitoring are those locations described in the individual MS4 NPDES permits or otherwise determined to be representative of the MS4 service areas and approved by the Executive Officer on an MS4-specific basis. The points of compliance and monitoring plans for non-point sources shall be determined during the Control Studies. Compliance with the load allocations for nonpoint sources and waste load allocations for MS4s may be documented by monitoring methylmercury loads at the compliance points or by quantifying the annual average methylmercury load reduced by implementing pollution prevention activities and source and treatment controls.

Entities will be allowed to comply with their mercury receiving water monitoring requirements by participating in a regional monitoring program, when such a program is implemented.

Chapter ~~V~~5, Surveillance and Monitoring, contains additional monitoring guidance.

4.5.4.3.5.5 Requirements for State and Federal Agencies

Open water allocations are assigned jointly to the State Lands Commission, the Department of Water Resources, and the Central Valley Flood Protection Board as applicable. Other agencies that are identified in Phase 1 that implement actions and activities that have the potential to contribute to methylmercury production and loss in open water will be required to take part in the studies. In the Phase 1 review, the Regional Water Board will modify, as appropriate, the list of entities that are responsible for meeting the open water allocations. Open water allocations apply to the methylmercury load that fluxes to the water column from sediments in open-water habitats within channels and floodplains in the Delta and Yolo Bypass.

The State Lands Commission, Central Valley Flood Protection Board, Department of Water Resources, and other identified agencies shall conduct Control Studies and evaluate options to reduce methylmercury in open waters under jurisdiction of the State Lands Commission and floodplain areas inundated by flood flows. These agencies shall evaluate their activities to determine whether operational changes or other practices or strategies could be implemented to reduce ambient methylmercury concentrations in Delta open water areas and floodplain areas inundated by managed floodplain flows. Evaluations shall include inorganic mercury reduction projects. By 20 April 2012, these agencies shall demonstrate how the agencies have secured adequate resources to fund the Control Studies. Regional Water Board staff will work with the agencies to develop the Control Studies and evaluate potential mercury and methylmercury reduction actions.

Activities including water management and impoundment in the Delta and Yolo Bypass, maintenance of and changes to salinity objectives, dredging and dredge materials disposal and reuse, and management of flood conveyance flows are subject to the open water methylmercury allocations. Agencies responsible for these activities in the Delta and Yolo Bypass include, but are not limited to, Department of Water Resources, State Lands Commission, Central Valley Flood Protection Board, U.S. Bureau of Reclamation, U.S. Army Corps of Engineers (USACE), and the State Water Resources Control Board. Control Studies shall be completed for the activities that have the potential to increase ambient methylmercury levels. These agencies may conduct their own coordinated Control Studies or may work with the other stakeholders in comprehensive, coordinated Control Studies.

The agencies should coordinate with wetland and agricultural landowners during Phase 1 to characterize existing methylmercury discharges to open waters from lands immersed by managed flood flows and develop methylmercury control measures.

New wetland, floodplain, and other aquatic habitat restoration and enhancement projects, including but not limited to projects developed, planned, funded, or approved by individuals, private businesses, non-profit organizations, and local, State, and federal agencies such as USACE, U.S. Fish and Wildlife Service, National Oceanic and Atmospheric Administration Fisheries, U.S. Environmental Protection Agency, U.S. Bureau of Reclamation, State Water Resources Control Board, California Department of Water Resources, and California Department of Fish and Wildlife, shall comply with all applicable requirements of this program, including conducting or participating in Control Studies and complying with allocations. To the extent allowable by their regulatory authority, Federal, State, and local agencies that fund, approve, or implement such new projects shall direct project

applicants/grantees/loanees to apply to or consult with the Regional Water Board to ensure full compliance with the water quality requirements herein.

4.5.4.3.5.6 Dredging and Dredge Material Reuse

Dredging activities and activities that reuse dredge material in the Delta should minimize increases in methyl and total mercury discharges to Delta waterways (Appendix 43). The following requirements apply to dredging and excavating projects in the Delta and Yolo Bypass where a Clean Water Act 401 Water Quality Certification or other waste discharge requirements are required. The Clean Water Act 401 Water Quality Certifications shall include the following conditions:

- (1-) Employ management practices during and after dredging activities to minimize sediment releases into the water column.
- (2-) Ensure that under normal operational circumstances, including during wet weather, dredged and excavated material reused at upland sites, including the tops and dry-side of levees, is protected from erosion into open waters.

In addition to the above requirements, the following requirements apply to the California Department of Water Resources, USACE, the Port of Sacramento, the Port of Stockton, and other State and federal agencies conducting dredging and excavating projects in the Delta and Yolo Bypass:

- (1-) Characterize the total mercury mass and concentration of material removed from Delta waterways (Appendix 43) by dredging activities.
- (2-) Conduct monitoring and studies to evaluate management practices to minimize methylmercury discharges from dredge return flows and dredge material reuse sites. Agencies shall:
 - By 20 October 2013, project proponents shall submit a study workplan(s) to evaluate methylmercury and mercury discharges from dredging and dredge material reuse, and to develop and evaluate management practices to minimize increases in methyl and total mercury discharges. The proponents may submit a comprehensive study workplan rather than conduct studies for individual projects. The comprehensive workplan may include exemptions for small projects. Upon Executive Officer approval, the plan shall be implemented.
 - By 20 October 2018, final reports that present the results and descriptions of mercury and methylmercury control management practices shall be submitted to the Regional Water Board.

Studies should be designed to achieve the following aims for all dredging and dredge material reuse projects. When dredge material disposal sites are utilized to settle out solids and return waters are discharged into the adjacent surface water, methylmercury concentrations in return flows should be equal to or less than concentrations in the receiving water. When dredge material is reused at aquatic locations, such as wetland and riparian habitat restoration sites, the reuse should not add mercury-enriched sediment to the site or result in a net increase of methylmercury discharges from the reuse site.

The results of the management practices studies should be applied to future projects.

4.5.4.3.5.7 Cache Creek Settling Basin Improvement Plan and Schedule

Department of Water Resources, Central Valley Flood Protection Board, and USACE, in conjunction with any landowners and other interested stakeholders, shall implement a plan for management of mercury contaminated sediment that has entered and continues to enter the Cache Creek Settling Basin (Basin) from the upstream Cache Creek watershed. The agencies shall:

- (1-) By 20 October 2012, the agencies shall take all necessary actions to initiate the process for Congressional authorization to modify the Basin, or other actions as appropriate, including coordinating with the USACE.

- (2-) By 20 October 2013, the agencies shall develop a strategy to reduce total mercury from the Basin for the next 20 years. The strategy shall include a description of, and schedule for, potential studies and control alternatives, and an evaluation of funding options. The agencies shall work with the landowners within the Basin and local communities affected by Basin improvements.
- (3-) By 20 October 2015, the agencies shall submit a report describing the long term environmental benefits and costs of sustaining the Basin's mercury trapping abilities indefinitely.
- (4-) By 20 October 2015, the agencies shall submit a report that evaluates the trapping efficiency of the Cache Creek Settling Basin and proposes, evaluates, and recommends potentially feasible alternative(s) for mercury reduction from the Basin. The report shall evaluate the feasibility of decreasing mercury loads from the basin, up to and including a 50% reduction from existing loads.
- (5-) By 20 October 2017, the agencies shall submit a detailed plan for improvements to the Basin to decrease mercury loads from the Basin.

The agencies shall submit the strategy and planning documents described above to the Regional Water Board for approval by the Executive Officer. During Phase 1, the agencies should consider implementing actions to reduce mercury loads from the Basin. Beginning in Phase 2, the agencies shall implement a mercury reduction plan.

4.5.4.3.5.8 Tributary Watersheds

Table ~~IV4-7D-18~~ identifies methylmercury allocations for tributary inputs to the Delta and Yolo Bypass.

The sum total of 20-year average total mercury loads from the tributary watersheds identified in Table ~~IV4-7D-18~~ needs to be reduced by 110 kg/yr. Initial reduction efforts should focus on watersheds that contribute the most mercury-contaminated sediment to the Delta and Yolo Bypass, such as the Cache Creek, American River, Putah Creek, Cosumnes River, and Feather River watersheds.

Future mercury control programs will address the tributary watershed methylmercury allocations and total mercury load reductions assigned to tributary inputs to the Delta and Yolo Bypass. Additional methylmercury and total mercury load reductions may be required within those watersheds to address any mercury impairment within those watersheds.

Mercury control programs will be developed for tributary inputs to the Delta by the following dates:

- 2012: American River;
- 2016: Feather, Sacramento, San Joaquin, and Mokelumne Rivers, and Marsh and Putah Creeks; and
- 2017: Cosumnes River and Morrison Creek.

4.5.4.3.5.9 Mercury Offsets

The intent of an offset program is to optimize limited resources to maximize environmental benefits. The overall objectives for an offset program are to (1) provide more flexibility than the current regulatory system provides to improve the environment while meeting regulatory requirements (i.e., load and wasteload allocations) at a lower overall cost and (2) promote watershed-based initiatives that encourage earlier and larger load reductions to the Delta than would otherwise occur.

On or before 20 October 2020, the Regional Water Board will consider adoption of a mercury (inorganic and/or methyl) offsets program. During Phase 1, stakeholders may propose pilot offset projects for public review and Regional Water Board approval. The offsets program and any Phase 1 pilot offset projects shall be based on the following key principles:

- Offsets shall be consistent with existing USEPA and State Board policies and with the assumptions and requirements upon which this and other mercury control programs are established.

- Offsets should not include requirements that would leverage existing discharges as a means of forcing dischargers to bear more than their fair share of responsibility for causing or contributing to any violation of water quality standards. In this context “fair share” refers to the dischargers’ proportional contribution of methylmercury load.
- Offset credits should only be available to fulfill a discharger’s responsibility to meet its (waste) load allocation after reasonable load reduction and pollution prevention strategies have been implemented.
- Offsets should not be allowed in cases where local human or wildlife communities bear a disparate or disproportionate pollution burden as a result of the offset.
- Offset credits should be available upon generation and last long enough (i.e., not expire quickly) to encourage feasible projects.
- Creditable load reductions achieved should be real, quantifiable, verifiable, and enforceable by the Regional Water Board.

Alternatives to direct load credits may be developed.

4.5.4.3.5.10 Exposure Reduction Program

While methylmercury and mercury source reductions are occurring, the Regional Water Board recognizes that activities should be undertaken to protect those people who eat Delta fish by reducing their methylmercury exposure and its potential health risks. The Exposure Reduction Program (ERP) is not intended to replace timely reduction of mercury and methylmercury loads to Delta waters.

The Regional Water Board will investigate ways, consistent with its regulatory authority, to address public health impacts of mercury in Delta fish, including activities that reduce actual and potential exposure of and mitigate health impacts to those people and communities most likely to be affected by mercury in Delta caught fish, such as subsistence fishers and their families (State Water Board Resolution No. 2005-0060).

By 20 October 2012, Regional Water Board staff shall work with dischargers (either directly or through their representatives), State and local public health agencies (including California Department of Public Health, California Office of Health Hazard Assessment, and county public health and/or environmental health departments), and other stakeholders, including community-based organizations, tribes, and Delta fish consumers, to complete an Exposure Reduction Strategy. The purposes of the Strategy will be to recommend to the Executive Officer how dischargers will be responsible for participating in an ERP, to set performance measures, and to propose a collaborative process for developing, funding and implementing the program. The Strategy shall take into account the proportional share of methylmercury contributed by individual dischargers. If dischargers (either directly or through their representatives) do not participate in the collaborative effort to develop the ERP, the Regional Water Board will evaluate and implement strategies, consistent with the Regional Water Board’s regulatory authority, to assure participation from all dischargers or their representatives.

The objective of the Exposure Reduction Program is to reduce mercury exposure of Delta fish consumers most likely affected by mercury.

The Exposure Reduction Program must include elements directed toward:

- Developing and implementing community-driven activities to reduce mercury exposure;
- Raising awareness of fish contamination issues among people and communities most likely affected by mercury in Delta-caught fish such as subsistence fishers and their families;
- Integrating community-based organizations that serve Delta fish consumers, tribes, and public health agencies in the design and implementation of an exposure reduction program;
- Identifying resources, as needed, for community-based organizations and tribes to participate in the Program;
- Utilizing and expanding upon existing programs and materials or activities in place to reduce mercury, and as needed, create new materials or activities; and
- Developing measures for program effectiveness.

The dischargers, either individually or collectively, or based on the Exposure Reduction Strategy, shall submit an exposure reduction workplan for Executive Officer approval by 20 October 2013. The workplan shall address the

Exposure Reduction Program objective, elements, and dischargers' coordination with other stakeholders. Dischargers shall integrate or, at a minimum, provide good-faith opportunities for integration of community-based organizations, tribes, and consumers of Delta fish into planning, decision making, and implementation of exposure reduction activities.

The dischargers shall implement the workplan by six months after Executive Officer approval of workplan. Every three years after workplan implementation begins, the dischargers, individually or collectively, shall provide a progress report to the Executive Officer. Dischargers shall participate in the Exposure Reduction Program until they comply with all requirements related to their individual or subarea methylmercury allocation.

The California Department of Public Health, the California Office of Environmental Health Hazard Assessment, and the local county public health and/or environmental health departments should collaborate with dischargers and community and tribal members to develop and implement exposure reduction programs and provide guidance to dischargers and others that are conducting such activities. The California Department of Public Health and/or other appropriate agency should seek funds to contribute to the Exposure Reduction Program and to continue it beyond 2030, if needed, until fish tissue objectives are attained.

The State Water Board should develop a statewide policy that defines the authority and provides guidance for exposure reduction programs, including guidance on addressing public health impacts of mercury, activities that reduce actual and potential exposure of, and mitigating health impacts to those people and communities most likely to be affected by mercury.

4.5.4.3.5.11 Exceptions for Low Threat Discharges

Discharges subject to a waiver of waste discharge requirements based on a finding that the discharges pose a low threat to water quality, except for discharges subject to water quality certifications, are exempt from the mercury requirements of this Delta Mercury Control Program.

Discharges subject to waste discharge requirements for dewatering and other low threat discharges to surface waters are exempt from the mercury requirements of this Delta Mercury Control Program.

**TABLE IV4-7A15
METHYLMERCURY LOAD AND WASTE LOAD ALLOCATIONS FOR EACH DELTA SUBAREA BY SOURCE CATEGORY**

Source Type	DELTA SUBAREA													
	Central Delta		Marsh Creek		Mokelumne River		Sacramento River		San Joaquin River		West Delta		Yolo Bypass	
	Current Load (g/yr)	Allocation (g/yr)	Current Load (g/yr)	Allocation (g/yr)	Current Load (g/yr)	Allocation (g/yr)	Current Load (g/yr)	Allocation (g/yr)	Current Load (g/yr)	Allocation (g/yr)	Current Load (g/yr)	Allocation (g/yr)	Current Load (g/yr)	Allocation (g/yr)
Methylmercury Load Allocations														
Agricultural drainage ^(d)	37	37	2.2	0.40	1.6	0.57	36	20	23	8.3	4.1	4.1	19	4.1
Atmospheric wet deposition	7.3	7.3	0.23	0.23	0.29	0.29	5.6	5.6	2.7	2.7	2.4	2.4	4.2	4.2
Open water	370	370	0.18	0.032	4.0	1.4	140	78	48	17	190	190	100	22
Tributary Inputs ^(a)	37	37	1.9	0.34	110	39	2,034	1,129	367	133			462	100
Inputs from Upstream Subareas	(b)	(b)	---	---	---	---	---	---	---	---	(b)	(b)	---	---
Urban (nonpoint source)	0.14	0.14	---	---	0.018	0.018	0.62	0.62	0.0022	0.0022	0.066	0.066	---	---
Wetlands ^(d)	210	210	0.34	0.061	30	11	94	52	43	16	130	130	480	103
Methylmercury Waste Load Allocations														
NPDES facilities ^(a)	1.3	1.3	0.086	0.086	0	0	162	90	40	15	0.0019	0.0019	1.0	0.42
NPDES facilities future growth ^(a)	---	0.32 ^(b)	---	0.21	---	0	---	8.6	---	2.1	---	0.25 ^(b)	---	0.60
NPDES MS4 ^(a)	5.4	5.4	1.2	0.30	0.045	0.016	2.8	1.6	4.8	1.7	3.2	3.2	1.5	0.38
Total Loads ^(c) (g/yr)	668	668	6.14	1.66	146	52.6	2,475	1,385	528	195	330	330	1,068	235

Table ~~IV4-7A-15~~ Footnotes:

- (a) Values shown for Tributary Inputs, NPDES Facilities, NPDES Facilities Future Growth, and NPDES MS4 represent the sum of several individual discharges. See Tables ~~IV4-7B16~~, ~~IV4-7C17~~, and ~~IV4-7D-18~~ for allocations for the individual discharges that should be used for compliance purposes.
- (b) The Central Delta subarea receives flows from the Sacramento, Yolo Bypass, Mokelumne, and San Joaquin subareas. The West Delta subarea receives flows from the Central Delta and Marsh Creek subareas. These within-Delta flows have not yet been quantified because additional data are needed for loss rates across the subareas. Federal and state agencies whose activities affect methylmercury loss and production processes in the Delta and Yolo Bypass are assigned joint responsibility for the open water allocation. These subarea inflows are expected to decrease substantially (e.g., 40 80%) as upstream mercury management practices take place. As a result, reductions for sources within the Central and West subareas and tributaries that drain directly to these subareas are not required.
- (c) For each Delta subarea, the allocations in Table ~~IV4-7A-15~~ for agricultural drainage, atmospheric wet deposition, open water, urban (nonpoint source), and wetlands plus the individual allocations for tributary inputs (Table ~~IV4-7D18~~), NPDES facilities and NPDES facilities future growth (Table ~~IV4-7B16~~), and NPDES MS4 (Table ~~IV4-7C17~~) within that subarea equal the Delta subarea's TMDL (assimilative capacity).
- (d) The load allocations apply to the net methylmercury loads, where the net loads equal the methylmercury load in outflow minus the methylmercury loads in source water (e.g., irrigation water and precipitation).

**TABLE ~~IV-7B16~~
MUNICIPAL AND INDUSTRIAL WASTEWATER METHYLMERCURY (MEHG) ALLOCATIONS**

PERMITTEE ^(a)	NPDES Permit No.	MeHg Waste Load Allocation ^(b) (g/yr)
Central Delta		
Discovery Bay WWTP	CA0078590	0.37
Lincoln Center Groundwater Treatment Facility	CA0084255	0.018
Lodi White Slough WWTP	CA0079243	0.94
Metropolitan Stevedore Company	CA0084174	^(c)
Unassigned allocation for NPDES facility discharges	^(d)	0.31
Marsh Creek		
Brentwood WWTP	CA0082660	0.14
Unassigned allocation for NPDES facility discharges	^(d)	0.16
Sacramento River		
Rio Vista Northwest WWTP	CA0083771	0.069
Rio Vista WWTP	CA0079588	0.056
Sacramento Combined WWTP	CA0079111	0.53
SRCS D Sacramento River WWTP	CA0077682	89
Unassigned allocation for NPDES facility discharges	^(d)	8.5
San Joaquin River		
Deuel Vocational Inst. WWTP	CA0078093	0.021
Manteca WWTP	CA0081558	0.38
Mountain House Community Services District WWTP	CA0084271	0.37
Oakwood Lake Subdivision Mining Reclamation ^(f)	CA0082783	0.38 ^(f)
Stockton WWTP	CA0079138	13
Tracy WWTP	CA0079154	0.77
Unassigned allocation for NPDES facility discharges	^(d)	1.7
West Delta		
GWF Power Systems ^(e)	CA0082309	0.0052
Mirant Delta LLC Contra Costa Power Plant	CA0004863	^(e)
Ironhouse Sanitation District	CA0085260	0.030
Unassigned allocation for NPDES facility discharges	^(d)	0.22
Yolo Bypass		
Davis WWTP ^(g)	CA0079049	0.17 ^(g)
Woodland WWTP	CA0077950	0.43
Unassigned allocation for NPDES facility discharges	^(d)	0.42

Table IV4-7B-16 Footnotes:

- (a) If NPDES facilities that have allocations in Table IV4-7B-16 regionalize or consolidate, their waste load allocations can be summed.
- (b) Methylmercury waste load allocations apply to annual (calendar year) discharge methylmercury loads.
- (c) A methylmercury waste load allocation for non-storm water discharges from the Metropolitan Stevedore Company (CA0084174) shall be established in its NPDES permit once it completes three sampling events for methylmercury in its discharges. Its waste load allocation is a component of the “Unassigned Allocation” for the Central Delta subarea.
- (d) Table IV4-7B-16 contains unassigned waste load allocations for new discharges to surface water that begin after 20 October 2011. New discharges that may be allotted a portion of the unassigned allocation may come from (1) existing facilities that previously discharged to land and then began to discharge to surface water or diverted discharges to another facility that discharges to surface water as part of ongoing regionalization efforts; (2) newly built facilities that have not previously discharged to land or water; and (3) expansions to existing facilities beyond their allocations listed in Table IV4-7B-16 where the additional allocation does not exceed the product of the net increase in flow volume and 0.06 ng/l methylmercury. The sum of all new and/or expanded methylmercury discharges from NPDES facilities within each Delta subarea shall not exceed the Delta subarea-specific waste load allocation listed in Table IV4-7B-16.
- (e) Methylmercury loads and concentrations in heating/cooling and power facility discharges vary with intake water conditions. To determine compliance with the allocations, dischargers that use ambient surface water for cooling water shall conduct concurrent monitoring of the intake water and effluent. The methylmercury allocations for such heating/cooling and power facility discharges are 100%, such that the allocations shall become the detected methylmercury concentration found in the intake water. GWF Power Systems (CA0082309) acquires its intake water from sources other than ambient surface water and therefore has a methylmercury allocation based on its effluent methylmercury load.
- (f) The waste load allocation for the Oakwood Lake Subdivision Mining Reclamation (CA0082783) shall be assessed as a five-year average annual methylmercury load.
- (g) The City of Davis WWTP (CA0079049) has two discharge locations; wastewater is discharged from Discharge 001 to the Willow Slough Bypass upstream of the Yolo Bypass and from Discharge 002 to the Conaway Ranch Toe Drain in the Yolo Bypass. The methylmercury load allocation listed in Table IV4-7B-16 applies only to Discharge 002, which discharges seasonally from about February to June. Discharge 001 is encompassed by the Willow Slough watershed methylmercury allocation listed in Table D4-18.

TABLE IV-7C17
MS4 METHYLMERCURY (MEHG) WASTE LOAD ALLOCATIONS
FOR URBAN RUNOFF WITHIN EACH DELTA SUBAREA

Permittee	NPDES Permit No.	MeHg Waste Load Allocation ^(a, b) (g/yr)
Central Delta		
Contra Costa (County of) ^(c)	CAS083313	0.75
Lodi (City of)	CAS000004	0.053
Port of Stockton MS4	CAS084077	0.39
San Joaquin (County of)	CAS000004	0.57
Stockton Area MS4	CAS083470	3.6
Marsh Creek		
Contra Costa (County of) ^(c)	CAS083313	0.30
Mokelumne River		
San Joaquin (County of)	CAS000004	0.016
Sacramento River		
Rio Vista (City of)	CAS000004	0.0078
Sacramento Area MS4	CAS082597	1.0
San Joaquin (County of)	CAS000004	0.11
Solano (County of)	CAS000004	0.041
West Sacramento (City of)	CAS000004	0.36
Yolo (County of)	CAS000004	0.041
San Joaquin River		
Lathrop (City of)	CAS000004	0.097
Port of Stockton MS4	CAS084077	0.0036
San Joaquin (County of)	CAS000004	0.79
Stockton Area MS4	CAS083470	0.18
Tracy (City of)	CAS000004	0.65
West Delta		
Contra Costa (County of) ^(c)	CAS083313	3.2
Yolo Bypass		
Solano (County of)	CAS000004	0.021
West Sacramento (City of)	CAS000004	0.28
Yolo (County of)	CAS000004	0.083

Table ~~IV4-7C-17~~ Footnotes:

- (a) Some MS4s service areas span multiple Delta subareas and are therefore listed more than once. The allocated methylmercury loads for all MS4s are based on the average methylmercury concentrations observed in runoff from urban areas in or near the Delta during water years 2000 through 2003, a relatively dry period. Annual loads are expected to fluctuate with water volume and other factors. As a result, attainment of these allocations shall be assessed as a five-year average annual load. Allocations may be revised during review of the Delta Mercury Control Program to include available wet year data.
- (b) The methylmercury waste load allocations include all current and future permitted urban discharges not otherwise addressed by another allocation within the geographic boundaries of urban runoff management agencies within the Delta and Yolo Bypass, including but not limited to Caltrans facilities and rights-of-way (NPDES No. CAS000003), public facilities, properties proximate to banks of waterways, industrial facilities, and construction sites.
- (c) The Contra Costa County MS4 discharges to both the Delta and San Francisco Bay. The above allocations apply only to the portions of the MS4 service area that discharge to the Delta within the Central Valley Water Quality Control Board's jurisdiction.

TABLE ~~IV4-7D18~~
TRIBUTARY WATERSHED
METHYLMERCURY (MEHG) ALLOCATIONS

Tributary	MeHg Load Allocation ^(a) (g/yr)
Central Delta	
Bear Creek @ West Lane / Mosher Creek @ Morada Lane (sum of watershed loads)	11
Calaveras River @ railroad tracks u/s West Lane	26
Marsh Creek	
Marsh Creek @ Highway 4	0.34
Mokelumne River	
Mokelumne River @ Interstate 5	39.3 (39) ^(b)
Sacramento River	
Morrison Creek @ Franklin Boulevard	4.2
Sacramento River @ Freeport	1,125 (1,100) ^(b)
San Joaquin River	
French Camp Slough downstream of Airport Way	4.0
San Joaquin River @ Vernalis	129 (130) ^(b)
Yolo Bypass	
Cache Creek	30 ^(c)
Dixon Area	0.77
Fremont Weir	39
Knights Landing Ridge Cut	22
Putah Creek @ Mace Boulevard	2.4
Ulatis Creek near Main Prairie Road	2.1
Willow Slough	3.9

Table ~~IV4-7D-18~~ Footnotes:

- (a) Methylmercury allocations are assigned to tributary inputs to the Delta and Yolo Bypass. Mercury control programs designed to achieve the allocations for tributaries listed in Table ~~IV4-7D-18~~ will be implemented by future Basin Plan amendments. Methylmercury load allocations are based on water years 2000 through 2003, a relative dry period. Annual loads are expected to fluctuate with water volume and other factors. As a result, attainment of these allocations shall be assessed as a five-year average annual load. Allocations will be revised during review of the Delta Mercury Control Program to include available wet year data.
- (b) Tributary load allocations rounded to two significant figures for compliance evaluation.
- (c) The allocation for water from Cache Creek entering the Yolo Bypass in this table is designed to achieve fish tissue objectives in the Yolo Bypass and Delta established by the Delta Mercury Control Program. The allocation in Table ~~IV4-6-11~~ assigned by the Cache Creek Mercury Control Program applies to the Cache Creek Settling Basin and requires a greater reduction so that fish within the Settling Basin can achieve water quality objectives for methylmercury in fish tissue that apply to Cache Creek, including the Settling Basin.

4.5.5 Pesticide Discharges

The control of pesticide discharges to surface waters from nonpoint sources will be achieved primarily by the development and implementation of management practices that minimize or eliminate the amount discharged. The Board will use water quality monitoring results to evaluate the effectiveness of control efforts and to help prioritize control efforts.

Regional Board monitoring will consist primarily of chemical analysis and biotoxicity testing of major water bodies receiving irrigation return flows. The focus will be on pesticides with use patterns and chemical characteristics that indicate a high probability of entering surface waters at levels that may impact beneficial uses. Board staff will advise other agencies that conduct water quality and aquatic biota monitoring of high priority chemicals, and will review monitoring data developed by these agencies. Review of the impacts of "inert" ingredients contained in pesticide formulations will be integrated into the Board's pesticide monitoring program.

When a pesticide is detected more than once in surface waters, investigations will be conducted to identify sources. Priority for investigation will be determined through consideration of the following factors: toxicity of the compound, use patterns and the number of detections. These investigations may be limited to specific watersheds where the pesticide is heavily used or local practices result in unusually high discharges. Special studies will also be conducted to determine pesticide content of sediment and aquatic life when conditions warrant. Other agencies will be consulted regarding prioritization of monitoring projects, protocol, and interpretation of results.

The Board recognizes that implementation of the authorities of agencies that regulate pesticide use, including CDPR, USEPA Office of Pesticide Programs, and County Agricultural Commissioners, should be one of the primary mechanisms for addressing pesticide-caused water quality impairments. To ensure that new pesticides do not create a threat to water quality, the Board, either directly or through the State Water Resources Control Board, will review the pesticides that are processed through the Department of Pesticide Regulation's (DPR) registration program. Where use of the pesticide may result in a discharge to surface waters, the Board staff will make efforts to ensure that label instructions or use restrictions require management practices that will result in compliance with water quality objectives. When the Board determines that despite any actions taken by DPR, use of the pesticide may result in discharge to surface waters in violation of the objectives, the Board will take regulatory action, such as adoption of a prohibition of discharge or issuance of waste discharge requirements to control discharges of the pesticide. Monitoring may be required to verify that management practices are effective in protecting water quality.

The Board will notify pesticide dischargers through public notices, educational programs and DPR of the water quality objectives related to pesticide discharges. Dischargers will be advised to implement management practices that result in full compliance with these objectives by 1 January 1993, unless required to do so earlier. (Dischargers of carbofuran, malathion, methyl parathion, molinate and thiobencarb must meet the requirements detailed in the Prohibitions section.) During this time period, dischargers will remain legally responsible for the impacts caused by their discharges.

The Board will conduct reviews of the management practices being followed to verify that they produce discharges that comply with water quality objectives. It is anticipated that practices associated with one or two pesticides can be reviewed each year. Since criteria, control methods and other factors are subject to change, it is also anticipated that allowable management practices will change over time, and control practices for individual pesticides will have to be reevaluated periodically.

Public hearings will be held at least once every two years to review the progress of the pesticide control program. At these hearings, the Board will

- review monitoring results and identify pesticides of greatest concern,
- review changes or trends in pesticide use that may impact water quality,
- consider approval of proposed management practices for the control of pesticide discharges,
- set the schedule for reviewing management practices for specific pesticides, and

- consider enforcement action.

After reviewing the testimony, the Board will place the pesticides into one of the following three classifications. When compliance with water quality objectives and performance goals is not obtained within the timeframes allowed, the Board will consider alternate control options, such as prohibition of discharge or issuance of waste discharge requirements.

- (1-) Where the Board finds that pesticide discharges pose a significant threat to drinking water supplies or other beneficial uses, it will request DPR to act to prevent further impacts. If DPR does not proceed with such action(s) within six months of the Board's request, the Board will act within a reasonable time period to place restrictions on the discharges.
- (2-) Where the Board finds that currently used discharge management practices are resulting in violations of water quality objectives, but the impacts of the discharge are not so severe as to require immediate changes, dischargers will be given three years, with a possibility of three one year time extensions depending on the circumstances involved, to develop and implement practices that will meet the objectives. During this period of time, dischargers may be required to take interim steps, such as meeting Board established performance goals to reduce impacts of the discharges. Monitoring will be required to show that the interim steps and proposed management practices are effective.
- (3-) The Board may approve the management practices as adequate to meet water quality objectives. After the Board has approved specific management practices for the use and discharge of a pesticide, no other management practice may be used until it has been reviewed by the Board and found to be equivalent to or better than previously approved practices. Waste discharge requirements will be waived for irrigation return water per Resolution No. 82-036 if the Board determines that the management practices are adequate to meet water quality objectives and meet the conditions of the waiver policy. Enforcement action may be taken against those who do not follow management practices approved by the Board.

Carbofuran, malathion, methyl parathion, molinate and thiobencarb have been detected in surface waters at levels that impact aquatic organisms. Review of management practices associated with these materials is under way and is expected to continue for at least another two years. A timetable of activities related to these pesticides is at the end of the Prohibitions section. A detailed assessment of the impacts of these pesticides on aquatic organisms is also being conducted and water quality objectives will be adopted for these materials by the State or Regional Board by the end of 1993.

In conducting a review of pesticide monitoring data, the Board will consider the cumulative impact if more than one pesticide is present in the water body. This will be done by initially assuming that the toxicities of pesticides are additive. This will be evaluated separately for each beneficial use using the following formula:

$$\frac{C_1}{O_1} + \frac{C_2}{O_2} + \dots + \frac{C_i}{O_i} = S$$

Where:

- C = The concentration of each pesticide.
- O = The water quality objective or criterion for the specific beneficial use for each pesticide present, based on the best available information. Note that the numbers must be acceptable to the Board and performance goals are not to be used in this equation.
- S = The sum. A sum exceeding one (1.0) indicates that the beneficial use may be impacted.

The above formula will not be used if it is determined that it does not apply to the pesticides being evaluated. When more than one pesticide is present, the impacts may not be cumulative or they may be additive, synergistic or

antagonistic. A detailed assessment of the pesticides involved must be conducted to determine the exact nature of the impacts.

For most pesticides, numerical water quality objectives have not been adopted. USEPA criteria and other guidance are also extremely limited. Since this situation is not likely to change in the near future, the Board will use the best available technical information to evaluate compliance with the narrative objectives. Where valid testing has developed 96 hour LC50 values for aquatic organisms (the concentration that kills one half of the test organisms in 96 hours), the Board will consider one tenth of this value for the most sensitive species tested as the upper limit (daily maximum) for the protection of aquatic life. Other available technical information on the pesticide (such as Lowest Observed Effect Concentrations and No Observed Effect Levels), the water bodies and the organisms involved will be evaluated to determine if lower concentrations are required to meet the narrative objectives.

To ensure the best possible program, the Board will coordinate its pesticide control efforts with other agencies and organizations. Wherever possible, the burdens on pesticide dischargers will be reduced by working through the DPR or other appropriate regulatory processes. The Board may also designate another agency or organization as the responsible party for the development and/or implementation of management practices, but it will retain overall review and control authority. The Board will work with water agencies and others whose activities may influence pesticide levels to minimize concentrations in surface waters.

Since the discharge of pesticides into surface waters will be allowed under certain conditions, the Board will take steps to ensure that this control program is conducted in compliance with the federal and state antidegradation policies. This will primarily be done as pesticide discharges are evaluated on a case by case basis.

4.5.5.1 Diazinon and Chlorpyrifos Runoff into the Sacramento and Feather Rivers

(1-) The Sacramento and Feather River pesticide runoff control program shall:

- (a-)** ensure compliance with water quality objectives applicable to diazinon and chlorpyrifos water quality objectives in the Sacramento and Feather Rivers through the implementation of management practices;
- (b-)** ensure that measures that are implemented to reduce discharges of diazinon and chlorpyrifos do not lead to an increase in the discharge of other pesticides to levels that cause or contribute to violations of applicable water quality objectives and Regional and State Water Board policies; and
- (c-)** ensure that discharges of pesticides to surface waters are controlled so that the pesticide concentrations are at the lowest levels that are technically and economically achievable.

(2-) Dischargers must consider whether a proposed alternative to diazinon or chlorpyrifos has the potential to degrade ground or surface water. If the alternative to diazinon or chlorpyrifos has the potential to degrade ground water, alternative pest control methods must be considered. If the alternative to diazinon or chlorpyrifos has the potential to degrade surface water, control measures must be implemented to ensure that applicable water quality objectives and Regional Water and State Board policies are not violated, including State Water Resources Control Board Resolution 68-16.

(3-) Compliance with water quality objectives, waste load allocations, and load allocations for diazinon and chlorpyrifos in the Sacramento and Feather Rivers is required by August 11, 2008.

The water quality objectives and allocations will be implemented through the adoption or modification of waivers of waste discharge requirements, and general or individual waste discharge requirements where provisions necessary for implementation are not already in place.

(4-) The Regional Water Board will review the diazinon and chlorpyrifos allocations and the implementation provisions in the Basin Plan no later than 30 June 2013.

(5-) Regional Water Board staff will meet at least annually with staff from the Department of Pesticide Regulation and representatives from the California Agricultural Commissioners and Sealers Association to review pesticide use and instream pesticide concentrations during the dormant spray and irrigation

application season and to consider the effectiveness of management measures in meeting water quality objectives and load allocations.

- (6-) The Waste Load Allocations (WLA) for all NPDES-permitted dischargers, Load Allocations (LA) for nonpoint source discharges, and the Loading Capacity of the Sacramento and Feather Rivers shall not exceed the sum (S) of one (1) as defined below.

$$S = \frac{C_D}{WQO_D} + \frac{C_C}{WQO_C} \leq 1.0$$

where

- C_D = diazinon concentration in $\mu\text{g/L}$ of point source discharge for the WLA; nonpoint source discharge for the LA; or the Sacramento or Feather Rivers for the LC.
 C_C = chlorpyrifos concentration in $\mu\text{g/L}$ of point source discharge for the WLA; nonpoint source discharge for the LA; or the Sacramento or Feather Rivers for the LC.
 WQO_D = acute or chronic diazinon water quality objective in $\mu\text{g/L}$.
 WQO_C = acute or chronic chlorpyrifos water quality objective in $\mu\text{g/L}$.

Available samples collected within the applicable averaging period for the water quality objective will be used to determine compliance with the allocations and loading capacity. Prior to performing any averaging calculations, only chlorpyrifos and diazinon results from the same sample will be used in calculating the sum (S). For purposes of calculating the sum (S) above, analytical results that are reported as “nondetectable” concentrations are considered to be zero.

Compliance with the load allocations will be determined where the nonpoint source discharges into the Sacramento or Feather Rivers.

- (7-) The established waste load and load allocations for diazinon and chlorpyrifos and the water quality objectives for diazinon and chlorpyrifos in the Sacramento and Feather Rivers represent a maximum allowable level. The Regional Water Board shall require any additional reductions in diazinon or chlorpyrifos levels necessary to account for additive or synergistic toxicity effects or to protect beneficial uses in tributary waters.

- (8-) Pursuant to CWC §13267, the Executive Officer will require dischargers to submit a management plan that describes the actions that the discharger will take to reduce diazinon and chlorpyrifos discharges and meet the applicable allocations.

The management plan may include actions required by State and federal pesticide regulations. The Executive Officer will require the discharger to document the relationship between the actions to be taken and the expected reductions in diazinon and chlorpyrifos discharge(s). The Executive Officer will allow individual dischargers or a discharger group or coalition to submit management plans.

The management plan must comply with the provisions of any applicable waiver of waste discharge requirements or waste discharge requirements. The Executive Officer may require revisions to the management plan if compliance with applicable allocations is not attained or the management plan is not reasonably likely to attain compliance. When requiring any revisions to the management plan, the Executive Officer may consider the relative contributions of diazinon and chlorpyrifos to the lack of compliance with the allocations.

- (9-) Any waiver of waste discharge requirements or waste discharge requirements that govern the control of pesticide runoff that is discharged directly or indirectly into the Sacramento or Feather Rivers must be consistent with the policies and actions described in paragraphs 1-8.

- (10-) In determining compliance with the waste load allocations, the Regional Water Board will consider any data or information submitted by the discharger regarding diazinon and chlorpyrifos inputs from sources

outside of the jurisdiction of the permitted discharge, including any diazinon and chlorpyrifos present in precipitation; and any applicable provisions in the discharger's NPDES permit requiring the discharger to reduce the discharge of pollutants to the maximum extent practicable.

- (11-) The above provisions for control of diazinon and chlorpyrifos discharges apply to the Sacramento and Feather Rivers as described in Table III-2A3-4.

4.5.5.2 Diazinon and Chlorpyrifos Runoff in the San Joaquin River Basin

- (1-) The pesticide runoff control program shall:
- (a-) Ensure compliance with water quality objectives applicable to diazinon and chlorpyrifos in the San Joaquin River through the implementation of management practices.
 - (b-) Ensure that measures that are implemented to reduce discharges of diazinon and chlorpyrifos do not lead to an increase in the discharge of other pesticides to levels that cause or contribute to violations of applicable water quality objectives and Regional Water Board policies; and
 - (c-) Ensure that discharges of pesticides to surface waters are controlled so that pesticide concentrations are at the lowest levels that are technically and economically achievable.
- (2-) Dischargers must consider whether a proposed alternative to diazinon or chlorpyrifos has the potential to degrade ground or surface water. If the alternative has the potential to degrade groundwater, alternative pest control methods must be considered. If the alternative has the potential to degrade surface water, control measures must be implemented to ensure that applicable water quality objectives and Regional Water Board policies are not violated, including State Water Resources Control Board Resolution 68-16.
- (3-) Compliance with applicable water quality objectives, load allocations, and waste load allocations for diazinon and chlorpyrifos in the San Joaquin River is required by 1 December 2010.

The water quality objectives and allocations will be implemented through one or a combination of the following: the adoption of one or more waivers of waste discharge requirements, and general or individual waste discharge requirements. To the extent not already in place, the Regional Water Board expects to adopt or revise the appropriate waiver(s) or waste discharge requirements by 31 December 2007.

- (4-) The Regional Water Board intends to review the diazinon and chlorpyrifos allocations and the implementation provisions in the Basin Plan at least once every five years, beginning no later than 31 December 2009.
- (5-) Regional Water Board staff will meet at least annually with staff from the Department of Pesticide Regulation and representatives from the California Agricultural Commissioners and Sealers Association to review pesticide use and instream pesticide concentrations during the dormant spray and irrigation application seasons, and to consider the effectiveness of management measures in meeting water quality objectives and load allocations.
- (6-) The Waste Load Allocations (WLA) for all NPDES-permitted dischargers, Load Allocations (LA) for nonpoint source discharges, and the Loading Capacity of the San Joaquin River from the Mendota Dam to Vernalis shall not exceed the sum (S) of one (1) as defined below.

$$S = \frac{C_D}{WQO_D} + \frac{C_C}{WQO_C} \leq 1.0$$

where

- C_D = diazinon concentration in $\mu\text{g/L}$ of point source discharge for the WLA; nonpoint source discharge for the LA; or San Joaquin River for the LC.
- C_C = chlorpyrifos concentration in $\mu\text{g/L}$ of point source discharge for the WLA; nonpoint source discharge for the LA; or San Joaquin River for the LC.
- WQO_D = acute or chronic diazinon water quality objective in $\mu\text{g/L}$.

WQO_c = acute or chronic chlorpyrifos water quality objective in µg/L.

Available samples collected within the applicable averaging period for the water quality objective will be used to determine compliance with the allocations and loading capacity. For purposes of calculating the sum (S) above, analytical results that are reported as “non-detectable” concentrations are considered to be zero.

~~(7-)~~ At a minimum, Loading Capacity shall be calculated for each of the following six water quality compliance points in the San Joaquin River:

- San Joaquin River at the Airport Way Bridge near Vernalis (United States Geological Survey (USGS) Identification Number 11303500)
- San Joaquin River at the Maze Boulevard (Highway 132) Bridge (USGS Identification Number 11290500)
- San Joaquin River at Las Palmas Avenue near Patterson (USGS Identification Number 11274570)
- San Joaquin River at Hills Ferry Road
- San Joaquin River at Highway 165 near Stevinson (USGS Identification Number 11260815)
- San Joaquin River at Sack Dam

The load allocations for non-point source discharges into the San Joaquin River are assigned to the following subareas:

- ~~(a-)~~ The combined Stanislaus River; North Stanislaus; and Vernalis North subareas.
- ~~(b-)~~ The combined Tuolumne River; Northeast Bank; and Westside Creek subareas.
- ~~(c-)~~ The combined Turlock; Merced; and Greater Orestimba subareas.
- ~~(d-)~~ The combined Stevinson and Grassland subareas.
- ~~(e-)~~ The combined Bear Creek and Fresno-Chowchilla subareas.

The established waste load and load allocations for diazinon and chlorpyrifos, and the water quality objectives for chlorpyrifos and diazinon in the San Joaquin River represent a maximum allowable level. The Regional Water Board shall require any additional reductions in diazinon and chlorpyrifos levels necessary to account for additional additive or synergistic toxicity effects or to protect beneficial uses in tributary waters.

~~(8-)~~ Pursuant to CWC Section 13267, the Executive Officer will require dischargers to submit a management plan that describes the actions that the discharger will take to reduce diazinon and chlorpyrifos discharges and meet the applicable allocations by the required compliance date.

The management plan may include actions required by State and federal pesticide regulations. The Executive Officer will require the discharger to document the relationship between the actions to be taken and the expected reductions in diazinon and chlorpyrifos discharges. The Executive Officer will allow individual dischargers or a discharger group or coalition to submit management plans.

The management plan must comply with the provisions of any applicable waiver of waste discharge requirements or waste discharge requirements.

The Executive Officer may require revisions to the management plan if compliance with applicable allocations is not attained or the management plan is not reasonably likely to attain compliance.

~~(9-)~~ If the loading capacity in the San Joaquin River is not being met by the compliance date, dischargers in subareas where load allocations are not being met will be required to revise their management plans and implement an improved complement of management measures to meet the loading capacity.

~~(10-)~~ Any waiver of waste discharge requirements or waste discharge requirements that govern the control of pesticide runoff that is discharged directly or indirectly into the San Joaquin River must be consistent with the policies and actions described in paragraphs 1 - 9.

(11-) In determining compliance with the waste load allocations, the Regional Water Board will consider any data or information submitted by the discharger regarding diazinon and chlorpyrifos inputs from sources outside of the jurisdiction of the permitted discharger, including any diazinon and chlorpyrifos present in precipitation, and other available relevant information; and any applicable provisions in the discharger's NPDES permit requiring the discharger to reduce the discharge of pollutants to the maximum extent possible.

4.5.5.3 Diazinon and Chlorpyrifos Runoff into the Sacramento-San Joaquin Delta Waterways (as identified in Appendix 42)

(1-) The pesticide runoff control program shall:

(a-) Ensure compliance with water quality objectives applicable to diazinon and chlorpyrifos in the Sacramento-San Joaquin Delta Waterways through the implementation of management practices.

(b-) Ensure that measures that are implemented to reduce discharges of diazinon and chlorpyrifos do not lead to an increase in the discharge of other pesticides to levels that cause or contribute to violations of applicable water quality objectives and Regional Water Board plans and policies, and

(c-) Ensure that discharges of pesticides to surface waters are controlled so that pesticide concentrations are at the lowest levels that are technically and economically achievable.

(2-) Dischargers must consider whether any proposed alternative to the use of diazinon or chlorpyrifos has the potential to degrade ground or surface water. If the alternative has the potential to degrade groundwater, alternative pest control methods must be considered. If the alternative has the potential to degrade surface water, control measures must be implemented to ensure that applicable water quality objectives and Regional Water Board plans and policies are not violated, including State Water Resources Control Board Resolution 68-16.

(3-) Compliance with applicable water quality objectives, load allocations, and waste load allocations for diazinon and chlorpyrifos in the Delta Waterways is required by December 1, 2011.

The water quality objectives and allocations will be implemented through one or a combination of the following: the adoption of one or more waivers of waste discharge requirements, and general or individual waste discharge requirements. To the extent not already in place, the Regional Water Board expects to adopt or revise the appropriate waiver(s) or waste discharge requirements by December 31, 2009.

(4-) The Regional Water Board intends to review the diazinon and chlorpyrifos allocations and the implementation provisions in the Basin Plan at least once every five years, beginning no later than December 31, 2010.

(5-) Regional Water Board staff will meet at least annually with staff from the Department of Pesticide Regulation and representatives from the California Agricultural Commissioners and Sealers Association to review pesticide use and instream pesticide concentrations during the dormant spray and irrigation application seasons and to consider the effectiveness of management measures in meeting water quality objectives and load allocations.

(6-) The waste load allocations (WLA) for all NPDES-permitted dischargers, load allocations (LA) for nonpoint source discharges, and the loading capacity (LC) of each of the Sacramento-San Joaquin Delta Waterways defined in Appendix 42 shall not exceed the sum (S) of one (1) as defined below.

$$S = \frac{C_D}{WQO_D} + \frac{C_C}{WQO_C} \leq 1.0$$

where

C_D = diazinon concentration in $\mu\text{g/L}$ of point source discharge for the WLA; nonpoint source discharge for the LA; or a Delta Waterway for the LC.

- C_c = chlorpyrifos concentration in $\mu\text{g/L}$ of point source discharge for the WLA; nonpoint source discharge for the LA; or a Delta Waterway for the LC.
- WQO_D = acute or chronic diazinon water quality objective in $\mu\text{g/L}$.
- WQO_C = acute or chronic chlorpyrifos water quality objective in $\mu\text{g/L}$.

Available samples collected within the applicable averaging period for the water quality objective will be used to determine compliance with the allocations and loading capacity. For purposes of calculating the sum (S) above, analytical results that are reported as “non-detectable” concentrations are considered to be zero.

- (7-) The established waste load and load allocations for diazinon and chlorpyrifos, and the water quality objectives for chlorpyrifos and diazinon in the Delta Waterways represent a maximum allowable level. The Regional Water Board shall require any additional reductions in diazinon and chlorpyrifos levels necessary to account for additional additive or synergistic toxicity effects or to protect beneficial uses in tributary waters.
- (8-) Pursuant to CWC Section 13267, the Executive Officer will require dischargers to submit a management plan that describes the actions that the discharger will take to reduce diazinon and chlorpyrifos discharges and meet the applicable allocations by the required compliance date. The management plan may include actions required by State and Federal pesticide regulations. The Executive Officer will require the discharger to document the relationship between the actions to be taken and the expected reductions in diazinon and chlorpyrifos discharges. The Executive Officer will allow individual dischargers or a discharger group or coalition to submit management plans. The management plan must comply with the provisions of any applicable waiver of waste discharge requirements or waste discharge requirements. The Executive Officer may require revisions to the management plan if compliance with applicable allocations is not attained or the management plan is not reasonably likely to attain compliance.
- (9-) If the loading capacity in one or more Delta Waterways is not being met by the compliance date, direct or indirect dischargers to the those waterways whose discharge exceeds their load allocation will be required to revise their management plans and implement an improved complement of management measures to meet the loading capacity.
- (10-) Any waiver of waste discharge requirements or waste discharge requirements that govern the control of pesticide runoff that is discharged directly or indirectly into the Delta Waterways must be consistent with the policies and actions described in paragraphs 1 – 9.
- (11-) In determining compliance with the waste load allocations, the Regional Water Board will consider any data or information submitted by the discharger regarding diazinon and chlorpyrifos inputs from sources outside of the jurisdiction of the permitted discharger, including any diazinon and chlorpyrifos present in precipitation and other available relevant information; and any applicable provisions in the discharger’s NPDES permit requiring the discharger to reduce the discharge of pollutants to the maximum extent possible.
- (12-) The above provisions for control of diazinon and chlorpyrifos discharges to the Delta Waterways do not apply to dischargers to the Sacramento and San Joaquin Rivers upstream of the Delta.

4.5.5.4 Diazinon and Chlorpyrifos Discharges

- (1)- The diazinon and chlorpyrifos discharge control program shall:
 - (a)- Ensure compliance with water quality objectives for diazinon and chlorpyrifos in the Sacramento and San Joaquin River Basins through the implementation of management practices;
 - (b)- Ensure measures that are implemented to reduce discharges of diazinon and/or chlorpyrifos do not lead to an increase in the discharge of other pesticides to levels that cause or contribute to exceedances of applicable water quality objectives.

(c)- Encourage implementation of measures or practices by all dischargers that result in concentrations of chlorpyrifos and diazinon in all discharges that are below the water quality objective concentrations.

(2)- Dischargers are responsible for ensuring that their pesticide discharges to surface water and groundwater, including discharges of pesticides used as alternatives to diazinon and/or chlorpyrifos do not cause or contribute to exceedance of applicable water quality objectives.

(3)- Except as otherwise stated in the Basin Plan, compliance with water quality objectives for diazinon and chlorpyrifos shall be as soon as practicable. The Regional Board shall establish time schedules for compliance with such objectives in Waste Discharge Requirements or waivers in accordance with existing laws and policies. Where no existing law or policy directs the length of the compliance schedule, discharges shall be reduced to ensure compliance with the proposed water quality objectives not later than 16 August 2027.

The Board will ensure that dischargers will comply with diazinon and chlorpyrifos water quality objectives by modifying existing waste discharge requirements and existing waivers (where provisions necessary for implementation are not already in place), by adopting new waste discharge requirements or waivers, or by enforcing the diazinon and chlorpyrifos discharge prohibition. If necessary, the Board will ensure that existing waste discharge requirements and waivers will be modified as soon as possible, but no later than 16 August 2022.

(4)- The Central Valley Water Board intends to review the diazinon and chlorpyrifos implementation provisions in the Basin Plan no later than 16 August 2024.

(5)- The water quality objectives for diazinon and chlorpyrifos represent a maximum allowable level and shall be considered additively as defined by the Policy for Application of Water Quality Objectives (~~IV 16.00–18.00~~Section 4.2.2.1.9). The Board shall require additional reductions in diazinon or chlorpyrifos levels if such reductions are necessary to account for additive or synergistic toxicity effects or to protect beneficial uses.

(6)- The Executive Officer shall require agricultural dischargers that discharge diazinon and/or chlorpyrifos to water bodies listed in Table ~~III 2A3-4~~ Applicable Water Bodies that are not attaining the diazinon and/or chlorpyrifos objective(s) to submit management plans. These management plans shall consider the watershed of the water body that is not attaining the objective(s) and must describe actions that the agricultural discharger will take to meet applicable diazinon and chlorpyrifos water quality objectives by the required compliance dates. Management plans must describe:

(a)- The causes of the nonattainment of objectives;

(b)- The actions that the discharger will take to reduce diazinon and/or chlorpyrifos discharges in order to meet the diazinon and/or chlorpyrifos water quality objectives as soon as practicable but no later than 16 August 2027.

(c)- A schedule for the implementation of those actions;

(d)- A monitoring plan to track effectiveness of pollution controls; and

(e)- A commitment to revise pollution controls, as necessary.

Management plans for water bodies not attaining the water quality objective(s) as of 16 August 2017 are due no later than 16 August 2018. Management plans that address diazinon and/or chlorpyrifos exceedances and that have already been submitted can be used to fulfill this requirement, provided that they contain all the required elements 6a through 6e described above.

After 16 August 2017, if the Executive Officer determines that a water body listed in Table ~~III 2A3-4~~ Applicable Water Bodies is exceeding an applicable diazinon and/or chlorpyrifos water quality objective, the Executive Officer shall require that dischargers that discharge diazinon and/or chlorpyrifos to that water

body submit a management plan to the Board. Management plans are due within one year after the discharger receives notification that such a determination has been made.

If a water body that is exceeding the diazinon and/or chlorpyrifos objective(s) is being used by a discharger to represent water quality conditions in multiple water bodies, the Executive Officer shall require the submittal of a management plan that addresses all of the represented water bodies.

Management plans may include actions required under state and federal pesticide laws and regulations. Management plans must include documentation of the relationship between the actions to be taken and reductions in diazinon and/or chlorpyrifos discharges that are reasonably likely to attain compliance with diazinon and chlorpyrifos water quality objectives. The Executive Officer may allow individual dischargers or a discharger group or coalition to submit management plans. The management plan must comply with the provisions of any applicable waste discharge requirements or waiver. Management plans may address discharges to multiple downstream water bodies for which discharge reductions are required. The Executive Officer may require revisions to the management plan if compliance with applicable water quality objectives is not attained.

(7)- Any waste discharge requirements or waivers that govern the control of pesticide discharges to Table ~~III-2A3-4~~ Applicable Water Bodies, must be consistent with the policies and actions described in paragraphs 1-6 of this section.

4.5.6 Dredging in the Sacramento River and San Joaquin River Basins

Large volumes of sediment are transported in the waters of the Sacramento and San Joaquin Rivers which drain the Central Valley. The average annual sediment load to San Francisco Bay from these two rivers is estimated to be 8 million cubic yards. Dredging and riverbank protection projects are ongoing, continuing activities necessary to keep ship channels open, prevent flooding, and control riverbank erosion. The Delta, with over 700 miles of waterways, is a major area of activity. At present, the Corps is overseeing the conduct and planning of rehabilitation work along 165 miles of levees surrounding 15 Delta islands. In addition, virtually all of the Delta levees have been upgraded by island owners or reclamation districts. The magnitude of recent operations, such as the Stockton and Sacramento Ship Channel Deepening Projects and Sacramento River Bank Protection Project, is discussed in recent U.S. Army Corps of Engineers Reports. For example, the Corps removes over 10 million cubic yards of sediment yearly from the Sacramento River. If the Sacramento River Deep Water Ship Channel is widened and deepened as proposed currently, 25 million cubic yards of bottom material will be removed from the river during the 5-year project. Environmental impacts of dredging operations and materials disposal include temporary dissolved oxygen reduction, increased turbidity and, under certain conditions, the mobilization of toxic chemicals and release of biostimulatory substances from the sediments. The direct destruction and burial of spawning gravels and alteration of benthic habitat may be the most severe impacts. The existing regulatory process must be consistently implemented to assure protection of water quality and compliance with the certification requirements of Section 401 of the Federal Clean Water Act.

The Regional Water Board continues to work with dredging interests in the San Francisco Bay and Delta to develop a long term management strategy (LTMS) for handling dredge spoils. We will adopt requirements for all significant dredging operations and upland disposal projects in the Region.

4.5.7 Nitrate Pollution of Ground Water in the Sacramento and San Joaquin River Basins

Since 1980, over 200 municipal supply wells have been closed in the Central Valley because of nitrate levels exceeding the State's 45 mg/l drinking water standard. Proposals have been submitted to assess the extent of the problem and explore possible regulatory responses, but without success. The increasing population growth in the Valley is expected to accelerate the problem's occurrence in the years ahead.

The Regional Water Board considers nitrate pollution to be a critical issue for beneficial use protection in the Central Valley Region. Staff will continue efforts to obtain study funds. Since nitrate pollution of ground water is not restricted to the Central Valley Region, the Regional Water Board recommends the State Water Board take the lead in developing programs for controlling ground water contamination resulting from the use of nitrogen fertilizer on irrigated crops.

4.5.8 Temperature and Turbidity Increases Below Large Water Storage and Diversion Projects in the Sacramento River Basin

The storage and diversion of water for hydroelectric and other purposes can impact downstream beneficial uses because of changes in temperature and the introduction of turbidity. There are several large facilities in the Basin which have had a history of documented or suspected downstream impairments.

Where problems have been identified, the staff will work with operators to prepare management agency agreements or make recommendations to State Water Board regarding requirements to remedy the problems. Where problems are suspected, the staff will seek additional monitoring.

4.5.9 Control Program for Factors Contributing to the Dissolved Oxygen Impairment in the Stockton Deep Water Ship Channel (DWSC) (Regional Water Board Resolution No. R5-2005-0005)

The purpose of this control program is to implement a dissolved oxygen TMDL to achieve compliance with the Basin Plan dissolved oxygen water quality objectives in the DWSC. The numeric targets for this TMDL are the existing dissolved oxygen water quality objectives.

The dissolved oxygen impairment in the DWSC is caused by the following three main contributing factors:

- Loads of oxygen demanding substances from upstream sources that react by numerous chemical, biological, and physical mechanisms to remove dissolved oxygen from the water column in the DWSC.
- Geometry of the DWSC that impacts various mechanisms that add or remove dissolved oxygen from the water column, such that net oxygen demand exerted in the DWSC is increased.
- Reduced flow through the DWSC impacts various mechanisms that add or remove dissolved oxygen from the water column, such that net oxygen demand exerted in the DWSC is increased.

For the purpose of this control program, net oxygen demand is defined as the combined impact of all chemical, biological, and physical mechanisms that add or remove dissolved oxygen from the water column. When the amount of oxygen removed from the water column is greater than the amount added there is a decrease in the dissolved oxygen concentration. When dissolved oxygen concentrations in the DWSC are below Basin Plan objectives, the assimilative capacity of the water column has been exceeded and the associated excess net oxygen demand (ENOD) is given by the equation:

$$ENOD = \{DO_{obj} - DO_{meas}\} \times \{Q_{DWSC} + 40\} \times 5.4$$

In the above equation DO_{obj} is the applicable Basin Plan dissolved oxygen objective in milligrams per liter, DO_{meas} is the measured dissolved oxygen concentration in the DWSC in milligrams per liter, Q_{DWSC} is the net daily flow rate through the DWSC in cubic feet per second (adjusted by 40 cfs to account for flow measurement error), and 5.4 is a unit conversion factor that provides ENOD in units of pounds of net oxygen demand per day in the DWSC.

To account for technical uncertainty a margin of safety (MOS) equal to 20% of ENOD is added to the overall required reduction of ENOD:

$$MOS = -0.2 \times ENOD$$

ENOD plus the MOS must be addressed by those collectively responsible for each of the three contributing factors:

$$\text{ENOD} - \text{MOS} = 1.2 \times \text{ENOD} = [\Sigma\text{WLA} + \Sigma\text{LA}] + R_{\text{DWSC}} + R_{\text{Flow}}$$

where $[\Sigma\text{WLA} + \Sigma\text{LA}]$ is the amount of ENOD and MOS for which sources of oxygen demanding substances are responsible, R_{DWSC} is the amount of ENOD and MOS for which DWSC geometry is responsible, and R_{Flow} is the amount of ENOD and MOS for which reduced DWSC flow is responsible.

This TMDL does not specify the relative responsibility among the three contributing factors. Each of the three contributing factors are considered to be 100% responsible for addressing ENOD and MOS. Those parties collectively responsible for each contributing factor must coordinate with those collectively responsible for the other factors to implement control measures addressing ENOD and MOS.

Those parties responsible for sources of oxygen demanding substances $[\Sigma\text{WLA} + \Sigma\text{LA}]$ are allocated relative responsibility for excess net oxygen demand as follows:

- a(1) 30% as a waste load allocation for the City of Stockton Regional Wastewater Control Facility.
- b(2) 60% as a load allocation to non-point sources of algae and/or precursors in the watershed.
- c(3) 10% as a reserve for unknown sources and impacts, and known or new sources that have no reasonable potential to impact.

In measuring compliance with waste load and load allocations, credit will be given for control measures implemented after 12 July 2004.

For the purpose of this control program, non-point source discharges are discharges from irrigated lands. Irrigated lands are lands where water is applied for producing crops and, for the purpose of this control program, includes, but is not limited to, land planted to row, field, and tree crops, as well as commercial nurseries, nursery stock production, managed wetlands and rice production.

For the purpose of this control program, oxygen demanding substances and their precursors are any substance or substances that consume, have the potential to consume, or contribute to the growth or formation of substances that consume or have the potential to consume oxygen from the water column.

The source area for loads of oxygen demanding substances and their precursors being addressed by this TMDL includes the SJR watershed that drains downstream of Friant Dam and upstream of the confluence of the San Joaquin River and Disappointment Slough, with the exception of the western slope of the Sierra Nevada foothills above the major reservoirs of New Melones Lake on the Stanislaus, Don Pedro Reservoir on the Tuolumne, Lake McClure on the Merced, New Hogan Reservoir on the Calaveras, Comanche Reservoir on the Mokelumne, and those portions of the SJR watershed that fall within Mariposa, Tuolumne, Calaveras, and Amador Counties.

Measures will also need to be implemented to reduce the impact of both the DWSC geometry and reduced flow through the DWSC.

The Regional Water Board will take the following actions, as necessary and appropriate, to implement this TMDL:

- (1-) The Regional Water Board will use its authority under California Water Code § 13267 (or alternately by Waste Discharge Requirements and NPDES permits) to require that entities responsible for point and non-point sources of oxygen demanding substances and their precursors within the TMDL source area perform the following studies by December 2008. These studies must identify and quantify:
 - (a) sources of oxygen demanding substances and their precursors in the dissolved oxygen TMDL source area
 - (b) growth or degradation mechanisms of these oxygen demanding substances in transit through the source area to the DWSC

- (c) the impact of these oxygen demanding substances on dissolved oxygen concentrations in the DWSC under a range of environmental conditions and considering the effects of chemical, biological, and physical mechanisms that add or remove dissolved oxygen from the water column in the DWSC

A study plan describing how ongoing studies and future studies will address these information needs must be submitted to Regional Water Board staff by 23 October 2006. The study plan and studies may be conducted by individual responsible entities or in collaboration with other entities.

~~(2-)~~ The Regional Water Board establishes the following waste load allocations:

- (a) The waste load allocations of oxygen demanding substances and their pre-cursors for all NPDES-permitted discharges are initially set at the corresponding effluent limitations applicable on 28 January 2005.
- (b) Waste load allocations and permit conditions for new or expanded point source discharges in the SJR Basin upstream of the DWSC, including NPDES and stormwater, will be based on the discharger demonstrating that the discharge will have no reasonable potential to cause or contribute to a negative impact on the dissolved oxygen impairment in the DWSC.

~~(3-)~~ The Regional Water Board will require any project that requires a Clean Water Act Section 401 Water Quality Certification from the Regional Water Board, and that has the potential to impact dissolved oxygen conditions in the DWSC, to evaluate and fully mitigate those impacts. This includes, but is not limited to:

- (a) Future projects that increase the cross-sectional area of the DWSC
- ~~(e)b~~ Future water resources facilities projects that reduce flow through the DWSC

~~(4-)~~ The Regional Water Board will require, pursuant to California Water Code § 13267, the United States Army Corps of Engineers to submit by 31 December 2006 a technical report identifying and quantifying:

- (a) the chemical, biological, and physical mechanisms by which loads of substances into, or generated within the DWSC, are converted to oxygen demand
- (b) the impact that the Stockton Deep Water Ship Channel has on re-aeration and other mechanisms that affect dissolved oxygen concentrations in the water column

~~(5-)~~ The Regional Water Board may consider alternate measures, as opposed to direct control, of certain contributing factors if these measures adequately address the impact on the dissolved oxygen impairment and do not degrade water quality in any other way.

~~(6-)~~ The Regional Water Board will review allocations and implementation provisions based on the results of the oxygen demand and precursor studies and the prevailing dissolved oxygen conditions in the DWSC by December 2009.

~~(7-)~~ The Regional Water Board will require compliance with waste load allocations and load allocations for oxygen demanding substances and their precursors, and development of alternate measures to address non-load related factors by 31 December 2011.

~~(8-)~~ The established allocations and implementation provisions represent a maximum allowable level for the purpose of addressing the dissolved oxygen impairment in the DWSC. Where more than one allocation may be applicable, the most stringent allocation applies. The Regional Water Board may take other, more restrictive, actions affecting the contributing factors to this impairment as needed to protect other beneficial uses or to implement other water quality objectives.

4.5.10 Clear Lake Nutrients

Nuisance algae blooms impair beneficial uses in Clear Lake, which is a violation of the narrative basin plan objective that states “water shall not contain biostimulatory substances which promote aquatic growths in concentrations that cause nuisance or adversely affect beneficial uses”

Research and studies have concluded that there are likely multiple factors that influence the occurrence of nuisance algae blooms in Clear Lake. Recent improvements in water clarity may be due to a reduction in phosphorus loading or a result of other factors such as iron or sulfur availability, changes to lake ecology (introduced species, etc.), water year type or a combination of factors. For the purposes of this program of implementation both phosphorus loading and other factors that may affect algae growth will be addressed.

- (1-) Modeling studies predict that a 40% reduction in average phosphorus loading will significantly reduce the incidence of algae blooms. A 40% reduction would equal an annual allowable loading of approximately 87,100 kg. Therefore, for this program of implementation, an average annual (five year rolling average) phosphorus load of 87,100 kg is established as the loading capacity for Clear Lake.
- (2-) Waste load allocations for the NPDES facilities discharging to the lake or tributaries are as follows:
 - (a-) Lake County Stormwater Permittees (Lake County, City of Clearlake, City of Lakeport) - 2,000 kg phosphorus/yr
 - (b-) California Department of Transportation (Caltrans) – 100 kg phosphorus/yr
- (3-) The load allocation for nonpoint source dischargers is 85,000 kg/yr average annual load (five year rolling average). The U.S. Bureau of Land Management (USBLM), U.S. Forest Service (USFS), Lake County (County) and irrigated agriculture are responsible for controlling phosphorus discharges from those portions of the watershed within their respective authority.
- (4-) Regional Water Board staff will work with the responsible parties – Stormwater permittees, Caltrans, USBLM, USFS, County and irrigated agriculture – to develop and implement a plan to collect the information needed to determine what factors are important in controlling nuisance blooms and to recommend what control strategy should be implemented. The responsible parties will submit the plan to the Regional Water Board by 19 June 2008. The plan should address the following topics:
 - Studies to assess the current limnological conditions and to determine the appropriate measures necessary for Clear Lake to meet the Basin Plan objectives
 - Appropriate monitoring for evaluating conditions in the lake
 - Effective collection of phosphorus loading information from the various sources
 - Practices implemented or planned to control phosphorus loading to the lake
 - Develop criteria to determine when Clear Lake is no longer impaired
- (5-) Compliance with load and waste load allocations for phosphorus in Clear Lake is required by 19 June 2017. However, by 19 September 2012, the Regional Water Board will consider information developed and determine whether the phosphorus load and waste load allocations should continue to be required or if some other control strategy or approach is more appropriate. To the extent that other controllable water quality factors, besides phosphorus, cause or contribute to nuisance algae blooms, those factors will be addressed in revisions to this program of implementation. Implementation of phosphorus control practices to achieve load and waste load allocations will occur under waste discharge requirements or waivers of waste discharge requirements.
- (6-) If Clear Lake is attaining its beneficial uses and the Regional Water Board determine that phosphorus loads above allocated amounts are not causing or contributing to nuisance algae problems, the Regional Water Board will amend the Basin Plan to revise this nutrient control program for Clear Lake.

4.5.11 Point Source Discharges Containing Trihalomethanes Lower New Alamo and Ulatis Creeks

Municipal wastewater that is chlorinated to remove bacteria generally forms trihalomethanes as disinfection by-products. The Policy for Implementation of Toxics Standards for Inland Waters, Enclosed Bays, and Estuaries of California (“State Implementation Plan” or “SIP”) (see the 15th Policy in State Water Board Policies and Plans, page IV-10.01) implements criteria for priority pollutants, including trihalomethanes. However, the SIP does not address situations where water quality objectives for water bodies downstream of the first receiving water are more stringent than the water quality objectives for the first receiving water.

Old Alamo Creek is tributary to New Alamo Creek and Ulatis Creek. Ulatis Creek, downstream of the confluence with New Alamo Creek, is within the legal boundary of the Delta. Old Alamo Creek is not designated MUN, but New Alamo and Ulatis Creeks are designated MUN. The SIP does not specifically address how to determine the need for water quality-based effluent limitations or calculate water quality-based effluent limitations in this situation, so special permitting provisions are needed for discharges of trihalomethanes to Old Alamo Creek.

With respect to the site-specific water quality objectives in Table ~~III-1A3-2~~ for trihalomethanes in New Alamo Creek, from Old Alamo Creek to Ulatis Creek, and Ulatis Creek, from New Alamo Creek to Cache Slough, the following provisions shall apply to any point source discharges into Old Alamo Creek. For determining if water quality-based effluent limitations are necessary, Section 1.3 of the SIP does not apply. For calculation of water quality-based effluent limitations, Section 1.4 of the SIP does not apply, unless specified below.

Determination of Need for Water Quality-Based Effluent Limitations:

Step 1: For chlorodibromomethane (DBCM), dichlorobromomethane (DCBM) and chloroform, if the pollutant is not detected in the effluent and any of the reported detection limits is less than or equal to the site-specific objectives specified in Table ~~III-1A3-2~~ (the site-specific objectives specified in Table ~~III-1A3-2~~ will be referred to as C), then water quality-based effluent limitations are not necessary. If the pollutant is not detected in the effluent and all of the detection limits are greater than site-specific objectives (C), then proceed to Step 5. If the pollutant is detected in the effluent then proceed to Step 2.

Step 2: Determine the observed maximum ambient background concentration for DBCM, DCBM, and chloroform. The observed maximum ambient background concentrations shall be measured in New Alamo Creek at Lewis Road and is the B, as defined in section 1.4.3.1 of the SIP. If the background (B) is greater than the site-specific objectives (C), then water quality-based effluent limitations are necessary. If the background (B) is less than or equal to the site-specific objectives (C), then proceed to Step 3.

Step 3: Determine the observed maximum pollutant concentration for the effluent (MEC). If the MEC is less than or equal to the site-specific objectives (C), water quality-based effluent limitations are not necessary. If the MEC is greater than the site-specific objectives (C), then proceed to Step 4 to determine if water quality-based effluent limitations are necessary.

Step 4: If the in-stream maximum concentrations of DBCM, DCBM or chloroform at the terminus of Old Alamo Creek are greater than the site-specific objectives (C), then water quality-based effluent limitations are necessary for the constituents that exceeded the applicable objectives.

Step 5: If the pollutant has not been detected in the effluent and all detection limits are greater than the site-specific objectives (C), then the discharger shall be required to conduct twice-monthly monitoring of the effluent and of the terminus of Old Alamo Creek between 1 November and 31 March using detection limits less than or equal to the site-specific objectives (C). Steps 1-4 above will then be applied to these data to determine whether water-quality based effluent limitations are necessary.

Calculation of water quality-based effluent limitations for DBCM, DCBM, and chloroform shall be as follows:

An Attenuation Factor, which is the median of the individual sample attenuation values, is necessary because the water quality objectives do not apply in the first receiving water of the discharge (i.e., do not apply in Old Alamo Creek). If water quality-based effluent limitations are required, an attenuation factor to account for the reduction in constituent concentrations between the point of effluent discharge to Old Alamo Creek and the terminus of Old Alamo Creek shall be applied to the calculation of the Effluent Concentration Allowance (ECA), which is one of the factors used in the derivation of the effluent limitations as described in Section 1.4B of the SIP.

The ECA shall be calculated as:

$$\begin{aligned} \text{ECA} &= \text{Attenuation Factor} \times [C + D(C-B)] && \text{when } C > B \\ \text{ECA} &= \text{Attenuation Factor} \times C && \text{when } C \leq B \end{aligned}$$

Where:

Attenuation Factor = the median of the individual sample attenuation values derived from all representative historical data for the 1 November through 31 March period of each year. An individual sample attenuation value is calculated as the effluent constituent concentration measured on a given day divided by the in-stream constituent concentration at the terminus of Old Alamo Creek measured the same day. It should be noted that the effluent should be sampled prior to sampling at the terminus of Old Alamo Creek.

C = the site-specific objective specified in Table ~~III-1A3-2~~

D = dilution credit, as determined in section 1.4.2 of the SIP

B = background concentration, as defined by Section 1.4.3 of the SIP, and measured in New Alamo Creek at Lewis Road

Dilution credits may be allowed in deriving water quality-based effluent limitations for DBCM, DCBM, and chloroform in accordance with Section 1.4.2 of the SIP.

The Average Monthly Effluent Limitation (AMEL) and the Maximum Daily Effluent Limitation (MDEL) shall be calculated in accordance with Section 1.4 of the SIP using the ECA calculated above.

4.6 ESTIMATED COSTS OF AGRICULTURAL WATER QUALITY CONTROL PROGRAMS AND POTENTIAL SOURCES OF FINANCING

4.6.1 San Joaquin River Subsurface Agricultural Drainage Control Program

The estimates of capital and operational costs to achieve the selenium objective for the San Joaquin River range from \$3.6 million/year to \$27.4 million/year (1990 dollars). The cost of meeting water quality objectives in Mud Slough (north), Salt Slough, and the wetland supply channels is approximately \$2.7 million /year (1990 dollars).

Potential funding sources include:

- (1-) Private financing by individual sources.
- (2-) Bonded indebtedness or loans from governmental institutions.
- (3-) Surcharge on water deliveries to lands contributing to the drainage problem.
- (4-) Ad Valorem tax on lands contributing to the drainage problem.
- (5-) Taxes and fees levied by a district created for the purpose of drainage management.
- (6-) State or federal grants or low-interest loan programs.
- (7-) Single-purpose appropriations from federal or State legislative bodies (including land retirement programs).

4.6.2 Lower San Joaquin River Salt and Boron Control Program

The estimates of capital and operational costs to implement drainage controls needed to achieve the salt and boron water quality objectives at the Airport Way Bridge near Vernalis range from 27 to 38 million dollars per year (2003 dollars).

Potential funding sources include:

- (1-) Those identified in the San Joaquin River Subsurface Agricultural Drainage Program and the Pesticide Control Program.
- (2-) Annual fees for waste discharge requirements.

4.6.3 Pesticide Control Program

Based on an average of \$15 per acre per year for 500,000 acres of land planted to rice and an average of \$5 per acre per year for the remaining 3,500,000 acres of irrigated agriculture in the Sacramento and San Joaquin River Basins, the total annual cost to agriculture is estimated at \$25,000,000. Financial assistance for complying with this program may be obtainable through the U.S.D.A. Agricultural Stabilization and Conservation Service and technical assistance is available from the University of California Cooperative Extension Service and the U.S.D.A. Soil Conservation Service.

4.6.4 Sacramento and Feather Rivers Diazinon and Chlorpyrifos Runoff Control Program

The total estimated costs for management practices to meet the diazinon and chlorpyrifos objectives for the Sacramento and Feather Rivers range from \$0 to \$6.2 million/year (2007 dollars). The estimated costs for discharger monitoring, planning, and evaluation range from \$0.3 to \$1.5 million/year (2007 dollars).

Potential funding sources include:

- (1-) Those identified in the San Joaquin River Subsurface Agricultural Drainage Control Program and the Pesticide Control Program.

4.6.5 San Joaquin River Dissolved Oxygen Control Program

The *Control Program for Factors Contributing to the Dissolved Oxygen Impairment in the Stockton Deep Water Ship Channel (DWSC)* requires agricultural and municipal dischargers to perform various studies. The total estimated cost of the studies to be performed as part of this control program is approximately \$15.6 million. The preferred alternative also includes a prohibition of discharge if water quality objectives are not achieved by 31 December 2011. The estimated cost to cease discharge of water from irrigated lands ranges from \$95 to \$133 million per year. The estimated cost to provide minimum flows that would remove the need for the prohibition is approximately \$37 million dollars per year to eliminate the impairment through provision of purchased water. The cost of construction of an aeration device of adequate capacity to eliminate the impairment, in conjunction with point source load reductions already required, is estimated to be \$10 million, with yearly operation and maintenance costs of \$200,000 per year.

Potential funding sources:

- (1-) Proposition 13 includes \$40 million in bond funds to address the dissolved oxygen impairment in the DWSC. Approximately \$14.4 million of this \$40 million has been identified to fund the oxygen demanding substance and precursor studies. An additional \$1.2 million is being provided from various watershed stakeholders. Approximately \$24 million of Proposition 13 funds are available to pay for projects such as the design and construction of an aeration device.

- (2-) The State Water Contractors, Port of Stockton, San Luis and Delta Mendota Water Authority, San Joaquin Valley Drainage Authority, and the San Joaquin River Group Authority have proposed to develop an operating entity for an aeration device and have indicated their commitment to execute a funding agreement among themselves and other interested parties, (subject to ultimate approval of respective governing boards) that would provide the mechanism to support operation of a permanent aerator at a cost expected to be in the annual range of \$250,000 to \$400,000.

4.6.6 Diazinon and Chlorpyrifos Runoff into the San Joaquin River Control Program

The total estimated costs for management practices to meet the diazinon and chlorpyrifos objectives for the San Joaquin River range from \$56,000 to \$2.5 million for the dormant season, and from \$3.9 million to \$5.3 million for the irrigation season. The estimated costs for discharger compliance monitoring, planning and evaluation range from \$600,000 to \$3.1 million. The estimated total annual costs range from \$4.4 million to \$10.9 million (2004 dollars).

Potential funding sources include:

- (1-) Those identified in the San Joaquin River Subsurface Agricultural Drainage Control Program and the Pesticide Control Program.

4.6.7 Diazinon and Chlorpyrifos Runoff into the Sacramento-San Joaquin Delta Waterways

The total estimated costs for management practices to meet the diazinon and chlorpyrifos objectives for the Delta Waterways range from \$5.9 to \$12.7 million. The estimated costs for discharger compliance monitoring, planning and evaluation range from \$600,000 to \$1.8 million. The estimated total annual costs range from \$6.5 to \$14.4 million (2005 dollars).

Potential funding sources include:

- (1-) Those identified in the San Joaquin River Subsurface Agricultural Drainage Control Program and the Pesticide Control Program.

4.6.8 Clear Lake Nutrient Control Program

Estimated costs to implement best management practices, if necessary, are \$400,000 to \$1,800,000 (2006 dollars).

Potential funding sources include:

- (1-) Those identified in the San Joaquin River Subsurface Agricultural Drainage Control Program and the Pesticide Control Program.

4.6.9 Delta Mercury Control Program

The total estimated costs (2007 dollars) for the agricultural methylmercury control studies to develop management practices to meet the Delta methylmercury allocations range from \$290,000 to \$1.4 million. The estimated annual costs for agricultural discharger compliance monitoring range from \$14,000 to \$25,000. The estimated annual costs for Phase 2 implementation of methylmercury management practices range from \$590,000 to \$1.3 million.

- (1-) Potential funding sources include those identified in the San Joaquin River Subsurface Agricultural Drainage Control Program and the Pesticide Control Program.

4.6.10 Long-Term Irrigated Lands Regulatory Program

The Central Valley Water Board intends on establishing a long-term irrigated lands regulatory program (Long-Term Program) by adopting one or more general waste discharge requirements and/or conditional waivers of WDRs to regulate the discharge of waste to ground and surface waters from irrigated agricultural operations. The Long-Term Program will be based, in whole or in part, on six alternatives described in the *Irrigated Lands Regulatory Program Final Environmental Impact Report* (Final PEIR; ICF International 2011) certified by resolution R5-2011-0017. The cost estimate below is based upon and encompasses the full range of those alternatives.

The cost estimate for the Long-Term Program accounts for program administration (e.g., Board oversight and third-party activities), monitoring for groundwater and surface water quality, and implementation of management practices throughout the Central Valley. The estimated cost for the annual capital and operational costs to comply with the Long-Term Program range from \$216 million to \$1,321 million (2007 dollars). This cost estimate is a cumulative total that includes costs from the Sacramento River and San Joaquin River Basins, and the Tulare Lake Basin.

Potential funding sources include:

- (1-) The Federal Farm Bill, which authorizes funding for conservation programs such as the Environmental Quality Incentives Program (EQIP) and the Conservation Stewardship Program.
- (2-) Grant and loan programs administered by the State Water Resources Control Board and Department of Water Resources, which are targeted for agricultural drainage management, water use efficiency, and water quality improvement. These programs include:
 - (a-) Agricultural Drainage Management Program (State Water Resources Control Board)
 - (b-) Agricultural Drainage Loan Program (State Water Resources Control Board)
 - (c-) Clean Water Act funds (State Water Resources Control Board)
 - (d-) Agricultural Water Quality Grant Program (State Water Resources Control Board)
 - (e-) Clean Water State Revolving Fund (State Water Resources Control Board)
 - (f-) Integrated Regional Water Management grants (State Water Resources Control Board, Department of Water Resources)
3. Those identified in the San Joaquin River Subsurface Agricultural Drainage Control Program.

4.6.11 Drinking Water Policy

The total estimated costs to implement management practices, if necessary, range from zero to approximately \$6.8 million (2013 dollars).

Potential funding sources include:

- (1-) Those identified in the San Joaquin River Subsurface Agricultural Drainage Control Program and Pesticide Control Program.

4.6.12 Diazinon and Chlorpyrifos Discharges

The costs estimated in this section were calculated in consideration of the requirements for diazinon and chlorpyrifos discharges only. Most of these compliance costs likely already exist due to other Board Requirements under the Irrigated Lands Regulatory Program, and the requirements for diazinon and chlorpyrifos in the Sacramento and Feather Rivers, the San Joaquin River Basin, and the Sacramento-San Joaquin Delta.

The total estimated costs for management practices to meet the diazinon and chlorpyrifos objectives in the Sacramento and San Joaquin River Basins range from \$5 to \$21.6 million/year (2010 dollars). The estimated costs for agricultural discharger compliance monitoring, planning, and evaluation range from \$1.6 to \$6.0 million/year (2010 dollars). The estimated annual costs range from \$6.6 to \$27.6 million (2010 dollars).

Potential funding sources include:

- (1) Those identified in the San Joaquin River Subsurface Agricultural Drainage Control Program and Pesticide Control Program.

This chapter describes the methods and programs that the Regional Water Board uses to acquire water quality information. Acquisition of data is a basic need of a water quality control program and is required by both the Clean Water Act and the Porter-Cologne Water Quality Control Act.

The Regional Water Board's surveillance and monitoring efforts include different types of sample collection and analysis. Surface water surveillance may involve analyses of water, sediment, or tissue samples and ground water surveillance often includes collection and analysis of soil samples. Soil, water, and sediment samples are analyzed via standard, EPA approved, laboratory methods. The Regional Water Board addresses quality assurance through bid specifications and individual sampling actions such as submittal of split, duplicate, or spiked samples and lab inspections.

Although surveillance and monitoring efforts have traditionally relied upon measurement of key chemical/physical parameters (e.g., metals, organic and inorganic compounds, bacteria, temperature, and dissolved oxygen) as indicators of water quality, there is increasing recognition that close approximation of water quality impacts requires the use of biological indicators. This is particularly true for regulation of toxic compounds in surface waters where standard physical/chemical measurement may be inadequate to indicate the wide range of substances and circumstances able to cause toxicity to aquatic organisms. The use of biological indicators to identify or measure toxic discharges is often referred to as biotoxicity testing. EPA has issued guidelines and technical support materials for biotoxicity testing. A key use of the method is to monitor for compliance with narrative water quality objectives or permit requirements that specify that there is to be no discharge of toxic materials in toxic amounts. The Regional Water Board will continue to use biotoxicity procedures and testing in its surveillance and monitoring program.

As discussed previously, the protection, attainment, and maintenance of beneficial uses occur as part of a continuing cycle of identifying beneficial use impairments, applying control measures, and assessing program effectiveness. The Regional Water Board surveillance and monitoring program provides for the collection, analysis, and distribution of the water quality data needed to sustain its control program. Under ideal circumstances, the Regional Water Board surveillance and monitoring program would produce information on the frequency, duration, source, extent, and severity of beneficial use impairments. In attempting to meet this goal, the Regional Water Board relies upon a variety of measures to obtain information. The current surveillance and monitoring program consists primarily of seven elements:

5.1 Data Collected by Other Agencies

The Regional Water Board currently relies on internal staff coordination and compilation of data collected by a variety of other agencies to augment data collected by internal programs in order to assess ambient water quality conditions and program effectiveness. For example, the Department of Water Resources (DWR) has an ongoing monitoring program in the Delta and the United States Geological Survey (USGS) and DWR conduct monitoring in some upstream rivers. The Department of Fish and Wildlife, Fish and Wildlife Service, USGS, and State Water Board Division of Drinking Water Programs also conduct special studies and collect data, as do local entities such as water purveyors, county health departments and wastewater treatment plants.

The long-term goal is to have a system in place that facilitates consolidation of information gathered from all agencies in a format that can be readily utilized to provide the foundation for regular assessments of ambient surface water quality conditions and program effectiveness including support of updates to the California Integrated Report (Clean Water Act Sections 303(d)/305(b)) which provides a water quality conditions assessment of surface water bodies.

5.2 Regional Water Board and State Water Board Monitoring Programs

The State Water Board manages its own Toxic Substances Monitoring (TSM) program to collect and analyze fish tissue for the presence of bioaccumulative chemicals. The Regional Water Board participates in the selection of sampling sites for its basins and annually is provided with a report of the testing results.

5.3 Special Studies

Intensive water quality studies provide detailed data to locate and evaluate violations of receiving water standards and to make waste load allocations. They usually involve localized, frequent and/or continuous sampling. These studies are specially designed to evaluate problems in potential water quality limited segments, areas of special biological significance or hydrologic units requiring sampling in addition to the routine collection efforts.

One such study is the *San Joaquin River Subsurface Agricultural Drainage Monitoring Program*. The program includes the following tasks:

- (1)- The dischargers will monitor discharge points and receiving waters for constituents of concern and flow (discharge points and receiving water points)
- (2)- The Regional Board will inspect discharge flow monitoring facilities and will continue its cooperative effort with dischargers to ensure the quality of laboratory results.
- (3)- The Regional Board will, on a regular basis, inspect any facilities constructed to store or treat agricultural subsurface drainage.
- (4)- The Regional Board will continue to maintain and update its information on agricultural subsurface drainage facilities in the Grassland watershed. Efforts at collecting basic data on all facilities, including flow estimates and water quality will continue.
- (5)- The Regional Water Board, in cooperation with other agencies, will regularly assess water conservation achievements, cost of such efforts and drainage reduction effectiveness information. In addition, in cooperation with the programs of other agencies and local district managers, the Regional Board will gather information on irrigation practices, i.e., irrigation efficiency, pre-irrigation efficiency, excessive deep percolation and on seepage losses.

Another such study is a surveillance and monitoring program conducted by the El Dorado Irrigation District (EID) on Deer Creek in El Dorado and Sacramento Counties. Regional Board staff will work with EID to ensure adequate temperature, flow and biological monitoring is conducted to evaluate compliance with the site-specific temperature objectives for Deer Creek and their effect on beneficial uses.

5.4 Aerial Surveillance

Low-altitude flights are conducted primarily to observe variations in field conditions, gather photographic records of discharges, and document variations in water quality.

5.5 Self-Monitoring

Self-monitoring reports are normally submitted by the discharger on a monthly or quarterly basis as required by the permit conditions. They are routinely reviewed by Regional Water Board staff.

For point source discharges to Old Alamo Creek that contain detectable concentrations of chlorodibromomethane (DCBM), dichlorobromomethane (DCBM) or chloroform, the discharger's monitoring and reporting program shall include coordinated monitoring of the effluent and Old Alamo Creek at its terminus, immediately prior to Old

Alamo Creek's discharge into New Alamo Creek, for DBCM, DCBM or chloroform. It should be noted that the effluent should be sampled prior to sampling at the terminus of Old Alamo Creek. At a minimum, the discharger shall conduct the coordinated monitoring twice-monthly from 1 November through 31 March once during the 5-year term of the NPDES permit.

5.6 Compliance Monitoring

Compliance monitoring determines permit compliance, validates self-monitoring reports, and provides support for enforcement actions. Discharger compliance monitoring and enforcement actions are the responsibility of the Regional Water Board staff.

5.7 Complaint Investigation

Complaints from the public or governmental agencies regarding the discharge of pollutants or creation of nuisance conditions are investigated and pertinent information collected.

5.8 Mercury and Methylmercury

The Regional Water Board will use the following criteria to determine compliance with the methylmercury fish tissue objectives. Site-specific criteria for various water bodies are described below.

The number of fish collected to determine compliance with the methylmercury objective will be based on the statistical variance within each species. The sample size will be determined by methods described in USEPA's Guidance for Assessing Chemical Contaminant Data for Use in Fish Advisories (Third Edition, 2000) or other statistical methods approved by the Executive Officer.

Analysis of fish tissue for total mercury is acceptable for assessing compliance. Compliance with the fish tissue objective is achieved when the average concentrations in local fish are equivalent to the respective objective for three consecutive years.

5.8.1 Clear Lake

Fish from the following species will be collected and analyzed every ten years. The representative fish species for trophic level 4 shall be largemouth bass (total length 300-400 mm), catfish (total length 300 – 400 mm), brown bullhead (total length 300-400 mm), and crappie (total length 200-300 mm). The representative fish species for trophic level 3 shall be carp, hitch, Sacramento blackfish, black bullhead, and bluegill of all sizes; and brown bullhead and catfish of lengths less than the trophic level 4 lengths.

Fish tissue mercury concentrations are not expected to respond quickly to remediation activities at Sulphur Bank Mercury Mine, Clear Lake sediments, or the tributaries. Adult fish integrate methylmercury over a lifetime and load reduction efforts are not expected to be discernable for more than five years after remediation efforts. To assess remedial activities, part of the monitoring at Clear Lake will include indicator species, consisting of inland silversides and largemouth bass less than one year old, to be sampled every five years. Juveniles of these species will reflect recent exposure to methylmercury and can be indicators of mercury reduction efforts. Average concentrations of methylmercury by trophic level should be determined in a combination of the identified species collected throughout Clear Lake.

Total mercury in tributary sediment, lake sediment, and water will be monitored to determine whether loads have decreased. The water and sediment monitoring frequency will be every five years.

5.8.2 Cache Creek, Bear Creek, Harley Gulch, and Sulphur Creek

The Regional Water Board will use the following criteria to determine compliance with the methylmercury fish tissue objectives in Cache and Bear Creeks. Compliance with the respective objectives shall be determined based on

fish tissue analysis in Cache Creek from Clear Lake to the Settling Basin, North Fork Cache Creek, and Bear Creek upstream and downstream of Sulphur Creek.

The representative fish species for each trophic level shall be:

- Trophic Level 3: green sunfish, bluegill, and/or Sacramento sucker (rainbow trout also an option for North Fork Cache Creek);
- Trophic Level 4: Sacramento pikeminnow, largemouth bass, smallmouth bass and/or channel catfish.

The sample sets will include at least two species from each trophic level (i.e., bass and Sacramento pikeminnow, for TL4) collected at each compliance point or stream section. The samples will include a range of sizes of fish between 250 and 350 mm, total length, with average length of 300 mm. If green sunfish and bluegill are not available in this size range; those sampled should be greater than 125 mm total length. If two species per trophic level are not available and are unlikely to be present given historical sampling information, one species is acceptable (the only TL4 species typically in North Fork is Sacramento pikeminnow).

Compliance with the Harley Gulch methylmercury water quality objective will be determined using hardhead, California roach, or other small (TL2/3), resident species in the size range of 75-100 mm total length.

Aqueous methylmercury goals are in the form of the annual, average concentration in unfiltered samples. For comparison of methylmercury concentration data with aqueous methylmercury goals, water samples are recommended to be collected periodically throughout the year and during typical flow conditions as they vary by season, rather than targeting extreme low or high flow events. Aqueous methylmercury data may be collected by Regional Water Board staff or required of project proponents.

Monitoring for mine cleanups or other projects that are expected to significantly affect methylmercury or mercury loads are recommended to include the following parameters. The data may be collected by Regional Water Board staff or required of project proponents.

- Monitoring parameters for soil and sediment: concentration of total mercury in soil or sediment in the silt/clay (<63 microns) fraction.
- Monitoring parameters for water: methylmercury (if project is methylmercury source), total mercury, total suspended solids, turbidity, and stream flow. Water sampling in major tributaries is recommended to include high flow events for mercury and total suspended solids. More frequent monitoring (two to four significant storm events for three consecutive years) is recommended after cleanup to evaluate the effectiveness of cleanup actions.
- Monitoring of mercury in suspended sediment: The ratio of concentrations of mercury in suspended sediment (Hg/TSS) is a useful measure of mercury contamination. Effectiveness of cleanup of the mines may be assessed by comparing concentration of mercury in fine-grained sediment discharging from the mines to the average concentration in background (not affected by mining activities) soil or sediment.

5.8.3 Delta

5.8.3.1 Fish Methylmercury Compliance Monitoring

The Regional Water Board will use the following specifications to determine compliance with the methylmercury fish tissue objectives in the Sacramento-San Joaquin Delta. Beginning 2025, Regional Water Board staff will initiate fish tissue monitoring. Thereafter compliance monitoring will ensue every ten years, more frequently as needed where substantial changes in methyl or total mercury concentrations or loading occur, but not to exceed ten years elsewhere.

Initial fish tissue monitoring will take place at the following compliance reaches in each subarea:

- Central Delta subarea: Middle River between Bullfrog Landing and Mildred Island;
- Marsh Creek subarea: Marsh Creek from Highway 4 to Cypress Road;
- Mokelumne/Cosumnes River subarea: Mokelumne River from the Interstate 5 bridge to New Hope Landing;

- Sacramento River subarea: Sacramento River from River Mile 40 to River Mile 44;
- San Joaquin River subarea: San Joaquin River from Vernalis to the Highway 120 bridge;
- West Delta subarea: Sacramento/San Joaquin River confluence near Sherman Island;
- Yolo Bypass-North subarea: Tule Canal downstream of its confluence with Cache Creek; and
- Yolo Bypass-South subarea: Toe Drain between Lisbon and Little Holland Tract.

Compliance fish methylmercury monitoring will include representative fish species for comparison to each of the methylmercury fish tissue objectives:

- Trophic Level 4: bass (largemouth and striped), channel and white catfish, crappie, and Sacramento pikeminnow.
- Trophic Level 3: American shad, black bullhead, bluegill, carp, Chinook salmon, redear sunfish, Sacramento blackfish, Sacramento sucker, and white sturgeon.
- Small (<50 mm) fish: primary prey species consumed by wildlife in the Delta, which may include the species listed above, as well as inland silverside, juvenile bluegill, mosquitofish, red shiner, threadfin shad, or other fish less than 50 mm.

Trophic level 3 and 4 fish sample sets will include three species from each trophic level and will include both anadromous and non-anadromous fish. Trophic level 3 and 4 fish sample sets will include a range of fish sizes between 150 and 500 mm total length. Striped bass, largemouth bass, and sturgeon caught for mercury analysis will be within the CDFW legal catch size limits. Sample sets for fish less than 50 mm will include at least two fish species that are the primary prey species consumed by wildlife at sensitive life stages. In any subarea, if multiple species for a particular trophic level are not available, one species in the sample set is acceptable.

5.8.3.2 *Water Methylmercury and Total Mercury Compliance Monitoring*

Compliance points for irrigated agriculture and managed wetlands methylmercury allocations shall be developed during the Phase 1 Control Studies.

In conjunction with the Phase 1 Control Studies, nonpoint sources, irrigated agriculture, and managed wetlands shall develop and implement mercury and/or methylmercury monitoring, and submit monitoring reports.

NPDES facilities' compliance points for methylmercury and total mercury monitoring are the effluent monitoring points currently described in individual NPDES permits.

During Phase 1 and Phase 2, facilities listed in Table ~~IV-7B4-16~~ shall conduct effluent total mercury and methylmercury monitoring starting by 20 October 2012. Monitoring frequencies shall be defined in the NPDES permits. Effluent monitoring requirements will be re-evaluated during the Delta Mercury Control Program Reviews.

Facilities that begin discharging to surface water during Phase 1 and facilities for which effluent methylmercury data were not available at the time Table ~~IV-7B4-16~~ was compiled, shall conduct monitoring.

Compliance points and monitoring frequencies for MS4s required to conduct methylmercury and total mercury monitoring are those locations and wet and dry weather sampling periods currently described in the individual MS4 NPDES permits or otherwise determined to be representative of the MS4 service areas and approved by the Executive Officer on an MS4-specific basis.

Annual methylmercury loads in urban runoff in MS4 service areas within the Delta and Yolo Bypass may be calculated by the following method or by an alternate method approved by the Executive Officer. The annual methylmercury load in urban runoff for a given MS4 service area during a given year may be calculated by the sum of wet weather and dry weather methylmercury loads. To estimate wet weather methylmercury loads discharged by MS4 urban areas, the average of wet weather methylmercury concentrations observed at the MS4's compliance locations may be multiplied by the wet weather runoff volume estimated for all urban areas within the MS4 service area within the Delta and Yolo Bypass. To estimate dry weather methylmercury loads, the average of dry weather methylmercury concentrations observed at the MS4's compliance locations may be multiplied by the estimated dry weather urban runoff volume in the MS4 service area within the Delta and Yolo Bypass.

5.9 Diazinon and Chlorpyrifos Runoff into the Sacramento and Feather Rivers

The Regional Water Board requires a focused monitoring effort of agricultural pesticide runoff into the Sacramento and Feather Rivers.

The monitoring and reporting program for any waste discharge requirements or waiver of waste discharge requirements that addresses agricultural pesticide runoff into the Sacramento and Feather Rivers must be designed to collect the information necessary to:

- (1)- determine compliance with established water quality objectives and the loading capacity applicable to diazinon and chlorpyrifos in the Sacramento and Feather Rivers;
- (2)- determine compliance with load allocations for diazinon and chlorpyrifos;
- (3)- determine the degree of implementation of management practices to reduce off-site migration of diazinon and chlorpyrifos;
- (4)- determine the effectiveness of management practices and strategies to reduce off-site migration of diazinon and chlorpyrifos;
- (5)- determine whether alternatives to diazinon or chlorpyrifos are causing surface water quality impacts;
- (6)- determine whether the discharge causes or contributes to a toxicity impairment due to additive or synergistic effects of multiple pollutants; and
- (7)- demonstrate that management practices are achieving the lowest pesticide levels technically and economically achievable.

Dischargers are responsible for providing the necessary information. The information may come from the dischargers' monitoring efforts; monitoring programs conducted by State or federal agencies or collaborative watershed efforts; or from special studies that evaluate the effectiveness of management practices.

5.10 Diazinon and Chlorpyrifos Runoff in the San Joaquin River Basin

The Regional Water Board requires a focused monitoring effort of pesticide runoff from orchards and fields in the San Joaquin Valley.

The monitoring and reporting program for any waste discharge requirements or waiver of waste discharge requirements that addresses pesticide runoff from orchards and fields in the San Joaquin valley must be designed to collect the information necessary to:

- (1)- determine compliance with established water quality objectives and the loading capacity applicable to diazinon and chlorpyrifos in the San Joaquin River;
- (2)- determine compliance with established load allocations for diazinon and chlorpyrifos;
- (3)- determine the degree of implementation of management practices to reduce off-site movement of diazinon and chlorpyrifos;
- (4)- determine the effectiveness of management practices and strategies to reduce off-site migration of diazinon and chlorpyrifos;
- (5)- determine whether alternatives to diazinon and chlorpyrifos are causing surface water quality impacts;

- (6)- determine whether the discharge causes or contributes to a toxicity impairment due to additive or synergistic effects of multiple pollutants; and
- (7)- demonstrate that management practices are achieving the lowest pesticide levels technically and economically achievable.

Dischargers are responsible for providing the necessary information. The information may come from the dischargers' monitoring efforts; monitoring programs conducted by State or federal agencies or collaborative watershed efforts; or from special studies that evaluate the effectiveness of management practices.

5.11 Diazinon and Chlorpyrifos Runoff into the Sacramento-San Joaquin Delta Waterways

The Regional Water Board requires a focused monitoring effort of pesticide runoff from orchards and fields discharging to the Sacramento-San Joaquin Delta Waterways (as identified in Appendix 42).

The monitoring and reporting program for any waste discharge requirements or waiver of waste discharge requirements that addresses pesticide runoff into the Delta Waterways must be designed to collect the information necessary to:

- (1)- Determine compliance with established water quality objectives and loading capacity, applicable to diazinon and chlorpyrifos in the Delta Waterways.
- (2)- Determine compliance with the load allocations applicable to discharges of diazinon and chlorpyrifos into the Delta Waterways.
- (3)- Determine the degree of implementation of management practices to reduce off-site movement of diazinon and chlorpyrifos.
- (4)- Determine the effectiveness of management practices and strategies to reduce off-site migration of diazinon and chlorpyrifos.
- (5)- Determine whether alternatives to diazinon and chlorpyrifos are causing surface water quality impacts.
- (6)- Determine whether the discharge causes or contributes to a toxicity impairment due to additive or synergistic effects of multiple pollutants.
- (7)- Demonstrate that management practices are achieving the lowest pesticide levels technically and economically achievable.

Dischargers are responsible for providing the necessary information. The information may come from the dischargers' monitoring efforts; monitoring programs conducted by State or federal agencies or collaborative watershed efforts; or from special studies that evaluate the effectiveness of management practices.

With Regional Water Board Executive Officer approval, monitoring can be performed in a subset of the Delta Waterways listed in Appendix 42, and the tributaries of those waterways, to determine compliance with the water quality objectives, loading capacity and load allocations.

5.12 Clear Lake Nutrients

The responsible parties – Lake County, City of Clearlake, City of Lakeport, Caltrans, USBLM, USFS and irrigated agriculture – will work with Regional Water Board staff to estimate nutrient loadings from activities in the watershed. Loading estimates can be conducted using either water quality monitoring or computer modeling or a combination of the two.

5.13 Drinking Water Policy

Monitoring and surveillance for the Drinking Water Policy consists of two elements.

5.13.1 *Cryptosporidium* and *Giardia* Monitoring

It is not the intent of the Drinking Water Policy to require routine effluent monitoring for *Cryptosporidium* and *Giardia*. Rather, the Regional Water Board should work with interested stakeholders to gather data that could be used to help identify potential sources if *Cryptosporidium* levels increase to the trigger level (in [Section IV Chapter 4](#)) at an existing public water system intake in the future. This one-time *Cryptosporidium* special study could be conducted through the Delta Regional Monitoring Program or through another coordinated effort between dischargers, drinking water suppliers, and state agencies. The study will characterize ambient background conditions and potential sources to be used when and if exceedance of a trigger occurs. The study is envisioned to last two years targeting the period of Long Term 2 Enhanced Surface Water Treatment Rule second round monitoring. The study may consist of the following elements:

- Literature review to identify available source information
- Continued monitoring at existing public water systems intakes
- Monitoring at several ambient locations that will be identified as sites that integrate the pathogen sources where historic pathogen data are unavailable
- Monitoring at several representative discharge locations, if representative pathogen concentrations are not available or if coordinated data are necessary
- Hydrodynamic and particle tracking models to simulate the transport of pathogens from potential sources to public water system intakes
- If needed, focused studies to identify the viability and fate and transport of *Cryptosporidium*.

A report documenting the results of the special study should be prepared.

5.13.2 Organic carbon, salinity, and nutrients

As waste discharge requirements are renewed, the Regional Water Board should consider the necessity for inclusion of monitoring of organic carbon, salinity, and nutrients. This consideration should include a combination of the following:

- (1) The location with respect to drinking water intakes.
- (2) The importance of the load based on available information.
- (3) Whether the information exists that the load has significantly increased.
- (4) Importance of data to management decisions to protect drinking water.

For general permits, agriculture and small dischargers (smaller than 5 mgd), careful consideration should be made as to whether monitoring for these constituents is necessary.

Where water quality monitoring is performed to evaluate management practices to control other constituents, the Regional Water Board recommends monitoring of organic carbon, salinity, and nutrients be considered to evaluate the influence on drinking water quality.

5.14 Diazinon and Chlorpyrifos Discharges

The Central Valley Water Board will ensure that there will be a focused monitoring effort to monitor pesticide discharges in the Sacramento and San Joaquin River Basins.

The Board will require those that discharge diazinon and chlorpyrifos to provide information to the Board. This information may come from the dischargers' monitoring efforts; monitoring programs conducted by state or federal agencies or collaborative watershed efforts; or from special studies that evaluate the effectiveness of management practices. To be used in determining compliance with the water quality objectives, diazinon and chlorpyrifos concentration data must be from analysis with limits of quantification (reporting limits) at or below the water quality objective concentrations.

5.14.1 Agricultural Discharge Monitoring

The monitoring and reporting program for any waste discharge requirements or waiver of waste discharge requirements that address agricultural pesticide discharges to Table ~~III-2A3-4~~ Applicable Water Bodies must be designed to collect the information necessary to:

- (1) Determine compliance with established water quality objectives applicable to diazinon and/or chlorpyrifos;
- (2) Determine the extent of implementation of management practices to reduce off-site migration of diazinon and/or chlorpyrifos;
- (3) Determine the effectiveness of management practices and strategies to reduce off-site migration of diazinon and/or chlorpyrifos;
- (4) Determine whether alternatives to diazinon and/or chlorpyrifos are being discharged at concentrations which have the potential to cause or contribute to exceedances of applicable water quality objectives; and
- (5) Determine whether the discharge causes or contributes to a toxicity impairment due to additive or synergistic effects of multiple pollutants.

Representative monitoring may be used to determine compliance with the water quality objectives. Monitoring shall be representative of all Table ~~III-2A3-4~~ Applicable Water Bodies, either directly or through a representative monitoring program. Changes in monitoring requirements may be required if pesticide use data, management practices, runoff potential, or other information indicates additional or less monitoring, including discontinuation of monitoring for diazinon and/or chlorpyrifos is needed to meet the monitoring requirements.

5.14.2 Municipal Storm Water and Municipal and Domestic Wastewater Monitoring

The monitoring and reporting program for any waste discharge requirements that address discharges to Table ~~III-2A3-4~~ Applicable Water Bodies from

- municipal storm water
- municipal or domestic wastewater, or
- other non-agricultural sites where diazinon or chlorpyrifos are applied,

must be designed to collect the information necessary to:

- (1) Determine whether the discharge causes or contributes to an exceedance of water quality objectives for diazinon and/or chlorpyrifos;
- (2) Determine whether alternatives to diazinon and/or chlorpyrifos are being discharged at concentrations with the potential to cause or contribute to exceedances of water quality objectives. In determining if monitoring for alternatives to diazinon and/or chlorpyrifos is necessary, and to identify alternatives for which monitoring might be appropriate, the Board will consult and coordinate with DPR and will consider the commercial availability of analytical methods.

With Executive Officer approval, representative monitoring programs, including coordinated regional monitoring programs, may be used to meet the monitoring requirements listed above. Regular monitoring for diazinon and chlorpyrifos and alternatives to diazinon and chlorpyrifos can be discontinued upon a showing by a discharger that such pesticides are not found in the effluent at concentrations with the potential to cause or contribute to exceedances of water quality objectives.

6 GLOSSARY

Regional Water Board: California Regional Water Quality Control Board, Central Valley Region (Wat. Code, § 13203)

State Water Board: State Water Resources Control Board

Attachment 1b

Reformat Amendments to the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins

Revised Appendices 2, 4, 5, 6, 7, 8, 11 and 12

Changes shown in **red** and ~~strikeout~~ and underline

Appendix 2

State Water Board Resolution No. 68-16 Statement of Policy with Respect to Maintaining High Quality of Waters in California

https://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/1968/rs68_016.pdf

Appendix 4

State Water Board Resolution No. 75-58 Water Quality Control Policy on the Use and Disposal of Inland Waters Used for Powerplant Cooling

https://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/1975/rs75_058.pdf

Appendix 5

State Water Board Resolution No. 77-1 Policy with Respect to Water Reclamation in California

https://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/1977/rs77_001.pdf

Appendix 6

State Water Board Resolution No. 87-22 Policy on the Disposal of Shredder Waste

https://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/1987/rs1987_0022.pdf

Appendix 7

State Water Board Resolution No. 88-23 Policy Regarding the Underground Storage Tank Pilot Program

https://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/1988/rs1988_0023.pdf

Appendix 8

State Water Board Resolution No. 88-63 Sources of Drinking Water Policy

https://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/2006/rs2006_0008_rev_rs88_63.pdf

Appendix 11

State Water Board Water Quality Control Plan for Temperature in Coastal and Interstate Waters and Enclosed Bays and Estuaries in California (Thermal Plan)

https://www.waterboards.ca.gov/water_issues/programs/ocean/docs/wgplans/thermpln.pdf

Appendix 12

State Water Board Resolution No. 92-82 Exception to the Thermal Plan for Sacramento Regional County Sanitation District

https://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/1992/rs1992_0082.pdf

Attachment 2a

Reformat Amendments to the Water Quality Control Plan for the Tulare Lake Basin

Changes shown in **red** and ~~strikeout~~ and underline

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FOREWORD TO THE SECOND EDITION

Water quality control plans, or basin plans, contain California's administrative policies and procedures for protecting state waters. Basin plans are required by the state Porter-Cologne Water Quality Control Act (California Water Code Section 13240). In addition, Section 303 of the federal Clean Water Act requires states to adopt water quality standards that “consist of the designated uses of the navigable waters involved and the water quality criteria for such waters based upon such uses.”

Each of California's nine regional water quality control boards must formulate and adopt a basin plan for all areas within its region. The basin plans must conform with statewide policy set forth by the legislature and by the State Water Resources Control Board. Basin plans consist of designated beneficial uses to be protected, water quality objectives to protect those uses, and a program of implementation needed for achieving the objectives {California Water Code, Section 13050(j)}.

Beneficial uses, together with their corresponding water quality objectives, meet federal regulatory criteria for water quality standards. Hence, California's basin plans serve as regulatory references for meeting both State and federal requirements for water quality control {40 CFR Parts 130 and 131}. One significant difference between the state and federal programs is that California's basin plans establish standards for ground waters in addition to surface waters.

Basin plans are adopted and amended by regional water boards under a structured process involving full public participation and state environmental review. Basin plans and amendments do not become effective until approved by the State Water Board. Regulatory provisions must be approved by the Office of Administrative Law. Adoption or revision of surface water standards are subject to the approval of the U. S. Environmental Protection Agency before they become accepted standards for the federal program.

Basin plans complement water quality control plans adopted by the State Water Board. It is the intent of the state and regional water boards to maintain basin plans in an updated and readily available edition that reflects all current water quality control programs.

The first edition of this *Water Quality Control Plan for the Tulare Lake Basin* (Basin Plan) was adopted by the California Regional Water Quality Control Board, Central Valley Region, on 25 July 1975, and became effective following approval by the State Water Board on 21 August 1975 and the U. S. Environmental Protection Agency (EPA) in June 1976. Although several revisions have been adopted and approved since 1975, this revision is the first complete rewrite of the text of the Basin Plan.

Regional Water Board resolutions adopted prior to 17 August 1995, that revise or supplement the first edition of the plan which are not expressly incorporated by reference into the second edition of the plan are superceded.

In this Basin Plan, "Regional Water Board" refers to the Central Valley Regional Water Quality Control Board and "State Water Board" refers to the State Water Resources Control Board.

1.1 BASIN DESCRIPTION

The Central Valley Region includes about 40% of the land in California and stretches from the Oregon border to the Kern County/Los Angeles County line. It is bound by the Sierra Nevada Mountains on the east and the Coast Range on the west. The Region is divided into three basins: the Sacramento River Basin, the San Joaquin River Basin, and the Tulare Lake Basin. This basin plan covers only the Tulare Lake Basin. The Sacramento River Basin and the San Joaquin River Basin are covered in a separate basin plan.

The Tulare Lake Basin comprises the drainage area of the San Joaquin Valley south of the San Joaquin River (See Figure [H-1](#)).

Note: In 1976, the U. S. Geologic Survey, the Department of Water Resources, and the State Water Resources Control Board agreed upon the hydrologic boundaries for basins within California. The agreed boundaries did not match the planning boundaries in certain cases such as between the San Joaquin River Basin and the Tulare Lake Basin. The planning boundary between the San Joaquin River Basin and the Tulare Lake Basin follows the southern watershed boundaries of the Little Panoche Creek, Moreno Gulch, and Capita Canyon to boundary of the Westlands Water District. From here, the boundary follows the northern edge of the Westlands Water District until its intersection with the Firebaugh Canal Company's Main Lift Canal. The basin boundary then follows the Main Lift Canal to the Mendota Pool and continues eastward along the channel of the San Joaquin River to the southern boundary of the Little Dry Creek watershed (Hydrologic Subareas No. 540.70 and 545.30) and then follows along the southern boundary of the San Joaquin River drainage basin.

Surface water from the Tulare Lake Basin only drains north into the San Joaquin River in years of extreme rainfall. This essentially closed basin is situated in the topographic horseshoe formed by the Diablo and Temblor Ranges on the west, by the San Emigdio and Tehachapi Mountains on the south, and by the Sierra Nevada Mountains on the east and southeast.

The Basin encompasses approximately 10.5 million acres, of which approximately 3.25 million acres are in federal ownership. Kings Canyon and Sequoia National Parks and substantial portions of Sierra, Sequoia, Inyo, and Los Padres National Forests are included in the Basin. Valley floor lands (i.e., those having a land slope of less than 200 feet per mile) make up slightly less than one-half of the total basin land area. The maximum length and width of the Basin are about 170 miles and 140 miles, respectively. The valley floor is approximately 40 miles in width near its southern end, widening to a maximum of 90 miles near the Kaweah River.

Urban development is generally confined to the foothill and eastern valley floor areas. Major concentrations of population occur in or near the metropolitan areas of Bakersfield, Fresno, Porterville, Hanford, Tulare, and Visalia.

The Basin is one of the most important agricultural centers of the world. Industries related to agriculture, such as food processing and packaging (including canning, drying, and wine making), are prominent throughout the area. Producing and refining petroleum lead non-agricultural industries in economic importance.

Surface water supplies tributary to or imported for use within the Basin are inadequate to support the present level of agricultural and other development. Therefore, ground water resources within the valley are being mined to provide additional water to supply demands. Water produced in extraction of crude oil is used extensively to supplement agricultural irrigation supply in the Kern River sub-basin.

The Kings, Kaweah, Tule, and Kern Rivers, which drain the west face of the Sierra Nevada Mountains, are of excellent quality and provide the bulk of the surface water supply native to the Basin. Imported surface supplies, which are also of good quality, enter the Basin through the San Luis Canal/California Aqueduct System, Friant-Kern Canal, and the Delta-Mendota Canal. Adequate control to protect the quality of these resources is essential, as imported surface water supplies contribute nearly half the increase of salts occurring within the Basin.

Buena Vista Lake and Tulare Lake, natural depressions on the valley floor, receive flood water from the major rivers during times of heavy runoff. During extremely heavy runoff, flood flows in the Kings River reach the San Joaquin River as surface outflow through the Fresno Slough. These flood flows represent the only significant outflows from the Basin.

Besides the main rivers, the basin also contains numerous mountain streams. These streams have been administratively divided into eastside streams and westside streams using Highway 58 from Bakersfield to Tehachapi. Streams from the Tehachapi and San Emigdio Mountains are grouped with westside streams. In contrast to eastside streams, which are fed by Sierra snowmelt and springs from granitic bedrock, westside streams derive from marine sediments and are highly mineralized, and intermittent, with sustained flows only after extended wet periods.

Surface water hydrologic units within the Tulare Lake Basin have been defined and numbered by the Department of Water Resources, as shown on Figure H2-1. Eastside streams are surface waters in hydrologic units 552, 553, 554, and 555. Westside streams are surface waters in hydrologic units 556 and 559 and portions of 541 and 542. Valley floor waters are surface waters in hydrologic units 551, 557, and 558. All natural surface waters within the Basin have designated beneficial uses (See Table H2-1).

Normally all native surface water supplies, imported water supplies, and direct precipitation percolate into valley ground water if not lost through consumptive use, evapotranspiration, or evaporation.

Ground water is defined as subsurface water that occurs beneath the ground surface in fully saturated zones within soils and other geologic formations. Where ground water occurs in a saturated geologic unit that contains sufficient permeability and thickness to yield sufficient water to sustain a well or spring, it can be defined as an aquifer {USGS, Water Supply Paper 1988, 1972}. A ground water basin is defined as a hydrogeologic unit containing one large aquifer or several connected and interrelated aquifers {Todd, Groundwater Hydrology, 1980}.

Major ground water basins underlie the valley floor, and there are scattered smaller basins in the foothill areas and mountain valleys. In many parts of the Basin, usable ground waters occur outside of these identified basins. There are water-bearing geologic units within ground water basins in the Basin that do not meet the definition of an aquifer. Therefore, for basin planning and regulatory purposes, the term "ground water" includes all subsurface waters that occur in fully saturated zones and fractures within soils and other geologic formations, whether or not these waters meet the definition of an aquifer or occur within identified ground water basins.

Generally, the quality and the beneficial uses of the deep ground waters remain the same as before man entered the valley. A few areas within the Basin have ground waters that are naturally unusable or of marginal quality for certain beneficial uses.

Because of the closed nature of the Tulare Lake Basin, there is little subsurface outflow. Thus, salts accumulate within the Basin due to importation and evaporative use of the water. The paramount water quality problem in the Basin is the accumulation of salts. This problem is compounded by the overdraft of ground water for municipal, agricultural, and industrial purposes, and the use of water from deeper formations and outside the basin which further concentrates salts within remaining ground water.

1.2 WASTE DISCHARGE TYPES

Discharges can be classified as point source or nonpoint source discharges. A point source discharge usually refers to waste emanating from a single, identifiable point. A nonpoint source discharge usually refers to waste emanating from diffused locations. Agricultural runoff may discharge to waters of the state from a pipe, but is treated as a nonpoint source.

Both sources may cause health hazards, contamination, and nuisance problems and both must be managed to reduce salt contributions. Point sources may be high in heavy metals and other toxic materials. Nonpoint source wastes traditionally contribute more dissolved minerals and sediments, but have also contaminated waters with pesticides. Nonpoint source discharges contribute the largest portion of the waste load to surface and ground water resources within the Tulare Lake Basin.

Effective water quality management requires more than control of point source discharges. It must respond to many factors such as water use, land use, social and economic needs, and various other activities within the Basin. Although only a few management actions involve facility construction of some kind, all involve some cost to society. The Regional Water Board has authority to control both categories of discharge, but the approach is less direct for nonpoint sources.

Not fitting either category are spills, leaks, above and under ground storage tanks, and other sites that discharge illegally and impact waters of the state. The Regional Water Board has authority to require investigation and cleanup of these sites.

1.2.1 Point Sources

Problems from point source wastes are highly identifiable and for several decades have been subject to regulation. However, they must still be actively managed to protect the state's waters. Regulated point sources include municipal wastewater, oil field wastewater, winery discharges, solid waste sites and other industrial discharges. These dischargers must apply for and obtain waste discharge requirements or a waiver.

1.2.2 Nonpoint Sources

Nonpoint sources include drainage and percolation from a variety of activities, such as agriculture, forestry, recreation, and storm runoff. Specific sources of nonpoint source pollution may be difficult to identify, treat, or regulate. The goal is to reduce the adverse impact of nonpoint source discharges on the Basin's water resources through better management of these activities.

Much of the nonpoint source pollutants originate from agriculture. The Basin's economy is dependent upon agriculture, which is dependent upon water. Water supplies are finite. Some ground water areas are being overdrafted and additional water is needed to sustain the present intensity of farming. When new lands are put under irrigation, or when cropping patterns are changed, the potential for eliminating overdraft may be lost. Efficient use and development of supplies within the Basin can provide some water to meet growth demands, but to alleviate the projected overdraft, imported water supplies will still be required. The imported water quality should be the highest quality possible to prolong and protect good quality ground water.

Adequate disposal of collected agricultural drainage water from subsurface drains is essential to sustain agriculture in some areas and provide water quality protection. The preferred and long deferred permanent solution of exporting drainage water to San Francisco Bay may not be feasible. In the interim, evaporation ponds are being used for disposal of these saline waters. However, the ponds have created an impact on wildlife that must be mitigated for this interim disposal option to remain viable.

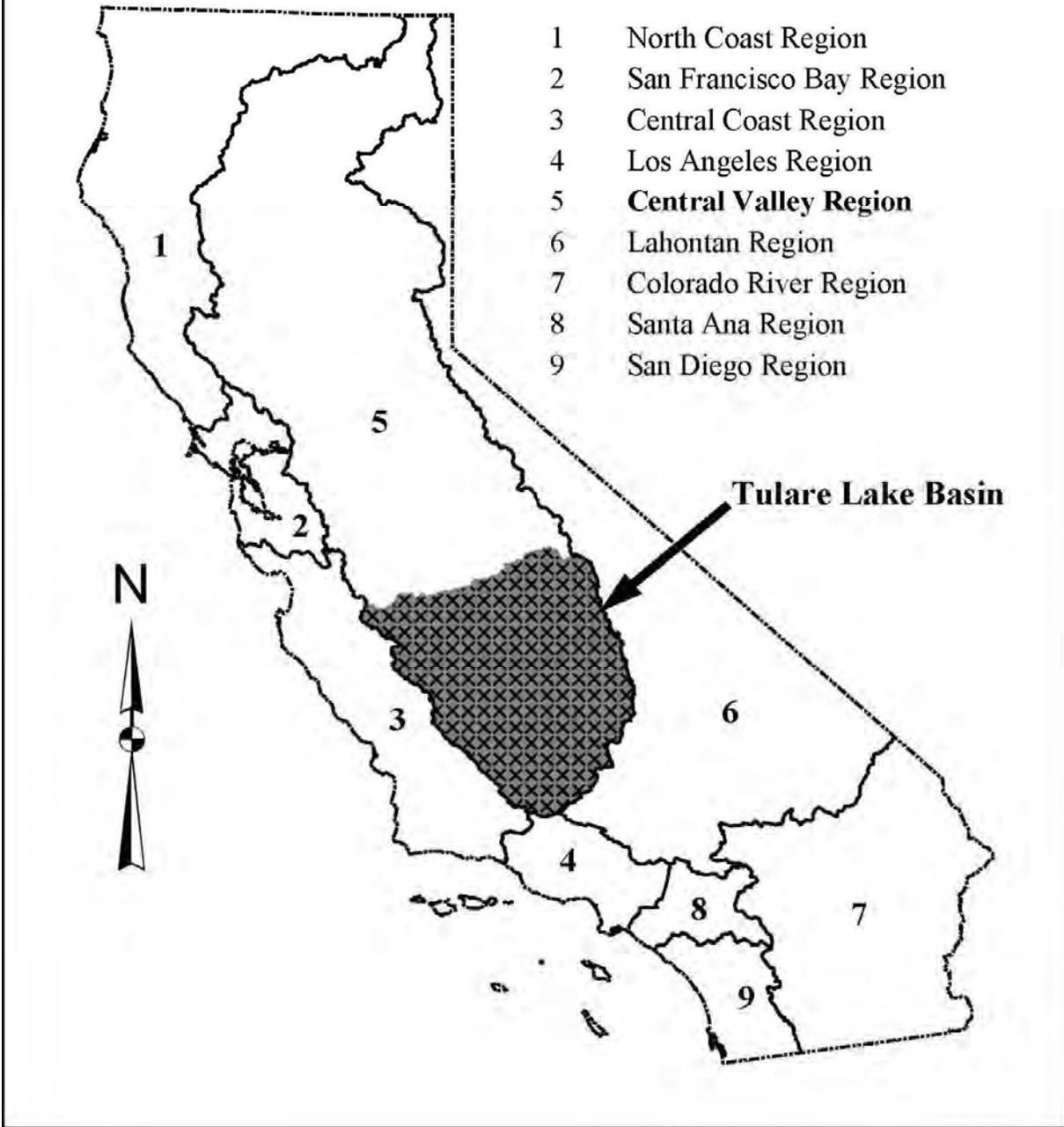
Salinity increases in ground water can ultimately eliminate the beneficial use of the resource. This loss will not be immediate, but control of the increase is a major part of this plan. Salt loads reaching the ground water body must be reduced. Storage of salt in the soil through increased irrigation efficiency is being done, but is only a temporary solution. Current fertilization and soil amendment practices should be reviewed. Methods to control the leachate from newly developed lands should be studied.

Watersheds must be managed to protect water quality. This can be accomplished within the concept of multiple uses of resources. Esthetic, recreational, wildlife, and other uses should receive consideration. Two historical problems within the Tulare Lake Basin are poor sanitation associated with recreational use and erosion from construction, logging, grazing, and irrigated agriculture. Management of these activities has improved the situation and must continue to assure no significant adverse effect on pristine streams. Erodible material must be stabilized so that turbidity in streams will be of limited intensity and duration. Activities in stream protection zones must be regulated. Provisions should be made to protect fishery flow releases in designated reaches of streams.

Waste disposal from land developments and from animals in confinement must conform with the State Water Board's *Water Quality Control Policy for Siting, Design, Operation, and Maintenance of Onsite Wastewater Treatment Systems* (OWTS Policy). New developments must consider collection systems and should connect if

within the sphere of influence of an established collection and treatment system. Septic tank pumpings must be treated and disposed of in a way that prevents impact to waters of the state.

FIGURE 1-1
REGIONAL WATER QUALITY CONTROL BOARDS
TULARE LAKE BASIN LOCATION MAP



II.2 EXISTING AND POTENTIAL BENEFICIAL USES

Protection and enhancement of beneficial uses of water against quality degradation is a basic requirement of water quality planning under the Porter-Cologne Water Quality Control Act. In setting water quality objectives, the Regional Water Board must consider past, present, and probable future beneficial uses of water.

Significant points concerning beneficial uses are:

- ~~1~~(1) All water related problems can be stated in terms of whether there is water of sufficient quantity and quality to protect or enhance beneficial uses.
- ~~2~~(2) Fish, plants, and other wildlife, as well as humans, depend on and use water beneficially both directly or indirectly.
- ~~3~~(3) Defined beneficial uses do not include all possible uses of water. For example, use of waters for disposal of wastewaters is not included as a beneficial use. Similarly, the use of water for the dilution of salts in other waters is not a beneficial use. These may, in some cases, be reasonable and desirable uses of water, but they are not protected uses and are subject to regulation as activities that may harm protected uses.
- ~~4~~(4) The protection and enhancement of beneficial uses requires that certain quality and quantity objectives be met for surface and ground waters.
- ~~5~~(5) Quality of water in upstream reaches and upper aquifers may impact the quality and beneficial uses of downstream reaches and lower aquifers.

Beneficial use designations (and water quality objectives, see Chapter ~~III~~3, or variance of a water quality standard, see Chapter ~~IV~~4) must be reviewed at least once during each three-year period for potential modification as appropriate {40 CFR Part 131.20}.

The beneficial uses and abbreviations as defined and listed below are the standard designations used in all basin plans in California with the exception of the definition for Fish Spawning (SPWN) and Warm Freshwater Habitat (WARM). The standard statewide definition for SPWN includes spawning of both warm and cold water fish. In the Tulare Lake Basin, warm water spawning is considered to occur wherever a warm freshwater habitat exists while only select cold water habitats are suitable for spawning by cold water species. For example, certain cold water species require gravel beds in order to spawn. For this reason, for the Tulare Lake Basin, SPWN has been modified to limit the designation to suitable reaches of cold water streams and WARM has been modified to clarify that it includes sensitive fish propagation stages.

Municipal and Domestic Supply (MUN) - Uses of water for community, military, or individual water supply systems, including, but not limited to, drinking water supply.

Agricultural Supply (AGR) - Uses of water for farming, horticulture, or ranching, including, but not limited to, irrigation, stock watering, or support of vegetation for range grazing.

Industrial Service Supply (IND) - Uses of water for industrial activities that do not depend primarily on water quality, including, but not limited to, mining, cooling water supply, hydraulic conveyance, gravel washing, fire protection, or oil well repressurization.

Industrial Process Supply (PRO) - Uses of water for industrial activities that depend primarily on water quality.

Hydropower Generation (POW) - Uses of water for hydropower generation.

Water Contact Recreation (REC-1) - Uses of water for recreational activities involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, swimming, wading, water-skiing, skin and scuba diving, surfing, white water activities, fishing, or use of natural hot springs.

Non-Contact Water Recreation (REC-2) - Uses of water for recreational activities involving proximity to water, but where there is generally no body contact with water, nor any likelihood of ingestion of water. These uses include, but are not limited to, picnicking, sunbathing, hiking, beachcombing, camping, boating, tidepool and marine life study, hunting, sightseeing, or aesthetic enjoyment in conjunction with the above activities.

Warm Freshwater Habitat (WARM) - Uses of water that support warm water ecosystems, including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates.

WARM includes support for reproduction and early development of warm water fish.

Cold Freshwater Habitat (COLD) - Uses of water that support cold water ecosystems, including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates.

Wildlife Habitat (WILD) - Uses of water that support terrestrial or wetland ecosystems, including, but not limited to, preservation and enhancement of terrestrial habitats or wetlands, vegetation, wildlife (e.g., mammals, birds, reptiles, amphibians, invertebrates), or wildlife water and food sources.

Rare, Threatened, or Endangered Species (RARE) - Uses of water that support habitats necessary, at least in part, for the survival and successful maintenance of plant or animal species established under state or federal law as rare, threatened or endangered.

Spawning, Reproduction, and/or Early Development (SPWN) - Uses of water that support high quality aquatic habitats suitable for reproduction and early development of fish.

SPWN shall be limited to cold water fisheries.

Migration of Aquatic Organisms (MIGR) - Uses of water that support habitats necessary for migration or other temporary activities by aquatic organisms, such as anadromous fish.

Ground Water Recharge (GWR) - Uses of water for natural or artificial recharge of ground water for purposes of future extraction, maintenance of water quality, or halting of saltwater intrusion into freshwater aquifers.

Freshwater Replenishment (FRSH) - Uses of water for natural or artificial maintenance of surface water quantity or quality.

Aquaculture (AQUA) - Uses of water for aquaculture or mariculture operations including, but not limited to, propagation, cultivation, maintenance, or harvesting of aquatic plants and animals for human consumption or bait purposes.

Preservation of Biological Habitats of Special Significance (BIOL) - Uses of water that support designated areas or habitats, such as established refuges, parks, sanctuaries, ecological reserves, or Areas of Special Biological Significance (ASBS), where the preservation or enhancement of natural resources requires special protection.

Navigation (NAV) - Uses of water for shipping, travel, or other transportation by private, military, or commercial vessels.

The existing and probable future beneficial uses which currently apply to surface waters are presented in Figure H2-1 and Table H2-1. The beneficial uses of any specifically identified water body generally apply to its tributary streams. In some cases a beneficial use may not be applicable to the entire body of water. In these cases the Regional Water Board's judgement will be applied. It should be noted that it is impractical to list every surface water body in the Region. For unidentified water bodies, the beneficial uses will be evaluated on a case-by-case basis.

Upstream from the foothill reservoirs, the quality of surface waters remains good to excellent. The quality of the major streams is suitable for all beneficial uses. Beneficial uses below the dams, however, may be significantly impacted because of the reduced flows in the channels.

For ground water, the following beneficial uses have been identified and occur throughout the Basin: Municipal and Domestic Supply (MUN), Agricultural Supply (AGR), Industrial Service Supply (IND), Industrial Process Supply (PRO), Water Contact Recreation (REC-1), and Wildlife Habitat (WILD).

Figure H2-2 and Table H2-2 present the AGR, IND, PRO, REC-1, REC-2, and WILD beneficial uses of ground water that existed as of 1993. Due to the "Sources of Drinking Water Policy," all ground waters are designated MUN (the use may be existing or potential) unless specifically exempted by the Regional Water Board and approved for exemption by the State Water Board. Ground water areas exempted from MUN are footnoted in Table H2-2. In addition, unless otherwise designated by the Regional Water Board, all ground waters in the Region are considered suitable or potentially suitable, at a minimum, for agricultural supply (AGR), industrial supply (IND), and industrial process supply (PRO).

Existing beneficial uses generally apply within the listed Detailed Analysis Unit (DAU). Due to the size of the DAUs, however, the listed uses may not exist throughout the DAU. For the purpose of assigning beneficial uses, the term ground water is defined in Chapter H1.

In considering any exceptions to the beneficial use designation of MUN, the Regional Water Board employs the following criteria:

- ~~1~~(1) The TDS must exceed 3,000 mg/l (5,000 µmhos/cm EC) and the aquifer cannot be reasonably expected to supply a public water system, or
- ~~2~~(2) There is contamination, either by natural processes or by human activity (unrelated to a specific pollution incident), that cannot reasonably be treated for domestic use using either Best Management Practices or best economically achievable treatment practices, or
- ~~3~~(3) The water source cannot provide sufficient water to supply a single well capable of producing an average, sustained yield of 200 gallons per day, or
- ~~4~~(4) The aquifer is regulated as a geothermal energy producing source or has been exempted administratively pursuant to 40 CFR, Section 146.4 for the purpose of underground injection of fluids associated with the production of hydrocarbon or geothermal energy, provided that these fluids do not constitute a hazardous waste under 40 CFR, Section 261.3.

To be consistent with State Water Board Resolution No. 88-63 in making exceptions to beneficial use designations other than municipal and domestic supply (MUN), the Regional Water Board will consider criteria for exceptions, parallel to Resolution No. 88-63 exception criteria, which would indicate limitations on those other beneficial uses as follows:

In making any exceptions to the beneficial use designation of agricultural supply (AGR), the Regional Water Board will consider the following criteria:

- ~~1~~(1) There is pollution, either by natural processes or by human activity (unrelated to a specific pollution incident), that cannot reasonably be treated for agricultural use using either Best Management Practices or best economically achievable treatment practices, or
- ~~2~~(2) The water source does not provide sufficient water to supply a single well capable of producing an average, sustained yield of 200 gallons per day, or
- ~~3~~(3) The aquifer is regulated as a geothermal energy producing source or has been exempted administratively pursuant to 40 CFR, Section 146.4 for the purpose of underground injection of fluids associated with the production of hydrocarbon or geothermal energy, provided that these fluids do not constitute a hazardous waste under 40 CFR Section 261.3.

In making any exceptions to the beneficial use designation of industrial supply (IND or PRO), the Regional Water Board will consider the following criteria:

| ~~1~~(1) There is pollution, either by natural processes or by human activity (unrelated to a specific pollution incident), that cannot reasonably be treated for industrial use using either Best Management Practices or best economically achievable treatment practices, or

| ~~2~~(2) The water source does not provide sufficient water to supply a single well capable of producing an average, sustained yield of 200 gallons per day.

**TABLE H2-1
TULARE LAKE BASIN PLAN
SURFACE WATER BENEFICIAL USES**

Stream	MUN	AGR	IND	PRO	POW	REC-1	REC-2	WARM	COLD	WILD	RARE	SPWN	GWR	FRSH
552, 551 Kings River														
North Fork, Upper					•	•	•	•	•	•	•	•		•
Main Fork, Above Kirch Flat	•					•	•	•	•	•	•	•		•
Kirch Flat to Pine Flat Dam (Pine Flat Reservoir)					•	•	•	•	•	•				•
Pine Flat Dam to Friant-Kern	•	•			•	•	•	•	•	•		•	•	•
Friant Kern to Peoples Weir	•	•		•		•	•	•		•			•	
Peoples Weir to Stinson Weir on North Fork and to Empire Weir No. 2 on South Fork		•				•	•	•		•			•	
553, 558 Kaweah River														
Above Lake Kaweah	•				•	•	•	•	•	•	•	•		•
Lake Kaweah					•	•	•	•		•				•
Below Lake Kaweah	•	•	•	•		•	•	•		•			•	
555, 558 Tule River														
Above Lake Success	•	•			•	•	•	•	•	•	•	•		•
Lake Success		•			•	•	•	•		•				•
Below Lake Success	•	•	•	•		•	•	•		•			•	
554, 557 Kern River														
Above Lake Isabella	•				•	•	•	•	•	•	•	•		•
Lake Isabella					•	•	•	•	•	•				•
Lake Isabella to KR-1‡					•	•	•	•	•	•	•			
Below KR-1‡	•	•	•	•	•	•	•	•		•	•		•	
555, 558 Poso Creek		•				•	•	•	•	•			•	•
552 Mill Creek, Source to Kings River	•					•	•	•		•			•	•
552, 553, 554, 555 Other East Side Streams	•	•				•	•	•	•	•			•	
556, 559 West Side Streams		•	•	•		•	•	•		•	•		•	
551, 557, 558 Valley Floor Waters		•	•	•		•	•	•		•	•		•	

‡KR-1: Southern California Edison Kern River Powerhouse No. 1.

**TABLE H2-2
TULARE LAKE BASIN
GROUNDWATER BENEFICIAL USES**

HYDROLOGIC UNIT	DAU	MUN	AGR	IND	PRO	REC-1	REC-2	WILD
Delta-Mendota Basin								
	216	•	•	•				
	235	•	•	•	•		•	•
	237	•	•	•				
Kings Basin								
	233	•	•	•	•	•	•	
	234	•	•	•				
	235	•	•	•	•			
	236	•	•	•	•			
	237	•	•	•				
	239	•	•	•	•			
	240	•	•					
Kaweah Basin	242	•	•	•	•	•	•	
Tulare Lake Basin								
	238	•	•	•	•			
	241	•	•	•				
	246	•	•	•				
Tule Lake Basin								
	243	•	•	•	•			•
	257	•	•					
Pleasant Valley Basin	245	•	•	•				
Westside Basin	244	•	•	•				
Kern County Basin								
	245	•	•	•				
	254 ^a	•	•	•	•	•	•	•
	255	•	•	•				•
	256	•	•	•	•			
	257	•	•	•		•		
	258	•	•	•	•			
	259 ^b	•	•	•				
	260	•		•				
	261	•	•	•				

Table 2-1 notes are located after the table.

**TABLE H2-2
TULARE LAKE BASIN
GROUNDWATER BENEFICIAL USES* (continued)**

HYDROLOGIC UNIT	DAU	MUN	AGR	IND	PRO	REC-1	REC-2	WILD
Satellite Basins								
Panoche Valley		•						
Squaw Valley		•	•	•				
Kern River Valley		•	•	•				
Walker Basin Creek Valley		•	•	•				
Cummings Valley		•	•	•		•	•	
Tehachapi Valley West		•	•	•		•	•	•
Castac Lake Valley		•	•	•				
Vallecitos Creek Valley		•						
Cedar Grove Area		•						
Three Rivers Area		•						
Springville Area		•		•				
Templeton Mountain Area		•						
Monache Meadows Area		•	•				•	
Secator Canyon Valley		•						
Rockhouse Meadow Valley		•				•		
Linns Valley		•		•				
Brite Valley		•	•	•		•	•	•
Bear Valley		•	•	•		•	•	•
Cuddy Canyon Valley		•		•			•	
Cuddy Ranch Area		•	•					
Cuddy Valley		•	•	•				
Mill Potrero Area		•		•			•	
All Other Ground Waters ^c		•						

Table 2-1 notes are located after the table.

* Table H2-2 presents the AGR, IND, PRO, REC-1, REC-2, and WILD beneficial uses of ground water that existed as of 1993.

TABLE H2-2
TULARE LAKE BASIN
GROUND WATER BENEFICIAL USES (continued)
Beneficial Use Exceptions

- ^a Ground water contained in the lower Transition Zone and Santa Margarita formation within 3,000 feet of the Kern Oil and Refining Company proposed injection wells in Section 25, T30S, R28E, MDB&M, is not suitable, or potentially suitable, for municipal or domestic supply (MUN).
- Ground water contained in the basal Etchegoin formation, Chanac formation, and Santa Margarita formation within, and extending to one-quarter mile outside the administrative boundary of the Fruitvale Oil Field, as defined by the State of California, Department of Conservation, Division of Oil and Gas in Application for Primacy in the Regulation of Class II Injection Wells Under Section 1425 of the Safe Drinking Water Act, dated April 1981, is not suitable, or potentially suitable, for municipal or domestic supply (MUN). However, the upper ground water zone (ground water to a depth of 3,000 feet) retains the MUN beneficial use.
- ^b Ground water and spring water within 1/2 mile radius of the McKittrick Waste Treatment (formerly Liquid Waste Management) site in Section 29, T30S, R22E, MDB&M, are not suitable, or potentially suitable, for municipal or domestic supply (MUN).
- ^c Ground water in the San Joaquin, Etchegoin, and Jacalitos Formations within one-half mile of existing surface impoundments P-1, P-2, P-3, P-4, P-4 1/2, P-5, P-6, P-7, P-8, P-9, P-10, P-11, P-12/12A, P-13, P-14, P-15, P-16, P-17, P-18, P-19, and P-20, and proposed surface impoundments P-21, P-24, P-25, P-27, P-28, and P-29 at the Kettleman Hills Facility (Sections 33 and 34, T22S, R18E, and Section 3, T23S, R18E, MDB&M) of Chemical Waste Management is not a municipal or domestic supply (MUN).

Figure 2-1 is available at:

http://www.waterboards.ca.gov/centralvalley/water_issues/basin_plans/tlb_fig2_1.pdf

Figure 2-2 is available at:

http://www.waterboards.ca.gov/centralvalley/water_issues/basin_plans/tlb_fig2-2.pdf

~~Figures II-1 and II-2 will be included at 1:500,000 scale in map pockets in back of final plan.~~

The Porter-Cologne Water Quality Control Act defines water quality objectives as "...the limits or levels of water quality constituents or characteristics which are established for the reasonable protection of beneficial uses of water or the prevention of nuisance within a specific area" {Water Code Section 13050(h)}. It also requires the Regional Water Board to establish water quality objectives, while acknowledging that it is possible for water quality to be changed to some degree without unreasonably affecting beneficial uses. In establishing water quality objectives, the Regional Water Board must consider, among other things, the following factors:

- Past, present, and probable future beneficial uses;
- Environmental characteristics of the hydrographic unit under consideration, including the quality of water available thereto;
- Water quality conditions that could reasonably be achieved through the coordinated control of all factors which affect water quality in the area;
- Economic considerations;
- The need for developing housing within the region;
- The need to develop and use recycled water. {Water Code Section 13241}

The federal Clean Water Act requires a state to submit for approval of the Administrator of the U. S. Environmental Protection Agency (USEPA) all new or revised water quality standards which are established for surface and ocean water. The ground water objectives contained in this plan are not required by the federal Clean Water Act. In California, water quality standards are either water body specific or are based on beneficial uses designated for a water body and the water quality objectives that protect those uses.

There are six important points about water quality objectives. The first point is that water quality objectives can be revised through the basin plan amendment process. Objectives may apply region-wide or specifically to individual water bodies or parts of water bodies. Site-specific objectives may be developed if the Regional Water Board believes they are appropriate. Federal regulations require the review of water quality standards at least every three years. These "Triennial Reviews" provide one opportunity to evaluate the effectiveness of existing water quality objectives because the reviews begin with an identification of potential and actual water quality problems. The results of the Triennial Review are used to identify and prioritize Regional Water Board actions to achieve objectives and protect beneficial uses. Actions include assessment, remediation, monitoring, or whatever else may be appropriate, to address water quality problems. For example, a beneficial use may be impacted because the existing water quality objective is inadequate. This water quality objective should be reevaluated and a proper objective should be amended into the Basin Plan, along with a plan and schedule for attainment. In other cases, the existing water quality objective may be adequate and it may be necessary to develop new implementation strategies to address the problem.

Changes to a water quality objective can also occur because of new scientific information on the effects of a specific waste constituents. A major source of information is USEPA data on the effects of chemical and other constituent concentrations on particular aquatic species and human health. Other common information sources for data on protection of beneficial uses include the National Academy of Science, which has published data on bioaccumulation, and the federal Food and Drug Administration, which has issued criteria for unacceptable levels of chemicals in fish and shellfish used for human consumption. The Regional Water Board may also make use of other state or federal agency information sources when assessing new or revised water quality objectives.

The second point is that achievement of water quality objectives depends on applying them to regulate controllable water quality factors, although regulating controllable water quality factors may not necessarily cause water quality objectives to be achieved. Controllable water quality factors are those actions, conditions, or circumstances resulting from human activities that may influence the quality of the waters of the State, that are subject to the authority of the State Water Board or the Regional Water Board, and that may be reasonably controlled. These factors are subject to

the authority of the State Water Board or the Regional Water Board. Controllable factors are not allowed to degrade water quality unless it is demonstrated that degradation is consistent with maximum benefit to the people of the State. In no cases may controllable water quality factors unreasonably affect present and anticipated beneficial uses of water nor result in water quality less than that prescribed in water quality control plans and policies. In instances where uncontrollable factors have already resulted in water quality objectives being exceeded, controllable factors are not allowed to cause further degradation of water quality. The Regional Water Board recognizes that manmade changes that alter flow regimes can affect water quality and impact beneficial uses.

The third point is that water quality objectives are achieved primarily through the adoption of waste discharge requirements (including federal NPDES permits) and enforcement orders. When adopting requirements and ordering actions, the Regional Water Board considers the beneficial uses within the area of influence of the discharge, the existing quality of receiving waters, and water quality objectives that apply to the reach or uses of the receiving water. Effluent limits may be established to reflect what is necessary to achieve water quality objectives, or, if more stringent, will reflect the technology-based standard for the type of discharge being regulated. The objectives in this plan do not require improvement over naturally occurring background concentrations. Water quality objectives contained in this plan, and any State or Federally promulgated objectives applicable to the Tulare Lake Basin, apply to the main water mass. They may apply at or in the immediate vicinity of effluent discharges, or may apply at the edge of an approved mixing zone. A mixing zone is an area of dilution or criteria for diffusion or dispersion defined in the waste discharge requirements. The Regional Water Board recognizes that immediate compliance with water quality objectives adopted by the Regional Water Board or the State Water Board, or with water quality criteria adopted by the federal Environmental Protection Agency, may not be feasible in all circumstances. Where the Regional Water Board determines it is infeasible for a discharger to comply immediately with such objectives or criteria, compliance shall be achieved in the shortest practicable period of time (determined by the Regional Water Board), not to exceed ten years after the adoption of applicable objectives or criteria. This policy shall apply to water quality objectives and water quality criteria adopted after the effective date of this Basin Plan update. The Regional Water Board will establish compliance schedules in NPDES permits consistent with the provisions of the State Water Board's Compliance Schedule Policy (Resolution 2008-0025). Time schedules in waste discharge requirements are established consistent with Water Code Section 13263.

The fourth point is that, in cases where water quality objectives are formulated to preserve historic conditions, there may be insufficient data to determine completely the temporal and hydrologic variability representative of historic water quality. When violations of such water quality objectives occur, the Regional Water Board evaluates the reasonableness of achieving those objectives through regulation of the controllable factors in the areas of concern.

The fifth point is that the State Water Board adopts policies and plans for water quality control that can specify water quality objectives or affect their implementation. Chief among the State Water Board's policies for water quality control is State Water Board Resolution No. 68-16, *Statement of Policy with Respect to Maintaining High Quality of Waters in California* (Antidegradation Policy). It requires that, wherever the existing quality of surface or ground waters is better than the objectives established for those waters, the existing quality will be maintained unless as otherwise provided by Resolution No. 68-16 or any revisions thereto. This policy and others establish general objectives.

The sixth point is that water quality objectives may be in numerical or narrative form. The enumerated milligram-per-liter (mg/l) limit for dissolved oxygen is an example of a numerical objective; the objective for color is an example of a narrative objective.

3.1 WATER QUALITY OBJECTIVES FOR INLAND SURFACE WATERS

Surface water quality in the Basin is generally good, with excellent quality exhibited by most eastside streams. The Regional Water Board intends to maintain this quality. The water quality objectives below are presented by categories which, like the beneficial uses of Chapter [H2](#), were standardized for uniformity among the regional water boards. Designated beneficial uses of the waters of the Tulare Lake Basin for which provisions should be made are identified in Chapter [2H](#); this chapter gives the water quality objectives to protect those beneficial uses. As new information becomes available, the Regional Water Board will review the appropriateness of these objectives, and may modify them accordingly.

3.1.1 Ammonia

Waters shall not contain un-ionized ammonia in amounts which adversely affect beneficial uses. In no case shall the discharge of wastes cause concentrations of un-ionized ammonia (NH₃) to exceed 0.025 mg/l (as N) in receiving waters.

3.1.2 Bacteria

In waters designated REC-1, the fecal coliform concentration based on a minimum of not less than five samples for any 30-day period shall not exceed a geometric mean of 200/100 ml, nor shall more than ten percent of the total number of samples taken during any 30-day period exceed 400/100 ml.

3.1.3 Biostimulatory Substances

Waters shall not contain biostimulatory substances in concentrations that promote aquatic growths to the extent that such growths cause nuisance or adversely affect beneficial uses.

3.1.4 Chemical Constituents

Waters shall not contain chemical constituents in concentrations that adversely affect beneficial uses. The Regional Water Board will consider all material and relevant information submitted by the discharger and other interested parties and numerical criteria and guidelines for detrimental levels of chemical constituents developed by the State Water Board, the California Office of Environmental Health Hazard Assessment, the State Water Board Division of Drinking Water Programs, the U.S. Food and Drug Administration, the National Academy of Sciences, the U. S. Environmental Protection Agency, and other appropriate organizations to evaluate compliance with this objective.

At a minimum, water designated MUN shall not contain concentrations of chemical constituents in excess of the maximum contaminant levels (MCLs) specified in the following provisions of Title 22 of the California Code of Regulations, which are incorporated by reference into this plan: Tables 64431-A (Inorganic Chemicals) and 64431-B (Fluoride) of Section 64431, Table 64444-A (Organic Chemicals) of Section 64444, and Table 64449-A (Secondary Maximum Contaminant Levels-Consumer Acceptance Limits) and 64449-B (Secondary Maximum Contaminant Levels-Ranges) of Section 64449. This incorporation-by-reference is prospective, including future changes to the incorporated provisions as the changes take effect. At a minimum, water designated MUN shall not contain lead in excess of 0.015 mg/l. The Regional Water Board acknowledges that specific treatment requirements are imposed by state and federal drinking water regulations on the consumption of surface waters under specific circumstances. To ensure that waters do not contain chemical constituents in concentrations that adversely affect beneficial uses, the Regional Water Board may apply limits more stringent than MCLs.

3.1.5 Color

Waters shall be free of discoloration that causes nuisance or adversely affects beneficial uses.

3.1.6 Dissolved Oxygen

Waste discharges shall not cause the monthly median dissolved oxygen concentrations (DO) in the main water mass (at centroid of flow) of streams and above the thermocline in lakes to fall below 85 percent of saturation concentration, and the 95 percentile concentration to fall below 75 percent of saturation concentration.

The DO in surface waters shall always meet or exceed the concentrations in Table [HH3-1](#) for the listed specific water bodies and the following minimum levels for all aquatic life:

Waters designated WARM	5.0 mg/l
Waters designated COLD or SPWN	7.0 mg/l

Where ambient DO is less than these objectives, discharges shall not cause a further decrease in DO concentrations.

**TABLE H3-1
TULARE LAKE BASIN
SPECIFIC DISSOLVED OXYGEN WATER QUALITY OBJECTIVES**

<u>Stream</u>	<u>Location</u>	<u>Min. DO (mg/l)</u>
Kings River		
Reach I	Above Kirch Flat	9
Reach II	Kirch Flat to Pine Flat Dam	9
Reach III	Pine Flat Dam to Friant-Kern	9
Reach IV	Friant-Kern to Peoples Weir	7
Reach V	Peoples Weir to Island Weir	7
Kaweah River	Lake Kaweah	7
Tule River	Lake Success	7
Kern River		
Reach I	Above Lake Isabella	8
Reach II	Lake Isabella to Southern California Edison Powerhouse (KR-1)	8

3.1.7 Floating Material

Waters shall not contain floating material, including but not limited to solids, liquids, foams, and scum, in concentrations that cause nuisance or adversely affect beneficial uses.

3.1.8 Oil and Grease

Waters shall not contain oils, greases, waxes, or other materials in concentrations that cause nuisance, result in a visible film or coating on the surface of the water or on objects in the water, or otherwise adversely affect beneficial uses.

3.1.9 pH

The pH of water shall not be depressed below 6.5, raised above 8.3, or changed at any time more than 0.3 units from normal ambient pH.

In determining compliance with the above limits, the Regional Water Board may prescribe appropriate averaging periods provided that beneficial uses will be fully protected.

3.1.10 Pesticides

Waters shall not contain pesticides in concentrations that adversely affect beneficial uses. There shall be no increase in pesticide concentrations in bottom sediments or aquatic life that adversely affect beneficial uses. (For the purposes of this objective, the term pesticide is defined as any substance or mixture of substances used to control objectionable insects, weeds, rodents, fungi, or other forms of plant or animal life.) The Regional Water Board will consider all material and relevant information submitted by the discharger and other interested parties and numerical criteria and guidelines for detrimental levels of chemical constituents developed by the State Water Board, the California Office of Environmental Health Hazard Assessment, the State Water Board Division of Drinking Water Programs, the U.S. Food and Drug Administration, the National Academy of Sciences, the U. S. Environmental Protection Agency, and other appropriate organizations to evaluate compliance with this objective.

At a minimum, waters designated MUN shall not contain concentrations of pesticide constituents in excess of the maximum contaminant levels (MCLs) specified in Table 64444-A (Organic Chemicals) of Section 64444 of Title 22 of the California Code of Regulations, which is incorporated by reference into this plan. This incorporation-by-reference is prospective, including future changes to the incorporated provisions as the changes take effect. The Regional Water Board acknowledges that specific treatment requirements are imposed by state and federal drinking water regulations on the consumption of surface waters under specific circumstances. To ensure that waters do not contain chemical constituents in concentrations that adversely affect beneficial uses, the Regional Water Board may apply limits more stringent than MCLs.

In waters designated COLD, total identifiable chlorinated hydrocarbon pesticides shall not be present at concentrations detectable within the accuracy of analytical methods prescribed in *Standard Methods for the Examination of Water and Wastewater, 18th Edition*, or other equivalent methods approved by the Executive Officer.

3.1.11 Radioactivity

Radionuclides shall not be present in concentrations that are deleterious to human, plant, animal, or aquatic life nor which result in the accumulation of radionuclides in the food web to an extent that presents a hazard to human, plant, animal, or aquatic life.

At a minimum, waters designated MUN shall not contain concentrations of radionuclides in excess of the maximum contaminant levels (MCLs) specified in Table 64442 of Section 64442 and Table 64443 of Section 64443 of Title 22, California Code of Regulations, which are incorporated by reference into this plan. This incorporation-by-reference is prospective, including future changes to the incorporated provisions as the changes take effect.

3.1.12 Salinity

Waters shall be maintained as close to natural concentrations of dissolved matter as is reasonable considering careful use of the water resources.

"The only reliable way to determine the true or absolute salinity of a natural water is to make a complete chemical analysis. However, this method is time-consuming and cannot yield the precision necessary for accurate work" {*Standard Methods for the Examination of Water and Wastewater, 18th Edition*}. Conductivity is one of the recommended methods to determine salinity.

The objectives for electrical conductivity in Table [H3-2](#) apply to the water bodies specified. Table [H3-3](#) specifies objectives for electrical conductivity at selected streamflow stations.

**TABLE H3-2
TULARE LAKE BASIN
MAXIMUM ELECTRICAL CONDUCTIVITY LEVELS**

<u>Stream</u>	<u>Location</u>	<u>Max. Electrical Conductivity (µmhos/cm)</u>
Kings River		
Reach I	Above Kirch Flat	100
Reach II	Kirch Flat to Pine Flat Dam	100 ^a
Reach III	Pine Flat Dam to Friant-Kern	100
Reach IV	Friant-Kern to Peoples Weir	200
Reach V	Peoples Weir to Island Weir	300 ^b
Reach VI	Island Weir to Stinson Weir on North Fork and Empire Weir No. 2 on South Fork	300 ^b
Kaweah River		
Reach I	Above Lake Kaweah	175
Reach II	Lake Kaweah	175 ^c
Reach 3	Below Lake Kaweah	^d
Tule River		
Reach I	Above Lake Success	450
Reach II	Lake Success	450 ^e
Reach III	Below Lake Success	^d
Kern River		
Reach I	Above Lake Isabella	200
Reach II	Lake Isabella	300
Reach III	Lake Isabella to Southern California Edison Powerhouse (KR-1)	300
Reach IV	KR-1 to Bakersfield	300 ^f
Reach V	Below Bakersfield	^d

^a Maximum 10-year average - 50 µmhos/cm

^b During the period of irrigation deliveries. Providing, further, that for 10 percent of the time (period of low flow) the following shall apply to the following reaches of the Kings River:

Reach V 400 µmhos/cm

Reach VI 600 µmhos/cm

^c Maximum 10-year average - 100 µmhos/cm

^d During the irrigation season releases should meet the levels shown in the preceding reach. At other times the channel will be dry or controlled by storm flows.

^e Maximum 10-year average - 250 µmhos/cm

^f Maximum 10-year average - 175 µmhos/cm

Table H3-3
TULARE LAKE BASIN
ELECTRICAL CONDUCTIVITY OBJECTIVES AT SELECTED STREAMFLOW STATIONS

<u>Streamflow Station Number</u>		<u>Location</u>	<u>Electrical Conductivity (µmhos/cm)</u>		
<u>USGS</u>	<u>DWR</u>		<u>90-Percentile</u>	<u>Median</u>	<u>Mean</u>
--	C01140.00	Kings River below Peoples Weir	198	81	102
11-2185	C11460.00	Kings River below North Fork	68	48	47
11-2215	C11140.00	Kings River below Pine Flat Dam	54	36	42
11-2105	C21250.00	Kaweah River near Three Rivers	154	95	94
11-2032	C31150.00	Tule River near Springville	429	278	367
11-2049	C03195.00	Tule River below Success Dam	368	244	235
11-1870	C51500.00	Kern River at Kernville	177	116	118
11-1910	C5135.00	Kern River below Isabella Dam	278	141	165
11-1940	C05150.00	Kern River near Bakersfield	233	158	167

3.1.13 Sediment

The suspended sediment load and suspended sediment discharge rate of waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses.

3.1.14 Settleable Material

Waters shall not contain substances in concentrations that result in the deposition of material that causes nuisance or adversely affects beneficial uses.

3.1.15 Suspended Material

Waters shall not contain suspended material in concentrations that cause nuisance or adversely affect beneficial uses.

3.1.16 Tastes and Odors

Waters shall not contain taste- or odor-producing substances in concentrations that cause nuisance, adversely affect beneficial uses, or impart undesirable tastes or odors to fish flesh or other edible products of aquatic origin or to domestic or municipal water supplies.

3.1.17 Temperature

Natural temperatures of waters shall not be altered unless it can be demonstrated to the satisfaction of the Regional Water Board that such alteration in temperature does not adversely affect beneficial uses.

Temperature objectives for COLD interstate waters, WARM interstate waters, and Enclosed Bays and Estuaries are as specified in the *Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays of California*, including any revisions. (See Appendix 10.)

Elevated temperature wastes shall not cause the temperature of waters designated COLD or WARM to increase by more than 5°F above natural receiving water temperature.

In determining compliance with the above limits, the Regional Water Board may prescribe appropriate averaging periods provided that beneficial uses will be fully protected.

3.1.18 Toxicity

All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life. This objective applies regardless of whether the toxicity is caused by a single substance or the interactive effect of multiple substances. Compliance with this objective will be determined by analyses of indicator organisms, species diversity, population density, growth anomalies, biotoxicity tests of appropriate duration, or other methods as specified by the Regional Water Board. The Regional Water Board will also consider all material and relevant information submitted by the discharger and other interested parties and numerical criteria and guidelines for toxic substances developed by the State Water Board, the California Office of Environmental Health Hazard Assessment, the State Water Board Division of Drinking Water Programs the U.S. Food and Drug Administration, the National Academy of Sciences, the U. S. Environmental Protection Agency, and other appropriate organizations to evaluate compliance with this objective.

The survival of aquatic life in surface waters subjected to a waste discharge or other controllable water quality factors shall not be less than that for the same water body in areas unaffected by the waste discharge, or, when necessary, for other control water that is consistent with the requirements for “dilution water” as described in *Standard Methods for the Examination of Water and Wastewater, 18th Edition*. As a minimum, compliance shall be evaluated with a 96-hour bioassay.

In addition, effluent limits based upon acute biotoxicity tests of effluents will be prescribed where appropriate; additional numerical receiving water quality objectives for specific toxicants will be established as sufficient data become available; and source control of toxic substances will be encouraged.

3.1.19 Turbidity

Waters shall be free of changes in turbidity that cause nuisance or adversely affect beneficial uses. Increases in turbidity attributable to controllable water quality factors shall not exceed the following limits:

- Where natural turbidity is between 0 and 5 Nephelometric Turbidity Units (NTUs), increases shall not exceed 1 NTU.
- Where natural turbidity is between 5 and 50 NTUs, increases shall not exceed 20 percent.
- Where natural turbidity is equal to or between 50 and 100 NTUs, increases shall not exceed 10 NTUs.
- Where natural turbidity is greater than 100 NTUs, increases shall not exceed 10 percent.

In determining compliance with the above limits, the Regional Water Board may prescribe appropriate averaging periods provided that beneficial uses will be fully protected.

3.2 WATER QUALITY OBJECTIVES FOR GROUND WATERS

The following objectives apply to all ground waters in the Tulare Lake Basin.

3.2.1 Bacteria

In ground waters designated MUN, the concentration of total coliform organisms over any 7-day period shall be less than 2.2/100 ml.

3.2.2 Chemical Constituents

Ground waters shall not contain chemical constituents in concentrations that adversely affect beneficial uses. The Regional Water Board will consider all material and relevant information submitted by the discharger and other interested parties and numerical criteria and guidelines for detrimental levels of chemical constituents developed by the State Water Board, the California Office of Environmental Health Hazard Assessment, the State Water Board Division of Drinking Water Programs, the U.S. Food and Drug Administration, the National Academy of Sciences, the U. S. Environmental Protection Agency, and other appropriate organizations to evaluate compliance with this objective.

At a minimum, waters designated MUN shall not contain concentrations of chemical constituents in excess of the maximum contaminant levels (MCLs) specified in the following provisions of Title 22 of the California Code of Regulations, which are incorporated by reference into this plan: Tables 64431-A (Inorganic Chemicals) and 64431-B (Fluoride) of Section 64431, Table 64444-A (Organic Chemicals) of Section 64444, and Table 64449-A (Secondary Maximum Contaminant Levels-Consumer Acceptance Limits) and 64449-B (Secondary Maximum Contaminant Levels-Ranges) of Section 64449. This incorporation-by-reference is prospective, including future changes to the incorporated provisions as the changes take effect. At a minimum, water designated MUN shall not contain lead in excess of 0.015 mg/l. To ensure that waters do not contain chemical constituents in concentrations that adversely affect beneficial uses, the Regional Water Board may apply limits more stringent than MCLs.

3.2.3 Pesticides

No individual pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses.

At a minimum, waters designated MUN shall not contain concentrations of pesticide constituents in excess of the maximum contaminant levels (MCLs) specified in Table 64444-A (Organic Chemicals) of Section 64444 of Title 22 of the California Code of Regulations, which is incorporated by reference into this plan. This incorporation-by-reference is prospective, including future changes to the incorporated provisions as the changes take effect. The Regional Water Board acknowledges that specific treatment requirements are imposed by state and federal drinking water regulations on the consumption of surface waters under specific circumstances. More stringent objectives may apply if necessary to protect other beneficial uses.

3.2.4 Radioactivity

Radionuclides shall not be present in ground waters in concentrations that are deleterious to human, plant, animal, or aquatic life, or that result in the accumulation of radionuclides in the food web to an extent that presents a hazard to human, plant, animal or aquatic life.

At a minimum, ground waters designated MUN shall not contain concentrations of radionuclides in excess of the maximum contaminant levels (MCLs) specified in Table 64442 of Section 64442 and Table 64443 of Section 64443 of Title 22, California Code of Regulations, which are incorporated by reference into this plan. This incorporation-by-reference is prospective, including future changes to the incorporated provisions as the changes take effect.

3.2.5 Salinity

All ground waters shall be maintained as close to natural concentrations of dissolved matter as is reasonable considering careful use and management of water resources.

No proven means exist at present that will allow ongoing human activity in the Basin and maintain ground water salinity at current levels throughout the Basin. Accordingly, the water quality objectives for ground water salinity control the rate of increase.

The maximum average annual increase in salinity measured as electrical conductivity shall not exceed the values specified in Table [H3-4](#) for each hydrographic unit shown on Figure [H3-1](#).

The average annual increase in electrical conductivity will be determined from monitoring data by calculation of a cumulative average annual increase over a 5-year period.

3.2.6 Tastes and Odors

Ground waters shall not contain taste- or odor-producing substances in concentrations that cause nuisance or adversely affect beneficial uses.

3.2.7 Toxicity

Ground waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life associated with designated beneficial use(s). The Regional Water Board will also consider all material and relevant information submitted by the discharger and other interested parties and numerical criteria and guidelines for toxic substances developed by the State Water Board, the California Office of Environmental Health Hazard Assessment, the State Water Board Division of Drinking Water Programs, the U.S. Food and Drug Administration, the National Academy of Sciences, the U. S. Environmental Protection Agency, and other appropriate organizations to evaluate compliance with this objective. This objective applies regardless of whether the toxicity is caused by a single substance or the interactive effect of multiple substances.

TABLE H3-4
TULARE LAKE BASIN
GROUND WATER QUALITY OBJECTIVES FOR SALINITY

<u>Hydrographic Unit</u>	<u>Maximum Average Annual Increase in Electrical Conductivity ($\mu\text{mhos/cm}$)</u>
Westside (North and South)	1
Kings River	4
Tulare Lake and Kaweah River	3
Tule River and Poso	6
Kern River	5

FIGURE H3-1

TULARE LAKE BASIN
GROUND WATER HYDROGRAPHIC UNITS



The Porter-Cologne Water Quality Control Act requires that every basin plan consist of beneficial uses, water quality objectives, and a program of implementation for achieving water quality objectives {California Water Code Section 13050(j)}. This Basin Plan covers the first two components in earlier chapters. According to the Act, the implementation program must at least include:

- ~~1.~~ A description of the nature of actions which are necessary to achieve the objectives, including recommendations for appropriate action by any entity, public or private;
- ~~2.~~(2) A time schedule for the actions to be taken; and,
- ~~3.~~(3) A description of surveillance to be undertaken to determine compliance with the objectives. {California Water Code Section 13242}

In addition, state law requires that every new water quality control program for agriculture estimate the total cost and identify potential sources of funding as part of its implementation {California Water Code Section 13141}. This chapter of the Basin Plan contains all but the surveillance component of the implementation program. That is described in Chapter ~~VII~~.

The "Water Quality Concerns" section of this chapter describes water quality concerns and how the Regional Water Board addresses them. This section is organized by discharge type (agriculture, silviculture, mines, etc.). The "Nature of Control Actions Implemented by the Regional Water Board", section lists Regional Water Board programs, and plans and policies which will result in the achievement of most of the water quality objectives in this plan. This section includes a list of Regional Water Board prohibition areas. The "Actions Recommended for Implementation by Other Agencies", section contains recommendations for appropriate action by entities other than the Regional Water Board to protect water quality. The "Continuous Planning for Water Quality Control", section describes how the Regional Water Board integrates water quality control activities into a continuous planning process.

4.1 WATER QUALITY CONCERNS

Impairment of beneficial uses or degradation of water quality generally reflect the intensity of activities of key discharge sources. The impact a discharge may have is relative to the volume, quality, and uses of the receiving waters.

Our knowledge of the number and types of problems associated with discharge activities changes over time. Early federal and state control efforts focused on the most understood and visible problems, such as discharge of raw sewage to rivers and streams. As these problems were controlled, focus shifted to prevention of nuisance and protection of ground water. As data became available on toxics in the environment and their harmful effects at low concentrations, and as toxic pollutant detection and measurement methods improved, regulatory emphasis shifted further. Control of toxic discharges now receives major emphasis. Small amounts of pesticides in drinking water wells within the Tulare Lake Basin have caused the closure of some wells.

The greatest long-term problem facing the entire Tulare Lake Basin is the increase of salinity in ground water. Even though an increase in the salinity of ground water in a closed basin is a natural phenomenon, salinity increases in the Basin have been accelerated by man's activity, with the major impact coming from intensive use of soil and water resources by irrigated agriculture. Salinity increases in ground water could ultimately eliminate the beneficial uses of this resource. Controlled ground water degradation by salinity is the most feasible and practical short-term management alternative for the Tulare Lake Basin.

The following briefly describes the water quality impacts associated with specific discharge activities and the policies and programs developed to protect beneficial uses and achieve water quality objectives.

4.1.1 Agriculture

In 1987, agriculturally induced employment in the Basin ranged from 20 percent to more than 50 percent [“A Management Plan for Agricultural Subsurface Drainage and Related Problems on the Westside San Joaquin Valley”, September 1990]. Most of the agricultural activity occurs on the valley floor. However, the natural precipitation on the Valley portion of the Basin averages less than 10 inches per year. Most precipitation occurs in the Sierras and the Coast Ranges. In order to supply the water needs of agriculture, water from the mountain areas is held in reservoirs and released during irrigation periods. The released water is transported to crops through a complex distribution system crisscrossing the Valley. Irrigated agriculture, agricultural support activities, and animal confinement operations create their own unique problems.

4.1.1.1 Irrigated Agriculture

Irrigated agriculture accounts for most water used in the Tulare Lake Basin. Local surface water, mainly stored in foothill reservoirs, is controlled for agricultural use. Historically, ground water made up the rest of agricultural needs. However, heavy ground water extractions after the 1930s, when improvements in pump technology led to the development of large turbine pumps, caused severe overdraft and accompanying land subsidence. This led to development of water projects (i.e., the California Aqueduct, the Delta-Mendota Canal, the Friant-Kern Canal, and the Cross City Canal) in the 1950’s, 1960’s and 1970’s to import additional water into the Basin to relieve the demands on ground water. Even with the imported water, municipal, agricultural, and industrial water users continue to pump ground water to meet demands. Ground water pumping continues to contribute to overdraft of ground water aquifers.

Another problem from irrigated agriculture is drainage, excess water not used by crops which runs off or percolates. Agricultural drainage, depending on management and location, carries varying amounts of salts, nutrients, pesticides, trace elements, sediments, and other by-products to surface and ground waters.

The crucial problem in the Tulare Lake Basin is the salts brought in with irrigation water and leached out of soils. Evaporation and crop transpiration remove water from soils, which can result in an accumulation of salts in the root zone of the soils at levels that retard or inhibit plant growth. Additional amounts of water often are applied to leach the salts below the root zone. The leached salts eventually enter ground or surface water.

The amount of salts which are leached depends on the amounts in the soil profile and the applied waters. In 1970, the Department of Water Resources estimated that 481 million tons of salt were stored in the top 20 feet of soil (or the root zone) in the San Joaquin Valley {Department of Water Resources, “Land and Water Use Aspects of San Joaquin Valley Drainage Investigations”, June 1970}. In 1971, the Department of Water Resources estimated that the four major rivers of the Tulare Lake Basin bring in 145,000 tons of salt per year. Another 63,000 tons are brought in by the Friant-Kern Canal, annually. The Delta-Mendota Canal brings in 336,000 tons per year {Department of Water Resources, “A General Survey of Electrical Conductivity in Ground Water, San Joaquin Valley”, March through June 1971}.

The movement of the salts to surface waters can occur as shallow subsurface ground water flows or it can result from the surface water discharge of agricultural subsurface collection systems (or tile drains) which are employed in areas where farm lands have naturally poor drainage. Tile drains consist of pipe systems below the root zone of crops that drain water from soils that would otherwise stay saturated. TDS concentrations in tile drained water is many times greater than in the irrigation water that was applied to the crops. Tile drain water can also contain trace elements and nutrients. Removal and export, through a valleywide drain, of perched waters will offset, in part, the Basin’s adverse salt accumulation.

Subsurface drainage will be a constant threat to surface water and usable ground water quality unless the disposal method is adequate. Disposal must be in a manner that isolates the salts in the drainage from the usable ground water body. In some areas of the Basin, evaporation basins are used to concentrate drainage water and contain salts. However, evaporation basins cannot be considered permanent solutions due to wildlife impacts, and the cost of ultimate salt disposal and basin closure. The California Department of Water Resources and other federal, state and local agencies continue to study alternative approaches for reuse and disposal of agricultural drainage waters.

The Central Valley provides critically important wetland habitat for wintering waterfowl of the Pacific Flyway. The Pacific Flyway covers the western portion of the North American Continent. Most Pacific Flyway waterfowl are from the prairies and parklands of western Canada and the river valleys and deltas of Alaska. The Central Valley supports approximately 60% of the Pacific Flyway wintering waterfowl population. Hundreds of thousands of shorebirds and other water or marsh birds annually winter or pass through the Central Valley {San Joaquin Valley Drainage Program, “Fish and Wildlife Resources and Agricultural Drainage in the San Joaquin Valley, California”, Volume I, October 1990}.

Evaporation ponds constitute attractive oases for many species of wildlife. Aquatic migratory birds of the Pacific Flyway are drawn to the ponds, in part, because almost all of the native aquatic and wetland habitats in the San Joaquin Valley (especially in the Tulare Lake Basin) have been lost and because the ponds hold surface water in a vast, relatively sterile, agricultural landscape. The ponds also produce abundant aquatic invertebrates which feed large numbers of waterbirds {San Joaquin Valley Drainage Program, “Fish and Wildlife Resources and Agricultural Drainage in the San Joaquin Valley, California”, Volume I, October 1990}.

Evaporation basins have varying potentials to impact wildlife, specifically shorebirds. Various studies have been conducted on this impact. Technical reports addressing site-specific and cumulative impacts from the majority of operating basins were completed in 1993. These reports were certified as environmental impact reports (EIRs).

The EIRs focussed on impacts to wildlife and found all basins pose a risk to birds due to salinity and avian disease. To prevent and mitigate these impacts, waste discharge requirements for evaporation basins, adopted in 1993, include the following:

- Removal of attractive habitat, such as vegetation.
- A program for avian and waterfowl disease prevention, surveillance and control.
- Closure and financial assurance plans.
- Drainage operation plan to reduce drainage.

Basins with concentrations of selenium greater than 2.7 µg/l in the drainage water have potential for reduced hatchability and teratogenic impacts on waterfowl. To prevent and mitigate these impacts, waste discharge requirements for these basins, adopted in 1993, include those listed above and the following:

- Intensive hazing prior to the breeding season.
- Egg monitoring.
- Basin reconfiguration, if necessary, to minimize attractiveness to waterbirds.
- Wildlife enhancement program, alternative habitat and/or compensatory habitat.

Regional Water Board policy on agricultural subsurface drainage:

- A valleywide drain to carry salts out of the valley remains the best technical solution to the water quality problems of the Tulare Lake Basin.
- Evaporation basins are an acceptable interim disposal method for agricultural subsurface drainage and may be an acceptable permanent disposal method in the absence of a valley drain provided that water quality is protected and potential impacts to wildlife are adequately mitigated. For existing basins requiring substantial physical improvements and other mitigations, some of which are dependent upon empirically derived techniques, operators shall implement mitigations as early as feasible.
- Persons proposing new evaporation basins and expansion of evaporation basins shall submit technical reports that assure compliance with, or support exemption from, Title 27, California Code of Regulations,

Section 20080, et seq., and that discuss alternatives to the basins and assess potential impacts of and identify appropriate mitigations for the proposed basins.

- Agricultural drainage may be discharged to surface waters provided it does not exceed 1,000 µmhos/cm EC, 175 mg/l chloride, nor 1 mg/l boron. Other requirements also apply. An exception from the EC and/or the chloride limit for agricultural drainage discharged to surface waters may be permitted consistent with the *Program for Exception from Implementation of Water Quality Objectives for Salinity*.

4.1.1.1.1 Lower Kings River

The Lower Kings River from Peoples Weir to Stinson Weir on the North Fork and Empire Weir #2 on the South Fork is a Water Quality Limited Segment (see discussion regarding water quality limited segments later in this chapter) because of high salinity. Studies indicate that the source of the salinity is either surface or subsurface agricultural drainage. Levels of boron, molybdenum, sulfates, and chlorides in the Lower Kings River are high enough to impact agricultural uses and aquatic resources. Additional information is necessary to further characterize discharges to this section of the Kings River. A monitoring program is described in Chapter ~~VI~~6. In the meantime, drainage should be reduced by the use of at least the following management practices:

- Maximize distribution uniformity of irrigation systems.
- Minimize or eliminate pre-irrigation.
- Control the amount of water applied to each crop so it does not exceed the evapotranspiration needs of the crop and a reasonable leaching factor.
- Minimize seepage losses from ditches and canals to the extent feasible by lining them or replacing them with pipe.
- During periods of extreme dry conditions when dilution flows in the River are very low, farmers in the area should temporarily remove poorly drained land from production.

4.1.1.1.2 Agricultural Chemicals

Pesticides and nutrients in agricultural drainage have found their way to ground waters in many areas of the basin. Nitrate and pesticide levels exceeding the State drinking water standards occur in some ground waters in the basin, and have caused closure of domestic supply wells in several locations. One of the biggest problems facing municipal water providers is the presence of the chemical dibromochloropropane (DBCP) in their wells. The fumigant was widely used in the 1960's to control nematodes in vineyards and can now be found in wells down gradient of the use areas. Providers sued the manufacturers to recover damages and, as of 1995, most providers within the Valley have settled. State and local agencies are searching for methods to mitigate this problem.

The Department of Pesticide Regulation investigates reported cases of pesticide residues in ground water. Where contamination is confirmed to be through legal use of a pesticide, the Department designates a pest management zone after holding a public hearing. Use of the pesticide of concern is modified within the management zone created for it. Responsibility for water quality, however, remains with the State and Regional Water Boards. There is a Memorandum of Understanding between the State Water Board and the Department of Pesticide Regulation describing the role of each agency with regard to pesticide regulation.

Agricultural chemical applicators have been a source of pollution from spills, and improper containment and disposal of waters used to clean equipment or work areas. The application facilities fall under Regional Water Board regulatory programs. When appropriate management practices are implemented, waste discharge requirements may be waived (see Appendices 27 and 28, which are incorporated by reference into this plan). Regional Water Board staff also inspect high risk sites to evaluate compliance. Enforcement strategies are implemented as warranted.

4.1.1.2 Confined Animal Activities

The Tulare Lake Basin is a fast-growing animal and milk production area. With urban pressures increasing in other parts of the State, dairymen and poultry operators are moving into the Basin. In 1994, Tulare County had the largest number of cows in the United States. Tulare County was also the top milk producing county in the United States.

Where not controlled, surface runoff from such operations can impair both surface and ground water beneficial uses. Uncontrolled runoff can also cause nuisance conditions. Disposal of washwater and manure must occur in a manner that protects both surface and ground waters.

Animal wastes may produce significant bacteria, organic, nitrate, and TDS contamination. The greatest potential for water quality problems has historically stemmed from the overloading of the facilities' waste containment and treatment ponds during the rainy season and inappropriate application of waste water and manure. Overloading sometimes results in discharge of manure waste to canals and drainageways. Most animal confinement facilities have some crop land available for wastewater and spreading manure; the lands assimilative capacity will depend upon area, crop, crop yield, soil, and season of the year. When land and capacity is exceeded, the excessive salts and nutrients are leached to the underlying ground water. Where land is not available, agreements between the operator and other landowners can increase area available for disposal.

Title 27, California Code of Regulations contains minimum standards to protect both surface and ground waters from discharges of animal waste at confined animal facilities.

In addition to the standards in Title 27, the following is required:

- Lands that receive dry manure shall be managed to minimize erosion and runoff, and applied manure shall be incorporated into surface soils soon after manure application.
- Animal confinement areas, manure storage areas, lagoons, disposal fields, and crop lands that receive manure shall not create a nuisance.
- Salt in animal rations should be limited to the amount required to maintain animal health and optimum production.
- Animal confinement facilities, including retention ponds, shall be protected from overflow from stream channels during 20-year peak stream flows for facilities that existed as of 25 July 1975 and protected from 100-year peak stream flows for facilities constructed after 25 July 1975. Facilities constructed after 8 December 1984 must comply with the specifications in Chapter 15.
- Facilities shall be designed and constructed to retain all facility wastewater generated, together with all precipitation on, and drainage through, manured areas during a 25-year, 24-hour storm. Facilities with operation capacities equal to or greater than the capacities described in 40 CFR 412 (Feedlots Point Source Category) must obtain an National Pollutant Discharge Elimination System (NPDES) permit prior to discharge for events greater than a 25 year, 24 hour storm. (See "Storm Water" section for additional information regarding stormwater regulation.)
- New manure retention ponds shall be sited, designed, constructed, and operated to ensure that the invert of the pond will be at least 5 feet above the highest anticipated elevation of underlying ground water.

Waste discharge requirements for the land application of wastewater may be conditionally waived for animal confinement facilities that can demonstrate compliance with the above. This waiver does not waive responsibility of the facility owner or operator to apply for and comply with a storm water permit. Facilities for which waste discharge requirements are waived shall provide an annual report to the Regional Water Board describing land and waste management practices for the past year. The annual report should summarize the following:

- ~~4.1~~ (1) Inventory of total head of milking cows, dry cows, heifers, calves, and comparable number of animal units at the dairy during the year.

~~2~~(2) Crops and acreage used for wastewater disposal (irrigation application).

~~3~~(3) Estimates of the quantity of dry manure (tons) spread on site and exported off site, including the location of the fields where the manure is applied, and the names of buyers, and/or locations of application (disposal) areas, if applicable.

4.1.1.3 Unconfined Animals

Grazing animals can contribute bacteria and pathogens to surface waters, just as wildlife do. The greatest potential problem, though, is erosion resulting from overgrazing. Grazing impacts are generally considered nonpoint source pollution. Due to the diffuse nature of this type of pollution, the State Water Board's Nonpoint Source Management Plan recommends that land use entities in an affected area develop a coordinated resource management plan with Regional Water Board assistance. Good grazing management will prevent pollution and impairment of water quality.

4.1.2 Overdraft

The elimination of overdraft is an important step in managing the rate of salinity increase in the ground water. Continued overdraft will deplete good quality water supplies and introduce salts from poorer quality aquifers.

Continued overdraft has other effects, such as increased costs to overlying landowners from greater pumping lifts, depletion of local ground water, and possible deep subsidence in certain soils with permanent loss of ground water storage capacity.

Various measures can reduce overdraft. Measures include improving efficiency of water use by domestic, industrial, and agricultural users; expanded ground water recharge; watershed management; and development of new sources of supply. The solution to the overdraft problem requires a combination of management programs.

The Regional Water Board goal is to alleviate overdraft and the water quality problems associated with overdraft, and extend the beneficial uses of the ground water resource for the longest period economically feasible. Water used to recharge ground water and imported water supplies must be of the highest quality possible. Banking of water in the ground is encouraged. Construction of storage facilities to store surplus wet-weather basin outflows is also recommended where such facilities do not adversely impact other waters of the state.

4.1.3 Salinity

Degradation of ground water in the Tulare Lake Basin by salts is unavoidable without a plan for removing salts from the Basin. A valleywide drain to carry salts out of the valley remains the best technical solution to the water quality problems of the Tulare Lake Basin. The drain would carry wastewater generated by municipal, industrial, and agricultural activities, high in salt and unfit for reuse. The only other solution is to manage the rate of degradation by minimizing the salt loads to the ground water body.

Some of the salt load to the ground water resource is primarily the result of natural processes within the Basin. This includes salt loads leached from the soils by precipitation, valley floor runoff, and native surface waters.

Salts that are not indigenous to the Basin water resources result from man's activity. Salts come from imported water, soil leached by irrigation, animal wastes, fertilizers and other soil amendments, municipal use, industrial wastewaters, and oil field wastewaters. These salt sources, all contributors to salinity increases, should be managed to the extent practicable to reduce the rate of ground water degradation.

The Regional Water Board supports construction of a valleywide drain to remove salt-laden wastewater from the Basin under the following conditions:

- All toxicants would be reduced to a level which would not harm beneficial uses of receiving water.

- The discharge would be governed by specific discharge and receiving water limits in an NPDES permit.
- Long-term continuous biological monitoring would be required.

The Regional Water Board also encourages proactive management of waste streams to control and manage salts that remain in the Basin. Application or disposal of consolidated treated effluents should be to the west, toward the drainage trough of the valley. If feasible, salts in waste streams should be processed for reuse to reduce the need to import salt. Salt import should be reduced by assuring that imported water is of the highest quality possible. Water conveyance systems used to import water into the Basin should not be used to transport inferior quality water.

4.1.3.1 Limited-Term Exceptions from Basin Plan Provisions and Water Quality Objectives for Groundwater and for non-NPDES Dischargers to Surface Waters

Pursuant to Water Code sections 13050 and 13240 et seq., the Regional Water Board has adopted beneficial use designations and water quality objectives that apply to surface and ground waters in the basins covered by this Basin Plan as well as programs of implementation. The Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS) is a stakeholder effort to develop comprehensive salt and nitrate management plans (SNMPs) by May 2016 that is expected to result in basin plan amendments that will be considered by the Regional Water Board by May 2017. CV-SALTS is undertaking technical work to analyze salt and nitrate conditions in surface and ground water in the Central Valley, identify implementation measures, and develop monitoring strategies to ensure environmental and economic sustainability. The technical work under development includes developing the models for loading and transport of salt, development and evaluation of effective management practices, and implementing activities to ensure beneficial uses are protected. Participation by all stakeholders is necessary to ensure that the work is scientifically justified, supported by broad stakeholder representation, and completed in a timely fashion. The Regional Water Board has indicated its support for the comprehensive effort through CV-SALTS in Resolutions R5-2006-0024, R5-2010-0024, and R5-2013-0149 and the March 2010 Memorandum of Agreement between the Regional Water Board, the Central Valley Salinity Coalition and the State Water Board. The Regional Water Board finds that it is reasonable to grant exceptions to the discharge requirements related to the implementation of water quality objectives for salinity for non-NPDES dischargers to surface water, and for discharges to groundwater in order to allow for development and implementation of the SNMPs.

4.1.3.1.1 Exception to Discharge Requirements Related to the Implementation of Water Quality Objectives for Salinity

- ~~1~~(1) Any person¹ subject to waste discharge requirements and/or conditional waivers issued pursuant to Water Code 13269 that are not also NPDES permits may apply to the Regional Water Board for an exception to discharge requirements from the implementation of water quality objectives for salinity. The exception may apply to the issuance of effluent limitations and/or groundwater limitations that implement water quality objectives for salinity in groundwater, or to effluent limitations and/or surface water limitations that implement water quality objectives for salinity in surface water. For the purposes of this Program, salinity and its constituents include, and are limited to, the following: electrical conductivity, total dissolved solids, chloride, sulfate and sodium. The application for such an exception(s) shall be submitted in accordance with the requirements specified in paragraph ~~(8)~~, below.
- ~~2~~(2) An exception to discharge requirements from the implementation of water quality objectives for salinity imposed as limitations in either waste discharge requirements and/or conditional waivers that are not also NPDES permits shall be set for a term not to exceed ten years. For exception terms greater than five years, the Regional Water Board will review the exception five years after approval to confirm that the exception should proceed for the full term. The Regional Water Board review will be conducted during a public hearing. An exception may be renewed beyond the initial term if the SNMPs are still under development, and if a renewal application is submitted in accordance with the requirements specified in paragraph ~~(8)~~, below. A renewal must be considered during a public hearing held in accordance with paragraph ~~(10)~~, below.

¹ The term “person” includes, but is not limited to, “any city, county, district, the state, and the United States, to the extent authorized by federal law.” (Wat. Code, § 13050, subd. (c).)

- ~~3~~(3) The Regional Water Board will consider granting an exception to the implementation of water quality objectives for salinity under this Program if the applicant is actively participating in CV-SALTS as indicated by the letter required under paragraph ~~(8)~~(-e), below.
- ~~4~~(4) When granting an exception to the implementation of water quality objectives for salinity under this Program, the Regional Water Board shall consider including an interim performance-based effluent limitation and/or groundwater limitation that provides reasonable protection of the groundwater or the receiving water, where appropriate. When establishing such a limitation, the Regional Water Board shall take into consideration increases in salinity concentrations due to drought, water conservation, and/or water recycling efforts that may occur during the term of the exception granted.
- ~~5~~(5) When granting an exception to the implementation of water quality objectives for salinity under this Program, the Regional Water Board shall require the discharger to prepare and implement a Salinity Reduction Study Work Plan, or a salinity-based watershed management plan. A Salinity Reduction Study Work Plan shall at a minimum include the following:
- ~~a~~(a) Data on current influent and effluent salinity concentrations;
 - ~~b~~(b) Identification of known salinity sources;
 - ~~c~~(c) Description of current plans to reduce/eliminate known salinity sources;
 - ~~(d)~~(d) Preliminary identification of other potential sources;
 - ~~(e)~~(e) A proposed schedule for evaluating sources; and
 - ~~f~~(f) A proposed schedule for identifying and evaluating potential reduction, elimination, and prevention methods.

A salinity-based watershed management plan shall at a minimum include the following²:

- ~~a~~(a) A discussion of the physical conditions that affect surface water or groundwater in the management plan area, including land use maps, identification of potential sources of salinity, baseline inventory of identified existing management practices in use, and a summary of available surface and/or groundwater quality data;
 - ~~b~~(b) A management plan strategy that includes a description of current management practices being used to reduce or control known salinity sources;
 - ~~c~~(c) Monitoring methods;
 - ~~(d)~~(d) Data evaluation; and,
 - ~~e~~(e) A schedule for reporting management plan progress.
- ~~6~~(6) When granting an exception to the implementation of water quality objectives under this Program, the Regional Water Board will include a requirement to participate in CV-SALTS and contribute to the development and implementation of the SNMPs in accordance with the plan submitted under paragraph ~~(8)~~(f), below.
- ~~7~~(7) The granting of an exception to the implementation of water quality objectives for salinity under this Program by the Regional Water Board is a discretionary action subject to the requirements of the California Environmental Quality Act. As such, the Regional Water Board may require the applicant for the exception to prepare such documents as are necessary so that the Regional Water Board can ensure that its action complies with the requirements set forth in the California Environmental Quality Act or the Regional Water Board may use any such documents that have been prepared and certified by another state or local agency that address the potential environmental impacts associated with the project and the granting of an exception from implementation of water quality objectives for salinity in groundwater and/or surface water.

² A salinity-based watershed management plan prepared to meet requirements contained within adopted waste discharge requirements, such as those contained in MRP Order R5-2012-0116, Appendix MRP-1, and that is approved by the Executive Officer of the Regional Water Board may be used in lieu of new requirements identified here.

- ~~8.~~(8) A person seeking an exception to the implementation of water quality objectives for salinity under this Program must submit an application to the Regional Water Board. The person's request shall include the following:
- ~~a.~~(a) An explanation/justification as to why the exception is necessary, and why the discharger is unable to ensure consistent compliance with existing effluent and/or groundwater/surface water limitations associated with salinity constituents at this time;
 - ~~b.~~(b) A description of salinity reduction/elimination measures that the discharger has undertaken as of the date of application, or a description of a salinity-based watershed management plan and progress of its implementation;
 - ~~c.~~(c) A description of any drought impacts, irrigation, water conservation and/or water recycling efforts that may be causing or cause the concentration of salinity to increase in the effluent, discharges to receiving waters, or in receiving waters;
 - ~~d.~~(d) Copies of any documents prepared and certified by another state or local agency pursuant to Public Resources Code section 21080 et seq.; or, such documents as are necessary for the Regional Water Board to make its decision in compliance with Public Resources Code section 21080 et seq.
 - ~~e.~~(e) Documentation of the applicant's active participation in CV-SALTS as indicated by a letter of support from CV-SALTS.
 - ~~f.~~(f) A detailed plan of how the applicant will continue to participate in CV-SALTS and how the applicant will contribute to the development and implementation of the SNMPs.
- ~~9.~~(9) Upon receipt of an application for an exception to the implementation of water quality objectives for salinity under this Program, the Regional Water Board shall determine that the exception application is complete, or specify in writing any additional relevant information, which is deemed necessary to make a determination on the exception request. Failure of an applicant to submit any additional relevant information requested by the Regional Water Board Executive Officer within the applicable time period may result in the denial of the exception application.
- ~~10.~~(10) Within a reasonable time period after determining that the exception application is complete, the Regional Water Board shall provide notice, request comment, and schedule and hold a public hearing on the application within a timely manner. The notice and hearing requirements shall comply with those set forth in Water Code section 13167.5. The exception shall be issued through a resolution or special order that amends applicable waste discharge requirements and/or conditional waiver requirements.
- ~~11.~~(11) There will be no new salinity exceptions and salinity exceptions will not be renewed after 30 June 2019.

4.1.4 Silviculture

Forest management activities, principally timber harvesting and application of herbicides, have the potential to impact beneficial uses.

Timber harvest activities occur annually on tens of thousands of acres of private and federal land in the Basin and they may affect water quality throughout the area being harvested. Logging debris may be deposited in streams. Landslides and other mass soil movements can also occur as a result of timber operations. The amount of sediment washed from a logged area is directly proportional to the density of roads and skid trails in the area. Thus, the area used for roads, skid trails, and landings should be minimized. Proper drainage should be provided. Crossings of streams and other natural channels must be kept to a minimum. Activities (particularly, use of mechanical equipment) in wet meadow areas should be minimized. Disturbed areas should be reseeded or should receive erosion control treatment. The U. S. Forest Service and the California Department of Forestry and Fire Protection designates zones in each harvest area where the activities are closely controlled to protect the quality of water in streams and lakes. These water protection zones reflect the degree of erosion hazard in the tributary areas and apply in all areas where man's activities threaten to degrade the quality of waters in the streams.

Herbicides are sometimes used in silviculture to reduce commercial timber competition from weeds, grasses, and

other plants or to prepare a site for planting of commercial species by eliminating existing vegetation. Problems associated with use of herbicides in forests in the Tulare Lake Basin are not well documented, although there is concern that there may be transport from target sites to streams by wind and water runoff. The U. S. Forest Service and the California Department of Forestry and Fire Protection should keep records of all pesticides, herbicides, or fertilizers used for forest and range management, for insect and disease protection, or for fire control, listing time, place, reason for use, and amounts used. To the extent feasible, such materials shall be precluded from entering streams.

The State and Regional Water Boards entered into agreements with both the U. S. Forest Service and the California Department of Forestry and Fire Protection. These agreements require these agencies to control nonpoint source discharges by implementing control actions certified by the State Water Board as best management practices. The Regional Water Board enforces compliance with best management practices and may impose control actions above and beyond what is specified in the agreements, such as adoption of waste discharge requirements, if the practices are not applied correctly or do not adequately protect water quality.

4.1.5 Mineral Exploration and Extraction

Drainage and runoff from mines and various operations associated with mining can result in serious impacts to ground and surface water beneficial uses, if not properly managed. Efforts to control drainage have gradually expanded over the years. A staff assessment of mine water quality problems, done in 1979, identified an approach to the problems (see Appendix 29, which is incorporated by reference into this plan). Sedimentation caused by mining can be addressed by discharge requirements for existing mines, but the Regional Water Board does not have a specific program for controlling erosion from abandoned mines.

Title 23, California Code of Regulations (CCR), Division 2, Chapter 15 and Title 27, CCR, Division 2, Subdivision 1 contains standards to protect both surface and ground waters from discharge of mining wastes. Surface and subsurface drainage systems should be installed to prevent or minimize contact between water and any minerals that will impair the quality of water draining from the mine. Mine tailing piles must be prevented from eroding.

Additional environmental protection regulations are found in Title 14, California Code of Regulations, Division 2, Chapter 8, Subchapter 1.

Discharges of dredge spoils and process discharges from sand and gravel operations to surface waters shall be regulated by a National Pollutant Discharge Elimination System (NPDES) permit. In addition, these operations are also subject to storm water regulations. Operators must submit a Notice of Intent to comply with the General Industrial Activities Storm Water Permit or obtain an individual NPDES permit.

Requirements for small, short-term discharges confined to land from sand and gravel operations may be waived.

4.1.6 Erosion

Erosion is one of the greatest problems in the watershed area. Erosion is a natural occurrence, but most activities of man accelerate the process. Erosion causes discoloration of streams, and the suspended matter settles to form a smothering blanket on the stream bed. Erosion is accelerated by poor drainage and soil stabilization associated with the following activities: road building, clearing land, leveling land, construction, logging, brush clearing, off-road vehicle use, agriculture, overgrazing, and fires.

Disturbance of soil, vegetation, organic debris, and other materials that control runoff should be minimized. The Regional Water Board's policies on soil disturbance activities are as follows:

- Operations and activities should be planned and conducted in a manner that will not disturb extensive areas of soil or that will disrupt local drainage.
- Areas where soil is disturbed should be promptly reseeded or stabilized to prevent erosion.

- Strict regulation of activities in water protection zones, as described above in the “Silviculture” section, should be established.
- The stream flow regimen should be stabilized and maintained, and soil control measures should be applied in a timely manner.
- Neither organic nor earthen material should be discharged into any streams nor should such materials be placed at locations where they can pass into streams in quantities that could impair any beneficial use of the water.
- Operations and activities that cause increased turbidity levels in local streams must be regulated so that streams are not affected for extended periods or for more than ten percent of the time and operations and activities shall not violate water quality objectives.

Erosion control guidelines are included in the erosion/sedimentation action plan which is Appendix 30 and is incorporated by reference into this plan.

4.1.7 Recreation

Recreational activity can cause water quality problems. Boating can cause waves which increase lake bank erosion. Other potential water quality impacts may result from boat exhausts and oils entering the water, human secretions and excretions, various waste disposal activities, or cleaning fish and other activities. In certain intensive use areas without sufficient toilet facilities, a reach of stream bank or section of trail may be marked with closely interspersed fecal deposits, a direct threat both from contact and from ready transport into surface stream channels. Another problem is the disposal of material from vault privies or chemical toilets. Most installations are far removed from conventional waste treatment plants; thus, the use of such facilities for disposal is impractical. Climate, geology, and other factors become critical when considering local disposal as a part of routine maintenance. Some installations are considering use of flush toilets and a package, biological treatment system. Such systems must meet the requirements of a domestic wastewater treatment facility (See the “Discharges to Land” subsection of the “Municipal and Domestic Wastewater” section).

Attractive, convenient, and adequate toilet facilities, fish cleaning sinks, and disposal containers should be provided to prevent disposal in or near surface waters. Measures should be implemented to reduce lake bank erosion, such as reducing boat speeds near banks. Programs and procedures, developed from studies where necessary, must be adopted for processing and disposal of solid wastes and vault toilet pumpings from recreational areas. Educational programs on proper handling and disposal of wastes must be made available to classes and groups who would apply the techniques.

4.1.8 Well Standards

Improper well construction, maintenance, abandonment, or destruction can lead to contamination of ground water. California Water Code, Section 13801, requires all counties to adopt water well standards in accordance with Department of Water Resources Bulletin No. 74-81: “Water Well Standards: State of California,” and Bulletin No. 74-90: “California Well Standards”. Counties in the Tulare Lake Basin have established well standards equal to or more stringent than those in the bulletin.

4.1.9 Controlled Burning

Controlled burning is a method to regulate growth of some chaparral species and encourage the growth of preferable trees and grasses. Controlled burning helps prevent wildfire and uncontrolled burns. Burning changes the character of eroded matter from organic to mineral and may increase the contribution of material to streams. Burned areas, whether from controlled or uncontrolled burns, should be managed to minimize erosion of materials into streams.

4.1.10 Municipal and Domestic Wastewater

Increasing population and a higher standard of living require continuing expansion of wastewater treatment facilities. Advances in technology, normal equipment deterioration, and higher performance expectations require continuing replacement of these facilities. Expansion and replacement of municipal wastewater treatment facilities are integral components of the wastewater management program. Wastewater facilities should be evaluated periodically to determine if they adequately meet long-term needs, i.e., 20 years in the future. Financial programs must include a capital replacement fund to provide for these future needs. New land developments should include collection and treatment facilities as part of the initial plans.

The Regional Water Board regulates all municipal wastewater discharges to protect the quality and beneficial uses of ground water and surface water resources, to maximize reclamation and reuse, and to eliminate waste associated health hazards.

Municipal and industrial point source discharges to surface waters are generally controlled through National Pollutant Discharge Elimination System (NPDES) permits. Although the NPDES program is established by the federal Clean Water Act, the permits are prepared and enforced by the regional water boards through program delegation to California and implementing authority in the California Water Code.

The Regional Water Board will issue NPDES permits and waste discharge requirements for municipal waste discharges to protect water quality. Dischargers will be required to reclaim and reuse wastewater whenever reclamation is feasible.

To prevent nuisance, dischargers are required to manage vegetation on their respective facilities. However, birds may utilize this same vegetation during nesting season, creating a potential conflict between the Health and Water Codes and the Fish and Game Code. In accordance with a Memorandum of Understanding between the Department of Fish and Game (now the California Department of Fish and Wildlife) and Mosquito Abatement Districts in the Tulare Lake Basin (copy is Appendix 25), vegetation management operations should be conducted so that weed removal operations are not necessary when nesting takes place, which is between April 1 and June 30.

4.1.10.1 Individual Waste Systems

Control of individual waste treatment and disposal systems can best be accomplished by local county environmental health departments if these departments are strictly enforcing an ordinance that is designed to provide complete protection to ground and surface waters as well as public health. Consistent with this approach, the Regional Water Board implements the State Water Board's *Water Quality Control Policy for Siting, Design, Operation, and Maintenance of Onsite Wastewater Treatment Systems* (OWTS Policy).

The Regional Water Board will consider adoption of a ban on new septic tank systems and elimination of existing systems in areas where the systems contaminate underlying ground water or where a substantial percentage of existing systems fail annually. In making this determination, the Regional Water Board must consider the factors listed in Section 13281 of the California Water Code. (See the "Prohibitions" section of this chapter for a listing of communities with septic tank system moratoria.) The Regional Water Board will also review alternatives to protect water quality standards and beneficial uses; and prevent nuisance, pollution and contamination. Alternatives may include any combination of individual disposal systems, community collection and disposal systems with subsurface disposal, and conventional treatment systems.

A problem may develop in some agricultural areas of the Basin owing to saturation of the soil when irrigation water along the valley trough is restricted from percolating through the soil profile. As the areal extent of this condition expands, individual waste disposal systems in areas where community sewers are not an option may create surfacing waste and a public health problem.

4.1.10.2 Septage

Every three years, septage should be pumped from the average septic tank. Commercial liquid waste haulers provide this service. Small sewage treatment plants that may be in a rural area of septic tank users are reluctant to accept

pumpings from individual waste disposal systems and vault toilets because of the extremely variable nature of the waste and its potential adverse ~~effect~~ ~~effect~~ on the plant's operation. Where regional wastewater plants have been funded with federal or state grants, one condition of the award typically requires provision for septage. Where this variability can be accommodated, haulers may find the hauling distance too great and fees too large. As a result, illegal dumps of this waste sometimes occur and cause aesthetic and public health problems.

County authorities presently license septic tank pumpers through their environmental health departments. Thus, county and municipal agencies provide effective control, treatment, and disposal of septic tank pumpings. Upon approval of the County Health Officer, septic tank pumpings may be disposed to qualified waste disposal sites, as defined in Chapter 15, or to disposal facilities specifically approved to receive these wastes.

The Regional Water Board recommends construction of facilities for septic tank pumpings at municipal sewage treatment plants where the waste will not interfere with treatment or cause nuisances.

4.1.10.3 Effluent Limits

Discharges must meet effluent and receiving water limits set forth in adopted waste discharge requirements. Point source discharges to navigable waters must comply with Section 301 of the Clean Water Act. Point source discharges to land must comply with waste discharge requirements developed according to California Water Code Section 13377 and Section 13263, respectively. NPDES permits must be renewed every 5 years. Other waste discharge requirements must be reviewed every 5, 10, or 15 years depending upon the threat to water quality of the discharge.

The effluent limits presented in the following sections of this chapter are the minimum treatment level which must be provided.

4.1.10.4 Discharges to Navigable Waters

40 CFR 125 requires publicly owned treatment works to provide secondary treatment and best practicable waste treatment technology, or provide adequate treatment to meet the water quality standards, whichever is more stringent. (40 CFR 133 defines secondary treatment as removal of 85 percent or reduction to 30 mg/l, whichever is more stringent, of both 5-day BOD and suspended solids.) Effluent limitations for other point sources are also described in 40 CFR 125. Special limitations for certain types of industrial discharges are defined in the 40 CFR 400 series. These sources must provide best practicable control technology currently available.

The following policy shall govern waste discharges to navigable waters in the Tulare Lake Basin:

- Discharges to surface waters will not be considered a permanent solution when the potential exists for wastewater reclamation.
- Discharge to ephemeral streams or to streams that have limited dilution capacity will not be considered a permanent solution unless it is accomplished in such a manner as to safeguard the public health and prevent nuisances, and the wastewater is of such a quality that it benefits streamflow augmentation.
- Dischargers in mountain areas must evaluate land disposal as an alternative. Where studies show that year-round land disposal is not practicable, dischargers must evaluate dry season land disposal as an alternative.

As a minimum, dischargers to surface waters, including stream channels, shall comply with the following effluent limits:

- All domestic discharges shall be adequately treated and disinfected to reliably meet wastewater reclamation criteria (Title 22, California Code of Regulations, Division 4, Section 60301, et. seq.).
- The maximum electrical conductivity (EC) of a discharge shall not exceed the quality of the source water plus 500 micromhos per centimeter ($\mu\text{mhos/cm}$) or 1,000 $\mu\text{mhos/cm}$, whichever is more stringent. When the water is from more than one source, the EC shall be a weighted average of all sources.

- Discharges shall not exceed an EC of 1,000 $\mu\text{mhos/cm}$, a chloride content of 175 mg/l, or a boron content of 1.0 mg/l.
- An exception from the EC and/or the chloride limitations identified here may be granted for municipal and domestic wastewater discharges to navigable waters if a variance is granted pursuant to the *Variance Policy for Surface Water*.

In addition to the above, discharges to waters having an EC or water quality objective of less than 150 $\mu\text{mhos/cm}$ shall comply with the following:

- Complete removal of settleable and floatable solids
- Nutrient removal as necessary to control biostimulation
- Removal of dissolved solids to levels consistent with those of the receiving waters
- Ammonia removed as necessary to protect aquatic life.
- Substantially complete removal of any substance known to be toxic to plant and/or animal life.

4.1.10.5 Discharges to Land

Wastewater treatment facilities that discharge to land in a manner that waste may infiltrate below the ground surface and degrade ground water must also comply with effluent limits. The excellent quality of ground waters along the easterly edge of the Basin should be protected by encouraging the application or disposal of consolidated treated effluents to the west, toward the drainage trough of the valley.

The levels of treatment required of all domestic wastewater facilities with land disposal are as follows:

1. Primary: Primary treatment is acceptable only under exceptional circumstances, typically a relatively minor discharge in an isolated location where there is little risk of nuisance or water quality degradation. Treatment and disposal in some instances could be provided by septic tanks and a leach field. Increased amounts of wastewater or nuisance conditions would require an upgrade in level of treatment.
2. Advanced Primary: This treatment may be satisfactory for smaller facilities in outlying or remote areas where the potential for odors and other nuisances is low. Advanced primary shall provide removal of 60 to 70 percent or reduction to 70 mg/l, whichever is more restrictive, of both 5-day BOD and suspended solids.
3. Secondary Treatment: Secondary treatment should remove 85 percent or reduce to 30 mg/l, whichever is more restrictive, of both 5-day BOD and suspended solids. Secondary treatment may be required where public access to wastewater is not precluded.

Most wastewater discharges will be adequately precluded from public access and secondary treatment will not be necessary. Facilities which discharge or are designed to discharge in excess of 1 million gallons per day must provide removal of 80 percent or reduction to 40 mg/l, whichever is more restrictive, of both 5-day BOD and suspended solids. Smaller facilities (less than 1 million gallons per day) in close proximity to an urbanized area or using particular methods of effluent disposal (e.g., irrigation of certain types of crops) will also be required to provide 80 percent removal or reduction to 40 mg/l, whichever is more restrictive, of both 5 day BOD and suspended solids.

4. Advanced Wastewater Treatment: Reclaimed water used for the spray irrigation of food crops must also be coagulated and filtered. Coagulated wastewater means oxidized wastewater in which colloidal and finely divided suspended matter have been destabilized and agglomerated by the addition of suitable floc-forming chemicals or by an equally effective method. Filtered wastewater means an oxidized, coagulated, clarified wastewater which has been passed through natural undisturbed soils or filter media, such as sand or

diatomaceous earth, so that the turbidity does not exceed an average operating turbidity of 2 NTUs and does not exceed 5 NTUs more than 5 percent of the time during any 24-hour period {Title 22, California Code of Regulations, Section 60301, et seq.}.

Additional effluent limits follow:

- The incremental increase in salts from use and treatment must be controlled to the extent possible. In most circumstances, the maximum EC shall not exceed the EC of the source water plus 500 µmhos/cm. When the source water is from more than one source, the EC shall be a weighted average of all sources. However, under certain circumstances, the Regional Board, upon request of the discharger, may adopt an effluent limit for EC that allows EC in the effluent to exceed the source water by more than 500 µmhos/cm. This request will be granted consistent with the Policy for Exception from Implementation of Water Quality Objectives for Salinity.
- Concentration of total coliform organisms in reclaimed wastewater must be in accordance with limits established in the following provisions of Title 22, California Code of Regulations: Sections 60303 (Spray Irrigation of Food Crops), 60305 (Surface Irrigation of Food Crops), 60311 (Pasture for Milking Animals), 60313 (Landscape Irrigation), 60315 (Nonrestricted Recreational Impoundment), 60317 (Restricted Recreational Impoundment), and 60319 (Landscape Impoundment).
- In the Poso Creek Subarea, discharges shall not exceed 1,000 µmhos/cm EC, 200 mg/l chlorides, and 1.0 mg/l boron. The Poso Creek subarea consists of about 35,000 acres of land between State Highways 99 and 65 about six miles north of Bakersfield, and is defined more specifically in Regional Water Board Resolution No. 71-122, which is incorporated by reference into this plan.
- In the White Wolf Subarea, for areas overlying Class I irrigation water, discharges shall not exceed 1,000 µmhos/cm EC, 175 mg/l chlorides; 60 percent sodium, and 1.0 mg/l boron. For areas overlying Class II or poorer irrigation water, discharges shall not exceed 2,000 µmhos/cm EC, 350 mg/l chlorides, 75 percent sodium, and 2 mg/l boron. In areas where ground water would be Class I except for the concentration of a specific constituent, only that constituent will be allowed to exceed the specified limits for Class I water. In no case shall any constituent be greater than those limits specified for areas overlying Class II irrigation water. The White Wolf subarea consists of 64,000 acres within the valley floor, at the southern tip of the Tulare Lake Basin, about 20 miles south of Bakersfield. The subarea is bounded on the west by the San Emigdio Mountains, on the south and east by the Tehachapi Mountains, and on the north by the White Wolf Fault.

Criteria for mineral quality of irrigation water is described below:

<u>Constituent</u>	<u>Class I</u>	<u>Class II</u>	<u>Class III</u>
TDS (mg/l)	<700	700 - 2,000	>2,000
EC (µmhos/cm)	<1,000	1,000 - 3,000	>3,000
Chlorides (mg/l)	<175	175 - 350	>350
Sodium (percent base constituents)	<60	60 - 75	>75
Boron (mg/l)	<0.5	0.5 - 2	>2

- Discharges to areas that may recharge to good quality ground waters shall not exceed an EC of 1,000 µmhos/cm, a chloride content of 175 mg/l, or a boron content of 1.0 mg/l.
- An exception from the EC and/or the chloride limit for discharges to land may be permitted consistent with the *Program for Exception from Implementation of Water Quality Objectives for Salinity*.

4.1.10.6 Wastewater Reclamation

Reclaimed water provides a substitute source of water and provides nutrients that nourish crops. When properly managed, reclamation consumes nitrates and effluent that would normally percolate to local ground waters underlying a community and can free up potable water for growth or other uses. Extensive reclamation is a practical necessity simply to maintain present levels of development and activity in the Basin.

Wastewater reclamation shall be maximized by controlling or limiting salt pickup and evaporation during use, treatment, or disposal. Integration of final disposal into existing surface distribution systems appears to be advantageous. Wherever feasible, eventual wastewater reclamation will be requested.

Title 22, California Code of Regulations, establishes reclamation criteria for direct use of reclaimed water but has no criteria for wastewater distributed with irrigation supplies. Therefore, municipal treatment facilities producing effluent for introduction to irrigation canals for unrestricted irrigation will be required, as a minimum, to disinfect to 23 MPN coliform per 100 ml. The State Water Board Division of Drinking Water Programs will be consulted for all cases.

To facilitate the use of treated wastewater with short notice, wastewater reclamation requirements may be waived for up to one year provided that the following conditions are met:

- ~~1.~~(1) The reclaimed water will comply with any applicable criteria provided by Title 22, Division 4, California Code of Regulations;
- ~~2.~~(2) The proposed uses receive prior approval from the state and local health departments and the Executive Officer; and
- ~~3.~~(3) The reclamation project is consistent with the "Guidelines for Use of Reclaimed Water" developed by the Department of Health Services (now the State Water Board Division of Drinking Water Programs). The "Guidelines for Use of Reclaimed Water" is incorporated by reference into this plan. (See Appendix 34.)

Reclamation projects more than one year in duration may be allowed to proceed prior to final approval of reclamation requirements provided that the use complies with reclamation criteria.

Waste discharge requirements will be revised and wastewater reclamation requirements adopted as soon as possible to allow reuse. No enforcement actions will be taken against a community allowing wastewater reuse prior to revision of waste discharge requirements provided that the use complies with reclamation criteria.

Reclamation policies are as follows:

- Discharges to surface water and evaporation of reclaimable wastewater will not be acceptable permanent disposal methods where opportunity exists to replace an existing use or proposed use of fresh water with reclaimed water; a timetable for reclamation or reuse may be set by the Regional Water Board.
- The quality of waste discharges shall be regulated to promote reclamation and reuse wherever feasible.
- Rates of wastewater application that exceed reasonable agronomic rates will not be considered as reclamation or reuse.
- Project reports for new or expanded wastewater facilities shall include plans for wastewater reclamation or the reasons why this is not possible.
- Where studies show that year-round or continuous reuse of all of the wastewater is not practicable, consideration shall be given to partial reuse of the flow and seasonal reuse.

The irrigation season in the Tulare Lake Basin area typically extends 9 to 10 months, but monthly water usage varies widely. To maximize reuse, users should provide water storage and regulating reservoirs, or percolation ponds that could be used for ground water recharge of surplus waters when there is no irrigation demand.

State Water Board policy, described in Resolution No. 77-1, Appendix 4, encourages and provides funds for reclamation projects that protect beneficial uses of existing water supplies, encourage water conservation, and encourage other agencies to assist in implementation.

4.1.10.7 Consolidations

Proliferation of small treatment plants in developed areas is undesirable. Most small communities do not have adequate resources to properly manage, treat and dispose of wastewater in an urban environment. Typical problems involve nuisance and ground water pollution. Small communities and development close to other small communities may be able to construct and operate a joint wastewater treatment facility with greater treatment ability, opportunity for reclamation, and for lower cost. Policies on consolidation are as follows:

- Adjoining small communities should combine resources to construct and operate a joint or regional wastewater treatment plant.
- Consolidation, whether one or more regional facilities operated by a single sewerage authority, should be cost-effective, and consider benefits to the ecology, treatment efficiencies, and effective reuse of the waters.
- Unsewered areas and new developments adjacent to or within existing wastewater collection system service areas should be connected to the system. Developments not within a service area but within the projected sphere of influence of a regional system should be developed in a manner that provides for future connection to the system when the regional sewer system becomes available. One condition of approval of individual sewage disposal systems in certain areas and of certain densities may be that developments be dry sewerage in a manner that provides cost-effective sewerage infrastructure to be placed during initial construction.
- Each municipal facility should act as a regional facility and provide sewerage services within its sphere of influence. The municipality must be equitably compensated for these services.
- Areas recommended for consolidation of wastewater systems are the Parlier area, the Bakersfield area, and the City of Delano. The Selma-Kingsburg-Fowler (Tri-Cities) and Fresno-Clovis regions have been consolidated. Consolidations of other wastewater treatment plants may be justified at some future time.

The intent of this policy is to make consolidation the rule rather than the exception. Consolidation should be compared to other approaches. If such a comparison yields clear technical, environmental, or economic advantages for consolidating, then consolidation should be implemented.

4.1.10.8 Pretreatment

Many municipal facilities in the Basin treat significant volumes of industrial wastewater. Most of this wastewater is from agriculture-related industries that fluctuate seasonally. Requirements for industrial users that discharge directly to surface water or to land are in the “Industrial Wastewater” Section of this chapter. Indirect industrial users discharge to a municipal wastewater treatment system and are regulated by the municipal discharger. Policies on pretreatment are as follows:

- All publicly owned treatment works (POTWs) with a design flow greater than 5.0 million gallons per day must comply with 40 CFR 403, the federal pretreatment program requirements.
- Smaller POTWs with industrial flows which may cause pass-through or interference may also be required to develop pretreatment programs.

- All industrial users that discharge to POTWs must comply with the National Pretreatment Standards regardless of whether the POTW has an approved pretreatment program.

4.1.11 Industrial Wastewater

The number of known cases of ground water pollution or public nuisance attributable to industrial sources has increased steadily over the last decade. Much of the increase is due to sources such as underground tanks that were never intended to discharge but which leaked undetected for years. The Region’s inventory of underground storage tanks indicates a high number of leaking tanks. Ground water contamination from other industrial sources generally occurs from the illegal discharge of fluids or other materials used in production processes. Waste compounds have been discharged directly to unlined sumps, pits, or depressions and spread on soils. In some cases, these disposal practices went on for many years before they were discovered or discontinued.

There are two types of industrial dischargers: direct and indirect. Indirect dischargers are those who discharge into community wastewater systems. The federal regulations require that all indirect users abide by general National Pretreatment Standards and that certain categories of indirect users comply with specific discharge standards. (See Pretreatment Section, above.)

Direct dischargers discharge to either surface water or land. Surface water dischargers are subject to federal and state regulations. Federal regulations require dischargers to comply with best conventional pollutant control technology (BCT), best practicable control technology currently available (BPT), or best available technology economically achievable (BAT). Effluent limitations for specific industrial waste discharges to surface waters, together with standards of performance and pretreatment standards for new sources, are found in 40 CFR 400. Waste source categories of particular interest in the Tulare Lake Basin include dairy product processing, meat product and rendering processing, canned and preserved fruit and vegetable processing, beet sugar processing, and petroleum production and refining. When treatment technology is not defined, regulations specify use of best practicable judgement (BPJ).

Generally, the effluent limits established for municipal waste discharges will apply to industrial wastes. Industrial dischargers shall be required to:

- ~~1.~~(1) Comply with water quality objectives established in Chapter ~~III~~3.
- ~~2.~~(2) Comply with Chapter 15 for discharges of designated or hazardous waste unless the discharger demonstrates that site conditions and/or treatment and disposal methods enable the discharge to comply with this Basin Plan and otherwise qualify for exemption from Chapter 15.
- ~~3.~~(3) Comply with effluent limitations set forth in 40 CFR 400 when discharge is to surface water.
- ~~4.~~(4) Comply with, or justify a departure from, effluent limitations set forth in 40 CFR 400 if discharge is to land.
- ~~5.~~(5) Limit the increase in EC of a point source discharge to surface water or land to ~~to~~ a maximum of 500 µmhos/cm. A lower limit may be required to assure compliance with water quality objectives.

An exception to this EC limit may be permitted for industrial sources when the discharger technically demonstrates that allowing a greater net incremental increase in EC will result in lower mass emissions of salt and in conservation of water, provided that beneficial uses are protected.

An exception may also be permitted for food processing industries that discharge to land and exhibit a disproportionate increase in EC of the discharge over the EC of the source water due to unavoidable concentrations of organic dissolved solids from the raw food product, provided that beneficial uses are protected. Exceptions shall be based on demonstration of best available technology and best management practices that control inorganic dissolved solids to the maximum extent feasible.

Cull fruits and wastes from food processing generally are voluminous and may have a high water content

like winery wastes. Provision should be made for thin spreading of such materials on the fields, followed promptly by disking into the soil.

An exception from the EC limit may also be permitted consistent with the *Program for Exception from Implementation of Water Quality Objectives for Salinity*.

- ~~6~~(6) The Regional Water Board encourages the reclamation and reuse of wastewater, including treated ground water resulting from a cleanup action, where practicable and requires as part of a Report of Waste Discharge an evaluation of reuse and land disposal options as alternative disposal methods. Reuse options should include consideration of the following, where appropriate, based on the quality of the wastewater and the required quality for the specific reuses: industrial and municipal supply, crop irrigation, landscape irrigation, ground water recharge, and wetland restoration. Where studies show that year-round or continuous reuse of land disposal of all the wastewater is not practicable, the Regional Water Board will require dischargers to evaluate how reuse or land disposal can be optimized, such as consideration of reuse/disposal for part of the flow and seasonal reuse/disposal options (e. g., dry season land disposal).
- ~~7~~(7) Unless an exception is technically justified, segregate domestic waste from industrial waste, and treat and dispose of domestic waste according to the policy for municipal and domestic wastewater.

Additional specific requirements have been adopted for wastewater from oil fields and wineries.

4.1.11.1 Oil Field Wastewater

Hydrocarbon production in the San Joaquin Valley's 74 oil fields generates significant volumes of wastewater. Oil field producers continue to use hundreds of sumps as oil/wastewater separators and as wastewater disposal sumps. Some oil field wastewaters contain salts, oil and grease, metals, and organics which can present a threat to the beneficial uses of underlying good quality ground water. However, in some areas, wastewater may be of a quality which allows its reuse for reclamation or discharge to surface waters. In these instances, waste discharge requirements or NPDES permits, as appropriate, are issued. In addition, some ground water in the Basin is naturally of such poor quality that oil field wastewater will not impact its beneficial uses. Due to historical practices, degradation of ground water from oil field wastewater disposal occurred in some areas. The petroleum industry has been eliminating oilfield wastewater disposal sumps.

With the gradual elimination of the use of sumps for disposal, increased amounts of produced wastewater are being discharged to Class II injection wells. Title 14, California Code of Regulations, Section 1724.6, et seq., defines environmental protection regulations relating to oil and gas operations administered by the California Department of Conservation, Division of Oil, Gas & Geothermal Resources in cooperation with other state regulatory agencies. The Department of Conservation administers the federal underground well injection program for Class II injection wells within the state. The Regional Water Board reviews and may comment on the permit application regarding water quality concerns. The review process is in accordance with a Memorandum of Agreement between the State Water Board and the Department of Conservation. The purpose of the agreement is to ensure that the construction or operation of Class II injection disposal wells and the land disposal of wastewaters from oil, gas, and geothermal production facilities does not cause degradation of waters of the state. The Memorandum of Agreement provides a coordinated approach that results in a single permit satisfying the statutory obligations of both agencies.

The Memorandum of Agreement also requires the Department of Conservation to notify the Board of all pollution problems, including spills associated with operators and/or new proposed oil field discharges. The agencies must work together, within certain time-lines, to review and prepare permits and coordinate enforcement actions.

Policies regarding the disposal of oil field wastewater are:

- Maximum salinity limits for wastewaters in unlined sumps overlying ground water with existing and future probable beneficial uses are 1,000 μ mhos/cm EC, 200 mg/l chlorides, and 1 mg/l boron, except in the White Wolf subarea where more or less restrictive limits apply. The limits for the White Wolf subarea are discussed in the "Discharges to Land" subsection of the "Municipal and Domestic Wastewater" section.

- Discharges of oil field wastewater that exceed the above maximum salinity limits may be permitted to unlined sumps, stream channels, or surface waters if the discharger successfully demonstrates to the Regional Water Board in a public hearing that the proposed discharge will not substantially affect water quality nor cause a violation of water quality objectives.
- An exception from the EC and/or the chloride limit may be permitted consistent with the *Program for Exception from Implementation of Water Quality Objectives for Salinity*.
- Disposal sumps shall either be free of oil or effectively covered or screened to preclude entry of birds or animals. Compliance monitoring for wildlife problems shall continue to be deferred to the Department of Conservation and the California Department of Fish and Wildlife. The Regional Water Board will respond to complaints, spot check for compliance, and enforce conditions as necessary.
- Sumps adjacent to natural drainage courses shall be protected from inundation or washout, or properly closed.
- Regulation of oil field dischargers shall be coordinated with all other state and federal agencies having jurisdiction and interest in the oil field.
- The discharge of produced wastewater to land, where the concentration of constituents may cause ground water to exceed water quality objectives, shall be subject to the requirements contained in the California Code of Regulations, Title 27, Section 20005, et seq. (Title 27).

4.1.11.2 Wineries

A substantial number of wineries operate throughout the Central Valley. Many of these wineries produce substantial quantities of stillage waste which is high in concentrations of BOD, EC, TDS, and nitrogen. As stillage is normally discharged directly to land without any prior treatment, there is significant potential for the waste to affect water quality and to create nuisance conditions if not managed properly.

A study conducted in 1980 developed recommendations for minimizing water quality effects and nuisance conditions resulting from land application of stillage waste {Metcalf and Eddy, "Land Application of Stillage Waste: Odor Control and Environmental Effects"}. Based on the study, the Regional Water Board adopted guidelines for the land disposal of stillage waste from wineries. These guidelines may not be sufficient where local soil, ground water, weather, or other conditions are not compatible with the stillage to be disposed. These guidelines prescribe the minimum requirements for disposal of stillage waste from wineries and do not preclude the establishment of more stringent requirements as necessary to comply with water quality objectives. The policy for land disposal of stillage waste is presented below.

Land Disposal of Stillage Waste from Wineries

Rapid Infiltration Method for Disposal of Stillage:

A-(1) Disposal Site Requirements

- 1-(a)** Land for disposal should be as remote from habitation as possible.
- 2-(b)** Soils should be capable of infiltrating 3 to 4 inches of stillage in 24 hours or less.
- 3-(c)** Soil permeability should be greater than 2 inches per hour for the entire profile.
- 4-(d)** There should be no unripped hardpan within the top 10 feet of the soil profile.
- 5-(e)** Soil depth should be 10 feet or greater.

~~6.(f)~~ Depth to ground water should be 10 feet or greater.

~~B.(2)~~ Operational Procedures

~~1.(a)~~ Cooling water and any other wastewater with low COD concentrations should be separated from the stillage before land application.

~~2.(b)~~ Stillage waste should be spread on land between long, narrow, level checks. The surface should be leveled uniformly within 0.1 foot per 100 feet, without potholes.

~~3.(c)~~ At the inlet of the checks, the flow should be distributed using splash plates or other devices to prevent deep holes from forming.

~~4.(d)~~ The depth of each stillage application should not exceed the following:

<u>Period of Year</u>	<u>Depth of Stillage Application (inches)</u>
Aug 1 to Oct 1	3.7
Oct 1 to Dec 1	3
Dec 1 to May 1	2.5

~~5.(e)~~ Standing stillage should not be present 24 hours after application has ceased.

~~6.(f)~~ After stillage waste has been applied to an area, the area should be allowed to dry for at least the following period before re-application of waste:

<u>Period of Year</u>	<u>Drying Time (days)</u>
Aug 1 to Oct 1	6
Oct 1 to Dec 1	9
Dec 1 to May 1	13

~~7.(g)~~ After stillage has been applied to an area, if leathers have not been removed, the area should be raked, rototilled, or an equivalent method should be used before re-application of stillage.

~~8.(h)~~ Loading rates and drying times for stillage waste from raisins or pomace should follow the criteria for December 1 to May 1 operations.

~~9.(i)~~ Land area used for disposal should equal or exceed the following:

<u>Period of Year</u>	<u>Land Area † (acres per 100,000 gpd of stillage waste)</u>
Aug 1 to Oct 1	7
Oct 1 to Dec 1	12.3
Dec 1 to May 1	20.6

† These land areas are directly related to the drying time stated in ~~No. 6(f)~~ above. Complete infiltration recovery to the original values may not be obtained by these relatively short resting cycles. At some application sites, the infiltration rate constantly decreases as the application season progresses. A decrease in infiltration of about 75% can be expected with only three applications. Therefore, the number of stillage applications at a specific site should be kept to a minimum. Repeated applications of stillage allowing only minimum drying times may require larger land areas.

~~10.(j)~~ During periods when it is not used for stillage disposal, the disposal area should be planted with crops to assist in the removal of residual nitrogen concentrations from the soil if necessary.

Slow Rate Irrigation Method:

Most existing stillage disposal sites are located on relatively permeable soils. Where the available land for application of stillage is such that the limiting permeability is slow to moderately slow, the use of slow rate irrigation may be used as an alternative to rapid infiltration. The application depends on the expected evaporation and infiltration and can range from less than 0.5 to 1.5 inches (13,600 to 40,000 gal/acre). Resting periods should range from 18 to 20 days or more. The resultant average loading rates and land areas are shown in Table IV4-1. All other disposal site requirements and operational procedures for the rapid infiltration method also apply to the slow rate irrigation method.

**TABLE IV4-1
SLOW RATE IRRIGATION AREA REQUIREMENTS**

	Soil Permeability Rate	
	<u>Slow</u>	<u>Moderately Slow</u>
Limiting soil permeability, in/hr	0.06 - 0.2 (clay loam)	0.2 - 0.6 (clay loam or silt loam)
Infiltration capacity, in/day	0.5	1.0
Resting period, days	20	13
Average loading rate, gal/acre/day	670	1,940
Area required per 100,000 gal/day of stillage, acres	150	52

4.1.12 Storm Water

Runoff from residential and industrial areas can contribute to water quality degradation. Urban storm water runoff contains organics, pesticides, oil, grease, and heavy metals. Because these pollutants accumulate during the dry summer months, the first major storm after summer can flush a highly concentrated load to receiving waters and catch basins. Combined storm and sanitary systems may result in some runoff to wastewater treatment plants. In other cases, storm water collection wells can produce direct discharges to ground water. Impacts of storm water contaminants on surface and ground waters are an important concern.

EPA has promulgated regulations for municipal and industrial stormwater permits in 40 CFR 122. The State Water Board implemented these regulations by adopting a General Industrial Activities Storm Water Permit (excluding construction activity) and a General Construction Activity Storm Water Permit. Storm water dischargers indicate intention to follow the specifications in the appropriate permit by filing a Notice of Intent with the State Water Board.

The Regional Water Board will take all measures necessary to protect the quality of surface and ground waters from treatment or disposal of urban runoff.

- The Regional Water Board will issue waste discharge requirements on the discharge of urban runoff when a threat to water quality exists.
- The Regional Water Board will regulate large and medium municipal stormwater dischargers and, at its discretion, specific industrial dischargers through the issuance of individual NPDES permits. Industrial dischargers may also be regulated with individual, site-specific NPDES permits. The Regional Water Board will issue waste discharge requirements on the discharge of urban runoff to land when a threat to water quality exists.
- Combined sewer systems will not be allowed without satisfactory justification.
- The Regional Water Board will require source control programs by local agencies when water quality benefits will be realized.

- Governing agencies should provide facilities for the treatment (if necessary), storage and percolation of runoff.

4.1.13 Hazardous and Non-Hazardous Waste Disposal

Discharges of solid, semi-solid, and liquid wastes to landfills, waste piles, surface impoundments, pits, trenches, tailings ponds, natural depressions, and land treatment facilities (collectively called “waste management units”) have the potential to become sources of pollution affecting the quality of waters of the state. Unlike surface waters which often have the capacity to assimilate discharged waste constituents, ground waters have little or no assimilative capacity due to their slow migration rate, lack of aeration, lower biological activity, and laminar flow patterns. If concentrations of waste constituents in land-discharged waste are sufficiently high to prevent the waste from being classified as “inert waste” under 27 CCR, Section 20230, discharges of such wastes to waste management units require long-term containment or active treatment following the discharge in order to prevent waste or waste constituents from migrating to and impairing the beneficial uses of waters of the state. Pollutants from such discharges may continue to affect water quality long after the discharge of new waste to the unit has ceased, either because of continued leachate or gas discharges from the unit, or because pollutants have accumulated in underlying soils from which they are gradually released to ground water.

Landfills for disposal of municipal or industrial solid waste (solid waste disposal sites) are the major categories of waste management units in the region, but there are also surface impoundments used for storage or evaporative treatment of liquid wastes, waste piles for the storage of solid wastes, and land treatment units for the biological treatment of semi-solid sludges from wastewater treatment facilities and liquid wastes from cannery and other industrial operations. Sumps, trenches, and soil depressions have been used in the past for liquid waste disposal. Mining waste management units (tailings ponds, surface impoundments, and waste piles) also represent a significant portion of the waste management units in the Region. The Regional Water Board issues waste discharge requirements to ensure that these discharges are properly contained to protect the Region’s water resources from degradation, and to ensure that dischargers undertake effective monitoring to verify continued compliance with requirements. In addition, the Toxic Pits Cleanup Act of 1984 precludes the storage or disposal of liquid hazardous wastes or hazardous wastes containing free liquid. The Regional Water Board is responsible for enforcing this Act under the authority of the Health and Safety Code, Section 25208 et seq.

These discharges, and the waste management units at which the wastes are discharged, are subject to concurrent regulation by other state and local agencies responsible for land use planning, solid waste management, and hazardous waste management. “Local Enforcement Agencies” (mainly cities and counties) implement the state’s solid waste management laws and local ordinances governing the siting, design, and operation of solid waste disposal facilities (usually landfills) with the concurrence of the California Department of Resources Recycling and Recovery (CalRecycle) (formerly the California Integrated Waste Management Board (Waste Management Board)). CalRecycle also has direct responsibility for review and approval of plans for closure and post-closure maintenance of solid waste landfills. The Department of Toxic Substances Control issues permits for all hazardous waste treatment, storage, and disposal facilities (which include hazardous waste incinerators, tanks, and warehouses where hazardous wastes are stored in drums as well as landfills, waste piles, surface impoundments, and land treatment units). The State Water Board, regional water boards, Waste Management Board (now CalRecycle), and Department of Toxic Substances Control have entered into Memoranda of Understanding to coordinate their respective roles in the concurrent regulation of these discharges.

The statutes and regulations governing the discharges of both hazardous and non-hazardous wastes have been revised and strengthened in the last few years. The discharge of municipal solid wastes to land are closely regulated and monitored; however, some water quality problems have been detected and are being addressed. Solid waste water quality assessment tests and recent monitoring efforts under the State and regional water boards’ Title 23, CCR, Division 2, Chapter 15 and Title 27, CCR, Division 2, Subdivision 1 have revealed that discharges of municipal solid wastes to unlined landfills have resulted in ground water degradation and pollution by volatile organic constituents and other waste constituents. Volatile organic constituents are components of many household hazardous wastes and certain industrial wastes that are present within municipal solid waste streams. Volatile organic constituents can easily migrate from landfills either in leachate or by vapor-phase transport. Clay liners and natural clay formations between discharged wastes and ground waters are largely ineffective in preventing water

quality impacts from municipal solid waste constituents. In a recently adopted policy for water quality control, the State Water Board found the “[r]esearch on liner systems for landfills indicates that (a) single clay liners will only delay, rather than preclude, the onset of leachate leakage, and (b) the use of composite liners represents the most effective approach for reliably containing leachate and landfill gas.” {State Water Board Resolution No. 93-62, Policy for Regulation of discharges of Municipal Solid Waste}

As a result of similar information on a national scale, the U. S. Environmental Protection Agency (USEPA) adopted regulations under Subtitle D of the Resource Conservation and Recovery Act (RCRA) which require the containment of municipal solid wastes by composite liners and leachate collection systems. Composite liners consist of a flexible synthetic membrane component placed above and in intimate contact with a compacted low-permeability soil component. This liner system enhances the effectiveness of the leachate collection and removal system and provides a barrier to vapor-phase transport of volatile organic constituents from the unit. Regional water boards and CalRecycle are implementing these new regulations in California under a policy for water quality control from the State Water Board (Resolution No. 93-62) and regulations from CalRecycle. The State Water Board adopted revised regulations in 27 CCR, Division 2, Subdivision 1 to fully implement water quality-related portions of the RCRA, Subtitle D federal regulations.

Inert waste does not contain hazardous waste or soluble pollutants at concentrations in excess of applicable water quality objectives and does not contain significant quantities of decomposable waste. Some examples of inert wastes include: concrete rubble and excess clean earth fill. Inert wastes do not necessarily need to be disposed of at classified waste management units, but waste discharge requirements may be issued for their discharge at the discretion of the Regional Water Board.

4.1.14 Other Discharge Activities

Some remaining discharges of concern include small hydroelectric facility development, dredging and dredging spoils runoff.

The energy crisis of the 1970s resulted in a surge of small hydroelectric facility development in the mountains and foothills. Impairments to beneficial uses may occur from this type of stream development because of erosion from construction and changes in water temperature. The Regional Water Board has published guidelines for small hydroelectric facilities (see Appendix 31, which is included by reference into this plan) to help address some of the problems associated with small hydroelectric plants.

Dredging can result in turbidity and the reintroduction and resuspension of harmful metal or organic materials. This latter effect occurs directly as a result of the displacement of sediment at the dredging site and indirectly as a result of erosion of dredge spoil to surface waters at the deposition site. The Regional Water Board currently regulates dredging operations on a case-by-case basis. Operational criteria may result from permits or the water quality certification requirements stemming from Section 401(a) of the Clean Water Act. The opportunity may exist to regulate certain of the dredging operations under a general permit.

The Regional Water Board receives notice of spills, leaks, and overflows as they occur. These incidents are evaluated for water quality impacts and remedial actions are implemented when necessary.

4.2 THE NATURE OF CONTROL ACTIONS IMPLEMENTED BY THE REGIONAL WATER BOARD

The nature of actions to achieve water quality objectives are the following:

- ~~1~~(1) identifying potential water quality problems;
- ~~2~~(2) confirming and characterizing water quality problems through assessments of source, frequency, duration, extent, fate, and severity;
- ~~3~~(3) remedying water quality problems through imposing or enforcing appropriate measures;

4.4 monitoring problem areas to assess effectiveness of the remedial measures.

Generally, the actions associated with the first step consist of surveys or reviews of survey information and other data sources to isolate possible impairments of beneficial uses or water quality.

The characterization step usually involves studies that attempt to answer questions about a water quality problem's source, extent, duration, frequency, and severity. Information on these parameters is essential to confirm a problem and prepare for remedy. The Regional Water Board may gain this information through its own work or through data submittals requested of actual or potential dischargers under Section 13267 of the California Water Code.

Problem remedy calls for the Regional Water Board to prevent or cleanup problems. A common means of prevention, as well as protection, of water quality is through the issuance of NPDES permits, waste discharge requirements, discharge prohibitions, or other discharge restrictions. The NPDES is a requirement of the Federal Clean Water Act (Section 402) and California has implementing responsibility. The national permit system only applies to certain surface water discharges. Waste discharge requirements, which encompass permits, are described in the Water Code Section 13260, et seq. The waste discharge requirements system is not as restricted as the federal NPDES.

Waste discharge requirements may be used to control any type of discharge to land, ground waters or surface waters that may affect water quality. The Regional Water Board considers existing quality of receiving waters; historical, present, and future beneficial uses and the rates of use; nature and character of the discharge and possible ~~effect~~ on beneficial uses and receiving water quality; particular impact on beneficial uses within the immediate area of the discharge; and water quality objectives. The Regional Water Board will make a finding as to all beneficial uses within the area of influence of the discharge, and will set waste discharge requirements to protect these uses while not allowing the discharge to violate receiving water quality objectives.

Cleanup is implemented through enforcement measures such as cease and desist and cleanup and abatement orders. Cease and desist orders and cleanup and abatement orders are two of the enforcement tools available to the Regional Water Board to correct actual or potential violations of waste discharge requirements, NPDES permits, prohibitions, and nuisance or pollution.

The details of the monitoring step are explained in Chapter ~~V~~6. In general, the Regional Water Board has wide latitude to require actual and potential dischargers to submit monitoring and surveillance information, in addition to collecting its own or using State Water Board data.

Whatever actions that the Regional Water Board implements must be consistent with the Basin Plan's beneficial uses and water quality objectives, as well as certain State and Regional Water Boards' policies, plans, agreements, prohibitions, guidance, and other restrictions or requirements. These considerations are described in Chapter ~~V~~5 and included in the Appendix when noted.

4.2.1 Antidegradation

The antidegradation directives of State Water Board Resolution No. 68-16 (Appendix 2) require that high quality waters of the State be maintained "consistent with the maximum benefit to the people of the State." The Regional Water Board applies these directives when issuing a permit, or in an equivalent process, regarding any discharge of waste which may affect the quality of surface or ground waters in the region.

No proven means exist at present that will allow ongoing human activity in the Basin and maintain ground water salinity at current levels throughout the Basin. Consistent with the above, the Regional Water Board has determined that controlled ground water degradation by salinity is the most feasible and practical short-term management alternative for the Tulare Lake Basin. The water quality objectives for ground water salinity control the rate of increase and maintain beneficial uses as long as possible. A valleywide drain to carry salts out of the valley remains the best technical solution to the water quality problems of the Tulare Lake Basin.

Implementation of this policy to prevent or minimize surface and ground water degradation is a high priority for the Board. In nearly all cases, preventing pollution before it happens is much more cost-effective than cleaning up

pollution after it has occurred. Once degraded, surface water is often difficult to clean up when it has passed downstream. Likewise, cleanup of ground water is costly and lengthy due, in part, to its relatively low assimilative capacity and inaccessibility. The prevention of degradation is, therefore, an important strategy to meet the policy's objectives.

The Regional Water Board will apply the directives of Resolution No. 68-16 in considering whether to allow a certain degree of degradation to occur or remain. In conducting this type of analysis, the Regional Water Board will evaluate the nature of any proposed, existing, or materially changed discharge, that could affect the quality of waters within the region. Any discharge of waste to high quality waters must apply best practicable treatment or control not only to prevent a condition of pollution or nuisance from occurring, but also to maintain the highest water quality possible consistent with the maximum benefit to the people of the State.

Pursuant to this policy, a Report of Waste Discharge, or any other similar technical report required by the Board pursuant to Water Code Section 13267, must include information regarding the nature and extent of the discharge and the potential for the discharge to affect surface or ground water quality in the region. This information must be presented as an analysis of the impacts and potential impacts of the discharge on water quality, as measured by background concentrations and applicable water quality objectives. The extent of information necessary will depend on the specific conditions of the discharge. For example, use of best professional judgement and limited available information may be sufficient to determine that ground or surface water will not be degraded. In addition, the discharger must identify treatment or control measures to be taken to minimize or prevent water quality degradation.

4.2.2 Application of Water Quality Objectives

Water quality objectives are defined in the Water Code as “the limits or levels of water quality constituents or characteristics which are established for the reasonable protection of beneficial uses of water or the prevention of nuisance within a specific area.” (See Chapter [H3](#)) Water quality objectives may be stated in either numerical or narrative form. Water quality objectives apply to all waters within a surface water or ground water resource for which beneficial uses have been designated, rather than at an intake, wellhead or other point of consumption.

In conjunction with the issuance of NPDES and storm water permits, the Regional Water Board may designate mixing zones within which water quality objectives will not apply provided the discharger has demonstrated to the satisfaction of the Regional Water Board that the mixing zone will not adversely impact beneficial uses. If allowed, different mixing zones may be designated for different types of objectives, including, but not limited to, acute aquatic life objectives, chronic aquatic life objectives, human health objectives, and acute and chronic whole effluent toxicity objectives, depending in part on the averaging period over which the objectives apply. In determining the site of such mixing zones, the Regional Water Board will consider the applicable procedures and guidelines in EPA's Water Quality Standards Handbook, August 1994, and the Technical Support Document for Water Quality-based Toxics Control, March 1991, both of which are incorporated by reference into this plan. Pursuant to EPA guidelines, mixing zones designated for acute aquatic life objectives will generally be limited to a small zone of initial dilution in the immediate vicinity of the discharge.

State Water Board Resolution No. 68-16 requires the maintenance of the existing high quality of water (i.e., “background”) unless a change in water quality “will be consistent with maximum benefit to the people of the State...”. This State Water Board policy explains how the Regional Water Board applies numerical and narrative water quality objectives to ensure the reasonable protection of beneficial uses of water and how the Regional Water Board applies Resolution No. 68-16 to promote the maintenance of existing high quality waters.

The numerical and narrative water quality objectives define the least stringent standards that the Regional Water Board will apply to regional waters in order to protect beneficial uses. Numerical receiving water limitations will be established in Board orders for constituents and parameters which will, at a minimum, meet all applicable water quality objectives. However, the water quality objectives do not require improvement over naturally occurring background concentrations. In cases where the natural background concentration of a particular constituent exceeds an applicable water quality objective, the natural background concentration will be considered to comply with the objective. Consistent with Resolution No. 68-16, the Regional Water Board will impose more stringent numerical limitations (or prohibitions) which will maintain the existing quality of the receiving water, unless, pursuant to Resolution No. 68-16, some adverse change in water quality is allowed. Maintenance of the existing high quality of

water means maintenance of “background” water quality conditions, i.e., the water quality found upstream or upgradient of the discharge, unaffected by other discharges. Therefore, the water quality objectives will define the least stringent limits which will be imposed and background defines the most stringent limits which will be imposed on ambient water quality.

This Basin Plan contains numerical water quality objectives for various constituents and parameters in Chapter [4.3](#). Where numerical water quality objectives are listed, these are the limits necessary for the reasonable protection of beneficial uses of the water. In many instances, the Regional Water Board has not been able to adopt numerical water quality objectives for constituents or parameters, and instead has adopted narrative water quality objectives (e.g., for bacteria, chemical constituents, taste and odor, and toxicity). Where compliance with these narrative objectives is required (i.e., where the objectives are applicable to protect specified beneficial uses), the Regional Water Board will, on a case-by-case basis, adopt numerical limitations in orders which will implement the narrative objectives.

To evaluate compliance with the narrative water quality objectives, the Regional Water Board considers, on a case-by-case basis, direct evidence of beneficial use impacts, all material and relevant information submitted by the discharger and other interested parties, and relevant numerical criteria and guidelines developed and/or published by other agencies and organizations (e.g., State Water Board, State Water Board Division of Drinking Water Programs, California Office of Environmental Health Hazard Assessment, California Department of Toxic Substances Control, University of California Cooperative Extension, California Department of Fish and Wildlife, U. S. EPA, U. S. Food and Drug Administration, National Academy of Sciences, U. S. Fish and Wildlife Service, Food and Agricultural Organization of the United Nations). In considering such criteria, the Board evaluates whether the specific numerical criteria, which are available through these sources and through other information supplied to the Regional Water Board, are relevant and appropriate to the situation at hand and, therefore, should be used in determining compliance with the narrative objective. For example, compliance with the narrative objective for taste and odor may be evaluated by comparing concentrations of pollutants in water with numerical taste and odor thresholds that have been published by other agencies. This technique provides relevant numerical limits for constituents and parameters which lack numerical water quality objectives. To assist dischargers and other interested parties, the Regional Water Board staff has compiled many of these numerical water quality criteria from other appropriate agencies and organizations in the Central Valley Regional Water Board’s staff report, A Compilation of Water Quality Goals. This staff report is updated regularly to reflect changes in these numerical criteria.

Where multiple toxic pollutants exist together in water, the potential for toxicologic interactions exists. On a case by case basis, the Regional Water Board will evaluate available receiving water and effluent data to determine whether there is a reasonable potential for interactive toxicity. Pollutants which are carcinogens or which manifest their toxic effects on the same organ systems or through similar mechanisms will generally be considered to have potentially additive toxicity. The following formula will be used to assist the Regional Water Board in making determinations:

$$\sum_{i=1}^n \frac{[\text{Concentration of Toxic Substances}]_i}{[\text{Toxicological Limit for Substances in Water}]_i} < 1.0$$

The concentration of each toxic substance is divided by its toxicologic limit. The resulting ratios are added for substances having similar toxicologic effects and, separately, for carcinogens. If such a sum of ratios is less than one, an additive toxicity problem is assumed not to exist. If the summation is equal to or greater than one, the combination of chemicals is assumed to present an unacceptable level of toxicologic risk. For example, monitoring shows that ground water beneath a site has been degraded by three volatile organic chemicals, A, B, and C, in concentrations of 0.3, 0.4, and 0.04 µg/l, respectively. Toxicologic limits for these chemicals are 0.7, 3, and 0.06 µg/l, respectively. Individually, no chemical exceeds its toxicologic limit. However, an additive toxicity calculation shows:

$$\frac{0.3}{0.7} + \frac{0.4}{3} + \frac{0.04}{0.06} = 1.2$$

The sum of the ratios is greater than unity (> 1.0); therefore, the additive toxicity criterion has been violated. The concentrations of chemicals A, B, and C together present a potentially unacceptable level of toxicity.

Where the Regional Water Board determines it is infeasible to achieve immediate compliance with water quality objectives adopted by the Regional Water Board or the State Water Board, or with water quality criteria adopted by the federal Environmental Protection Agency, or with an effluent limitation based on these objectives or criteria, the Regional Water Board shall establish in NPDES permits a schedule of compliance. The schedule of compliance shall include a time schedule for completing specific actions that demonstrate reasonable progress toward the attainment of the objectives or criteria and shall contain a final compliance date, based on the shortest practicable time (determined by the Regional Water Board) required to achieve compliance. In no event shall an NPDES permit include a schedule of compliance that allows more than ten years (from the date of adoption of the objective or criteria) for compliance with water quality objectives, criteria or effluent limitations based on the objectives or criteria. Schedules of compliance are authorized by this provision only for those water quality objective or criteria adopted after the effective date of this provision. The Regional Water Board will establish compliance schedules in NPDES permits consistent with the provisions of the State Water Board's Compliance Schedule Policy (Resolution 2008-0025) and in accordance with Title 23, California Code of Regulations, Section 2231, compliance schedules may be included in waste discharge requirements for discharges other than from point sources to navigable waters. Time schedules in waste discharge requirements are established consistent with Water Code Section 13263.

For permitting purposes, it is important to clearly define how compliance with the narrative toxicity objectives will be measured. Staff is currently working with the State Water Board to develop guidance on this issue.

4.2.3 Ground Water Cleanups

The Regional Water Board's strategy for managing contaminated sites is guided by several important principles, which are based on Water Code Sections 13000 and 13304, the Chapter 15 regulations and State Water Board Resolution No. 92-49:

1-(1) State Water Board Policy and Regulation

The Regional Water Board will require conformance with the provisions of State Water Board Resolution No. 68-16 in all cases and will require conformance with applicable or relevant provisions of Title 23, California Code of Regulations, Division 3, Chapter 15 and 27 CCR, Division 2, Subdivision 1 to the extent feasible. These provisions direct the Regional Water Board to ensure that dischargers are required to cleanup and abate the effect of discharges in a manner that promotes attainment of background water quality, or the highest water quality which is reasonable and protective of beneficial uses if background levels of water quality cannot be restored.

2-(2) Site Investigation

An investigation of soil and ground water to determine full horizontal and vertical extent of pollution is necessary to ensure that cleanup plans are protective of water quality. The goal of the investigation shall be to determine where concentrations of constituents of concern exceed beneficial use protective levels (water quality objectives) and, additionally, where constituents of concern exceed background levels (the zero-impact line). Investigations shall extend off-site as necessary to determine the full extent of the impact.

3-(3) Source Removal/Containment

Immediate removal or containment of the source, to the extent practicable, should be implemented where necessary to prevent further spread of pollution as well as being among the most cost-effective remediation actions. The effectiveness of ground water cleanup techniques often depends largely on the completeness of source removal or containment efforts (e.g., removal of significantly contaminated soil or pockets of dense non-aqueous phase liquids).

4-(4) Cleanup Level Approval

Ground water and soil cleanup levels are approved by the Regional Water Board through the adoption of enforcement orders or waste discharge requirements. The Executive Officer may approve cleanup levels as

appropriately delegated by the Regional Water Board.

~~5~~(5) Site Specificity

Given the extreme variability of hydrogeologic conditions in the Region, cleanup levels must reflect site specific factors.

~~6~~(6) Discharger Submittals

The discharger must submit the following information for consideration by the Regional Water Board in establishing cleanup levels which meet the criteria contained in Title 23, California Code of Regulations, Section 2550.4(c) through (g):

- ~~a~~(a) water quality assessment to determine impacts and threats to the quality of water resources;
- ~~b~~(b) risk assessment to determine impacts and threats to human health and the environment; and
- ~~e~~(c) feasibility study of cleanup alternatives which compare effectiveness, cost, and time to achieve cleanup levels. Cleanup levels covered by this study shall include, at a minimum, background levels, levels which meet all applicable water quality objectives and which do not pose significant risks to health or the environment, and an alternate cleanup level which is above background levels and which also meets the requirements as specified in paragraphs ~~(7)~~(e). and f. below.

~~7~~(7) Ground Water Cleanup Levels

Ground water cleanup levels shall be established based on:

- ~~a~~(a) background concentrations of individual pollutants;
- ~~b~~(b) applicable water quality objectives to protect designated beneficial uses of the water body, as listed in Chapters ~~H-2~~ and ~~3H~~;
- ~~e~~(c) concentrations which do not pose a significant risk to human health or the environment, considering risks from toxic constituents to be additive across all media of exposure and, in the absence of scientifically valid data to the contrary, additive for all constituents having similar toxicologic effects or having carcinogenic effects; and
- ~~d~~(d) technologic and economic feasibility of attaining background concentrations and of attaining concentrations lower than defined by b and c, above.
- ~~e~~(e) Pursuant to Title 23, California Code of Regulations, the Regional Water Board establishes cleanup levels that are protective of human health, the environment and beneficial uses of waters of the state, as measured by compliance with b and c, above, and are equal to background concentrations if background levels are technologically or economically feasible to achieve. If background levels are infeasible to achieve, cleanup levels are set between background concentrations and concentrations that meet all criteria in b and c, above. Within this concentration range, cleanup levels must be set at the lowest concentrations that are technologically and economically achievable. In no case are cleanup levels established below natural background concentrations.
- ~~f~~(f) Technologic feasibility is determined by the availability of technologies which have been shown to be effective in reducing the concentrations of the constituents of concern to the established cleanup levels. Bench-scale and/or pilot-scale studies may be necessary to make this feasibility assessment in the context of constituent, hydrogeologic, and other site-specific factors. Economic feasibility does not refer to the subjective measurement of the ability of the discharger to pay the costs of cleanup, but rather to the objective balancing of the incremental benefit of attaining more

stringent levels of constituents of concern as compared with the incremental cost of achieving those levels. Factors to be considered in the establishment of cleanup levels greater than background are listed in Title 23, California Code of Regulations, Section 2550.4(d). The discharger's ability to pay is one factor to be considered in determining whether the cleanup level is reasonable. However, availability of economic resources to the discharger is primarily considered in establishing reasonable schedules for compliance with cleanup levels.

~~8.(g)~~ Compliance with c, above, shall be determined through risk assessments, performed by the discharger, using procedures consistent with those used by the Department of Toxic Substances Control, the Office of Environmental Health Hazard Assessment, and the USEPA. The Regional Water Board is not the lead agency for specifying risk assessment procedures or for reviewing risk assessments. The Board will assist the discharger, as necessary, in obtaining the appropriate, most current procedures from the above listed agencies. To prevent duplication of effort, the Regional Water Board will rely on the Department of Toxic Substances Control, the Office of Environmental Health Hazard Assessment, or appropriately designated local health agencies to review and evaluate the adequacy of such risk assessments.

~~8.(8)~~ Compliance with Ground Water Cleanup Levels

To protect potential beneficial uses of the water resource as required by Water Code Sections 13000 and 13241, compliance with ground water cleanup levels must occur throughout the pollutant plume.

~~9.(9)~~ The Regional Water Board may consider modifying site-specific ground water cleanup levels (that have been determined pursuant to subsection ~~(7)~~, above) that are more stringent than applicable water quality objectives, only when a final remedial action plan has been pursued in good faith, and all of the following conditions are met:

~~a.(a)~~ Modified cleanup levels meet the conditions listed in 7b and c, above.

~~b.(b)~~ An approved cleanup program has been fully implemented and operated for a period of time which is adequate to understand the hydrogeology of the site, pollutant dynamics, and the effectiveness of available cleanup technologies;

~~c.(c)~~ Adequate source removal and/or isolation is undertaken to eliminate or significantly reduce future migration of constituents of concern to ground water;

~~d.(d)~~ The discharger has demonstrated that no significant pollutant migration will occur to other underlying or adjacent aquifers;

~~e.(e)~~ Ground water pollutant concentrations have reached asymptotic levels using appropriate technology;

~~f.(f)~~ Optimization of the existing technology has occurred and new technologies have been evaluated and applied where economically and technologically feasible; and

~~g.(g)~~ Alternative technologies for achieving lower constituent levels have been evaluated and are inappropriate or not economically feasible.

~~10.(10)~~ Soil Cleanup Levels

For soils which threaten the quality of water resources, soil cleanup levels should be equal to background concentrations of the individual leachable/mobile constituents, unless background levels are technologically or economically infeasible to achieve. Where background levels are infeasible to achieve, soil cleanup levels are established to ensure that remaining leachable/mobile constituents of concern will not threaten to cause ground water to exceed applicable ground water cleanup levels, and that remaining constituents do not pose significant risks to health or the environment. The Regional Water Board will

consider water quality, health, and environmental risk assessment methods, as long as such methods are based on site-specific field data, are technically sound, and promote attainment of all of the above principles.

~~11~~(11) Verification of Soil Cleanup

Verification of soil cleanup generally requires verification sampling and follow-up ground water monitoring. The degree of required monitoring will reflect the amount of uncertainty associated with the soil cleanup level selection process. Follow-up ground water monitoring may be limited where residual concentrations of leachable/mobile constituents in soils are not expected to impact ground water quality.

~~12~~(12) Remaining Constituents

Where leachable/mobile concentrations of constituents of concern remain onsite in concentrations which threaten water quality, the Regional Water Board will require implementation of applicable provisions of Title 23, CCR, Division 3, Chapter 15 and Title 27, CCR, Division 2, Subdivision 1. Relevant provisions of Title 23, CCR, Division 3, Chapter 15 and Title 27, CCR, Division 2, Subdivision 1 which may not be directly applicable, but which address situations similar to those addressed at the cleanup site will be implemented to the extent feasible, in conformance with Title 27, CCR, Section 20090(d). This may include, but is not limited to, surface or subsurface barriers or other containment systems, pollutant immobilization, toxicity reduction, and financial assurances.

4.2.4 Variance Policy for Surface Waters

As part of its state water quality standards program, states have the discretion to include variance policies. (40 C.F.R., §131.13.) This policy provides the Regional Water Board with the authority to grant a variance from application of water quality standards under certain circumstances.

4.2.4.1 Variances from Surface Water Quality Standards for Point Source Dischargers

~~a~~(1) A permit applicant or permittee subject to an NPDES permit may apply to the Regional Water Board for a variance from a surface water quality standard for a specific constituent(s), as long as the constituent is not a priority toxic pollutant identified in 40 C.F.R., §131.38(b)(1). A permit applicant or permittee may not apply to the Regional Water Board for a variance from a surface water quality standard for temperature. The application for such a variance shall be submitted in accordance with the requirements specified in section ~~H of this Policy~~4.2.4.2. The Central Valley Water Board may adopt variance programs that provide streamlined approval procedures for multiple dischargers that share the same challenges in achieving their water quality based effluent limitation(s) (WQBELs) for the same pollutant(s). The *Variance Program for Salinity Water Quality Standards* in section ~~4.2.5.1~~4.3, below, is a multiple discharger variance program. Permittees that qualify for the *Variance Program for Salinity Water Quality Standards* by meeting the criteria in section 4.2.5.~~1~~3(1) may submit a salinity variance application in accordance with the requirements specified in section ~~III~~4.2.4.3 of this Policy.

~~b~~(2) The Regional Water Board may not grant a variance if:

- ~~i~~(a) Water quality standards addressed by the variance will be achieved by implementing technology-based effluent limitations required under sections 301(b) and 306 of the Clean Water Act, or
- ~~ii~~(b) The variance would likely jeopardize the continued existence of any endangered species under section 4 of the Endangered Species Act or result in the destruction or adverse modification of such species' critical habitat.

~~e~~(3) The Regional Water Board may approve all or part of a requested variance, or modify and approve a requested variance, if the permit applicant demonstrates a variance is appropriate based on at least one of the six following factors:

- ~~i~~(a) Naturally occurring pollutant concentrations prevent the attainment of the surface water quality standard; or

- ~~ii~~(b) Natural, ephemeral, intermittent, or low flow conditions or water levels prevent the attainment of the surface water quality standard, unless these conditions may be compensated for by the discharge of sufficient volume of effluent discharges without violating state water conservation requirements to enable surface water quality standards to be met; or
 - ~~iii~~(c) Human caused conditions or sources of pollution prevent the attainment of the surface water quality standard and cannot be remedied or would cause more environmental damage to correct than to leave in place; or
 - ~~iv~~(d) Dams, diversions, or other types of hydrologic modifications preclude the attainment of the surface water quality standard, and it is not feasible to restore the waterbody to its original condition or to operate such modification in a way that would result in the attainment of the surface water quality standard; or
 - ~~v~~(e) Physical conditions related to the natural features of the waterbody, such as the lack of a proper substrate, cover, flow, depth, pools, riffles, and the like, unrelated to water quality preclude attainment of aquatic life protection of surface water quality standards; or
 - ~~vi~~(f) Controls more stringent than those required by sections 301(b) and 306 of the Clean Water Act would result in substantial and widespread economic and social impact.
- ~~d~~(4) In making a determination on a variance application that is based on factor (~~iii~~c) in paragraph ~~c~~(3) above, the Regional Water Board may consider the following:
- ~~i~~(a) Information on the type and magnitude of adverse or beneficial environmental impacts, including the net impact on the receiving water, resulting from the proposed methodologies capable of attaining the adopted or proposed WQBEL.
 - ~~ii~~(b) Other relevant information requested by the Regional Water Board or supplied by the applicant or the public.
- ~~e~~(5) In making a determination on a variance application that is based on factor (~~vii~~f) in paragraph ~~e~~(3). above, the Regional Water Board may consider the following:
- ~~i~~(a) The cost and cost-effectiveness of pollutant removal by implementing the methodology capable of attaining the adopted or proposed WQBEL for the specific constituent(s) for which a variance is being requested.
 - ~~ii~~(b) The reduction in concentrations and loadings of the pollutant(s) in question that is attainable by source control and pollution prevention efforts as compared to the reduction attainable by use of the methodology capable of attaining the adopted or proposed WQBEL.
 - ~~iii~~(c) The overall impact of attaining the adopted or proposed WQBEL and implementing the methodologies capable of attaining the adopted or proposed WQBEL.
 - ~~iv~~(d) The technical feasibility of installing or operating any of the available methodologies capable of attaining the WQBEL for which a variance is sought.
 - ~~v~~(e) Other relevant information requested by the Regional Water Board or supplied by the applicant or the public.
- ~~f~~(6) A determination to grant or deny a requested variance shall be made in accordance with the procedures specified in section ~~HH~~4.2.4.2, below. Procedures specified in section ~~HH~~4.2.4.3, below, will be used for applicants that qualify for the *Variance Program for Salinity Water Quality Standards*.
- ~~g~~(7) A variance applies only to the permit applicant requesting the variance and only to the constituent(s) specified in the variance application.
- ~~h~~(8) A variance or any renewal thereof shall be for a time as short as feasible and shall not be granted for a term greater than ten years.
- ~~i~~(9) Neither the filing of a variance application nor the granting of a variance shall be grounds for the staying or dismissing of, or a defense in, a pending enforcement action. A variance shall be prospective only from the date the variance becomes effective.
- ~~j~~(10) A variance shall conform to the requirements of the State Water Board's *Antidegradation Policy* (State Water Board Resolution 68-16).

4.2.4.2H Variance Application Requirements and Processes

- ~~a~~-(1) An application for a variance from a surface water quality standard for a specific constituent(s) subject to this Policy may be submitted at any time after the permittee determines that it is unable to meet a WQBEL or proposed WQBEL based on a surface water quality standard, and/or an adopted wasteload allocation. The variance application may be submitted with the renewal application (i.e., report of waste discharge) for a NPDES permit. If the permittee is seeking to obtain a variance after a WQBEL has been adopted into a NPDES permit, the WQBEL shall remain in effect until such time that the Regional Water Board makes a determination on the variance application.
- ~~b~~-(2) The granting of a variance by the Regional Water Board is a discretionary action subject to the requirements of the California Environmental Quality Act. As such, the Regional Water Board may require the variance applicant to prepare such documents as are necessary so that the Regional Water Board can ensure that its action complies with the requirements set forth in the California Environmental Quality Act, or the Regional Water Board may use any such documents that have been prepared and certified by another state or local agency that address the potential environmental impacts associated with the project and the granting of a variance.
- ~~e~~-(3) A complete variance application must contain the following:
- ~~i~~-(a) Identification of the specific constituent(s) and water quality standard(s) for which a variance is sought;
 - ~~ii~~-(b) Identification of the receiving surface water, and any available information with respect to receiving water quality and downstream beneficial uses for the specific constituent;
 - ~~iii~~-(c) Identification of the WQBEL(s) that is being considered for adoption, or has been adopted in the NPDES permit;
 - ~~iv~~-(d) List of methods for removing or reducing the concentrations and loadings of the pollutants with an assessment of technical effectiveness and the costs and cost- effectiveness of these methods. At a minimum, and to the extent feasible, the methods must include source control measures, pollution prevention measures, facility upgrades and end-of-pipe treatment technology. From this list, the applicant must identify the method(s) that will consistently attain the WQBELs and provide a detailed discussion of such methodologies;
 - ~~v~~-(e) Documentation of at least one of the following over the next ten years. Documentation that covers less than ten years will limit the maximum term that the Regional Water Board can consider for the variance:
 - ~~(1)~~i) That naturally occurring pollutant concentrations prevent the attainment of the surface water quality standard or
 - ~~(2)~~ii) That natural, ephemeral, intermittent, or low flow conditions or water levels prevent the attainment of the surface water quality standard, unless these conditions may be compensated for by the discharge of sufficient volume of effluent discharges to enable surface water quality standards to be met; or
 - ~~(3)~~iii) That human caused conditions or sources of pollution prevent the attainment of the surface water quality standard from which the WQBEL is based, and it is not feasible to remedy the conditions or sources of pollution; or
 - ~~(4)~~iv) That dams, diversions, or other types of hydrologic modifications preclude the attainment of the surface water quality standard from which the WQBEL is based, and it is not feasible to restore the water body to its original condition or to operate such modification in a way that would result in attainment of the surface water quality standard; or
 - ~~(5)~~v) Physical conditions related to the natural features of the water body, such as the lack of a proper substrate, cover, flow, depth, pools, riffles, and the like, unrelated to water quality, preclude attainment of aquatic life protection of surface water quality standards from which the WQBEL is based; or
 - ~~(6)~~vi) That installation and operation of each of the available methodologies capable of attaining the WQBEL would result in substantial and widespread economic and social impact.
 - ~~vi~~-f) Documentation that the permittee has reduced, or is in the process of reducing, to the maximum extent practicable, the discharge of the pollutant(s) for which a variance is sought through implementation of local pretreatment, source control, and pollution prevention efforts; and,

~~vii-g~~ A detailed discussion of a proposed interim discharge limitation(s) that represents the highest level of treatment that the permittee can consistently achieve during the term of the variance. Such discussion shall also identify and discuss any drought, water conservation, and/or water recycling efforts that may cause certain constituents in the effluent to increase, or efforts that will cause certain constituents in the effluent to decrease with a sufficient amount of certainty. When the permittee proposes an interim discharge limitation(s) that is higher than the current level of the constituent(s) in the effluent due to the need to account for drought, water conservation or water recycling efforts, the permittee must provide appropriate information to show that the increase in the level for the proposed interim discharge limitation(s) will not adversely affect beneficial uses, is consistent with state and federal antidegradation policies (State Water Board Resolution No. 68-16 and 40 C.F.R., § 131.12.), and is consistent with anti-backsliding provisions specified in section 402(o) of the Clean Water Act. If the permittee indicates that certain constituents in the effluent are likely to decrease during the term of the variance due to recycling efforts or management measures, then the proposed interim discharge limitation(s) shall account for such decreases.

~~viii-h~~ Copies of any documents prepared and certified by another state or local agency pursuant to Public Resources Code section 21080 et seq.; or, such documents as are necessary for the Regional Water Board to make its decision in compliance with Public Resources Code section 21080 et seq.

~~d(4)~~ Within 60 days of the receipt of a variance application, the Regional Water Board shall determine that the variance application is complete, or specify in writing any additional relevant information, which is deemed necessary to make a determination on the variance request. Such additional information shall be submitted by the applicant within a time period agreed upon by the applicant and the Regional Water Board Executive Officer. Failure of an applicant to submit any additional relevant information requested by the Regional Water Board Executive Officer within the agreed upon time period may result in the denial of the variance application.

~~e(5)~~ The Regional Water Board shall provide a copy of the variance application to USEPA Region 9 within 30 days of finding that the variance application is complete.

~~f(6)~~ Within a reasonable time period after finding that the variance application is complete, the Regional Water Board shall provide public notice, request comment, and schedule and hold a public hearing on the variance application. When the variance application is submitted with the NPDES permit renewal application (i.e., report of waste discharge), the notice, request for comment and public hearing requirement on the variance application may be conducted in conjunction with the Regional Water Board's process for the renewal of the NPDES permit.

~~g(7)~~ The Regional Water Board may approve the variance, either as requested, or as modified by the Regional Water Board. The Regional Water Board may take action to approve a variance and renew and/or modify an existing NPDES permit as part of the same Board meeting. The permit shall contain all conditions needed to implement the variance, including, at a minimum, all of the following:

~~i(a)-~~ An interim effluent limitation for the constituent(s) for which the variance is sought. The interim effluent limitation(s) must be consistent with the current level of the constituent(s) in the effluent and may be lower based on anticipated improvement in effluent quality. The Regional Water Board may consider granting an interim effluent limitation(s) that is higher than the current level if the permittee has demonstrated that drought, water conservation, and/or water recycling efforts will cause the quality of the effluent to be higher than the current level and that the higher interim effluent limitation will not adversely affect beneficial uses. When the duration of the variance is shorter than the duration of the permit, compliance with effluent limitations sufficient to meet the water quality criterion upon the expiration of the variance shall be required;

~~ii(b)~~ A requirement to prepare and implement a pollution prevention plan pursuant to Water Code section 13263.3 to address the constituent(s) for which the variance is sought;

~~iii(c)~~ Any additional monitoring that is determined to be necessary by the Regional Water Board to evaluate the effects on the receiving water body of the variance from water quality standards;

~~iv(d)~~ A provision allowing the Regional Water Board to reopen and modify the permit based on any revision to the variance made by the Regional Water Board during the next revision of the water quality standards or by EPA upon review of the variance; and

- ~~v~~(e) Other conditions that the Regional Water Board determines to be necessary to implement the terms of the variance.
- ~~h~~(8) The variance, as adopted by the Regional Water Board in section ~~G~~(7), is not in effect until it is approved by U.S. EPA.
- ~~i~~(9) Permit limitations for a constituent(s) contained in the applicant's permit that are in effect at the time of the variance application shall remain in effect during the consideration of a variance application for that particular constituent(s).
- ~~j~~(10) The permittee may request a renewal of a variance in accordance with the provisions contained in paragraphs ~~A~~(1), ~~B~~(2) and ~~C~~(3) and this section. For variances with terms greater than the term of the permit, an application for renewal of the variance may be submitted with the renewal application for the NPDES permit in order to have the term of the variance begin concurrent with the term of the permit. The renewal application shall also contain information concerning its compliance with the conditions incorporated into its permit as part of the original variance and shall include information to explain why a renewal of the variance is necessary. As part of its renewal application, a permittee shall also identify all efforts the permittee has made, and/or intends to make, towards meeting the standard(s). Renewal of a variance may be denied if the permittee did not comply with any of the conditions of the original variance.
- ~~k~~(11) All variances and supporting information shall be submitted by the Regional Water Board to the U.S. EPA Regional Administrator within 30 days of the date of the Regional Water Board's final variance decision for approval and shall include the following:
 - ~~i~~(a) The variance application and any additional information submitted to the Regional Water Board;
 - ~~ii~~(b) Any public notices, public comments, and records of any public hearings held in conjunction with the request for the variance;
 - ~~(c)iii~~ The Regional Water Board's final decision; and
 - ~~iv~~(d) Any changes to NPDES permits to include the variance.
- ~~l~~(12) All variances shall be reviewed during the Regional Water Board's triennial review process of this Basin Plan. For variances with terms that are greater than the term of the permit, the Regional Water Board may also review the variance upon consideration of the permit renewal.

4.2.4.3HH Variance Program for Salinity Water Quality Standards

The State Water Board and the Regional Water Board recognize that salt is impacting beneficial uses in the Central Valley and management of salinity in surface and ground waters is a major challenge for dischargers. In response, the Water Boards initiated the Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS) in 2006. The State Water Board *Recycled Water Policy* requires the development of salt and nutrient management plans protective of ground water and submittal of these plans to the Regional Water Board by May 2016. These plans are to become the basis of basin plan amendments to be considered by the Regional Water Board by May 2017. CV-SALTS is the stakeholder effort working to develop comprehensive salt and nitrate management plans (SNMPs) that will satisfy the *Recycled Water Policy's* salt and nutrient management plans. CV-SALTS is undertaking technical work to analyze salt and nitrate conditions in surface and ground water in the Central Valley, identify implementation measures, and develop monitoring strategies to ensure environmental and economic sustainability. The technical work under development includes developing the models for loading and transport of salt, development and evaluation of effective management practices, and implementing activities to ensure beneficial uses are protected. Participation by all stakeholders is necessary to assure that the work is scientifically justified, supported by broad stakeholder representation, and completed in a timely fashion. The Regional Water Board has indicated its support for the comprehensive effort through CV-SALTS in Resolutions R5-2006-0024, R5-2010-0024, and R5-2013-0149 and the March 2010 Memorandum of Agreement between the Regional Water Board, the Central Valley Salinity Coalition and the State Water Board.

- ~~a~~(1) During the development and initial implementation of the SNMPs by CV-SALTS, permittees who qualify may apply for a variance from salinity water quality standards if they have or will have WQBELs for salinity that they are unable to meet by submitting a salinity variance application. The *Salinity Variance Program* as described specifically herein is for municipal and domestic wastewater dischargers that have or will implement local pretreatment, source control, and pollution prevention efforts to reduce the effluent

concentrations of salinity constituents and are now faced with replacing the municipal water supply with a better quality water or installing costly improvements, such as membrane filtration treatment technology, such that widespread social and economic impacts are expected consistent with the justification provided for the case study cities in the *Staff Report for the Amendments to the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins and the Water Quality Control Plan for the Tulare Lake Basin to add Policies for Variances from Surface Water Quality Standards for Point Source Dischargers, Variance Program for Salinity, and Exception from Implementation of Water Quality Objectives for Salinity, June 2014*. Consistent with the planned development and implementation of the SNMPs, no salinity variance under this section shall be approved after 30 June 2019. For the purposes of the *Salinity Variance Program*, salinity water quality standards are defined to only include water quality standards for the following constituents: electrical conductivity, total dissolved solids, chloride, sulfate and sodium.

~~b~~(2) An application for a variance for a specific salinity water quality standard may be submitted at any time after the permittee determines that it is unable to meet a WQBEL or proposed WQBEL based on a salinity water quality standard. Preferably, the salinity variance application should be submitted with the renewal application (i.e., report of waste discharge) for a NPDES permit. If the permittee is seeking to obtain a variance after a WQBEL has been adopted into a NPDES permit, the WQBEL shall remain in effect until such time that the Regional Water Board makes a determination on the variance application.

~~e~~(3) An application for variance from WQBELs based on a salinity water quality standard must contain the following:

~~i~~(a) Identification of the salinity constituents for which the variance is sought;

~~ii~~(b) Identification of the receiving surface water, and any available information with respect to receiving water quality and downstream beneficial uses for the specific constituent;

~~iii~~(c) Identification of the WQBEL that is being considered for adoption, or has been adopted in the NPDES permit;

~~iv~~(d) A description of salinity reduction/elimination measures that have been undertaken as of the application date, if any;

~~v~~(e) A Salinity Reduction Study Work Plan, which at a minimum must include the following:

~~(1)~~ Data on current influent and effluent salinity concentrations,

~~(2)~~ Identification of known salinity sources,

~~(3)~~ Description of current plans to reduce/eliminate known salinity sources,

~~(4)~~ Preliminary identification of other potential sources,

~~(5)~~ A proposed schedule for evaluating sources,

~~(6)~~ A proposed schedule for identifying and evaluating potential reduction, elimination, and prevention methods.

~~vi~~(f) An explanation of the basis for concluding that there are no readily available or cost-effective methodologies available to consistently attain the WQBELs for salinity.

~~vii~~(g) A detailed discussion explaining why the permittee's situation is similar to or comparable with the case studies supporting the *Salinity Variance Program identified in the Staff Report for the Amendments to the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins and the Water Quality Control Plan for the Tulare Lake Basin to add Policies for Variances from Surface Water Quality Standards for Point Source Dischargers, Variance Program for Salinity, and Exception from Implementation of Water Quality Objectives for Salinity, June 2014*.

~~viii~~(h) A detailed discussion of proposed interim discharge limitation(s) that represents the highest level of treatment that the permittee can consistently achieve during the term of the variance. If the permittee indicates that certain constituents in the effluent are likely to decrease during the term of the variance due to efforts, then the proposed interim discharge limitation(s) shall account for such decreases.

~~ix~~(i) Documentation of the applicant's active participation in CV-SALTS as indicated by a letter of support from CV-SALTS.

~~x~~(j) A detailed plan of how the applicant will continue to participate in CV-SALTS and how the applicant will contribute to the development and implementation of the SNMPs.

~~d~~(4) After the receipt of a variance application for salinity, the Regional Water Board shall determine whether the variance application is complete and whether the permittee qualifies for consideration of the variance, or specify in writing any additional relevant information that is deemed necessary to make a determination

on the salinity variance request. Such additional information shall be submitted by the applicant within a time period agreed upon by the applicant and the Regional Water Board Executive Officer. Failure of an applicant to submit any additional relevant information requested by the Regional Water Board Executive Officer within the time period specified by the Executive Officer may result in the denial of the variance application for salinity.

- ~~e~~(5) After determining that the variance application for salinity is complete, the Regional Water Board shall provide notice, request comment, and schedule and hold a public hearing on the variance application for salinity. When the variance application is submitted with the NPDES permit renewal application (i.e., report of waste discharge), the notice, request for comment and public hearing requirement on the variance application may be conducted in conjunction with the Regional Water Board's process for the renewal of the NPDES permit.
- ~~f~~(6) The Regional Water Board may approve a salinity variance, either as requested, or as modified by the Regional Water Board, after finding that the permittee qualifies for the salinity variance, the attainment of the WQBEL is not feasible, the permittee has implemented or will implement feasible salinity reduction/elimination measures and the permittee continues to participate in CV-SALTS consistent with the demonstrations based on the case studies identified in *the Staff Report for the Amendments to the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins and the Water Quality Control Plan for the Tulare Lake Basin to add Policies for Variances from Surface Water Quality Standards for Point Source Dischargers, Variance Program for Salinity, and Exception from Implementation of Water Quality Objectives for Salinity, June 2014*. The Regional Water Board may take action to approve a variance and issue a new, or reissue or modify an existing NPDES permit as part of the same Board meeting. The permit shall contain all conditions needed to implement the variance, including, at a minimum, all of the following:
 - ~~i~~(a) The interim effluent limitation(s) that are determined to be attainable during the term of the variance. When the duration of the variance is shorter than the duration of the permit, compliance with effluent limitations sufficient to meet the water quality criterion upon the expiration of the variance shall be required;
 - ~~ii~~(b) A requirement to implement the Salinity Reduction Study Work Plan submitted with the variance application as required by paragraph ~~C-5~~(3)(e), above;
 - ~~iii~~(c) A requirement to participate in CV-SALTS and contribute to the development and implementation of the SNMPs in accordance with the plan required by paragraph ~~C-10~~(3)(j), above.
 - ~~iv~~(d) Any additional monitoring that is determined to be necessary to evaluate the effects on the receiving water body of the variance from water quality standards;
 - ~~v~~(e) A provision allowing the Regional Water Board to reopen and modify the permit based on any revision to the variance made by the Regional Water Board during the next revision of the water quality standards;
 - ~~vi~~(f) Other conditions that the Regional Water Board determines to be necessary to implement the terms of the variance.
- ~~g~~(7) Permit limitations for a substance contained in the applicant's permit that are in effect at the time of the variance application shall remain in effect during the consideration of the variance application for that particular substance.
- ~~h~~(8) The permittee may request a renewal of a salinity variance in accordance with the provisions contained in paragraphs ~~B-2~~ and ~~C-3~~ of this section. For variances with terms greater than the term of the permit, an application for renewal of the salinity variance may be submitted with the renewal application for the NPDES permit in order to have the term of the variance begin concurrent with the term of the permit. The renewal application shall also contain information concerning its compliance with the conditions incorporated into its permit as part of the original variance, and shall include information to explain why a renewal of the variance is necessary. As part of its renewal application, a permittee shall also identify all efforts the permittee has made, and/or intends to make, towards meeting the standard. Renewal of a variance may be denied if the permittee did not comply with the conditions of the original variance.
- ~~i~~(9) All variances shall be reviewed during the Regional Water Board's triennial review process of this Basin Plan. For variances with terms that are greater than the term of the permit, the Regional Water Board may also review the variance upon consideration of the permit renewal.

4.2.5 Dilution

Neither surface nor ground waters shall be used to dilute wastes for the primary purpose of meeting waste discharge requirements, where reasonable methods for treating the wastes exist. Blending of wastewater with surface or ground water to promote beneficial reuse of wastewater in water short areas may be allowed where the Regional Water Board determines such reuse is consistent with other regulatory policies set forth or referenced herein.

4.2.6 Prohibitions

The Porter-Cologne Water Quality Control Act allows the Regional Water Board to prohibit certain types of discharges or discharges to certain waters {California Water Code, Section 13243}. Prohibitions may be revised, rescinded, or adopted as necessary. The prohibitions applicable to the Tulare Lake Basin are identified and described below.

4.2.6.1 Leaching Systems

Discharge of wastes from new and existing leaching and percolation systems in the following areas is prohibited:

Corcoran Fringe Area, Kings County (Order No. 77-224)
East Porterville Area, Tulare County (Order No. 75-069)
Home Garden Community Services District, Kings County (Order No. 77-20)
Kettleman City County Service Area No. 1, Kings County (Order No. 75-071)

In addition, county moratoria prohibit new septic tank disposal systems in the following areas:

Del Rio, Fresno County
Delft Colony, Tulare County
El Rancho, Tulare County
Lindcove, Tulare County
Poplar, Tulare County
Seville, Tulare County
Tonyville, Tulare County
Tooleville, Tulare County
Traver, Tulare County
Wells Tract, Tulare County
Yetter, Tulare County

4.2.6.2 Petroleum

The discharge of oil or any residuary product of petroleum to the waters of the State, except in accordance with waste discharge requirements or other provisions of Division 7, California Water Code, is prohibited.

4.2.6.3 Hazardous Waste

Any discharge that may affect water quality of hazardous waste or chemicals known to cause cancer or reproductive toxicity, except in accordance with waste discharge and other federal, state, and local requirements.

4.2.7 Water Quality Limited Segments (WQLSs)

WQLSs are those sections of lakes, streams, rivers or other fresh water bodies where water quality does not meet (or is not expected to meet) water quality standards even after the application of appropriate effluent limitations for point sources {40 CFR 130, et seq.}.

Additional treatment beyond minimum federal requirements will be imposed on dischargers to a WQLS. Point source dischargers will be assigned or allocated a maximum allowable load of critical pollutants. If necessary,

nonpoint source discharges will be identified and reduction goals will be developed for these sources.

The list of WQLSs is updated biennially as required by the Clean Water Act Section 303(d). The current list may be obtained by contacting the Regional Water Board office.

4.2.8 Water Quality Assessment

A second list of water bodies comprises the Water Quality Assessment. The Assessment describes the condition of water bodies within the Tulare Lake Basin to the best of the Regional Water Board's knowledge. For water bodies with impairments (actual or suspected), a fact sheet is prepared to describe the Regional Water Board's actions or proposed actions and to estimate the costs to correct the impairments. The Assessment is updated periodically on an as-needed basis.

4.2.9 Waivers

State law allows Regional Water Boards to conditionally waive waste discharge requirements for a specific discharge or types of discharges where the waiver is consistent with any applicable state or regional water quality control plan and it is in the public interest. A waiver may not exceed five years in duration, but may be renewed by a Regional Water Board. Waiver conditions must include ~~monitoring~~ **monitoring** requirements unless the Regional Water Board determines that the discharge does not pose a significant threat to water quality. Prior to renewing any waiver for a specific type of discharge, the Regional Water Board shall review the terms of the waiver policy at a public hearing. At the hearing, the Regional Water Board shall determine whether the discharge for which the waiver policy was ~~established~~ **established** should be subject to general or individual waste ~~discharge~~ **discharge** requirements (California Water Code, Section 13269). However, NPDES permits for discharge to surface waters may not be waived.

The Regional Water Board may, after compliance with the California Environmental Quality Act (CEQA), allow short-term variances from Basin Plan provisions, if determined to be necessary to implement control measures for vector and weed control, pest eradication, or fishery management which are being conducted to fulfill statutory requirements under California's Fish and Wildlife, Food and Agriculture, or Health and Safety Codes. In order for the Regional Water Board to determine if a variance is appropriate, agencies proposing such activities must submit to the Regional Water Board project-specific information, including measures to mitigate adverse impacts.

4.3 ACTIONS RECOMMENDED FOR IMPLEMENTATION BY OTHER AGENCIES

Consistent with the Porter-Cologne Water Quality Control Act, the Basin Plan may identify control actions recommended for implementation by agencies other than the Regional Water Board {California Water Code, Section 13242(a)}.

4.3.1 Irrigated Agriculture

The water quality concerns from irrigated agriculture are great and the Regional Water Board cannot resolve these alone. The following actions should be taken by other agencies:

- ~~1-~~**(1)** As a last resort and where the withholding of irrigation water is the only means of achieving significant improvements in water quality, the State Water Board should use its water rights authority to preclude the supplying of water to specific lands.
- ~~2-~~**(2)** The State Water Board should require all water agencies in the Central Valley, regardless of size, to submit an "informational" report on water conservation.
- ~~3-~~**(3)** The State Water Board should continue to declare the drainage problem in the Central Valley a priority nonpoint source problem in order to make EPA nonpoint source control funding available to the area.

~~4~~(4) The Legislature should sponsor additional bond issues before the voters to provide low interest loans for agricultural water conservation and water quality projects. The bonds should incorporate provisions that would allow recipients to be private landowners, and that would allow irrigation efficiency improvement projects that reduce drainage discharges to be eligible for both water conservation funds and water quality facilities funds.

~~5~~(5) The US Bureau of Reclamation should give the districts and growers subject to this program first priority in their water conservation loan program.

~~6~~(6) The State Water Board should request legislation that will protect negotiated fish flow releases for instream uses in those critical reaches designated by the California Department of Fish and Wildlife from any new exercise of appropriative or riparian rights. These flow releases should recognize and protect existing contractual commitments for beneficial use.

4.3.2 Mining

Agencies with jurisdiction over mineral rights should issue these rights for limited periods of time and distribute them to the Regional Water Board for review.

4.3.3 Transfer of Water

Before granting new permits for water storage or diversion which involves interbasin transfer of water, the State Water Board should require the applicant to evaluate the alternatives listed below. Permits should not be approved unless the alternatives have been thoroughly investigated and ruled out for social, environmental, or economic reasons.

~~1~~(1) Make optimum use of existing water resource facilities.

~~2~~(2) Store what would otherwise be surplus wet-weather basin outflows in off-stream reservoirs.

~~3~~(3) Conjunctively use surface and ground waters.

~~4~~(4) Give careful consideration to the impact on basin water quality of inland siting of power plants.

~~5~~(5) Make maximum use of reclaimed water while protecting public health and avoiding severe economic penalties to a particular user or class of users.

4.3.4 Water Quality Planning

A core planning group should be continued within the staff of the State Water Board, which has the responsibility to integrate the statewide planning of water quality and water resources management.

4.3.5 Sole Source Aquifer

An aquifer may be designated by the U. S. Environmental Protection Agency to be a Sole Source Aquifer if it is the sole or principal drinking water source for an area and which, if contaminated, could create a significant hazard to public health.

The U. S. Environmental Protection Agency has designated a Sole Source Aquifer in Fresno County in accordance with Section 1424(e) of the Safe Drinking Water Act. The Sole Source Aquifer includes all or portions of the communities of Fresno, Clovis, Kerman, Raisin City, Selma, and Sanger. Specifically, it is the area bordered by (1) Fresno Slough Bypass on the west, (2) the San Joaquin River on the north, (3) the Friant-Kern Canal on the east, and (4) the Kings River on the south.

4.3.6 Watershed Management Plans

In many cases, particularly situations involving nonpoint source pollution, standard regulatory techniques are not appropriate or adequate to improve the quality of water. The Regional Water Board supports implementing a watershed based approach to address water quality problems. The benefits to implementing a watershed based program would include gaining participation of stakeholders and focusing efforts on the most important problems and those sources contributing most significantly to those problems.

In many instances, a watershed program is initiated by entities other than the Regional Water Board. A group of affected and concerned entities identifies water quality problems caused or exacerbated by the presence of man. This group then considers the needs and concerns of the watershed to develop a watershed management plan in a coordinated manner. In some of these groups, the Regional Water Board is in an oversight position and the solution is developed from within the group.

4.4 CONTINUOUS PLANNING FOR WATER QUALITY CONTROL

Knowledge of water quality problems changes constantly. Because of this, control actions and water quality objectives must be regularly evaluated for their effectiveness in protecting beneficial uses. As warranted, the actions, water quality objectives, or designated beneficial uses may be changed to ensure that the proper beneficial uses are protected and enhanced. The Regional Water Board has a continuous planning process to serve these functions and maintain its water quality regulatory program.

The Regional Water Board is periodically apprised of water quality problems in the Tulare Lake Basin, but the major review of water quality is done every three years as part of the Triennial Review of water quality standards.

During the Triennial Review, the Regional Water Board holds a public hearing to receive comments on actual and potential water quality problems. A workplan is prepared which identifies the control actions that will be implemented over the succeeding three years to address the problems. The actions may include or result in revision of the Basin Plan's water quality standards if that is an appropriate problem remedy. Until such time that a basin plan is revised, the Triennial Review also serves to reaffirm existing standards.

The control actions that are identified through the Triennial Review process are incorporated into the Basin Plan to meet requirements of Water Code Section 13242 (a) and (b). These requirements include describing actions to achieve water quality objectives and developing a time schedule to implement these actions.

This basin plan update serves as the Triennial Review. The following issues are identified for study during this triennial review period:

- I-(1)** Salinity in the Lower Kings River: This issue was identified during the 1987 Triennial Review. Since that time, two studies were conducted on the Lower Kings River. The result of these studies was proposed modifications to the implementation and the monitoring and surveillance portions of this plan. However, due to drought conditions, neither investigation was conclusive. Additional study will be necessary to adequately define the salinity problems and develop policy decisions.
- II-(2)** Beneficial Uses of Surface Water: The Basin Plan designated beneficial uses for all streams in the Tulare Lake Basin but recognized that those uses needed to be modified when additional studies become available. Various agencies have information on uses which were not available in 1975. This information should be used to develop a new table of beneficial uses which accurately describes the individual streams.
- III-(3)** Ground Water Monitoring Network to detect trends in water quality: The Basin Plan describes a ground water monitoring network for the Tulare Lake Basin. This network was never established. As more and more contaminants are found in the ground water, establishment of an effective monitoring system has become imperative.
- IV-(4)** Ground Water Contamination: There are several areas within the Tulare Lake Basin where the ground water is adversely impacted by salts and chemicals to the extent that the ground water no longer supports

all its beneficial uses. In some cases, the cause of the impact is identified and clean-up operations are proceeding. In most cases, the presence of the salts and chemicals are due to nonpoint source impacts and the source is not clear. Investigations should be done to identify potential sources of these contaminants and practices should be developed to reduce these impacts.

~~V-(5)~~ Ground Water Quality Objectives for Salinity: The Basin Plan contains water quality objectives for salinity increases in ground water. These objectives have never been studied to determine their adequacy in promoting the Board's goal of minimizing the rate of salinity increase in the Tulare Lake Basin. A study should be conducted to confirm the adequacy of the listed objectives.

~~VI-(6)~~ Dissolved Oxygen Objectives: The dissolved oxygen objective for Reach III of the Kings River (Pine Flat Dam to Friant-Kern) may not be achievable due to natural conditions. A study should be conducted to investigate this and establish more appropriate objectives, if necessary.

4.4.1 Estimated Costs of Agricultural Water Quality Control Programs

4.4.1.1 Long-Term Irrigated Lands Regulatory Program

The Central Valley Water Board intends on establishing a long-term irrigated lands regulatory program (Long-Term Program) by adopting one or more general waste discharge requirements and/or conditional waivers of WDRs to regulate the discharge of waste to ground and surface waters from irrigated agricultural operations. While the Central Valley Water Board has not established the Long-Term Program yet, it will be based, in whole or in part, on six alternatives described in the *Irrigated Lands Regulatory Program Final Environmental Impact Report* (Final PEIR; ICF International 2011) certified by resolution R5-2011-0017. The cost estimate below is based upon and encompasses the full range of those alternatives.

The cost estimate for the Long-Term Program accounts for program administration (e.g., Board oversight and third-party activities), monitoring for groundwater and surface water quality, and implementation of management practices throughout the Central Valley. The estimated cost for the annual capital and operational costs to comply with the Long-Term Program range from \$216 million to \$1,321 million (2007 dollars). This cost estimate is a cumulative total that includes costs from the Sacramento River and San Joaquin River Basin, and the Tulare Lake Basin.

Potential financing sources include:

~~1-(1)~~ The Federal Farm Bill, which authorizes funding for conservation programs such as the Environmental Quality Incentives Program (EQIP) and the Conservation Stewardship Program.

~~2-(2)~~ Grant and loan programs administered by the State Water Resources Control Board and Department of Water Resources, which are targeted for agricultural drainage management, water use efficiency, and water quality improvement.

These programs include:

~~a-(a)~~ Agricultural Drainage Management Program (State Water Resources Control Board)

~~b-(b)~~ Agricultural Drainage Loan Program (State Water Resources Control Board)

~~e-(c)~~ Clean Water Act funds (State Water Resources Control Board)

~~d-(d)~~ Agricultural Water Quality Grant Program (State Water Resources Control Board)

~~e-(e)~~ Clean Water State Revolving Fund (State Water Resources Control Board)

~~f-(f)~~ Integrated Regional Water Management grants (State Water Resources Control Board, Department of Water Resources)

- ~~3.~~(3) Those identified in the San Joaquin River Subsurface Agricultural Drainage Control Program (see Water Quality Control Plan for the Sacramento River and San Joaquin River Basins), which are listed below:
- ~~a.~~(a) Private financing by individual sources.
 - ~~b.~~(b) Bonded indebtedness or loans from governmental institutions.
 - ~~c.~~(c) Surcharge on water deliveries to lands contributing to the drainage problem.
 - ~~d.~~(d) Ad Valorem tax on lands contributing to the drainage problem.
 - ~~e.~~(e) Taxes and fees levied by a district created for the purpose of drainage management.
 - ~~f.~~(f) State or federal grants or low-interest loan programs.
 - ~~g.~~(g) Single-purpose appropriations from federal or State legislative bodies (including land retirement programs).

In addition to this Basin Plan, statewide plans and policies adopted by the State Water Board direct Regional Water Board actions or clarify the Regional Water Board's intent. Agreements between other agencies and either the State or Regional Water Board also affect Regional Water Board actions. All policies, plans, and agreements may be revised. Any revision will supersede the policies, plans, and agreements described below and found in the appendices.

5.1 STATE WATER BOARD POLICIES AND PLANS

The State Water Board adopts water quality control policies and water quality control plans to direct Regional Water Board actions. Two of the policies (Policy for the Enclosed Bays and Estuaries of California, and the Pollutant Policy Document) and three of the plans (the Ocean Plan, the Delta Plan, and the Tahoe Plan) do not apply to the Tulare Lake Basin. The applicable policies and plans are described below.

~~1~~(1) The State Policy for Water Quality Control

Adopted in 1972, this policy declares the State Water Board's intent to protect water quality through the implementation of water resources management programs and serves as the general basis for subsequent water quality control policies. See Appendix 1.

~~2~~(2) State Water Board Resolution No. 68-16, Statement of Policy with Respect to Maintaining High Quality of Water in California

This policy, adopted on 28 October 1968, is intended to maintain high quality waters. It establishes criteria the Regional Water Board must satisfy before allowing discharges that may reduce water quality of surface or ground waters even though such a reduction will still protect beneficial uses.

Changes in water quality may be allowed only if the change is consistent with maximum benefit to the people of the State, does not unreasonably affect present and anticipated beneficial uses, and does not result in water quality less than that prescribed in water quality control plans and policies. U. S. EPA water quality standards regulations require each state to adopt an "antidegradation" policy and specify the minimum requirements for it {40 CFR 131.12}. The State Water Board has interpreted Resolution No. 68-16 to incorporate the federal antidegradation policy. Appendix 2 contains Resolution No. 68-16, Appendix 26 contains the federal policy.

~~3~~(3) State Water Board Resolution No. 75-58, Water Quality Control Policy on the Use and Disposal of Inland Waters Used for Powerplant Cooling

Adopted in June 1975, this policy prohibits discharge of blowdown waters to land unless in compliance with Title 23, California Code of Regulations, Chapter 15. The policy also prohibits the discharge of once through cooling water to surface waters unless existing water quality and aquatic resources can be maintained. Further, it sets forth seven principles that, among other things, establish higher priorities for use of water sources other than fresh inland waters. For the Tulare Lake Basin, the powerplant must investigate the feasibility of using wastewater for powerplant cooling. Regional water boards are directed to adopt requirements that contain mass emission rates that maintain existing water quality. See Appendix 3.

~~4~~(4) State Water Board Resolution No. 77-1, Policy and Action Plan for Water Reclamation in California

This policy was adopted on 6 January 1977. Because reclamation provides an alternate source of water suitable for irrigation, reuse is encouraged by the State Water Board. The policy also encourages water conservation and calls for other agencies to assist in implementation. See ~~is~~ Appendix 4.

~~5-(5)~~ State Water Board Resolution No. 87-22, Policy on the Disposal of Shredder Waste

This policy, adopted 19 March 1987, permits wastes produced by the mechanical destruction of car bodies, old appliances and similar castoffs to be disposed of into certain landfills at the discretion of and under specific conditions designated and enforced by the Regional Water Board. See Appendix 5.

~~6-(6)~~ State Water Board Resolution No. 88-23, Policy Regarding Regulation of Underground Storage Tanks

This policy, adopted on 18 February 1988, implements a pilot program to fund oversight of remedial action at leaking underground storage tank sites, in cooperation with the California Department of Public Health. Oversight may be deferred to the regional water boards. See Appendix 6.

~~7-(7)~~ State Water Board Resolution No. 88-63, Sources of Drinking Water Policy

This policy, adopted on 19 May 1988, specifies that, except under specifically defined exceptions, all surface and ground waters are suitable or potentially suitable for MUN. The specific exceptions are for waters with existing high total dissolved solids concentrations (greater than 3,000 mg/l), aquifers with low sustainable yield (less than 200 gallons per day for a single well), water with contamination that cannot be treated for domestic use using best management practices or best economically achievable treatment practices, waters within particular municipal, industrial and agricultural wastewater conveyance and holding facilities, and regulated geothermal ground waters. Where the Regional Water Board finds that one of the exceptions applies, it may remove the MUN designation for the particular water body through a formal Basin Plan amendment which includes a public hearing. The exception becomes effective upon approval by the State Water Board and the Office of Administrative Law. See Appendix 7.

~~8-(8)~~ State Water Board Resolution No. 92-49, Policies and Procedures for Investigation and Cleanup and Abatement of Discharges Under Water Code Section 13304

These policies and procedures describe the manner in which the Regional Water Board will require dischargers to cleanup and abate the effect of discharges. This cleanup and abatement shall be done in a manner that promotes attainment of background water quality, or the highest water quality which is reasonable if background levels of water quality cannot be restored. Any cleanup less stringent than background water quality shall be consistent with State Water Board Resolution No. 68-16. These policies and procedures, including future revisions, are specifically incorporated into this Basin Plan. See Appendix 8.

~~9-(9)~~ State Water Board Resolution No. 93-62, Policy for Regulation of Discharges of Municipal Solid Waste

Adopted on 17 June 1993, this policy directs the Regional Water Board to amend waste discharge requirements for municipal solid waste landfills to incorporate pertinent provisions of the federal "Subtitle D" regulations under the Resource Conservation and Recovery Act (40 CFR Parts 257 and 258). Landfills which are subject to the Subtitle D regulations and this policy are those which accepted municipal solid waste on or after 9 October 1991. See Appendix 9.

~~10-(10)~~ The Water Quality Control Plan for the Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California (Thermal Plan)

This plan was adopted on 18 May 1972 and amended 18 September 1975. It specifies water quality objectives, effluent quality limits, and discharge prohibitions related to thermal characteristics of interstate waters and waste discharges. See Appendix 10.

~~11-(11)~~ Nonpoint Source Management Plan and the Nonpoint Source Implementation and Enforcement Policy

In December 1999, the State Water Board, in its continuing efforts to control nonpoint source (NPS) pollution in California, adopted the *Plan for California's Nonpoint Source Pollution Control Program* (NPS Program Plan). The NPS Program Plan upgraded the State's first *Nonpoint Source Management Plan*

adopted by the State Water Board in 1988 (1988 Plan). Upgrading the 1988 Plan with the NPS Program Plan brought the State into compliance with the requirements of Section 319 of the Clean Water Act and Section 6217 of the Coastal Zone Act Reauthorization Amendments of 1990.

The NPS Implementation and Enforcement Policy, adopted by the State Water Board on 20 May 2004 (State Water Board Resolution No. 2004-0030), explains how the Porter-Cologne Act mandates and authorities, delegated to the State Water Board and Regional Water Boards by the California Legislature, will be used to implement and enforce the NPS Program Plan. The policy also provides a bridge between the NPS Program Plan and the *SWRCB Water Quality Enforcement Policy*. The NPS Implementation and Enforcement Policy, including future revisions, is incorporated into this Basin Plan and shall be implemented according to the policy's provisions.

~~12~~-(12) Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (a.k.a. State Implementation Policy or SIP)

The State Water Board adopted a policy that establishes: (1) implementation provisions for priority pollutant criteria promulgated by the U.S. Environmental Protection Agency (U.S. EPA) through the National Toxics Rule (40 CFR 131.36) (promulgated on 22 December 1992 and amended on 4 May 1995) and through the California Toxics Rule (40 CFR 131.38) (promulgated on 18 May 2000 and amended on 13 February 2001), and for priority pollutant objectives established by Regional Water Boards in their basin plans; (2) monitoring requirements for 2,3,7,8-TCDD equivalents; and (3) chronic toxicity control provisions. In addition, the SIP includes special provisions for certain types of discharges and factors that could affect the application of other provisions in the SIP. The SIP including future revisions is incorporated into this Basin Plan and shall be implemented according to the policy's provisions.

~~13~~-(13) Water Quality Enforcement Policy (Enforcement Policy) and Policy on Supplemental Environmental Projects (SEP Policy)

The State Water Board adopted the Enforcement Policy to create a framework for identifying and investigating instances of noncompliance, for taking enforcement actions that are appropriate in relation to the nature and severity of the violation, and for prioritizing enforcement resources to achieve maximum environmental benefits. The State Water Board adopted the SEP Policy as an adjunct to the Water Boards' enforcement program and allows for the inclusion of a supplemental environmental project in administrative civil liability actions as long as certain criteria are met to ensure that such a project has environmental value, furthers the goals of the State Water Board and Regional Water Boards, and are subject to appropriate input and oversight by the Water Boards. Both the Enforcement Policy and the SEP Policy, including future revisions, are incorporated into this Basin Plan and shall be implemented according to the policies' provisions.

~~14~~-(14) Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List (303(d) Listing Policy)

Pursuant to California Water Code Section 13191.3(a), this State policy for water quality control describes the process by which the State Water Board and the Regional Water Boards will comply with the listing requirements of Section 303(d) of the federal Clean Water Act. The objective of this policy is to establish a standardized approach for developing California's Section 303(d) List in order to achieve the overall goal of achieving water quality standards and maintaining beneficial uses in all of California's surface waters. The 303 (d) Listing Policy, including future revisions, is incorporated into this Basin Plan and shall be implemented in accordance with the Policy's provisions.

~~15~~-(15) Water Quality Control Policy for Addressing Impaired Waters: Regulatory Structure and Options (Impaired Waters Policy)

Section 303(d) of the Clean Water Act requires states to identify waters within their borders that are not attaining water quality standards. This State policy for water quality control describes the existing tools and mechanisms that the regional water boards will use to address the water bodies listed as impaired under

Section 303(d) of the federal Clean Water Act. The Impaired Waters Policy, including future revisions, is incorporated into this Basin Plan and shall be implemented in accordance with the Policy's provisions.

~~16.~~(16) Policy for Compliance Schedules in National Pollutant Discharge Elimination System Permits (Compliance Schedule Policy)

The Policy authorizes the Regional Water Board to include a compliance schedule in a permit for an existing discharger to implement a new, revised, or newly interpreted water quality objective or criterion in a water quality standard that results in a permit limitation more stringent than the limitation previously imposed. The Compliance Schedule Policy, including future revisions, is incorporated into this Basin Plan and shall be implemented in accordance with the Policy's provisions.

~~17.~~(17) Policy for Water Quality Control for Recycled Water (Recycled Water Policy)

The Recycled Water Policy establishes requirements to increase the use of recycled water in California. These requirements include the development and adoption of salt/nutrient management plans, requirements for the regulation of incidental runoff from landscape irrigation with recycled water, criteria and procedures for streamlined permitting of recycled water landscape irrigation projects, procedures for permitting ground water recharge projects including procedures for demonstrating compliance with the Resolution No. 68-16 (the State Antidegradation Policy), and provisions for addressing constituents of emerging concern. The Recycled Water Policy, including future revisions, is incorporated into this Basin Plan and shall be implemented in accordance with the Policy's provisions.

~~18.~~(18) Water Quality Control Policy for Siting, Design, Operation, and Maintenance of Onsite Wastewater Treatment Systems (OWTS Policy)

This Policy implements Water Code, Chapter 4.5, Division 7, sections 13290 through 13291.7 by establishing statewide regulations and standards for permitting onsite wastewater systems. The OWTS Policy specifies criteria for existing, replacement, and new onsite systems and establishes a conditional waiver of waste discharge requirements for onsite systems that comply with the policy. The OWTS Policy, including future revisions, is incorporated into this Basin Plan and shall be implemented according to the policy's provisions.

5.2 STATE WATER BOARD MANAGEMENT AGENCY AGREEMENTS (MAAS), MEMORANDA OF UNDERSTANDING (MOUS), AND MEMORANDA OF AGREEMENT (MOAS)

The Regional Water Board acts in accordance with State Water Board agreements with federal agencies and other State agencies which have been formalized with either an MAA, MOU, or an MOA.

~~1.~~(1) U. S. Forest Service Agreement

On 26 February 1981 the State Water Board Executive Director signed an MAA with the U. S. Forest Service (Forest Service) which waives discharge requirements for certain Forest Service nonpoint source discharges provided that the Forest Service implements State Water Board approved best management practices and procedures and the provisions of the MAA. The MAA covers all Forest Service lands in California. Implementation of the best management plans, in conjunction with monitoring and performance review requirements approved by the State and Regional Water Boards, is the primary method of meeting the Basin Plan's water quality objectives for the activities to which the best management plans apply. The MAA does not include Forest Service point source discharges and in no way limits the authority of the Regional Water Board to carry out its legal responsibilities for management or regulation of water quality. See Appendix 11.

2-(2) Department of Toxic Substances Control

On 26 January 1986, the State Water Board signed an MOA with the Department of Health Services, now the Department of Toxic Substances Control, regarding the implementation of the hazardous waste program. The agreement covers surveillance and enforcement related to water quality at landfills, surface impoundments, waste piles, and land treatment facilities that treat, store, or dispose of hazardous waste. It also covers the issuance, modification, or denial of permits to facilities, including the revision of the water quality aspects of hazardous waste management facility siting, design, closure, post-closure, and surface and ground water monitoring and protection. See Appendix 12.

3-(3) State Water Board Division of Drinking Water Programs

In 1988, the State Water Board signed an MOA with the Department of Health Services (now the State Water Board Division of Drinking Water Programs) regarding the use of reclaimed water. The MOA outlines the basic activities of the agencies, allocates primary areas of responsibility and authority between these agencies, and provides for methods and mechanisms to assure coordination for activities related to the use of reclaimed water. See Appendix 13.

4-(4) California Department of Forestry Agreement

In February 1988, the State Water Board signed an MAA with the California Department of Forestry and Fire Protection and the California Board of Forestry, for the purpose of carrying out, pursuant to Section 208 of the Federal Clean Water Act, those portions of the State's Water Quality Management Plan related to controlling water quality impacts caused by silvicultural activities on nonfederal forest lands. As with the Forest Service MAA, the Department of Forestry agreement requires the Department to implement certain best management plans to protect water quality from timber harvest and associated activities. Approval of the MAA as a water quality management plan component by the U. S. EPA results in the Regional Water Boards relinquishing some authority to issue waste discharge requirements for State timber operations. However, Department of Forestry and the Regional and State Water Boards must still ensure that the operations incorporate best management plans and comply with applicable water quality standards. Appendix F of the MAA also calls for the preparation of a MOU for the Regional Water Boards, the State Water Board, and the Department of Forestry to prescribe interagency procedures for implementing best management plans. See Appendix 14.

5-(5) Department of Conservation Agreement

A March 1988 MOA between the State Water Board and the State Department of Conservation, California Department of Oil and Gas, Gas & Geothermal Resources (Department of Conservation), outlines procedures for reporting proposed oil, gas, and geothermal field discharges and for prescribing permit requirements. The procedures are intended to provide a coordinated approach resulting in a single permit satisfying the statutory obligations of both agencies. The purpose of the new agreement is to ensure that the construction or operation of Class II injection disposal wells and the land disposal of wastewaters from oil, gas, and geothermal production facilities does not cause degradation of waters of the state. The MOA requires the Department of Conservation to notify the Regional Water Board of all pollution problems, including spills associated with operators and/or new proposed oil field discharges. The agencies work together to review, prepare, and coordinate permits and enforcement. See Appendix 15.

6-(6) Department of Toxic Substances Control

On 30 July 1990, the State Water Board signed a MOU with the Department of Health Services, Toxic Substances Control Program (later reorganized into the Department of Toxic Substances Control) explaining the roles of the agencies (including the Regional Water Board) in the cleanup of hazardous waste sites. The MOU describes the protocol the agencies will follow to determine which agency will act as lead and which will act as support, the responsibilities of the agencies in their respective roles, the procedures the agencies will follow to ensure coordinated action, the technical and procedural requirements which each agency must satisfy, the procedures for enforcement and settlement, and the mechanism for

dispute resolution. This MOU does not alter the Regional Water Board's responsibilities with respect to water quality protection. See Appendix 16.

~~7~~(7) Soil Conservation Service, U. S. Department of Agriculture

On 31 July 1990, the State Water Board signed a MOU with the Soil Conservation Service, now the Natural Resources Conservation Service, to develop appropriate guidelines and procedures to provide technical assistance on the management of nonpoint sources. See Appendix 17.

~~8~~(8) Environmental Affairs Agency, Air Resources Board, and California Department of Resources Recycling and Recovery (CalRecycle)

On 27 August 1990, the State Water Board signed a MOU with the Environmental Affairs Agency, Air Resources Board, and California Integrated Waste Management Board (now CalRecycle) to enhance program coordination and reduce duplication of effort. This MOU consists of provisions describing the scope of the agreement (including definitions of the parties and issues to which the MOU applies), the principles which will govern the conduct of the parties, and the existing statutory framework. See Appendix 18.

~~9~~(9) California Department of Pesticide Regulation

On 23 December 1991, the State Water Board signed a MOU with the California Department of Pesticide Regulation to exchange information regarding pesticides in surface waters, develop water quality objectives to protect beneficial uses, and promote the identification and development of best management practices whenever necessary to protect beneficial uses. This agreement was revised on 19 January 1993 to facilitate implementation of the original agreement. See Appendix 19.

~~10~~(10) Implementation of the San Joaquin Valley Drainage Program's Recommended Plan

In January 1992, the State Water Board signed a MOU with the U. S. Bureau of Reclamation, the U. S. Fish and Wildlife Service, the U. S. Soil Conservation Service (now the Natural Resources Conservation Service), the U. S. Geological Survey, the Department of Water Resources, the Department of Fish and Game (now the California Department of Fish and Wildlife), and the Department of Food and Agriculture. Subject to the availability of funding and legal authority, these agencies agreed to use the management plan described in the September 1990 final report of the San Joaquin Valley Drainage Program as a guide for remediating subsurface agricultural drainage and related problems. See Appendix 20.

~~11~~(11) California Integrated Waste Management Board (now the California Department of Resources Recycling and Recovery (CalRecycle))

On 8 January 1993, the State Water Board signed a MOU to address the Regional Water Board's review of Solid Waste Assessment Test (SWAT) reports. See Appendix 21.

~~12~~(12) U. S. Bureau of Land Management

On 27 January 1993, the State Water Board signed a MOU to work cooperatively with the U. S. Bureau of Land Management to develop and implement best management practices to reduce or prevent nonpoint source pollution. See Appendix 22.

5.3 REGIONAL WATER BOARD GENERAL POLICY

~~1~~(1) Regional Water Board Resolution No. 70-118, Delegation of Duties and Powers to the Regional Water Board's Executive Officer

In January 1970, the Regional Water Board adopted Resolution No. 70-118, which delegates certain duties and powers of the Board to its Executive Officer pursuant to Section 13223 of the California Water Code. See Appendix 23.

5.4 REGIONAL WATER BOARD MEMORANDA OF UNDERSTANDING (MOU)

1(1) U. S. Bureau of Land Management

In September 1985, the Regional Water Board Executive Officer signed an MOU with the U. S. Bureau of Land Management, Bakersfield District. The MOU aims at improving coordination between the two agencies for the control of water quality problems resulting from mineral extraction activities on BLM administered lands. See Appendix 24.

2(2) California Department of Fish and Wildlife and Mosquito Abatement and Vector Control Districts

In March 1993, the Regional Water Board Executive Officer signed a MOU with the Department of Fish and Game (now the California Department of Fish and Wildlife) and Mosquito Abatement Districts in the southern San Joaquin Valley to coordinate weed control efforts in wastewater treatment facilities. See Appendix 25.

VI.6 SURVEILLANCE AND MONITORING

The effectiveness of a water quality control program cannot be judged without the information supplied by a comprehensive surveillance and monitoring program. This chapter describes the methods and programs that the Regional Water Board uses to acquire water quality information. Accumulation of data is required by both the Clean Water Act and the Porter-Cologne Water Quality Control Act.

Many local water agencies conduct data collection programs, as do some governmental agencies. Cost-effective management shows the benefit of utilizing local efforts for basic elements of the programs. Governmental agencies would perform valuable service by processing data, engaging in cooperative programs, and conducting special studies and intensive surveys.

Although not addressed in detail in this chapter, water quality analysis must comply with the laboratory certification program, and data must be reported to EPA in a form compatible with the STORET; the federal data storage and retrieval program.

The overall objectives of the surveillance and monitoring program are to:

- Measure the achievement of water quality goals and objectives and to aid in setting priorities for improvements;
- Measure specific effects of water quality changes on the beneficial uses;
- Measure background conditions of water quality and long-term trends in water quality;
- Locate and identify sources of water pollution that pose an acute, accumulative, or chronic threat to the environment;
- Provide information needed to relate receiving water quality to mass emissions of point and nonpoint sources of pollutants;
- Provide data for determining waste discharger compliance with NPDES permit conditions and waste discharge requirements;
- Collect data necessary to perform segment classifications and ranking for the water quality assessment;
- Form a basis for setting water quality based requirements;
- Provide data for preparing waste load allocations and total maximum daily load allocations necessary to achieve water quality control in water quality limited segments;
- Provide data needed to carry on the continuing planning process;
- Measure the effects of water rights decisions on water quality and to guide the State Water Board in its responsibility to regulate unappropriated water for the control of quality;
- Provide a clearinghouse for the collection and dissemination of water quality data gathered by other agencies and private parties cooperating in the program;
- Prepare reports on water quality conditions as required by Federal and State regulations and other users requesting water quality data.

Currently, monitoring and surveillance by the Regional Water Board within the Tulare Lake Basin is irregular and detailed information may not be available for certain areas in the Basin. In selecting sampling points, maximum use will be made of stations and data that are now a part of the program of other governmental agencies with whom cooperation has been agreed upon or favorably discussed. In order to ensure that collected data is useful to the

present surveillance program, stations will be selected which can reasonably be expected to provide information consistent with the needs of this plan.

The Regional Water Board's surveillance and monitoring efforts include different types of sample collection and analysis. Surface water surveillance may involve analyses of water, sediment, or tissue samples. Ground water surveillance often includes collection and analysis of soil samples. Soil, water, and sediment samples are analyzed via standard, EPA approved, laboratory methods. The Regional Water Board addresses quality assurance through bid specifications and individual sampling actions such as submittal of split, duplicate, or spiked samples and lab inspections.

Although surveillance and monitoring efforts have traditionally relied upon measurement of key chemical or physical parameters (e.g., metals, organic and inorganic compounds, bacteria, temperature, and dissolved oxygen) as indicators of water quality, there is increasing recognition that close approximation of water quality impacts requires the use of biological indicators. This is particularly true for regulation of toxic compounds in surface waters where standard physical or chemical measurement may be inadequate to indicate the wide range of substances and circumstances able to cause toxicity to aquatic organisms. The use of biological indicators to identify or measure toxic discharges is often referred to as biotoxicity testing. EPA has issued guidelines and technical support materials for biotoxicity testing. A key use of the method is to monitor for compliance with narrative water quality objectives or permit requirements that specify that there is to be no discharge of toxic materials in toxic amounts. The Regional Water Board will continue to use biotoxicity procedures and testing in its surveillance and monitoring program.

The recommended surveillance program is composed of the following elements:

6.1 SURFACE WATER

The surface water monitoring network for the Tulare Lake Basin will be composed of a small number of fixed stations to evaluate water quality trends. If additional stations, parameters, or frequencies are required in this network, contractual funds should be budgeted by the State Water Board.

Sampling stations for the major surface waters of the Tulare Lake Basin were selected from those used by the Department of Water Resources in their surface water quality monitoring program. Areas not covered may be supplemented by other federal, state or local data on water column sampling. Table ~~V16~~-1 lists the surface water sampling stations for the Tulare Lake Basin.

Surface water grab samples are expected to provide sufficient analytical detail to affirm the mineral character of the stream at key points, occurrence of toxic substances, general levels of nutrients and biological responses, and common physical characteristics.

The State Water Board manages its own Toxic Substances Monitoring Program to collect and analyze fish tissue for the presence of bioaccumulative chemicals. The Regional Water Board participates in the selection of sampling sites for its basins and annually is provided with a report of the testing results.

Table ~~V16~~-1
SURFACE WATER SAMPLING STATIONS

<u>DWR Station No.</u>	<u>Station Name</u>
	Kings River
C1 1490.00	Above North Fork at Rogers Crossing
C1 1460.00	Below North Fork
C1 1140.00	Below Pine Flat Reservoir
C0 1140.00	Below Peoples Weir near Kingsburg
C0 1121.00	South Fork below Empire Weir 2 near Stratford
C0 1128.00	North Fork below Stinson Weir near Wheaton

Table VI-1
SURFACE WATER SAMPLING STATIONS

	Kaweah River
C2 1250.00	At Three Rivers
C0 2185.00	Below Terminus Dam
	Tule River
C3 1150.00	Near Springville
C0 3196.00	Below Success Dam
	Kern River
C5 1500.00	At Kernville
C5 1350.00	Below Isabella Dam
C0 5150.00	Near Bakersfield
	California Aqueduct at Check 13
	California Aqueduct at Tehachapi Afterbay
B7 1910.00	Friant-Kern Canal at Friant
B0 7715.00	San Joaquin River above Mendota Dam
	San Luis Drain near Mendota
C0 0965.00	Buena Vista Slough near Lost Hills
C6 1350.00	Caliente Creek near Bena
	Grapevine Creek at Grapevine
C7 1820.00	Bitterwater Creek near Lost Hills
C0 7120.00	Avenal Creek near Avenal
C0 7050.00	Zapato Chino near Avenal
	Jacalitos Creek near Coalinga
C7 5400.00	Warthan Creek Trib 2 near Coalinga
C7 6150.00	Los Gatos Creek above Nunez Canyon near Coalinga
C7 7050.00	Cantua Creek near Cantua
B8 1100.00	Panoche Creek below Silver Creek near Panoche
C1 5100.00	Dry Creek near Academy
C0 1555.00	Dog Creek below Dry Creek near Academy
	Redbank Creek
	Fancher Creek
C1 1120.00	Mill Creek near Piedra
C0 1185.00	Wahtoke Creek near Navelencia
C0 2520.00	Sand Creek near Monson
C0 2680.00	Cottonwood Creek near Redbank
C0 2780.00	Limekiln Creek near Terminus
C2 8170.00	Yokhohl Creek at Friant Kern Canyon near Exeter
C0 3650.00	Lewis Creek East of Lindsay
C3 5100.00	Deer Creek Foothills near Terra Bella
C4 1100.00	White River Foothills near Ducor

6.2 GROUND WATER

Ground water monitoring will be undertaken in various areas to support activities in the point and nonpoint source investigations. Sampling will be done to show long-term trends and identify problem areas for further study. Basins with the highest priority will be selected on the basis of economic importance and degree of threat to ground water quality. The first priority subtasks are:

- Designation of principal aquifers
- Selection of wells for potential inclusion in the ground water network
- Identification of potential pollution sources.

Wells for this ground water monitoring network shall be selected from a pool of qualified wells. Qualified wells are geologically and structurally described on a well log which includes perforated intervals. Qualified wells are also clearly located and accessible. Field checks of their availability, suitability, and access will be made. Final selection of wells shall be based on how representative the well is of ground water pollution and in areas of high use of ground water. This effort also relies upon information generated as part of state and federal programs' ground water surveillance efforts. A Ground Water Sampling Manual should be prepared by the State Water Board in cooperation with the Department of Water Resources to standardize sampling procedures and give guidance to local agencies when conducting ground water data programs.

6.3 SELF-MONITORING

Self-monitoring reports are normally submitted by the discharger on a monthly or quarterly basis as required by the permit conditions. Most dischargers will be required to submit self-monitoring reports. These reports will be reviewed by the Regional Water Board and entered into the data bank. This program will be continued at its present level, with additions made to the present list as additional self-monitoring requirements are imposed.

6.4 COMPLIANCE MONITORING

Compliance monitoring will determine permit compliance, validate self-monitoring reports, and provide data for enforcement actions. Discharger compliance monitoring and enforcement actions are the responsibility of Regional Water Board staff. The key element of the compliance monitoring program will be personal visits to the facility for direct observation and to review procedures that assure quality control.

The scope of the Compliance Monitoring Program for the Basin depends on the number and complexity of Waste Discharge Requirements and NPDES orders issued.

6.5 COMPLAINT INVESTIGATION

Every effort will be made to prevent conditions that give rise to complaints. When such conditions occur, complaints from citizens and public or governmental agencies stemming from the discharge of pollutants or creation of nuisance conditions will be investigated. The Regional Water Board will document observed conditions and prepare reports and letters, or take other follow-up actions as necessary.

6.6 INTENSIVE SURVEYS

Intensive monitoring surveys are specially designed to investigate problems in water quality class segments or hydrologic units requiring sampling in addition to the routine monitoring programs. Surveys are repeated at appropriate intervals depending on the parameters involved, the variability of conditions, and changes in hydrologic or effluent regimes. They usually consist of localized intermittent sampling at a higher than normal frequency. These surveys will provide detailed water quality data to locate and evaluate violations of water quality objectives and to calculate waste load allocations or total maximum daily load allocations as the case may require. The level of effort devoted to a given monitoring survey will depend upon the severity and complexity of the pollution problem in the survey area.

6.7 AERIAL SURVEILLANCE

Low-altitude flights are conducted primarily to observe variations in field conditions, gather photographic records of discharges, and document variations in water quality.

6.8 SUBSURFACE AGRICULTURAL DRAINAGE

All local agricultural water supply and drainage agencies should participate in joint, coordinated programs to monitor the volume and quality of drainage water in collection, treatment, and/or disposal systems.

6.9 LOWER KINGS RIVER

The Kings River Conservation District should continue monitoring the Lower Kings River monthly for electrical conductivity, pH and temperature.

The Regional Water Board should continue monitoring the River and specific discharges for constituents of concern on a regular basis. River samples should focus on areas of special concern, i.e. where human activity such as fishing or boating is most frequent and/or where water quality objectives are not met on a regular basis. Specific discharges should be selected based upon the electrical conductivity of the discharge. Monitoring should be conducted quarterly, at a minimum, to assess seasonal variations in flow and water quality.

The Regional Water Board should monitor storm water discharges from NAS Lemoore to check for hydrocarbons during peak flow periods and review existing pollution control procedures at the installation to insure such discharges are minimized.

7 GLOSSARY

Regional Water Board: California Regional Water Quality Control Board, Central Valley Region (Wat. Code, § 13203)

State Water Board: State Water Resources Control Board

Attachment 2b

Reformat Amendments to the Water Quality Control Plan for the Tulare Lake Basin

Revised Appendices 2, 3, 4, 5, 6, 7 and 10

Changes shown in **red** and ~~strikeout~~ and underline

Appendix 2

State Water Board Resolution No. 68-16 Statement of Policy with Respect to Maintaining High Quality of Waters in California

https://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/1968/rs68_016.pdf

Appendix 3

State Water Board Resolution No. 75-58 Water Quality Control Policy on the Use and Disposal of Inland Waters Used for Powerplant Cooling

https://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/1975/rs75_058.pdf

Appendix 4

State Water Board Resolution No. 77-1 Policy with Respect to Water Reclamation in California

https://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/1977/rs77_001.pdf

Appendix 5

State Water Board Resolution No. 87-22 Policy on the Disposal of Shredder Waste

https://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/1987/rs1987_0022.pdf

Appendix 6

State Water Board Resolution No. 88-23 Policy Regarding the Underground Storage Tank Pilot Program

https://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/1988/rs1988_0023.pdf

Appendix 7

State Water Board Resolution No. 88-63 Sources of Drinking Water Policy

https://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/2006/rs2006_0008_rev_rs88_63.pdf

Appendix 10

State Water Board Water Quality Control Plan for Temperature in Coastal and Interstate Waters and Enclosed Bays and Estuaries in California (Thermal Plan)

https://www.waterboards.ca.gov/water_issues/programs/ocean/docs/wgplans/thermpln.pdf